



**OAW**

Österreichische Akademie  
der Wissenschaften

# Progress Report

2006–2007

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## Preface

With a staff of more than one thousand scientific and technical co-workers in 66 research institutions the Austrian Academy of Sciences is unquestionably the most important scientific authority in Austria. All its research activities aim to achieve a degree of excellence in accord with international standards. In order to combine small units into larger institutions, research centres have been established in the philosophical-historical section and in the geosciences. All centres and research institutes are correlated to international scientific councils. A board of international experts will cooperate with the Academy on issues concerning the coordination of research projects and the pursuit of specific scientific objectives. Besides this commitment the board will administer the regular evaluation of all institutions of the Academy in respect to their five-year research programmes. From the year 2006 onward a reorganisation of the Austrian Academy of Sciences has been initiated, which will further enhance its function as an agent for the advancement of science. In 2007 the legal conditions for new structures were established through alterations of its statute and rules of procedure. The new rules came into force on 1 January 2008 and are now gradually being implemented. The Academy has established a “junior division”, in which highly qualified young Austrian scientists of an age below 45 years will be represented. Representatives of the junior division will cooperate in the administrative bodies of

the Academy and are expected to intensify contacts with the young scientific avant-garde outside the institutions of the Academy. A complete coverage of all scientific subdisciplines through the Academy is impossible. For this reason additional criteria for the establishment of research institutions had to be set up: a complementary function in regard to disciplines represented at the universities, long-term undertakings, intensified participation in high level international research as well as support for existent national know-how. Nevertheless, the research institutions of the Academy reflect a wide range of Austria’s scientific scene, embracing technical sciences, biology, medicine and environment, physics, space research, geosciences, mathematics, social sciences, linguistics and literary studies, cultural and historical studies, and law. In the bio-medical division three institutes were established as limited companies; in this way a new type of basic research institution has been created that combines an advanced autonomy with a higher degree of responsibility and an improved potential for cooperation with business. The following report on the years 2006 and 2007 is intended to afford an insight into the diversity of the research and publishing activities of the Academy and to give proof of its achievements to the public.

Peter Schuster  
President

Herbert Matis,  
Vice-President



# **Research Facilities of the Section for Mathematics and the Natural Sciences**

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## Biology and Medicine

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### CeMM – Research Center for Molecular Medicine GmbH

Head: GIULIO SUPERTI-FURGA



#### Aims and Functions

CeMM is an international, independent and interdisciplinary research Center in Molecular Medicine of the Austrian Academy of Science. “From the clinic to the clinic”: Driven by medical needs, CeMM integrates basic research and clinical expertise to pursue innovative diagnostic and therapeutic approaches focused on cancer, inflammation and immune disorders.

At the center of CeMM’s interest are patients and associated diseases. The goal of CeMM is to assist in preparing the predictive, preventive and personalized medicine of the future. CeMM’s mission is to combine insight obtained from basic and clinical research and use it to implement the development of innovative therapeutic and diagnostic strategies. Located at the Vienna General Hospital (AKH), Austria’s largest medical research complex, CeMM functions as bidirectional channel between basic research and clinical

applications. CeMM provides access to post-genomic technologies for the biomedical community and is a training and teaching center for a new generation of researchers in molecular medicine.

At CeMM, we are interested in the molecular mechanisms responsible for pathological processes as well as the mode-of-action of novel or existing drugs. CeMM employs a “systems-wide” approach elucidating molecules and pathways that play a role across different disease conditions. These molecular systems-medicine techniques encompass modern post-genomic methods including functional genomics, proteomics, chemical biology, biological-chip technologies and bioinformatics.

#### Results for 2006–2007

Giulio Superti-Furga assumed the scientific leadership of CeMM at the beginning of 2005.



Fig. 1:  
CeMM Building, constructed at the center of the General Hospital Campus. Expected completion: End of 2009/ Beginning of 2010



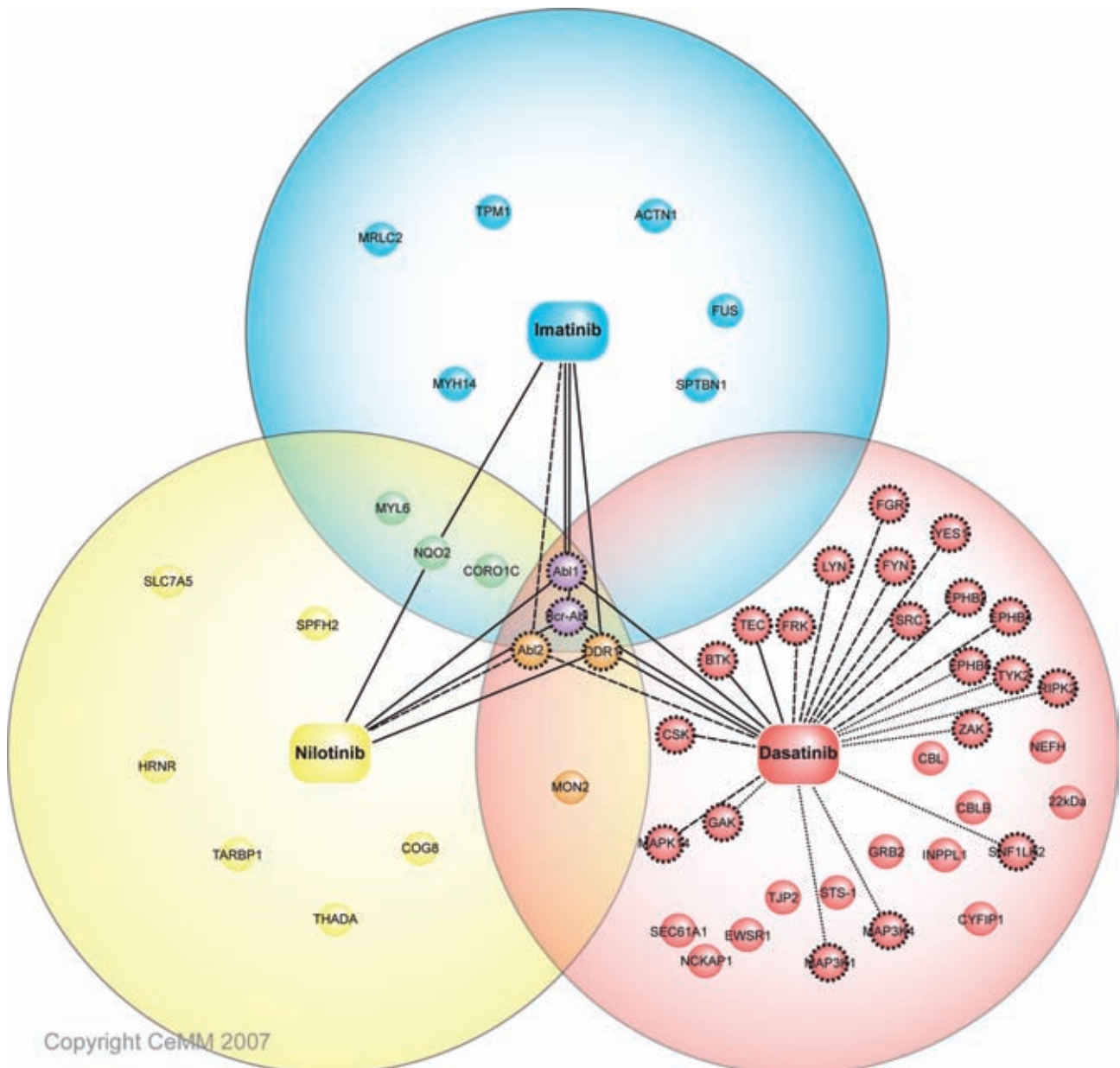


Fig. 3: Cartoon of the interaction network of tyrosine kinase inhibitors imatinib, dasatinib and nilotinib with their respective protein targets. Data were obtained by chemical proteomics, and protein targets for each drug are shown in a different color. Solid (Superti-Furga laboratory) and hatched (literature) lines represent interactions that have been confirmed in cells or *in vitro*, and dotted lines represent highly probable direct interactions. Note the dramatic differences between the interaction networks of the different drugs and the small number of overlapping targets – namely Bcr-Abl, Abi1 and Abi2 kinases and the receptor tyrosine kinase DDR1. The latter, as well as the oxidoreductase NQO2 and the Tec-family kinases Btk and Tec, are potentially novel drug targets and could explain the side effects of the drugs.

- Dieter Maurer, Lymphatic Endothelium as Gatekeeper for Leukocyte Trafficking
- Günter Steiner, Immunotherapy of Rheumatoid Arthritis

Three publications published in 2006/2007 should be highlighted:

- An efficient tandem affinity purification procedure for interaction proteomics in mammalian cells by Bürckstümmer T, Bennett KL, Preradovic A, Schüt-

ze G, Hantschel O, Superti-Furga G, Bauch A. Nat Methods 2006 Dec; 3(12): 1013-9.

CeMM has obtained more than 200 material requests after the publication of this new analytical method for human protein complexes. Recipient colleagues represent the who's who of biochemistry and signal transduction from all over the world, including Nobel prize laureates and Howard Hughes Investigators.

- Chemical proteomic profiles of the BCR-ABL inhibitors imatinib, nilotinib and dasatinib reveal novel kinase and non-kinase targets by Rix U, Hantschel O, Durnberger G, Rensing Rix LL, Planyavsky M, Fernbach NV, Kaupe I, Bennett KL, Valent P, Colinge J, Kocher T, Superti-Furga G. *Blood* 2007 Aug; 110(12): 4055-63.
- The Btk tyrosine kinase is a major target of the Bcr-Abl inhibitor dasatinib by Hantschel O, Rix U, Schmidt U, Burckstummer T, Kneidinger M, Schutze G, Colinge J, Bennett KL, Ellmeier W, Valent P, Superti-Furga G. *Proc Natl Acad Sci USA* 2007 Aug; 104(33): 13283-8.

In the third quarter of 2007 we have seen the fruits of the investments of the first years, with the publication of two medically-oriented papers in PNAS and in *Blood*. Both represent an important step as they stem from collaborations with clinical as well as non-clinical departments of the MUW. The work describes the molecular mechanism of action of three clinical drugs and the resulting possibilities for additional medical indications for the same compounds as well as a rationale for some of the observed side effects.

#### **Preview for 2008–2009**

CeMM Principal Investigators are building a growing network of collaborations with biomedical researchers and clinicians in the immediate Viennese surrounding as well as at the international level. Partnerships and collaborations are central to CeMM's mission as a center of reference for modern research networking in molecular medicine. CeMM's expertise and state-of-the-art instrumentation are accessible to the biomedical community and industrial partners via research collaborations.

Expected breakthroughs involve the discovery and characterization of genes involved in the predisposition to several frequent malignancies of the hematological system as well as the description of mechanisms aimed at boosting the organism's own inborn defense mechanisms. We further hope to identify new biomarkers for immunological and inflammatory conditions as well as elucidate the mechanism of action of important therapeutic agents.

CeMM's new building, expected to be ready by the end of 2009/beginning of 2010, will be situated in the AKH/MUV campus, house about 90 collaborators and require an overall yearly budget of approx. 9 Mio. Euro. In strategic questions CeMM will be advised by a newly appointed Supervisory Board. An international Scientific Advisory Board will continue to assist CeMM in its scientific direction.

## Breath Research Unit, AA

Head: ANTON AMANN



### Aims and Functions

The Breath Research Unit of the Austrian Academy of Sciences (AA\_OAW) is located in Dornbirn (province of Vorarlberg), close to the Swiss border. AA\_OAW is an international leading competence unit for research and development of breath tests for medical diagnosis. Breath analysis is – in contrast to blood tests or a gastroscopy – non-invasive, and is therefore appreciated by both young and old patients. Nowadays, mass spectrometric detection of volatile compounds is possible in concentration ranges down to parts per billion. It is the aim of the AA\_OAW to develop and validate breath tests for application in clinical practice by the next years. Pilot studies showed that this methodology can be useful to detect several diseases or to monitor effects of therapies. However, many research efforts are still necessary to reach these goals.

First qualitative measurements were performed by Nobel laureate Linus Pauling, who used gas chromatography to show that exhaled breath contains many different volatile organic compounds. The most important

questions for clinical application of breath tests are: How can breath gas measurement being standardized, and how can artefacts being avoided when applying analytical methodologies? Therefore, the Breath Research Unit tries to build up a worldwide network of leading scientists from the field of breath analysis, who are associated with the AA\_OAW.

The AA\_OAW is member of the International Association for Breath Research (IABR), which was founded in Schoenbrunn Palace, Vienna, in 2005. This association consists of around 30 research units worldwide.

### Results for 2007

Anton Amann (ETH Zurich and Innsbruck Medical University) has been appointed as Director of AA\_OAW in March 2007. Since that time, he has promoted many activities, which range from the project coordinator position of BAMOD (sixth frame work program), to project leadership at the Innsbruck University Clinics and a comprehensive study in collaboration with “aks Gesundheitsvorsorge” in Bregenz.



Fig. 1:  
headspace vials for gas chromatographic  
analysis



Fig. 2: tedlar bags ready for automatic proton transfer reaction mass spectrometric analysis

The aim of BAMOD is to detect markers for lung and oesophagus carcinoma to develop a breath test for early diagnosis. This project with its 13 European research centres is multidisciplinary, which means, that not only physicians and natural scientists but also mathematicians, software developers and analytical staff are involved.

In collaboration with the Innsbruck University Clinic of Pediatrics, markers in breath were detected which might allow therapeutic monitoring of a hereditary disease, propionic acidaemia. The analytical potential of breath research has been demonstrated with diagnostic on-line monitoring during methadone therapy at Innsbruck University Clinic for Psychiatry. All these projects have to be considered as pilot studies.

In collaboration with “aks Gesundheitsvorsorge” a comprehensive field study has been performed to test the feasibility of breath sampling in practice. The study showed that a dozen of general practitioners had no problems to work with breath sampling techniques during a time period of three months.

A newly allocated project will focus on possibilities to determine cancer of the upper airways. The Breath Research Unit of the Austrian Academy of Sciences has a focus on development of technologies for early diagnosis of different types of cancer during the next years.

A project for simulation and modelling of hemodynamics and lung mechanics will be performed by a DOC fellowship PhD student. This comprises, in par-



Fig. 3: campus DORNBIRN II – © PRISMA Holding AG

ticular, on-line measurements of exhaled breath during training on an ergometer and during night in a sleep laboratory. Since exhaled breath can be sampled continuously, one may thereby observe the dynamics of volatile compounds' concentration during a relatively long time.

#### **Preview for 2008–2009**

The Breath Research Unit (AA\_OAW) is the first academic institution of the Austrian Academy of Sciences in the province of Vorarlberg. The AA\_OAW will promote the city of Dornbirn as leading competence unit location for breath research.

The Director of AA\_OAW, Anton Amann, is editor-in-chief of the "Journal of Breath Research" (IOP, Bristol,

UK) since 2007, which presently is the only journal devoted to exhaled breath research.

Within the seventh framework programme of the European Commission, the AA\_OAW is partner in a project which aims at detecting entrapped persons by use of trace gas analysis, e.g. in collapsed buildings after an earthquake.

All research projects mentioned above require a professional research infrastructure which the "campus DORNBIERN II" may offer. Therefore, AA\_OAW intends to join these governmental and non-governmental endeavours to build a multidisciplinary research infrastructure in the city of Dornbirn.

*Author: MMMag. Marco Freek*

## GMI – Gregor Mendel Institute of Molecular Plant Biology

Head: DIETER SCHWEIZER<sup>\*)</sup>



### Aims and Functions

There is a long tradition of plant research in Austria. However, due to the ongoing public debate about genetically modified agricultural products and due to the importance of animal models for biomedical research, over the last few decades the political will to allocate research funds for basic research in plant biology has been diminishing. Plants are, however, the primary producers of all organic matter and biomass, and are thus the most important group of organisms in the biogeochemical cycles of the biosphere. Research funding should reflect the special position accorded to plants in nature. By establishing the Gregor Mendel Institute (GMI) in the year 2000 at the Vienna Biocenter Campus, the Austrian Academy of Sciences undertook an important initiative in counteracting the misguided lack of support for plant research.

Basic research is performed at the GMI, and research projects chiefly concentrate on topics of general biological interest such as physiology, cell and developmental biology, and plant genetics. The institute's results are published in high impact, international, peer-reviewed journals, and where appropriate patent applications are submitted with a view to commercialisation.

While the establishment of IMBA (Institute for Molecular Biotechnology), a second Academy institute located in the same building and opened at the same time as the GMI strengthened existing research areas in Austria, the establishment of the GMI has complemented the Austrian research landscape. Both institutes play an important role at the Vienna Biocenter Campus as partners of the neighbouring university institutes, namely the Max F. Perutz Laboratories of the University and of the Medical University of Vienna. The Gregor Mendel Institute thus capitalises on the resulting synergies and GMI members take part in a certain amount of teach-

ing at the university. Highly desirable interdisciplinary approaches from diverse fields of biological research are inevitably promoted at the Vienna Biocenter Campus, also home to the renowned Research Institute of Molecular Pathology (IMP), by the proximity of talented researchers from different disciplines.

### Results for 2006–2007

All eight group leaders at the GMI at three levels (Senior, Junior, Young) are autonomous regarding their research topics but also regarding personnel and budget matters, which is guaranteed contractually. The research groups at the GMI work on individual research topics and their results are evaluated annually by an external, international scientific advisory board. The GMI is promoting a pioneering programme at the campus to fund exceptional, young researchers (Young Investigators), who are given the opportunity to lead their own groups after only a single post-doc position. In the case of junior groups, group projects last for the period of employment of the group leader (5 + 3 years for Junior Principal Investigators; 5 years for Young Investigators). The following concisely described research projects are primarily GMI-financed but also include projects funded by external funds (FWF, WWTF, GEN-AU, EU, NSF).

*Group Werner Aufsatz* (start date: July 2005). A new allele of *Arabidopsis* histone deacetylase 6, an HDAC involved in RNA-mediated transcriptional gene silencing, was identified, which uncouples silencing and DNA methylation. The group further identified interesting interaction partners of HDA6, which suggest a novel recruitment mechanism of HDA6 to target genes by silencing RNAs.

*Group Thomas Greb* (start date: February 2006). This newly established group started a new research programme at the GMI addressing the molecular control of vascular tissue development in *Arabidopsis thaliana*.

<sup>\*)</sup> Dr. Ortrun Mittelsten Scheid was appointed interim director as of 1st December 2007.



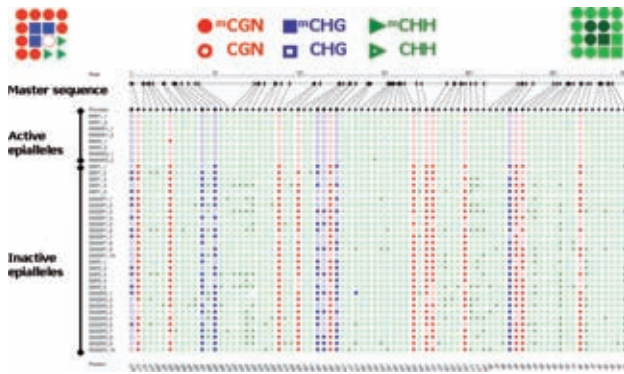


Fig. 1: CyMATE: Cytosine Methylation Analysis Tool for Every-one. This software tool, developed in cooperation with the Vienna University of Technology, can analyse DNA methylation data after bisulfite sequencing and helps to document the location and quantity of modified cytosine residues in every sequence context, as shown here for the promoter region of active and inactive epialleles in diploid and tetraploid plants. The tool is available at: <http://www.gmi.oew.ac.at/cymate>.

Several factors important for the process of secondary growth initiation, which is the basis of lateral growth of shoot axes by the formation of vascular tissue, were identified and characterised. These findings have implications for the understanding of plant development in general and specifically for wood production in trees.

*Group Claudia Jonak* (start date: June 2005). Environmental stress impairs plant growth and development, and severely limits agricultural yield. A multidisciplinary approach was used to identify a protein kinase as a key regulator linking stress-induced signal transduction with the metabolic adaptation response. The publication reporting this important finding was highlighted by the “Faculty of 1000”. Moreover, the group established the dynamics of the *Arabidopsis thaliana* metabolome in response to high soil salinity which serves as a basis for improving plant stress tolerance.

*Group Marjori and Antonius Matzke* (start date: January 2004). The Matzke group developed a novel transgene system to identify proteins required for RNA-directed DNA methylation in *Arabidopsis*. Mutant screens based on this system have been highly informative and already revealed at least two novel proteins involved in RNA-directed DNA methylation and spreading of methylation.

*Group Mittelsten Scheid* (start date: January 2004). Molecular features of epialleles in heritable, active and silent expression states in diploid and tetraploid *Arabidopsis* plants were analysed. In addition, the pairing of homologous chromosomes in tetraploid meiosis was

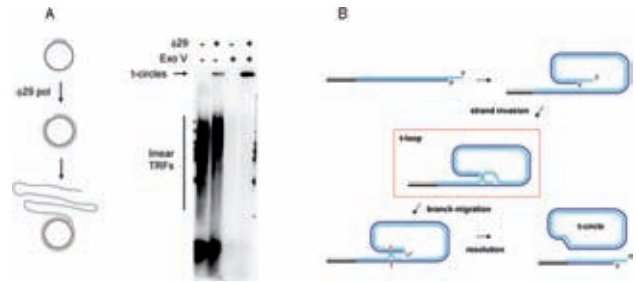


Fig. 2: (A) Detection of t-circles in Ku-deficient plants using a telomeric circle amplification technique. (B) The t-loop is a stabilised intermediate of homologous recombination. Telomeric DNA forms a t-loop by invasion of the 3' G-overhang into a duplex region. Resolution of the t-loop, which is usually inhibited, would result in an extrachromosomal t-circle and a deletion of telomere.

studied and a screen for mutants affected in maintenance of gene silencing occurring in polyploids was undertaken. Two additional projects are the effect of stress on (epi-) genetic features, and in collaboration with the Vienna University of Technology, the development of software (CyMATE) to analyse DNA methylation data (Fig. 1).

*Group Karel Riba* (start date: June 2005). Research focussed on the role of DNA repair proteins in telomere function and maintenance. The evolutionary conserved Ku complex plays a key role in chromosome end protection. It prevents resection of 5' chromosome ends by exonuclease 1 and suppresses excision of circular DNA molecules from telomeres (Fig. 2). Furthermore, a highly sensitive assay for detection of telomeric circles was developed. This method has a potential application in cancer diagnostics (patent pending).

*Group Dieter Schweizer* (start date: January 2003). In 2005, a new project on the molecular biology of SMCHD proteins was initiated, and has become the major focus of the group. *Arabidopsis* has three SMCHD-coding genes, and their organisation and putative products are being molecularly and biochemically characterised. The results to date indicate that one of the *Arabidopsis* SMCHD proteins plays a role in cell cycle control and DNA repair. There is also evidence that another of the *Arabidopsis* SMCHD proteins is involved in DNA methylation, which confirms unpublished results, already obtained independently by the Matzke group (Marjori Matzke pers. comm.).

*Group Hisashi Tamaru* (start date: April 2006). Constitutive heterochromatin is involved in important chromosomal processes such as silencing of repetitive foreign DNA and chromosome segregation. The dis-

covery of a global heterochromatin disassembly process in *Arabidopsis* pollen, which breaks the traditional rule of “constitutive” heterochromatin being continuously condensed, has evoked a new aspect of plastic heterochromatin and opened the opportunity to unveil novel epigenetic mechanisms involved in the process.

### Preview for 2008–2009

The author of this report considers the mission assigned to him in 2000 by the Austrian Academy of Sciences as founding director of the GMI to be complete. The successfully operating Gregor Mendel Institute, one of three new research companies established by the Academy, has forged a unique corporate identity as well as a clearly defined role in research. As the author of this report would like to devote more time to research, in agreement with the Austrian Academy of Sciences, he retired from his duties as managing director of the GMI GmbH at the end of November 2007. The Austrian Academy of Sciences appointed senior group leader Dr. Ortrun Mittelsten Scheid as interim director as of 1st December 2007.

The founding director considers the following future developments to be of great importance: The top priority is to appoint a new scientific director in the near future, and with that to establish a large “Director’s Group”. This is coupled to establishing the third, independent *Junior Principal Investigator (JPI)* group foreseen for the GMI; the new director will play a decisive role in the recruitment of this new group. Furthermore, the development of the institute’s administration (appointment of an administrative director), the extension of lab services (installation of additional plant growth chambers) and the participation of the GMI in the IMBA-IMP technology platform (the so called *IMBA-IMP services*) are important goals to be reached in 2008–2009.

In 2008–2009, the overall project themes of the eight research groups already established at the GMI will continue along the same lines as in 2006–2007. The *Aufsatz Group*, in addition to identifying and characterising HDA6-containing protein complexes for their role in RNA-mediated “silencing”, intends to work on a new applied project, namely naturally encoded antibiotic resistance in plants and its potential applications in biotechnology. The main objective of the *Greb Group* is to further consolidate their research activities and to publish their initial findings. The *Jonak Group* aims to use an integrative approach to obtain further insight into mechanisms crucial for plant survival and productivity under unfavourable environmental conditions. The *Matzke Group* plans to continue isolating and characterising additional mutants obtained in their screen. Characterising the mutations already isolated and their genome-wide effects, studying the role of meiosis in epiallelic silencing, the nuclear localisation of epialleles and the heritable effects of stress are on the programme in the *Mittelsten Scheid Group*. The *Riha Group* will follow up molecular biological and genetic analysis of the Ku complex. An important question is how Ku regulates different DNA processing activities that contribute to the formation of a functional telomere structure. The *Schweizer Group* will continue with their studies on the functional characterisation of *Arabidopsis* SMCHD proteins. The *Tamaru Group* plans to identify genes that are involved with heterochromatin disassembly in the vegetative nucleus of mature pollen.

In the coming two years, the above mentioned external appointments will enrich the institute with new cutting edge research projects and methodologies. There are no thematic restrictions on the groups to be recruited to the GMI – scientific excellence is the only important selection criterion.

## IMBA – Institute of Molecular Biotechnology GmbH

Head: JOSEF PENNINGER



### Aims and Functions

Completion of the human genome and genomes of many other species is but one of many significant milestones in the new era of systems biology that encompasses genomics and all of its derivations. The current phase of genomic studies is focused upon parsing this new found genetic data with respect to scientific interest, economic and health impact applications. The emphasis is therefore on functional genomic analysis which represents the new front-line and limiting factor for realizing potential benefits of genome-based science. In addition to the identification and structural and biochemical characterization of novel gene products, it is critical to validate the function of these molecules in a whole organism using genetic approaches. Defined gene targeting and genetic alterations have been proven to be particularly useful since loss of expression mutants can reveal essential functions of molecules.

IMBA uses model organisms and cutting-edge functional genomics to investigate fundamental molecular processes and their contribution to disease. In interdisciplinary research groups, IMBA pursues an integrative approach that combines functional screening, cellular RNAi, stem cell research and imaging technologies to rapidly generate disease models to examine the role of genes in physiology and pathogenesis. Collaborations with leading academic and industrial partners are an integral part of IMBA's strategy and commitment to deliver outstanding results from its basic research and to translate these discoveries into future human medicine.

### Results for 2006–2007

#### *Highlights of IMBA Projects*

##### *1. Mitochondrial function and diabetes*

Type-2 diabetes mellitus, with an estimated global incidence exceeding 350 million by the year 2030, rep-

resents one of today's greatest health care challenges. Associated in >50 % of cases with obesity, diabetes results in part from the development of insulin resistance in peripheral tissues, a process whose etiology remains unclear. Recent clinical studies place altered mitochondrial oxidative phosphorylation (OxPhos) in muscle and liver as an underlying genetic element of insulin resistance. However, the causative or compensatory nature of these OxPhos changes and their exact etiological contribution towards diabetes and obesity remains unclear.

Mitochondrial dysfunction in humans is manifest as a variety of disorders with clinical outcomes largely dependent on the magnitude and tissue distribution of the impairment (Lane, 2006; Wallace, 1999). A number of recent studies have implicated impaired skeletal muscle OxPhos in the etiology of insulin resistance proposing a mechanism for the development of diabetes and obesity. Despite the profound implications of these findings for diabetes and obesity, however, the causative or compensatory nature of primary mitochondrial OxPhos deficiencies, with regards to insulin sensitivity, remains an enigma.

The IMBA team had previously shown that conditional deletion of the mitochondrial flavoprotein apoptosis inducing factor (AIF) in mice can initiate progressive OxPhos dysfunction. AIF was originally identified as a mitochondrial protein involved in cell death. However, mutation analysis in numerous model organisms has now established that the primary physiological role of AIF is maintenance of a fully functional respiratory chain. When deleted, this inner-mitochondrial membrane associated protein leads to a progressive loss of respiratory chain function and activity, affecting primarily complex I. The IMBA investigators exploited the respiratory chain stabilizing properties of AIF to generate models of progressive OxPhos deficiency and ask the question whether primary defects in mitochondrial respiration cause insulin resistance, diabetes and/

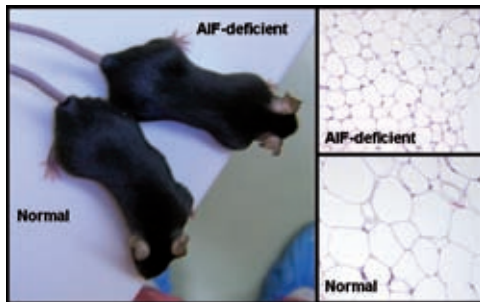


Abb. 1: When engineered to have less efficient muscles (AIF-deficiency), mice are normal and live healthy lives (left panel). Intriguingly, when pushed towards diabetes and obesity through a high-fat "Western-like" diet the mice are extremely resistant to the development of both obesity and diabetes. The right panels show fat cells from high-fat fed normal (bottom) and AIF-deficient (top) mice. Note the marked reduction in fat cell size in the "energy inefficient" mice.

or obesity. Muscle- and liver- specific AIF ablation in mice initiated a pattern of OxPhos deficiency closely mimicking that of human insulin resistance, and contrary to current expectations, resulted in increased glucose tolerance, reduced fat mass, and increased insulin sensitivity. These results were confirmed under hypercaloric conditions and in both genetic mosaic and ubiquitous OxPhos deficient mutants. Importantly, the effects of AIF on glucose metabolism are acutely inducible and reversible. These surprising findings establish that tissue-specific as well as global OxPhos defects in mice can counteract the development of insulin resistance, diabetes and obesity. This paper was chosen as the Cover page of *Cell*.

Pospisilik, A., Knauf, C., Joza, N., Benit, P., Orthofer, M., Cani, D., Nakashima, T., Sarao, R., Neely, G., Esterbauer, H., Kozlov, A., Kahn, C., Kroemer, G., Rustin, P., Burcelin, R., and J. M. Penninger. Targeted deletion of AIF reduces mitochondrial oxidative phosphorylation and protects from obesity and diabetes. *Cell* 131, 476–491. 2007.

(see picture Pospisilik)

## 2. Identification of the first RNA specific kinase

The discovery of RNA interference which was awarded with the Nobelprize to Andy Fire and Craig Mello (2006) has revolutionized our understanding of biology and put RNA biology on the forefront of molecular research. RNA interference allows the analysis of gene function by introducing synthetic, short interfering RNAs (siRNAs) into cells. In contrast to siRNA and microRNA duplexes generated endogenously by the RNaseIII endonuclease Dicer, synthetic siRNAs display a 5' OH group. However, to become incorporated into the RNA-induced silencing complex (RISC) and mediate target RNA cleavage, the guide strand of an siRNA needs to display a phosphate group at the 5' end. The identity of the responsible kinase remained elusive.

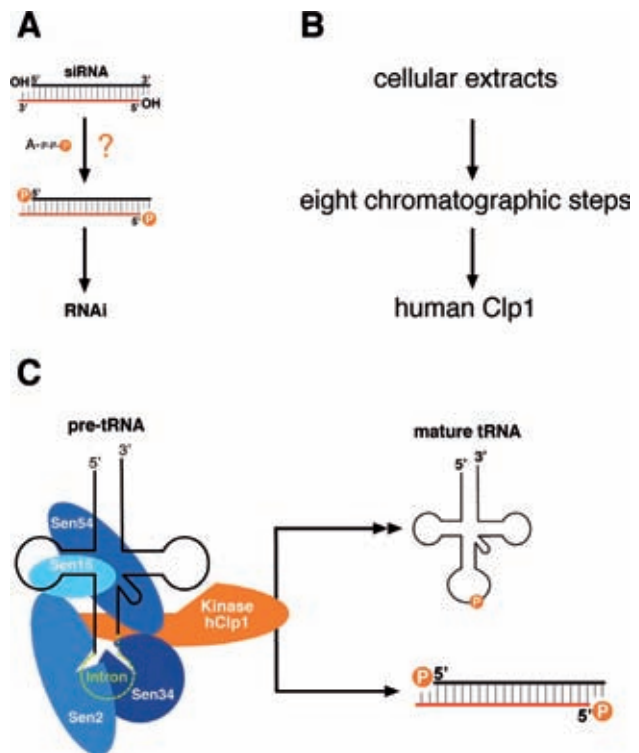


Fig. 2:

A – The goal: to find the enzyme that phosphorylates siRNAs when transfected into HeLa cells, an essential step in a method known as RNA interference (RNAi), currently a powerful tool to analyze the function of the genome. Since RNAi is an artificial procedure, we expected the actual phosphorylating enzyme, or "kinase", to be also involved in other RNA metabolic pathways.

B – How we did it: we prepared cytoplasmic extracts from HeLa cells and carried out an extensive purification protocol monitoring the ability of every fraction to phosphorylate a siRNA molecule.

C – What we found: the responsible enzyme is hClp1, an already known component, without assigned function, of the machinery that catalyzes tRNA-splicing, i.e. the maturation of a precursor tRNA molecule into a final, functional tRNA. We showed that hClp1 is adding a phosphate group to the 5' terminus of the 3' exon, thereby facilitating the ligation step and leading to the formation of a mature tRNA.

Monitoring siRNA phosphorylation, the IMBA team headed by Javier Martinez applied a chromatographic approach that resulted in the identification of the protein hClp1 (human Clp1), a known component of both transfer RNA splicing and messenger RNA 3'-end formation machineries. The kinase hClp1 phosphorylates and licenses synthetic siRNAs to become assembled into RISC for subsequent target RNA cleavage. More importantly, this research revealed the physiological role of hClp1 as the first ever identified RNA kinase that phosphorylates the 5' end of the 3' exon during human tRNA splicing, allowing the subsequent ligation of both exon halves by an unknown tRNA ligase. The investigation of this novel enzymatic activity of hClp1 in the context of mRNA 3'-end formation, where no

RNA phosphorylation event has hitherto been predicted, will be a key topic for the future.

Weitzer, S., and J. Martinez. The human RNA kinase hClp1 is active on 3' transfer RNA exons and short interfering RNAs. *Nature* 447, 222–226 (2007).

(see picture Martinez)

### 3. Identification of BRAT as a key tumor suppressor that regulates stem cell renewal

With his research, the IMBA group of Jürgen Knoblich followed up on recent discoveries that reframed the most basic concepts of what tumors are. They are not just a bunch of cells gone wild altogether, but rather like an organ made of highly differentiated cells. Those who control the working and the growth of a tumor are like stem cells. Normally, when they divide, the result is one specialized cell for the organ, while the other retains the flexibility of stem cells and hence keeps the process of growth going in the healthy, controlled way.

Knoblich's team now checked a large number of proteins which are involved in regulating growth. Among those, a singular and outstanding role is reserved for Brat: When a cell divides, Brat is transmitted in only one of the two resulting cells. Once the process of cell division is complete, Brat stops growth in this cell while in the other resulting cell, which lacks Brat, further divisions and growth will occur.

With Brat, the IMBA team identified the very first gene that controls growth in one of the two daughter cells of the division process. For the first time, they could exactly trace a gene that, if it is missing, turns a normal stem cell into a tumor cell. What makes the discovery in the tiny fly even more exciting is the fact that the same protein can be also found in human cells. Additional tests will need to check if the same process works in human cells. However, a human homologue of Brat has been already suspected to be involved in tumor growth in humans. Another issue is to find out how exactly this protein operates within the metabolism of a cell and how the entire regulatory system for growth is regulated. For these next steps, the labs at IMBA are

in a unique position due to the creation of a complete library of mutants in all known genes of *Drosophila melanogaster* (Dietzl et al. *Nature* 2007).

Betschinger, J., Mechtler, K., and J. A. Knoblich. Asymmetric segregation of the tumor suppressor brat regulates self-renewal in *Drosophila* neural stem cells. *Cell* 124, 1241–1253 (2006).

(see picture Knoblich)

### Preview for 2008–2009

One major problem of modern biology is the fact that genes identified in microarrays or functional screens, e. g. in our ongoing like large scale fly screens, need to be functionally tested in mammals. Researchers at IMBA are currently performing Whole Genome Screens for different biological processes in *Drosophila*. Various novel genes that control the growth of tumor stem cells, pain, natural bacterial infections or heart functions, have already been identified. IMBA has also built a state-of-the-art animal house, which guarantees that researchers working at IMBA can do the best research under ideal conditions. The animal house is linked to a histology service department and provides services for mouse genetics and stem cell technology. With these new services, we have now been able to focus gene targeting in Austria at IMBA.

IMBA has now established its own international Scientific Advisory Board (SAB). Current members of the SAB are Eric Kandel (Nobel Prize 2000; Columbia University); Gunther Blobel (Nobel Prize 2001; Rockefeller University), Tony Hyman (Max Planck, Dresden), Susan Lindquist (former Head of the Whitehead Institute, Boston), and Ken Chien (Harvard). With the aid of the SAB, IMBA has developed a strategy for the next years by emphasising three research areas: stem cell biology and tumor stem cells around the group of Jürgen Knoblich (IMBA's Deputy Director), Disease Modeling and Mouse Genetics around the research group of Josef Penninger (IMBA Director), und RNA Biology around the research group of Javier Martinez. With these initiatives IMBA aims at positioning itself as European "Centre of Excellence" in these research areas.

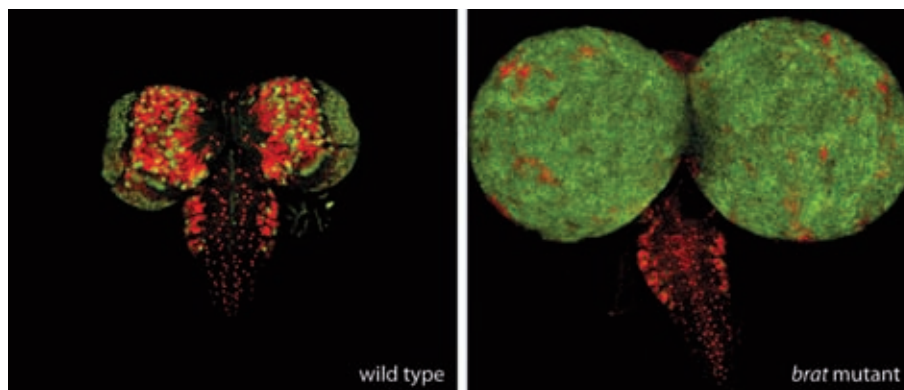


Fig. 3: Stem cell derived tumor formation in *Drosophila*. The figure shows the larval brain from a wild type (left) and a brat mutant animal. Neuroblasts are green, differentiating neurons are red. brat brains show a dramatic overproliferation of neuroblasts.

## Institute for Biomedical Aging Research, IBA

Head: BEATRIX GRUBECK-LOEBENSTEIN



### Aims and Functions

The Institute for Biomedical Aging Research (IBA) in Innsbruck with its focus on biogerontology is unique in Austria. In view of the present demographic development this research topic is of high social and economic relevance, as novel solutions for age-related health problems are urgently needed. Since its foundation in 1992 the institute has gained scientific excellence and broad national as well as international acceptance. The senior scientists of the institute are leaders in their respective research areas and have thus greatly contributed to the quality of the Austrian research community and to its international esteem. The IBA's specific research goal is to help to prevent age-related functional losses and diseases by analyzing aging processes at a cellular level. The results will be applicable to the development of new diagnostic tools, preventive measures and therapeutic treatments.

### Results for 2006–2007

At the *Immunology Division* we focus on a better understanding of age-related changes of the T-cell repertoire and to investigate into the reasons for insufficient vaccination reactions that tend to occur with increasing age. We found out that prevalent virus infections like the Cytomegalovirus (CMV) accelerate the aging

of the immune system. CMV-specific T cells dominate over T cells of other specificity, which is particularly pronounced in old age due to the incidence of T-cell clonotypes of high affinity. Another interesting finding is that molecules which are particularly highly expressed by T-cells in old age and during stress regulate the lifespan of the model organism *Drosophila*. This finding sheds new light to the mechanisms of survival and regeneration of immune cells during aging.

Since currently available animal models are only of limited value for the understanding of aging processes in humans, cell culture-based systems are widely used as models for research on cellular aging of humans. It is the goal of the *Molecular and Cell Biology Division* to reach a better understanding of the molecular mechanisms that cause and influence cellular aging. Using model systems such as primary human fibroblasts and endothelial cells, we studied age-related modifications in cell proliferation, differentiation and programmed cell death (apoptosis). In particular, we studied the function of apoptosis in the aging of endothelial cells and the role of extracellular proteins, e. g. IGF-binding protein 3, in this process. We also studied the role of secreted proteins in the aging of dermal fibroblasts. In these experiments, we identified a set of candidate genes whose role in cellular aging is currently being analysed.

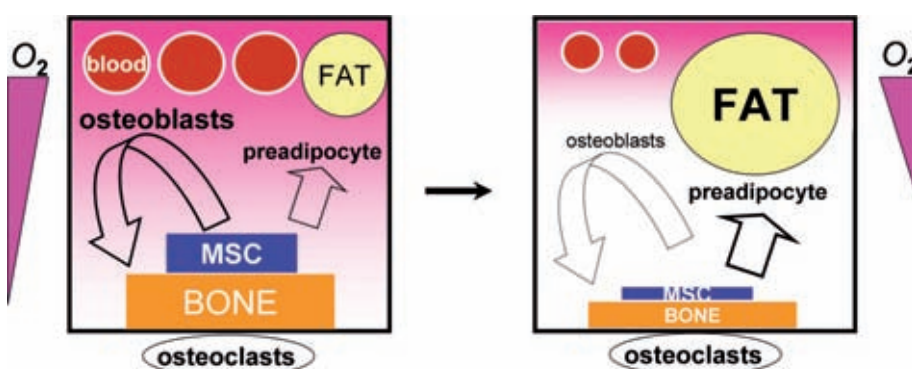


Fig. 1: Environmental cues for and of Mesenchymal Stem Cell (MSC) aging. MSC were found to be located to bone in vivo, where they are imposed to low oxygen concentrations. Both, adipogenic and to a much higher degree osteogenic differentiation need oxygen. During aging oxygen levels change, which leads to enhanced formation of fat relative to bone remodelling.

Besides experiments with cultured human cells, these experiments also included studies in lower eukaryotic model organisms, to address the role of candidate genes in regulating organismic lifespan. Another research focus was on the question why increased oxidative stress – significantly influencing cell aging – prevails in senescent fibroblasts of human skin. In particular, we analysed alterations in the function of mitochondria and novel NADPH-oxidases, which were found to play an important role in endothelial cell senescence. In order to validate the results of these experiments we compared the gene expression in skin biopsies of young and old probands. We could show that the cell cycle regulator p16INK4A plays an important role in skin aging. We also analyzed mitochondrial function in aging human skeletal muscle. Our goal for the future is to continue our current basic research line and, based on our research findings, to develop diagnostic tools and methods for the prevention and treatment of age-related diseases of the cardiovascular system and the skin.

The *Endocrinology Division* focuses on the Aging Male. Major fields of interest are age-related changes of male hormonal regulatory circuits, structure, function and diagnostic of human glycoprotein- and protein hormones and the hormonal regulation of human reproductive organs, particularly the prostate. The aging prostate is characterized by tissue reorganization and subsequent functional changes that lead to annoying clinical symptoms of benign prostatic hyperplasia. These characteristic changes, which occur predominantly in the stromal compartment, may also support malignant epithelial growth i. e. prostate cancer. In current investigations genes and their proteins involved in tissue reorganization are identified by gene arrays and other techniques. Determination of the systemic, cellular and molecular functions of such candidate molecules forms the basis for selection of new pharmacological treatments. Our long-term goal is to develop new methods for prevention, diagnosis and treatment of age-related changes and diseases in the human prostate.

Tissue function and cell viability relies on an appropriate organization of the extracellular matrix as a mediator of signals for cell proliferation and differentiation, as well as for apoptosis. In the context of aging biology, the *Extracellular Matrix research group* strives at understanding mechanisms that lead to cellular and extracellular changes, which specifically sustain aging processes and is concerned with questions related to how an altered milieu affects cell and tissue function and how specific/molecular changes in the extracellular environment contribute to harmed tissue and organ functions often observed with aging. Specific research topics are



Fig. 2: Institute of Biomedical Aging Research, IBA

regarding the aging and stemness of adult tissue-specific mesenchymal stem cells and their corresponding *in vivo* niche, the establishment of a database presenting genes that are involved in senescence, aging and oxidative stress (GiSAO), undertaken as a collaborative effort of the National Research Network on Aging Research, and the role of the endothelial glycocalyx in the context of early atherosclerotic lesion development.

The main function of smooth muscles of the gastrointestinal tract is not to develop force and contract but also to maintain organ dimension against an imposed load such as a bolus of food. This involves a higher degree adaption of the cell length known as muscle plasticity. The aim of the *Aging of Smooth Muscle research group* is to investigate the molecular basis of the smooth muscle plasticity and how this may be affected during aging. The analysis includes elucidation of factors that attenuate myofilaments length and assembly under different ionic conditions. This is necessary for the interpretation of previous EM studies on the filaments organization at different cell length and relationship between force and thin/thick filament overlap. Numerous studies have been conducted analyzing the neuronal control of the smooth muscle plasticity. Very



Fig. 3: Laboratory technology

little, however, is known about the structural basis of smooth muscle contraction.

The *Cell Metabolism and Differentiation* research group studies the biology of the aging adipocyte. Fat mass and distribution as well as the differentiation status of fat cells change during the aging process. As a result, several adipocyte functions are altered, including adipokine secretion and fat accumulation. These fat tissue dysfunctions are associated with major age-associated diseases such as metabolic syndrome, obesity, dyslipidemia, thermal dysregulation, diabetes type II, atherosclerosis and cancer. Moreover, fat tissue plays an important part in mediating the effects of calorie restriction (CR), which is of major importance for the control of lifespan. It was shown that specific inactivation of the insulin signal pathway of fat tissue in mice leads to the inhibition of fat cell differentiation and to an extension of the lifespan in those mice. A major aim is to better understand the molecular mechanism underlying the regulation of preadipocyte/adipocyte proliferation, differentiation and lifespan and the dysregulation of these processes during aging. Another aim is to study basic mechanisms of the regulation of cell proliferation, differentiation and lifespan. To do this, the group investigates the immortalizing activity of the E7 oncoprotein of human papillomaviruses (HPV). HPV E7 switches off the mechanisms controlling proliferation and differentiation in order to maintain the proliferation of the infected cell.

#### Preview for 2008–2009

To realize the scientific program of the IBA and thus to assure continuous scientific excellence and international competitiveness, an extension and a relocation of the institute are necessary. At its present location, there is no further space for an extension, which precludes the essential addition of animal facilities and additional

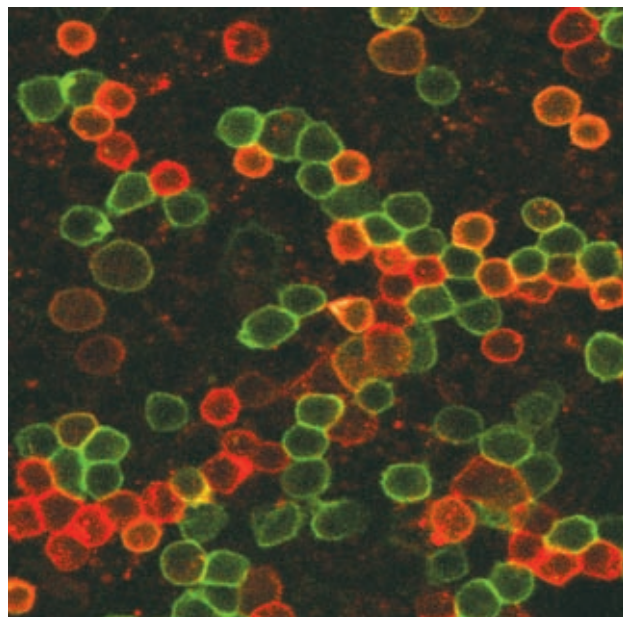


Fig. 4: T cells

lab space. Furthermore, the cooperation with other academic facilities is suboptimal. According to our strategy the future institute will comprise three thematic sections on the topics of (a) *immunology*, (b) *endocrinology and metabolism*, and (c) *repair and regeneration*. Each of these sections will consist of one larger division and two smaller junior research groups. The addition of new junior research groups will allow to recruit excellent young scientists with a well-rounded background in the field. Scientific continuity required to pursue the present successful work will thus be combined with a maximum of innovation and flexibility. The new institute building should be located on the campus of a University. This is of particular importance, as gerontology is not yet represented at Austrian universities. The new building should provide space for a staff of approximately 100 employees. In 2007 a strategy to an extension of the Institute was drawn up together with Richard Hodes, Director of the National Institute of Aging, Bethesda, USA. In 2008 the Institute is going to tentatively rent laboratory space to prepare the necessary extension. The laboratory space will be used for translational research projects financed by third-party funds. This facilitates to deepen basic research at the main building at the Rennweg. In particular, it strengthens basic research carried out in the framework of the National Research Network “Proliferation, Differentiation and Cell Death during Cellular Aging” which is coordinated at the IBA and whose funding period was extended after thorough re-evaluation by the FWF in fall 2007 for a further period of three years.



## Institute of Biophysics and Nanosystems Research, IBN

Head: PETER LAGGNER



### Aims and Functions

Biophysics is the essential link between biochemistry and cell biology. While biochemistry focuses primarily on the molecular chemical reactions underlying the essential biological functions, such as metabolism, energy transformation, information storage, cell biology concentrates on the whole cell as an integral element of living and dying systems. Between these poles lie at least four orders of magnitude in dimensions. The dominating question to be answered by biophysics, is therefore: How does structural self-organization of billions of molecules in a nanosystem lead to a living microorganism? One may safely use the analogy between the single person and its manifold interactions and synergies within the society that is more than the sum of its individuals.

The objectives of the IBN within this broad pursuit are well defined: The principles and forms of molecular self-organization, especially of lipids and proteins within the aqueous medium of the cytoplasm are at the focus of research. These entities play key roles in compartmentation and transport within the cell. The structures concerned lie below the limit of resolution of

the light microscope, and hence their visualization requires special techniques of X-ray diffraction and scattering. The development and implementation of new X-ray techniques at synchrotron radiation facilities as well as in the routine laboratory, is a well-recognized speciality of the IBN.

The knowledge gained from the biophysical and nanosystems research has important, fundamental relevance to biomedical and pharmaceutical applications. On the other hand, new approaches towards the design of nano-biotechnological devices, e. g. in the bio-functionalization of supramolecular systems for the use in diagnostics or synthesis result from the research at the IBN.

The research projects of the IBN are embedded in numerous of national and international programmes, such as the Austrian Nano-Initiative (NanoHealth), the programmes of the FWF, and EU framework programmes. The IBN-Outstation at the synchrotron light source ELETTRA in Trieste is a world-wide recognized research facility heavily used by the international scientific community (Fig. 1).

### Results for 2006–2007

*Working group R. PRASSL  
(Lipoproteins and Lipid Nanoparticles)*

The WG Prassl was able to determine the domain structure of the 550 kD protein molecule of the low density lipoprotein (Apo B100 of the LDL) by a combination of neutron scattering and bioinformatics (Highlight 2006, ILL/Grenoble, [http://www.ill.eu/fileadmin/users\\_files/Annual\\_Report/AR-06/page/data/17\\_2\\_1.pdf](http://www.ill.eu/fileadmin/users_files/Annual_Report/AR-06/page/data/17_2_1.pdf)). Hence, they developed an improved structural model of the LDL with a topographic image of the functional domains in the LDL-particle (Fig. 2). These results disclose a new strategy of structural analysis: Since a complete analysis of the atomic structure of the LDL does not seem to be promising,



Fig. 1: The IBN operates a beamline for X-ray Nanoanalytics at the Synchrotron light source ELETTRA, Trieste

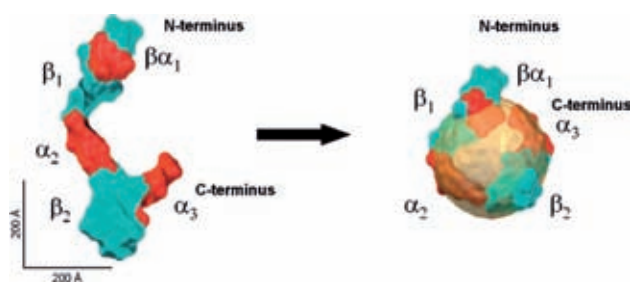


Fig. 2: Structural model of the low density lipoprotein with the domain structure of the Apo B100 protein (Cover of the Journal of Biological Chemistry, June 2006)

henceforth the more promising approach of the analysis of parts of the Apo-B can be started in order to set up the analyzed parts afterwards, accordingly to the domain model.

Furthermore, different liposomal nanoparticle systems were established for the targeted application of the vasoactive intestinal peptide (VIP) directly in the lungs in order to develop an inhalation therapy as well as an imaging clinical diagnostics.

#### Working group K. LOHNER (*Functional Lipidomics*)

The WG Lohner is mainly engaged in the molecular action mode of defense peptides on cell membranes and the investigation of novel agents against antibiotics resistant germs, sepsis, and cancer. The interaction of antimicrobial and antitumor peptides with artificial membrane systems, e. g., model systems of *S. aureus* and cancer cells, have been biophysically characterized. In the frame of an EU-project coordinated by Lohner, highly active antimicrobial and antiseptic agents have been developed using the native peptide Lactoferricin as a matrix. A PCT-registration was submitted. Experiments performed on model systems consisting of the four most important lipid species by using the multifunctional human peptide LL-37, resulted in different effectivenesses characteristic for each lipid. This outcome clearly emphasizes the significant impact of the lipid composition of cell membranes.

#### Working group H. AMENITSCH (*synchrotron radiation; Outstation at ELETTRA, Trieste*)

The WG Amenitsch is in charge of the Austrian SAXS-Beamline at Elettra which is integrated as an User-Facility in the international synchrotron research. In the frame of the EU-project SAXIER (<http://www.saxier.org/>), methodological developments in the fields of microfluidics and gas phase analysis were performed. Essential achievements in regard to single particle structural analysis was achieved by the combination of laser-tweezers and synchrotron X-ray diffraction

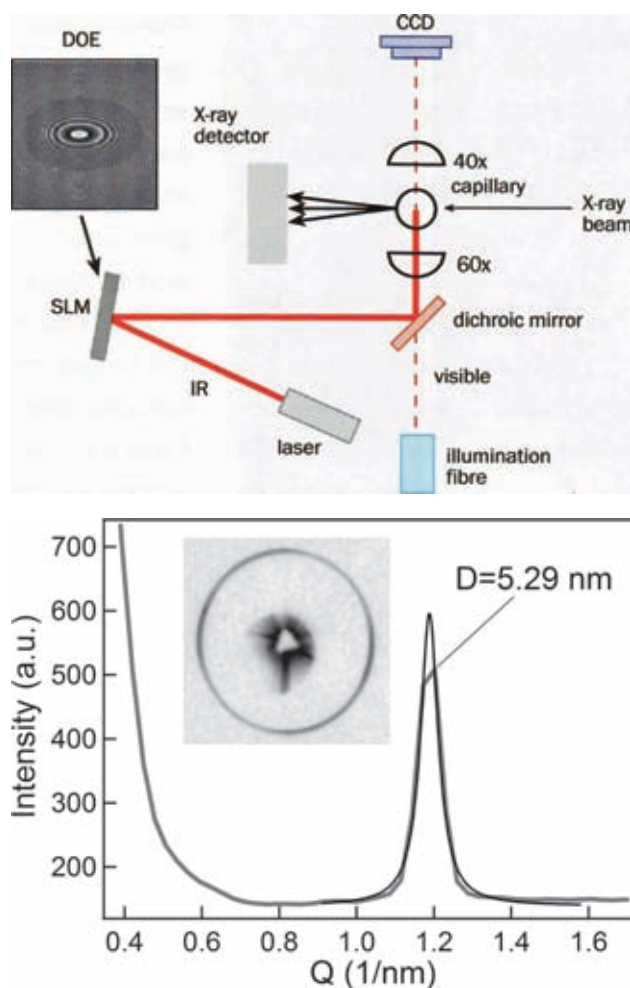


Fig. 3: (a) Optical trapping of microparticles via laser-tweezers in the synchrotron X-ray beam (b) Scattering image of a single liposome-clusters.

(ESRF-Highlights June 2007: <http://www.esrf.eu/files/Newsletter/NL45.pdf>) shown in Figure 3. Thus, promising approaches regarding the interaction of single liposomal clusters were carried out (Fig. 3). Furthermore, the investigations on the nanoscopic structural changes of the collagen in human arteries were finished, done by biaxial stretching experiments combined with simultaneous X-ray measurements.

#### Working group P. LAGGNER (*Physical Chemistry*)

The WG Laggner focuses its work on the development and the implementation of new methods and concepts in the field of nanosystems research. Thus, this group provides the basis for the other working groups at the IBN with emphasis on the structural and the dynamic properties of lyotropic liquid crystalline phases and their phase transitions. Moreover, the systematic investigation of multicomponent systems – lipid mixtures and additives under variable temperature-concentra-

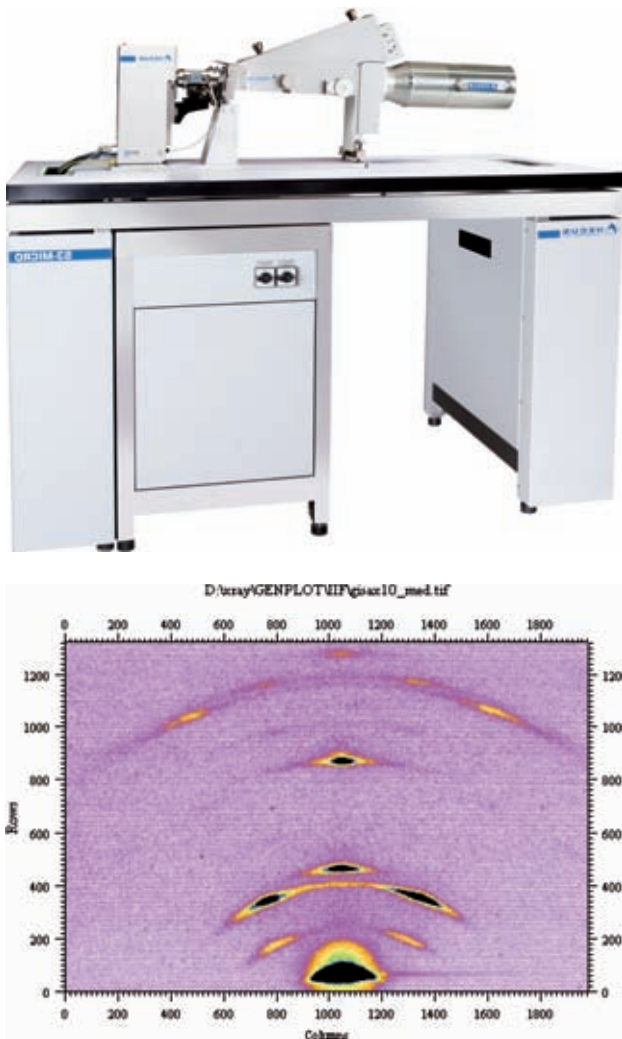


Fig. 4: (a) Lab-SAXS-device, developed at the IBN, with high brilliant point-focusing camera system and 50 watt micro X-ray source; (b) GISAXS (grazing incidence SAXS) experiment done on a nanostructured ultra thin film of Si-wafer.

tion conditions – provides essential knowledge on the local domain formation (clusters, rafts) and also on nanostructured carriers (cubosomes, hexosomes).

A second focus is the development of a lab X-ray technique: In this context, a prototype for a high-duty device with a 50-watt X-ray source was built in coopera-

tion with equipment industry. This device bridged the gap between the conventional laboratory equipment and the high brilliant synchrotrons (Fig. 4).

#### Preview for 2008–2009

##### *Working group R. PRASSL*

The three-dimensional structural analysis of ApoB100 is to be continued with detergent-analogue polymers and lipid-analogue peptides. In the field of lipid-nanoparticles, the currently investigated systems will be specifically functionalized in order to selectively visualize tumors and atherosclerotic plaques.

##### *Working group K. LOHNER*

Lipid analytics as basis for the development of peptides which are able to specifically act on the lipid model systems of multiresistant bacterial strains is planned to be extended. The set-up of a cancer cell-culture laboratory for the examination of antitumor peptides is also planned.

##### *Working group H. AMENITSCH*

The development and application research (project SAXIER) in the fields of microfluidics and gas phase analysis should be promoted. In a new EU-project, the basics for the nanofabrication should be defined and developed. The project „Nanomechanics of human arteries“ will be completed through modelling of our present data.

##### *Working group P. LAGNER*

In regard to the multicomponent-lipid systems, the work on domain formation and nanoparticles will be continued. Moreover, basic research studies on general anesthesia and the impact of oxidized lipids are planned. The possible applications of the new laboratory-MICROSAXS camera system in the fields of reflectometry and thin-film structure analysis will be further examined.

## Konrad Lorenz Institute for Ethology, KLIVV

Head: DUSTIN PENN



### Aims and Functions

The *Konrad Lorenz Institute for Ethology* is a research institute for the study of animal behavior. It was founded in 1945 and named after Konrad Lorenz who played a central role in pioneering the field of ethology (or “behavioral biology”).

As ethologists, the scientists address interdisciplinary questions concerning both the proximate mechanisms and the evolution of behavior. Their research is mainly focused on questions regarding the adaptive functions of behavior (behavioral ecology), which are best studied in natural and seminatural conditions.

The institute therefore has facilities for studying animals in seminatural conditions, including large aviaries and aquariums (Fig. 1), and it recently added a molecular genetics laboratory (PCR machines and DNA sequencers). Additionally, it has facilities for studying acoustic communication, infectious diseases, and a Geographic

Information System (GIS) for habitat assessment and other biogeographical analyses.

There are five senior scientists, eight post-doctoral scientists (half supported by external funding), 12 support staff, and a number of graduate students, who come from many different countries. The scientists study a diversity of species, especially vertebrates, such as birds, fish, and mammals (including *H. sapiens*), and a variety of topics, from chemosensory communication to coloniality.

The main topic of interest is sexual selection, as it potentially explains many puzzling aspects of behavior, such as the elaborate courtship displays found in many species. In addition to conducting basic research on animal behavior, the institute aims to apply insights from ethology to better understand the behavior of our own species—and address applied problems in conservation and the environment.



Fig. 1:  
The Konrad Lorenz-  
Institute for Ethology

### Results for 2006–2007

The scientists published 38 papers in peer-reviewed, international journals. Several publications received considerable attention from the international press, and in fact, the institute was ranked #2 in the Academy (*Wissensbilanz 2006*) for receiving the most media attention. Below are some highlights of these publications.

- It has long been thought that each individual has their own distinctive scent, and D. Penn led an international project to identify the volatile compounds that comprise individual odor in humans and mice. They chemically analyzed underarm sweat from subjects in an Austrian village, and discovered individual and sex-specific fingerprints in the volatiles (*J. R. Soc. Interface*). They also found that individuals have distinctive underarm microbiota (*The Analyst*), which can explain the individual volatiles in sweat (*Metabolomics*). Their findings are relevant for efforts to design electronic sensors to recognize individuals and diagnose disease.
- Individuals face an evolutionary (life-history) tradeoff between reproduction versus longevity. To test this idea in humans, D. Penn and his collaborator, K. Smith (University of Utah), analyzed demographic records of couples from the 19th century living in the American frontier and found that increased reproduction reduced parents' survivorship, and more for women than men. Their findings help to explain several puzzling aspects of human physiology and behavior, including menopause and modern fertility declines (*Proc. Natl. Acad. Sci USA*).
- Telomeres are the DNA-protein complexes on the ends of chromosomes that control genomic integrity, and they might play a role in life-history tradeoffs.

Telomeres become shorter with age, which causes cellular senescence (Fig. 2). A. Kotrschal et al. found that exposing wild mice to elevated reproduction or social stress caused telomere attrition and hindered restoration, which supports the idea that telomeres might be useful for assessing exposure to oxidative stress (*Biology Letters*).

- It has been difficult to understand why many animals breed in dense aggregations such as colonies, as this increases competition, aggressive interactions, and infectious diseases. The conventional hypothesis is that coloniality reduces predation. Contrary to this idea, R. Wagner and his collaborators reported the first evidence that colonies are actually more prone to predation because of their conspicuousness, suggesting other explanations are needed to explain breeding aggregations (*J. Evol. Biol.*).
- Global climate change potentially affects all organisms. In a very recent study (supported by the Ministry for Environment) H. Winkler and colleagues found that climate change is influencing the departure schedules of long-distance migrants and also



Fig. 2: Social and reproductive stress impacts the dynamics of telomeres, the DNA-protein caps on chromosomes that control genomic integrity.



Fig. 3: The institute hosted the European Ornithologist's Conference in 2007

the social interactions between adults and juveniles. Their research also found that the genetic diversity within populations of migratory birds is high, suggesting that these birds may be able to adapt to the new conditions.

- Achieving ecological sustainability requires a better understanding of human behavior, especially overpopulation and consumption of resources. D. Penn and I. Myrsetrud edited the first book to show how evolutionary analyses of behavior offer important implications for our environmental problems (*Evolutionary Perspectives on Environmental Problems. Forward by E.O. Wilson. Transactions/Aldine de Gruyter*).

Additionally, in 2007, the institute organized and hosted the *6th European Ornithology Conference* in Vienna, which was attended by 250 scientists (Fig. 3). The scientists at the institute also obtained a number of third-party grants to support research, including two grants awarded to H. Hoi from the FWF.

### Preview for 2008–2009

The research will continue to be broad and address a variety of different questions, such as the following:

- *Sexual selection.* Studies will aim to better understand how individuals choose their mates, and how mate choice affects offspring fitness.
- *Maternal effects and egg allocation strategies.* H. Hoi and C. Biard will investigate how females use hormones and antioxidants to influence offspring development.
- *Social behavior and coloniality.* R. Wagner and F. Schädlein will continue studying the role of public information for habitat selection and coloniality.
- *Cognitive ethology.* G. Gajdon is researching learning and intelligence of keas, a highly explorative parrot, and he will begin to employ touch-screen monitors.
- *Conservation and global climate change.* H. Winkler will continue to study climate change and genetic and other determinants of avian migratory behavior. H. Beissmann will apply geographical analyses to forecast the effects of climate change on biodiversity.

## Earth Sciences

### Research Unit for Geographic Information Science, GIScience

Head: JOSEF STROBL



#### Aims and Functions

The research unit “GIScience” ([www.oeaw.ac.at/gis-science](http://www.oeaw.ac.at/gis-science)) is focussed on basic research for geoinformatics. Spatial Analysis and Spatial Data Infrastructures are core themes complemented by cross-cutting work on modelling of space-time phenomena and the introduction of “thinking spatially” to learners from target groups in formal and informal education.

Geographic Information Science is considered the theoretic basis and conceptual foundation for geoinformatics as a methodology. GIScience researches the representation as models, the organisation, analysis and visual communication of all kinds of georeferenced information. It thus serves as the foundation for applications of Geographic Information Systems (“GIS”) in industry, public administration and in the personal sphere of individuals.

*Spatial Analysis* aims at the extraction of information from georeferenced empirical data. Research objectives are directed at remote sensing image processing, at the geostatistical analysis of 3D and 4D data sets and the modelling and simulation of dynamic processes.

*Spatial Data Infrastructures (SDI)* are complex architectures supporting the full spectrum of Geo-ICT appli-

cations. The implementation of distributed geo-databases requires an extensive set of continuously evolving standards. The GIScience unit contributes to current research on metadata, catalog services and portal development in collaboration with national and international consortia.

Integrated *Space-Time* analysis is based on extended data models, and requires dedicated analytical strategies as well. Research aims are directed at the development of new analytical operators for spatiotemporal data as well as their validation across various application contexts.

*Competence in spatial communication and spatial thinking* are the foundation for the practical use of geospatial information in business and daily life. Transfer into and through schools is therefore actively supported, with the additional objective of fostering interest on study programmes within the science and technology fields.

#### Results for 2006–2007

After the formal creation of the GIScience research unit in the summer of 2006 the first group of researchers started work in early 2007. Individual as well as team projects have been initiated within the framework of our research programme and based on feasibility controlled by our evolving research infrastructure.

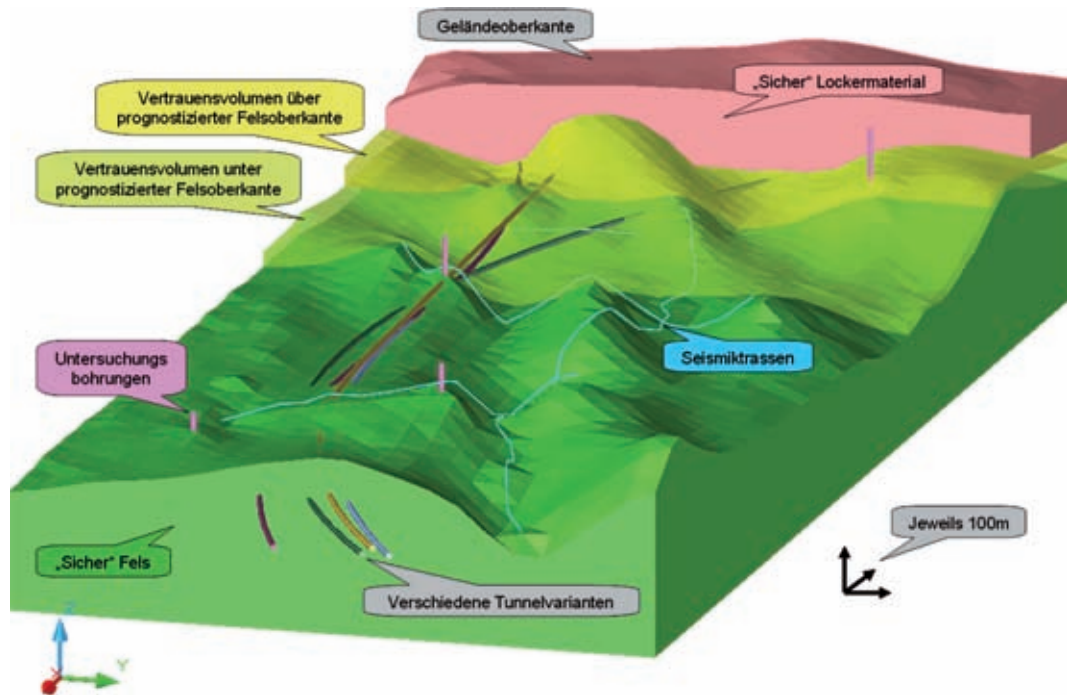
The implementation of the above stated research objectives through specific tasks is coordinated within internal as well as collaborative projects with external partners. The interdisciplinary composition of the GIScience research team is a critically important asset, bringing social and economic scientists together with natural science and technology researchers.

One core research theme is focussed on the development of application logics and rule sets for extracting objects (features) from remote sensing imagery. Urban as well as natural environments are represented in imagery from different sensors with varying spatial and temporal resolution. The extracted features are then



Fig. 1: Main themes in the GIScience research programme

Fig. 2:  
3D geostatistical modelling of rock volumes for a tunneling project. System-induced errors in data acquisition and model parametrisation are represented as 3D corridors of the probable position of bedrock upper edge (probability volume).



employed for documentation, visualisation, modelling and process-oriented simulation.

A particular challenge for segmentation is posed by 3D image spaces. These are highly relevant for the reconstruction of materials and e. g. for biological objects. This topic is tightly connected with 3D data models, and with geostatistical analysis for decision support applications (see Fig. 2)

As an Austrian contribution to the International Polar Year (FERMAP-IPY) we accepted responsibility for the “Schools on Ice” initiative. Here we reach out from Global Change research in Greenland to Austrian high school students doing field work on a glacier in the Hohe Tauern National Park.

Another project with significant potential for innovative science is jointly pursued with researchers at MIT: based on a highly integrated digital city model the concept of a “Real Time City” opens up new approaches to population and mobility research, as well as for behavioural analysis (see Fig. 3)

Special emphasis is dedicated to the development and careers of young scientists. Three projects are focussed on international PhD students jointly supervised with Innsbruck University, VU Amsterdam and MIT Boston:

- G. Wallentin: “Spatio-temporal modelling of natural reforestation”
- F. Fischer: “Location Based Social Media”
- F.d.Fiore: “Understanding mobility in an ubiquitously connected society”

Research projects are continuously translated into communication of research results and public relations:

- At the annual AGIT symposium at Salzburg University’s Science Faculty an exhibit booth was designed to display research posters from other ÖAW departments, showcasing their GIS-related research outcomes.
- The “Geoinformatics Forum Salzburg” was co-organised in a leading capacity as a strongly international venue for leading researchers.
- In July 2007 a working group symposium for “Computer Oriented Geology” (COG) was dedicated to hydro(geo)logical modelling and GIS-based integration, analysis and modelling of geological data.
- Hundreds of high schools students participated in the “Global GIS Day” in November 2007, fascinated by contributions from the GIScience unit.
- The ongoing “Geoinformatics Colloquia” series is co-sponsored by GIScience.
- During the official opening of GIScience highlights from our research programme were presented, receiving a high level of media attention.

The GIScience research unit is tightly integrated with the “GIS Research Cluster”, made up from research institutions in the industry-led “GIS Cluster Salzburg”. Between the Centre for Geoinformatics (Salzburg University), the iSPACE Research Studio (ARC), Salzburg Research and GIScience numerous cooperations and joint projects are contributing towards a critical mass



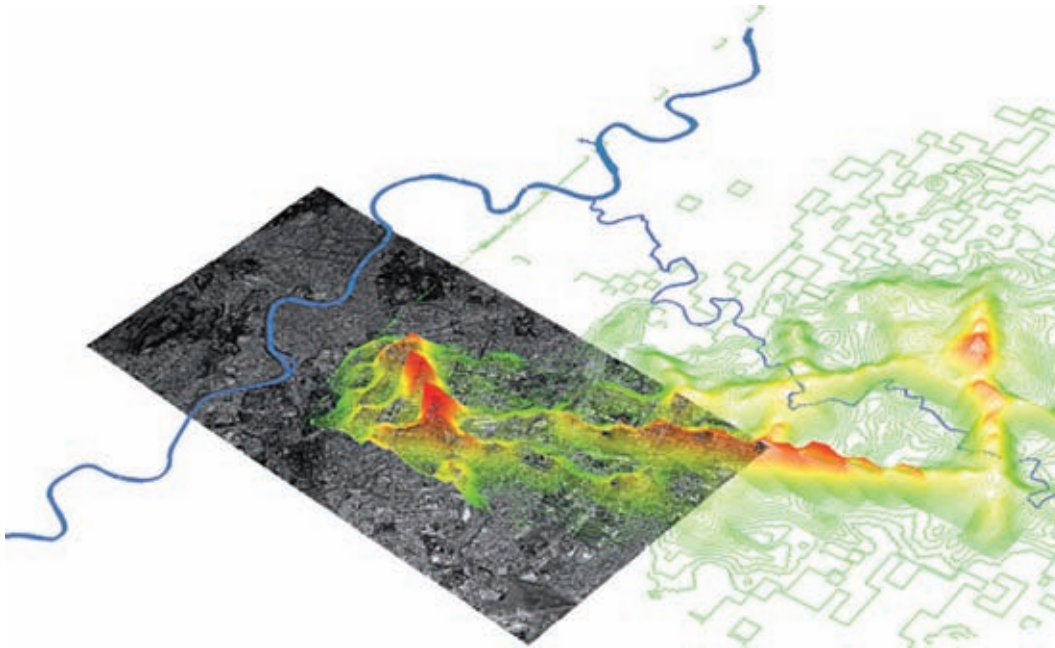


Fig. 3:  
Current density of cell phones along traffic corridors in Rome, used as an indicator for spatio-temporal behaviour and mobility patterns of urban populations.

of Geographic Information Science researchers at the Salzburg hub for GIScience.

#### Preview for 2008–2009

The *SDI* research theme is currently gaining momentum, and is not the least driven by the European initiatives of GMES and INSPIRE, requiring the implementation of regional and national SDI's. GIScience is aiming at contributing to the Austrian SDI and its integration with transnational infrastructures.

Within this context one particular objective will be the participation in an eContentplus project (DG Information Society and Media), in order to leverage and validate research outcomes within a wider application framework of environmental information systems and services.

The *Spatial Analysis* research theme will be accentuated with research into multidimensional methods and operators, leading to simulation of dynamic processes. It will be important to maintain the positioning of research at the interfaces between social science and technology, covering individual mobility, behavioural changes induced by technology, mobility of populations etc ... all based on empirical evidence.

Another particular initiative will be the progress from analysis towards systems dynamics approaches, representing change and temporal dynamics across scales and disciplines, ranging from local social and ecological systems towards global change.

## Commission for the Palaeontological and Stratigraphical Research of Austria, CPSA

Head: WERNER E. PILLER



### Aims and Functions

The Commission for the Palaeontological and Stratigraphical Research of Austria (CPSA) focuses on the two basic topics in earth sciences, palaeontology and stratigraphy. It aims to foster basic scientific knowledge in this field of science but also to provide its sound documentation and presentation.

The primary goal of the commission was the edition of the “Catalogus Fossilium Austriae” (CFA), which represents a systematic encyclopaedia of all described and indicated fossils on Austrian territory. This documentation is still one goal of the commission but its field of activity has considerably changed in 2006 focusing now on primary scientific research work. In connection with the fossil documentation in CFA the database “OETYP” has been established to provide public online access to all palaeontological types and figured materials of Austrian fossil collections.

Starting with 2006, the CPSA put its main emphasis on *Palaeoecosystems* as a prime scientific research target and considers the identification of specific Austrian topics out of this very broad scientific field as a mission. The scientific researchers have to adopt innovative methods in their particular projects and these have to be integrated into international perspectives, however, an Austrian component has still be visible.

In *Stratigraphy* a broad spectrum should be covered out of this wide thematic field. The basis for this is the “Stratigraphic Chart of Austria 2004 (sedimentary sequences)” which includes most lithostratigraphic units on Austrian territory ([http://www.uni-graz.at/gepwww/forschung/Stratigraphische\\_Tabelle\\_von\\_Oesterreich\\_2004.pdf](http://www.uni-graz.at/gepwww/forschung/Stratigraphische_Tabelle_von_Oesterreich_2004.pdf)). These units have to be described and documented in detail, they also have to be put into an international context and properly evaluated. The database “LITHSTRAT” acts as a documentation tool for the units. Besides this basic work also modern stratigraphic principles and methods have to be applied to Austrian rocks and sedi-

ments, to develop a broad based integrated stratigraphy in Austria.

### Results for 2006–2007

Fossil reefs are considered to be an excellent opportunity for reconstructing a palaeoecosystem. In Austria a broad variety of examples exist which are internationally well known and come from a wide stratigraphic range. Out of this palette two examples have been selected and their investigation started within the considered time interval:

#### *Upper Triassic reefs of the Northern Calcareous Alps*

Within this project the internationally famous model reef of the Steinplatte (Tyrol/Salzburg) was started to be studied mid-2006 (B. KAUFMANN) (Fig. 1). Field work was finished end of 2007 and the integration of modern aerial photographs and application of a digital elevation model allowed for the first time precise mapping of the area. This was a prerequisite for an exact geometric reconstruction of the reef and a precise stratigraphic correlation within the complex. This acts as basis for a detailed sequence stratigraphic analysis. Within this project a cooperation was established with the University of Vienna (L. Krystyn) and with R. J. Stanton (Natural History Museum, Los Angeles, USA). First results have been presented at scientific conferences and workshops.

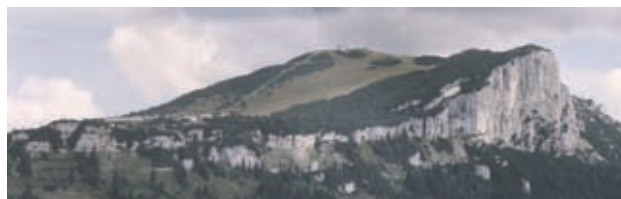


Fig. 1: Upper Triassic reef complex of the Steinplatte (Tyrol/Salzburg) (view from west). In the nearly vertical walls the thick massive reef limestone is clearly visible (right) contrasting to the well-bedded limestone-marl sequence of the Kössen Formation (left).

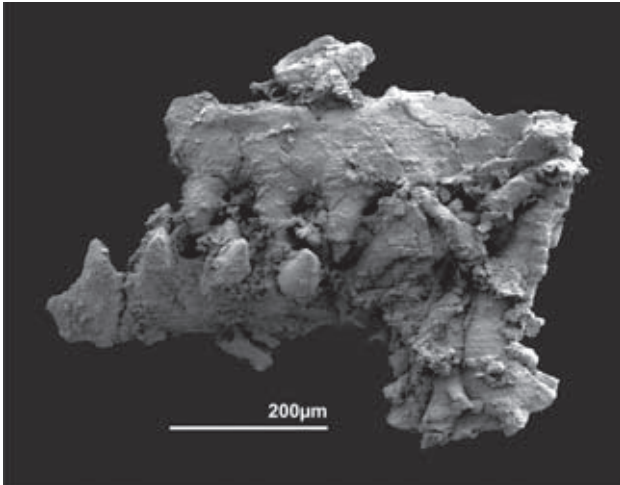


Fig. 2: First documented conodont-cluster of *Icriodus woschmidti* (Lower Devonian, approx. 416 Ma). Baron von Kottwitz Quarry, Kirchfidisch, S-Burgenland.

#### *Devonian reefs of Austria*

This project was started in 2007 including several field campaigns (T. J. SUTTNER) in the Carnic Alps and the Graz Palaeozoic. For palaeoenvironmental reconstruction many rock thin sections for microfacial analyses have been prepared, for dating a great number of conodont samples were analysed (Fig. 2). Integrating the project in the frame of IGCP project 497 as a subproject (“Mid-Devonian bio-crises of proto-alpine carbonate platforms”) allowed additional funding and the project is thus already internationally embedded. Also a cooperation with the Czech Geological Survey has been established. First results have been presented during international conferences, some are already published.

Besides the research on fossil reef ecosystems several smaller projects have been started within the palaeoecosystem focus, mainly dealing with Austrian Neogene topics:

#### *Dinoflagellate cysts of the Austrian Neogene*

Dinoflagellate cysts are widely unknown and undescribed out of the Austrian Neogene although these microfossils are generally known as good stratigraphic markers and as highly valuable tools for palaeoecological interpretations. Within this project (collaborator A. SOLIMAN) a major part of the Neogene sequence has been successfully sampled during the reported period. First emphasis was put on the Karpatian/Badenian boundary in studying several localities in Styria. This boundary, which is also the Lower/Middle Miocene boundary, can be well recognized based on the occurrence of selected dinoflagellate cysts (Fig. 3). Palaeo-

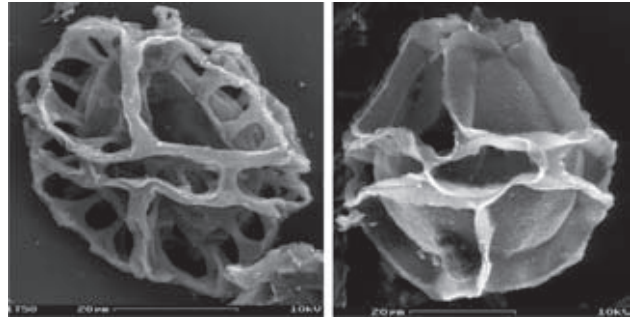


Fig. 3: Dinoflagellate cysts in excellent preservation (left *Unipontidinium aquaeductum*, right *Impagidinium paradoxum*, REM-photographs); Middle Miocene, Retznei, Styria.

oecologically they are also very interesting since they do not react as sensitive as other microorganisms (e. g., foraminifers) to eutrophication. These results were presented to a broad international audience during a Penrose Conference of the Geological Society of America (“Chronostratigraphy: Beyond the GSSP”), which was organized by the commission head at Schloss Seggau (Stmk.). Some results of this project are already published. Some of the studies of this project have been carried out in close cooperation with the Institute of Limnology (Mondsee) of the ÖAW (working group D. L. DANIELOPOL). Together with D. DANIELOPOL and M. GROSS (Landesmuseum Joanneum Graz) joint studies have been carried out in the field of palaeolimnology with special emphasis on the Late Miocene Lake Pannon. Out of this cooperation several publications already originated.

During the reported period studies have been continued and newly started applying geochemical proxies (e. g., stable isotopes) of molluscan shells and foraminiferal tests to palaeoecological and palaeoceanographical reconstructions of Neogene topics (scientific collaborators S. MÜLLEGGER, P. GRUNERT). These studies are carried out in close cooperation with the Natural History Museum Vienna (M. HARZHAUSER). Within these studies also the type locality of the Ottangian (Ottang Schanze, Upper Austria) will be restudied.

#### *Database projects*

The database “OETYP” (coordinator: A. KROH, Natural History Museum Vienna) has been considerably enlarged during the reported period and includes 63,807 records (end 2007) (<http://www.oeaw.ac.at/oetyp/palhome.htm>). The database “LITHSTRAT” (coordinator: I. ZORN, Geological Survey Vienna) was enlarged by 218 records of lithostratigraphic units of the Upper Triassic of the Northern Calcareous Alps.

*Publication projects*

To facilitate publication of comprehensive monographs within the series “Schriftenreihe der Erdwissenschaftlichen Kommissionen” of the ÖAW publication of special volumes has been enabled. The first special volume was published in 2006: GROSS, M., 2006. Mittelmiozäne Ostracoden aus dem Wiener Becken (Badenium/Sarmatium, Österreich). Österr. Akad. Wiss. Schriftenr. Erdwiss. Komm., Sonderband 1, 224 pp., Wien; editor: W. E. PILLER.

A regular volume of the “Schriftenreihe der Erdwissenschaftlichen Kommissionen” was published (volume 17) in 2007: “Fossil Corals and Sponges. Proceedings of the 9<sup>th</sup> International Symposium on Fossil Cnidaria and Porifera” (eds. B. HUBMANN und W. E. PILLER).

**Preview for 2008–2009**

Starting a new phase in 2006 focusing on primary scientific research work this approach will be continued for the next years. Concerning the palaeoecosystem topic the projects on “Upper Triassic reefs of the Northern Calcareous Alps”, “Devonian reefs of Austria” and

“Dinoflagellate cysts of the Austrian Neogene” will be in the centre of research. The project “Dinoflagellate cysts of the Austrian Neogene” will be finished during the next 2 years. One of the results will be a comprehensive monograph of the discovered dinocysts. The study on the Steinplatte reef will also be finished and the focus of this project will move to the reef belt along the southern margin of the Dachstein Limestone platforms (Hochkönig, Tennengebirge, Hochschwab). Within the Devonian reef project the comparison between the Carnic Alps and the Graz Palaeozoic will be crucial. The reef studies should become more internationally integrated and also strengthened by acquiring additional external financial support.

The focus in stratigraphy will be the publication of the “Explanations of the Stratigraphic Chart of Austria 2004 (sedimentary sequences)”.

The long term project *Catalogus Fossilium Austriae* (CFA) and the database projects OETYP and LITHSTRAT have to be continued. Within CFA publication of 1–2 volumes is scheduled, also several volumes of “Schriftenreihe der Erdwissenschaftlichen Kommissionen” of the ÖAW are planned.

## Commission for Geophysical Research

Head: MICHAEL KUHN



### Results for 2004–2005

#### *3D-Mapping of Alpine Permafrost (Refraction seismic with continuous data sampling)*

As a contribution to the ÖAW-Project “Permafrost in Austria – part 1” (Prof. Karl Krainer, Institute of Geology and Paleontology, Univ. Innsbruck) the mapping of Alpine permafrost with a seismic methodology is planned. The Commission of Geophysical Research of the ÖAW is supporting the project by providing the financial means for a 6-channel-logger (REFTEC 130-01/6). Testing the REFTEC 130-01/6 for its application in seismic permafrost mapping was successfully done near the Weißseehaus (2750 m a. s. l., end of Kaunertal mountain road, Tyrol).

#### *Investigation of the austrian glacier inventory*

Climatological and glaciological analysis of the austrian glaciers according to the 1969 and 1998 inventories. To investigate the broad data set of the new austrian glacier inventory of 1998 it was necessary to highlight

different characteristics of the glaciers. In a first step, different exposition characteristics have been quantitatively compared. Fig. 1 gives an example of how changes and mean minimum elevations are distributed over the different exposition classes:

A mean area decrease between 1969 and 1998 can be pointed out in all exposition classes. The main part of the glacierized area is exposed towards north, followed by northwest and northeast. The area-weighted mean minimum glacier elevation is least for northward-exposed glaciers which is a result of less incoming short-wave radiation. The southward-exposed glaciers have a mean minimum elevation that is some hundred meters higher. The only exception for this is the southeast-exposed class that is dominated by Austria’s largest glacier, the Pasterzenkees. It extends down to 2074 m, covering a third of this class’ area and therefore governing the mean value distinctly.

A further step was necessary to analyse the glaciological characteristics of the different mountain ranges. Data from 1998 have been compared with the former inventory of 1969 and relative area changes, mean thickness changes and volume changes depending on size- and exposition classes have been studied. The mean relative area change of the individual mountain ranges shows a minimal value for the Allgäu Alps where glacier area has decreased to its half between 1969 and 1998. This group as well as the only one with positive area changes (Karnian Alps) consist only of one small glacier and are therefore rather unrepresentative.

For the more important mountain ranges in terms of total glacierised area the relative area changes are more homogenous. For the Ötztal Alps or the Glocknergruppe relative area changes account for  $-17\%$  and  $-13\%$  respectively.

In total the decrease of glacierized area in Austria between 1969 and 1998 was about  $17\%$  (Lambrecht and Kuhn, 2007).

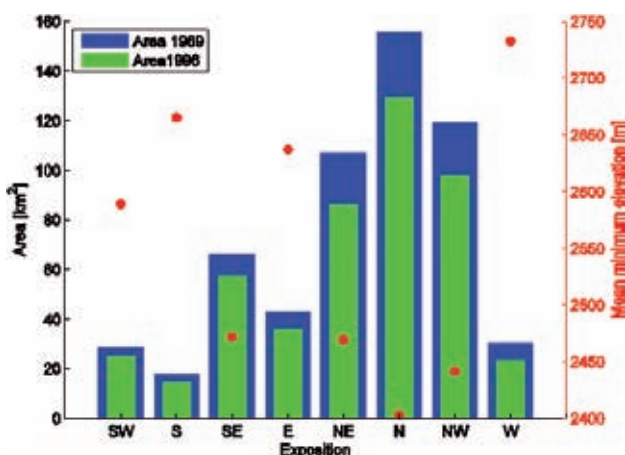


Fig. 1: Glacierized area in the respective exposition class for 1969 and 1998 (bars, left axis) and the mean minimum elevation of the glaciers in each class (dots, right axis)

*Seismic sounding in Lake Traunsee*

A seismic survey of the lake Traunsee was accomplished in 2005. The recording was carried out in 5 stages; the first 3 stages were evaluated in the years 2006–2007.

The field survey was carried out in cooperation with *Meerestechnik/Umweltforschung* Bremen (MTU), department *Geowissenschaften*. The seismic equipment was therefore mounted at the *Karl Eder*, a vessel operating at the lake Traunsee.

For a preliminary processing of the data set the SU (seismic utility) package was used, the final processing of the data – based on the experience with SU – was done using the ProMax system.

As a consequence of the hydrophone distance of 1 m, the default distance for the common midpoint gathers resulted in 0.5 m with weak coverage yielding in an insufficient subsequent noise reduction. Optimising that CMP distance caused improved trace coverage in the particular CMP gathers and thus a superior noise reduction by means of stacking.

True amplitude recovery based on a preliminary velocity model corrected the loss of energy of the seismic waves along the wave path. After velocity analysis in a subsequent processing step the updated velocity model was used for that correction. Noisy traces were killed by trace editing and unwanted first breaks were eliminated by use of first break muting.

A very dominant monofrequent noise depicted a big challenge, but the noise could be removed by a combination of two different notch filters. An additional band pass filter led to further improvement of the noise/signal ratio; the optimal filter parameters were thereby estimated by elaborate test runs.

After CMP collection a preliminary stack was created whereby the stacking was done using a constant velocity field based on the seismic velocity of fresh water for the velocity correction. That preliminary stack was subsequently used for selecting the positions for the velocity analysis points. The velocity field estimated from the velocity analysis was used for normal move out correction of the CMP gathers prior to stacking. Stacking the CMP gathers resulted in the final stack. That final stack was used on the one hand for gaining geological information about the quaternary sediments below the sea bed and on the other hand for estimating the depth of the lake along the seismic lines.

As a conclusion it can be stated that within the framework of this work a great deal of experience has been gained concerning acquisition and processing of seismic data originating from marine environment. That experience might be vitally important for subsequent marine seismic surveys in Austrian lakes.

## Commission for Basic Research on Mineral Raw Materials

Head: HORST WAGNER



### Aims and Functions

The aims and objectives of the Commission are:

- Promotion of research activities
- Coordination of research activities
- Promotion of international co-operation
- Creating an awareness in the general public of the importance of mineral resources.

The Commission achieves this by:

- Creating a multidisciplinary discussion platform (the Commission)
- Identifying key research areas in the field of mineral resources
- Sponsoring and/or supporting research projects
- Publication of research results
- Collecting funding
- Supporting exchange programmes for scientists
- Promoting scientific development
- Creating public awareness of the importance of minerals
- Supporting the activities under the Austrian Minerals Plan.

### Results for 2006–2007

The programme of the Commission is long range and focussed on identified research topics. These address a number of open questions which were identified by the

work on the “Metallogenic Map of Austria”. Key research areas are:

*“Element mobility and formation of mineral deposits during the Alpine orogeny of the Eastern Alps”, “Mineral deposits and mineralization processes in late orogenic shear zones of collision orogens”, “Distribution and characteristics of faciesbound mineralizations of the Carnian stage of the Eastern Alps”, and “Increasing the value of industrial minerals”.* In 2007 a further key research topic was added which addresses the distribution of isotopes in areas of mineralization *“Isotope map of Austria”.*

*“Element mobility and formation of mineral deposits during the Alpine orogeny of the Eastern Alps”*

E. SCHROLL showed in an international cooperation with H. KUCHA (Krakow) for the first time the existence of fossil sulphate-reducing bacteria in the Pb/Zn-deposit of Bleiberg-Kreuth. Together with a geostatistical treatment of S isotope data (G. RANTITSCH and E. SCHROLL) these results provide a new understanding of metal accumulation in carbonate hosted Alpine Pb/Zn-deposits. New and well supported by ore microscopy and EMS analytics is the proof Zn accumulation by sulphate reducing bacteria. Parts of the results have been published in international journals.

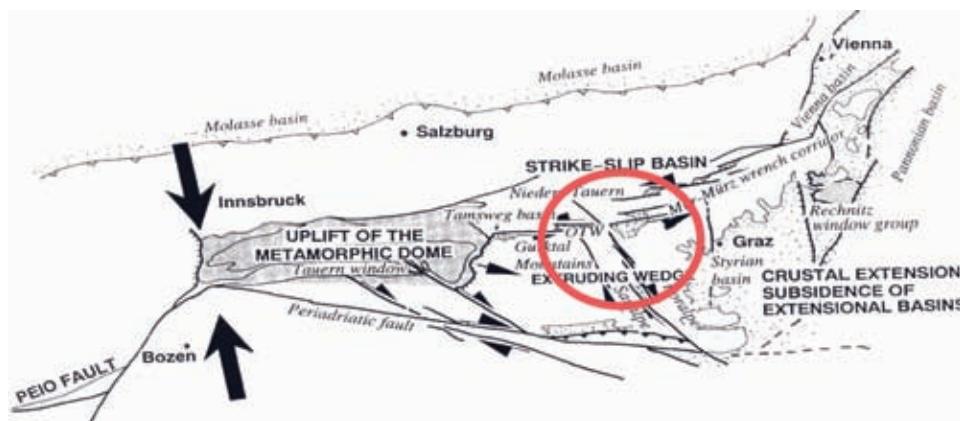


Fig. 1: The Pöls-Mur-Lavanttal fault system of the Eastern Alps is one of the focal areas of the key research area “Mineral deposits and mineralization processes in late orogenic shear zones of collisional orogens” (base map of F. NEUBAUER).

Several projects (W. PAAR) investigated the formation of polymetallic precious ore mineralizations in the eastern “Hohe Tauern” mountains. The results were recently published in a book on gold in the Tauern region (W. PAAR et al. 2006). In the Erzwies district two vein systems of late Alpine age can be distinguished on the basis of their mineralization. The older veins suggest a higher temperature (350–400°) bismuth enriched mineral paragenesis, with members of the Aikinit-Bismuthinit-sequence, and the Lillianit- and Pavonit-groups. These sulfosalts are found in considerable concentrations and are always accompanied by free gold. The gold mineralization of the Silbereck-formation in the Altenberg district is characterized by exotic mineralization. Talcum rich structures of particularly high gold concentration and bismuth rich sulfosalts which intersect the metamorphic dolomitic rock formation were identified. Comparative studies were also conducted in similar gold mineralizations in Western Iran. The investigations by W. PAAR initiated recent exploration activities in cooperation with foreign companies in the eastern part of the “Hohe Tauern”.

E. SCHROLL has studied the mobility of mercury in the Eastern Alps especially under the aspect of the Alpine metamorphism. E. STUMPFL has investigated the composition of fluids in relation to mineralizations in Austroalpine ultramafic complexes. This provides a correlation of mineralization in dunite-clinopyroxene complexes of the Eastern Alps with similar mineralizations (chromite, PGE) in Australian ultramafic complexes. Leaching experiments (initiated by L. Weber) at selected rock types of the ore rich Graywacke zone are the aim of a long-time project.

*“Mineral deposits and mineralization processes in late orogenic shear zones of collision orogens”*

Projects under this key research area covered coal deposits in pull-apart-basins Lavanttal, R. SACHSENHOFER and D. REISCHENBACHER), effect of “Pöls”- fault zone on magnesite quality of the Sunk/Hohentauern magnesite deposit (F. EBNER and A. AZIM-ZADEH), and the effect of the Lavantal fault system on the formation of iron mineralizations (Fig. 1). W. PROCHASKA showed that in the vicinity of the fault leached fluids have relatively high Na/Br and Cl/Br ratios. It is suggested that meteoric water invaded into the crust and the ascending fluids have formed hematite in carbonate host rocks within an oxidizing regime (specularite – of Waldenstein type) whereas siderite (Hüttenberg type) has been formed in the reducing regime.

*“Distribution and characteristics of faciesbound mineralizations of the Carnian stage of the Eastern Alps”*

Under this research area the possible effects of the geothermal environment on Pb/Zn-mineralizations in carbonate rocks of the Carnian stage of the Calcareous Alps have been investigated. It was found that the paleogeothermal environment had no significant influence on the formation of Pb/Zn-mineralizations. Pb/Zn-deposits can be found in the metamorphic higher temperature zone of the central section of the northern Calcareous Alps (portion of the “Ultra-Tirolikum”), the moderately influenced regions of the “Hoch-Tirolikum” and thermally largely unaffected region of the “Tief-Tirolikum”. In contrast Pb/Zn mineralizations are missing in the Hallstatt melange zones. Palinspastic reconstructions referring the Oligocene situation indicate rather a control of the mineralizations by sedimentary facies than by epigenetic processes.

*“Isotope map of Austria”*

Work on this new key research area commenced in 2007. The research projects on the geochemical characteristics of sulfide mineralizations in the Bohemian Massif (L. WEBER) and Pb isotopes in the Drauzug Pb/Zn district (E. SCHROLL) aim to bridge information gaps on isotopes using classical methods while two other projects on the characterization of magnesites using isotopes (W. PROCHASKA, F. EBNER) enter from a methodological point of view new territory.

*“Increasing the value of industrial minerals”*

Work in this area concentrated on improving the quality of quartz, graphite, antimonite and bentonite (H. FLACHBERGER). It could be demonstrated that using a combination of magnetic separation and flotation quartz and feldspar concentrates of high quality can be obtained. In the case of graphite ash contents of the finer fractions still exceeded 20 % even after density separation and flotation. The concentration of antimonite was successful but the content of arsenic matter was above the required levels due to the fine mineral matrix. The work on enhancing the quality of bentonite proved to be extremely difficult. G. RANTITSCH and Ch. TEICHERT investigated the microtexture of natural graphite using innovative methods (Raman spectroscopy, Atomic force microscopy, Ion beam microprobe).

*“Projects outside Austria”*

Several studies on mineral deposits outside Austria were conducted on gold mineralizations in Western Iran (W. PAAR), Fig. 2 and 3, Ag/Sn-mineralizations



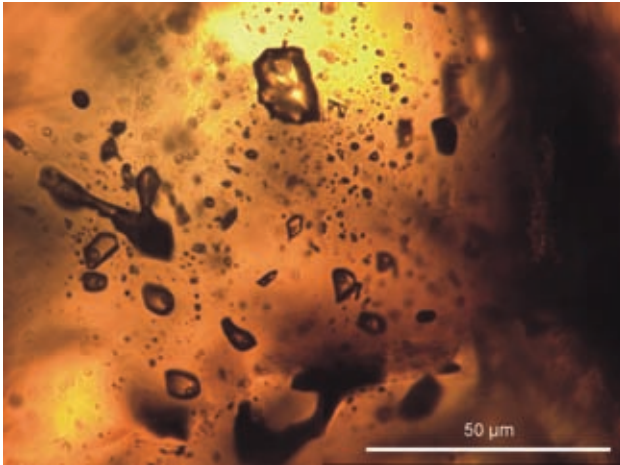


Fig. 2: Core region in sphalerite with diluted double-phased fluid inclusions of primary (?) origin. (Zarshuran, sample Z1).

of Argentina (W. PAAR & F. EBNER), and orogenic gold and stratabound tungsten mineralizations in Greenland (J. RAITH).

*Promotion of young researches in minerals sciences:  
“Walther E. Petrascheck-Award”*

On the occasion of the 100<sup>th</sup> anniversary of the birth of the imminent Austrian geologist and mineral scientist Walther Emil Petrascheck an academy award for young scientists and engineers working in the field of minerals research was established. The first recipient of this award was Dr. Hubert Putz from the University

of Salzburg whose Ph. D. thesis was concerned with the genesis of a polymetallic mineral deposit in Argentina.

*Creating public awareness of the activities of the Commission*

In collaboration with the Mineral Resources Division of the Department of Industry and Labour a folder on the importance of minerals for the modern society was published and distributed to all secondary schools and to all visitor mines in Austria. A poster presentation of the Commissions research activities was organised in connection with the European Minerals Day and the Annual General Meeting of the Austrian Mining Association.

**Preview for 2008–2009**

Over the next few years it is planned to finalise the work on the first three of the key research areas and to concentrate on the isotope investigation of Austrian mineral deposits and on the improvement of the properties of industrial minerals. It is intended to link the isotope data with the already existing data on Austrian mineral deposits (Metallogenetic map of Austria) and to integrate it into the interactive mineral resources information system “IRIS”. The duration of this programme is estimated to be five years. Work on enhancing and improving the properties of industrial minerals will continue.

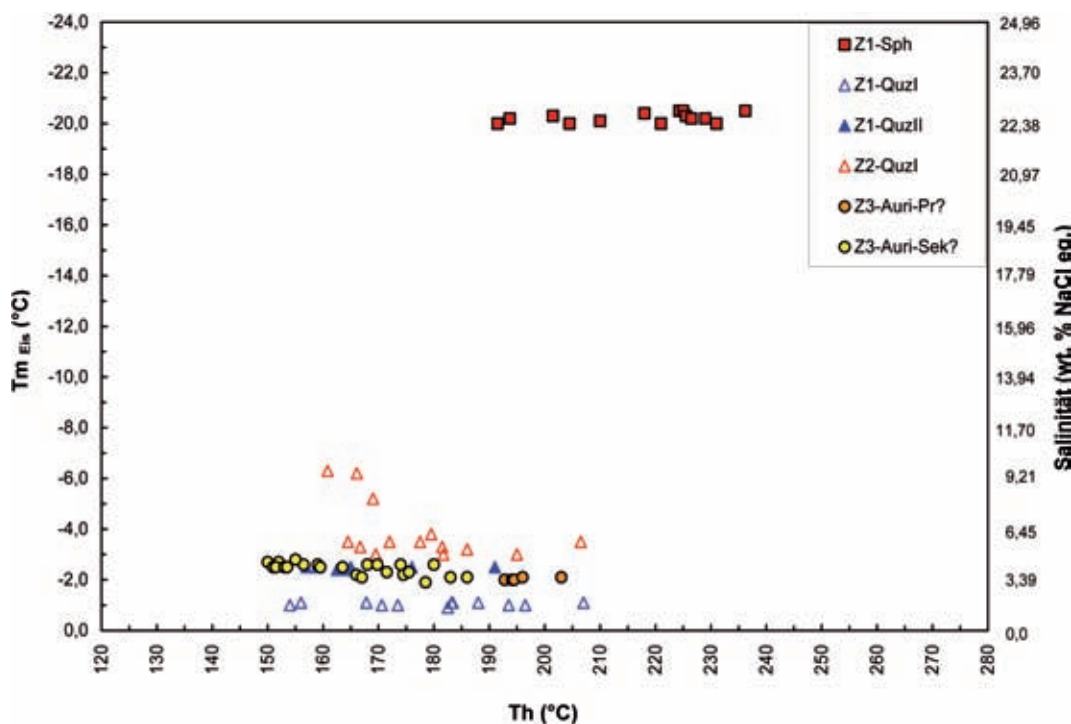


Fig. 3: Tm<sub>EIS</sub>/Th-plot of microthermometric data from fluid inclusions in sphalerite, quartz and auroggment from the gold mineralization Zarshuran/NW Iran.

## Commission for Quaternary Research, KFQ

Head: GERNOT RABEDER



### Aims and Functions

The main aim of the commission is to promote the research, which has a connection to the Quaternary period. Included fields of research are: glaciology, palaeontology, anthropology, geology of the Quaternary, dating and palaeoclimatology, the latter has a prominent position within the aforementioned fields of research.

The reconstruction of the climatic changes in the Eastern Alps between the Middle Pleistocene and the Holocene is a current key aspect of the research group. These palaeo-climatologic studies base on material that show evidence of former climatic trends: traces and sediments of glaciers, sediments of rivers and lakes, loess and soil, decline of ice in caves, abundant fossil cave sites. All of these are controlled by climatic changes:

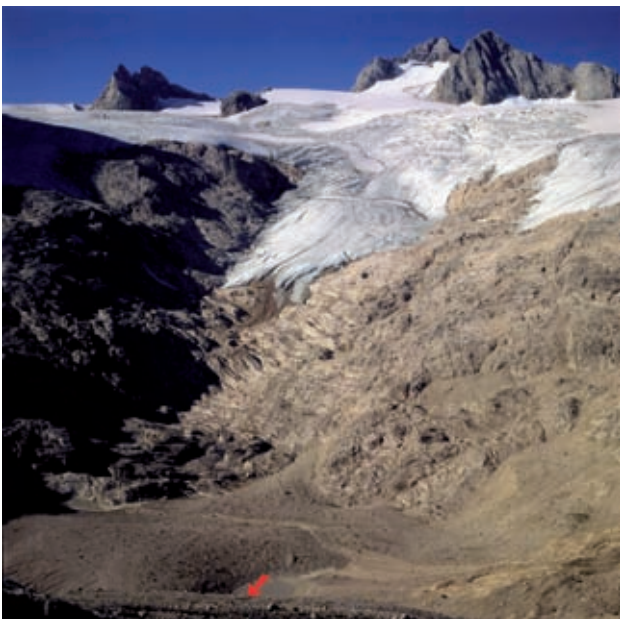


Fig. 1: The Hallstättergletscher with the Dachstein (8. 9. 2005). The arrow shows the position of sampling. This area was covered 130 m by ice, during 1850 AD. (Foto: G. Patzelt)

Traces of glaciers and moraines indicate former spread of glaciers, lake- and turf-sediments show effects of climatic changes in fauna and flora as well as in sinter and ice in caves. In loess and cave-sediment are remains of fossil bones and artefacts, which preserved evidence of the environmental conditions former humans and animals lived in.

### Results for 2006–2007

#### *Status of ice in caves (working group K. Mais):*

Measurements during many years in some alpine ice caves (Dachstein-Mammuthöhle, Dachstein-Rieseneishöhle, Kolowrathhöhle, Beilsteineishöhle) proved further declines of the ice bodies, the decline is still linear. During 2006 and 2007 studies of travertines involved the Northern Limestone Alps between Salzkammergut and the Vienna Forest, 50 sites have been sampled. The focus is on the rates of sedimentation and the ages of travertines. Information about the Holocene climate is possible.

#### *Datings of glacier levels (G. Patzelt):*

Samples of humus formerly covered by morains have been taken in the Dachstein area for information of the glacial dynamics in the postglacial.

From 5000 to 1.600 BC the glacier probably has not reached the Taubenriedl and thus remained smaller than in 1920. The glacier advance, proved for the period around, 4.400 BC has therefore not reached the size of glacier in 1920 AD.

#### *Aurignacien of Krems-Wachtberg*

##### *(Ch. Neugebauer-Maresch):*

On the site Krems-Wachtberg (FWF P17258 till FWF P17258 bis Feb. 2007, FWF P19347 Feb. 2007, now FWF P19347) another finding of a baby could be excavated. 1 cm above the skull a needle made of mammoth ivory was found (Nature 444, 285).

During 2007, the center of the excavation site was re-covered. It was a multi-stage fireplace, with an extreme

accumulation of bones and charcoals. The most important finding was a part of an animal sculpture made of clay as well as a human rib.

*Phylogenie of the Carnivores*  
(D. Nagel & G. Rabeder):

*AlpiNet*

The EU-Project *AlpiNet* financed the collection of data concerning caves and open land sites holding palaeontological as well as archaeological material. These informations will be available on the internet to get more insight into the habitation periods of the Alpine area. Minor works were additionally financed by the Quaternary Commission. The project terminated June 2007.

*Migration Pattern of Pleistocene Mammals*

In the years 2006 and 2007, additional material from cave bear and cave hyena could be sampled from the Natural History Museum London (Kent's Cavern) as well as from the locus typicus material *Ursus spelaeus* "odessanus" from Helsinki.

*Chronology, migration and systematic of cave-bears*  
(working group G. Rabeder):

The research of the fossil Cave Bears of Massif Vercors yielded the information, that in addition to the Conturines bear (*Ursus ladinicus*) existed another cave bear species. *Ursus ladinicus* inhabited the Grotte Merveillease and Grotte Préletang while in the Bâlme Noire the additional cave bear species was found.

The excavations in the Ochsenhalt-cave have been finished as well as the excavations in the Herkova-Jama in Slovenia. Morphological and metrical comparisons produced results of a small form of *Ursus deningeri*. This kind of bear is of enormous relevance for the entire cave-bear-group. New radiometric datings proved a contemporary existence of *Ursus ladinicus* and *Ursus eremus* in the same alpine region of Totes Gebirge. This is very important for the systematic status of alpine cave-bears.

A new excavation-project has been started in Slovakia. The so called "Slovakian paradise" hosts an extended cave which is rich of fossils. The first excavation campaign brought rich fossil materials of a bear of so far unknown taxonomical position.

The Early Pleistocene remains of an ancestral bear from the carstic area of Deutsch Altenburg have been



Fig. 2: Beilstein icecave near Palfau. (Foto: H. Thaler)

studied. The study proved this material to be the first appearance of the modern brown bear.

**Preview for 2008–2009**

During the next years the successful work will be continued:

*Early holocene evolution of vegetation:* Main emphasis will be the consequences of climatic changes on humans. Detailed analysis will show the effects the climatic influence had on human activities in some selected locations.

*Ice bodies in caves:* Analysis of ice in alpine caves will be continued. Sampling and analyses of travertines will be broadened to all areas of Eastern Alps.

*Phylogeny of carnivore groups:* Morphological studies and DNA sequencing are in progress to show migration pattern of cave hyenas in the Pleistocene of Europe.

*Chronology, migration and systematic of cave-bears:* Excavations in Medvedia jaskyna (Slovakia) will be going on in the next years. The monographs about Krizna, Ajdovska, Herkova jama (Slovenia) and Loutraki (Greece) will be finalized.

The central point of interest is the taxonomic classification of the different bear-groups and the construction of a new phylogenetic tree of ursides.

*Warm periods in the Alps:* A new project aims on the intensity and chronology of warm and moderate climatic periods in the High Alps during the Quaternary. The data from areas of melting glaciers and from High Alpine bear caves will be the basis.



Fig. 3:  
A cave bear skull  
covered with  
montmilk from  
Medvedia jaskyna  
(Slovakia). (Foto:  
R. Gold)

## Mathematics, Simulation and Metrology

### Research Unit for Integrated Sensor Systems, FiSS

Head: THILO SAUTER



#### Aims and Functions

The research unit was established in 2004, its basic idea being to combine in a multidisciplinary way those research fields that are essential for modern integrated sensor systems: Sensor technology, microelectronics, and communication technology. The focus is on structural aspects of the investigated sensor systems, thus the weight of the three complementary fields can vary from case to case. Adequate modelling plays a central role in both the analysis and design of sensor systems, and the methods employed range from the investigation of analytical models to numerical analyses.

The integration aspects the research unit derives its name from can be manifold. They comprise circuitry (with respect to miniaturisation of the sensor or the components relevant for signal processing) as well as functional aspects (mechanisms to increase fault tolerance, but also to combine various sensor principles in order to improve accuracy, measurement range, or robustness) or system-related aspects (in terms of connecting sensors to higher-level systems). The research unit has particular expertise in the areas of miniaturised thermal sensors, resonant micromechanical sensors, optimized system architectures and signal processing for integrated sensors as well as synchronisation and security aspects in sensor networks.

Co-operation with external partners is of high significance in the definition and implementation of research projects. The research unit collaborates with research institutes (both university and non-university) and industrial partners alike. Concrete projects comprise problems from automation, medical technology, or test and measurement technology.

#### Results for 2006–2007

The research focus *thermal sensors* is concerned with sensors which determine the measurand indirectly via a thermally induced effect. This comprises highly sensitive calorimetric flow sensors as well as sensors for

measuring thermal properties of liquids (like thermal conductivity and specific thermal capacity). Both sensor types consist of one resistive heater made of chromium and several spatially distributed, highly sensitive temperature sensors made of amorphous germanium. These elements are, depending on their embodiment, completely embedded either in a roughly 1  $\mu\text{m}$  thin micromechanically produced membrane made of silicon nitride or in thermally isolated, micromechanical bridges.

An angular-resolved flow sensor consists of several thermistors circularly aligned and equally spaced around a resistive heating element. In operational mode, the convective heat transfer induced by the flowing medium distorts the temperature distribution generated by the heaters unevenly, which permits calculation of flow velocity and direction. The shape of the heater and the alignment of the thermistors were optimized by numerical simulations so as to achieve small angular errors and high-resolution direction measurement of gas flow at a time.

A sensor for thermal property measurement relies on the conductive heat transport between heater and temperature sensor via the liquid to be examined. If all components are placed on a simple membrane, parasitic heat conduction in the membrane leads to a significant measurement error, particularly for media with very small thermal conductivity. To overcome this deficiency, a novel structure was designed where all elements are carried by thermally separated, thin microbridges. Without the thermal shunt, very simple mathematical models can be formulated for the function of the sensor. From these models, a novel and robust measurement method could be derived.

Within the research area *resonant sensors*, feasibility studies were carried out for capacitive measurement of oscillation amplitudes in micromechanical resonators. It appeared that electrode sizes of few  $\mu\text{m}^2$  are sufficient to yield useful and stable signals. These findings are

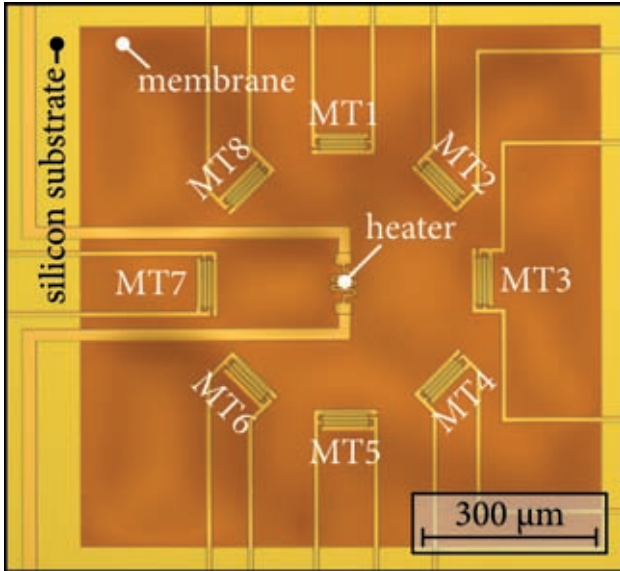


Fig. 1: Angular-resolved flow sensor with eight temperature sensors (MT1–MT8).

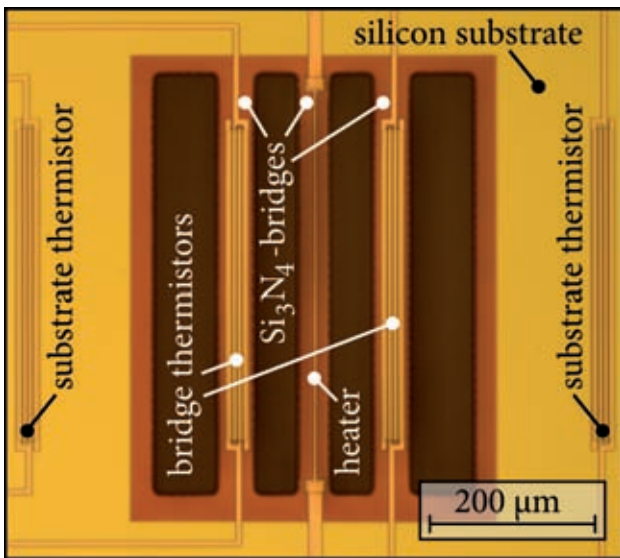


Fig. 2: Bridge-based sensor for determination of thermal conductivity in liquids with perforated membrane carrying heater and thermistors.

of eminent importance for subsequent development of fully integrated sensors for magnetic field or acceleration measurement.

Within the research area *clock synchronization in sensor networks*, emphasis was laid on the improvement of fault tolerance in heterogeneous networks. A dedicated, newly developed simulation environment forms the basis for the design of new algorithms. Simulation models for quartz oscillators and communication protocols permit an accurate investigation of real-world networks. For experimental verification, a fault-toler-

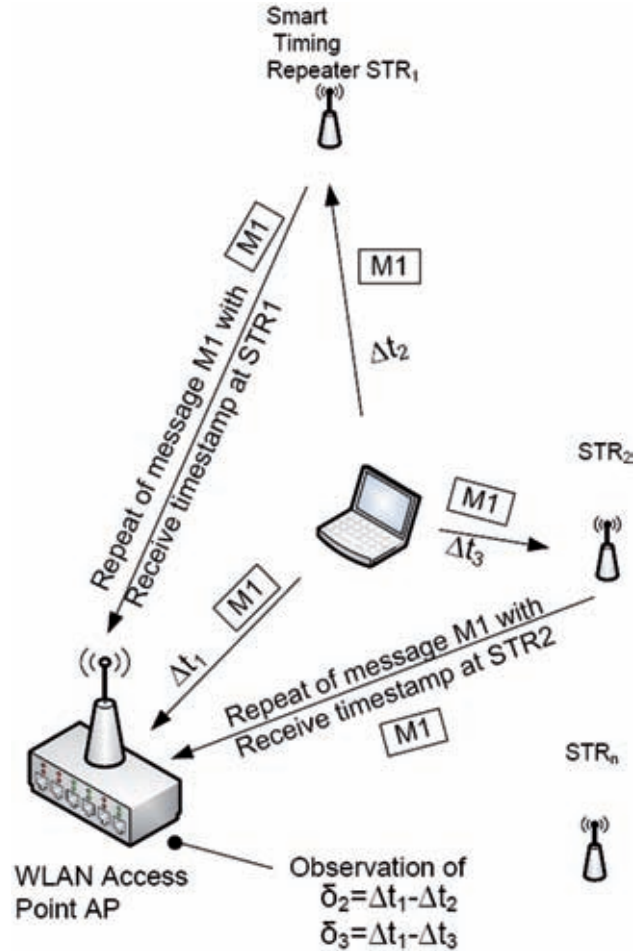


Fig. 3: Localization of mobile devices in wireless networks through differential time-of-flight measurement, synchronized antennas, and hyperbola navigation.

ant Ethernet switch was developed. Refined control algorithms yielded a breakthrough: for the first time, synchronization accuracy below one nanosecond could be achieved between two network nodes.

A further focus was the definition of the first practicable security concept for distributed clock synchronization. The concept pays particular attention to well-balanced security mechanisms allowing for a mixed operation of security-aware and non-secure nodes. These results together with the findings from the investigation of fault tolerance were included in the IEEE1588 standard, whose first revision was completed in 2007.

A newly started project extends the synchronization and security activities into the wireless domain. Goal of the project is to localize a commercial off-the-shelf mobile device (such as a notebook) in a wireless LAN without the necessity for modifications in standard hard- or software. Based on the position information, graded access to network resources can subsequently be granted. Localization works similar to GPS satellite

navigation by differential time-of-flight measurement of data packets. During the first phase of the project, possibilities for high-precision time stamping of data frames in wireless LANs were evaluated. To that end, the detail structure of IEEE 802.11b receivers was investigated and first tests were made within the scope of simulations and experiments.

**Preview for 2008–2009**

For the next two years, the research unit plans to intensify the work on all ongoing projects. Emphasis will still be on micromechanical physical sensors. As regards flow measurement, the prime interest will be in the development of mechanisms making the sensor

more robust and fault tolerant. For resonant sensors, capacitive readout techniques to capture the oscillation amplitudes will be fully integrated in silicon. Know-how in the field of micromechanical resonators will be extended to other application areas such as biomedical devices. A general focus will be put on novel approaches to increase power awareness and energy efficiency of sensor systems. Within the scope of signal processing for capacitive sensors, event- and stream-based algorithms will be investigated. Research in the field of clock synchronisation will focus on wireless networks and integration into real-time applications. A cross-sectional topic will be the development of concepts for data communication security.

## Acoustics Research Institute, ARI

Head: WERNER DEUTSCH



### Aims and Functions

The Acoustics Research Institute is active in four major areas – physical acoustics, physiological and psychological acoustics, acoustic phonetics and hearing with cochlear implants. Research in human and animal auditory perception needs profound knowledge of the physical structure of sound sources and sound fields. Acoustic measurements, numerical simulations and psycho-physiological models are applied to specify and

explain the function of hearing. The effect of acoustic signals is manifold, ranging from low frequency utterances of elephants to ultrasonic communicative “syllables” of mouse populations. It extends from daily speech and music listening to the acoustical design of living rooms and the area of audio technology.

Various resources are at the Acoustics Research Institute’s disposal, ranging from physics to numeric analysis, mathematics, signal processing and psychological experiments. The integration of the results from the individual areas plays a decisive role. The common software platform of the institute (S\_TOOLS-STx) establishes coherence and provides the infrastructure for the effective treatment of complex auditory phenomena.

### Results for 2006–2007

Computational acoustics deals with a wide range of issues in the measuring, modelling and simulation of sound and vibrations.

The project *Prognosis of railway environmental vibrations along surface and tunnel lines* included the numerical simulation of the spread of vibrations in soils and the measurement of the seismic refraction on a test field, provided by the Austrian Railway Corporation. The spectral velocity ratios measured were compared with the model calculation developed within the framework of the project. The model predictions and the measurement results correspond within the frequency range from 10 to 70 Hz and for distances between 10 to 50 m. The objective of the project to provide a prognosis of ground vibrations at the planning stage of new railway lines has been achieved.

In the framework of the project *Calm Tracks & Routes – Simulation of the shielding effect of noise barriers (EC-CRAFT)* the attenuation efficiency of a 3 m high curved (curvature and inclination outside) noise barrier was compared with that of a 4 m high straight barrier. Altogether 8 different barrier profiles were investigated. The insertion loss (the sound pressure with and with-

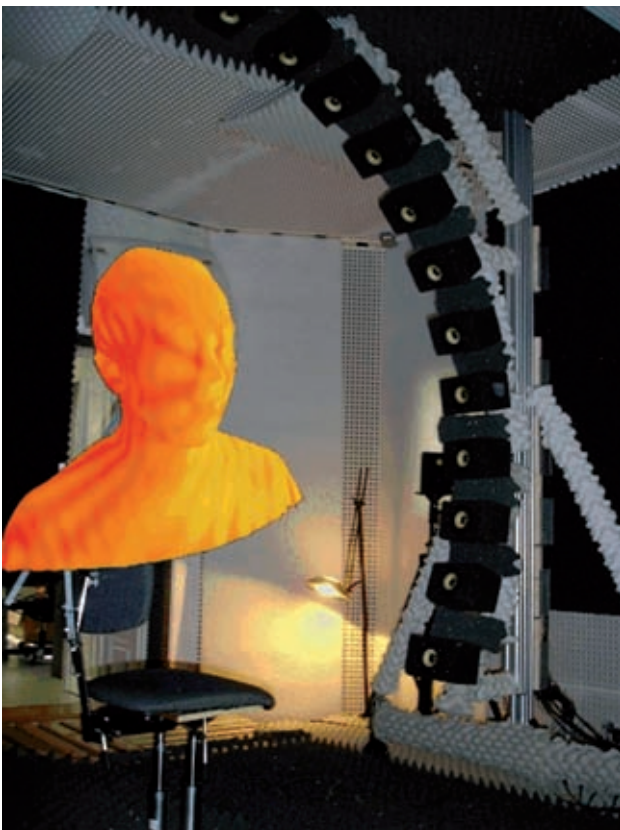


Fig. 1: Equipment for the measurement of the external ear transfer functions (horizontal and vertical) of a test listener. The numerical simulation of the sound field at the head of a test listener after the numerical simulation of a geometric model (sound source left, frequency 13000 Hz) has been superimposed to the picture.



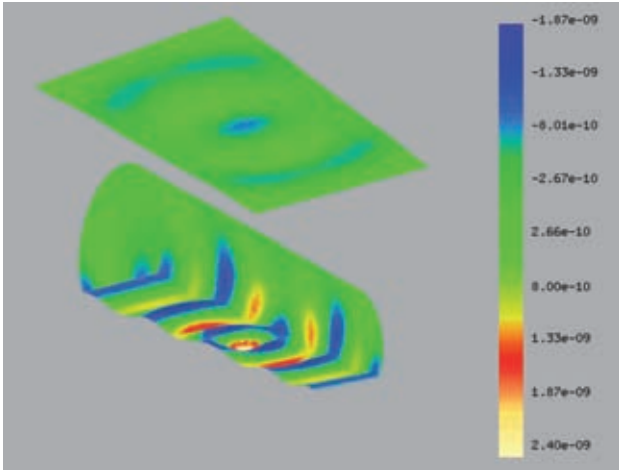


Fig. 2: Real part of the deformations on the z-axis at the tunnel and its ground (upper edge of the tunnel at a depth of 6m).

out barrier) was calculated using the boundary element method (BEM). On a grid (50 m length  $\times$  8 m height) it could be shown that the height of tilted and absorbent barriers can be lowered compared to straight walls without reduction of the insertion loss.

New software components were developed in co-operations with industrial partners. Among them an improved method of the calculation of flow resistances in small gaps and slots (*Viscotubes & Layers*) was implemented. Moreover a new approach for the efficient calculation of sound generators in walls using the boundary element method (BEM) was introduced. By introducing the Fast Multipole Method into the BEM software code and its parallelisation for multi-processor systems (64 bit), the computational efficiency could be substantially improved. Until now the computation of frequencies covering the whole human auditory frequency range was not possible. Furthermore, new linear and quadratic frequency analysis methods, such as from the Cohen class, were integrated in the software package STx. An extension to the order analysis was implemented to compensate for the irregularities in rotational speed signals.

The method developed for the computation of the sound distribution at dummy heads with BEM was applied to “natural” heads. 3D-head-scans of test subjects were made in co-operation with the Vienna University of Technology’s Institute of Discrete Mathematics and Geometry. Each grid contains approximately 65000 to 70000 triangle elements with 30000 to 35000 knots. Such a high resolution of the grid is necessary for calculating the acoustic sound pressure level at high frequencies up to 16000 Hz. The new method enables the determination of computational robust parts of head

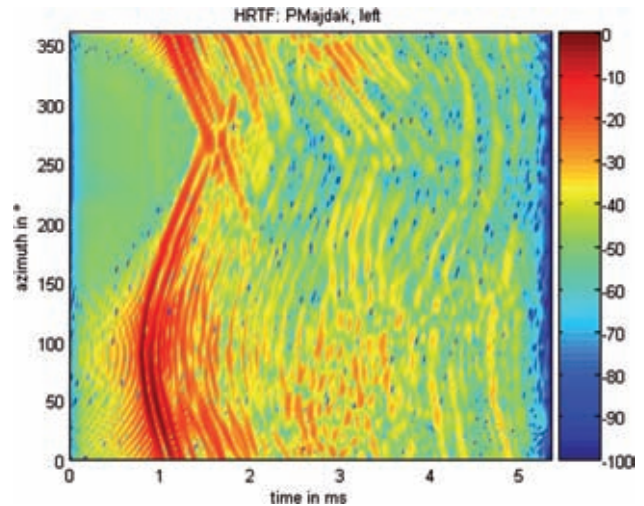


Fig. 3: Impulse responses of the external ear of a test subject in dependence of the incident sound source location (Azimuth angle).

related transfer functions (HRTF). HRTFs describe the auditory localisation of sound sources in the sagittal planes. The results are used to explore the 3D-localisation of sounds for deaf subjects, equipped with bilateral Cochlear Implants.

#### *Psychoacoustics:*

Noise consists of unwanted sounds. The project *NOIDESc (classification of rail traffic noise)* aimed to develop an objective description of railway noise immission loads. Noise induced effects range from mild annoyance to detrimental effects on the health, depending on many subjective criteria. The usual noise exposure limits do not describe the immission effects sufficiently, since they are based on averaged sound level values. The project *NOIDESc* proposes a description and classification scheme on the basis of detailed automatically extractable sound parameters. The new classification system applies cluster- and principle component analysis including the noise event level, event duration and timbre, measured in 21 frequency bands. The study was based on sound recordings of approximately 6000 trains passing by at the microphone of a monitoring station, positioned at a distance of 70 m to the train tracks. If timbre is included, train noise can be classified correctly with an accuracy of close to 95 %. The classification system may be capable to deliver useful information for establishing a noise bonus-malus system in the railway traffic.

#### *Acoustic Phonetics:*

The recently finished post doctoral thesis about *Vowels in Standard Austrian German* is based on a large col-

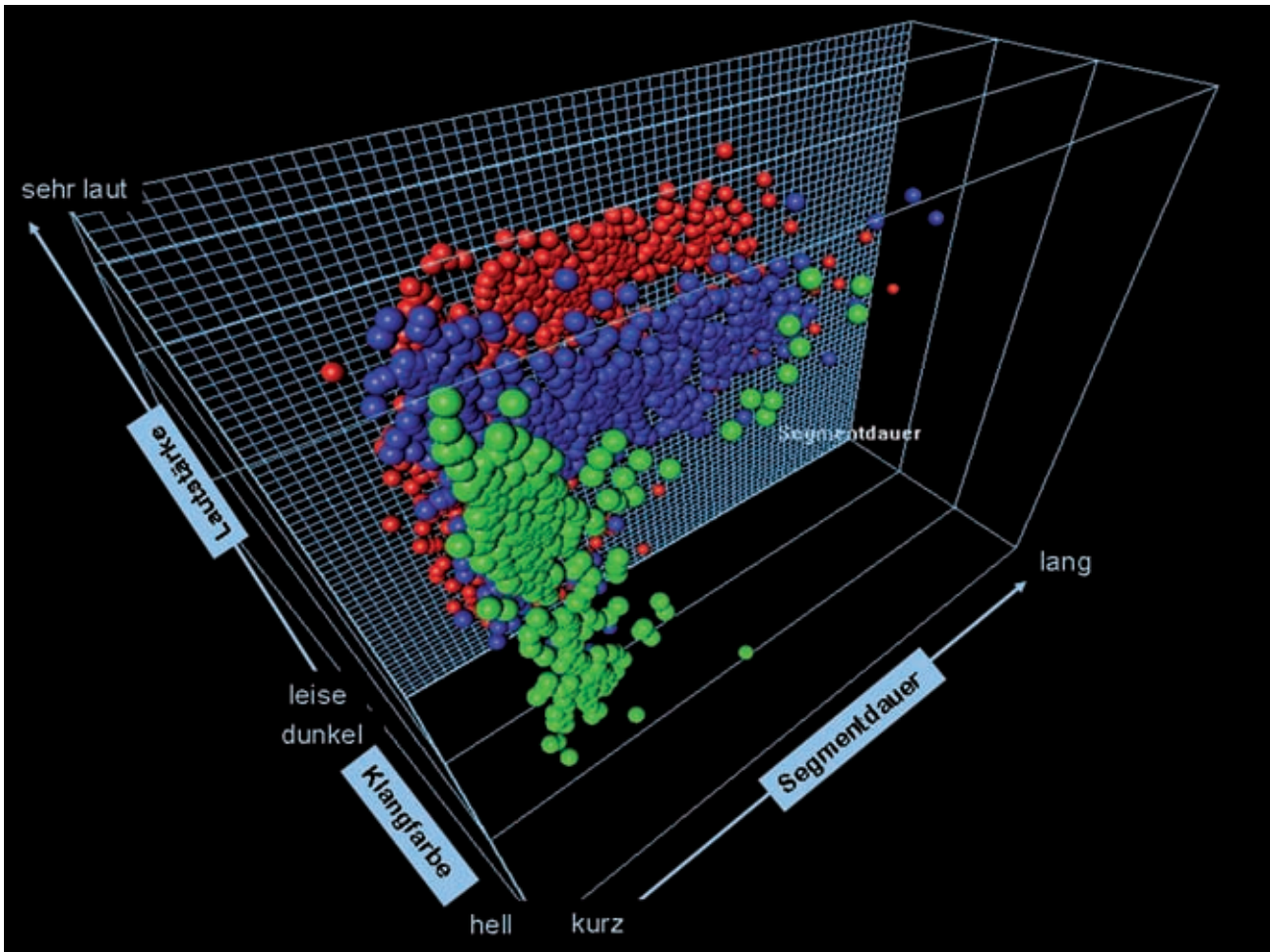


Fig. 4: NOIDESc feature room of train noise; event level, timbre and duration. Timbre is measured in 21 frequency bands.

lection of sound material. The thesis measures acoustic parameters (formant frequencies, vowel lengths and fundamental frequency) using approved measuring methods and statistical analysis. The vowels are defined according to constriction localisation, constriction degree, labial opening and lip protrusion. It also deals with the co-articulation, the vowel variability and the speaker specific differences.

The main conclusion is that the vowels of Austrian German are articulated on five constriction locations. Except for the vowel /a/, the vowels appear in pairs,

	/i/	/i/	/y/	/ɛ/	/e/	/e/	/o/	/œ/	/a/	/o/	/ɔ/	/u/	/u/
constricted	+	-	+	-	+	-	+	-	+	+	-	+	-
open	-	+	-	+	-	+	-	+	+	-	+	-	+
round	-	-	+	+	-	-	+	+	-	+	+	+	+
front	+	+	+	+	+	+	+	+	-	-	-	-	-
lower pharyngeal	-	-	-	-	-	-	-	-	+	-	-	-	-
velar	-	-	-	-	-	-	-	-	-	-	-	+	+
pre-palatal	+	+	+	+	-	-	-	-	-	-	-	-	-

Fig. 5: Feature matrix for the vowels of Standard Austrian German.

whereas the pairs differ speaker specifically either by the feature [±constricted] or by the feature [± open]. The vowels /i/, /y/ and /u/ seem to be subject to a sound change in progress in which vowels [-constricted] are dismissed.

The concept of invariance was re-determined: the more the context of the vowel can be isolated (interactional situation, position in the sentence, phonetic context), the lower its variability. The phoneme is defined as intended, fully specified and pronounceable. Phonological processes have the function to distinguish between regional and group specific varieties. Most co-articulation and ease of articulation phenomena fulfil this function. Within a variety, the situation of the specific interaction is responsible for the appropriate and applied variation. Most processes have the function of making an adequate figure-ground relationship for the particular interactional situation.

*Automatic speaker recognition:* from the different parameters for the analysis of voice signals, such as MFCC, RASTA-MFCC, LPC, PLP, RASTA-PLP, etc., the

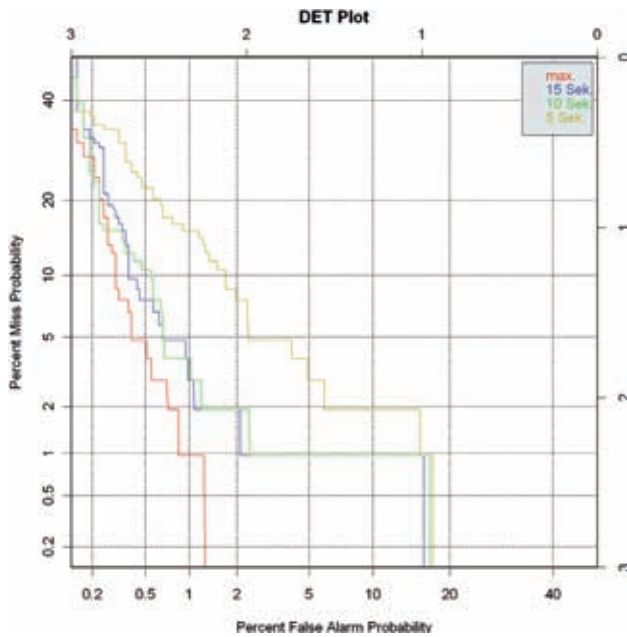


Fig. 6: DET-Plot for different length of the test signal (after elimination of speech pauses).

Mel-Cepstrum coefficients (MFCC) have proved to be particularly usable for speech and speaker recognition. The modelling of the speakers is based on Gaussian mixture models (GMM). MFCC feature extraction, different methods of cluster analysis, the GMM parameterisation and the expectation maximisation for the parameter estimation were integrated in the Software package STx. Further components for the simulation of automatic speaker recognition processes are the building of “Universal Background Models” (UBM) with “Maximum A Posteriori Adaption” (MAP), as well as additional speech corpora for training and testing.

An “UBM-GMM System” is evaluated by means of two error types: “false alarm” and “false rejection”. The error probability for the different thresholds is calculated from the system’s “scores”. The error probabilities “false alarm probability” and “miss probability”, are usually represented in a “Detection Error Trade off Plot” (DET-Plot).

On the basis of DET-Plots, the comparison of different speaker and signal conditions, such as the minimum required duration of the speech signal, transmission line characteristics, manner of speaking, etc. can be performed. DET-Plots are additionally suitable to compare the efficiency of different recognition methods. The aim of the current work involves the systematic study of boundary conditions which influence the error rate. Among those investigated: sound quality, voice signal duration, language dependence and the

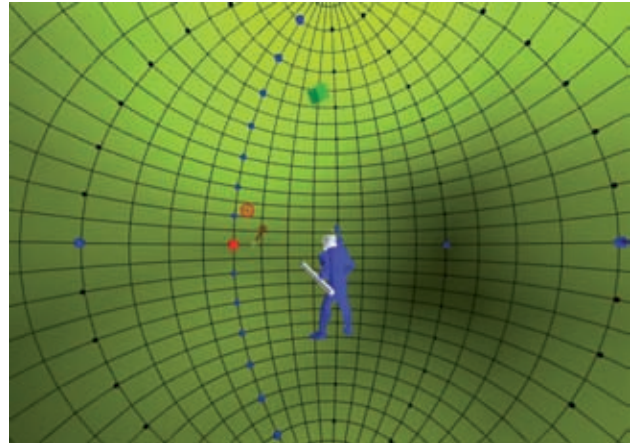


Fig. 7: Subjects are asked to indicate the appearing localisation of artificial sound sources in a virtual room environment.

variability between and within speakers. Currently, considerable differences between the results obtained from laboratory data and field data are observed. The work is supported by the BKA-Wiesbaden supplying large speech data corpora.

#### *Psychoacoustics – Experimental Audiology:*

The project *Localisation of sound sources with bilateral Cochlear Implants (CI-HRTF)* aims at enabling the auditory 3D-perception of deaf subjects supplied with Cochlear Implants (CI). CI-listeners perceive left-right interaural intensity differences at nearly the same sensitivity as normal hearing listeners. However, the sensitivity of CI-listeners to interaural time differences has been measured consistently to be lower. On the other hand, HRTF information, usable for the perception of up-down and front-back localisations, has barely been studied up to now. The project is developing specific methods to transfer HRTF information to the CI-listener using high frequency ranges, which are not required for speech intelligibility.

Stimulation strategies play an important role in “electrical” hearing. A substantial enhancement concerning the CI-Listener’s sensitivity for interaural time differences is achieved by introducing a binaural synchronised jitter. The technology has been patented and negotiations are underway for its adoption by an Austrian manufacturer of cochlear implants.

#### *Mathematics in Signal Processing:*

The results of experimental research in psychoacoustics, acoustic phonetics and applied signal processing often produce models which are defined heuristically at the beginning. The mathematicians complete the formal definitions in close co-operation with the re-

search area's specialists. In 2007, several preparations for an international project "*Frame Multipliers, Theory and Applications*" were completed. Frame multipliers can be used to effectively reconstruct modified acoustic signals in analysis-synthesis procedures. In addition, frame multipliers are appropriate to develop time variant filter systems, needed to model psychoacoustic functions (e. g. simultaneous masking).

Furthermore, new mathematic algorithms are implemented for the approximation of vocal tract resonances (formant frequencies) based on the amplitude spectrum of speech. In case of nasalised voiced sounds, the computation of an all-pole model of the vocal tract is insufficient; the transfer function must include both poles and zeroes.

#### *Software development S\_TOOLS-STx*

The software system STx, which has been developed at the institute for long time, follows the strictly kept strategy of reusability and cumulative enhancement. With the exception of special cases, it is used by all research projects of the institute and many cooperation partners in Austria and abroad. STx is universally programmable by its own script language, which provides a flexible and capable way of processing large quantities of signal data. One can see the external interest for STx by looking at the number of downloads of the time limited free version via the internet. The main source of interest comes from the USA (123), followed by Austria (92) and Germany (66), with a total of 526 downloads worldwide in 2007.

STx implements all established frequency analysis methods from FFT to Wavelet to transformations of the Cohen class, which were implemented in the reference period. Furthermore, statistical functions (PCA,

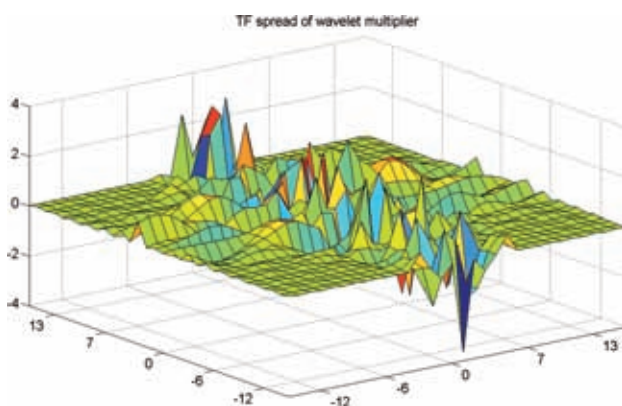


Fig. 8: Best approximation of the time-frequency distribution of a system by means of a Wavelet multiplier.

SVD) and interfaces (e. g. the statistical package "R") were implemented for large quantities of data. Among others, the above mentioned project NOIDESc included a selection of MPEG 7/4 features, a user interface and test design. A recorder was installed to make unattended continuous audio recordings over several weeks. The signal segmentation and annotation were improved so that inexperienced users can transcribe speech signals easily. The foundation for the installation of a sound data bank was laid with advanced segment list management. The expected size per data bank will be approximately 1500 sound files with about 180000 sound segments.

#### **Preview for 2008–2009**

##### *Numerical Acoustics, Simulation and Signal Processing*

- Development of nonlinear models for FEM / BEM Simulations.
- Inverse method on the basis of the Multipole Method for the determinations of sound and vibration velocity distributions on structures.

##### *Traffic Noise:*

- Extension of the railway noise description and classification for general traffic noise sources.

##### *Acoustic Phonetics:*

- The vowel system of the East- and Westmandekan varieties (Gambia, Senegal).
- Phonetics and Phonology of the Viennese Dialect.
- Comparison of automatic methods of speaker verification with acoustic-phonetic recognition methods (EC-project).

##### *Psychoacoustics – Experimental Audiology:*

- Continuation of the project on CI-HRTF.
- Systematic studies on the effect of binaural synchronised jitter for electrical and acoustic hearing.
- Additivity of time-frequency masking effects.

##### *Mathematics and Signal Processing:*

- Supra-regional research project, Frame Multipliers, Theory und Applications.

##### *Software-Development:*

- Automatic segmentation of acoustic signals.
- Real Time Signal Processing in Audio.
- Graphic Signal Sequencer.
- Extension of sound data base functions in STx.

## Johann Radon Institute for Computational and Applied Mathematics, RICAM

Head: HEINZ ENGL



### Aims and Functions

The Johann Radon Institute for Computational and Applied Mathematics (RICAM) currently employs 60 scientist, about half of them being financed from external funds (mainly FWF); they joined RICAM coming from 14 different countries. RICAM cooperates in educating PhD-students with the Johannes Kepler Universität Linz and, as far as “real world” applications are concerned, with the Industrial Mathematics Competence Center. RICAM does applications-oriented basic research in currently seven groups led by the senior scientists mentioned

- Computational Methods for Direct Field Problems (Ulrich Langer)
- Inverse Problems (Heinz Engl)
- Financial Mathematics (Hansjörg Albrecher, Walter Schachermayer)
- Symbolic Computation (Josef Schicho)
- Optimization and Optimal Control (Karl Kunisch)
- Analysis of Partial Differential Equations (Peter Markowich, Christian Schmeiser)
- Mathematical Imaging (Otmar Scherzer)

Important aspects are cooperations between these groups, e. g., connecting analytical and numerical with symbolic and algebraic methods. In the Financial Mathematics group, synergies between stochastic and number theoretic methods are exploited. Among the application areas considered are mathematical methods in imaging, numerical and optimization methods for solid and fluid mechanics and mathematical modeling and algorithm development for molecular any systems biology. The last topic was intensively treated in a “Special Semester on Quantitative Biology Analyzed by Mathematical Methods” with many international participants.

### Results for 2006–2007

#### *Computational Methods for Direct Field Problems (Ulrich Langer)*

The research of the Group has focused on the development, analysis and implementation of computational methods for Partial Differential Equations with the focus on the following topics:

- Fast solvers for field problems in Magnetohydrodynamics (MHD) and for MHD optimal control problems in cooperation with the group “Optimization and Optimal Control” (see Fig. 2),
- Algebraic multigrid (AMG) methods for large-scale technical problems and problems in life sciences (Fig. 1 shows a bone-voxel-model leading to finite element equations with more than 50 million unknowns which can efficiently be solved by new robust AMG methods)\*,
- high-order finite element methods with focus on elasticity problems (thin shells) and electro-magnetic problems.

The latter topic is connected with the START project “hp-FEM” led by Joachim Schöberl. The START project is supported by the Austrian Science Fund (FWF) under the grant Y192.

Furthermore, new Domain Decomposition Methods (DDM) have been proposed for elliptic boundary value problems. DDM are not only the most important parallelization technique but also the main technique for coupling different discretization methods and different physical fields. The development of new DDM is main research direction of the next years. RICAM was the host of the 17<sup>th</sup> International Domain Decom-

\*) The data set used here was generated in the framework of the ESA-Project Bone 3D (ESA MAP Project AO 99-030, ESTEC Contract #14592/00/NL/SH): Vertebral Body Data Set ESA29-99-L3, <http://bone3d.zib.de/data/2005/ESA29-99-L3/> via a Micro-CT Scan.

position Conference held in St. Wolfgang / Strobl, July 3–7, 2006.

#### *Inverse Problems (Heinz Engl)*

The group is active in the mathematical theory and numerics of regularization methods, and in applying inverse problems techniques to science, engineering and finance. Recent achievements concern the extension of regularization theory to a non-Hilbert space setting that allows a development of effective methods for a regularization of statistical inverse problems including problems of learning theory, as well as for a sparsity constraints regularization with close connections to imaging and inverse bifurcation problems in systems biology, where sparsity plays a major role.

Significant progress has been made towards a convergence theory in non-normed spaces including the first quantitative convergence results for Bayesian inversion, measured in the Prokhorov and Ky Fan metrics, and convergence rate results in Bregman distance.

#### *Financial Mathematics (Hansjörg Albrecher, Walter Schachermayer)*

For portfolio optimization, optimal trading strategies under transaction costs could be derived under various scenarios. A long-standing puzzle in computational financial practice concerning mispricings of options with long maturity after calibration to traded option prices in the Heston model could be resolved. For the classical risk model of an insurance portfolio, tax payments on profits could be incorporated leading to an unexpected simple relation of the ruin probability to the one without tax. A new nonlinear pseudorandom generator with a linear complexity profile lower bound

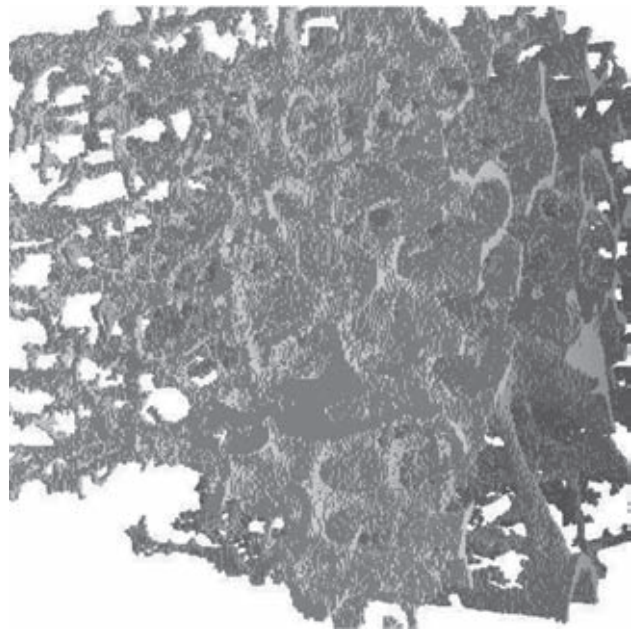


Fig. 1: Bone-Voxel-Model (AMG Simulation).

of exponential size has been identified which is defined by recursions with Redei functions.

#### *Symbolic Computation (Josef Schicho)*

**Algebraic Surfaces:** we improved existing algorithms for the conversion of implicit algebraic surfaces to parametric algebraic surfaces.

In particular, the subtask of analyzing the singularities of the given surface was done by a new method, which made it possible to deal with more complicated data.

**Symbolic Functional Analysis:** symbolic methods are used by several groups for manipulating differential equations. We developed a frame in which also the

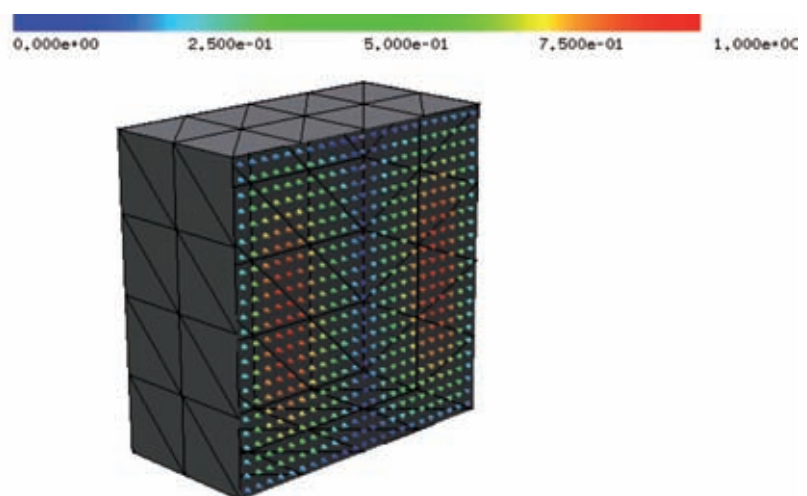


Fig. 2:  
MHD-Control: Velocity of the Fluid.



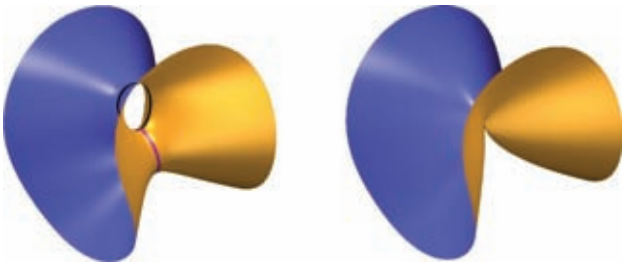


Fig. 3: A singularity of type A1, and its resolution

boundary conditions can be handled symbolically. This has led to a method for decomposing linear boundary problems.

#### *Optimization and Optimal Control (Karl Kunisch)*

The focus of the group was put on infinite dimensional optimization problems with partial differential equations as constraints. Significant progress was made on optimal control of large-scale systems, specifically on problems in magneto-hydrodynamics (see Fig. 2). – In the area of numerical treatment of optimal control problems, efficient adaptive numerical realizations and the development of a-priori and a-posteriori error estimators, as well as efficient numerical treatment of pointwise inequality constraints on the control and or the state variables was achieved. Further it was established that Discontinuous Galerkin techniques allow to eliminate the problem concerning whether to first discretize or optimize an infinite dimension optimization problem.

#### *Analysis of Partial Differential Equations (Peter Markowich, Christian Schmeiser)*

The group is concentrating on three application areas: image processing by nonlinear partial differential equations, multiscale modelling of the movement of living cells, and shallow water waves. Significant results have been achieved in the mathematical restoration of destroyed frescos, in the modelling of cell adhesion, and in the existence theory of generalized solutions of a classical nonlinear wave model. One group member was awarded a “EU-Individual Marie Curie Fellowship” in 2006.

#### *Mathematical Imaging (Otmar Scherzer)*

A new hybrid imaging technique has been invented and studied by Dr. Gebauer and Prof. Dr. Scherzer. The Austrian Academy of Sciences will patent this new technology together with the University of Innsbruck. Also, fast reconstruction techniques for low-frequency

tomography were developed further and published in international research journals.

Furthermore, new algorithms were developed which are able to compensate measurement errors especially in higher dimensional image data as they occur for instance in modern clinical applications like diffusion tensor magnetic resonance imaging.

#### **Preview for 2008–2009**

##### *Computational Methods for Direct Field Problems (Ulrich Langer)*

The development of new DDM is main research direction of the next years.

##### *Inverse Problems (Heinz Engl)*

Further development of the methodology of inverse problems towards such application fields as biology, medicine, image analysis and finance. Several externally funded projects will be realized, among them is a large scale integrating project “DIAdvisor”, where Group “Inverse Problems” together with Group “Optimization and Optimal Control” is responsible for mathematical part. The project is funded by European Commission and aimed at the diabetes therapy improvement.

In cooperation with the Fraunhofer Society, a group for mathematical modelling and algorithm development in molecular and systems biology will be established in Vienna.

##### *Financial Mathematics (Hansjörg Albrecher, Walter Schachermayer)*

Systematic study of economic factors and dependence in risk theory, development of an appropriate duality theory for markets with transaction costs, further investigation of nonlinear pseudorandom number generators.

##### *Symbolic Computation (Josef Schicho)*

We want to design robot manipulators that are dynamically balanced, i.e. they do not exert forces or torques to the base during its moves.

##### *Optimization and Optimal Control (Karl Kunisch)*

Future work will include optimal control of interface problems. A multi-grid based solver for the systems arising by time discretization of parabolic equation with higher order discontinuous Galerkin schemes should be developed. Semi-smooth Newton methods will be derived for portfolio optimization problems.

*Analysis of Partial Differential Equations*  
(Peter Markowich, Christian Schmeiser)

The group is planning an intensification of the RICAM-internal cooperations in image processing as well as the application of cell adhesion models to tumor growth and angiogenesis.

*Mathematical Imaging (Otmar Scherzer)*

It is planned to further investigate the new hybrid technique both theoretically and by laboratory experiments. The algorithms shall be refined such that eventually they can be used for medical applications.



## Commission for Scientific Visualization, VISKOM

Head: WOLFGANG MECKLENBRÄUKER



### Aims and Functions

Scientific Visualization has meanwhile established itself as one of the core disciplines of applied computer science. It is a combination of computer graphics, image processing and virtual reality. Its task is the development of methods and algorithms for (computer) graphical presentation of large data quantities and for visually presenting various scientific results thus enabling insights in complex relations which otherwise would be only difficult or even impossible to recognize. As a result, Scientific Visualization is interdisciplinary to a high degree but its part goes far beyond the role of a pure auxiliary discipline because its goals bring also new scientific questions along.

Two work areas are currently defined at the commission where problems of volume visualization and geometric modeling resp. ones from theoretical and applied signal processing are being investigated. This happens on the one hand in the form of academy-internally assigned projects, and, on the other hand, as publicly sponsored ones. The focus of the commission is on fundamental questions as well as on questions originating from specific applications. The most important application areas are imaging methods in medicine, virtual archeology, history, computer art, cognitive science, and speech processing.

### Results for 2006–2007

#### *Volume visualization*

The works in this core field of the Commission concentrated around following projects:

- **Clinical Visualization Tools for Peripheral CT-Angiography (AngioVis II):** The goal of this project is to improve and integrate previous basic research developments into a clinically applicable set of new interactive and user friendly tools – the AngioVis Toolbox – for fast routine processing of peripheral CT angiograms in patients with peripheral arterial occlusive disease (PAOD).

- **Cell modeling:** The structure of living cells is given by three-dimensional organization of their numerous intracellular organelles of various sizes, shapes and locations. To understand them in their complexity, realistic computer models of cells may be instrumental and may moreover serve for virtual experiments as, e. g. in validation of morphological techniques or in simulations of various kinds. We developed an environment for stereology-based cell modeling aimed at creation, verification and visualization of a realistic infrastructure of the micro-world of muscle cells.

#### *Watermark and Paper Expertise*

The Commission is coordinator of the eContentPlus project “Bernstein – The Memories of Papers”. The project is a cooperative effort between nine institutions from Austria, England, France, Germany, Italy and the Netherlands. The goal of project Bernstein is the creation of a European integrated digital environment about paper history and expertise. The project connects all presently existing European online watermark databases and thus offers a comprehensive and significant information source about paper and its history. The databases are equipped with specialized image processing tools for measuring, authenticating and dating papers, and augmented by a plenitude of contextual data with bibliographical and geographical contents. A substantial further project goal is the dissemination of the achieved results to a broad audience in the form of an easily installable software package. The circle of potential users and interested parties includes historians, curators, archivists, librarians, art historians, musicologists, incunabula researchers, auctioneers, forensic technicians, and paper makers.

#### *Applied Signal Processing*

The commission took part in the development of new algorithms and processing methods based on non-line-

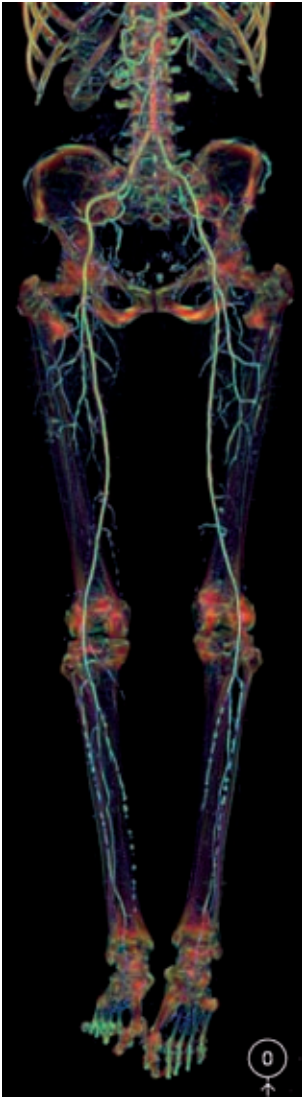


Fig. 1: A model of a striated muscle cell. The model was automatically generated and shows several consecutive sarcomeres of the cell. For better clarity, the outer cell membrane, sarcolemma, is hidden and the bottom part of the myofibrillar system is clipped off by a transversal plane (left). The complex system of organelle is made visible by a longitudinal clipping (right). The myofibrillar system (1) is defined by means of c-graphs (2). The remaining organelles include mitochondria (3), sarcoplasmic reticulum (4), t-tubules (5) and sarcolemma (6).

ar dynamics and information theory. Specifically, large investigations of several questions were conducted. One example is given here:

In a multinational (Russia, Germany, USA and Japan) collaborative research, an analysis of statistical memory quantifiers in neuromagnetic brain signals (MEG) to study the photosensitivity against colour combination was made. We included both healthy controls and patients and showed that it is possible to distinguish the two populations by these quantifiers, and further identified those brain regions which are possibly involved with dynamical protection mechanisms against photosensitive epilepsy.

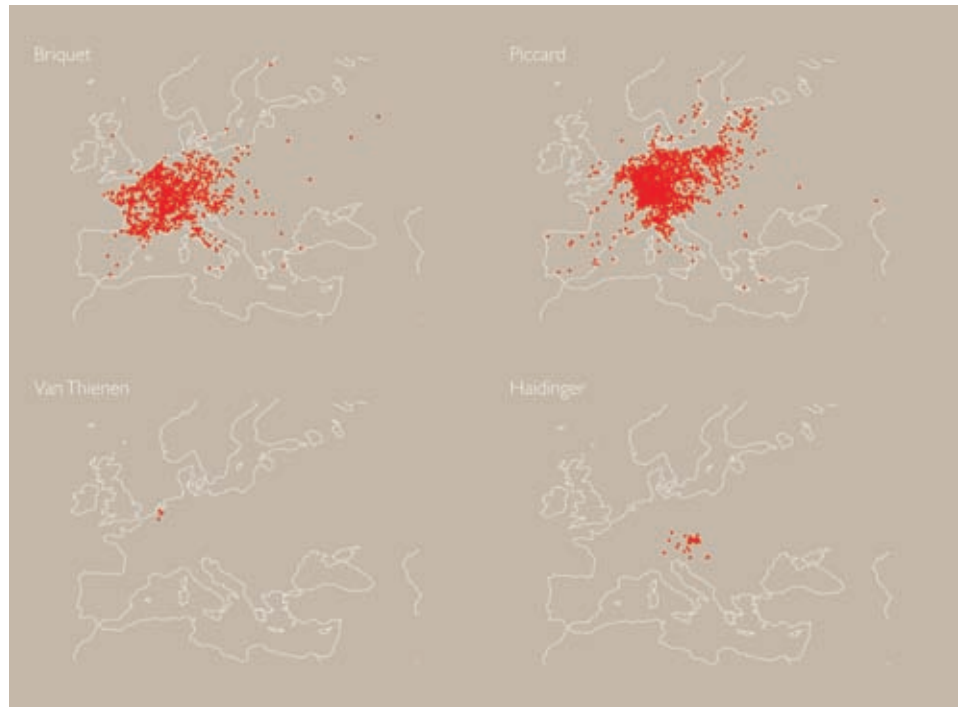


Fig. 2: Handwritten and printed books or official and private documents are of special value to historians if inscribed with dates and places of production. They provide fixed points in time and space to which historical events can be related and help identify undated and not located events and documents. This figure shows the distribution of 3.884 locations from the four databases of the Bernstein project on paper history and expertise, representing places where watermarks were found in manuscripts and books written and printed during the late Middle Ages to the early modern times. Each databases is an individual enterprise of a scholar and reflects his own interests (Dutch and Austrian national history for the Van Thienen and Haidinger) or travel preferences (French-speaking areas better covered by the Swiss Briquet and German-speaking territories covered by the German Piccard). The integration of databases undertaken in the Bernstein project allows for richer historical research through a more regular spatial coverage of data.

#### *Automatic Speech Recognition*

Speech recording is a common practice in daily professional activities, such as for lawyers, physicians, journalists and architects, among others. The combination of dictation systems with automatic speech recognition (ASR) is being demanded today as the natural procedure to take over their daily transcription routines. However, in those working environments (e. g. hospital, court of law, street, etc.), it is not always possible to record in silent or noise-free conditions, this fact causing ASR to become unreliable. The Commission cooperates with the Graz University of Technology and the PHILIPS Austria GmbH as the indus-

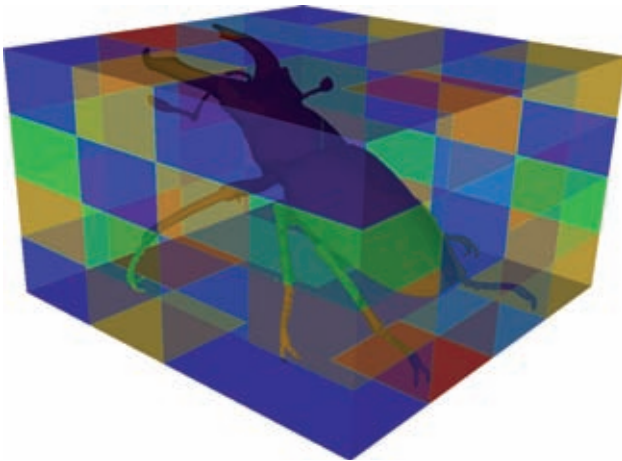


Fig. 3: Slice based streaming: a high-degree of parallelism is necessary in order to exploit better the hardware processing facilities. In the context of volume processing this means splitting the data in smaller chunks (blocks, slices), processing them in parallel at the different stages, and combining them into a final image just at the last (visualization) step. One example of this approach is shown here using a standard test data set with the block splitting revealed.

trial partner in the project oneVoice with the aim of recording “clean speech in real noisy environments”. The researchers in oneVoice, from the Commission of the Austrian Academy of Sciences and Graz University of Technology, have developed several novel signal processing-based techniques for analyzing speech

with natural intonation. These methods represent the scientific basis of the project outcome, namely, a new single-channel speech enhancement/coding system that removes the background interferences present in the recording.

#### Preview for 2008–2009

The main goal in the area of visualization is the development and implementation of new and efficient algorithms for presentation, segmentation, classification, and visualization of large three-, four-, and more-dimensional data stemming from the areas of medical imaging, electron, and confocal microscopy with special respect to exploiting modern high-end computational resources: computer clusters and general-purpose graphics cards.

In the area of applied signal processing are a. o. EEG experiments in a wide stretched area of paradigms planned: (i) cognitive insight, (ii) cross modal emotional transfer, (iii) mirror neural system, (iv) multi-sensor interaction, (v) choice dynamics, (vi) expectancy during listening to music, and (vii) creativity in music. The speech processing techniques being developed at the commission are going to be applied to the implementation of a commercial, novel single channel speech improvement and coding system removing background interferences from recordings.

## Physics and Materials Sciences

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### Erich Schmid Institute of Materials Science, ESI

Head: GERHARD DEHM



#### Aims and Functions

The Erich Schmid Institute of Materials Science (ESI) in Leoben performs basic research in the field of complex materials bridging length scales from macro- to nano-dimensions with the mission of providing a basic understanding of the material properties. In order to understand the relationships between properties and material architecture advanced electron microscopy techniques, X-ray diffraction and synchrotron facilities are used. Furthermore, in-situ experiments are developed to gain new insights in the nucleation and interactions of defects. Quantitative models describing the material properties are deduced from the experimental observations.

The institute is highly active in the synthesis of nanocrystalline materials by severe plastic deformation, the analysis of deformation and fracture properties of complex and applied materials, and the investigation of mechanical size-effects of miniaturized materials and material systems. The ESI is headed jointly with the Department Materials Physics of the University of Leoben and also hosts the Christian Doppler Laboratory for *Local Analysis of Deformation and Fracture*. In total, more than 50 people are employed. The cutting-edge research of basic and applied material science problems is ensured by numerous worldwide collaborations with leading research facilities (e. g. Max-Planck-Institutes (Germany), CNRS (France), Risø (Denmark), Univ. Minnesota, Purdue Univ. (USA), etc) and partners from industry.

The institute is active in organizing scientific symposia at international conferences, e. g. the EUROMAT 2007 meeting in Germany and the ICMCTF 2006 and 2007 conferences in USA. Additionally, the institute was strongly involved in the successful application of the K2 centre "MPPE" (Materials, Processing and Product Engineering) in the Austrian excellence programme Comet.

#### Results for 2006–2007

The short and mid-term scientific directions of the Erich Schmid Institute are comprised of the following 5 strongly interconnected topics:

- complex materials
- plasticity and fracture
- severe plastic deformation
- micro- and nano-mechanics
- micro- and nanostructure

The life-time of a component is confined by the nucleation and growth of small defects during production and in service; the material is successively damaged until the component fails or cannot fulfil a necessary function. The investigation of damage nucleation and evolution under various loading conditions as a function of the micro- or nanostructure of the considered material is the main topic of research in the area plasticity and fracture. To do that, we develop and employ new experimental procedures that allow us to study the deformation and fracture behaviour very locally (Fig. 1). On the other hand, new conceptual ideas are introduced to describe quantitatively the behaviour of cracks in materials and components by numerical simulation.

Nearly all modern technical materials are inhomogeneous from its micro- or nanostructure. Often the material properties are intentionally varied, e. g., to combine high hardness at the surface and good toughness in the interior in a cutting tool. But also biological materials, such as bone or nacre, which are both known to be stiff and tough, exhibit spatial variations in their properties. We have applied the newly developed concept of configurational forces to predict the behavior of cracks in such biological materials, and we found that the spatial variation of the elastic modulus induces a shielding effect so that the driving force of a crack may reduce to zero and the crack arrests. Similar effects have been observed, both experimentally and by numerical modelling, in metallic bi-material specimens where the yield strength shows a jump at the interface, or in multilay-

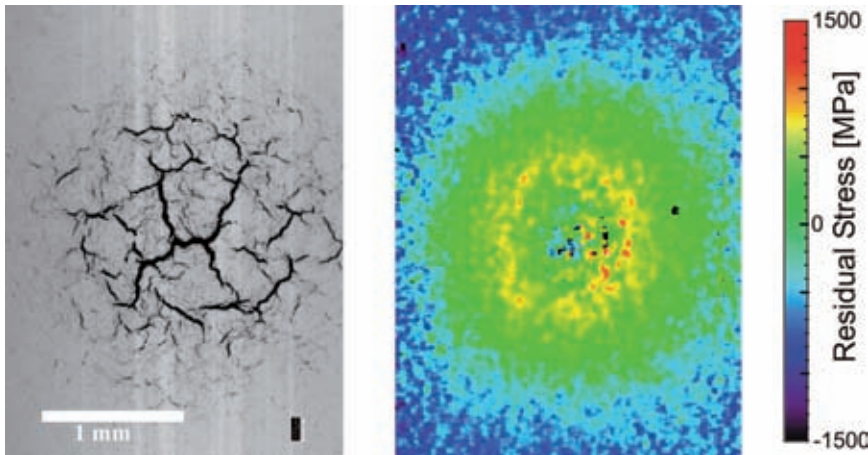


Fig. 1: Residual stress distribution (right) near the surface of a shot-peened steel (left) measured at HASYLAB. The surface was 10,000 cycled in the temperature range 50–650 °C using a laser beam with the diameter 2 mm. The stresses were determined with a local resolution of 24  $\mu\text{m}$ .

ered ceramic materials where spatially varying thermal residual stresses are introduced during the cooling from the sintering temperature by combining ceramic alloys that have different coefficients of thermal expansion. The combination of our more and more refined experimental procedures for the measurement of local deformation and fracture properties with the advanced numerical modelling using the concept of configurational forces seems to open bright prospects for the future development of damage resistant materials and components.

The high strength and the special physical properties are the main reasons for the enormous interest in nanocrystalline materials. Heavy plastic deformation at relatively low temperatures – called severe plastic deformation (SPD) – is an efficient technique to produce such materials in a bulk form. In the last years we established and developed different methods to apply such heavy plastic deformation without failure of the material. One of our research directions in that field is to obtain materials with tuneable magnetic properties. A decrease of the grain size in ferromagnetic materials causes a change from soft to hard magnetic behaviour; i.e. coercivity,  $H_c$ , increases

as the grain size,  $d$ , decreases. Between 10 and 100 nm an inversion of the grain size dependence is observed and  $H_c$  is proportional to  $d^6$ . Below 10 nm grain size the materials behave superparamagnetic. So far such materials could be produced only in small quantities, for example by thin film technologies. We try now to produce bulk ferromagnetic materials in the grain size regime between 10–100 nm by SPD. This grain size regime is very interesting for applications, because the magnetic properties can be tuned over a wide range. In first screening tests we have severely deformed different standard magnetic steels (Fe, FeSi, FeCo, NiFe, ...) in order to investigate if the interesting grain size regime can be reached by SPD. Fig. 2 shows selected TEM micrographs and the variation of the coercivity. SPD at room temperature induces a grain size between 80–200 nm. SPD at the temperature of liquid nitrogen enables a further reduction of the grain size to 40 – 80 nm, which is in the region of interest. Actually, we are looking to the grain size controlling process in order to find a way for a further reduction of the grain size.

#### Preview for 2008–2009

Regarding the area of plasticity and fracture, the clarification of the relationships between the local deformation- and fracture behaviour and the local micro- and nanostructure of complex material systems is a long-term goal and will be continued in the future. The combination of the experimental studies with multi-scale numerical modelling will be intensified.

The research activities in the field of micro- and nano-mechanics will be strengthened. In addition to experimental approaches theoretical techniques such as finite element modelling and discrete dislocation dynamic simulations will be employed. New perspectives down to atomic dimensions will be given by advanced transmission electron microscopy techniques, which will be established at the ESI in the near future.

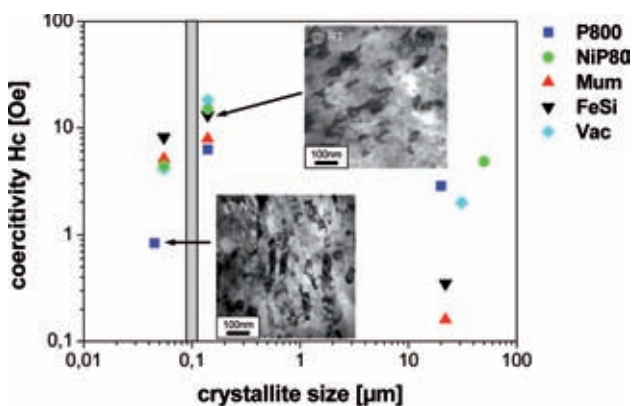


Fig. 2: Coercivity of severe plastically deformed magnetic materials and selected transmission electron microscopy images.

## Institute of High Energy Physics, HEPHY

Head: WALTER MAJEROTTO



### Aims and Functions

The goal of elementary particle physics is to explore the fundamental laws governing the smallest constituents of matter and their interactions. The great breakthrough in our present understanding of the world of elementary particles has only been possible by the development of more and more powerful particle accelerators. Due to the Heisenberg uncertainty principle they allow us with increasing energy to explore continually smaller dimensions. The accelerators are the modern microscopes for studying elementary particles. For this purpose, the institute carries out experiments within big international teams at the European Particle Laboratory *CERN in Geneva* and in the Japanese research center *KEK near Tokyo/Japan*.

The institute develops and builds for these experiments particle detectors, electronic devices for the data acquisition, develops software for the data analysis, participates in the physics interpretation of the data taken. It also works on theoretical models for describing and understanding the experimental results.

The experimental and theoretical research over the last decades has led to a coherent picture of the fundamental particles of matter and their interactions. It is expressed in the so-called “Standard Model”. Despite the striking successes of this model it leaves many fundamental questions open. With the start of the *Large Hadron Collider (LHC)* at CERN in 2008 one enters an energy region so far unexplored where one expects the answers to some of these questions. Why have the fundamental particles, quarks and leptons a mass and why is this mass so different for these particles? According to the Standard Model, the “Higgs mechanism” is responsible for that. However, this mechanism requires the existence of a new particle, the Higgs boson, which is expected to be discovered at the LHC.

A primary goal of all experiments is furthermore the search for “supersymmetric particles”. According to the “supersymmetry”, to each known particle there should

be a supersymmetric partner. The lightest supersymmetric particle is considered a good candidate for explaining the dark matter of our Universe. Within the last years one could observe a strong and fruitful interplay of particle physics, cosmology and astrophysics. Many of the most important aspects in the evolution of the Universe since the “Big Bang” have to be examined in particle physics experiments.

In this light also our interest in the planned *International Linear Collider (ILC)* has to be seen, which could start operation by the end of the next decade.

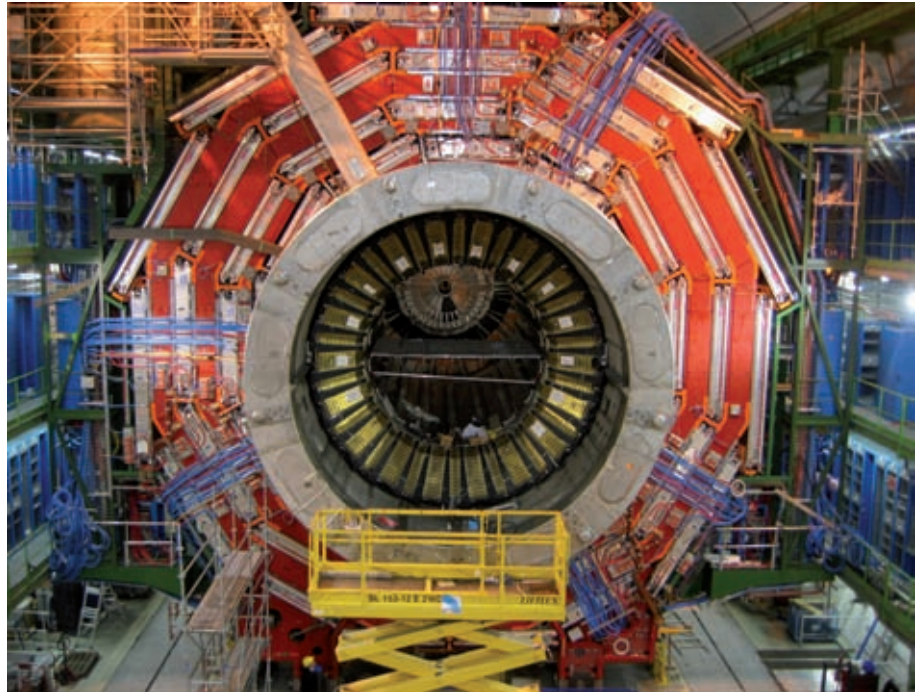
### Results for 2006–2007

#### *The CMS-Experiment at the “Large Hadron Collider” (LHC) of CERN*

In the CMS surface assembly hall, the iron yoke of the experiment’s solenoidal magnet was closed in 2006 for the first time. The magnet was then gradually run up to its nominal field strength of 4 Tesla. In this test also a fraction of the muon chambers, of the calorimeters and a partial structure of the Tracker were installed and put into operation. Data of cosmic muons were collected with this setup; subsequently they were injected into the GRID distributed computing network and successfully analysed. By the end of the year 2007 almost all components of the CMS detector have been lowered to the underground experimental cavern, and some parts are already prepared for routine operation.

The *Tracker* section equipped with silicon-strip detector modules has been ready to be inserted into the CMS detector since summer 2007. The institute contributed substantially to the construction of this detector part. During the time of module assembly until mid 2006, the quality assurance for the silicon sensors and the module production for the Tracker End Caps were coordinated by the Vienna institute. The manufacturing of 624 modules for the second innermost ring of the end caps at the institute included the mechanical assembly,

Fig. 1:  
The central part of the CMS detector in the underground experimental cavern.



the micro-bonding of the electrical connections as well as standardized functionality tests. During the subsequent integration phase, different repair interventions on defect modules needed to be coordinated.

Early in 2007, the assembly of the Tracker was finished in the Tracker Integration Facility at CERN, with active participation of Viennese personnel. In the following months, the Tracker was tested as an operational unit; about a quarter was connected to the readout electronics in order to record tracks of cosmic muons. These test experiments have confirmed the excellent quality of the CMS Tracker. For instance, the fraction of defective channels is less than three per mille. Using these data sets, the Kalman alignment algorithm that was developed at the institute could for the first time be tested with tracks of genuine muons.

The analysis programmes developed in our group include the subjects of track and vertex reconstruction, b-tagging, and alignment of the Inner Tracker. The algorithms developed in the course of this work have all been adapted to the new CMS framework CMSSW, and most of them are standard tools of the CMS data analysis. In addition, the group accepted responsibility for the so-called “combined b-tagger”.

Around mid 2006, the company Kapsch Components KG, under the technical supervision of the institute, has successfully completed an order of about 14000 pieces of “Analogue Opto-Hybrids” used for the transmission of the electronics data of the Silicon-Strip-Tracker. The opto-hybrids in the Pixel-system of the Tracker are pro-

duced by the same company, the technical responsibility being again with the Vienna institute. Furthermore, the Front End Driver, i. e. the readout module for the Pixel-system, has been developed at the institute. The series production of 48 units was delivered by end of 2007.

At the Large Hadron Collider up to one billion proton-proton collisions will take place per second. The Trigger, consisting of the Level-1 Trigger and the High-Level Trigger, selects only those that are most interesting for new physics.

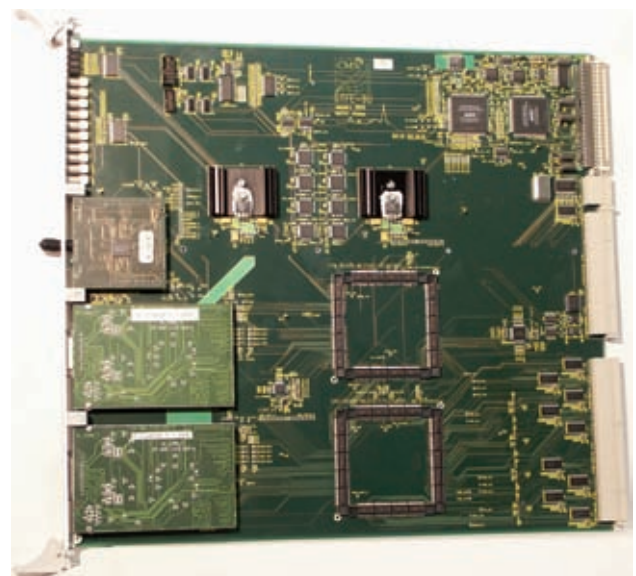


Fig. 2: Readout board of the Global Trigger (Global Trigger Front End, GTFE).

The CMS Trigger Group is responsible for the design and the construction of indispensable trigger electronics and software components. These are:

- the Global Trigger, which decides for each collision if it should be rejected or accepted for further analysis;
- the Global Muon Trigger, which identifies the muons with the highest transverse momenta in the whole CMS detector, based on measurements in the three muon systems;
- the regional Drift Tube Muon Trigger, also called Drift Tube Track Finder, which determines muon candidates in the central region of CMS;
- the central Trigger Control System, which controls the data taking according to the status of the data acquisition system and the subdetectors;
- the Trigger Supervisor, which controls the configuration, operation, testing and monitoring of the trigger components of CMS;
- the Trigger Emulator for the trigger components built by the group. It predicts and checks the functionality of the trigger components and delivers information to the High-Level Trigger.

The electronics components are part of the Level-1 Trigger and consist of several modules with programmable, highly integrated, fast digital electronics. Final construction, installation and commissioning of all components within the CMS experiment were the principal activities. The first common operation of several CMS components took place during the so-called Magnet Test and Cosmic Challenge. It was the first opportunity to operate the trigger components built by the group as a system. The DTTF delivered the majority of trigger signals for cosmic muons. Furthermore, Letters of Intent for new developments in the framework of the upgrade project Super LHC (SLHC) were worked out.

Members of our Institute had the function as Deputy CMS Trigger Projekt Manager and the Trigger Software Coordinator

### Physics Analysis

The new CMS physics analysis group has chosen searches for new particles predicted by different models of supersymmetry as its main topic. A study on the reconstruction of stop quark decays in events with top quarks, W- and Z-bosons and missing transverse energy has been presented in 2006. The data for this analysis have been processed in parallel on several tiers of the LHC computing GRID. At the same time the CMS experiment decided to change its simulation, reconstruction and analysis software frameworks. As a

consequence, the main activity during the year 2007 was the creation of new software tools for the reconstruction and selection of fundamental physics objects like electrons, muons and jets. At the same time the work on modified analyses for the search for third generation squarks has started. These studies aim for a more inclusive analysis of squark decays which is better adapted to the limited amount of data expected at the start of LHC operations.

### The BELLE-Experiment at the japanese laboratory KEK

The Belle experiment at the asymmetric KEKB collider has been extremely successful in the past two years. This is documented in 78 publications in peer-reviewed journals such as Phys.Rev.Lett. and Phys.Rev.D, 23 Belle presentations at the ICHEP06 conference in Moscow and 18 presentations at the EPS HEP07 conference in Manchester. All these results support the CKM mechanism of quark flavor mixing using a  $3 \times 3$  unitary matrix proposed by M. Kobayashi and T. Maskawa in 1973 (Fig. 1), making it *the* theory of CP violation in the Standard Model. This experimental evidence has been the foundation for the “High Energy and Particle Physics Prize” of the European Physical Society awarded in summer 2007 to these two Japanese physicists. The award also emphasizes the importance of flavor physics in the study of particle phenomena.

The Vienna institute has contributed to this success: The working group “electronics II” has built the read-out electronics for the silicon vertex detector (SVD) and is working on its upgrade to reduce occupancy in the inner layers and allow data taking at higher luminosities (Fig. 2). Physics analysis in Vienna focuses on two primary topics: the determination of the CKM matrix elements  $|V_{cb}|$  and  $|V_{ub}|$  and the study of charmed meson decays. Both fields of research have lead to conference presentations and journal publications in the period covered by this report.

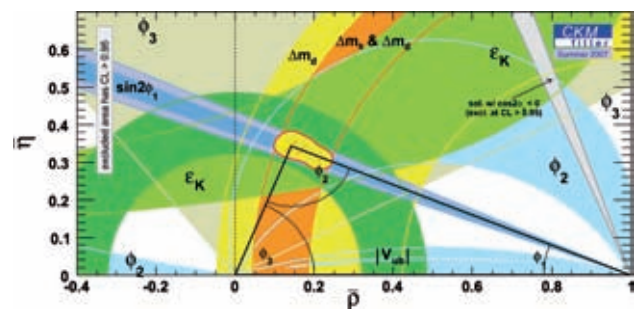


Fig. 3: The unitary triangle, a representation of the CKM mechanism. The colored surfaces represent constraints from experimental data (mostly Belle and BaBar), all overlapping in the apex point of the triangle.



### *Experiment at the proposed “International Linear Collider” (ILC)*

Physics at center-of-mass energies in the TeV range aims at fundamental questions of micro- and macrocosm. First signs are expected from pp collisions at LHC, starting up in 2008. However, a deeper understanding requires quantifiable precision measurements which are attainable only in  $e^-e^+$  collisions.

Such a linear  $e^-e^+$  collider, up to 1 TeV, is being designed since 2004 in a worldwide common effort. Studies on the physics potential and detector R&D resulted in four detector concepts. Milestones have been in 2006 the “Baseline Configuration Document” and 4 “Detector Outline Documents”, and in 2007 the “Detector R&D Review” (tracking, calorimetry, vertexing) and the “ILC Reference Design Report” (covering physics, accelerator and detectors).

Our Institute has pursued theoretical studies on physics at the ILC since 1991. Hard- and software R&D, aimed at planning an experiment, has started in 2003/04: semiconductor detectors of high spatial resolution for precise measurements of particle tracks (SiLC project, supported by FP6 of the EU); a software toolkit based on robust statistical methods for the reconstruction of decays of short-lived particles (RAVE); and a fast simulation tool for the optimization of detector design (LiC Toy). We have joined the “International Large Detector” (ILD) collaboration which is a merger of the European and Japanese concepts, and contribute to the “Letter of Intent” of this experiment.

The Institute was also organizer of the international “3<sup>rd</sup> ECFA Workshop on Physics and Detectors for the ILC”, November 14–18<sup>th</sup>, 2005 in Vienna.

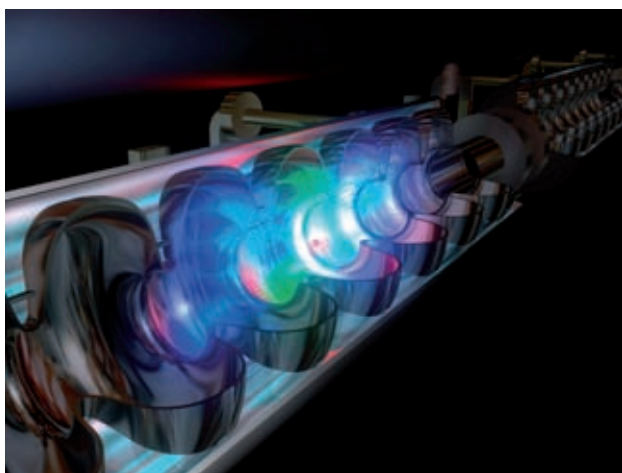


Fig. 4: Computer display of the electrical RF fields in the superconducting accelerator cavities.

### *Theoretical Studies*

Within the *Supersymmetry Project* of the Institute which is also supported by the European

Union the following topics have been treated:

- Precision calculations for supersymmetric processes
- The first “two-loop” calculation for the masses of supersymmetric fermions was performed
- CP violation in decays of the charged Higgs boson
- Signatures of lepton flavour violation at the LHC and ILC.

Another field of research of the theory group has been the systematic investigation of *relativistic bound states* within the quantum field theory.

### **Preview for 2008–2009**

#### *The CMS-Experiment at the “Large Hadron Collider” (LHC) of CERN*

From the beginning of the year 2008 the *Tracker*, installed in the CMS detector, will be connected to its supply lines, then thoroughly tested and commissioned. During this labour-intensive period the Tracker must be brought to a fully operational state and entirely integrated into the CMS detector and its readout electronics. The LHC is expected to start operation in April 2008 with tests of the machine and with the commissioning at the nominal beam energy of 7 TeV. Correspondingly also the CMS detector, the control systems and the readout and analysis software are planned to be ready for data taking.

In the coming years of LHC running, the components of the CMS detector including the Tracker, its associated electronics and the whole software chain, must be routinely operated during data collection, and the correct functioning of all subsystems needs to be systematically verified. Furthermore, work for maintenance and for necessary improvements will have to be carried out regularly. For all these tasks the members of our project group will, where necessary after adequate training, take their appropriate share of work. In addition, the individual expert knowledge of our group members will contribute to the different topics of physics data analysis on which the institute is working.

For the more distant future of LHC (working title SuperLHC), discussions have already started some time ago about a corresponding upgrade of CMS, especially concerning the Tracker and the possibilities to include it into the trigger system. As already in the past, our project group will efficiently contribute its expertise in the fields of detector construction, electronics and in the development of algorithms for the reconstruction programmes and for physics data analysis. At present

a proposal for a research and development programme, which will be devoted to the development and to different aspects of detectors for a new CMS Tracker at SLHC, is in preparation, jointly with other institutes. At the beginning of CMS data taking around mid 2008, the production of all *Trigger* components must be completed, they must be entirely tested and integrated into the experiment. If everything functions correctly the collection of physics data can start, and we all hope to obtain interesting results in the near future.

#### *Physics analysis*

The next challenge is to improve the precision of the Belle measurements and to substantially increase the constraints to the CKM model. Physics beyond the Standard Model usually come with new sources of CP violation and deviations from the CKM picture would hint to new, heavy particles and complement direct searches at the LHC experiments in Geneva. In any case, Super-Belle will substantially reduce the parameter space for New Physics scenarios. Therefore, KEKB and the Belle detector will start a 3-year upgrade program starting from April 2009. The Vienna institute is involved in this project through its participation in the SVD upgrade and its contribution to the “Detector Study Report” due in March 2008.

#### *The BELLE-Experiment at the Japanese laboratory KEK*

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constraints to the CKM model. Physics beyond the Standard Model usually comes with new sources of CP violation and deviations from the CKM picture would hint to new, heavy particles and complement direct searches at the LHC experiments at CERN. In any case, Super-Belle will substantially reduce the parameter space for New Physics scenarios. Therefore, KEKB and the Belle detector will start a 3-year upgrade program starting from April 2009. The Vienna institute is involved in this project through its participation in the SVD upgrade and its contribution to the “Detector Study Report” due in March 2008.

#### *Experiment at the proposed “International Linear Collider” (ILC)*

The “Letters of Intent” must be submitted by October 1<sup>st</sup>, 2008; at the end of that year, an international advisory committee will select two experiments. The selection of a site for the ILC is scheduled for 2009. “Engineering Design Reports” for the accelerator and the 2 chosen detectors are due by 2010. The decision for starting construction of the ILC could be made after LHC has shown relevant scientific results.

#### *Theoretical Studies*

Studies in the framework of supersymmetry will remain a central research field. They will certainly be influenced by the forthcoming results from the LHC experiments.

## Institute for Quantum Optics and Quantum Information, IQOQI

Head: RAINER BLATT



### Aims and Functions

#### *Profile of the Institute for Quantum Optics and Quantum Information*

In November 2003 the Institute for Quantum Optics and Quantum Information of the Austrian Academy of Sciences (IQOQI) was founded by means of treaties with the Universities of Innsbruck and Vienna. The institute consists of a section in Innsbruck, with research groups led by the Scientific Directors R. BLATT and R. GRIMM (experimental physics), H. BRIEGEL and P. ZOLLER (theoretical physics), and of a section in Vienna with A. ZEILINGER as Scientific Director. The institute is based in Innsbruck, one section is located in Vienna. In the groups of the sections in Innsbruck and Vienna, currently 10 Senior Scientists, 16 postdocs and 36 PhD students actively participate in the research projects. They are supported by technical and administrative staff of a headcount of 26. In total, at the moment, round about 100 persons are administrated. The common institute is essential for focussing the activities in Vienna and Innsbruck; furthermore, there exist cooperation agreements with the University of Innsbruck and the University of Vienna.

The goal of the foundation of the IQOQI was to create a research institute of the Academy directly linked to the university, in a framework which allows the institute and the university to mutually complement each other in their research and teaching activities. The institute has been modelled following the Max-Planck Institutes in Germany, regarding the research standards as well as the structures – as far as they are compatible with the Academy's structures – but with a significantly larger proportion of fundraising in the financing of the institute. The close connection to the University, especially also the spatial proximity, is thought to induce a close exchange on the level of PhD students and postdocs, and to achieve the integration of members of the Academy Institute in the teaching activities of the University.

The research profile of the institute is characterised by the broad experimental and theoretical basic research in the fields of quantum information, quantum optics and atomic physics. Besides the formal theoretical foundations of quantum information (BRIEGEL group), one focus lies on the development of theoretical concepts for the realization and implementation of quantum computers and quantum simulators (ZOLLER group), and quantum protocols (BRIEGEL group and ZOLLER group). The experimental work is devoted to quantum optical experiments and the realization of quantum computers on the basis of single stored ions (BLATT group), experiments on Bose-Einstein condensates and superfluid Fermi gases at ultra low temperatures (GRIMM group) and with experiments probing the fundamentals of quantum physics as well as its application for quantum communication and quantum computers (ZEILINGER group). The close collaboration of these groups leads to substantial synergy effects, so that the Institute for Quantum Optics and Quantum Information

- provides a framework for focussed research
- allows for long-term projects with large time horizon
- complements the University's research
- develops quantum technology in collaboration with industrial enterprises
- constitutes a platform for internationally funded research
- provides a center for international guest scientists
- allows young scientist to develop a personal research profile.

### Results for 2006–2007

#### *Division R. Blatt*

The research group led by R. Blatt investigates quantum processes in a system of few ions held in ion traps. The experiments aim at achieving complete control over all

quantum degrees of freedom in order to store and process quantum information in a system of trapped ions. Furthermore, the experimental setups are also used to do precision spectroscopy at the quantum level. To the most important results in 2007 belongs the realisation of a new universal entangling quantum gate with a fidelity above 99 %. With such a high fidelity it is now in principle possible to perform fault tolerant quantum computing. Furthermore, we determined the transition frequency between the ground state in Calcium-40 and the D-level to be 411 042 129 776 398.2 (1.9) Hz. Finally, we trapped ions in a planar surface trap.

#### *Division H. Briegel*

The research group led by H. J. Briegel investigates models of quantum computation and the foundations of quantum information theory. Highlights include the development of criteria in measurement-based quantum computation for universality and classical simulatability, the discovery of connections between quantum information and statistical physics as well as mathematical logic, the development of various methods for entanglement detection in experiments, new simulation methods for strongly correlated quantum systems, and schemes to purify multiparticle entangled states. Furthermore the group has investigated entanglement in open driven systems and the characterization of the complexity of (entangled) quantum systems.

#### *Division R. Grimm*

At extremely low temperatures, matter behaves very different from our everyday experience. It becomes apparent that atoms, usually regarded as particles, can also behave like waves described by the laws of quantum mechanics. The group of Prof. Grimm studies these phenomena. In late 2005 we started to construct a facility at IQOQI to study mixtures of ultracold lithium, potassium and strontium gases. In spring 2007 the machine was ready to study the unknown interaction properties of the two fermionic isotopes  ${}^6\text{Li}$  and  ${}^{40}\text{K}$ . Understanding those properties is crucial for any further research with this mixture, e. g. the study of fermion pairing similar to the one happening in superconductors. We found a dozen “magnetic Feshbach resonances” which were used by theorists to model the interactions between the two isotopes.

#### *Division A. Zeilinger*

The Zeilinger group further extended its activities in the field of “one-way quantum computers” and achieved several milestones. Among those is the implementation of a four photon high-speed quantum computer

with “feed forward” operations in the 100 nanosecond regime (Nature 2007). In the field of quantum communication over long distances entanglement over 144 kilometers could be demonstrated by exchanging photons between two of the Canary Islands using the optical ground station OGS of the European Space Agency ESA (Nature Physics 2007). In the field of foundations of quantum physics the incompatibility between non-local realistic theories and predictions of quantum physics as proposed by Leggett was confirmed experimentally for the first time (Nature 2007). The initial demonstration of laser cooling of a micromechanical mirror (Nature 2006) opens up the completely new field of “quantum-opto-mechanics”.

#### *Division P. Zoller*

The research projects in the Zoller group are centered around the core areas theoretical atomic physics, quantum optics, and quantum information theory. The development of concepts for the control, manipulation and characterization of such systems plays a central role. Starting from this, interfaces to condensed matter and mesoscopic physics are explored. The cleanliness and controllability of ultracold gases, e. g. in the optical lattice, allow for the implementation of novel quantum ensembles, which are of high interest in the latter areas. A central branch of research is constituted by many-body systems of cold polar molecules in optical lattices. Via control of the inter-molecular coupling with micro-wave fields, strongly correlated systems emerge which e. g. exhibit a quantum phase transition from a superfluid to a crystalline phase. Furthermore, ensembles of polar molecules have been used to implement lattice spin models, which are highly relevant from the perspective of so-called topological quantum computation. A detailed theoretical proposal for the experimental analysis of such systems has been presented recently. In addition, novel many-body models have been proposed and analyzed theoretically, such as systems with three-body interactions or extended Hubbard models with controllable long-range interactions. Finally, it could be shown in detailed theoretical studies that polar molecules are promising candidates for high-fidelity quantum memory.

A further research direction deals with open quantum systems. For example, a team of the AG Zoller demonstrated how well established methods from quantum optics can be transferred to open atomic many-body systems, thus finding a new area of application. In practice, an efficient cooling scheme has been worked out which is based on the coupling of a superfluid reservoir to the atomic system in an optical lattice.

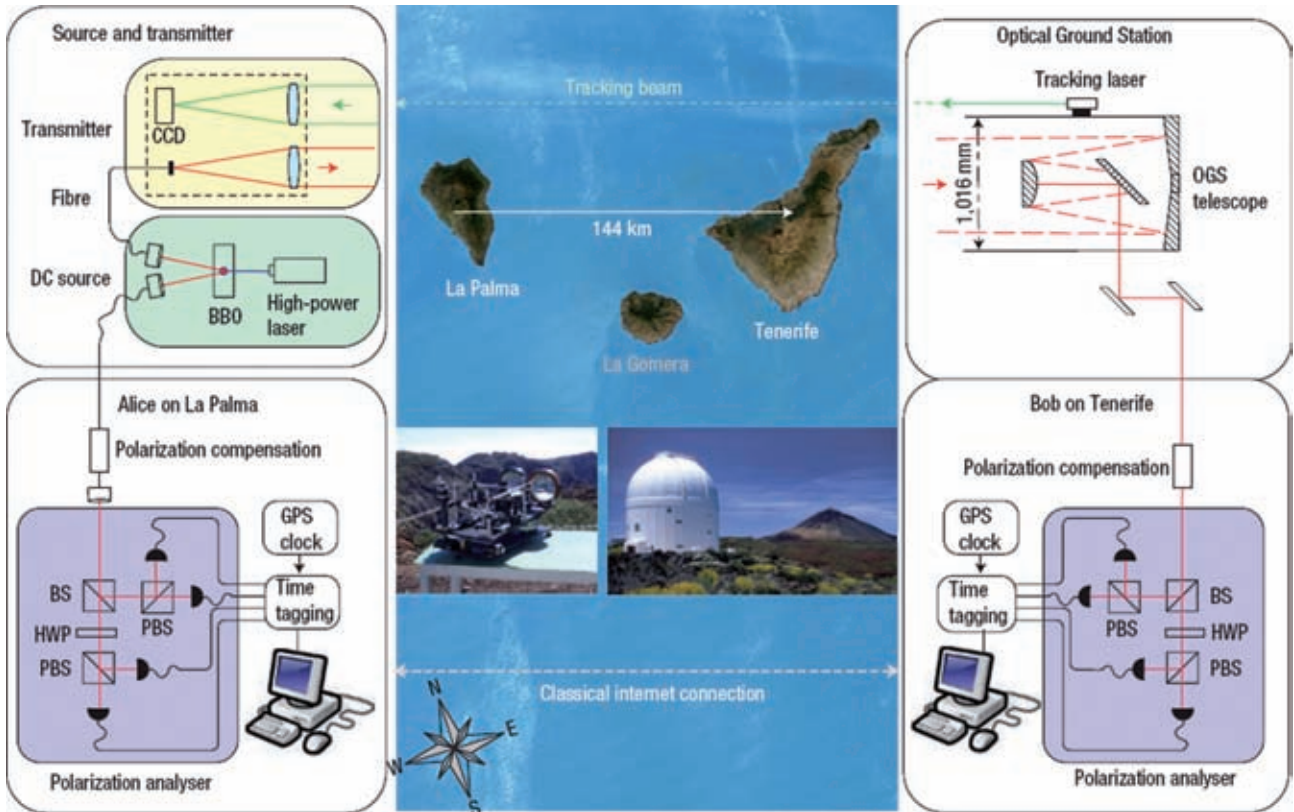


Fig. 1: Entanglement over 144 km. One of the photons of an entangled pair produced on La Palma is sent via a telescope to the OGS on Tenerife where it is detected. Entanglement is confirmed by violating a Bell inequality for the measured polarization correlations. This work was elected one of the "Research Highlights 2007" by Nature.

## Preview for 2008–2009

### *Questions and Perspectives of Future Developments*

The institute is currently in the fourth year after its foundation. The research activities are now fully up and running and the institute is internationally excellently established. Hence questions of mid- and long-term staff structure and development arise. The guiding principle of this discussion must be the criterion of scientific quality, while such a discussion cannot be disentangled from financial boundary conditions.

A short-term goal must be the actual implementation of junior scientist research groups. The necessity of these groups has been documented in detail in earlier reports to the academy and to the ministry and is no longer under debate. In these reports, also the modus of the announcement of these positions has been discussed. A further central question concerns the implementation of further research groups under the guidance of the current directors as well as established researchers at the locations Innsbruck and Vienna. Goals of the implementation of new research groups are a broadening of the scientific activities of the institute in various promising directions, as well as a balanced age struc-

ture of the institute's board, where the young generation shall be integrated as a crucial part.

### *Division R. Blatt*

We will apply the new gate to ion strings with three and more ions and create high-fidelity entangled states with it. Furthermore, we will test the new planar traps in room as well as in cryogenic setups.

### *Division H. Briegel*

In the following years we will investigate the foundations of quantum computation and quantum simulation, connections of quantum information to classical statistical mechanics as well as the characterization and simulation of complex quantum systems with quantum information methods.

### *Division R. Grimm*

We will use the Feshbach resonances, which we found, to produce  ${}^6\text{Li}^{40}\text{K}$  molecules and investigate phenomena related to superconductivity. In a later stage we plan to extend our experiments to mixtures including strontium.

*Division A. Zeilinger*

The focus in the years 2008 and 2009 will be on extending theory and experiments for the examination of fundamental aspects of entanglement in more complicated systems (higher number of particles, more degrees of freedom, mechanical systems) as well as on continuing the work in the field of quantum information and quantum communication.

*Division P. Zoller*

The above mentioned topics provide a rich foundation for future work. Of particular interest is the further exploration of systems with long-range and few-body

interactions, as they are found in dipolar gases in the optical lattice or in systems of Rydberg atoms and ions. In addition, refined detection and addressability methods shall be developed for these systems. On this basis, new resources for quantum information can be established, and the perspective of an implementation of robust qubits with tailored interactions as well as novel quantum memories is given. Furthermore, the above systems will – once they can be prepared in a controlled way – shed light on one of the most challenging aspects of modern quantum physics: the understanding of strongly interacting many-body systems.

## Stefan Meyer Institute for Subatomic Physics, SMI

Head: EBERHARD WIDMANN



### Aims and Functions

The Stefan Meyer Institute for Subatomic Physics (SMI) is performing basic experimental research in the field of subatomic physics. The main scientific topics are kaon-nucleon interaction, matter-antimatter symmetry and antiproton physics at the international accelerator facility FAIR (Facility for Antiproton and Ion Research) at Darmstadt/Germany.

Exotic atoms are used as test systems for the experimental investigation of fundamental interactions and symmetries. New results on the matter-antimatter symmetry can be obtained by spectroscopy of antiprotonic helium atoms and with the determination of the hyperfine structure of antihydrogen. The study of X-ray transitions in hadronic atoms (e. g. kaonic hydrogen) enables the precise investigation of strong interaction, thus information on chiral symmetry breaking and kaonic nuclear clusters can be obtained.

At present the search for kaonic nuclear clusters is one of the most interesting research topics in subatomic physics since highly compressed matter can be produced and studied in the laboratory. The implications of the experimental results extend to astrophysical questions. The experiments are performed in international collaborations at particle accelerators: Antiproton Decelerator at CERN/Switzerland, electron-positron collider DAΦNE of LNF/Italy, accelerator center of GSI/Germany and J-PARC in Japan.

The upcoming international particle accelerator facility FAIR at Darmstadt constitutes a main center of future research in subatomic physics. SMI is partner in three projects with antiproton beams at FAIR.

### Results for 2006–2007

The most important experiments and their results in the period 2006–2007 are given below.

- The so far most precise results of the laser spectroscopy experiments of antiprotonic helium performed within the ASACUSA collaboration at CERN-AD

were published in 2006. Comparing the experimental results with state-of-the-art QED calculations, the most accurate value world wide for the ratio antiproton-to-electron mass was obtained with a precision of 3 ppb ( $3 \times 10^{-9}$ ). Our value agrees well with the corresponding ratio of the proton (see Fig. 1), which constitutes also a test of the fundamental *matter-antimatter symmetry*, the CPT symmetry.

Another quantity of the antiproton important for CPT tests is its spin magnetic moment, which so far is known to only 0.3 %. Under the leadership of SMI two beam times were performed in 2006 and 2007 by the ASACUSA collaboration. More measurements and systematic studies will be needed in 2008 to reach our goal, a factor 10 improvement over our earlier results using a laser-microwave resonance technique. If this precision is achieved, a determination of the antiproton magnetic moment with an accuracy of 0.1 % will be possible.

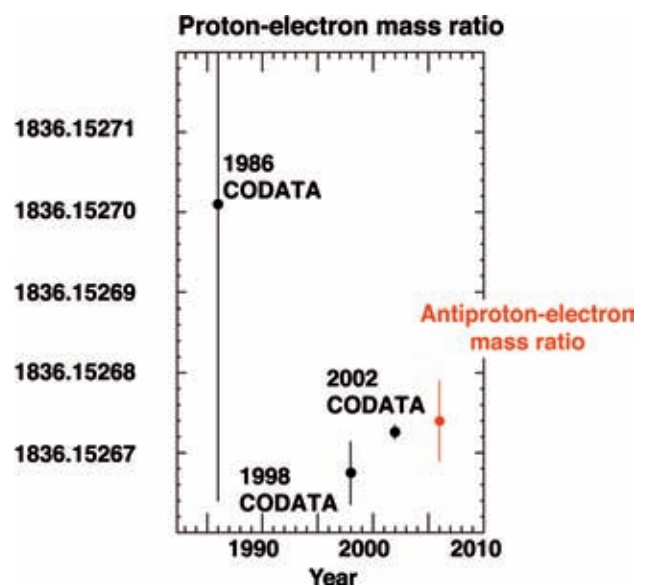


Fig. 1: Proton to electron mass ratio over the years and new antiproton to electron mass ratio.

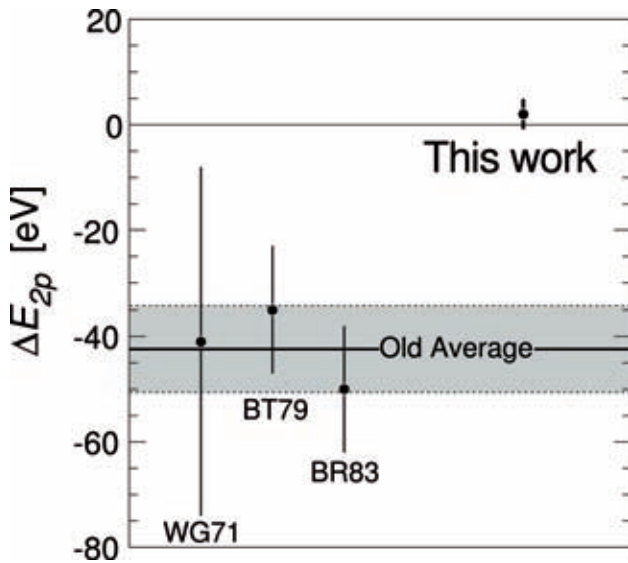


Fig. 2: Comparison of our new result on the shift of the 2p state in electron volt (eV) with the earlier experiments done in 1971–1983 (WG71, BT79 und BR83).

- In the field *Kaon-Nucleon Interaction* we published in 2007 the final result of the measurement of the energy of the 3d–2p X-ray transition in kaonic helium (experiment E570 at KEK-Japan). The measured strong-interaction shift is found to be much smaller than all previous experiments claimed (see Fig. 2), which agrees with all available theoretical results.

Our measurement, using newly developed Silicon Drift Detectors (SDDs) and identifying the kaons stopped in the helium gas, had much higher energy resolution and lower background compared to the previous results, and solved this 20 year old puzzle of strong interaction.

On the subject of Kaon-Nucleon Interaction a lively workshop was organized by E. Widmann, C. Curceanu (LNF) and A. Rusetzki (Bonn) at ECT\* Trento in 2006.

The development and integration of SDD detectors for the SIDDHARTA experiment, which will take place in Frascati in 2008, was a strong effort at SMI in 2006 and 2007.

A proposal to study the simplest deeply bound kaonic cluster,  $K^-pp$ , with the FOPI detector was submitted to GSI Darmstadt and accepted. In spring 2006 we submitted, together with a collaboration of about 100 international scientists, the finalized letter of intent for AMADEUS to LNF Frascati. The aim of AMADEUS is to study deeply bound kaon clusters at the DAΦNE2 facility. For the first time all emitted particles in the cluster decay including neutral particles will be determined with high efficiency. This is crucial for the clear proof of the existence of the clusters and for the determination of the properties like density. This experiment could become a European counterpart to the planned experiments with kaons in-flight at J-PARC.



Fig. 3: Sketch of the planned international research center FAIR.



- The institute participates in FAIR (see Fig. 3) with three experiments using antiprotons (FLAIR, PANDA and AIC). Precise studies on matter-antimatter symmetry will be performed with FLAIR (Facility for Low-energy Antiproton and Ion Research) with superior technology compared to the AD/CERN. In the PANDA project antiprotons at high energy will be used for investigations in the charm sector. In the AIC project questions on nuclear structure will be studied. With the official kick-off meeting in November 2007, the project was formally started and preparations will now be intensified.

#### Preview for 2008–2009

*Kaon-nucleon interaction:* The measurement of the X-rays of kaonic hydrogen and deuterium (experiment SIDDHARTA at LNF) will be conducted in 2008.

For the search for kaon clusters, a test experiment with FOPI is planned for 2008, and the real run will take place 2009. Technical developments for the AMADEUS detector will be continued.

*Matter-antimatter symmetry:* The spectroscopy of antiprotonic helium will be continued 2007–2008 at AD. On the one hand the antiproton mass will be determined with higher accuracy using 2-photon laser spectroscopy, on the other hand the hyperfine structure of antiprotonic helium will be investigated more precisely. The technical design for an apparatus for the measurement of the hyperfine structure of antihydrogen will be started in 2008. In 2009 we expect the first production of antihydrogen in ASACUSA.

*Experiments at FAIR:* The developments for the experiments FLAIR, PANDA and AIC will be intensified after the official project start.

## Environmental Research

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### Institute for Limnology, ILIM

Head: THOMAS WEISSE



#### Aims and Functions

Limnology is the comprehensive science of the biological properties of inland waters in their physical-chemical environment. Process oriented basic research is the main task of the Institute for Limnology (ILIM) of the Austrian Academy of Sciences. Model organisms, reaching from bacteria to fish species, are being used to investigate issues of general ecological and evolutionary relevance. The research results are, however, also used for consulting and in the search for solutions in the planning, use and protection of inland waters. The present research of ILIM provides the basis for the sustainable use and protection of the water quality of our fresh waters.

Current research focuses on investigating the origin and maintenance of diversity of aquatic organisms and communities at various levels, ranging from molecules (genes and proteins) over organisms and populations to communities.

The Institute participated in 14 FWF and 2 EU/ESF research projects during 2006/2007, and it is, with > 40 staff members and collaborators, the largest Austrian research institution in aquatic ecology. Its core competences are in the fields of lake research, paleolimnology, and ground water ecology; the latter research area was terminated with the retirement of the leading scientist at the end of 2007. Microbial ecology is in the focus of its current lake research. Eight staff members are qualified to give lectures at various Austrian universities. The Institute manages the International Post-Graduate training course in Limnology (IPGL) and provides a substantial part of teaching within this course. Several of the Institute's researchers serve in national and international professional societies and working groups and are active as peer reviewers and editorial board members of international journals.

#### Results for 2006–2007

The complex synthesis pathways of the highly variable, hepatotoxic cyanopeptides (microcystin synthetase

gene) of filamentous cyanobacteria of the genus *Planktothrix* were investigated at the molecular level; the goal is to understand the evolution of and to evaluate the ecological impact on their variety, in order to apply the knowledge gained for the human use of surface waters. The phenotypic variation is caused, to a large extent, by the effect of transposable elements ('jumping genes'), that inactivate the corresponding enzymes by insertions or may lead to deletions of the gene of the inactivated enzymes. All non-toxic isolates can be traced back to a common ancestor that has spread across Europe since then. Lateral gene transfer was presumably of minor importance for the spreading of the microcystin synthesizing enzymes.

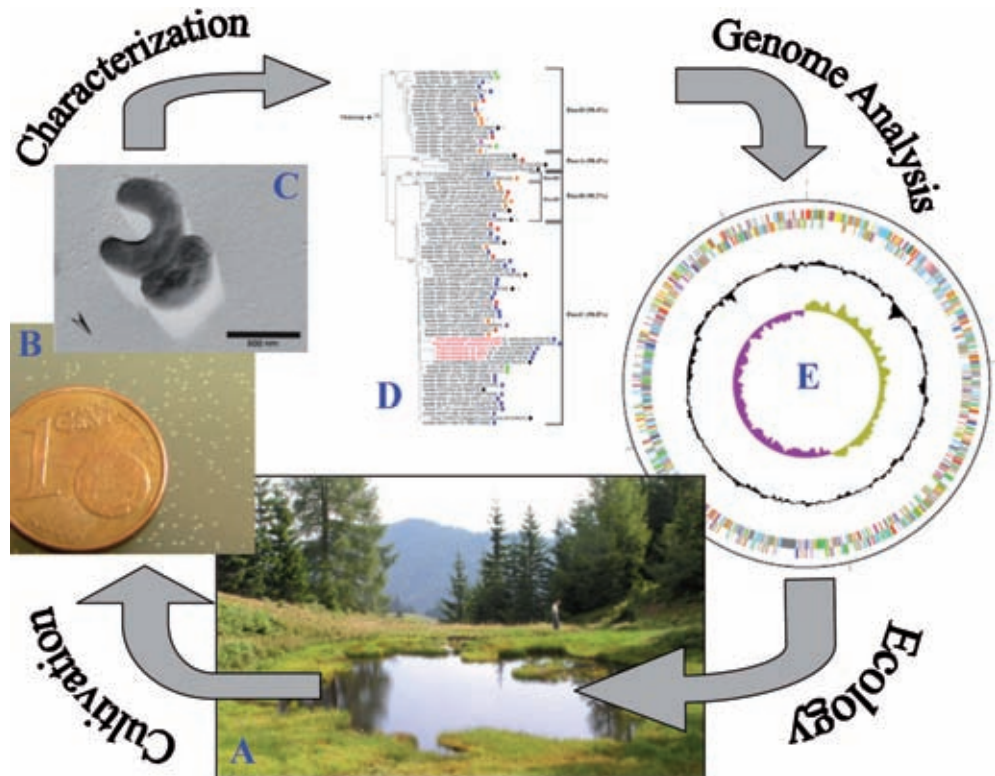
The first successful cultivation in our laboratory of the cosmopolitan, quantitatively significant freshwater bacteria of the genus *Polynucleobacter* enabled detailed research into their physiology, evolution, and biogeography (Fig. 1).

Inter- and intraspecific diversity, biogeography and adaptations to specific environmental conditions were studied with various flagellates and ciliates. Molecular genetic investigations revealed a large diversity within morphologically similar or even identical organisms. Ecophysiological adaptation is different among the various taxonomic groups and may correspond to their molecular diversity (Fig. 2). Geographic dispersal patterns can, however, superimpose on ecophysiological adaptation, as in the case of chrysophytes from temperate to tropical regions.

Fish ecology studied the extent of gene flow and the mechanisms of ecological niche separation between the endogenous coregonids (whitefish) from Alpine lakes and closely related species that have been introduced by human activities from the Baltic region. Differences were studied morphologically, genetically, and by crossing experiments. Genetic differentiation of coregonid larvae from Lake Traunsee could be demonstrated in relation to their temporal-spatial patterns of occurrence.

Fig. 1:

*Polynucleobacter* bacteria were isolated from a pond at Faistenau, Salzburg (A), continuously cultivated (B), and studied for their phenotypic (C) and phylogenetic characters (D). Various molecular methods were developed to further characterize these bacteria; genome sequencing that was recently completed (in cooperation with the Joint Genome Institute, USA) will facilitate a holistic understanding of their ecology.



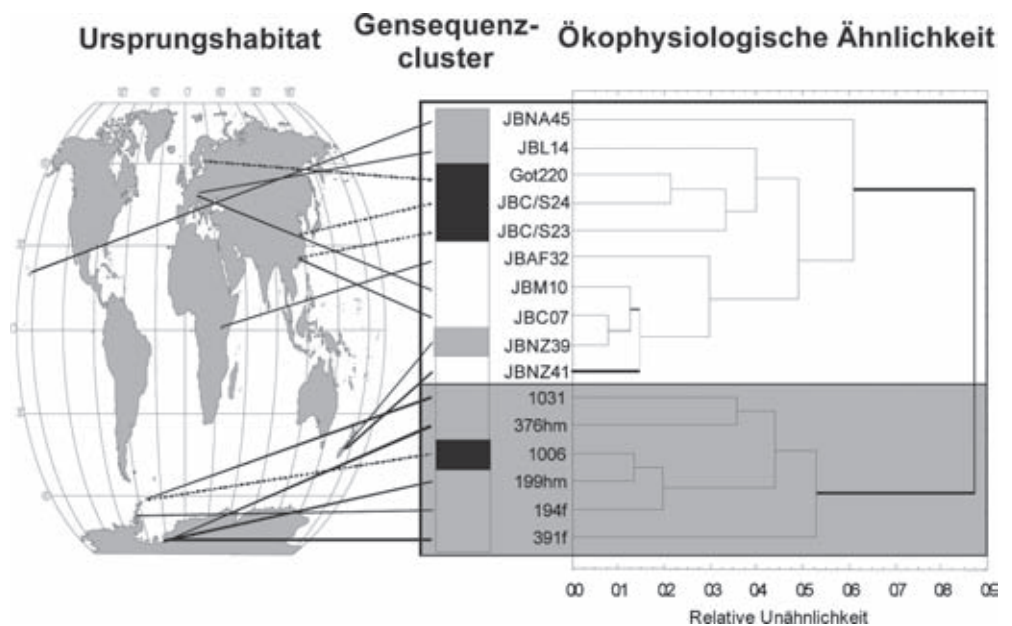
The results from this research are directly relevant for environmental protection and fisheries management of Austrian alpine lakes. Studies into the speciation of groundwater crustacea (ostracods) complemented our diversity research with extant organisms for long-term time scales.

Recombination in the course of sexual reproduction is an important process maintaining sexual diversity of eukaryotes. Asexual lineages emerged, however, repeatedly among cyclical parthenogenetic freshwater

taxa with intermitting sexual and asexual reproduction such as, e. g. cladocera (“water fleas”). Among rotifers, sexual reproduction is triggered by release of chemical signals, which accumulate with increasing population density in the ambient medium. Our recent research revealed that asexual strains of *Brachionus calyciflorus* still release the chemical signal for the onset of sexual reproduction, but that they cannot any longer respond to this signal.

Fig. 2:

Dispersal, genetic, and ecophysiological diversity of flagellates (Chrysophyceae). Ecophysiological diversity of the strains (assessed as tolerance to temperature, salinity, and pH) is shown as cluster analysis (right) and compared to their molecular identity (central part; grey, black and white denote one sequence cluster each) and origin (left). The cluster analysis revealed ecophysiological adaptation of the Antarctic strains.



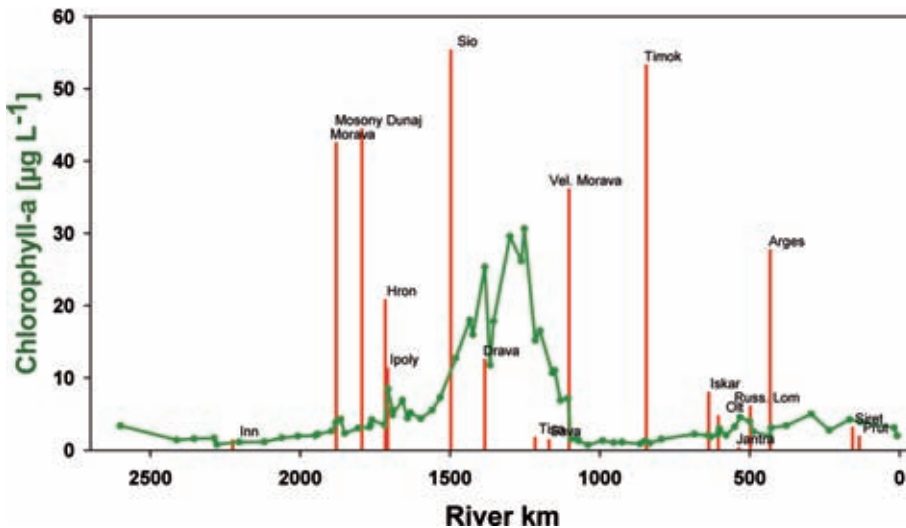


Fig. 3: Longitudinal transect of chlorophyll *a* concentration (a proxy for algal biomass) along the River Danube from river km 2800 (in south Germany) to its delta in the Black Sea (km 0). Red columns indicate chlorophyll concentrations at the mouth of tributaries.

Paleolimnological reconstruction of seasonal air temperature anomalies was achieved by temperature calibrated transfer functions using siliceous algae from the sediment archive of lakes from the Central Alps (Niedere Tauern); results indicated similar warm periods as today during the Roman epoch and the Middle Ages. Coupling of temperature data with geochemical and palynological indicators revealed that the intensification of the land use during the medieval warming increased the potential for erosion and nutrient run off, in particular during humid climate fluctuations.

Within the field of Applied Limnology, the Institute participated in the international Joint Danube Survey 2 organized by the International Commission for the Protection of the Danube. More than 100 samples were taken to measure major parameters characterizing the algal river plankton (Fig. 3). Highest algal concentrations were measured in the middle section of the river from Budapest to south of Novi Sad.

Teaching and research activities of the IPGL course were reinforced by several projects funded by the EU and the African Development Bank. A transdisciplinary workshop with 130 participants was held on the occasion of the 30<sup>th</sup> anniversary of IPGL in Mombasa, Kenya, in December, 2006. The workshop focused on the future of science and research in East Africa and their perspectives for a sustainable development. The BOMOSA project, financed by the EU, began in Oc-

tober, 2006. This project is based upon a long-standing cooperation with the University of Natural Resources and Applied Life Sciences, Vienna, and Sagana Fish Farm and Moi University in Kenya. The primary goal of this project is to establish an optimized and sustainable aquaculturing system in Kenya, Uganda and Ethiopia, to improve the quality of life for the rural population.

#### Preview for 2008–2009

The investigations that were started within the > 10 extramurally funded projects within the Institute's research focus will be continued during the next two years. The new research field on evolutionary ecology of rotifers and the significance of their sexual and asexual reproduction will be expanded by molecular and cytogenetic analyses on the evolution and ecology of further asexual aquatic organisms (poeciliid fishes, daphnids, ostracods).

It is at present impossible to forecast precisely the extent of impairment of our research by the construction work in the course of the rebuilding and expansion of the laboratory building at Mondsee; this is because a detailed scenario of the reconstruction is pending. We currently favour to rent office and laboratory containers at an alternative site to ensure the progress of our research activities in the course of the construction work, which will begin in spring, 2008.

## Institute of Technology Assessment, ITA

Head: MICHAEL NENTWICH



### Aims and Functions

The Institute of Technology Assessment (ITA) performs inter-disciplinary scientific research at the interface of technology and society. Technology assessment (TA) aims to develop insights into the societal consequences of new technologies in order to be able to shape the structural conditions for technological change. In concrete terms, societal benefit from technological progress should be maximised while avoiding negative impacts.

ITA investigates the applications of new technologies in their societal context. The analysis of technological and social conditions, of risks and opportunities provides the basis for developing technological and organisational design alternatives and regulatory options. To this end it is important to seek systematic and interdisciplinary empirical verification and to present the results in a highly transparent form. In addition, a pre-condition for ITA's work is a considerable amount of basic research and an effort to detect fields of future problems as early as possible.

The results are processed into decision-related options. The reports address all those who are interested in the conditions and consequences of technological change. In particular, they are aimed at decision-makers involved in the shaping of this change. Many of ITA's projects for national and supra-national organisations highlight this function. Furthermore, international co-operation, particularly within the European Union, represents a significant part of ITA's work.

### Results for 2006–2007

The ITA's research activities in 2006/07 can be assigned to seven work focuses: information society technologies, e-governance – ICT in the public sector, privacy – the protection of the private sphere, innovative and sustainable environmental technologies, governance of technological knowledge, security research and methods and monitoring. In this period, a total of 29

projects were carried out, a few highlights from which are set out below in the following.

In the ITA-coordinated EU project PRISE, our aim is to make a contribution to the secure future of Europe's citizens by means of innovative technologies and measures that are compatible with the protection of the private sphere and human rights. With the aim of establishing criteria for *privacy enhancing security technologies*, we have elaborated – approximately two thirds of the way through the project – a number of concerted scenarios regarding the development of security technologies, and have discussed them in a cross-national participatory event.

*Participation*, the involvement of persons other than experts and stakeholders, in other words the methodical participation of citizens with a lay status in TA projects and in technology policy, is widespread internationally and has now also gained practical importance at ITA. In 2006, ITA made concrete proposals to the Austrian Council for Research and Technology Development concerning our project "Techpol 2.0: Awareness – Participation – Legitimacy" how and with respect to



Fig. 1: Project FSA Energy: Preparatory workshop on 27/9/2007, Vienna, Library of the Institute of Technology Assessment



Fig. 2: Project FSA Energy: Working party during the citizens' conference on 24–25/11/2007, Vienna, Hotel Mercure Europaplatz

which topics Austrian technology policy might profit from participation. The Austrian Council together with BMVIT and BMWA mandated ITA to organise a two-day citizens' conference in autumn 2007 on the topic of energy and end-users. As planned, the results are a valuable input to the research programme on energy technology e2050.

In the reporting period we started our intensive pre-occupation with nanotechnologies. A first project in 2006 gave a comparative overview of the European state of affairs regarding *accompanying research in the field of nanotechnologies*. ITA recommended BMVIT to adopt an independent Austrian approach to nanogovernance – a recommendation that has fortunately been accepted: In autumn 2007 ITA started the three-year NanoTrust project aimed at establishing a sort of clearinghouse on nano risk research. A team of three experts is busy preparing a database on health and environmental aspects of these new technologies and will serve as an information platform on these questions.

The research area of “environmental technologies” has been re-oriented thematically. Initially we completed two larger EU projects dealing with the political conditions for the implementation of environment-friendly technologies and with so-called performance targets within the framework of the European environmental action plan. Subsequently, the team focused in this area on the development of a stable component of the Institute's overall medium-term research programme. In the newly defined area of *technology and sustainability* we have already been assigned a first project dealing with technologies for the elderly.

Finally, within the framework of our interest in questions of the governance of technological knowledge



Fig. 3: Project FSA Energy: Presentation of the results for State Secretary Kranzl on 26/11/2007, Vienna, Aula of the Sciences

and controversies, mention should be made of the completion of the three-year project (funded under the GENAU programme) on the “Post-genomic Area”. In this project we investigated the as yet slim impact of the increasingly complex debate inside the genome research community on public perception and discussion. The later only deals with concrete, but so far rather speculative benefit and risk claims.

#### Preview for 2008–2009

Alongside the continuation of some of the above-mentioned projects (in particular NanoTrust, PRISE), 2008/09 will be affected by the following further research activities: On the one hand, we shall deal with questions of electronic participation in the Demo-Net network of excellence, in which we are developing an evaluation framework for projects in the field of electronic democracy and in which we systematically involve stakeholders from civil society, from administration and from politics with a view to formulate the relevant research agenda. In a second project in this field we shall compare the various national approaches to the identification of individuals electronically in the communication between the state and its citizens. In the coming years we plan to complete a fundamental work on the sociology of bio-ethical expertise as well as a book on technical education between local commitment and global responsibility. In the EuroPrise project we are developing a data protection seal of approval together with European partners. Finally, we shall focus on societal aspects of synthetic biology and of the “sensitive technologies” in general. However, there can be no doubt that we shall discover a number of further topics worth a project by means of our monitoring activities. A likely candidate is, for instance, converging technologies.

## Commission for Interdisciplinary Ecological Studies, KIÖS

Head: GERHARD GLATZEL



### Aims and Functions

The Commission for Interdisciplinary Ecological Studies at the Austrian Academy of Sciences deals with complex ecological questions, which require the cooperation of various scientific disciplines.

Members from both the natural sciences and the humanities are represented in KIÖS. Priority is given to issues requiring the cooperation beyond the boundaries of institutes, faculties, universities and institutions.

The scientific activities of KIÖS focus on the gathering and the documentation of biodiversity and bioresources in Austria, as well as on interdisciplinary ecological long-term studies, which are of particular interest in view of the discussion on global change. In the context of biodiversity research, specific taxonomic, ecogeographical, phylogenetic and evolutionary investigations are conducted. Particular emphasis is placed on the synthesis of organismic and molecular results. Apart from fundamental scientific research and the documentation of biodiversity, the tasks of KIÖS include advisory service for the scientific and political community on complex ecological issues, as well as public relations. Scientific studies and services for pub-

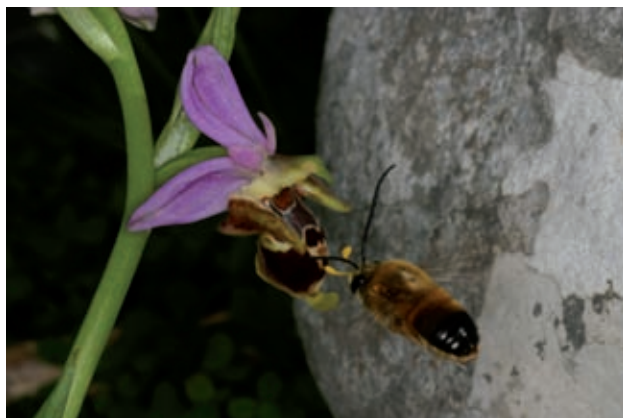


Fig. 1: *Eucera berlendi* approaches *Ophrys heldreichii* at Crete.  
© H. F. Paulus

lic and private clients are financed by means of third-party funds.

The KIOES publishes in the BIOSYSTEMATICS AND ECOLOGY SERIES the CATALOGUS FLORAE AUSTRIAE, the CATALOGUS NOVUS FAUNAE AUSTRIAE, the CHECKLISTS OF THE AUSTRIAN FAUNA, as well as GENERAL SCIENTIFIC ARTICLES.

The scientific workshops of KIÖS are named after the important Austrian natural scientist Kerner von Marilaun. The Kerner von Marilaun workshops aim at the development of new approaches and cooperations in the field of ecological long-term studies. In addition, current issues of interdisciplinary ecological research are presented to the scientific community and the interested public.

The members of KIÖS are associated with numerous national and international scientific boards. Therefore, a competent and unique interdisciplinary assessment of scientific questions is guaranteed.

### Results for 2006–2007

In the context of the publishing activities of KIÖS for the documentation of biodiversity in Austria, numerous contributions were edited in the report period. Edited by R. Schuster, already the 3rd issue of Checklist of the Austrian Fauna is in print, containing Collembola (springtails), Palpigradi (microwhip scorpions) and Vespidae (social wasps). The 4<sup>th</sup> issue of the checklist is in process and will comprise Branchiopoda (fresh water crustaceans), Opiliones (harvestmen), Bryozoa (moss animals), Carabidae (ground beetles), as well as Oribatida (oribatid mites). Renowned experts were engaged in the authorship for the respective fields of knowledge.

Two volumes of the Catalogus Florae Austriae from parts II (Bryophytes – Mosses): The Liverworts of Austria, and III (Thallophytes – Algae and Fungi): Supplements to the bibliography of lichens in Austria, have almost reached the stage of printing.



Fig. 2: What are the potentials of coppice and coppice with standards stands in eastern Austria to produce biomass and under which conditions is this achieved in a sustainable way? © V. Bruckman

In the category of general scientific contributions, two further volumes are in the stage of assessment and will be printed in the first half of 2008.

The publication project “Vienna-Environment” vol. 2, “Ecosystem city – The natural history of Vienna” by F. Ehrendorfer and R. Berger, which is financed by external funds, is about to be finalised. The printing is scheduled for the first half of 2008.

In the context of KIÖS research activities, the years 2006–2007 brought along a series of valuable insights, which can be integrated into the international context of interdisciplinary ecological research. A several years’ project by W. Wieser and R. Kaufmann on the succession of flora and fauna after the melting of the Rotmoosferner in Ötztal, which had led to internationally renowned presentations and publications, was finalised.

The project “Research on Chemo-diversity of the Evolution of the species *Artemisia* (Asteraceae: Anthemideae)” by K. Vetschera deals with chemical molecular variation, as well as the analysis of mechanisms that lead to the accumulation of phytochemicals. In the laboratory analyses, a suitable method of separation and detection by means of (High Pressure Liquid Chromatography) was established. Thus the collected pure substances were recorded in a database and now serve as a basis for further diversified comparative analyses in the field of polyacetylenes and isocumares.

A project by H. F. Paulus deals with the pollination-biological importance of blossom maculation of the orchid species *Ophrys heldreichii*. By means of choice experiments of both manipulated blossoms and photographs of blossoms, it was clearly proven that blossoms with coloured sepals are more attractive to male bees than blossoms without sepals, given an identical bouquet.

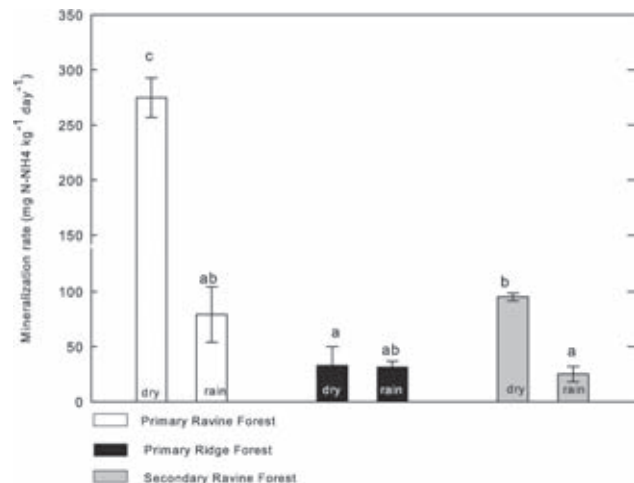


Fig. 3: Gross-Nitrogenmineralization in the topsoil (litter layer) during drought (January-March) and wet season (July-November) in the Esquinasforest, Costa Rica. Mean values and standard errors are shown, different letters showing significant differences ( $n=9$ ,  $P < 0.05$ , Kruskal Wallis test, Bonferroni multiple range test). © W. Wanek

In the context of the project, “Carbon and element cycling in a tropical lowland forest Costa Rica: Interannual variability and climate coupling” by W. Wanek, two diploma theses were finalised within the report period, which deal with the mechanisms of nutrient exchange in the crown zone on the one hand, and with the decomposing and mineralisation process of litter on the other hand. Another two diploma theses will be finalised until mid-2008. Further analyses by W. Wanek illustrate the special position of the Esquinas rain forest, as compared to other tropical research areas. For example, the high productivity shows in the so far lowest ever published nitrogen-use efficiency.

The event “Vom Waldessen und Waldbrennen” on October 24th 2007 was a great success for KIÖS. The top-class podium (G. Glatzel, V. Winiwarter, H. Pappen and R. Rabbinge) discussed the topical issue of whether forests and wood plantations can sustainably satisfy the constantly rising demand for biomass. In a joint statement, they warned against too high hopes and demanded a differentiated perspective.

Another project by G. Glatzel and V. Bruckman is occupied with the potentials for the production of biomass in East-Austrian middle- and coppice forests. The first results suggest a lack of water as a limiting factor in these regions. The “Kerner von Marilaun Workshop 2007”, organized by M. H. Gerzabek and V. Winiwarter titled “The challenge of sustaining soils: lessons from historical experience for a sustainable future” was pointing out the rising demands on soils. In this context, the “2007 Kerner von Marilaun Declaration on Soils” was issued.



**Preview of the years 2008–2009**

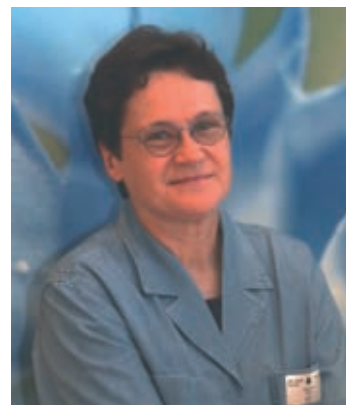
The compilation and documentation of biodiversity in the KIÖS publication series will continue to be a core task of KIÖS. Thus further volumes of the *Catalogus Novus Faunae Austriae* are in process (issue 2, Apterygota = primeval insects) or in planning, respectively. Moreover, a volume of the *Catalogus Florae Austriae*, part III, with the title, “The Austrian rust fungus species” is in process.

In 2007 alone, 12 further projects were supported by KIÖS, which will be finalised in the years 2008–2009,

so an abundance of interesting, interdisciplinary works can be expected. Further focal points are the administration and coordination of projects financed by third party funding, according to the KIÖS Mission Statement, the collaboration and representation in national and international scientific boards, advisory services to science and politics on complex ecological questions, as well as public relations. Of central importance is the organisation of scientific events, apart from the annual Kerner von Marilaun workshops.

## Clean Air Commission, CAC

Head: MARIANNE POPP



### Aims and Functions

The mission of the CAC comprises all issues associated with ambient air pollution, especially all impacts on air quality (emission), PM chemistry and transport influenced by atmospheric processes (transmission), and adverse effects on humans, animals, plants, soil, climate, goods as well as the relationships of these issues.

Topics of growing interest, such as the use of biomass for energy purposes generating a possible increase in PM burden, are dealt with by CAC's working groups composed of its members and in case of need external research partners; they transform complex information so that it can be communicated to the general public.

### Results for 2006–2007

Main emphasis was given to a cooperation initiative in the framework of the COST 633 Action. In the year 2006, Prof. Hitzenberger organized the mid-term conference with the title "Particulate Matter: Properties Related to Health Effects, International Conference, Similarities and differences in airborne particulate matter, exposure and health effects over Europe". Several members of the CAC participated in this conference (<http://cost633.dmu.dk>).

The main results of the AUPHEP project ([http://www.oeaw.ac.at/krl/projekte/abgeschl/auphep/data/AUPHEP\\_EB.pdf](http://www.oeaw.ac.at/krl/projekte/abgeschl/auphep/data/AUPHEP_EB.pdf)) were published in 2004. Analyses of the data collected are still going on resulting in further scientific publications (Moshhammer H., Hutter H-P., Hauck H., and Neuberger M., Low levels of air pollution induce changes of lung function in a panel of school children, *Europ. Respir. J.* 27 (2006). 1138–1143. Neuberger M., Rabczenko D., Moshhammer H., Extended effects of air pollution on cardiopulmonary mortality in Vienna, *Atmospheric Environment*, 41 (2007) 8549–8556) The results are also being presented in international conferences on particulate matter.

There still remains considerable uncertainty regarding PM associated health effects; these complex questions were treated in several lectures and were discussed in a press conference organized by the CAC. The crucial points presented in this press conference had been provided for by CAC's task force "biomass".

It was a special occasion for the CAC to present the book "40 years of CAC, Clean Air Commission 1962–2002" which had been worked upon during the past years. For this event Prof. Niessner (Technical University of Munich) delivered a speech on ultrafine soot aerosols.

The cooperation with the Federal Ministry of Agriculture, Forestry, Environment and Water Management with the aim to define indoor air quality guidelines was carried on. A scientific paper on CO<sub>2</sub> as ventilation parameter could be added to the series. Further topics are carried on.

Within the context of the "EcoCatch" project, the working group of Prof. Kasper-Giebel launched a cooperation with the Air Quality Department of Lower Austria in order to perform continuous monitoring of the PM burden in the town of Lunz. The plan to set up a monitoring site in a natural ecosystem had to be delayed due to insufficient infrastructure (electricity). This problem will be solved in the year 2008. The Water-based Condensation Particle Counter acquired under this project is currently being tested in parallel measurements of the routine monitoring at the Sonnblick observatory.

In view of the still pressing need to refine the measurement methods for PM exposure, the CAC decided to purchase an optical aerosol spectrometer to be used by the Institute of Environmental Hygiene (Prof. Neuberger, Hot Spots project).

### Preview for 2008–2009

In the years 2008 and 2009 the research projects mentioned under 2. will either be continued or be brought

to an end (EcoCatch, Hot Spots, Particle monitoring at the Sonnblick, indoor air quality guidelines)

As far as public relations about “ultrafines” is concerned, a cooperation with the Academy’s Institute of Technology Assessment is planned. As a first step, it is intended to organize together public lectures.

The CAC will keep up its tradition of bi-annual expert meetings on air quality questions inviting representatives of the following organizations: air quality net-

works of the federal states of Austria, the Federal Ministry of Agriculture, Forestry, Environment and Water Management, and the Federal Environment Agency.

Members of the Clean Air Commission will continue to serve as consultants in relevant international organizations such as SCOPE (Scientific Committee on Problems of the Environment) and Euro-CASE (European Council of Applied Sciences, Technologies and Engineering).

## Space Research

### Space Research Institute, IWF

Head: WOLFGANG BAUMJOHANN



#### Aims and Functions

The Space Research Institute (Institut für Weltraumforschung, IWF) in Graz focuses on the exploration of the solar system, on the investigation of near-Earth space, and on satellite geodesy. With more than 75 staff members from 14 different nationalities it is the Austrian space research institute par excellence. The activities of the institute cover the whole chain of research needed in its field. It develops and builds space-qualified instruments including calibration, and operates them once they are in space. The data returned by these instruments is scientifically analyzed and interpreted, with support from theoretical investigations. In terms of science, IWF concentrates on space plasma physics, on the interaction between the surface and exosphere of solar system bodies and the solar wind, and on the Earth's gravity field. In the area of instrument development the emphasis lies on building magnetometers and satellite potential control systems, on antenna calibration, and satellite laser ranging. Presently, IWF is involved in 14 international space missions. It collaborates

with the European Space Agency (ESA), national space agencies in the US (NASA), France, Japan, Russia, and China, with Austrian space industry and more than 120 research institutes worldwide. The missions cover the determination of the Earth's gravity field (GOCE), fleets of satellites in near-Earth space (Cluster, Double Star, THEMIS, RBSP, MMS, Resonance), observation of the Sun (STEREO), exploration of planets such as Saturn (Cassini), Mars (Yinghuo, ExoMars), Venus (Venus Express), Mercury (BepiColombo) and extra-solar planets (COROT) as well as landing on comets (Rosetta). From building the instruments to analyzing their data, all these projects last 10–20 years.

#### Results for 2006–2007

Four space missions with IWF participation had culmination points in 2006–2007: The first highlight was the arrival of the Venus Express probe at Venus in April 2006. The magnetometer, built under lead of IWF, now studies loss processes of Venusian atmosphere to the solar wind as well as lightning. First results were published in three articles in "Nature" in November 2007 (Fig. 1).

NASA's STEREO mission was launched in October 2006. Two probes lead and trail the Earth in their orbit around the sun and are making stereoscopic measurements of the sun and its neighborhood. IWF has played a key role in the calibration of the radio wave instruments and is participating its data analysis (Fig. 2).

The launch of the French space telescope COROT in December 2006 was the third highlight of the reporting period. COROT will look at stellar oscillations and search for extrasolare planets. IWF has built the so-called Boitiers Extracteur (BEX) (Fig. 3). BEX is using custom-built processors to extract the interesting information from the full exposure and has helped to detect the first two exoplanets.

The fourth highlight was the launch auf NASA's five THEMIS satellites in February 2007. This flotilla will

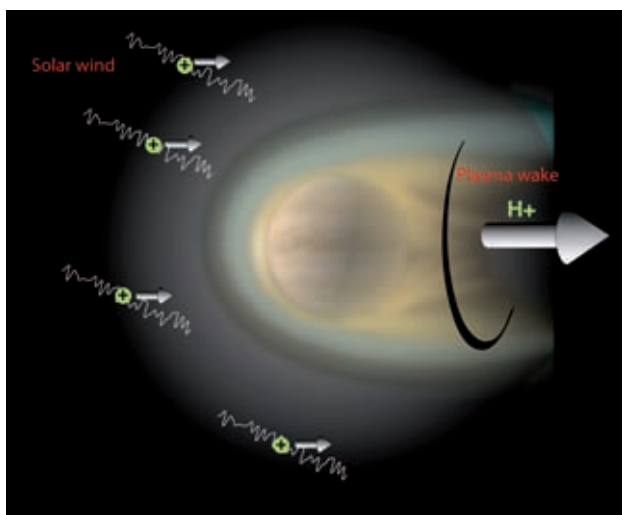


Fig. 1: Venus loses hydrogen to the solar wind.

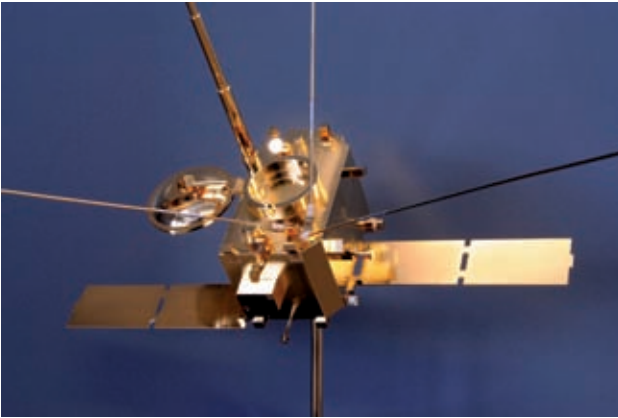


Fig. 2: Using this 1:20 model of the STEREO spacecraft, the wave antennas have been calibrated.

look into the processes that govern magnetospheric storms. IWF has involved in the overall planning of this mission, helped building the magnetometers, and will, of course, play a key role in analyzing their data. Last but not least, as additional highlight, the novel IWF kHz-laser ranging system provided accurate data on the spin rate of high-altitude satellites, such as Lageos.

Further data interpretation efforts and theoretical studies centered around the four Cluster satellites, launched by ESA in 2000 to investigate the Earth's magnetosphere, the two Chinese Double Star satellites, launched in 2003 and 2004, and the recently launched THEMIS spacecraft, thus making good use of the data from the altogether 11 magnetometers, which IWF helped to provide. In fact, IWF is one of the internationally leading institutions in this field. Furthermore, theoretical studies of exoplanet atmosphere-stellar wind interaction prepared the upcoming COROT data analysis.

During the reporting period, the institute has won, in international competition, new substantial shares in four space missions. IWF participates in two missions to Mars. For the Chinese Yinghuo ("Firefly") orbiter, the institute cooperates with a Swedish team in building an ion spectrometer; for ESA's ExoMars rover, IWF will develop a permittivity probe. Furthermore, members of the institute are cooperating with American and Russian partners in developing wave instruments for NASA's Radiation Belt Storm Probes and the Russian Resonance mission, respectively. These two missions will explore processes in the Earth's inner magnetosphere during the next decade.



Fig. 3: BEX processors onboard the CoRoT space telescope.

In closing some numbers: during 2006–2007 members of the institute published 156 articles in refereed international journals, 56 of these as first author. During the same period, articles with authors from the institute were cited altogether more than 2100 times in the international literature. In addition, nearly 300 talks and posters have been presented at international conferences, including 58 by special invitation from the convener. In national and international press media, the institute was mentioned more than 500 times. Last but not least, institute members have organized five international symposia, in Graz, Vienna, and Berne, as well as 17 sessions at international conferences.

#### Preview for 2008–2009

Flight instrument and other development efforts for two missions will pay off by launches in 2008 and 2009. ESA's GOCE mission, to be launched in 2008, will measure the Earth's gravity field. The Chinese Mars orbiter Yinghuo ("Firefly") will hitchhike on a Russian spacecraft in 2009. IWF is part of a collaboration that built the ion spectrometer. In experimental work, IWF will be particularly busy with building 15 instruments for NASA's MMS and the ESA-Japanese BepiColombo missions. Data analysis efforts will concentrate on the Venus Express and THEMIS missions, but also use data from the Cassini, Cluster, and STEREO spacecraft. The coupling between solar and stellar winds and (exo-)planets will be the focus of theoretical work.

## Commission for Astronomy

Head: MICHEL BREGER



### Aims and Functions

The Astronomical Commission was originally set up on March 3, 1967 in order to administer the Austrian membership in the International Astronomical Union. Austrian astronomy is represented by the Commission on a number of international committees. These include the International Astronomical Union and the Editorial Board of *Astronomy and Astrophysics*, the leading European scientific journal for astronomy. Furthermore, the Astronomical Commission supports a number of selected scientific projects with impact beyond a single scientific institution. The Commission also supports international scientific meetings held in Austria through the printing and distribution of abstract booklets.

The Commission also publishes an international, refereed scientific journal, “*Communications in Asteroseismology*.” The Austrian journal was chosen by the European Network for Excellence in Asteroseismology, the EU project HELAS (on solar and stellar astronomy) as well the European Astronomical Society as their publication medium for asteroseismology.

The digitization and cataloguing of a priceless collection of astronomical books and documents at the Vienna University Observatory is another important activity. These books cover seven centuries with over 13000 volumes. Other projects cover the naming of asteroids as well as astrochronological questions (together with the Phil-Hist. Klasse). Furthermore, the continuous monitoring of the Sun and the maintenance of the recorded data in a digital form are supported.

### Results for 2006 and 2007

*Asteroseismology – Publication of an international scientific journal*

The Commission publishes an international, refereed scientific journal, “*Communications in Asteroseismol-*

ogy.” The Austrian journal was chosen by the European Network for Excellence in Asteroseismology, the EU project HELAS (on solar and stellar astronomy) as well the European Astronomical Society as their publication medium for asteroseismology. In the last two years, the Academy has developed into a European center for Asteroseismology.

During 2006 and 2007, four volumes (147, 148, 150, and 151) were published, in part with external financial support from the European Union. Vol. 150 with the title of ‘The Future of Asteroseismology’ contains 390 pages.

Illustrated catalogs of historical volumes at the University Observatory from the 15th to the 19th centuries  
The University Observatory in Vienna houses one of the most important collections of astronomical books

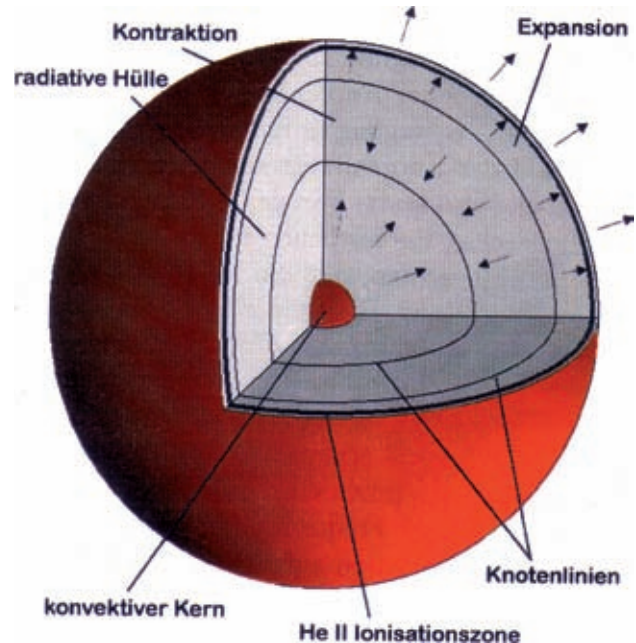


Fig. 1: Structure of a star according to asteroseismological measurements and models. This star with twice the mass of the Sun shows a radial pulsation, in which different stellar layers move in different directions.

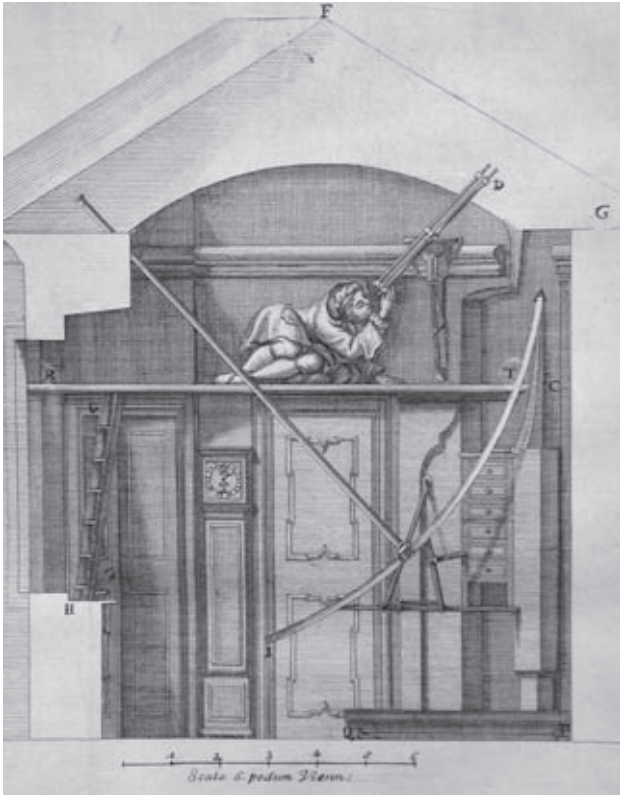


Fig. 2: Rather uncomfortable position for astronomical measurements in one of the earliest Viennese observatories on the Mölker-Bastei (Marinoni 1745).

and documents with more than 13.000 volumes from seven centuries. The project is concerned with detailed digitization and cataloguing of this priceless collection.

The second volume covering the 18<sup>th</sup> century was published during 2006.

#### *International Conferences*

The Commission for Astronomy participated in the organization of three international conferences and printed the Abstract Books:

1. Why Galaxies Care about AGB Stars (6–11 August, 2006)
2. The Future of Asteroseismology (20–22 September, 2006)
3. 250 Jahre Universitäts-Sternwarte Wien (29 September to 1 October, 2006).

#### *Astrochronology*

This project is carried out in collaboration with the Phil.-Hist. Klasse of the Academy and is concerned with astrochronological questions.

#### *Astronomical observatories in Austria*

The detailed historical listing of the different astronomical observatories in Austria was made available on CD and is updated online. The publication was extensively covered in Austrian newspapers.

#### *Naming of asteroids*

A detailed search of the asteroids in the “Minor Planet Circulars” of the International Astronomical Union showed that the names of 173 asteroids showed a connection to Austria. The results of the investigation by w. M. H. Haupt and G. Hahn was accepted by the Mat.-Nat. Klasse of the Austrian Academy of Sciences for publication.

#### *Editorial Board Meeting der Fachzeitschrift “Astronomy and Astrophysics”*

“Astronomy and Astrophysics” is the leading astronomical journal in Europe. In May, 2007 the Austrian Academy of Sciences was the host of the annual meeting of the Editorial Board.

#### **Preview for 2008–2009**

The present activities of the Commission will be continued. We will just mention some details of two of these projects:

The Commission publishes the international, refereed scientific journal, “Communications in Asteroseismology” (through the Academy of Sciences). The growth of the journal is expected to continue, especially through the publication of special issues. For 2008, two proceedings of large international conferences are planned: the Whole Earth Telescope Conference (USA) and the European HELAS Conference (Poland).

The Academy handles the official membership of Austria in the International Astronomical Union (IAU). Consequently, it takes the responsibility for a number of projects of the IAU. An example is the digitization of the IAU Archives of Unpublished Observations, expected to be completed in 2008.

## Interdepartmental Research Tasks

### Commission for Scientific Co-operation with the Austrian Federal Ministry of Defence

Head: HANS SÜNKELE



#### Aims and Functions

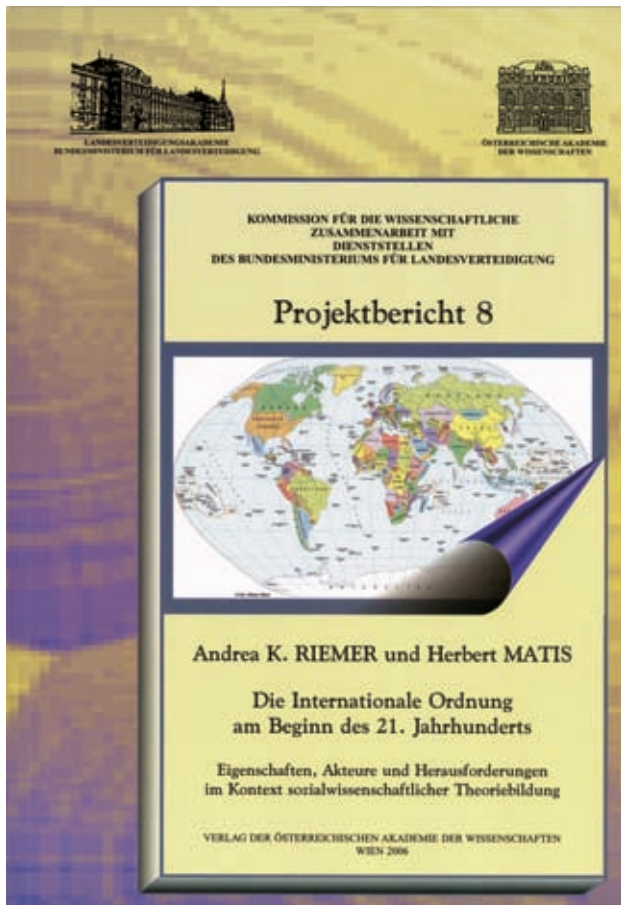
The commission aims at promoting scientific co-operation between the Austrian Academy of Sciences, the highest standing scientific research institution of the Austrian republic, and the Austrian Federal Ministry of Defence.

Commission functions include curiosity and knowledge oriented scientific research with application potential of common interest, mutual support in scientific matters as well as reciprocal information. Most often

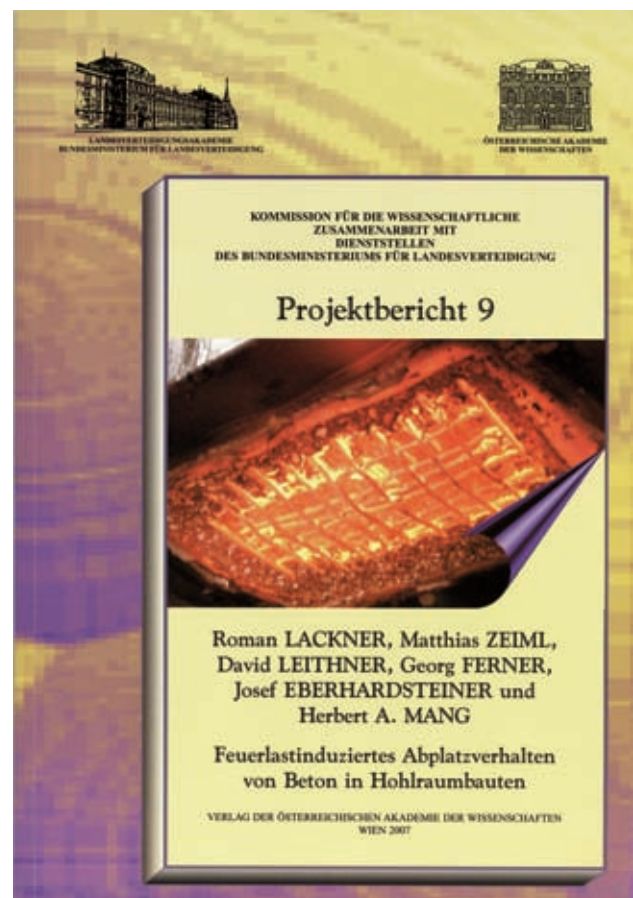
treated scientific problems and questions to deal with are of strategic nature.

#### Results for 2006–2007

Scientific commission work in 2006 concentrated on the important subject of International relations. Characterization of recent international relations developments, identification of driving actors and key challenges constituted a solid basis for the ambitious attempt to formulate elements of a social sciences in-



Viewgraph 1: Project Report 8 (2006)



Viewgraph 2: Project Report 9 (2007)



clined theory on International relations. The period from the 1989/90 turn until spring 2006 was considered for the scientific analysis and conclusions of the commission project *International relations in the early 21<sup>st</sup> century* led by Andrea K. RIEMER and Herbert MATIS. The findings are well documented in commission report 8 (Viewgraph 1). They lay foundation for further future commission investigations in the field of political strategy research.

In 2007 scientific commission activities focused on finalizing the commission project *Spalling Behavior of Concrete in Underground Facilities Caused by Fire Load* led by Roman LACKNER and Herbert MANG. Underground facilities (e. g. tunnels, garages, fuel and explosives storages, command and communication centres) are mainly protected by panels, plates and shells produced from reinforced concrete. Fire loads triggered under extraordinary circumstances (e. g. accidents, combat effects) can significantly damage the reinforced concrete structure of charged underground

facilities and produce concrete spalling thereby endangering or lethally harming e. g. victims and rescue team members.

Use of a reinforced concrete with optimal addition of polypropylene fibres increases concrete pore volume in case of fire load leading to substantially enhanced durability of the charged reinforced concrete structure and suppression of concrete spalling to a large extent. The results of this experimental and theoretical research are published in commission report 9 (Viewgraph 2).

#### **Preview for 2008–2009**

Scientific commission focus in 2008, as already selected in 2007, lies in the geosciences. The commission aims at comprehensive coverage of the long-term research project *Areas and Volumes of Austrian Glaciers* headed by Michael KUHN.

The commissions in its new composition on from 2008 shall determine its 2009 scientific focus in due time. Likely candidates are Psychology or Cryptology.

## Commission for Development Studies, KEF

Head: GERHARD GLATZEL



### Aims and objectives

The Commission for Development Studies (KEF) at the Austrian Academy of Sciences obtains a bridging function in uniting scientific questions with development-political objectives. The basic idea is to embed the development-political approach into the realm of science and research. The commission thus perceives itself as a multi- and interdisciplinary platform for all persons and institutions occupied with scientific questions of development cooperation (DC), as well as part of the European and global scientific community.

This idea is put into practice both through applied cooperative research projects with partner organisations in developing countries, and through consulting service for scientific institutions and funding organisations about scientific questions of DC.

Research partnerships are chosen by the commission members after an external scientific preliminary assessment, according to the KEF criteria of scientific quality, development-political relevance, sustainability, and in the context of the millennium development goals (MDGs). The KEF partner countries include development countries according to the DAC-list (Development Assistance Committee) of the OECD. These are countries in sub-Saharan Africa, in Central and South America, and Asia.

Complementary hereto, the commission sees itself as a mediator for contacts and agency for organisations from the fields of science, economy and DC, at home and abroad, regarding proactive information activity and the networking of institutions from both areas as a major task.

KEF was implemented in 1981 as the Austrian measure following the UN conference on “Science and Technology for Development”, held in Vienna in 1979. KEF consists of delegates from fund donors, scientific members, members from the field of DC and of international cooperation in science and research, and other members.

### Results for 2006–2007

In 2006–2007, the Commission for Development Studies was able to strengthen its position as an active partner in science and public. Apart from the regular publication of an e-newsletter, press briefings were issued, a press conference was held and a touring exhibition was organised. In addition to scientific events, KEF has also participated in events with a higher degree of publicity. The KEF events have caused a considerable media feedback; among others, three Ö1 radio features were configured in the context of KEF activities and projects.

A new series of KEF events was started in autumn 2006 under the title “Research for Development Roundtables”. In these events, project partners in developing countries are given a chance to present their projects in Austria and afterwards face a critical discussion with other experts.

In terms of events, 2006 and 2007 were particularly lively years for KEF. This was due to the Austrian Presidency of the EU-Council in the first half of 2006, but also to the 25th anniversary of the foundation of the



Fig. 1: The Peruvian project partner *Ciro Palomino* explains to the workshop participants the objectives of the project on localisation, restoration and analysis of the historical land titles of the Quechua-communities in Apurimac (© Rainer Hostnig).



Fig. 2: Panel discussion in the context of the Austrian Presidency of the EU-Council (EU-LAC Summit) in Vienna on EU-Latin America: Science-Economy-Politics: Knowledge sharing and human capacity building in scientific-economic cooperation. (Anna Rauchenberger, © fotodienst).

Commission, as well as the accompanying events of the touring exhibition.

A highlight of the year 2006 was the presentation of the touring exhibition “Expeditions through space and time: Scientific exchange between Ethiopia and Austria”, which is jointly financed by KEF with funds from the Ministry of Science and Research and Austrian Development Cooperation.

On 17 wall charts, the exhibition shows a fresh picture of a complex and fascinating country, by placing special emphasis on scientific cooperation. Until the end

of 2008, the touring exhibition will be shown all over Austria.

In 2006–2007 KEF has accepted nine projects and has supported two accompanying measures. Apart from detailed project reports, these projects give rise to a continuously rising number of publications in international journals, as well as presentations in front of an international expert audience. This pleasant trend is documented on the KEF website in the form of a project publication list.

In the field of publications, KEF published six factsheets and the proceedings of the KEF-MDG + 5-Workshops of November 29th 2005 (“A Critical Look at the Role of Research in Achieving the Millennium Development Goals”). Furthermore, a study on “project evaluation from a distance” on the basis of two KEF projects in Central America was finalised.

An important step was the publication of the book “Joint Learning., Joint Research. Research partnerships in Development Cooperation”, which was published with the financial help of the section of mathematics and the natural sciences by the publishing company of the Austrian Academy of Sciences.

In 2007 some administrative innovations in data organisation and the KEF website had to be implemented, which turned out to be very time-consuming. In 2006–2007 KEF was very actively involved in projects funded by third parties, which is a huge challenge for such a small organisation with little personnel resour-



Fig. 3: Opening of the festive symposium on October 24th 2006 by Dr. Christian Seiser in the ballroom of the Academy. (Anna Rauchenberger, © fotodienst).

es. The topics ranged from development-political PR in the field of Research for Development to projects on ethics and sustainability, economy and development, as well as forms of knowledge. They are based on the two focal working areas Research for Development (1) and the Cooperation of Science, Economy and Politics in Development Cooperation from the Perspective of Research (2). During this period, another task of KEF has proven to be especially important, which comprises the development of strategies and advising scientific institutions and sponsors in scientific questions of development cooperation. The development of strategies and concepts for the enhanced integration of scientific knowledge and methods into development cooperation, especially with regard to multi- and transdisciplinary cooperation, has taken up a considerable amount of the KEF team's time, ultimately leading to a visibly better positioning of the Commission.

#### **Preview for 2008–2009**

The coming two years will be decisive in setting the direction for the future of KEF as an organisation, but also for the field of Research for Development in Austria. Development cooperation can only succeed in a sustainable and lasting way if structures are changed and local approaches are promoted. The aim of KEF is



Fig. 4: Research assistant in conversation with a local cattle breeder in Uganda. (© Dr. Helen Nagimbugwe).

to enhance the cooperation between science in Austrian and the global scientific community in developing and transitional countries, and also to achieve a closer binding of scientists from developing and transitional countries to Austrian institutions by means of research partnerships. Thereby a better international networking and a better integration of Austrian competence into global cooperation will be achieved, which gives rise to many new possibilities of cooperation.

## Commission for the History of Natural Sciences, Mathematics and Medicine, KGNMM

Head: HERMANN HUNGER



### Aims and Functions

The Kommission main task is to deal with two collections: the Collection of the geographer Erich Woldan, and the archive of the Radium-Institut of the Academy. This means both scholarly work on the collections and facilitating their use for interested scholars.

While it is impossible for us to cover the whole of history of science, the Kommission organizes lectures, exhibitions and symposia to present topics from the history of science both to a scholarly and to a wider interested public; this includes presentations in schools.

We furthermore publish works on the history of science in a special series.

### Results for 2006–2007

Work on cataloguing the Woldan Collection of Geographica continued. Contents of the section America (1700–1918) were entered in the Combined Austrian Library Catalogue.

In the course of the year, approximately 400 inquiries of scholars from Austria and abroad about items in the Woldan Collection were received and answered.

History of Geography was the topic of two events: an exhibition, accompanied by papers, about the circumnavigation of the earth by the Austrian ship “Novara” 150 years ago; and a symposium about the expedition of Ludwig von Höhnel to East Africa.

The Woldan Collection was regularly used in connection with seminars at the University of Vienna.

Members of the Kommission, especially Dr. Sexl, participated in conferences and gave lectures. Conversely, we could invite specialists in several fields of the history of science to deliver lectures at the Academy.

Dr. Sexl completed a manuscript “Zentren der frühen Erforschung der Radioaktivität: Paris – Wien – Montreal/Manchester 1898–1920”. A few other publications appeared in the series of the Kommission.

We presented two new books on topics in the history of science to the general public, accompanied by lectures.

At the request of Prof. Erwin Stein of the University of Hannover, we organised a performance by two actors and three musicians with the title “Leibniz in Vienna”, which had first been performed in 2004 at the Academy, in Hannover in the church where Leibniz is buried.

Projects in the continuing education of high schools teachers and pupils were the responsibility of Dr. Sexl, who organised such seminars on different topics in the history of science at several occasions.

We participated in the “Kardinal-König-Begegnungen zwischen Naturwissenschaften und Theologie”, organised by W. Thirring and L. Sexl in collaboration with the Metanexus Institute, Philadelphia. On three evenings, scholars and representatives of religious groups discussed topics concerning both sciences and theology.

### Preview for 2008–2009

The Kommission will help organise a symposium in memory of Carl Auer von Welsbach on June 4, 2008. Dr. Sexl will give a paper at this occasion.

In summer of 2008, professor Wolfgang Rindler will give a lecture on cosmology at the invitation of the Kommission.

The European Society for the History of Science entrusted its 3rd International Conference, to be held in September 2008, to the Kommission. By permission of the President of the Academy it will be possible to hold the conference in the Academy’s buildings. The Chairman and the employees of the Kommission will therefore have to organise the necessary preparations.

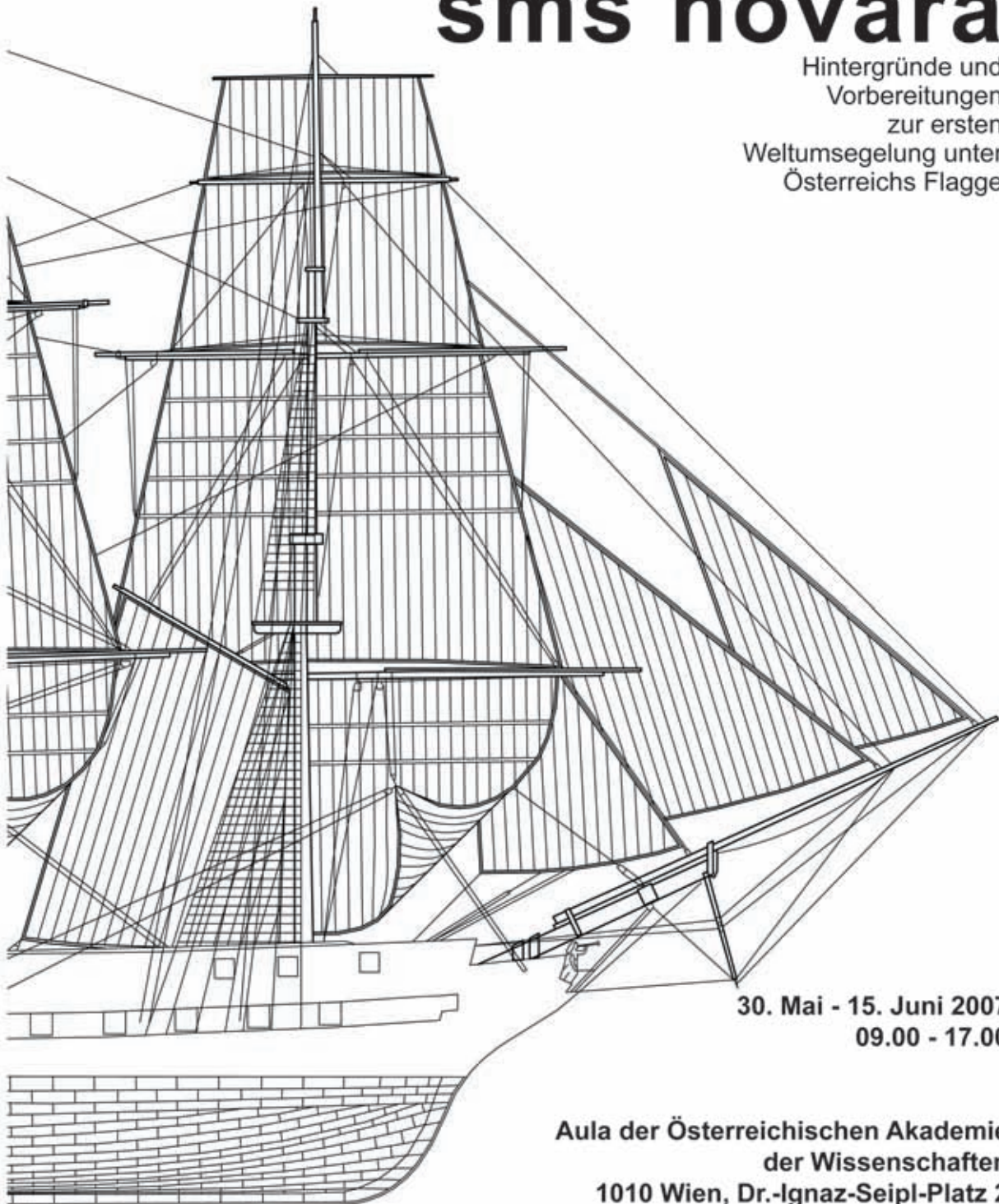
On the day preceding the conference Dr. Sexl will introduce pupils from Vienna schools to topics in the history of science.

Mag. Holzer will continue to work on the Woldan Collection.

Dr. Sexl will present themes from the history of science at schools in Vienna. In addition, she plans to present

# sms novara

Hintergründe und  
Vorbereitungen  
zur ersten  
Weltumsegelung unter  
Österreichs Flagge



30. Mai - 15. Juni 2007  
09.00 - 17.00

Aula der Österreichischen Akademie  
der Wissenschaften  
1010 Wien, Dr.-Ignaz-Seipl-Platz 2

the lives and work of important scientists who were members of the “Radium-Institut” in the early part of the 20th century. She will also continue a project on Leibniz’ proposals for an academy of sciences in Vienna.

Manuscripts of scientific books have been presented to the Kommission and will, after the usual evaluation, be published in its series.





**Research Institutions  
of the Section  
Humanities and  
Social Sciences**

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## Centre for Ancient World Studies (CAWS)

### Commission for Egypt and the Levant

Head: MANFRED BIETAK



#### Aims and Functions

First, the Commission for Egypt and the Levant runs research projects of its own. Second, it acts as a kind of interface for research within Egyptological institutions in Austria. Third, the majority of publications on the subject are edited and published in the Commission's own publication media. The Commission has a particularly close working relationship with the Institute for Egyptology at the University of Vienna and with the Austrian Archaeological Institute in Cairo. Several projects have been funded by the Austrian Science Fund.

On the one hand, the Commission's range encompasses the entire subject of Egyptology in philological as well as archaeological respects, on the other hand the areas of Syrian and Palestinian archaeology as well as the archaeology of Nubia and the Sudan.

The Special Research Programme SCIEM 2000, funded by the Austrian Science Fund, the excavations at Tell el-Dab'a, the Frescoes Project and the Cultural Contact Project are very international and interdisci-

plinary in nature, as is evident from the contributions in the output of publications. Scientists from most European countries and all continents are collaborating on the Special Research Area. Colleagues from Germany, Italy, Hungary, Poland, the United Kingdom, Greece, Spain, Argentina and the USA are involved in the excavations. The leading specialists in Minoan art are collaborating on the Frescoes Project.

The Egyptian Commission is the only institution in Austria which conducts cross-range archaeological research into the Bronze Age of the Eastern Mediterranean Area, in particular in Egypt and the Levant. It is the only institution competent to deal with and publish Ptolemy Age temple inscriptions. It is also the ideal hub for major international research projects, such as the current Special Research Programme.

Finally, the Commission, backed up by the organisation of the Austrian Academy of Sciences, is the only institution in its field able to organise and publish large-scale specialist conferences, symposia and workshops in quick succession, together with the necessary



Fig. 1:  
Fishbowl from large offering pit, area F/II



Fig. 2: Geo-magnetic survey

receptions accompanying them. Another noteworthy point is the ability to cope with a relatively large output of publications with the help of the Academy Press and its specialists.

### Results for 2006–2007

The excavations of the Austrian Archaeological Institute and the University of Vienna at Tell el Dab'a continued in four campaigns over 2006–2007, in which



Fig. 3: Offering pit in area F/II, Hyksos Period

the Austrian Academy of Sciences was intensively involved.

Excavation activity concentrated on the area of a palace compound of the Hyksos period in Area F/II, located through a geophysical survey. It shows no similarity with any known Egyptian palace structures but seems to correlate very well with palaces in Asia Minor – which amounts to a sensational discovery.

This palace was abandoned around the middle of the Hyksos Period (c. 1600 B. C.). The discovery of an offering pit with approximately 1500 intentionally smashed ceramic vessels – including Nubian Kerma vessels – suggests that a ritual meal was held in this vast building of a dimension of c. 8000 m<sup>2</sup>, probably in connection with funeral rites for the palace proprietor.

After an investigative campaign in autumn 2006, the excavations of the Tuthmoside palace of 'Ezbet Helmi were resumed in spring 2007. A large public building, presumably the domicile of a steward of the Tuthmoside stronghold, was revealed to a considerable extent. The building was connected to the private rooms of the main palace by means of a door. This palace and palace buildings excavated several years ago, were decorated

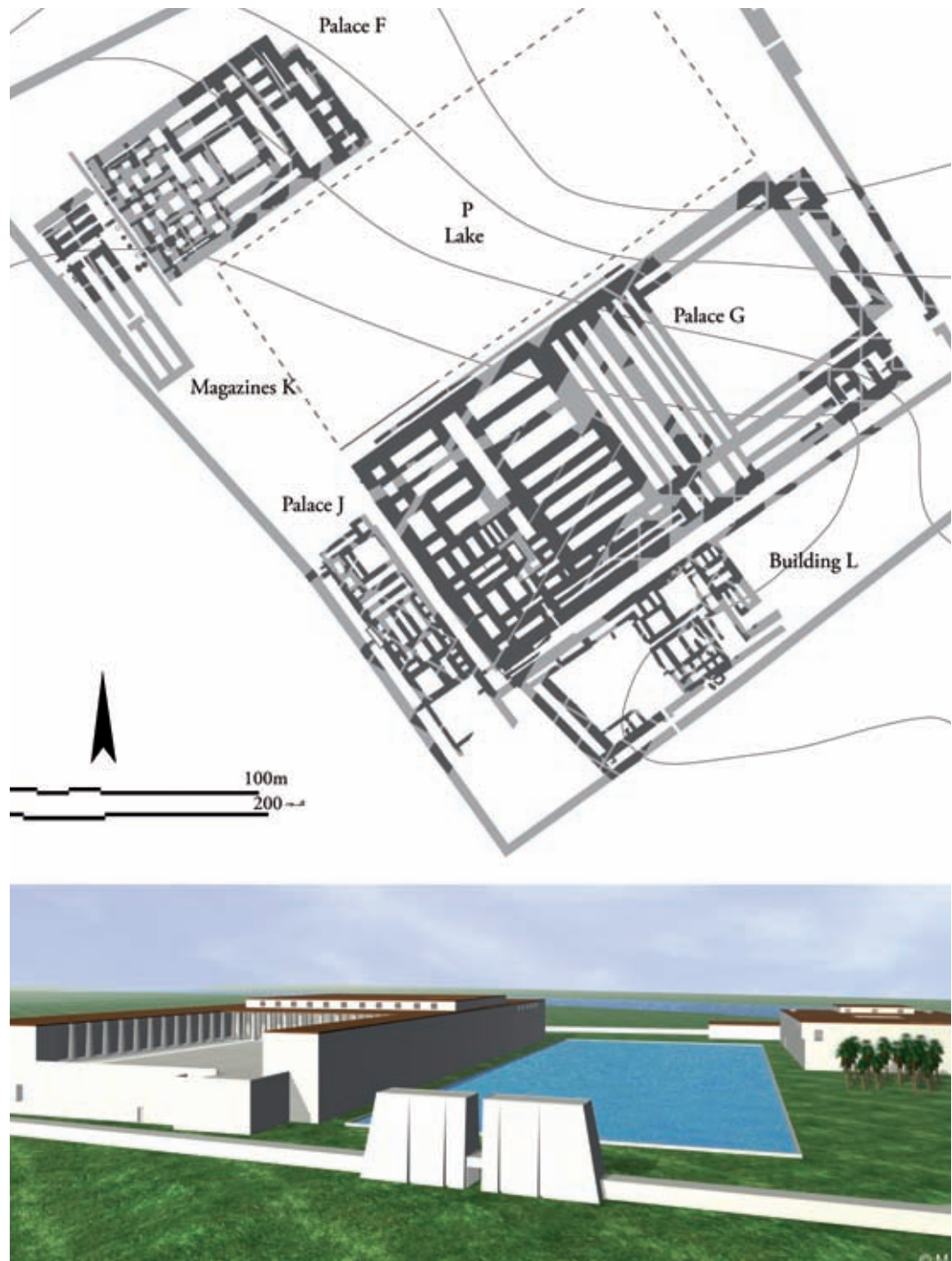


Fig. 4:  
Palace reconstruction

with Minoan frescos, part of which have been published in a first volume (Dec. 07).

A geophysical survey conducted by French palaeo-geographers of the University of Lyon and the CNRS led to the identification of a port basin of about  $450 \times 450$  m dimension, connected with the Pelusiac branch of the Nile via a feeder channel and returned to the Nile system through another channel. A further harbour in the immediate vicinity of the above mentioned Hyksos

palace could also be identified through the drilling of sediments. It seems almost certain therefore that the buildings of the 18<sup>th</sup> dynasty, the tuthmoside palace of royal dimensions, the large port basin and the city spreading south of the palace precinct can be identified with Peru-Nefer, the main base of the Egyptian navy. Until now its location had been sought near the capital Memphis on account of erroneous interpretations of ancient texts. The new archaeological evidence allows

for a new, amended location. Palaeogeographic considerations exclude the location at Memphis, situated c. 200 km upstream and distant from the Mediterranean. During the dry season from February to June the Nilotic system shrank dramatically to a hardly navigable trickle. Therefore, the harbour facilities of the Delta were situated 5 to 45 km inland to gain from the tidal waterlevels to keep offshore ships maneuverable. Furthermore, the stratigraphy of the palace precinct of the 18<sup>th</sup> dynasty and the layers above and below correspond exactly to the recorded life-span of Perunefer, i. e. Tuthmosis III and Amenophis II, hiatus during Tuthmosis IV and Amenophis III, re-activation of harbour and stronghold by Haremhab at the end of dynasty 18. Likewise the presence of canaanite gods from the Hyksos period onwards, the 18<sup>th</sup> dynasty in Perunefer, up to the 19<sup>th</sup> dynasty in Pi-ramesse confirms the continuity of these settlements.

In November 2006 an international conference with the title "Cities and Urbanism" was held in cooperation with the Austrian Archaeological Institute Cairo to mark the 40<sup>th</sup> anniversary of the Austrian excavations. The conference took place at the Austrian Academy of Sciences.

The cooperation with the special research programme SCIEM 2000, funded by the Austrian Science Fund, has been continued successfully. In the summer of 2007 a workshop of the project-directors and collaborators was organised at Langenlois/Lower Austria to discuss results and determine the last term of research.

Work on the publication Philae III was advanced in 2006–2007, making use of new technical aids and the most recent relevant publications.

#### **Preview for 2008–2009**

The excavations at Tell el Dab'a will concentrate on the area FII in 2008 and, consequently, return to the Hyksos period place district, whilst work in 2008/9 is likely to resume at 'Ezbet Helmi in the area of the Thutmosides palace district.

The SCIEM 2000 Special Research Programme is to work on the final evaluation process, which is set for 2009. It is to this end that several chronological syntheses will be established. In 2008 several small workshops will be held to advance the final report. Publication activity will also be stepped up over the next two years. In addition preliminary work will concern the Trading Project that is scheduled as part of the Medium-Term Research Programme. A further Special Research Programme with the title "TiMe – Transformation in the Mediterranean" is in progress. An international conference will take place in Vienna in January 2008 to set up a preliminary programme. An application for financial support is to be submitted at the Austrian Science Fund at the end of 2009.

The completion of the manuscript Philae III is planned for 2008 as part of the Philae Temple Publication Project. In addition another two volumes are to appear over the next 5 years. However, drawings are already available for ten volumes.

## Commission for Ancient Literature and Latin Tradition

Head: JOACHIM DALFEN



### Aims and Functions

Research into ancient literature and its influence on later centuries is effected under three focal headings: “Ancient Music”, “Nachleben (influence) of Classical Mythology”, and “Performativity / Theatricality in the Ancient and Modern World”. The project “Ancient Music” aims at an enhanced understanding of ancient musical culture in its practical aspects, with the focus on the Greek and the Roman eras. The methods employed comprise textual interpretation as well as the evaluation of archaeological evidence (artefacts as well as iconography) and extant melody fragments, and also the experimental reconstruction of musical instruments and their playing techniques. Innovative research is guaranteed through specialised software, whenever this proves helpful. The project “Nachleben of Classical Mythology” concentrates on the study of newly invented and newly devised myths of the Renaissance era which derive from no model or a completely different paradigm in Antiquity or Medieval times; an updated bibliography on the reception of ancient myth in modern times serves as a supplement. “Performativity / Theatricality in Ancient and Modern Times” is carried out in cooperation with theatre groups that engage in experiments on ancient drama as well as on modern pieces with ancient themes.

The commission supports research on the Latin language in antiquity and its further development and variations in the Middle Ages through a permanent cooperation with two international lexicographical projects, established at the Bavarian Academy of Sci-

ences (Munich): the “Thesaurus linguae Latinae” and the “Mittellateinisches Wörterbuch”.

### Results for 2006–2007

#### *Project “Ancient Music”:*

The last two years have significantly furthered our comprehension of the aulos, the principal woodwind of the ancient Mediterranean region, usually consisting of a pair of separate reeds with oboe-like mouth-pieces. From the scanty records about the tonal systems prior to Aristoxenus (around 300 B. C.), in combination with the oldest musical fragments and some finds, it was possible to deduce the general construction of a typical Hellenic professional instrument (Fig. 1): derived from archaic prototypes, but with a series of chromatic finger holes (in the modern sense), operated through metal bands, and a set of additional bass notes. An experimental reconstruction of such an instrument, demonstrating how the mechanism worked in practice, was on several occasions presented to an international public (Fig. 2).

Similarly, some remnants of instruments from the Roman period could be related to the music of their times, so the famous “Pompeii pipes” made of ivory, bronze and silver, but also some more modest wood instruments from a Greco-Egyptian context. As regards the archaic Greek aulos, the careful re-assessment of a frequently discussed passage in pseudo-Plutarch yielded a reconstruction of a “Dorian” instrument, whose music had survived in a cultic context up to Aristoxenus’

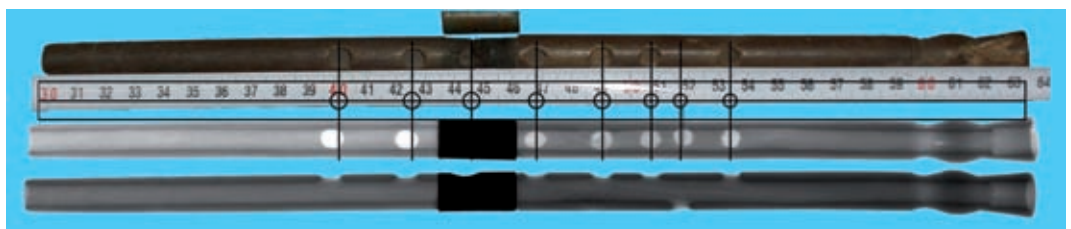


Fig. 1:  
Taking measurements of an ancient aulos reed.



Fig. 2:  
A Greco-Egyptian  
aulos played at  
Helwan University  
(Cairo)

times (and perhaps considerably later), when it was deemed many centuries old.

These new insights in the material background in turn provide a firmer foundation for interpreting the evolution of both ancient Greek music theory and practice, which so often requires a precise distinction between the genuinely musical basis and the mathematical and systemic idealizations developed out of it by different theorists in the course of centuries. Thus it was possible to derive a plausible historical model, where the origins of musical theory, as well as the conception of musical notation, lead up to instrumental practice, whereas Aristoxenus' lasting codification of scales and keys already presents a highly abstract approach, merging the not always compatible conditions of strings and woodwinds.

The *Project Hexameter Studies* is associated with these researches to some extent: New software was developed to prepare the incorporation of data from the *Chicago Homer Project* into our metrical database, and to adapt existing software to the new standards. The evaluation of the 'speaker' data already yielded promising results concerning the speech-melodic differentiation between speech and narration in the Homeric poems.

*Project "Nachleben of Classical Mythology":*

The activities concerning newly invented and newly devised myths of the Renaissance era have since 2007, in

cooperation with the Institute of Classics (University of Vienna), concentrated on several authors and selected myths, catalogued by author and genre as a kind of encyclopedia which can render valuable assistance to further research. In cooperation with Kunsthistorisches Museum (Vienna) a new interpretation of Giorgione's controversial picture "Three Philosophers" (Fig. 3) has been achieved; it is to be published in 2008.

Work on the "Bibliography" ([www.oeaw.ac.at/kal/mythos](http://www.oeaw.ac.at/kal/mythos)) consisted primarily in compiling, i. e. updating secondary literature as well as in expanding the lists of authors and works with special emphasis on Spanish literature, Italian drama – especially short plays, ballets and pantomimes written in large numbers for certain occasions ("dramma da rappresentarsi nel carnevale del ..."), up to now scarcely documented in secondary literature and international catalogues –, French literature (e. g. C. de Pizan, A. Danchet, P.-C. Roy; the poems of A. Chénier and Leconte de Lisle), and Croatian literature (M. Marulić, J. Palmotić). German literature has been supplemented by early, especially journalistic works of Novalis and Heinrich Heine; Paul Heyse's works were also examined.

*Project "Performativity / Theatricality in the Ancient and Modern World":*

In 2006 and 2007 cooperation with the group "theatercombinat" consisted in lending academic assistance



to a series of stage performances of Aeschylus' "The Persians", and of Shakespeare's "Coriolanus".

### Preview for 2008–2009

#### *Project "Ancient Music":*

Besides the publication of the reported results, experimental reconstruction of further instruments is planned for the near future, in particular of one Greco-Egyptian wooden aulos with what we currently regard as a primitive mechanism. On account of textual variations the import of morphological data from the Chicago Homer Project will still require some time. After its completion more specific searches within the corpus of early Greek poetry, and thus more general tests of certain hypotheses will become possible.

#### *Project "Nachleben of Classical Mythology":*

The aim of this project in the next years is to provide an online database for newly invented and newly devised myths of the Modern Age. In the first instance this database will cover literature over a period of a hundred years between 1450 and 1550, extending up to 1650, when mythological handbooks appeared, which



Fig. 3: Giorgione, Three Philosophers  
(by permission of Kunsthistorisches Museum, Vienna)

offered artists, authors and composers of libretti simple guidelines for their works. The database will provide the academic world with the opportunity for investigations in as well as for contributions to this field of mythology.

# Commission for the History of Ancient Law

Head: GERHARD THÜR



## Aims and Functions

The Commission was founded by Walter Selb In 1974 to ensure the further study of ancient legal systems which, although traditionally extensively researched in Austria, were not taught at universities. The Commission’s main areas of research are as follows: ancient Greek law, the law of Graeco-Roman Egypt, the law of the Christian Churches of the ancient Near East and Byzantine law. Papyri also form a important source for

the study of Roman law. New results may be expected. The START Project (1998–2004) has given juristic papyrology an impetus of international significance. A number of volumes of text-editions have either appeared or are currently in press.

## Results for 2006–2007

The main areas of the Commission’s research activities in 2006–2007 were as follows:

### *Legal History of the Greek Polis and Legal Epigraphy*

After completing her APART project “Local Autonomy and Roman Influence – The Constitution and Administration of Greek Poleis and Koina in the Roman province Achaea from 46 BC until Diocletian”, Kaja Harter-Uibopuu joined the School for Historical Studies at the Institute for Advanced Study, Princeton NJ during the summer term 2006 as a member. For her research project on procedural law in Athens (1<sup>st</sup> cent. BC – 3<sup>rd</sup> cent. AD) she had access to the epigraphic library founded by B. D. Merritt and C. Habicht as well as to the large collection of squeezes (cf. Zeitschrift der Savigny Stiftung 125, 2008). These studies are closely connected with the research project “Athenian epigraphs on procedural law” which she is to carry on at this commission after her habilitation in 2009. Meanwhile she is supported by the Austrian Science Fund through the career development programme for female scientists “Elise Richter” for three years. She is to conclude her work on legal procedure in Greek poleis under Roman rule with studies on the literary and epigraphic sources from Asia Minor. Since 2006 she has published several papers on Greek legal inscriptions and has taught ancient legal history at the Department for Ancient History at the University of Vienna.

### *The Law of Graeco-Roman Egypt and Papyrology*

This field of research was established at the Commission through the START Project (1998–2004), which



Fig. 1: IEPH 25, “rescriptum” of the emperors Marcus Aurelius and Lucius Verus to the logistes of the Ephesian gerousia Ulpus Eurycles. Facsimile, R. Heberday, FIE II (1912), Nr. 23.

aimed to publish papyrus documents in the collection of the Austrian National Library. As a consequence, a permanent position (for Fritz Mitthof) was established at the Commission for the first time. In addition, a co-operation agreement was concluded with the Austrian National Library and the new publication series “Papyrologica Vindobonensia” was begun.

In 2006 and 2007 Fritz Mitthof made 50 notarial documents from late ancient and early Arab Egypt available for publication in a future CPR volume (Fig. 2). These are lease contracts which are important not only for the history of law but also for the social and economic history of these periods. In addition, work continued on the publication of an account from the reign of Gallienus (260–268 AD), which provides an interesting insight into the progress and funding of restoration work on an urban roofed colonnade (stoa).

Furthermore, work begun on the START Project on the re-edition of the text corpus “Griechische Urkunden kleineren Formats” (Studien zur Paläographie und Papyruskunde III & VIII), first published by the Viennese papyrologist C. Wessely between 1904 and 1908, was also continued. The two-volume edition contains 1350 documents, of outstanding importance for the legal, administrative, social and economic history of Egypt between the 5th and 8th centuries AD as it also helps to reconstruct social and economic processes in other parts of the Mediterranean in late antiquity and the middle ages. After the publication of the first three fascicles in 2007, two further instalments are being prepared for publication. The entire work will consist of ten volumes.

In November 2007 the Commission organized an international conference on “Sources for Byzantine Legal Practice” in cooperation with the Institute of Byzantine Research and the Institute of Ancient History (University of Vienna). Finally, a large number of articles have been published in international scholarly journals and in collections of essays, for example on the victory titles of the Emperor Aurelian, the defence policy of Justinian and on forensic medicine in Roman Egypt.

In 2005 the editors of the journal “Archiv für Papyrusforschung” (APF) entrusted Fritz Mitthof with the edition of the biannual “Urkundereferat”, which counts as a leading review of new documentary papyrus editions. In addition Mitthof has lectured on Roman history and Latin epigraphy at the University of Vienna.

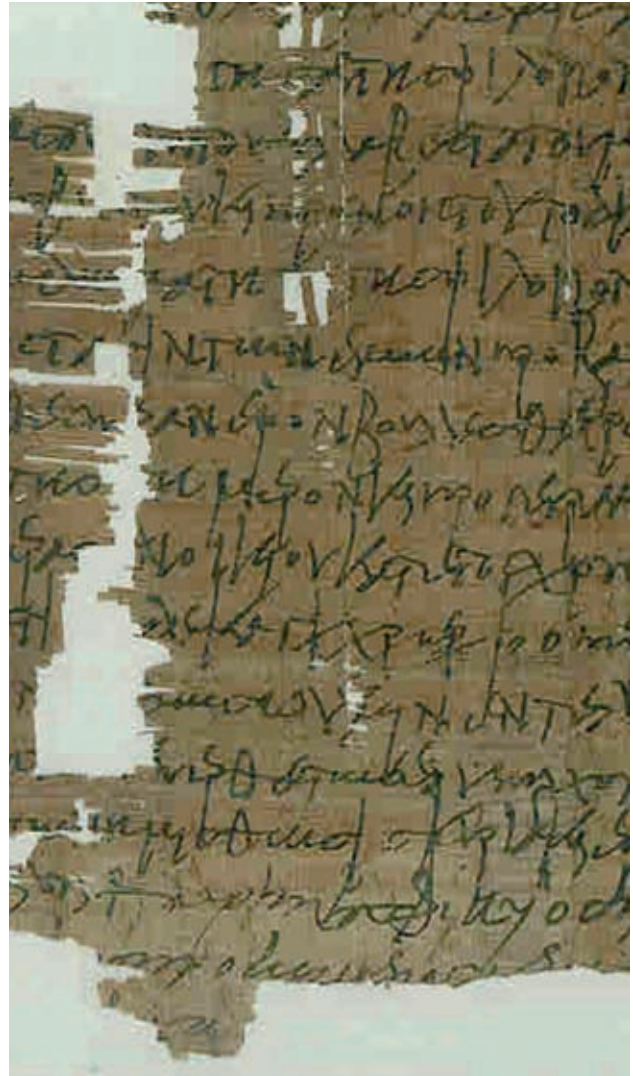


Fig. 2: P.Vindob. G 25783: Lease of a roof garden (Heracleopolis, Egypt; A.D. 555).

Photograph courtesy of the Austrian National Library.

### Preview for 2008–2009

The edition of epigraphic and papyrological sources and their legal interpretation will continue to claim priority. These research activities are to be carried out with funding from external sources and additional staff. After the publication of the volume “Arcadia” and two further volumes on “Argolis” and “Athens”, the project “The Law of Greek City-States”, will be continued with the edition of Greek inscriptions concerning procedural law. For 2008 an international colloquium on amnesty in antiquity is planned in cooperation with the Institute of Ancient History (University of Vienna). Finally, the Commission intends to devote itself increasingly to the training of young scholars from both Austria and abroad, in particular from the newly admitted countries of the European Community.

## Commission for Editing the Corpus of the Latin Church Fathers

Head: KURT SMOLAK



### Aims and Functions

Since its foundation in 1864 the Commission for Editing the Corpus of the Latin Church Fathers (CSEL) has pursued the aim of publishing critical editions of the works of the Latin Church Fathers, that is to say of the Christian authors up to the sixth century. From the Early Middle Ages onward this impressive mass of texts was accorded leading importance for the spiritual and intellectual development of the western world. Due to this fact, the writings mentioned are extant in many manuscripts and early prints, the readings of which differ considerably for various reasons. The first step to achieve the target of establishing a text which comes as close as possible to the original, is an intensive study of the manuscripts dispersed all over the world's libraries. Though this has become possible with the help of

microfilms, it may occasionally be necessary to inspect the codex itself. In cases like that it may often prove difficult to find out all textual evidence, on the other hand its relevance can only be determined after close inspection. In addition, deciding which reading approaches the author's intention most closely, requires profound knowledge of the linguistic characteristics of the relevant epoch or of an individual author. Nevertheless, if none of the transmitted variants makes satisfactory sense, the presumptively correct wording has to be achieved by making a conjecture. Considering all these prerequisites, it is evident that the methods used in the CSEL which alone guarantee high editorial quality call for first class specialization and for an adequate amount of time.

Fig. 1:  
Initial D with the face  
of an Augustinian  
monk (?) inscribed,  
from a manuscript  
written in the third  
quarter of the 12th  
century in Klos-  
terneuburg. Apart  
from other patristic  
texts the manuscript  
comprises a corpus  
of a correspondence  
between Augustin  
and Jerome  
(Klosterneuburg,  
Stiftsbibliothek,  
Cod. 219, 41')



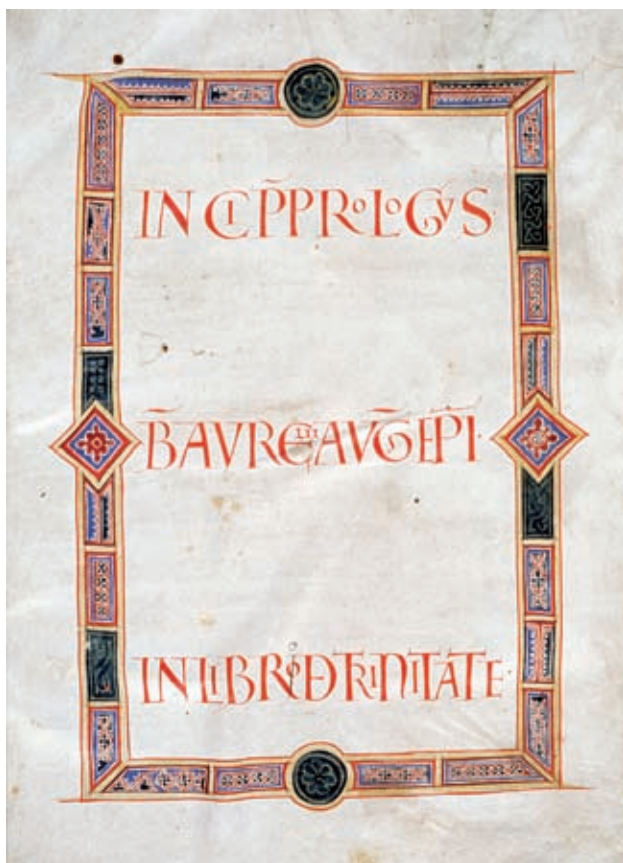


Fig. 2: Decorated frontispiece to Augustine's complex treatise on the Holy Trinity. The manuscript was written in Italy around 1200 and indicates the high prestige of the works of the most influential Church-Father as well as the intensity of cultural contacts in Europe during the High and Late Middle Ages (Klosterneuburg, Stiftsbibliothek, Cod. 229, 1<sup>v</sup>)

## Results for 2006–2007

### *CSEL-editions*

Although emphasis was laid on the central project of editing the works of Augustine, mainly the “Enarrationes in psalmos” and “Contra Iulianum” in this period, the anonymous commentary on the book of Job could be published (CSEL 96, eds. K. Steinhauser, H. Müller, D. Weber). This work is of major interest for philologists as well as for theologians on account of its distinctive language and its Arian Christology. Some years ago the Commission decided to have CSEL-volumes which are out of print revised and to publish them as adapted reprints. The volumes to be reprinted are chosen in accordance with the actual requirements of patristic research. Within this programme a revised edition of Sedulius, the author of hymns, a biblical epic and a prose-paraphrase of the latter, who was extremely influential on medieval literature, have appeared in print (CSEL 10, ed. I. Huemer, V. Panagl). The vol-

ume contains an updated bibliography and extended indexes.

### *Other publications*

Some years ago the Commission undertook the additional task of publishing linguistic and literary commentaries on selected texts of the Latin Church Fathers. As part of this long-time-project an interpretation of the two interrelated didactic poems “In Genesis” and “De evangelio”, both attributed to a certain Hilarius, was published (G. E. Kreuz, Pseudo-Hilarius. *Metrum in Genesis, Carmen de Evangelio: Einleitung, Text und Kommentar* (SBph 752). This commentary, which is accompanied by an introduction, a revised edition and a German translation, is the first ever written on these pieces of patristic poetry. Furthermore, the volume containing the proceedings of the conference on Greek and Latin Poetry in Late Antiquity and the Middle Ages held at the Commission in 2004 and organized in co-operation with the Centro internazionale di studi sulla poesia greca e latina in età tardoantica e medievale (University of Macerata) appeared in print. The contributions of scholars from Austria, the Czech Republic, Germany, Italy, Poland and the United Kingdom were edited by V. Panagl in Vienna and were published in Italy (Dulce Melos. Akten des III. internationalen Symposiums: Lateinische und griechische christliche Dichtung in Spätantike, Mittelalter und Neuzeit. Wien, 15.–18. November, Alessandria 2007).

### *The manuscript tradition of the Works of St. Augustine*

In 2006/07 the cataloguing of the manuscript holdings of Eastern Germany (directed by C. Weidmann), Hungary (by D. Weltin and others) and Russia (I. Galynina) could be completed. In the course of these activities some hitherto unknown texts of Augustine were discovered, a critical edition of which is in progress at the Commission. A list of the Augustinian manuscripts kept in the libraries of Slovenia, will be published together with the catalogues of Hungarian and Russian manuscripts.

### *Other matters*

In 2006 and 2007 a workshop dedicated to ‘Editing Latin Patristic Texts’ and organized by the academic staff of the Commission was held at the Austrian Academy of Sciences. Three scholars were invited for key lectures on history, theology and the language of the Vandals, since the pseudo-Augustinian text, which was to be edited as a collective study of all participants, consists in a fictional debate between a Catholic and an Arian (‘Collatio cum Pascentio Ariano’), resident in

Vandal Africa. So far no critical edition of this piece of Anti-Arian literature, which still belongs to Late Antiquity and is preserved in many manuscripts, has been published. The predominantly young scholars participating in the workshop came from Austria, Germany, Greece, Italy, Poland, Switzerland and the USA, which goes to show that the CSEL-Commission is internationally respected as a centre of excellence in textual criticism. A critical edition of the "Collatio" with a detailed introduction and a German translation, is to be published in the near future.

#### **Preview for 2008–2009**

For the next two years the editors will continue their work on the editions of Augustine's "Enarrationes in psalmos", two further volumes are expected by 2009. Moreover, work on the edition of Augustine's "Con-

tra Iulianum" will be advanced. By the end of 2008 Prosper's treatise "De vocatione omnium gentium" will be ready for print. This also hopefully holds good for the two monastic rules "Regula Magistri" and "Regula Donati". The publication of some minor pseudo-Augustinian works still dating from Late Antiquity by L. Dorfbauer should be completed by 2009. An additional task will be the edition of recently discovered texts of Augustine. A revised edition of the following CSEL-volumes is planned: vol. 53 containing Augustine's writings against the Donatists, and vol. 73, a corpus of some minor works of Ambrose, to which a new edition of his funeral speech on the emperor Gratianus will be added. Finally, a monograph on "Augustine as a philologist and commentator" will be brought out as well as the above mentioned catalogues of Augustinian manuscripts.

## Asia Minor Commission

Head: GERHARD DOBESCH



### Aims and Functions

Since its establishment in 1890 the Asia Minor Commission of the Austrian Academy of Sciences has been concerned with the recording, documentation, editing and interdisciplinary assessment of Greek and Latin epigraphs in classical Asia Minor, and with the investigation into all aspects of the history and cultural history of this region. To this end it produces three serials: *Tituli Asiae Minoris (TAM)*, *Ergänzungsbände zu den Tituli Asiae Minoris (ETAM)* and *Veröffentlichungen der Kleinasiatischen Kommission (VKK)*. Work on these publications involves, first and foremost, the discipline of ancient history in its widest sense. Furthermore the commission is engaged in a highly advantageous cooperation with the neighbouring disciplines of archeology, classical philology, Byzantine studies, numismatics, linguistics, Hittite studies, and Egyptology. The three basic commitments of the commission are: field research, work on explanatory texts on materials, and publication.

There are probably still thousands of inscriptions awaiting discovery in Asia Minor, one of the most densely settled regions of the Roman Empire, as hundreds of hitherto unknown texts are traced every year. Since the region of Anatolia cannot be covered by one institution only, all nations engaged in archeological research are involved in this undertaking. Austria has an important task to fulfil in this respect.

The “*Schedenapparat*” has to be updated continually with entries of all new finds and the incorporation of new specialised literature. In addition the comprehensive collection of squeezes has to be maintained.

Thirdly, the commission is committed to publish its own texts and general studies of Asia Minor in classical times at the earliest opportunity.

### Results for 2004–2005

#### *Publications:*

#### 1. *Tituli Asiae Minoris (TAM)*

Vol. V/3: GEORG PETZL (Ed.): *Tituli Lydiae linguis Graeca et Latina conscripti*. Philadelphia et Ager Philadelphenus, 2007, 354 S., 75 Abb., 1 Karte.

#### 2. *Ergänzungsbände zu den Tituli Asiae Minoris (ETAM)*

Nr. 24: PETER HERRMANN (†) – HASAN MALAY, *New Documents from Lydia*. Denkschriften, Bd. 340, 2007, 148 S., 103 Abb., 1 Karte.

Nr. 25: CHRISTOF SCHULER (Hg.), *Griechische Epigraphik in Lykien – Eine Zwischenbilanz*. Akten des Internationalen Kolloquiums München, 24.–26. Februar 2005. Denkschriften, Bd. 354, 2007, 196 S., 55 Abb.

#### 3. *Veröffentlichungen der Kleinasiatischen Kommission (VKK)*

Nr. 16: ADOLF WILHELM, *Kleine Schriften, Abteilung III: Schriften aus Adolf Wilhelms Nachlaß*, Teil I: *Bereits publizierte Schriften*, hrsg. v. Gerhard Dobesch u. Georg Rehrenböck; Teil II: *Attische Urkunden VI*, hrsg. v. Hans Taeuber. *Sitzungsberichte* 737. Bd., 2006, 298 S.

Nr. 21: ADOLF WILHELM, *Kleine Schriften, Abteilung IV: Gesamtindices und Schriftenverzeichnis*, erstellt von Luise und Klaus Hallof. *Sitzungsberichte* 772. Bd., 2008, 258 S.

Nr. 18: BÜLENT İPLİKÇİOĞLU – GÜLER ÇELGİN – A. VEDAT ÇELGİN: *Epigraphische Forschungen in Termessos und seinem Territorium IV*. *Sitzungsberichte* 743. Bd., 2007, 320 S., 7 Tfln., 242 Abb., 1 Karte.

Nr. 19: GERHARD HUBER, *Rhodiapolis: Beziehungen zwischen Bauforschung und Epigraphik*. An-

zeiger der phil.-hist. Kl. 141/1 (2006), 5–24, 25 Abb., 4 Skizzen, Stadtplan.

Nr. 20: BÜLENT İPLİKÇİOĞLU: Theoi Dikaioi – Die „Gerechten Götter“ in zwei neuen Inschriften aus Termessos. *Anzeiger der phil.-hist. Kl.* 141/2 (2006), 5–16, 9 Abb.

Nr. 22: BÜLENT İPLİKÇİOĞLU: Zwei Statthalter vespanianischer Zeit und die „Große“ Therme in Inschriften von Olympos (Lykien). *Anzeiger der phil.-hist. Kl.* 141/2 (2006), 75–81, 3 Abb.

*In print or approaching completion*

ETAM 26: Alexander ZÄH: Wissenschaftlicher Nachlaß der deutsch-böhmischen archäologischen Expedition nach Lykaonien, Ostpamphylien und Isaurien (Kleinasien), durchgeführt im Jahre 1902.

VKK 23: Alexander ZÄH: Vorläufiger Bericht über neue archäologische Beobachtungen auf Reisen an der karischen Küste und im lykaonisch-isaurischen Grenzgebiet.

*4. Field research*

Bülent İplikçioğlu (İstanbul) was engaged in field work in Termessos in Pisidia and in the adjoining regions of East Licia and West Pamphylia. In the summer of

2006 he was active in the urban aeras and Chorai of Arykanda, Olympos, Gagai and Melanippe where he was able to document more than 100 new texts including Addenda et Corrigenda: 111 (1 hellenistic decree; 19 honorifics; 4 sanctifications; 56 epitaphs; 1 blessing for the dead; 1 building inscription, 1 boundary, 1 milestone; 2 graffiti; 25 undefined fragments).

In 2007 the above visited Rhodiapolis, where 26 new texts could be recorded. From there he went to the Chorai of Kelbessos, Korydalla, Olympos and Trebenna and the vicinity of Elmalı, collecting about 20 epigraphs. In Arykanda he could finally discover 5 new texts and once again many fragments. The number of new finds (including fragments) thus amounts to ca. 70.

Hasan Malay (İzmir) was active in the ancient region of Lydia. In 2006 he worked in Saittai, Silandos, Kırkağaç, Magnesia at the Maeander, in the settlements of the Hermos valley, in the Museums of Manisa, Ödemiş, İzmir and Aydın and in private collections in Manisa und İzmir. Altogether he traced more than 50 unpublished Greek and Latin texts.

In 200 he was able to copy more than 40 epigraphs, including an oracle of Apollon Didymaios, many sanctifications, among them to Zeus Poteos, Augustus and the Pax Augusta (Eirene Sebaste), to the Neoi and the



Fig. 1: Laodikeia at Lykos in Phrygia, main axis (Photo: P. R. Franke, Summer 2005)



Demos (of Milet), Artemis Anaitis and Men Tiamou, the river god Hermos, Men Axiottenos, Apollon Axyr(e)os, Theos Helios Apollon Axyreos, the sanctification of an unknown Katoikia (Spelmenoi), three further fragmentary sanctifications, a Christian prayer on a bronze cross, 2 Christian monograms, 3 fragmentary honorifics, one fragmentary bilingue, and 17 partly fragmentary epitaphs.

Marijana Ricl (Belgrade) has commenced the project “history and epigraphy of the Kaystro valley in ancient times” in 2007 by visiting various sites in Lydia to work on unpublished inscriptions and undertake revisions of published items

Alexander Zäh (Frankfort) went to Isauria in 2006 and 2007 to clarify errors of earlier travellers and to establish the precise location of diverse monuments.

Kurt Tomaschitz (Vienna) travelled to West Cicilia in 2006. He will continue to participate in epigraphical and topographical research in this mountainous region. He is engaged in a “History of West Cicilia in Hellenistic and Roman Times”.

#### Preview for 2008–2009

W. Leschhorn (University of Leipzig) will complete the second volume of the “Lexikon der Aufschriften auf griechischen Münzen” (names of officials, ethnika).

Chr. Schuler (University of Munich) will edit two ETAM volumes on South Lycia: 1) Die Inschriften von Tyberissos und Teimioussa (ca. 110 texts), 2) Die Inschriften von Kyaneai (ca. 235 texts).

D. Feissel (University of Paris) is to publish his corpus of late-Byzantine inscriptions at Ephesos in three parts for ETAM: 1) imperial decrees and records of the early Byzantine administration; 2) Honorifics of late ancient Ephesos (in collaboration with Ch. Roueché); 3) Christian inscriptions at St John’s Church (in collaboration with M. Büyükkolancı, Museum Selçuk).

K. Tomaschitz is engaged in “Geschichte Westkilikiens in hellenistischer und römischer Zeit” to be published in ETAM (s. supra).

P. Freis is to continue work on the Phrygian fascicles of TAM (Dorylaion and vicinity), B. İplikçioğlu will equally be active on the inscriptions of Termessos for the Pisidies-fascicle of TAM and on the inscriptions in North Lycia for ETAM. G. Rehrenböck also will work on the repertory of inscriptions of Ikonion (Lykaonia) for ETAM.

J. Stauber is to commence his editorial activity on the inscriptions of Troas and Mysienia as will G. Maddolis on the inscriptions of Iasos in Karia.

B. İplikçioğlu is to continue his project “Die epigraphische Erforschung von Nordost- und Ostlykien



Fig. 2: Knidos, Westhafen, Temple of Dionysos (Photo: P. R. Franke, Summer 2005)

sowie Südwestpisidien unter Einbeziehung der epigraphischen Bestände des Museums Antalya” from the summer of 2008 onward.

H. Malay is to undertake epigraphical surveys in Lydia in the summer of 2008 and later.

M. Ricl is to continue her project “Geschichte und Epigraphik des Käystrotales in der Antike” in 2008 and 2009.

A. Zäh is to undertake further research tours in Lykaonia, East Pamphylia and Isauria.

R. Wedenig is to continue the project “T.E.NOR.” (Testimonia Epigraphica Norica – Römerzeitliche Kleininschriften aus Österreich“) initiated by M. Hainzmann (University of Graz) at the Asia Minor Commission.

## Institute for Studies of Ancient Culture

Head: FRIEDRICH KRINZINGER



### Aims and Functions

The Institute for Studies of Ancient Culture is mainly concerned with fundamental research on the material culture of antiquity, concentrating on the cultural area of the Aegean and the Eastern Mediterranean as well as the former Roman provinces in Austria.

In Ephesus research in the Roman lifestyle has played a prominent role; the revision of the excavation finds of Terrace House 2 resulted in a totally new chronological framework. Apart from architectural studies, the goal of the analysis of singular monuments on the Curetes-Street (Embolos) was the review of the finds and findings of the excavations. Research on the Mausoleum of Belevi and on the so-called Lucas' tomb is completed, studies on the Byzantine Palace are still under way. Paul's Grotto is being restored and documented in cooperation with the University of Vienna. The archaeological and architectural research on the Theatre of Ephesus is conducted in cooperation with the Technical University of Vienna, whereas the Austrian Archaeological Institute is to coordinate the fur-

ther structural safety measures and restorations, which will be financed by Turkish partners.

The team in charge of research on mosaics is entrusted with the publication project "Palace Mosaic of Constantinople" and of the revision of the mosaics of Ephesus. Within the scope of AIEMA, a bibliography of the ancient mosaics of Turkey is established.

Apart from Ephesian concerns, the working group for Christian Archaeology attends to the editing of corpora in Bulgaria.

A survey of Alinda aims at fully comprehending the historical topography and the urban structure of this Hellenistic city.

The Institute is also in charge of the START-project "The Domitilla Catacomb in Rome", which is in its third year and shows excellent progress.

In Carnuntum, publication of the military camp could be completed; the evaluation of the older excavations in the canabae legionis is still under way. The project on the stone monuments of Carnuntum covers a further aspect of Limes research.



Fig. 1: The Theatre of Ephesus – View from the West

Furthermore, the supervision and publication of Austrian articles for international corpora (CVA, CSIR) and of monographs and collected editions in the serials of the Institute and the Academy receive priority treatment.

### Results for 2006–2007

The Terrace House 2 in Ephesus offers an excellent possibility to analyse the lifestyle of the Roman elite in the Eastern part of the Roman Empire and has been one of the most important research assignments of the Institute. After the publication of dwelling unit 4, units 1 and 2 as well as 3 and 5 have been completed for publication or are directly forthcoming. Research in the building periods and the décor of dwelling unit 6 has been continued. The luxurious appearance of this residential architecture, of which the marble decoration of the large banquet hall is a significant example, is of great importance. The restoration of this décor is being financed by a Turkish sponsor. In addition, the development of the wall painting and the mosaic décor is of special interest; it is studied in projects supported by the Austrian Science Fund.

Work on the Heroon and on the Nymphäum Traiani was continued in the course of the Austrian Science Fund-project on the Embolos.

The ASF-research project on the Byzantine Palace was continued with architectural documentation and extensive archaeological examinations. In addition, an elaborate revision of the Byzantine residential architecture in the area of the harbour baths was conducted.

Publication work on the Mausoleum of Belevi is almost completed; the submission of the comprehensive manuscript is planned for 2008.

The architectural and archaeological research on the Theatre of Ephesus is being conducted in cooperation with the Technical University of Vienna. The results of this work shall lead to a publication as well as serve as a basis for a consolidation and partial reconstruction of the ruin, which will make a cultural use of the theatre possible. This will be carried out by Turkish partners in coordination with the Austrian Archaeological Institute. The essential result of the latest campaign is foremost the clarification of the former entrances in the South-Analemma, which were closed in Byzantine times when the complex became a fortress. Here, an exterior staircase could be examined; the Byzantine city wall seems to have led to the upper entrance of the building.

Detailed research in the material culture, especially the pottery, from current and older excavations is of great importance for all cultural-historical and chronological



Fig. 2: The Theatre of Ephesus – ruin of the South-Analemma



Fig. 3: Pillar of the balustrade with the reliefs of gladiators (STEPHANOS and AITALES)

assertions. On the basis of this material, comprehensive research on Hellenistic and Roman Imperialistic pottery in Ephesus receives an exceptional importance as a cross-sectional research of the material culture. Of special significance for the economic relations of the Metropolis Asiae is research on the amphorae that has been carried out at the institute for several years.



Fig. 4: Ephesus – Byzantine residential architecture in the area of the palaestra of the Roman harbour gymnasium (*opus sectile*-decor of the floor)

The Ayasoluk-project was restricted to the continuation of the ceramic-analysis in the past year.

Topographic and urban research on Alinda, a Hellenistic city on the northern border of Caria that had never been built-over, could commence. It is for this reason that the Hellenistic structure of the slope-constructions can be comprehended. First results concerning the higher situated fortifications have become available.

The work unit for Christian Archaeology is in charge of the painting and architecture of the so-called Paul's grotto in Ephesus, where samples of Christian painting of the 6<sup>th</sup> century AD are preserved. In addition, work on the corpus of late-ancient and Early Christian mosaics of Bulgaria was continued.

The treasure trove of Becin is important for the economic and cultural relationship between the Ottoman Empire and Europe. Its analysis, done in cooperation

with the Numismatic Commission, is almost completed.

Research on the Roman culture in Austria mainly concerns Carnuntum, where, apart from the Roman military camp and related topographical research, the *Canabae legionis* is being analysed. Here, the cultic site of the Syrian gods is of supra-regional importance. For planned research work on Lauriacum and the military camp of Albing primary project-planning was carried out.

For the publication of an inventory of Greek pottery from Austrian collections, done for the CVA, the analysis of the inventory of the Kunsthistorische Museum in Vienna was continued under an ASF-project. This new collaboration with the Museum is especially conducive to the scientific quality of the individual sub-projects.

Work on the sculptures of Flavia Solva for the CSIR was carried out in collaboration with the Landesmuseum Joanneum Graz. Fascicle I could be completed; the publication is delayed on account of the demise of the author.

#### Preview for 2008–2009

- Preparation of the publication of dwelling unit 6
- Publication of the dwelling units 1 and 2 as well as 3 and 5
- Archaeological and architectural research on the Theatre of Ephesus
- Research on Ephesus in late-antiquity and Byzantine times, with special regard to the material culture and to the topography of the urban organisation
- Ceramic research will concentrate on research on amphorae and the analysis of findings from current excavations
- Work on the publication of the Embolos-project
- Survey in Alinda with geophysical examinations
- Completion of the ASF-project “Living with pictures in Ephesus and Ostia” with comparative research on wall painting in two centres of the Roman Empire
- Continuation of the ASF-START-project “The Domitilla Catacomb in Rome”: Illustration of the topographic development of the complex in a virtual model with the help of a 3D-laserscan supported technology
- Completion of the project “The treasure of Becin”
- Completion of the fieldwork on the Byzantine Palace
- Working group for Christian Archaeology: Completion of the mosaic corpus of Bulgaria
- Working team for research on mosaics: Submission of the manuscript on the ancient mosaics of Ephesus
- Carnuntum: Completion of the ASF-project on consecration monuments
- Working group Canabae-Research: Start of the second step of the project “The Architecture and Decoration of the Sanctuary”
- Project “Lauriacum”: Planning and reorganization of the publication concept for the military camp of Albing

## Commission for Mycenaean Studies

Head: SIGRID JALKOTZY-DEGER



### Aims and Functions

The field of research of the Commission for Mycenaean Studies covers the pre- and proto-history of Greece and the Aegean from the Neolithic period until the Age of Homer, including the first palace-cultures of Europe of Minoan Crete and Mycenaean Greece. Another main topic is research on the Mycenaean Linear B tablets as well as on the illiterate cultures of post-Mycenaean times. It is the aim of the Commission to carry out archaeological, historical and Indo-European/philological projects.

The main project of the Commission is the monographic research report *“Aegean Prehistory”*, which provides a survey of new finds and new insights into the various periods of Greek and Aegean pre- and protohistory since 1975. A central aim is a comprehensive and analytical account of the entire actual state of research as well as its new tendencies, open questions and unsolved problems concerning the various periods.

The project *“End of Mycenaean Culture”* is part of the special research programme *“The Synchronisation of Civilisations in the Eastern Mediterranean in the Second Millennium BC”* (SCIEM 2000) of the Austrian Academy of Sciences. Its aims are the clarification of the chronology of the post-palatial Mycenaean period LH IIIC (12<sup>th</sup>/11<sup>th</sup> centuries B. C.) as well as the publication of the Austrian excavations of a Mycenaean settlement of this period at Aigeira/Achaia.

The *research programme Linear B* aims at the publication of studies on the history of Mycenaean civilisation based on the administrative texts of the Mycenaean palaces.

During 2006–2007 another key project *“Peripheral areas and external contacts of the Mycenaean world”* as well as the research and publication project *“Ein trojanischer Federkrieg. The conflict between Heinrich Schliemann and Ernst Boetticher about Troy”* gained special emphasis. Both research projects were completed in 2007 (see below).

### Results for 2006–2007

Within the project *“Die Ägäische Frühzeit, 2. Serie, report of finds since 1975”* work was continued on two volumes. One of these monographs is dedicated to the Neolithic and the prepalatial periods of Crete (subsequent to the two volumes on the Neolithic and the Early Bronze Age of Greece and the Aegean). Work on the second monograph, on the Early Mycenaean period of Greece, was extended by a study of the pottery remains found under the megaron of the Mycenaean palace of Tiryns.

In the course of the project *“End of Mycenaean Culture”* two books were published: S. Deger-Jalkotzy – M. Zavadil (eds.), *LH IIIC Chronology and Synchronisms II: LH IIIC Middle, Proceedings of the international workshop held at the Austrian Academy of Sciences at Vienna, October 29<sup>th</sup> and 30<sup>th</sup>, 2004, 2007*; E. Alram-Stern – S. Deger-Jalkotzy (eds.), *Aigeira I. Die mykenische Akropolis. fascicle 3: Vormykenische Keramik. Kleinfunde. Archäozoologische und archäobotanische Hinterlassenschaften. Naturwissenschaftliche Datierung*. On February 23<sup>rd</sup> and 24<sup>th</sup>, 2007 an international workshop on *“LH III C Chronology and Synchronisms III: LH III C Late”* took place at the Austrian Academy of Sciences. This conference was dedicated to the differentiation of the last phase of the period LH IIIC from its predecessor, as well as to the definition of the so called Submycenaean phase, and to the transition from the Mycenaean period to the Early Iron Age.

The key project *“Peripheral areas and external contacts of the Mycenaean world”* was finalized. In 2006 the monograph *“XPONOΛΟΓΙΑ COMPARATA. Vergleichende Chronologie von Südgriechenland und Süditalien von ca. 1700/1600 bis 1000 v. u. Z.”* (author: Reinhard Jung) was published. At present a manuscript is in progress which treats the bronzes of Italian type that came into use in the Eastern Mediterranean from the 14<sup>th</sup> century BC onwards. In 2007 a large num-



Fig. 1: Ritually bent and burnt sword from the Hoard of Pila del Brancón (Veneto, Italy), end of 12<sup>th</sup> century BC.

ber of bronzes were documented and investigated for analysis (Fig. 1). In 2006 the project “Between Parnassos and Olympus: the Northern and Western Regions of the Mycenaean World” was completed with a manuscript by Birgitta Eder. On the basis of Mycenaean seals (Fig. 2) a new definition of the northern boundary of Mycenaean Greece dividing the state system of Mycenaean Greece from the societies of Macedonia is proposed. Additionally, in the synthetic chapters on the various landscapes of Greece it can be shown that

the Mycenaean administrative structures differed considerably from the political geography of the Archaic and Classical periods.

During the period under report the monograph “*Ein trojanischer Federkrieg. Der Streit zwischen Heinrich Schliemann und Ernst Boetticher um die Grabungsergebnisse in Troja*” (author: Michaela Zavadil) was completed. Its aim is the publication of letters by Heinrich Schliemann and Ernst Boetticher held in the archive of the Austrian Academy of Sciences, in the



Fig. 2: The magula of Velestino-Pherai in Thessaly, and seals found in the Mycenaean chamber tombs at Pherai.



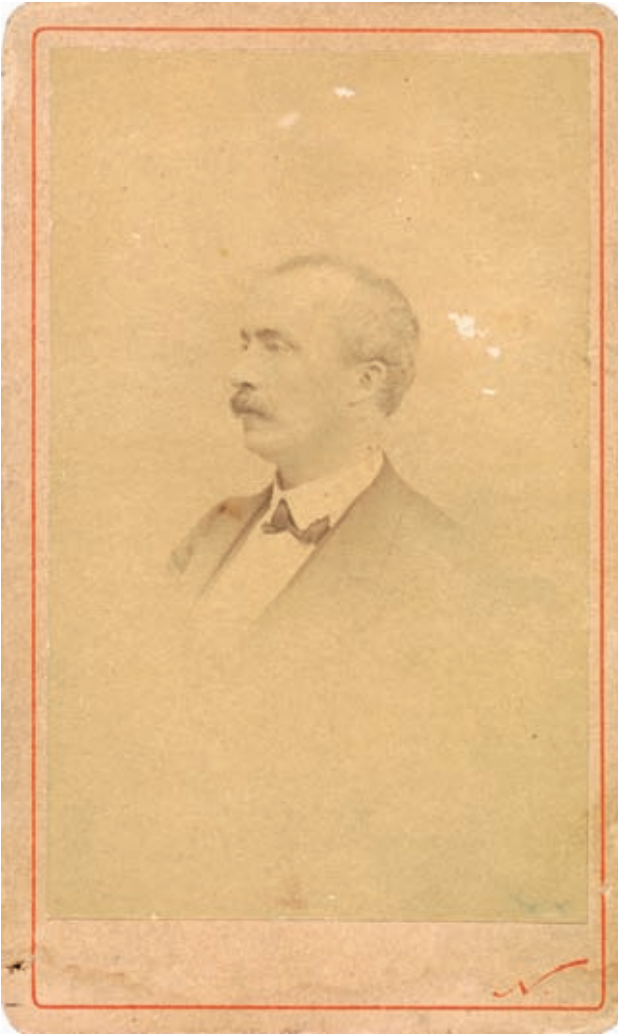


Fig. 3: Heinrich Schliemann. Undated photograph, Paris.

Department of Manuscripts and Autographs of the Austrian National Library, and in various Greek and German libraries and collections. Apart from the letters by Schliemann and Boetticher, the book contains the biographies of Boetticher, as well as of the persons involved in the conflict (Fig. 3).

Within the framework of the “*Linear B Programme*” the monographic analysis of a complex series of Linear B-texts from Knossos was published: M.-L. Nosch, *The Knossos Od-Series. An Epigraphical Study*, 2007. Moreover, the conference volume S. Deger-Jalkotzy – O.

Panagl (eds.), “Die neuen Linear B-Texte aus Theben: Ihr Aufschlußwert für die mykenische Sprache und Kultur, Akten des internationalen Forschungskolloquiums an der Österreichischen Akademie der Wissenschaften, 5.–6. Dezember 2002” was published in 2007.

Another conference volume was published in 2007 under the title of “Keimelion: The Formation of Elites and Elitist Lifestyles from Mycenaean Palatial Times to the Homeric Period. Acts of the International Congress from 3<sup>rd</sup> till 5<sup>th</sup> February in Salzburg”, edited by E. Alram-Stern – G. Nightingale.

#### Preview for 2008–2009

Work on the volumes of “*Aegean Prehistory*” will be continued, first of all “Neolithic and Pre-palatial Crete” (E. Alram-Stern) and “The Early Mycenaean Period of Greece” (M. Zavadil). Work will be started for the volumes “The Post-palatial Period LH IIIC” (S. Deger-Jalkotzy) and “The Early Iron Age of Greece”, 1070–750 B. C. (F. Ruppenstein). This main project of the Commission will be complemented by a special regional study on “Athens and Attica during the Mycenaean period” (F. Ruppenstein).

Within the special research programme SCIEM 2000 the publication of the proceedings of the workshop “LH IIIC Chronology and Synchronisms III: LH IIIC Late and Submycenaean”, which took place on 23<sup>rd</sup> and 24<sup>th</sup> Februar 2007 in Vienna is planned for 2009. Moreover, in 2008 and 2009 two volumes of the Aigeira publication will become ready for publication: Fascicle I/1 will contain the architecture and stratigraphy of the Mycenaean acropolis, fascicle I/2 the Mycenaean pottery and the handmade pottery of LH IIIC. In 2009 the project group SCIEM 2000 will undergo its final evaluation.

The study “*Ein trojanischer Federkrieg. Der Streit zwischen Heinrich Schliemann und Ernst Boetticher um die Grabungsergebnisse in Troja*” will be published in 2008.

The manuscript “Importe und Einflüsse aus Italien im mykenischen Achaia, in Ätolien und auf Kefalonia” which derived from the project “*Peripheral areas and external contacts of the Mycenaean world*” will be submitted for publication in 2008.

## Numismatic Commission

Head: MICHAEL ALRAM



### Aims and Functions

The Numismatic Commission is concerned with numismatics in its entirety, from antiquity to the modern era, and comprises basic numismatic research as well as the historical and monetary assessment of coinages. For this reason the Numismatic Commission's activity is also of utmost importance for neighbouring disciplines like ancient, medieval and modern history, art history, archaeology, economic history, as well as linguistics. Numismatics is doubtless one of the key disciplines of the humanities, a science in its own right, since research on coins requires scholars with an extensive numismatic training on account of the complexity of the field.

At present, the Numismatic Commission is carrying out research work on the coinages and finances of the Roman Empire in general and of Roman Austria in particular, furthermore on those of pre-Islamic Iran and its neighbouring countries and of the Ottoman Empire. Projects and publications of the past were dedicated to ancient Greek coins and to the European coinages of the Middle Ages.

In the international scientific community the Numismatic Commission is acknowledged as a major institution of numismatic research. Through mutual cooperation the Commission is linked to all the important European coin cabinets (Berlin, London, Paris, Vienna) as well as to the American Numismatic Society (New York) and other research institutions like the Centre National de la Recherche Scientifique (Paris), the Istituto Italiano per l'Africa e l'Oriente (Rome), the Department of Near Eastern Languages and Civilizations, Harvard University, and the Institute of Archaeology of the Uzbek Academy of Sciences.

### Results for 2006–2007

During this period, a considerable part of the research activity of the Numismatic Commission was devoted to the monetary history of Austria in Roman times,

with two monographs on the topic (comprising four volumes in all) published by the Austrian Academy of Sciences Press. When work on the coinage finds from the famous Roman site of Carnuntum ended, one of the most complex research projects in the Commission's history had been successfully concluded: In April 2007, the three-volume publication "Numismata Carnuntina. Forschungen und Material" finally appeared in print, containing the catalogue of the ancient coins preserved in the Museum Carnuntinum in Lower Austria (on a CD-ROM) as well as several essays interpreting the material, which provide valuable insight into diverse aspects of coin production and coin circulation along the Roman limes in Austria. The very same concept of embedding the analysis of a significant body of numismatic evidence into a work presenting the coin data itself had also been observed in the volume "Der antike Münzumschlag in der Steiermark", published in 2006. In that year, another research project on Aus-



Fig. 1: Antoninianus of Regalianus, overstruck on a denarius of Septimius Severus in c. AD 260, most probably in Carnuntum (Diameter 2.19 cm. Bad Deutsch-Altenburg, Archäologisches Museum Carnuntinum).

Obverse: Radiate bust of Regalianus right (in the right field traces of undertype: profile of Septimius Severus). Reverse: Sol standing left, raising right hand and holding whip in left.

In the Numismatic Commission's recently published monograph "Numismata Carnuntina", a new analysis of the coinage of the Roman usurper Regalianus is provided, including an up-to-date corpus of his rare antoniniani.

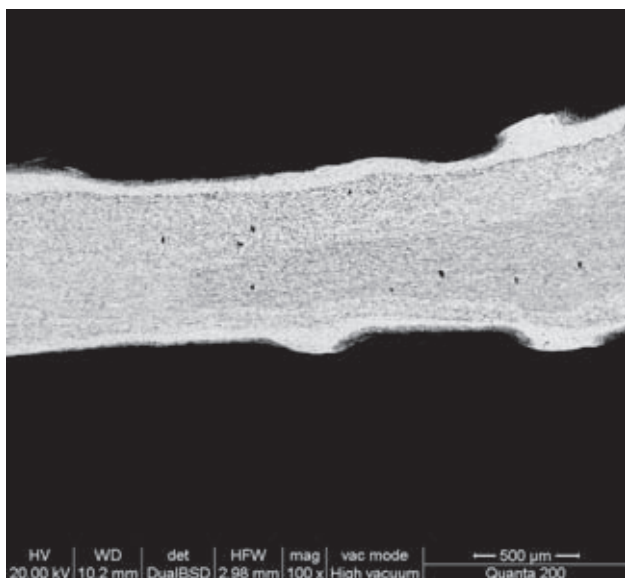


Fig. 2: Scanning Electron Microscope image of the cross section of a denarius of Trajan (AD 98–117).

In the course of the Numismatic Commission's research project on the financial history of Trajan's rule, scientific analyses of Trajanic silver coins were attained in cooperation with the Institute of Science and Technology in Art, Academy of Fine Arts, Vienna. In this SEM-image, bright silver enriched zones at the coin's surfaces are clearly to be discerned: They are due to the peculiar production technique of the flans.

trian coin finds was launched as well, featuring coins from ancient Lauriacum (Upper Austria): This project is carried out in a completely digitalised form. In addition to all these activities, the Numismatic Commission's interactive coin data base accessible on the internet: (Fundmünzdatenbank) – ([www.oeaw.ac.at/numismatik/projekte/dfmroe/dfmroe.html](http://www.oeaw.ac.at/numismatik/projekte/dfmroe/dfmroe.html)) is continuously updated.

In the field of Roman imperial numismatics, work on the coinages and mintings under the emperor Trajan was continued: the catalogue of the monograph "Moneta Imperii Romani 14 – Traianus" could be finished, the production of the plates section being well under way. The results of the interdisciplinary research project on the silver coinage of Trajan, in the course of which innovative metallurgical investigations of Roman denarii were carried out, have already been published. Research on various aspects of the political and financial history of Trajan's rule is continued through the APART fellowship "Trajan and the Arsacids: Money, Power and Politics between East and West", which started on October 1, 2006.

This APART fellowship is interlinked with the most important research project launched by the Commission in 2006/2007, viz. „Sylloge Nummorum Parthi-

corum“ (SNP): In this project, the numismatic heritage of the Arsacid dynasty, ruling in Iran from the middle of the third century BC until AD 224, will receive an in-depth scientific treatment for the first time. In the course of the project, the Arsacid holdings of the most important international coin collections, amounting to a total of about 15,000 coins, will be published by an international team of scholars in the Austrian Academy of Sciences Press in a series of 9 vols. designed according to the established sylloge format. The main project partners are the following: American Numismatic Society (New York), Bibliothèque nationale de France (Paris), British Museum (London), Kunsthistorisches Museum (Vienna), Iranian National Museum (Teheran), Staatliche Museen zu Berlin.

As regards the "Sylloge Nummorum Sasanidarum" (SNS) project, which is carried out in collaboration with partners in Paris and Berlin, considerable progress was made: Vol. 2 of the series (Ohrmazd I.–Ohrmazd II.) is nearly finished, and the manuscript of the supplementary volume "SNS Israel" has been submitted to the Academy's Publication Committee. The collection of the material for vol. 1 of the series "Coin Finds from Uzbekistan" (Sasanian Coins and their Imitations) was finished. The project "Coinage of the Iranian Huns and their Successors" is being carried out as part of the NFN-project "The Cultural History of the Western Himalaya from the 8th century" in cooperation with Kunsthistorisches Museum.

Work on the catalogue of the most important Ottoman coin hoard ever discovered, the Beçin hoard, has almost been accomplished, as has the numismatic interpretation of the hoard. Finally, at the end of 2007, the monograph "Numismatik des Mittelalters. Band I" by the Director of the Berlin Coin Cabinet, B. Kluge, was published in the series "Veröffentlichungen der Numismatischen Kommission" – doubtless a standard handbook-to-be in this important field.

#### Preview for 2008–2009

Work on the coin finds from Lauriacum/Enns (Upper Austria) will be continued according to schedule; it is intended to complete the process of coin identification in this period. The manuscript of "Moneta Imperii Romani 14 – Traianus" will be submitted in 2008, and research on the APART fellowship will continue as planned. In 2008, vol. 2 of the "Sylloge Nummorum Sasanidarum" as well as "SNS Israel" will be published; in 2009, the manuscript of vol. 4 of SNS will be submitted. By 2008 preparation of the manuscript of the Beçin coin hoard is expected to be finished. Furthermore, work on the international project "Sasanian



Fig. 3: Drachm of the Parthian King Parthamaspates (?), c. AD 116 (Diameter 2.01 cm. Kunsthistorisches Museum Vienna, Coin Cabinet).  
Obverse: Diademed bust of the king left, wearing tiara. Reverse: Parthian archer enthroned right.

In the international “Sylloge Nummorum Parthicorum” project, which has been conceived by the Numismatic Commission, a new series of standard references for Arsacid coinage will be produced.

Coins and their Imitations from Central Asia” will be advanced, with the publication of two Kushana and Kushano-Sasanian coin hoards from the collection of the Archeological Institute of the Uzbek Academy of Sciences receiving top priority. The Vienna project group on “Sylloge Nummorum Parthicorum” will focus on vols. 6 and 7 of the series (covering the years AD 8–105). In the project on Hun coinage, the publication of a most important private collection can be envisaged.

## Prehistoric Commission

Head: HERWIG FRIESINGER



### Aims and Functions

The activities of the Prehistoric Commission comprise the realization and scientific evaluation of research projects in selected chronological focal points such as the Palaeolithic Period, the Late Bronze Age (Urnfield Culture) and Late Iron Age (La Tène Culture), the coordination and the organization of projects and conferences, as well as editorial offices, above all the editing of the series "Mitteilungen der Prähistorischen Kommission" (MPK), the only Austrian series of monographs on prehistoric and protohistoric subjects.

The research projects are part of the commission's target to improve and coordinate research in the prehistoric periods mentioned above throughout the whole of Austria. Altogether eight major projects were dealt with by the Commission during the period considered in this report. The most important research projects will be briefly presented below:

Priorities of the focal point "Palaeolithic Period" have been set up for the research project "Gravettienzeitliche Besiedlungsmuster an der forschungsgeschichtlich bedeutenden Position Krems-Wachtberg, NÖ" ("Gravettian Settlement Patterns in Krems, Lower Austria"), and, beginning in March 2007, for the successive project "Untersuchungen zur Sozialstruktur gravettienzeitlicher Jäger und Sammler anhand der neuen Siedlungs- und Bestattungsfunde am Wachtberg in Krems" ("Social structures of gravettian hunter-gatherer societies"). After the unique find of a double burial of two newborns in 2005, another burial of a very young infant was uncovered in 2006. These extraordinary findings claim the necessity of further excavations which are to be carried out within the current research project. This will focus on issues like a detailed chronology and the functionality of the site.

With regard to the focal point of the Late Bronze Age (Urnfield Culture) two research projects, "Das jüngerurnenfelderzeitliche Gräberfeld von Nußdorf ob der Traisen, NÖ" ("The Later Urnfield Cemetery

of Nußdorf ob der Traisen, Lower Austria"), and "Das älterurnenfelderzeitliche Gräberfeld von Inzersdorf ob der Traisen, NÖ" ("The Older Urnfield Cemetery of Inzersdorf ob der Traisen, Lower Austria"), are viewed as part of a wider context. The social and international significance of this perspective is emphasized by the topic "burial rituals and society".

Editorial projects are the main task on the focal point "Late Iron Age (La Tène Culture)". Within the scope of the research programme "F.E.R.C.AN." (Fontes Epigraphici Religionis Celticae Antiquae), the Corpus F.E.R.C.AN., consisting of several volumes, will be edited. Further editorial projects of this focal point include philological and historical topics besides archaeological themes.

### Results for 2006–2007

Within the scope of Palaeolithic research, the evaluation of the excavations at Krems-Hundssteig 2000–2002 was concluded successfully with a publication. The monograph will be published in spring 2008: Chr. Neugebauer-Maresch et al, "Krems-Hundssteig – Mammutjägerlager der Eiszeit. Ein Nutzungsareal paläolithischer Jäger- und Sammler(innen) vor 41.000–27.000 Jahren", MPK 67, 2008.

Since 2005 the Gravettian site Krems-Wachtberg has been thoroughly examined in successive research projects, in close cooperation with other sciences like palaeobotany, sedimentology, malacology and palaeontology.

At present the major part of the work consists in carrying out excavations at the site of Krems-Wachtberg, and the cataloguing and determination of the finds. The excavation seasons last about five months each year. Up to date, 30 square metres have been excavated, and more than 7,000 stone artefacts and 10,000 faunal remains were recovered. After the unique find of a double burial of two newborns in 2005, another burial of a 0–3 month old infant was excavated in 2006. In 2007



Fig. 1: Krems-Wachtberg 2006. The burial of a 0–3 month old infant: The individual was buried 27,000 years ago, embedded in red ochre. (Photo: Natural History Museum Vienna, Dept. of Anthropology)

a distinct living floor, including a multi-phased hearth with a diameter of 1.5 m, was documented. Special finds of this area were a fragment of a zoomorphic figurine of fired clay as well as a human rib, which provides evidence for a fourth individual.

On the focal point of the Late Bronze Age (Urnfield Culture) the evaluation of the urnfields of Nußdorf ob der Traisen and Inzersdorf ob der Traisen has been reinforced since 2006 in current research projects. The cemetery of Nußdorf, encompassing 411 burials, is one of the largest yet documented urnfields of the Later Urnfield Culture between 1,000 and 750 BC. At present an internet presentation is being developed in cooperation with the Austrian Academy of Sciences Press. A statistical method is applied, e. g. to reconstruct chronology, grouping and rituals of the burials. As to the Older Urnfield Cemetery of Inzersdorf, the documentation of the extensive find material could be commenced.

These projects are part of a programme to intensify research on the period of the Urnfield Culture (1,250–750 BP) in Austria. At regular intervals meetings are held, the so-called “UK-Gespräche” (Urnfield culture talks) attended by Austrian researchers specialized in this field.

- S. Klemm is preparing the publication of the project “Prähistorischer Kupferschmelzplatz S1, Eisenerzer Ramsau (1992–2005)” (“Prehistoric Copper



Fig. 2: Thunau am Kamp, Lower Austria. Selection of ceramic vessels recovered from a dwelling of the Later Urnfield Culture (Photo: Sauter/IUF, University of Vienna)

Smelting Site S1, Eisenerzer Ramsau [1992–2005]”), which was financed by the Prehistoric Commission from 2003–2007.

- M. Lochner is working on the publication “Die urnenfelderzeitliche Höhensiedlung von Thunau am Kamp” (“The Urnfield Hillfort of Thunau am Kamp”). In this context work on the designing of the exhibition “Dunkle Orte – Ausgrabungen auf dem Schanzberg von Thunau am Kamp” (“Dark places – Excavations on the Schanzberg of Thunau am Kamp”) in the museum of Gars am Kamp has been going on since 2007.

The main project of the Late Iron Age focal point (La Tène Culture) is F.E.R.C.AN. (Fontes Epigraphici Religionis Celticae Antiquae). The international research team systematically compiles all epigraphic texts on the old Celtic religion. The Corpus-F.E.R.C.AN, a publication consisting of several volumes, is planned. The first volume, “Noricum” by M. Hainzmann, will be published in 2008.

The second volume of the publication “Antike literarische Zeugnisse zur Religion der Kelten von den Anfängen bis in die Spätantike” is in print and will also be published in 2008: Hofeneder A., Die Religion der Kelten in den antiken literarischen Zeugnissen. Band II. Von Caesar bis Florus, MPK 66, 2008.

During the period considered in this report two issues of the journal “Archaeologia Austriaca” (88/2004 and 89/2005) were edited and published by the Prehistoric Commission, as well as four publications of the “Mitteilungen der Prähistorischen Kommission” (MPK):

- Karwowski M., Thunau am Kamp – Eine befestigte Höhensiedlung (1965–1990). Die latènezeitlichen Siedlungsfunde, MPK 61, 2006, 1–168.
- Frank Chr., Plio-pleistozäne und holozäne Mollusken Österreichs, MPK 62, 2006, 1–860.
- Hellerschmid I., Die urnenfelder-/hallstattzeitliche Wallanlage von Stillfried an der March, Ergebnisse der Ausgrabungen 1969–1989 unter besonderer Berücksichtigung des Kulturwandels an der Epochen-grenze Urnenfelder-/Hallstattkultur, MPK 63, 2006, 1–416.

- Hainzmann M. (ed.), Auf den Spuren keltischer Götterverehrung. Akten des 5. F.E.R.C.AN.-Workshop Graz 9.–12. Okt. 2003, MPK 64, 2007, 1–280.

#### Preview for 2008–2009

In 2008 and 2009 the Prehistoric Commission will continue the above-mentioned projects, prepare the respective publications and organize conferences and workshops.

A special event in 2008 will be the 100-year anniversary of the discovery of the Venus of Willendorf. In cooperation with the Natural History Museum Vienna a large international conference including publications and an exhibition will be organized for this occasion. The exhibition “VENUS08. fettes Weib – schönes Weib” (VENUS08. fat woman – pretty woman) will be opened on 8<sup>th</sup> August 2008. The conference “VENUS08 – Art and Lifestyle” will take place from 10<sup>th</sup> to 14<sup>th</sup> November 2008, featuring the themes of cultural evolution and art. The publication of an excursion guide and the conference papers is planned in the series “Mitteilungen der Prähistorischen Kommission” (MPK).

The research projects “Das Gräberfeld von Nußdorf ob der Traisen” (“The Cemetery of Nußdorf ob der Traisen”) and “Das Gräberfeld von Inzersdorf ob der Traisen” (“The Cemetery of Inzersdorf ob der Traisen”) were conjoined in 2007 into an interdisciplinary project “Grabritual und Gesellschaft” (“Burial Ritual and Society”) in order to provide a wider thematic basis. As a first step, a cooperation with the Mycenaean Commission was initiated. Further disciplines like anthropology, ethnology and historical sources research will be called on for specific questions.

It is furthermore planned to hold workshops at regular intervals, and to publish the delivered papers in collections of essays. The first workshop is due to take place in autumn 2009, thematizing “Brandbestattung in der Ur- und Frühgeschichte und in historischer Zeit – religiöse, kulturelle und soziale Hintergründe” (“Cremation burials in pre- and protohistory and in historical times – religious, cultural and social backgrounds”). Interdisciplinary approaches are to analyse processes in the course of cremation.

## Centre for Studies in Asian Cultures and Social Anthropology (CSACSA)

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### Institute for Iranian Studies

Head: BERT G. FRAGNER



#### Aims and Functions

When the Institute for Iranian Studies (IfI) was established, it had to be considered that up to now no academic institutions devoted to Iranian Studies existed in Austria outside the Austrian Academy of Sciences. This called for some relevant strategies.

Distinct and clearly discernible statements must be made, settling any reasoning about the public relevance and necessity of a discipline like "Iranian Studies".

The Institute had to present to the international world of learning two contrasted directions of research proving that it was enabled to carry on the traditional work of the former commission for Iranian Studies on the one hand, and to introduce new initiatives in the field of Iranian Studies on the other. As there were scarcely any young scholars trained in this discipline available in Austria, qualified researchers had to be found at an international level. They are expected to present projects in line with the main goals of the Institute.

The main research aims of the Institute are:

1. *"Iranianate civilizations between tradition and modernity"*

The cultures of West, Central, and South Asia were largely determined by Iranian and Persian indicators, up to the 19<sup>th</sup> century. Research concerning these areas requires comparative studies of Iran, Afghanistan and Tajikistan and the neighbouring countries employing diverse and interdisciplinary methods of research. Moreover, the concept of "Iranianate cultures" is intended to introduce a new paradigm for research, correcting stereotypical concepts like "Middle East" or "the Muslim world".

2. *"Iranian Onomastics"* used to be the main research theme of the former "Commission of Iranian Studies", which the present Institute (IfI) is to continue, especially with the project "Iranisches Personennamenbuch" (book of Iranian personal names, IPNB).

3. *"Research with specific relevance to Austria" ("OeriF"):*

Among others, the following two projects are concerned with this aspect: "Iranian Migrants in Vienna", and "Objects of Islamic Art in Viennese Museums and Collections".

4. *"European Network of Iranian Studies (CENIS)":*

IfI aims to function as a centre of Iranian Studies within Central Europe, and particularly Eastern Central Europe.

5. *Extending the IfI library library as the only academic Iranian library in Austria.* A pictorial archive is also to be established at the Institute.

#### Results for 2006–2007

Above all, the activities of IfI during 2006 and 2007 were mainly determined by preparatory work for the "Sixth European Conference of Iranian Studies" which took place from September 18 until 22, 2007 in Vienna. The number of participants reached about 300, who came even from non-European countries including Iran. This was the sixth subsequent conference within a series convened by "Societas Iranologica Europaea" an association of high reputation in the world of learning. All members of the Institute participated in this conference and gave lectures.

"Iranianate civilizations between tradition and modernity": R. Kauz is to finish his copiously annotated English translation of the "Khatayname", a Persian "guide-book" to China from early modern times. In between, he was once more twice invited to fill temporarily vacant professorships at the university of Marburg (2006 and 2007, Chinese Studies). He organized the interdisciplinary conference "The International Horse Economy in Iran, India and China" (October 19–20, 2006). The proceedings are planned to be published in 2008. He is moreover engaged on a book project concerning the "History of the Persian





Fig. 1: Cloth of gold, attributed to Iran c. 1319–35, used as the burial shroud of Duke Rudolph IV (Photo after: Arthur Saliger, *Dom- und Diözesanmuseum Wien*, 1987, Fig. 3)  
© Dommuseum Wien

Language in China”. G. Rota continues to research on military slaves from the Caucasus in Safavid Persia. In addition he has initiated a research project concerning “Persia, the Venetian Republic, and the Ottoman Empire, 15th–17th centuries”. M. Ritter published his book on Iranian Mosques and Madrasas from the early 19<sup>th</sup> century (London: Brill 2006); he is now engaged on changing trends in Persian painting from 17th until 19th century. A new project is under way initiated by Ms. A. Zohri-Monfared (“Tradition and modernity in Bazaar architecture – the case of Arak”). Ms. Yukako Goto, MA spent six months as a guest at IfI in 2005 funded by her Japanese home university to engage in source studies concerning North Iranian local historiography. In 2007, a two-volume study on the “Persian Administration of Kashmir, 1842 until 1892” by Siegfried Weber appeared in the Institute’s series. The director of IfI continued his research, was invited to several international conferences and delivered guest lectures. In the summer term of 2006 he organized together with Prof. Kappeler (History of Eastern Europe, at the University of Vienna) a lecture series on Central Asia from early modern times until present times, the proceedings of which were published in May

2006. He also organized the conference “800 Years of Mongol Rule” held on 9 May 2006. Contracts, letters of understanding etc. were concluded with scholarly partners in Iran, Tajikistan, China, Hungary, Italy et alii. Following an invitation by the Tajik Academy of Sciences a delegation from the Austrian Academy of Sciences, including the secretary general Prof. Dr. H. Friesinger and the head of the external affairs section of the Academy, Bernhard Plunger, MA, paid a visit to Dushanbe. Since 2004 a series of lectures on cultural themes within Iranian Studies has been organized together with the “Oesterreichische Orient-Gesellschaft Hammer-Purgstall”. The series is continued with three lectures for the summer as well as the winter term.

“Iranian Onomastics”: Through the intensive work of V. Sadovski activities in this section were streamlined and updated. A number of fascicles were entrusted to several scholars. In 2006 a series “Iranische Onomastik” was established in addition to the “Beiträge zur Iranistik”. In this new series three new titles have been published until now. N. Rastegar is active in the early New-Persian section of IPNB, including a prosopographic volume. The volume on New-Persian etymology is dealt with by X. Tremblay (Belgium). P. Lurye has proved a competent researcher in the field of Sogdian onomastic studies. His doctoral dissertation on Sogdian toponyms is available on-line. In the course of the Institute’s cooperation with Italy, V. Sadovski acted as a visiting professor at the Universities of Bologna and Rome (“La Sapienza”, as a SOCRATES professor) and as an “Erasmus”-exchange-teacher in Ravenna (2007). Moreover, he gave a series of lectures in Leyden (November 2007).

Publications: Altogether fourteen titles were published in the two series edited by IfI.

A number of projects dating from the former “Commission of Iranian Studies” were published under the editorship of N. Rastegar. The facsimile edition of Xaqani’s “Xatm al-Ghara’ib” (a manuscript belonging to the Austrian National Library) was published together with an Iranian press in 2006. In 2007, after twelve years of active engagement, “Farhang-newis – Uto von Melzers Materialien zu einem persisch-deutschen Wörterbuch” was also brought out.

The library has been extended to hold at present 15,000 volumes. Its reference section has proved of considerable value to international researchers – as is shown by the number of guests who regularly visit IfI.

“OeriF” (research referring to Austrian affairs): J. Czarnowski’s project on Iranian migrants to Vienna, is now supported by the ASF (P19593-G14). This also applies to the project concerning the registration of objects of Islamic Art in Viennese collections and museums

(P19565-G13). Another project concerning Iranian pieces of gold brocade in Vienna museums has since 2007 been funded by the City of Vienna. Under the heading of transcultural perspectives A. Gaechter has started research on the life and writings of Jakob Eduard Pollak, who was active as a physician at various institutions in 19th century Iran and made substantial contributions to the modernisation of the health system. Moreover, various editorial projects referring mainly to classic Austrian works in Iranian Studies by Hammer-Purgstall, Melzer, Adam Pollak and others have been envisaged.

As for “CENIS”, close contacts have been established with scholars in Iranian Studies in Hungary and Poland, and most recently also with Bosnia and Ukraine. The following conferences held in 2006 and 2007 have still to be mentioned:

May 2006: “Prejudices towards Islam and Muslims”, in cooperation with the “Sir Peter Ustinov Institute”

August 2006: one panel organized by IfI, at the “Biennial International Conference on Iranian Studies”, London.

April 2007: International workshop in cooperation with the University of St. Andrews, Scotland (Prof. Ali Ansari): “Myths of Iranian Nationalism”

June 2007: “Representations of Power in Islamic Art”, annual meeting of the Ernst-Herzfeld-Gesellschaft.

#### Preview for 2008–2009

September 2008: International summer-school on “Persian Codicology and Paleography”, in cooperation with “Miras-e Maktub” in Tehran

October 2–3, 2008: International and interdisciplinary conference “Islam in China”, in cooperation with the Sinological Institute at the University of Vienna

2008 or 2009: “Turko-Iranica”, and in addition a theoretically oriented conference on “Iranianate civilizations between tradition and modernity”

As regards publications four additional volumes on Iranian onomastics and another four volumes on “Iranianate civilizations” are planned; six to eight further volumes on other Iranian topics may be published in extramural series.



Fig. 2: Karaj near Tehran, figural wall painting in the palace Sulaymaniye, c. 1812, portrait of the first Qajar ruler Agha Muhammad Shah (Photo: Markus Ritter)

The following research projects are in progress and may be brought to completion:

Projects run by Kauz and Rota within the focal point “Iranianate civilizations”; the same holds good for V. Sadovski’s study on “Indo-Iranian Poetic Language” and for N. Rastegar’s IPNB projects. In early 2010 financial support for “Islamic Art in Vienna Museums” will come to an end, and J. Czarnowski (“Iranian Migrants in Vienna”) is also expected to complete her research. The “Iranian gold brocades” are to be wound up by 2008. The project concerning J. E. Pollak may run on beyond 2009. Two new programmes are currently under discussion: “Seasonal Tajik workers in Russia” (cultural anthropology) and “Indo-Persian Historiography in Modern Times”.

## Institute for the Cultural and Intellectual History of Asia

Head: HELMUT KRASSER



### Aims and Functions

The Institute, founded in 1991, is dedicated to long-term research on Asian cultures. The geographic and cultural area under consideration includes East Asia, South-East Asia, South Asia and Central Asia, which encompasses the fields of Indology, Tibetology, Sinology, Japanology, Buddhist Studies and Religious Studies. Research at the Institute, applying philological-historical methods to original sources in the respective languages, deals above all with intellectual and cultural

history, as manifested in subjects reaching from the history of philosophy and religion, the history of mentalities, religious hermeneutics, studies on concepts and ideas to lexicography. Projects include research on complex cultural themes, the interpretation and editing of important primary sources, and the preparation of specialized dictionaries. In order to maintain its close international contacts, the Institute convenes symposia on a regular basis; while the staff are used to present their research results at international conferences. Extensive stays abroad regularly lead to new international cooperations on various projects. These practices ensure that the Institute is well linked internationally. A number of collaborations are also carried out with the University of Vienna, where the majority of the institute's members regularly teach, enabling them to pass the results of their research on to their students. Research results on this scale are to broaden our knowledge on diverse fields and to promote our understanding of the multifaceted developments, connections, and mutual influences in and between Asian cultures, cultures that are increasingly attracting public attention.

For more details concerning current projects, see <http://ikga.oeaw.ac.at/>.

### Results for 2006–2007

On account of the wide range of projects, only a sampling of the results will be presented.

Research in Japanology focused on old age in the early modern period and its “discovery” as a time of leisure but also of dependence, towards which programmes designed to support physical and mental health were developed. Attempts of commoners to imitate the lifestyle of the elite were analyzed, drawing on publications such as “life travel guidebooks” and illustrated games (*shusse sugoroku*), which depict life as a journey moving towards “leisurely retirement”, anticipated through artistic education in childhood. Similar beginnings of



Fig. 1: The deity Hachiman as a Buddhist monk. Painted wooden sculpture, Heian Period (9<sup>th</sup> c.?) Nara, Yakushi-ji “National Cultural Treasure”

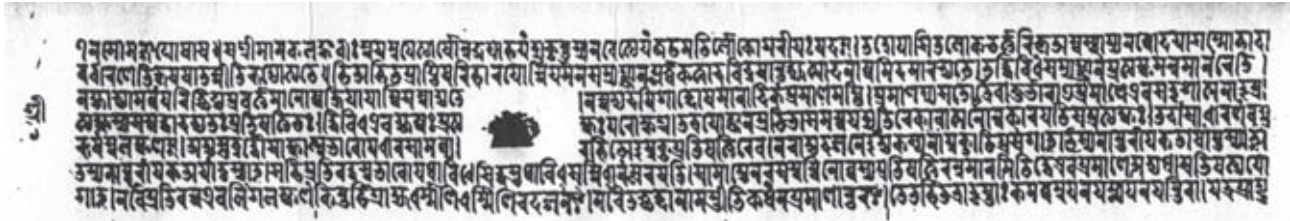


Fig. 2: Copy of Manuscript A of the *Pramāṇaviniścaya*, Folio 1b (12<sup>th</sup>/13<sup>th</sup> c.)

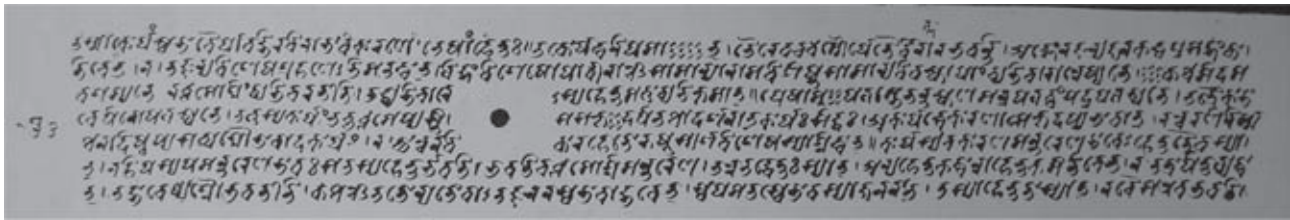


Fig. 3: Copy of Manuscript C of the *Pramāṇaviniścaya*, Folio 32b (12<sup>th</sup>/13<sup>th</sup> c.)

an “information society” were studied in the course of a participation in the project “*Ukiyoe* caricatures 1842–1905” at the University of Vienna. Research on the Shinto deification of sovereigns was augmented by preliminary studies on the deity Hachiman, who was originally revered by Buddhists and addressed as “Bodhisattva”, but who was also regarded as the ancestral deity of the emperor and the guardian of Japan. The various characteristics and functions of this deity will be analyzed systematically and in their historical development in order to achieve general conclusions concerning the mutual influences between indigenous deity beliefs and Buddhism.

The third and final volume of the dictionary of early Indian epistemology and logic, *Terminologie der frühen philosophischen Scholastik in Indien*, was published (2006). Research on proof and refutation in the medical compendium *Carakasamhitā* in relation to other early philosophical sources was continued, and was expanded by an analysis of the foundations of cognition found in classical medical texts.

In the area of Religious Studies, work on the third volume (*t-ph*) of the dictionary of Hindu Tantra terminology was continued with an international team of editors; articles on yogic perception in the Pāñcarātra tradition and on the Pāñcarātra sections of the *Agnipurāna* were completed, and a study regarding the authority of the Pāñcarātra on the basis of Veṅkaṭanātha’s *Pāñcarātra-rakṣā* was begun. Research on Veṅkaṭanātha’s doctrine of god in the *Nyāyasiddhāñjana* was continued with a translation of the chapter on god and an account of his teachings on substances as well as his critical analysis of the doctrines of other schools. In addition, articles

were written on religious-historical concepts relevant to the Rāmānuja School, as for example memory or a yogi’s perception

The agreement signed in January 2004 between the Austrian Academy of Sciences and the China Tibetology Research Center in Beijing (CTRC) regarding the editing of copies of Sanskrit manuscripts brought to Tibet between the 8<sup>th</sup> and 14<sup>th</sup> centuries was extended to 2010. This agreement provides the first access to the Sanskrit originals of texts that until now had only been available in their Chinese and Tibetan translations. During a visit to the CTRC a second sub-agreement was drawn up stipulating which texts will be collaborated on in the next years. The series *Sanskrit Texts from the Tibetan Autonomous Region*, which was established to publish these texts, brought out its second volume, a critical edition of the first two chapters, on perception and inference, of Dharmakīrti’s *Pramāṇaviniścaya*. The edition of the third and longest chapter on proof is nearly finished. Two further volumes, a critical edition of Vasubandhu’s *Pañcaskandhaka* and a critical edition with a study of the *Adhyardhaśatakā Prajñāpāramitā* are in progress. In addition to numerous lectures and articles, three monographs on Buddhist subjects were completed. The Institute’s international standing was ensured not only through its research fellows participating in a number of conferences, but also through the organisation of several symposia, including *Yogic Perception, Meditation and Altered States of Consciousness and Early Chinese Buddhist Translations*. The *Journal of the International Association for Buddhist Studies* has been co-edited at the institute since 2006.

**Preview for 2008–2009**

Japan-related projects will mainly consist in a monograph on aging in the early modern period, publications on printed material concerning human “life paths”, as well as research on concepts of the afterlife and on the deity Hachiman.

A new project towards collecting and evaluating the text fragments of the Nyāya philosophical school is to provide a substantial contribution to the history of Indian philosophy, since they contain fundamental concepts of this school by authors whose works are not extant otherwise.

The third volume of the “Tantra Dictionary” as well as research on Veṅkaṭanātha’s *Nyāyasiddhāñjana* are to be completed. Work on the next volume of the dictionary as well as the studies on Pāñcarātra and Viśiṣṭādvaita-Vedānta will be continued. Research on the early history of the Rāmānuja School will commence.

The critical editing of the Sanskrit texts from Tibet will be continued. A related panel entitled *Sanskrit Manuscripts in China – State and Prospects* is in progress for the 2008 Beijing Seminar on Tibetan Studies, which will be convened by the CTRC in October 2008.

# Social Anthropology Research Unit

Head: ANDRE GINGRICH



### Aims and Functions

The *Social Anthropology Research Unit* (SARU) was established on January 1st 2007 as part of the AAS's *Centre for Studies in Asian Cultures and Social Anthropology* (CSACSA). SARU develops and elaborates a number of anthropology's central competencies. Regionally, SARU is oriented toward the Islamic Middle East, Central Asia, and Southeast Asia. SARU's methods are directed towards balanced gender-specific, empirical fieldwork in native languages and systematic intercultural comparisons as well as the analysis and interpretation of socio-cultural processes of the present and the past, including the history of the discipline. The long term programme of SARU is set towards the theme of *Consensus and Conflict in Asia and the Eastern*

*Mediterranean*, with special emphasis upon economics, religion, and security. With reference to *economics*, the programme focuses on historical and contemporary transformations of current and historical socio-economic conditions with their accompanying dangers, potentials, and consequences. Perspectives on *religion* focus on regions influenced by Islam and/or Buddhism, with particular emphasis on their interactions with both local beliefs and smaller religious groups as well as with secularization and Christianity. Interactions of religious factors often contribute to the development of consensus and stability in the face of economic change. Sometimes, however, they may also induce discrimination and conflict. *Security* is primarily considered in its regional contexts as a set of localized strategies and

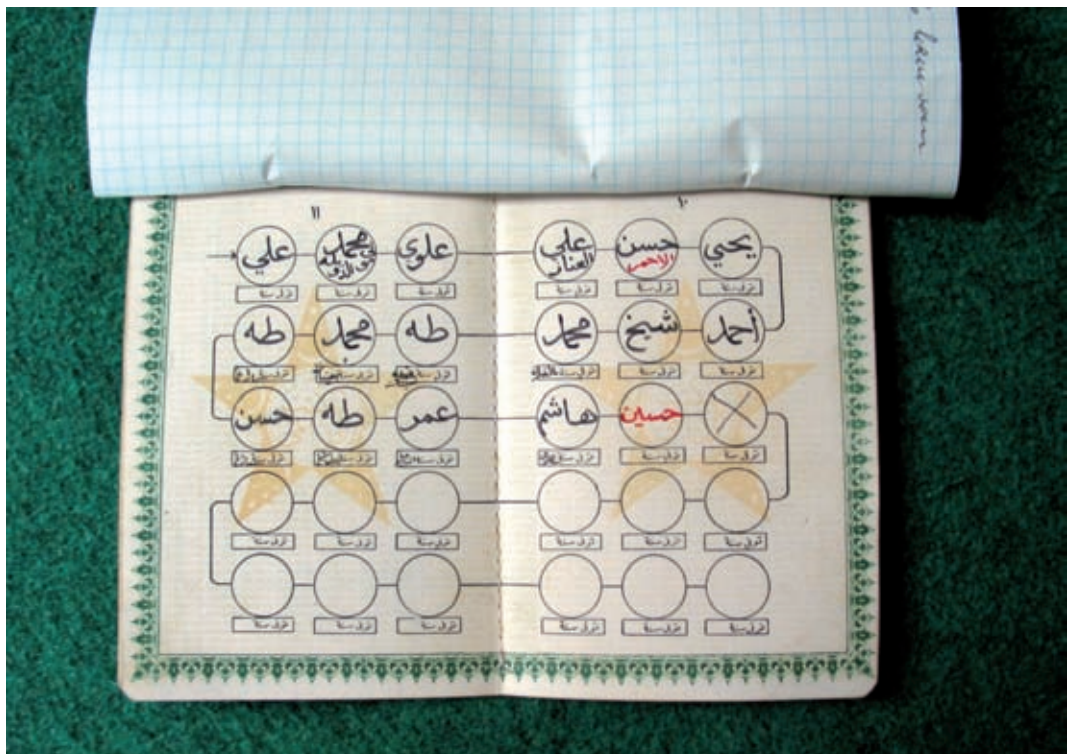


Fig. 1: Genealogy of a Sayyid: Pekalongan, Central Java, December 2003



Fig. 2:  
Magic objects for  
sale: spice market,  
Damascus, February  
2007

mechanisms for the pursuit as well as the prevention, termination, and settlement of (potentially) violent conflicts about ecological, economic, social, ethnic, political and/or religious questions.

### Results for 2006–2007

In total, the scholars involved in SARU (in 2006: Commission for Social Anthropology) published 6 books and 4 dozen scholarly articles and other materials between 2006 and 2007. The Austrian Science Fund (ASF) Project Wittgenstein2000 *Local Identities and Transcendent Influences* reached its successful conclusion in early 2007 with the publication of the third volume of the series in the AAS Press (Andre Gingrich and Guntram Hazod, eds.: *Der Rand und die Mitte. Beiträge zur Sozialanthropologie und Kulturgeschichte Tibets und des Himalaya*). Another component of the project's conclusion was an international *workshop on Comparison and Anthropology*, held in November 2006, and the publication of the first Eric Wolf Lecture (Gingrich/Fillitz/Musner, eds.: *Kulturen und Kriege, Freiburg: Rombach 2007*). In addition, a bi-lingual brochure with summaries entitled *Spotlights, Orientations and Results of the Wittgenstein Research Project in Social and Cultural Anthropology 2001–2007* was distributed to approximately 2000 scholars, opinion leaders, and institutions worldwide. Finally, with funding from the Jubilee foundations of the ANB and the City of Vienna, the project *Alpine Popular Culture Seen from Outside: The*

*Musikantenstadl in Scholarly Perspective* reached its successful conclusion with a collection of essays edited by Susanne Binder und Gebhard Fartacek that appeared in September 2006. With considerable media attention, due to cooperation with Austrian Broadcasting (ORF), a book presentation and workshop involving a panel of illustrious experts were held in October 2006 with the title: “*The Musikantenstadl – Austria’s Unresearched Calling Card?*” (*Der Musikantenstadl – die unerforschte Visitenkarte Österreichs?*).

In April 2006 the ASF Translational-Research-Project, *Handbook Globalization* hosted a workshop in which scholars presented anthropological perspectives on contemporary globalization. Participants included Ulf Hannerz (Stockholm) and Joanna Pfaff-Czarnecka (Bielefeld). Editorial work for this handbook was completed at the end of 2007, and a provisional contract with Edition Suhrkamp was concluded. Special acknowledgments also are due to Walter Dostal, SARU Advisory Board Chair, who edited *Tribal Societies in the southwestern regions of the Kingdom of Saudi Arabia: Social-anthropological Investigations*, the crowning achievement of several years of research work at the AAS. In addition, Ines Kohl (as part of an ongoing project financed by the Austrian Petrol Inc. OMV) and Anja Fischer organized a conference embracing new studies on the Tuareg societies of northern Africa. With additional funding, SARU was enabled to initiate five new projects: First, the EU-Tempus Project *Capac-*

*ity Building in Social Science Methodologies for Palestine (CASOP)*, through which doctoral students at Birzeit University (Palestine) receive training in social science methods. (This collaboration also includes the French IREMAM of CNRS, in Aix-en-Provence). Second, the ASF project *Networks of a Diaspora Society: Indonesian Hadhramis in the Homeland and in the Periphery*, which studies interactions between the Hadhrami diaspora from south Arabia in Indonesia and elsewhere. Third, a cooperation project with the AAS's Commission for Studies on Culture and the History of Theatre, *The Turkish Sword is at the Door ...Reconsidering Representations of Turks in Vienna*", financed through the City of Vienna's Jubilee Fund, considers the symbolic meaning of monuments and artefacts from and about the Turkish period in Vienna. Fourth, *The Mongolian Collection of Hans Leder at the Vienna Museum of Ethnology* focusses on 100-year-old Mongolian objects to consider everyday life around 1900. The collection's sacred objects also demonstrate the development of local Buddhism and Mongolian-Buddhist art. Five researchers, in the course of the newly established SARU *International Guest lectures*, such as Elinor Ochs (UCLA), Ravinder Kaur (IIT New Delhi), Bambi Schieffelin (NYU) or Mentor Mustafa (BostonU) presented their studies.

#### Preview for 2008–2009

The following publications are planned: *Handbuch Globalisierung*, (eds. Fernand Kreff, Eva-Maria Knoll and Andre Gingrich) with Suhrkamp; Helmut Lukas, *Ungleichheit und Egalität: Analyse der Sozialstruktur der vorkolonialen Toba-Batak Samosirs, Indonesien* with AAS press; and Gebhard Fartacek *Unheil durch Dä-*



Fig. 3: Team members of the Social Anthropology Research Unit during their winter retreat meeting, December 2007

*monen? Geschichten und Diskurse über das Wirken der Djinn* with LiT publishers. The edition of *Kaukasus-Studien von Johanna Stiegler* will be brought to completion by Stefan Krist and Andrea Strasser. Christian Jahoda's project on west Tibetan traditions and Guntram Hazod's history of ancient Tibet will also be completed. A new project by Christian Warta, *Religion and Conflict in Papua: Christian-Muslim Relationships in the Indonesian Periphery*, will be added to the programme, as well as two new ASF projects by Stefan Kloos (on Ladakh) and by Britta Lange (Lise Meithner, on anthropological studies among WW I POWs). New projects and their results will continue to be presented and discussed at SARU's scholarly events such as "Anthropological Dialogues", "The SARU Atelier" and the "Eric Wolf Lecture" 2008.



## Centre for Cultural Research (CCR)

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### AAC – Austrian Academy Corpus

Head: EVELYN BREITENEDER



#### Aims and Functions

In March 2001 a joint public declaration was signed by three Academies of the three German speaking countries Austria, Germany and Switzerland that underlined the necessity “to explore the German language in its cultural development in different national contexts and to both conserve its manifold lexical and textual qualities for posterity by means of information and technology and to take advantage of transnational modes of operation, in order to foster the international interest in the German language and to further it scientifically”. The AAC – Austrian Academy Corpus is a comprehensive und multiform collection of integral electronic texts of German language and literature from the period 1848–1989, from the March Revolution until the “Fall of the Berlin Wall”, which will be systematically digitised and annotated in the AACC, the Austrian Academy Corpus Container. Corpus research by means of text technology is the programme, which implies that the AAC aims at the incorporation of principles of the Humanities (such as philological exactness, structuring of texts, annotation, editorial techniques, indexing, commenting and so forth) into ICT technologies. After the initial phase of the AAC (2001–2006), which was used primarily to build up the core of the AAC’s text collection as well as to develop the theoretical and methodological foundations of the corpus programme, the second phase (2007–2012) will

be dedicated to application oriented approaches in text technological research.

The AAC digitizes texts to render them accessible to philological research, to evaluate and to interpret them. In all these efforts, the AAC’s academic interests concern the ever recurring questions of philology: how do words and texts work, where do they come from, what meaning do they convey, why were they written, why are they read, what is their impact on language use? Computerised data processing and innovative methods of modern text technology today allow researchers to investigate these questions on the basis of large amounts of texts and to accelerate work on them in a collaborative manner. This change in the methodological approach in textual research will result in new hypotheses and new answers, which in turn will lead to new suspense, controversy and new insights in the traditional philological fields.

#### Results for 2006–2007

The start-up phase, which was primarily intended to generate the core of the AAC’s text collection and to lay the theoretical and methodological foundations of the research programme, was completed in 2006, as planned. So far 150 million tokens have been dealt with and persistently marked up, another 250 million tokens have been digitised and are now available at varying stages of processing. Since mid-2007 the application development phase has intensified basic research by using subcorpora generated by modern text technological approaches. In the period under report we have also worked on various forms of digital editing focusing in particular on aspects of the usability and sustainability of editions literary journals. Research in the field of literary editing has yielded two extensive publications: On 1 January 2007 the digital edition of the journal “Die Fackel”, published by Karl Kraus between 1899 and 1936, went online and is accessible under the URL <http://www.aac.ac.at/fackel/>. Pub-



Fig. 1: AAC-Emblem



Fig. 2: Der Brenner



Fig. 3: Die Fackel

lic interest (media, users and professional audience) was enormous, approximately 20,000 users registered within the first weeks of the publication of the AAC-FACKEL. The AAC-FACKEL is characterised by both a highly refined reading and sophisticated search functions. Among others, the goal of this digital edition was to enable users to experience, in reading and learning, the unique linguistic, literary and satirical quality of the text of the FACKEL, and to optimize access to the extensive text through a variety of advanced search options and indices. In addition to the numerous options of full text searching and lexical search indices, the edition features for the first time a comprehensive table of contents of this historical journal, which was newly produced for the AAC-FACKEL on the basis of the tables of contents of the quarterly volumes of the FACKEL that were set up by Karl Kraus himself. The complete set of facsimiles of all the entire text of the FACKEL permits of correct citation in accordance with established editorial standards. The existence of a digital web edition will facilitate work on textual amendment and the improvement of the technical functions.

By the end of October 2007, the digital edition of the cultural journal DER BRENNER was completed and put online (<http://www.aac.ac.at/brenner/>), an undertaking which was carried out in cooperation with the research institute Brenner-Archiv of the University of Innsbruck. Between the years of 1910 and 1954, Lud-

wig von Ficker had published 104 issues of the BRENNER in Innsbruck. Whereas initially most authors of the BRENNER were Tyrolean (Carl Dallago, Max von Esterle, Hugo Neugebauer, Karl Röck, Ludwig Seifert and Arthur von Wallpach), the journal later on published contributions by authors from the whole German speaking area (Theodor Haecker, Karl Borromäus Heinrich, Else Lasker-Schüler, Ludwig Erik Tesar). The poetry of Georg Trakl, Ficker's most important literary discovery, lent the journal a particular profile during the years 1912–1914. Apart from full text search and search for lexical items, the digital BRENNER offers access to a database of personal names comprising data on all real and fictitious persons occurring in the journal, enabling the user to track connections between authors mentioned in the BRENNER and other real and fictitious persons.

#### Preview for 2008–2009

Research is to focus on refining and augmenting the structure and contents of the corpus: the texts and documents incorporated in the AAC-Container so far will be analysed and labelled with additional meta data indicating the structure and type of text. As regards specific projects work will turn from editorial applications towards applications of state-of-the-art corpus linguistics. The long standing cooperation with project partners based in Basle, Berlin and Bolzano is expected to bring out in the foreseeable future the



Fig. 4: Fackel-Gate

publication of what has been called C4, the first joint corpus venture documenting the German language of the 20<sup>th</sup> century. The AAC is particularly proud of the expected results of this undertaking, which was made possible through the equal cooperative contributions of all partners. Research work in the field of parallel text corpora has also been linguistically orientated. The Russian-German parallel corpus of Dostoevsky's novel "The Idiot" will be published in 2008. Currently a trilingual corpus (German/English/Russian) of Sigmund Freud's "Dream Interpretation" is in progress. In addition, projects concerning lexicographical work on specific parts of the corpus have been initiated.

# Commission for the Edition of a Text Dictionary of “Die Fackel” (FACKELLEX)

Head: WERNER WELZIG



## Aims and Functions

The “Kommission zur Herausgabe eines Textwörterbuches der Fackel (FACKELLEX)” is placed at the intersection of literary and linguistic research. Currently, FACKELLEX is working on a three-part dictionary of the journal “Die Fackel” (1899–1936), edited by Karl Kraus in Vienna. The “Wörterbuch der Redensarten” was published in 1999, the “Schimpfwörterbuch” will be published in 2008. The third, and final, planned volume will be concerned with the “Dritte Walpurgisnacht”, a text written by Karl Kraus in 1933.

## Results for 2006–2007

After the publication of the “Wörterbuch der Redensarten” editorial work on the “Schimpfwörterbuch” has continued in the period under report and is near completion.

The “Schimpfwörterbuch” comprises three volumes with the abbreviated titles of ALPHA, CHRONO, and EXPLICA.

ALPHA consists of 2,775 abusive phrases drawn from approximately 200,000 examples found on the 22,586 pages of “Die Fackel” and selected according to linguis-

ALPHA 1	Aasgeier	Zwischenstufen	ALPHA 126
<b>A</b>	<b>A</b>	<b>Zucht von Fortisbrassen</b>	<b>Z</b>
B	die Aasgeier des Interessanten	den Züchtern des Antisemitismus	A
C	die Ab- und Zufälle meiner Region	Zürcher Sachverständige	B
D	Abhub des bürgerlichen Geisteslebens	deutschen Pastoren und Zürcher Frauenvereine	C
E	der älteste Abhub der Wiener Geisteswelt	Zurft- und Zeitgenossen	D
F	schwacher Abblatich von Lustspielfiguren	einem vollendeten Zungenjongleur und Exzentrik-Träger	E
G	Abkänstlinge der Bürgerwelt	alle Prophetie des Zurechtlagers	F
H	Abkänstlinge meines Lebenskreises	Zusammenschluss von Teutschen, Deutschen und Dailischen	G
I	diese Abkürzer der Sprache und des Lebens	die Zuspätkommenen	H
J	diese Abkürzung eines Rezensenten	der Zuspätkommenen	I
K	Abonnenten der „Neuen Freien Presse“	Zuständige eines Landes, das keinen Richter brauchen wird, weil sich alles von selbst postuliert	J
L	Abonnenten der großen Tagespresse	der Zutreiber des Blutbordells	K
M	Abschaum von einer Creme	die Zutreiber der öffentlichen Moral	L
N	Abschaum der Wiener Advokatie	Zutreiber der Zeit	M
O	Altersten des Abschiednehmens	Zwangshandlungsgeschillen	N
P	einer der beliebtesten Abschließler von Verwundetenzügeln	die Zweckungen, die sich nicht abspesen lassen	O
Q	Franz Elin, ein Abt der roten Garde	der beiden großen Zweifler- und Bekennertypen, denen die Menschheit nachstrebt: des Entbrechers und des Erschleichers	P
R	Achilles des Wiener Feuilletons	Zwei-Seelen-Theoretiker	Q
S	glaubt das Volk, ein Achtundvierziger sei die Rufnummer eines Fiskus, und ein Unvornehmerer ist doch mehr	alle Zwischencharaktere ermuntert, alle Schieber geschoben und allem Schlimm zu einer Kruste verhelfen	R
T	Adabei und Naidabei	Urfug dieser Zwischenexistenzen von Regisseuren	S
V	Adept der Neuen Freien Mythologie	Zwischenhändlern des Geistes	T
W	Adepten des Ritualmordglaubens	den Zwischenhändlern einer lausigen Intelligenz	V
X	Adepten seiner Schmirke	Zwischenstufen lehnen sich auf, weil man oben ist!	W
Y	Adjektivkünstler		X
Z	Adjektivschmuser		Y
			Z

Fig. 1: ALPHA (First and last page)

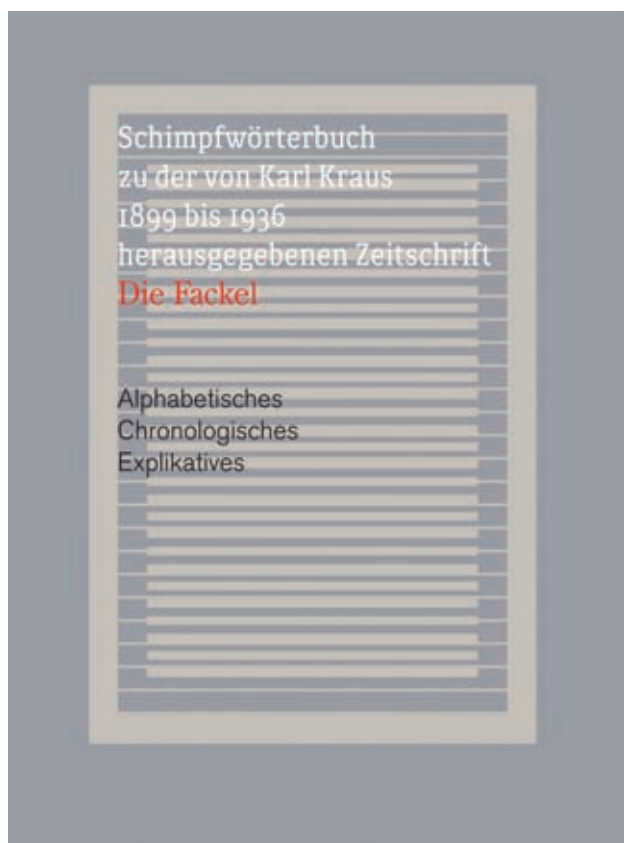


Fig. 2: Schimpfwörterbuch zu der von Karl Kraus 1899–1936 herausgegebenen Zeitschrift „Die Fackel“

tic and thematic criteria. In many cases these phrases are annotated with a short context.

CHRONO arranges a fifth of these abusive phrases in chronological order and within more extensively cited contexts.

The volume EXPLICA contains the editor-in-chief's explicatory and explanatory texts as well as "Wichtiges von Wichten", the final article of "Die Fackel", which represents the "source text" of the dictionary. On its 19 pages as many as 555 abusive phrases have been marked up, accompanied by exemplary commentaries and materials serving to indicate the scope of pejorative usage that reaches beyond the categories selected for the dictionary.

ALPHA has been provided with three indexes: an index of word forms, a reverse index of lexical forms, and an index of names.

Bachword-sorted Index (Excerpts):

-MÄNNER	-LINGE
Halbmänner	Lieblinge
Obmänner	Gründlinge
Scheidemänner	Blödlinge

Fachmänner	Höflinge
Literaturfachmänner	Parteihöflinge
Parteimänner	Unterwürflinge
Staackmänner	Tintenfeiglinge
Dunkelmänner	Abkömmlinge
Hampelmänner	Dümmlinge
Puppenmänner	Feuilletonlehrlinge
Ehrenmänner	Zauberlehrlinge
Ullsteinmänner	Antisemitenhäuptlinge
Zuckermänner	Preßhäuptlinge
Revolvermänner	Ordenswüstline
Handelsmänner	
Corruptionsmänner	
Dichtersmänner	
Staatsmänner	
Ratzmänner	

The three volumes of this dictionary are to be printed in Bratislava in order to reduce the estimated printing costs.

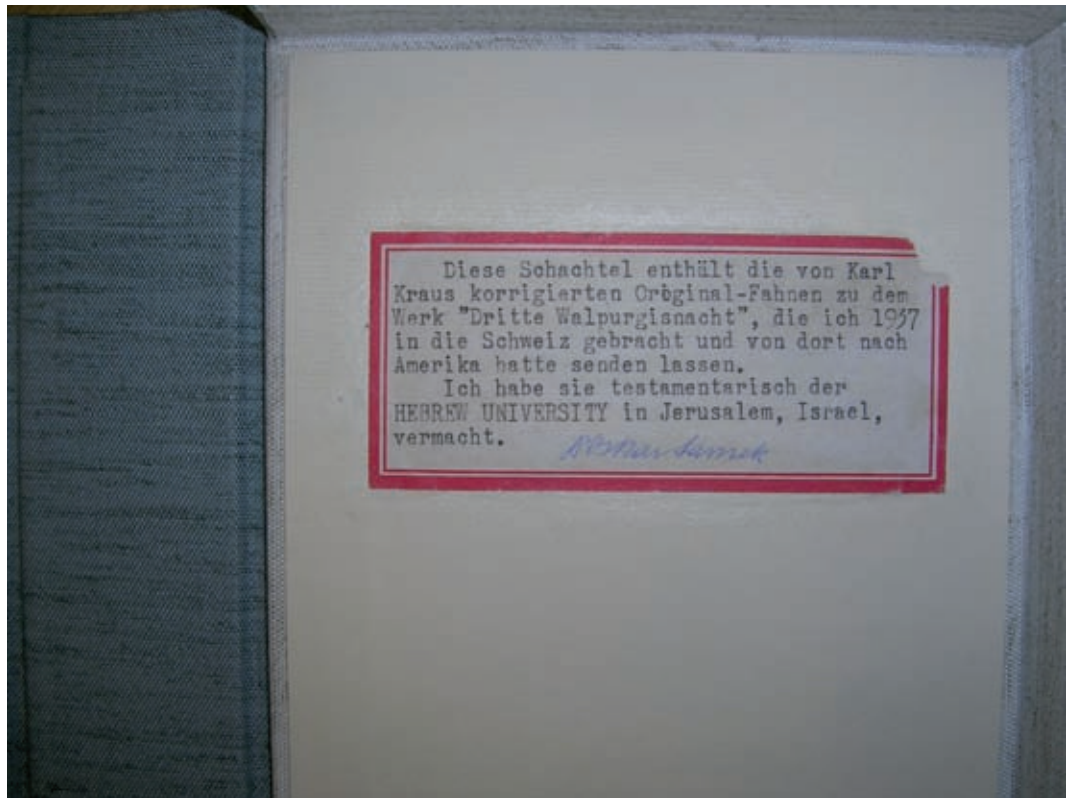
The Commission was evaluated on behalf of the Presidium by an international board in summer 2007. It reports that "die Ausführungen von Prof. Welzig über den bisher als ‚ideologisches‘ oder ‚thematisches‘ Wörterbuch bezeichneten dritten und letzten Teil des Gesamtprojektes [...] angesichts der Originalität der geplanten Arbeit eine sehr genaue und lebhaft Diskusion auslösten. Die wissenschaftlichen Mitarbeiter, die der Gutachtergruppe anschließend die imponierende technische Ausrüstung des AAC vorstellten, machten sowohl in ihren Kurzvorträgen wie auch bei der Vorführung der technischen Geräte einen äußerst kompetenten Eindruck". The summarizing recommendation to the Academy reads: "Aufgrund der bisherigen hervorragenden wissenschaftlichen Leistungen einerseits und der Klarheit und Originalität in der Konzipierung [...] andererseits erlaubt sich die Gutachtergruppe, dieses Projekt mit dem Prädikat ‚mit Nachdruck empfehlenswert‘ auszuzeichnen." Judging by the excellent scientific achievements attained so far on the one hand and the lucidity and originality of its conception [...] on the other, the evaluating team have decided to award the attribute "highly recommendable" to this project/.

### Preview for 2008–2009

Like all commissions of the Academy, FACKELLEX was reconstituted in December 2007. In the opinion of the present head, the new term of office starting in 2008 will be the commission's last period.

The third part of the "Fackel"-Dictionary, an "ideological", i. e. thematically structured dictionary, will be the commission's central commitment for the future work

Fig. 3:  
Dr. Oskar Samek's  
caption on the box  
containing the galley  
proofs of the "Dritte  
Walpurgisnacht",  
Jewish National and  
University Library  
(Photo by Hanno  
Biber)



phase. It will concern a text originally written for issues 888–907 of "Die Fackel", but – having partially appeared in issues 890–905 – published posthumously only after the end of National Socialism under the title "Dritte Walpurgisnacht", as had been suggested by Karl Kraus himself.

Its galley proofs complete with handwritten corrections have had a remarkable history: after the Anschluss, Oskar Samek brought the originals via Switzerland to New York and later bequeathed them in his will to the Hebrew University in Jerusalem. Even more remarkable than the journey of this text are its achievements: written in Austria in 1933 it contains the most important contemporary analysis of the beginnings of the Third Reich.

Thematic areas such as "language" or "law", which are equally important in this text as they are in the entire "Fackel", will be examined in their full development in the dictionary. In connection with "language" the lexical inventory of what is cited as NS-specific including abbreviations in this field – *USCHLA*, *Gaukulturwart*, *Weltanschauungssalat*, amongst others – will be investigated.

In preparing and complementing this dictionary what can be recognised as quotations and allusions in the

"Dritte Walpurgisnacht" will be collected as a first step. While the inclusion of classical literature has already been taken into account in research work, in particular by Kurt Krolop and Jochen Stremmel, phrases and sources of what was taken over from radio and the news media, from "Äther" and "Papierfabriken", to quote two metaphors of Karl Kraus, will have to be traced laboriously. The range of what will have to be dealt with is evident by the following names mentioned in the "Dritte Walpurgisnacht": "Arbeiter-Zeitung", "Berliner illustrierte Zeitung", "Berliner Lokal-Anzeiger", "Berliner Tageblatt", "Börsenblatt für den deutschen Buchhandel", "Der Brenner", "BZ am Mittag", "Deutsche Allgemeine Zeitung", "Deutsche Juristenzeitung (Deutsche Juristen-Zeitung)", "Dötz (Deutschösterreichische Tages-Zeitung)", "Frankfurter Zeitung und Handelsblatt", "Großdeutscher Pressedienst", "Der Kampf", "The Manchester Guardian", "Neue Freie Presse", "Neues Wiener Journal", "Norddeutsche Allgemeine Zeitung", "Reichspost", "6-Uhr-Blatt (Wiener Allgemeine Zeitung)", "Der Stürmer", "Die Stunde", "Völkischer Beobachter", "Vorwärts", "Vossische Zeitung".

**Post Scriptum:** „Die Berichterstattung [...] soll ohne Rücksicht auf die Kosten im größten Stile eingerichtet werden.“ [Journalistic notice of intent, as quoted from the "Fackel".]

## Commission for Studies on Culture and the History of Theatre

Head: MORITZ CSÁKY



### Aims and Functions

The Commission's research activities focus on studies on culture and on the history of theatre and of literature. Its programme is based on the premises of contemporary crossdisciplinary discourse in studies on culture and is centred on the interdisciplinary analysis of complex cultural systems characteristic of Central Europe. The results are meant to contribute to the understanding of cultural processes in modern societies. The Commission's research activities are pursued within a comprehensive notion of culture, replacing religious, scientific and aesthetic definitions with a concept perceiving culture as a dynamic ensemble of signs, codes and symbols through which individuals communicate. Culture is conceptualized as a system of orientation constituting identity by means of memory, appropriation, and the ascription of meaning. The Commission's undertakings are linked through the theme of memory research.

The Commission's research intends to exemplify the multiple meanings of memory in Central Europe. Central European cultures are connected by both confrontation and intersection, interacting at crosscultural points of reference that signify shared contents.

Taking this privileged situation as a point of departure, the Commission's work concentrates on common cultural aspects of the wider Central European region, continuing the basic work *Sites of Memory* but shifting the perspective (since 2004). Its research is committed to foster critical reflection on the constitution of identities within Europe and on a comparative global scale.

The activities of the Commission comprise three main fields of research:

1. a special research programme on *Theatre in the Habsburg Monarchy* (5 projects),
2. *Sites of Memory – Spaces of Memory* (8 projects) and
3. *Cultures of Knowledge* (5 projects).

These research initiatives are guided and connected by a metadisciplinary concept of culture.

The research activities of the Commission encompass nine sectors:

- *Research projects*: Basic research projects on theatre, memory, remembrance, identity (2006–2007: 18 ongoing research projects)
- International Interdisciplinary Conferences (2006–2007 two conferences)



Fig. 1: Burgtheater Vienna



Fig. 2: Publications of the Commission

**Kommission für Kulturwissenschaften und Theatergeschichte (KKT)**  
**Zentrum für Kulturforschung**  
 www.oeaw.ac.at/kkt



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### Forschungsorganisation

MitarbeiterInnen  
 Obmann, Obmannstellvertreter  
 Kommissionsmitglieder



### Forschungsschwerpunkte

*Leitlinie: Gedächtnis – Erinnerung – Identität*

1. Theater in der Habsburgermonarchie	→	← Internationale Konferenzen
2. Orte des Gedächtnisses – Erinnerungsräume	→	
3. Kulturen des Wissens	→	



Internationaler  
 ExpertInnenrat



### Interdisziplinäre wissenschaftliche Veranstaltungen

Workshops	Jours fixes	Ernst Mach-Forum	Literatur- u. kulturwissenschaftliches Komitee
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### Internationaler WissenschaftlerInnen-Austausch

Internationale Austausch-Programme

### Publikationen

Monografien, Sammelbände, Aufsätze  
 Sprachkunst (Zeitschrift)  
 Feuchtersleben (Edition)

Fig. 3: Organisation chart of the Commission



- *International Workshops* (2006–2007 six workshops)
- *Jours fixes* (monthly) cover current topical fields and threads that shape the discourse of culture studies; promotion of young scholars
- *ernst mach forum* (2006–2007 four panels with participants from the humanities, natural sciences, medicine and engineering)
- The *Committee for Cultural- and Literature Studies* of the Austrian and Hungarian Academies of Sciences
- Editing of the biannual journal *Sprachkunst*
- International Exchange Programmes
- Supervision of M.A. and PhD students by researchers of the Commission.

### Results for 2006–2007

The *International Conferences*, *Workshops* and *Jours fixes* thematically reflect the research projects' engagements; in offering incentives and impulses for the Commission's research activities they provide platforms for a critical examination of the premisses and results in close connection with international developments.

Two international conferences and several international workshops were held, e. g. *Communication – Memory – Space. The “Spatial Turn” in Cultural Studies*. (Vienna, November 2007). – *Overlapping Histories – Conflicting Memories. The Holocaust and the Cultures of Remembrance in Eastern and Central Europe*. (Vienna, April 2006). – *Multiculturalism. The Central European Experience and its Impact on Identity Formation in a Globalized World*. (Bellagio, September 2006). – *“The Making of ... ‘Genius’: Mozart and Wittgenstein. Biography and Myth”* (Vienna, October 2006). – *Continuity and Transformation. 1945. Academies of Sciences*

*in Eastern and Central Europe*. (Vienna, November 2007).

*Publications 2006–2007*: 2 monographs, 1 part of the collected works of Feuchtersleben, 7 edited volumes of papers given at the workshops and conferences, more than 100 articles.

### Preview for 2008–2009

- Vienna Theatres. Inaugural Addresses, Resignation Speeches and Necrologies of the Burgtheater-Directors from Laube to 1918. The Burgtheater and Its Audience III (E. Großegger, habilitation). 2008/2009.
- *Memory-Dance-Music* (M. Csáky, St. Schmidl). 2008/09.
- “Heldenplätze” in International Comparison (P. Stachel). 2009/10.
- Scientific/Scholarly Change in Culture Studies in Austria/Central Europe (1848–1938) (J. Feichtinger, habilitation). End of 2008.
- Science/Scholarship in an Ethnically and Culturally Heterogeneous Milieu (P. Stachel). 2008/09.
- Interruption and Continuity. The Austrian Academy of Sciences 1945–1955 (H. Uhl, J. Feichtinger, D. Hecht). 2009/10.
- *Topography of the Shoah* (H. Uhl, D. Hecht, M. Raggam-Blesch). 2009/10.
- References of the Bohemian Lands and Crosscultural Relations in Viennese Vormärz-Periodicals (Vol. I) (G. Marinelli-König). 2008/09.

New Project on *Literature and Conversation* (Ch. Leitgeb).

10<sup>th</sup> Intern. Conference on *Authenticity*. ÖAW Vienna (October 2008).

5 Workshops 2008.

## Commission for the History of Art

HEAD: ARTUR ROSENAUER



### Aims and Functions

Established in 1979, the Commission for the History of Art has become the most important independent research institution of its subject in Austria today. Basic research constitutes the common aim of the projects undertaken by the Commission; each research project is subjected to a detailed analysis which draws on an extended corpus of works and sources as well as the flexible use of its methodological approach. The focal point of interest lies in the scholarly study of the visual arts in Austria within the context of wider developments in Europe. When the Commission for the History of Art published the entire six volumes of *Geschichte der bildenden Kunst in Österreich* ("History of the Visual Arts in Austria", Munich / New York 1998–2003), it created a completely new basis for the investigation into artistic achievement in Austria.

In 2004 the Commission widened its task by adding a new focal point: in exploring the history of the building and functions of the Vienna Hofburg, the Commission directed its attention to a historical building of the highest artistic and political significance; one which has stood at the centre of European politics and culture for centuries and is now excellently suited for a study of Austrian and European identity. The findings of the interdisciplinary research project are to be published in a series of several volumes.

In joining the "Research Group – Baroque Ceiling Painting in Central Europe" the commission intends to collaborate closely with pre-eminent research institutes in Central Europe in view of the possible establishment of priorities for the future.

### Results for 2006–2007

In 2004, the architectural and urbanist complexity of the Vienna Hofburg prompted the Commission for the History of Art to develop an extensive research project centred on the history of the building and the functions of this palatial complex. Broadly defined themes

concerning the architecture, interior design, gardens and the urbanist context, the function and programmatic goals of the Hofburg are currently studied in five subordinate project groups. Thanks to support received from the Austrian Science Fund (FWF), four out of five groups were enabled to start their research activities in the course of 2005, and in 2007 an investigation of the history of the Hofburg in the 20th and 21st centuries was added to the undertaking.

The basis and starting point for the studies derive from extensive archive materials which experts at the Austrian State Archives have been examining since 2005. Some of the materials provide detailed information about the progress of the planning, indicating how some designs were implemented while others were rejected. The most important inventory of pictorial sources consists of some 8,000 plans, architectural drawings and *vedute*. As far as possible, these are all assigned to the written sources. In the field of building research, sondages of the stucco and dendrochronological investigations of the roof truss yielded decisive results for dating the oldest parts of the Hofburg.

The project: "Italian Jesuit architecture. Milanese province of the Jesuit order" was concluded with the publication of two volumes in 2007.

In addition to the above-mentioned work the Commission for the History of Art also acts as a cooperation partner in other ongoing projects: The "Corpus Vitrearum Medii Aevi" (CVMA) is a scientific organisation which studies and issues publications about largely unknown medieval glass paintings. In Austria over 3,500 glass paintings dating from the 12th to the early 16th century and taken from of sacred and profane buildings have been preserved as precious relics of monumental pictorial art, which the project is committed to catalogue and classify. The results of the investigation of medieval glass paintings in the provinces of Salzburg, the Tyrol and Vorarlberg (CVMA Vol. IV) were published by Böhlau in 2007.

Fig. 1:  
Vienna, Hofburg,  
Interior Burghof with  
a view of Amalien-  
burg and Reichskan-  
zleitrakt

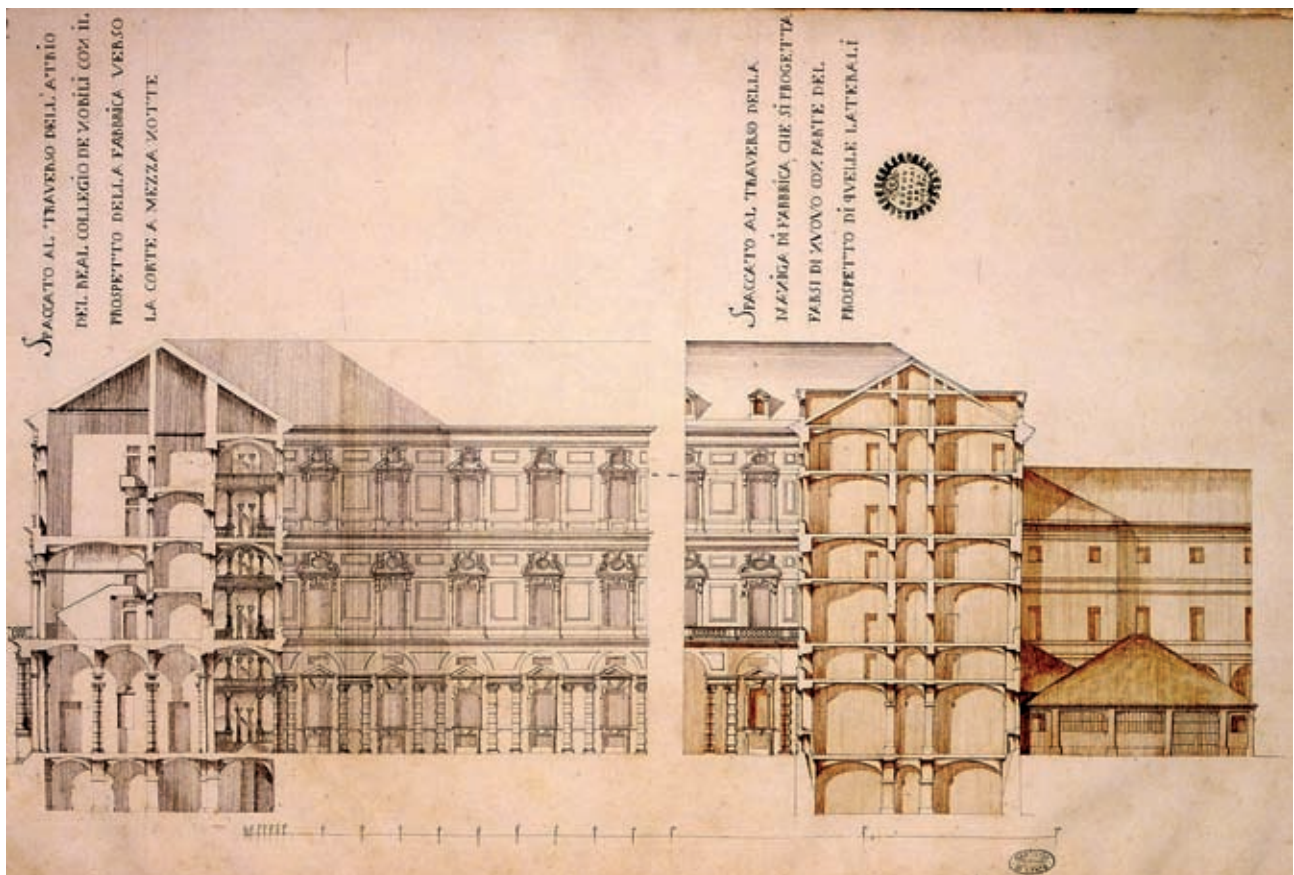


Fig. 2: Torino, Sectional elevation of Collegio dei Nobili (Torino, Archivio di Stato)



Fig. 3: Tamsweg (Salzburg), Pilgrimage Church dedicated to St. Leonhard, gold window with St. Rupert

The “Corpus of German and Dutch drawings 1350–1500” aims at a world-wide recording of German, Dutch, French and Bohemian drawings dating from about 1350 to 1500. In this respect research is focused on the systematic inventoring and scientific study of the drawings. In recent years the project has devoted itself in particular to researching and cataloguing the folios of the Hieronymus Bosch group, the graphic work of the Dirk Bouts group, and various drawings influenced by Hugo van der Goes.

Another project is dedicated to a study of the so-called Codex Albrecht. It deals with the annotated edition of an outstanding document on baroque art in Vienna. Named after its author, Conrad Adolph von Albrecht, the codex contains 14 programmes of high-ranking buildings, frescoes and sculptural ensembles, 11 of which were commissioned by the Emperor Karl VI. Pen drawings illustrate the programmes which Albrecht formulated among others for parts of the Hofburg and the Karlskirche. Until now, archive research has concentrated on the personality of Albrecht, his career and obligations at the court of the Emperor. It has served to broaden our knowledge of the individual works and the text of each programme.

The research carried out in association with the Austrian Federal Monuments Office on the “Giant Gate” of Vienna’s cathedral and metropolitan church dedicated to St. Stephen is to appear in 2008 in a publication containing articles on archaeology, architecture and art history as well as issues pertaining to the natural sciences and issues of conservation.

#### Preview for 2008–2009

For the next years the extensive archival research effort undertaken until now for the Hofburg project is to be continued. In addition to the Austrian archives it is intended to search foreign collections for relevant material. It is planned to publish the results of the research in a series of several volumes. Four of the five sub-projects will terminate in 2008: an application for an extension has already been placed with the Austrian Science Fund (FWF). The “Research Group” will organise a first joint conference in Ljubljana during the autumn of 2008. It will be followed by a symposium in Prague in 2009. The “Corpus Vitrearum Medii Aevi” (CVMA) intends to publish its manuscript on Styrian glass painting (CVMA Vol. V). Work on the inventories in Lower Austria is to continue. Manuscripts for the “van der Weyden” and “Goes” volume are prepared as part of the “Corpus of German and Dutch drawings 1350–1500”. Drafts of the articles for the volume annotating the Codex Albrecht are to be completed in 2008.

## Commission for Music Research

Head: GERNOT GRUBER



### Aims and Functions

The *Kommission für Musikforschung* (KMF, *Commission for Music Research*), established in 1944 and originally conceived as a “Zentralstelle für Schubert-Forschung” (“Centre for Schubert Research”), has become the most important non-university institution for research in the field of musicology and a coordinating centre for all activities in the field of musicology in Austria. Its investigations concentrate in particular on Austria’s musical tradition and history. Involving the cultural regions with which Austria had been closely linked for many centuries (i. e. the successor states of the Habsburg Monarchy, but also Germany, Italy and others) the Central European perspective has obtained priority in recent years.

Besides the main project *Musik – Identität – Raum* priority has also been given to editing and cataloguing as well as to the establishment of new data bases and the continuation of the online version of the *Oesterreichisches Musiklexikon* (oeml-Online).

Another focal point has developed through international cooperation on the *Neue Schubert-Ausgabe* (*New Schubert-Edition*), within the scope of which Franz Schubert’s works will be edited from a scholarly-critical point of view, including all versions, drafts, and fragments; and a separate research programme on Anton Bruckner, concentrating on investigations in his life, oeuvre, and the reception of his works.

Furthermore several minor research projects concerning *Studien zur Musikgeschichte Österreichs und Zentraleuropas*, *Musikwissenschaft im Kontext*, *Quellenorientierte Forschungen zur Musikgeschichte Wiens und Niederösterreichs*, *Musik an den Höfen des Hauses Österreich*, *Musikalische Quellen (9.–15. Jahrhundert) in der Österreichischen Nationalbibliothek*, *Musik und Medien im 20. Jahrhundert*, *Musikikonographie des Mittelalters und der Frühneuzeit* are carried out by members of the staff of the Commission.

### Results for 2006–2007

At the end of 2006 the print version of the *Oesterreichisches Musiklexikon* (oeml) under the editorship of the then head of the Commission Rudolf Flotzinger was completed in five volumes. Detailed preparations had started in 1998, and in 2002 the first volume was published. The oeml contains appr. 7,500 entries, com-



Fig. 1: Graz, Universitätsbibliothek, Codex 30, fol. 112r: This two-part version of a responsory verse is an example for the “polyphonic” troping of chant in Austrian monasteries (here in St. Lambrecht) in the later Middle Ages.



Fig. 2:  
During the Revolution of 1848 reactionary persons and institutions were heatedly denounced by "Katzenmusik" (rough music; illustrated supplement of the Viennese Theatre Journal).

prising articles on personalities and subjects as well as topographical articles based on a comprehensive view of music and of Austria. An extensive index of CDs soon to be published completes the print version of the *oeml*. The online version (*oeml-Online*, [www.musiklexikon.ac.at](http://www.musiklexikon.ac.at)) issued at the same time will be continually up-dated beyond the termination of the print version. Within the scope of the new main project of the Commission *Musik – Identität – Raum* (established on February 1, 2007), which is focussed from a comparative perspective on four climactic historical periods (about 1430, 1740, 1848, 1945–55/56), the first working hypotheses were formulated and sub-projects defined. Among them:

- Praxis der Mehrstimmigkeit in österreichischen Klöstern im Spätmittelalter (Polyphonic Practice in Austrian Monasteries in the Late Middle Ages)
- Kontinuität und Diskontinuität im Selbstverständnis und in der musikalischen Darstellung des Wiener Hofes 1735–45 (Continuity and Discontinuity of Self-awareness and its Musical Presentation at the Vienna Court 1735–45)
- Die Korrespondenz zwischen Joseph Proksch und Pius Richter als Spiegelbild musikalischer Identitätsprozesse in Prag und Wien um die Mitte des 19. Jahrhunderts (The Correspondence between Joseph Proksch and Pius Richter as a Reflection of Musical Identification Processes in Prague and Vienna at the Middle of the 19th Century)
- Das „Musikalisch-Schöne“ als Prototyp formalästhetischer Betrachtung bei Eduard Hanslick und Johann Friedrich Herbart (The “Beauty of Music” as a Prototype of Formal-Aesthetic Consideration by Eduard Hanslick and Johann Friedrich Herbart)
- Akkulturationsdiskurse am Beispiel von Salomon Sulzers Wirken am Wiener Stadttempel (Discourses of Acculturation exemplified by Salomon Sulzer’s Work at the Vienna Temple)
- Die Strategien der Identitätskonstruktion in der Musik des ersten österreichischen Nachkriegsjahrzehnts (Strategies in Constructing a Musical Identity in Austria during the First Decade after the War)

Although this project has only been started, some short articles have already been published and several lectures on this topic delivered at international conferences in Austria and abroad.

On account of the research activities investigating Bruckner’s life and oeuvre the following major publications were issued by the Commission for Music Research in 2006 and 2007: Gertrude Quast-Benesch, *Anton Bruckner in München*, Tutzing 2006; Erich W. Partsch (ed.), *Bruckner-Jahrbuch 2001–2005*, Wien 2006; Renate Grasberger, *Bruckner-Ikonographie. Teil 3: 1947 bis 2006*, Wien 2007; Rainer Boss (ed.), *Anton Bruckner – Die geistliche Musik. Tagungsband Mannheim 2005*, in print.

The projected book on *Anton Bruckner als Linzer Dom- und Stadtpfarrorganist* (Elisabeth Maier) is in progress and the publication of the papers of the conference *Bruckner – vokal* (E. W. Partsch), Steyr 2003 is continued. In 2007 a new edition of the *Bruckner Handbuch* (Bruckner Compendium) (1<sup>st</sup> edition by Uwe Harten, Salzburg/Vienna, 1996) and of the *Bruckner Werkverzeichnis* (Bruckner Catalogue of Works) (1<sup>st</sup> edition by Renate Grasberger, Tutzing, 1978) were commenced. Besides the preparation and organisation of the International Bruckner Symposium *Gemeinsa-*

*me Vergangenheit – gemeinsame Zukunft? Musikalische Beziehungen zu den neuen EU-Nachbarn Tschechien, Slowakei und Ungarn* (September 27–30, 2006) in the Brucknerhaus in Linz and the cooperation for a day devoted to studies on Bruckner's sacred music at the Mannheim University of Music and Performing Arts (Mai 2006) may be mentioned.

Research activities centring on the *New Schubert-Edition* in Vienna comprise investigations concerning several volumes of the *New Schubert-Edition* in the Green Library in Stanford, in the New York Pierpont Morgan Library, the Vienna City Library, the Archive of the Society of Music Lovers, Vienna and the Austrian National Library (description of manuscripts, identification of water marks as well as the assessment of sources and readings). The *New Schubert-Edition* took part in the exhibition *opera omnia – musikalische Gesamtausgaben* October 19–December 22, 2006 that was shown i.a. at the University of Music and Performing Arts in Vienna and at the University of Zurich.

In 2006 the following publications were presented as parts of the *New Schubert-Edition*: critical studies on *Der Vierjährige Posten/Fernando* (vol. II/2, Michael Kube/Han Theill), *Der Graf von Gleichen* (II/17, Manuela Jahrmärker), *Lieder 13* (IV/13, Walther Dürr). They were followed in 2007 by critical studies on *Lieder 14* (IV/14, W. Dürr), *Sinfonie in C* (VI/4, Werner Aderhold), *Tänze II* (VII/2,7a, Walburga Litschauer) and by the volumes *Fierabras* (II/8b, Christine Martin) and *Werke für Klavier zu vier Händen 1* (VII/1,1, W. Litschauer). Two series of the Commission, the *Veröffentlichungen der Kommission für Musikforschung* and *Tabulae Musicae Austriacae* (TMA) were continued in 2006 and 2007: Rudolf Flotzinger (ed.), *Musik als ... Ausgewählte Betrachtungsweisen*, Vienna, 2006 (Veröffentlichungen 28); Karl Mitterschiffthaler, *Das Musikarchiv des Stiftes Vorau. Die Handschriften (18.–20. Jh.)*, Vienna, 2006 (TMA 15); Ingrid Schubert, *Musikalienbestände im Institut für Musikwissenschaft der Universität Graz. 2. Teil*, Vienna 2007 (TMA 16).

The Commission for Music Research took an active part in the organisation and management of the following conferences in 2006 und 2007: “Mozart als Zeitgenosse” (March 31, 2007), “Staging Knowledge” (June 20, 2007), “Gedenken & Interesse” (November 6, 2007) and “Feste” (November 23–24, 2007).

### Preview for 2008–2009

In the forthcoming two years the above mentioned research projects, the cataloguing and the editing projects will be continued; the complete edition of the oeuvre of Johann Joseph Fux (editing directors: G. Gruber and



Fig. 3: „DER HEITERE IST MEISTER SEINER SEELE / WER SCHAFFEN WILL MUSZ HEITER SEIN“. Franz Molt, mosaic (detail) on the façade of Johann-Strauss-Gasse 22, 1040 Vienna, building damaged during World War II and rebuilt in 1958/59.

Herbert Seifert) will be advanced through an additional collaborator in 2008.

Workshops and symposia on all four interfaces of the project *Musik – Identität – Raum* will accompany the specific research activities of the Commission in the forthcoming two years, promoting the international cross-linking of the Commission. To this intent an international symposium on the topic *The Revolution 1848/49 and its Music* will be held on November 20–22, 2008.

Work on the *oeml-Online* will concern the addition of further visual and audio material, an improvement in the citation of references, the inclusion of new articles, and the revision and extension of existing entries.

Besides the above mentioned objectives (compendium, catalogue of works) the Bruckner research group will concentrate on the organisation of work-shops and a new publication series (*Wiener Bruckner Studien*).

At the Vienna section of the *New Schubert-Edition* the publication of the volumes *Werke für Klavier zu vier Händen 1* and 3 (vol. VII/1,1 u. 3), *Tänze I* (VII/2,6), *Adrast* (II/12) und *Sinfonien 2* (V/2), comprising the scores and critical assessments is under review.

The Commission for Music Research intends to advance the dialogue between science and practice; in this connection the organisation of a concert cycle accompanied by academic lectures has been proposed for the Haydn Year 2009.

## Centre for Medieval Studies (CMS)

### Institute for Byzantine Studies

Head: PETER SOUSTAL



#### Aims and Functions

The Institute, established on January 1<sup>st</sup> 2006 by merging the *Commission for Byzantine Studies* and the Commission for the *Tabula Imperii Byzantini (TIB)*, is engaged in basic and advanced studies on the Byzantine Empire. The main objects of research are manuscripts and small objects (seals) as well as the historical geography of the provinces of Byzantium. The results are published in catalogues, dictionaries and editions, and also in cultural historical studies.

*Main emphasis is put on the following commitments:*

- A critical edition of the *Registrum Patriarchatus Constantinopolitani* from the manuscripts Cod. Vind. Hist. gr. 47 and 48 (1315–1402) with translation, short commentary and diplomatic glossary (Vol. V supported by the FWF, project P19818-G02).
- The *Dictionary of Byzantine Greek* (9 volumes, 1<sup>st</sup> published in 1994), the first one of this type, contains the complete vocabulary of Byzantine literature.
- *Byzantine Epigrams extant in epigraphs* is a corpus of all Byzantine poetry preserved on frescoes, mosaics, small objects, manuscripts and stone (Vol. 1 and 2 are supported by the ASF, Project P16612-G02 and P20036-G02).
- The project *Byzantine Lead Seals in Austria* supplements detailed descriptions of lead seals with (cultural) historical comments, based on a specially arranged collection of about 35,000 photocopies (partly supported by ASF, Project P15319-G02).
- The Catalogue of Scribes of Greek Manuscripts in the Austrian National Library (subscribed, dated, localized and atelier- or style-specific codices) is based on an already available collection of more than 100,000 photos.
- Diplomatics: Critical edition and commentary of Byzantine documents of the imperial chancellery, of the patriarchate of Constantinople and monasteries as well as of private documents.

- Digital Palimpsest Research
- The series *Tabula Imperii Byzantini (TIB)* comprises descriptions of several regions of the Byzantine Empire accompanied by maps (scale 1:800.000). The volumes contain indices of the names of topographical objects indicated on the maps, denoting also objects mentioned in sources the location of which cannot be ascertained with certainty. The introductory chapters are devoted to topics like geography, climate, administration, history, ecclesiastical history, economy, population, communications, development of settlements, and fortifications. The descriptions derive from the study of sources, but also from surveys carried out in the course of field research.

#### Results for 2006–2007

- Critical edition of the *Registrum Patriarchatus Constantinopolitani*. Supported by the ASF (Project P19818-G02; EKATERINI MITSIOU und J. PREISER-KAPPELLER); started in February 2007 for volume V (1379–1390).
- *Dictionary of Byzantine Greek* under the supervision of E. TRAPP in cooperation with CAROLINA CUPANE, A. RHOBY and ELISABETH SCHIFFER. Fascicle 6 (παλιγγενεσ α–προσπελαχ ζω) was published. In the meantime preparatory work for fascicle 7 has begun.
- Two international symposia on epigrams, diplomatics, and paleography (Digital Palimpsest Research) were organized by A. RHOBY and CH. GASTGEBER respectively, devoted to the topics: *Die kulturhistorische Bedeutung byzantinischer Epigramme* (1<sup>st</sup>–2<sup>nd</sup> 12. 2006) and *Quellen zur byzantinischen Rechtspraxis. Aspekte der Textüberlieferung, Paläographie und Diplomatie* (5th–7th 11. 2007).
- In November 2006 a new project funded by the ASF (P19135-G02) was started. It is concerned with witnesses' signatures in Byzantine private documents.





Fig. 1: Research sector: Seals: Anonymus seal with metrical inscription, 2<sup>nd</sup> half of 13<sup>th</sup> c. (Collection Seibt)

A data base is being set up (supervisor O. KRESTEN; collaborator M. SCHALLER).

- *Byzantine Epigrams from non-Literary Sources*: In 2007 the first volume containing epigrams on frescoes and mosaics was completed by A. RHOBY (ASF-project P16612-G02). Vol. 2 concerning epigrams on small objects is prepared for publication. Supported by ASF (Project P20036-G02) R. STEFEC has started work on epigrams in manuscripts in November 2007 (supervisor: Prof. W. HÖRANDNER).
- ALEXANDRA WASSILIOU-SEIBT continued preparing the 3<sup>rd</sup> volume of *Byzantine Lead Seals in Austria and the Corpus of Byzantine Metric Lead Seals' Inscriptions*.
- LEENA MARI PELTOMAA in November 2007 started the project *The Intercessory Function of Mary as the Original Catalyst for the Cult of Mary in Byzantine Society* (ASF project P20242-G02; supervisor J. KODER)
- In the series *Tabula Imperii Byzantini* the following regions were investigated: *Macedonia, Southern Part* (TIB 11): the documents of the Vatopedi-Monastery were analysed; final editorial work on the entries; short survey of the region in 2006 (P SOUSTAL). – *Eastern Thrace (Eurōpē)* (TIB 12): A. KÜLZER completed the manuscript, the general map (1:800.000), and the special map of the Bosphoros region (1:100.000). – *Bithynia and Hellespont* (TIB 13) K. BELKE prepared entries, among others the more extensive items on Nicaea, Nicomedeia, Cyzikos. During a survey he discovered new settlements and fortresses. – *Caria* (TIB 14): F. HILD continued preparations for this volume. On the peninsula of Halikarnassos (Bodrum) he discovered a section of an ancient road. – *Macedonia, Northern Part* (TIB 16). In March 2006 M. POPOVIĆ started his research work (ASF project P 18866-G02; supervisor J. KODER). Working on archaeological material he engaged in two fortnightly tours to south-

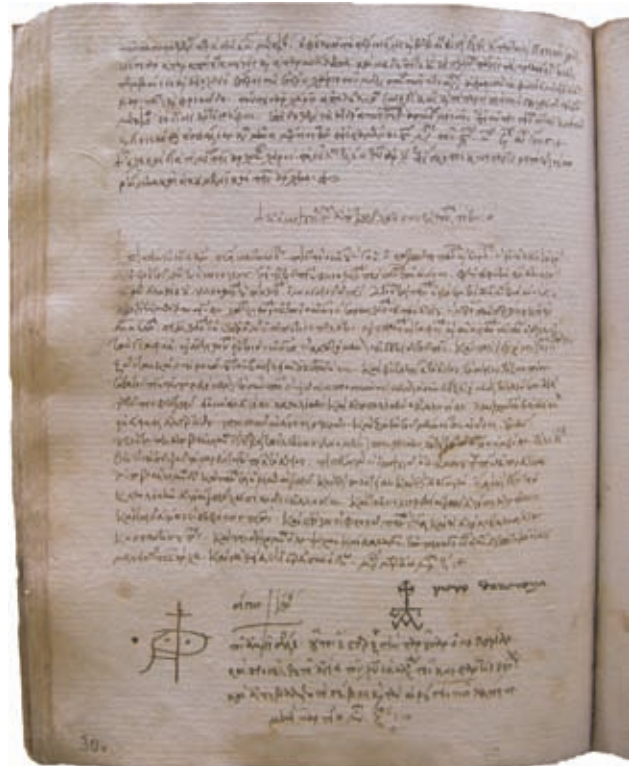


Fig. 2: Research sector: Edition of the *Registrum Patriarchatus Constantinopolitani* (Vo. V): Subscribed confession of the converted Piero da Verona and Ioannes Aminseles from March 1384, renouncing the filioque and the practice of the Latin church. (ÖNB, Cod. Hist. gr. 48, f. 30<sup>v</sup>)

western Bulgaria and FYROM in summer 2007. – The Institute collaborated in a volume concerning the *Northern Part of Syria*, carried out by K.-P. TODT and the specialist of Arabic and Syrian B.-A. VEST (Mainz). The map is prepared in collaboration with the Geographical Seminar of the University of Mainz.

#### Preview for 2008–2009

- Volumes 4 and 5 of the *Edition of the Registrum Patriarchatus Constantinopolitani* will be completed. A glossary for volumes 1–4 is in progress.
- *Dictionary of Byzantine Greek*: preparatory work on volume 7 will be continued.
- 2008 vol. 1 of the edition project *Byzantine Epigrams from non-Literary Sources* will be published in 2008, vol. 2 shortly afterwards; in 2008 the papers of the above mentioned symposium will be submitted for publication,
- Completion of the *Corpus of Byzantine Metric Lead Seals' Inscriptions*.
- As part of the work on *Greek Palimpsests in the Austrian National Library* an extensive study on a fragment of Andrew of Crete will be published.



Fig. 3: Research sector: *Tabula Imperii Byzantini*, Church of Archangel Michael, Katholikon of the monastery in Lesnovo (1<sup>st</sup> half of 14<sup>th</sup> century, FYROM)

- *The Chartulary of Paul's Monastery on Mountain Lattros* with translation, commentary and glossary will be prepared for print.
- In the research sector *Text Transmission and Paleography* the transmission of Demosthenes' speeches from antiquity to the 11<sup>th</sup> century will be investigated (ASF Project Nr. P20049-G02; collaborator: JANA GRUSKOVÁ).
- A data base version of the *Prosopographical Encyclopedia of the Paleologian Era*, corrections and addenda (especially in bibliography), will be prepared in cooperation with the University of Thessalonike (Cooperation partner: Prof. Dr. SOFIA KOTZABASSI).
- *Tabula Imperii Byzantini: Macedonia, Southern Part* (TIB 11): Final review of the completed volume and

production of maps. – *Eastern Thrace (Eurōpē)* (TIB 12) will be published. A. Külzer is to start research on Western Asia Minor (province of *Asia*). Work on the extensive area of "Ephesos" is carried out in cooperation with the Institute for Studies of Ancient Culture of the Austrian Academy of Sciences (SABINE LADSTÄTTER, A. PÜLZ). – *Bithynia and Hellespont* (TIB 13): Completion of the entries and preparation of the introductions. – *Caria* (TIB 14): Work on entries and detailed studies (milestones and roads, the Carian coast on portulans and nautical charts, regional bishoprics). – *Macedonia, Northern Part* (TIB 16): Work on special entries, studies on the toponyms of the Strumica Valley and survey of the western FYROM. – *Northern Part of Syria Nördliches Syrien*: Completion of the volume.

## Institute for Medieval Research

Head: WALTER POHL



### Aims and Functions

The aim of the Institute is to investigate the medieval foundations of Europe. It was in the Middle Ages that Europe was Christianized, that most of the European nations were formed and that fundamental legal and political orders as well as the corresponding discourses and forms of representation were developed. Knowledge was not only passed on but developed, which holds good for many beliefs and narrative patterns that retain their influence to this day. All these elements are part of the complex interdependencies constituting the medieval foundations of the modern world; a topic that so far has not been satisfactorily researched and explained. The old texts may be subjected to many new queries. A fundamental requirement for this undertaking is the production of reliable editions and studies of the sources. Furthermore, through extensive international cooperation new interpretations and descriptions of the manifold aspects of this fascinating age must be undertaken. Consequently, the task of the Institute in studying medieval history involves the documentation, consideration, editing, and analysis of early medieval and early modern sources. The following research projects are planned:

- editing regal charters for the *Diplomata* series of the MGH (currently the charters of Philip of Swabia)
- selecting and preparing the written sources for the *Regesta Imperii* series of the MGH
- collecting, documenting, and editing the medieval and early modern inscriptions in Austria and the South Tyrol
- investigating early medieval sources, their transmission and edition, as well as researches on the history of the early Middle Ages

### Results for 2006–2007

The award of the Wittgenstein Prize to Walter Pohl in the field of *Early Medieval Research* allowed work on a five year research programme “Ethnic Identities in

Early Medieval Europe” (since 2005). How was the development of the states and nations of Europe related to the establishment of Christian ideas and ways of life? Using the abundant source material, researchers are investigating the relationship between “Texts and Identities”. For example, traces of the changes in the meaning of Frankish identity are noticeable in the modifications that Frankish historians made in the course of transmitting texts. Saints’ lives and sermons propagated patterns of behaviour whose meaning can only be understood through careful investigations of their context. With international cooperation, the foundations of the early medieval state have been critically considered.



Fig. 1: Epitaph of Andre Feder († 1499) from St. Stephen's cathedral, Vienna. The restoration through the Bundesdenkmalamt that was undertaken in close cooperation with the inscription work group of St. Stephens, revealed a remarkable diversity of colours.



Fig. 2:  
King Conrad III († 1152),  
ceiling fresco. Work on  
the regesta of the first  
of the Staufer kings is  
finished.

Further projects dealt with the edition of the incomparable collection of original documents from ninth century St. Gallen, the historical ethnography of the Vandals, and with the perception of time in the writing of annals and apocalyptic narratives.

With regard to the project *Edition der Urkunden König Philipps von Schwaben* (1198–1208) for the *Diplomata* series of the *Monumenta Germaniae Historica*, archival research was undertaken in Germany, Belgium, the Netherlands and France to establish the entire charter

tradition. In sum approximately 350 previously unknown copies of the previously known 230 charters of King Philip were added. Together with this research work a critical text with commentaries has been established for more than 70 (almost a third) of the charters of Philip, supplemented by an index of the places, addressees and archival locations of the charters.

The *inscriptions work group* engaged on the dual task of editing and photographing inscriptions, each comprising several individual projects. Currently a major aim concerns the “*Inschriftenlandschaften an der Donau*”, (inscriptions in the Danube region) including St. Stephen’s cathedral, the most important location in Vienna, as well as an ASF-Project on the inscriptions in the city of Krems and the political district of Eferding. Studies in art history examine similar styles in the development of particular types of tombs that characterize the historically as well as culturally close-knit Austrian part of the Danube region. Furthermore, the editions of the inscriptions of the political district of Krems-Land and St. Veit an der Glan were completed. In many federal provinces security photographing is continued aiming at the establishment of an Austrian high-quality pictorial archive (currently about 13,500 photos).

The *work group Regesta Imperii* has continued work on the regesta (summaries) of numerous medieval rulers, Conrad III, Frederick Barbarossa, Albrecht I, Wenzel, Sigismund, Frederick III, and Maximilian I, and published related studies. In 2007 an index of the regesta of Maximilian I and issue 22 of the regesta of Frederick III (HHStA Vienna 1464–69) appeared; the companion part “*Außenpolitisches Handeln im ausgehenden Mittelalter. Akteure und Ziele*” and the large regesta

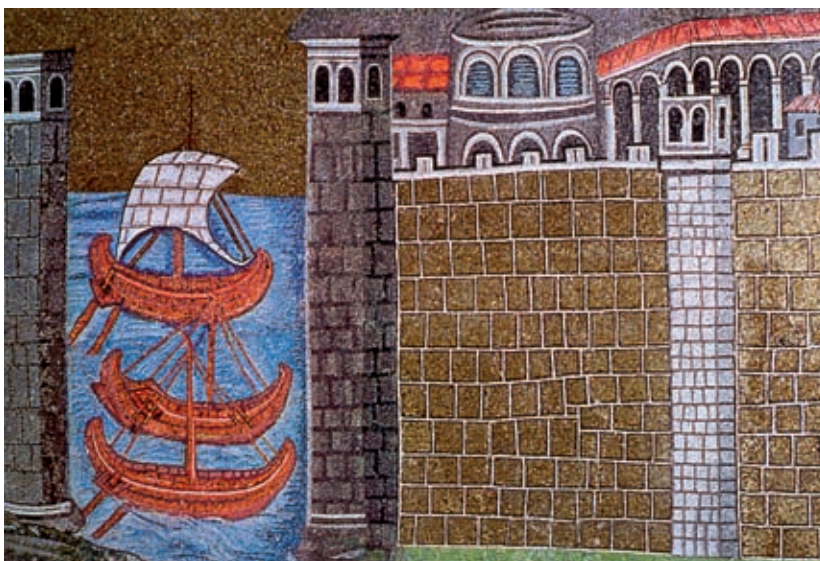


Fig. 3:  
The harbour of Classe, Mosaic in S. Apollinare  
Nuovo, Ravenna, 6<sup>th</sup> century. The transforma-  
tion of Roman Europe through its Christianiza-  
tion and the establishment of new kingdoms is  
an important early medieval research topic.

volume of Conrad III are completed. A new project on the political structure of Roman-German royalty in the 12<sup>th</sup> century was begun. The pilot project of the regesta of Sigismund, commenced in 2004, has already elucidated many aspects of the rule of Sigismund in Hungary, in Bohemia and in the Empire. All the completed regesta volumes have been incorporated in the Regesta Imperii Online, available in open access on the internet.

In the Institute's publication series "Forschungen zur Geschichte des Mittelalters" the following volumes have appeared: "Staat im frühen Mittelalter", "Epigraphik 2000" and "Texts and Identities". Conferences at the Institute ranged from "Archäologie der Identität", "Ego Trouble" (considering the individuality of medieval authors), "Staat und Staatlichkeit im frühen Mittelalter", and "Inschriften zwischen Mittelalter und Neuzeit" to a symposium "Mensch und Schrift" at St. Gallen and a conference on the Emperor Sigismund in Brünn.

#### **Preview for 2008–2009**

On the occasion of the 800<sup>th</sup> anniversary of the death of Philip of Swabia an international conference to be held in May 2008 will consider his personality and self-

awareness as well as his relationship to the divided parties of the "Deutscher Thronstreit", partisanship and changing commitments, and the possibilities of regulating and mediating conflicts.

A follow-up project to the "Inschriftenlandschaften an der oberen Donau" terminating in autumn 2008 is being planned with particular emphasis on interdisciplinary research on workshop interacting between different regions. Having produced several publications, the externally-funded project for the regesta of Sigismund and Frederick III will be completed; here too follow-up projects have been submitted in order to continue the highly promising work. In early medieval research the exegesis of the Old Testament and its significance for the formation of early medieval identity will receive special emphasis. "Forschungen zur Geschichte des Mittelalters" will be continued with the following volumes, "Das Reich der Vandalen", "Archäologie der Identität", "Vergangenheit und Vergegenwärtigung" "Zwischen Niederschrift und Widerschrift" and "Ego trouble". From the multiplicity of individual studies a new overview of the meaning of ethnic identities in the European Early Middle Ages should be gained at the end of the Wittgenstein project, 2009/10.

## Institute for the Material Culture of the Middle Ages and the Early Modern Period

Head: ELISABETH VAVRA



### Aims and Functions

The Institute is concerned with research on the everyday life of the Middle Ages and the Early Modern Age on the basis of an analysis of material culture. In this way it concentrates on the multiple contexts and connections between human beings and objects, and the semiotic patterns arising from them. The sources for this research are material evidence, pictures, and texts; their variety – e. g., panel paintings, poetry, applied literature, archeological finds – requires interdisciplinary approaches that are reflected in the different disciplines represented by the institute's staff.

A central aim of the Institute is the systematic documentation of the sources of everyday life in the past.

Particular emphasis is laid on photographing artefacts and visual sources and their cataloguing in the interdisciplinary database REALonline, a basis for the analysis of various cultural historical issues. At present one of the Institute's central projects "Living Spaces and the World of Things", has concentrated on space-related and object-bound structures of quotidianity. The research field "Signs – Actions – Meanings" has dealt with cognitive patterns, combinations of signs and actions in everyday life. The transdisciplinary project "Virtual Mediation" aims to inform a wider public about the results of specialised research in a comprehensive and up-to-date way. This is carried out in cooperation with the Austrian Ministry of Education and educators at museums.



Fig. 1:  
Annunciation, painted wing from the "Geschlechtwunder-Altars", Sebastian Taig, 1518 (Nördlingen, Stadtmuseum).

### Results for 2006–2007

The photographic documentation of artefacts and visual sources in Bavaria was continued. Having examined the material in the Historical Museum at Ratisbon its activities in the Upper Palatinate could be finished and the team went on to Franconia. For the analysis of the documented material the Institute has used the image database REALonline, which can be consulted on WWW since 2001. A newly implemented interface facilitates use of the database for untrained users.

The documentation of written sources concentrated on the edition of late medieval testaments. The third volume of the “Town-Books” from Vienna (1406–1411) containing mainly last wills was published. The transcriptions for the fourth volume (1412–1417) could be finished. The edition of the late medieval testament-books from the town of Korneuburg has commenced. The project “Spaces of Living and the World of Things” focussed on detailed analyses concerning roads and castles. In the planning phase of the project “Housing Cultures in the Middle Ages and the Early Modern Period; Artefacts – Functions – Structures” examinations were made of the relevant source material held in Austrian archives. Legacy inventories in particular proved valuable as regards the use and furnishings of rooms. Medieval noble estates of the eastern part of Austria have been documented in the “Lower Austrian Castle Database”. It will serve for an analysis of concepts of interior as well as exterior design in upper class society. As a result of the documentation of Lower Austrian castles the volume for the region “Mostviertel” could be brought out. The Institute has taken part in two EU projects that aim at documenting all medieval castles of the Rhine-Danube-area. Results of various source analyses in the project “Signs – Actions – Meanings” were presented at numerous international conferences. Late medieval supplications to the Holy See were used as a basis for research into daily life. Pictorial and textual sources were investigated to demonstrate gender-specific behaviour.

As part of the interdisciplinary project “Virtual Mediation”, and in cooperation with the Austrian Ministry of Education, learning modules for schools were developed. The module “Image narratives: the Altarpiece of St. Wolfgang” contains an interpretation of the images on the winged altarpiece of St. Wolfgang in Upper Austria in two versions for different school levels. The Institute has also participated in the European Union-project “Metadata Ecology for Learning and Teaching” (MELT), which is part of a strategy of the European School-Network (EUN) promoting the international



Fig. 2: Table with low relief ornament, bench with swivelling back (detail of the Annunciation).



Fig. 3: Hourglass with dial (detail of the Annunciation).



Fig. 4: Georg Heidt, the so called "poor Lazarus" (epitaph, 1628. Schwabach, Spitalkirche).

exchange of teaching-resources for schools and ministries of education.

The Institute continued its organisation of international events with the congress on "Old Age Cultures of the Middle Ages and the Early Modern Period" (2006) and the round table-discussion "The World of the Road" (2007). Three new volumes were published in the series of the Institute.

#### Preview for 2008–2009

Current projects in the documentation of sources will be continued. The photographic campaigns will concentrate on Franconia. The fourth volume of the Vienna "Town-Books" (1412–1417) will be published and the transcription for the fifth volume (1418–1424) is to be completed. The development of the image database will open access to REALonline and, connected with it, the "Middle High German Subject Database" (at the Interdisciplinary Centre for Medieval Studies at the University of Salzburg). The Motif-Index that was transferred to the Institute in 2005 will be finished with the publication of an index of cultural keywords. Studies on the "Material Comfort in the Medieval Way of Life" will concentrate on the analysis of castles, the arrangement and design of rooms and furnishings. A special subproject will deal with the function and design of tiled stoves in noble houses.



## Commission of Paleography and Codicology of Medieval Manuscripts in Austria

Head: OTTO KRESTEN



### Aims and Functions

The main research goal of the Commission of Paleography and Codicology of Medieval Manuscripts in Austria is the scientific classification of the estimated 20,000 medieval manuscripts in Austrian libraries. The importance of medieval manuscripts as research sources for all historical disciplines such as literary and philological studies, theology, history and art history is undisputed and has led to cataloguing and publishing projects in nearly all countries with an appreciable number of medieval manuscripts.

Cataloguing projects are mainly carried out within the range of two project groups which are largely financed or co-financed by the Austrian Science Fund (ASF). The catalogues of the project group “Generalkataloge österreichischer Handschriftenfonds” (general catalogues of Austrian manuscript libraries) provide detailed information about content, codicology, history and illuminations of all manuscripts in a collection (at present cataloguing projects are under way at Innsbruck, Klosterneuburg, Kremsmünster, Melk and Nonnberg), while richly illustrated catalogues of the project group “Illuminierte Handschriften und Inkunabeln in österreichischen Bibliotheken” (illuminated manuscripts and incunabulas in Austrian libraries) aim first and foremost at describing such manuscripts and early prints that contain figural and/or non-figural designs.

Research results are published in the series “Veröffentlichungen der Kommission für Schrift- und Buchwesen des Mittelalters” ([http://www.ksbm.oeaw.ac.at/\\_k3.htm](http://www.ksbm.oeaw.ac.at/_k3.htm)). Additionally the Internet is increasingly used for the publication of large numbers of pictorial material from medieval manuscripts.

### Results for 2006–2007

Project group “Generalkataloge österreichischer Handschriftenfonds”: Within the scope of this project group two research projects were completed: 2006 saw the

publication of the catalogue on medieval manuscripts in the Franciscan monastery at Graz and in 2007 the results of the project “Texts related to the University of Vienna from 1365 to 1500” (description of manuscripts at Klosterneuburg and Seitenstetten) were put on the commission’s website.

Project group “Illuminierte Handschriften und Inkunabeln in österreichischen Bibliotheken”: By the end of 2007 the catalogue of illuminated Turkish manuscripts held at the Austrian National Library was brought to print. Cataloguing of about 550 Austrian and South-German illuminated manuscripts dating from the first half of the fifteenth century was continued. Especially



Fig. 1: Prayer book for Friedrich III.: Trinity. Miniature by Martinus Opifex. Vienna, 1447/48  
(Wien, Österreichische Nationalbibliothek, Cod. 1767, 267v)



Fig. 2.: Bible (Straßburg, Mentelin, 1466), 168v: Banquet of the sons of Job. Tyrol, soon after 1466 (Wien, Österreichische Nationalbibliothek, Ink 3.C.6, 168v)

remarkable among the manuscripts of Austrian provenance are show-pieces which were ordered by Emperor Friedrich III (1452-1493) (Fig. 1). Other research projects which are carried out at the Austrian National Library are dedicated to the richly illustrated manuscripts of King Wenceslas IV and his court and to the entire illuminated incunabulas (Fig. 2). – Work on the first volume of the “Illuminated manuscripts of Graz University Library” covering the period from about 1400 to 1550 was completed by the end of 2007. The German Bible Cod. 48 illuminated by Ulrich Schreier has to be regarded as one of the highlights among the manuscripts of this volume. – In the years 2006/2007 cataloguing illuminated manuscripts and incunabulas of the late-gothic period was continued at the Oberösterreichische Landesbibliothek at Linz. On account of these activities some hitherto unknown cimelia were discovered. – The results of the projects mentioned above were presented at the international workshop “Buchmalerei in Inkunabeln” held in September 2007 in cooperation with Vienna University.

Further activities: In 2005 the 15th Colloque du Comité International de Paléographie Latine on “Régionalisme et Internationalisme: Problèmes de Paléographie et de Codicologie du Moyen Âge” was organized by the Commission of Paleography and Codicology

of Medieval Manuscripts. The papers of the Colloque will be published in 2008. – Since September 2006 the Commission has participated in the EU-Project “Bernstein – The Memory of Papers. Collaborative systems for paper expertise and history”. – In December 2006 the exhibition of watermarks “Ochsenkopf und Meerjungfrau. Wasserzeichen des Mittelalters” – resulting from the cooperation between the Commission and the Hauptstaatsarchiv Stuttgart – was opened at the Hauptstaatsarchiv Stuttgart. Until now this exhibition has also been shown at Vienna, Fabriano and Rome. – In 2007 the eight volumes of the “Katalog der datierten Handschriften in lateinischer Schrift in Österreich” were scanned and adapted for the Internet in cooperation with the Austrian National Library. Henceforth descriptions of dated manuscripts as well as pictures will be published exclusively via the Web.

#### Preview for 2008–2009

2008/2009 several volumes will come out in the series “Veröffentlichungen der Kommission für Schrift- und Buchwesen”: including the fifth volume of the manuscript catalogue of Innsbruck University Library, the catalogue of Latin manuscripts at the Benedictine Abbey at Nonnberg, the catalogue of German manu-

scripts of the fifteenth and sixteenth centuries at the Benedictine Abbey Melk and two volumes of the catalogue of illuminated manuscripts and incunabulas of the Austrian National Library (Turkish manuscripts as well as Austrian and South-German manuscripts of the period 1400/1450). Furthermore the first volume of the catalogue of illuminated manuscripts at

Graz University Library and two art historical monographs will be published ("History buech reimenweis. Geschichte, Bildprogramm und Illuminatoren der Willehalm-Trilogie König Wenzels IV. von Böhmen" [Cod. Ser. n 2643]; also „Die Handschriften des Lehrbüchermeisters sowie die österreichische Buchmalerei der Spätgotik“).

## Centre for Research on Modern and Contemporary History (CMC)

### Commission for the History of the Habsburg Monarchy

Head: HELMUT RUMPLER



#### Aims and Functions

The main task and top priority of the work of the Commission is the study of the history of the Habsburg Monarchy in the era of Francis Joseph (1848–1918) and the scientific presentation of its results in a compendium based on international cooperation. Up to now eight volumes (the latest, vol. VIII on “Political Public Opinion and Civil Society” appeared in 2006) have been published. Three further volumes are in progress or in planning: “Social Structures”, “Culture and Civilization”, “The First World War and the reorganization of (East)Central Europe”.

In addition to and in continuation of the results of its previous work, the Commission is pursuing the following projects: “The members of the Austrian/Cisleithanian Parliament 1848–1918. Keydates for the history of political elites in Habsburg (East)Central Europe”;

“Elections to the Austrian/Cisleithanian Parliaments 1848–1911”; and “Joseph Alexander von Helfert. His diaries, memoirs and political correspondence”.

In engaging a team of 25 to 35 scholars from different European and non-European countries for each volume, the Commission acts as a primary centre for “Habsburg studies”, a scientific field well established far beyond the republic of Austria. In analyzing central themes of the conflict-ridden history of (East)Central Europe, for example “The Nationalities of the Habsburg Empire” (1980) or “Constitution and Parliamentarism” (2000), the Commission has succeeded in making a significant, internationally acclaimed contribution to a discussion which also touches on the process of European unification.

#### Results for 2006–2007

The completion of the project “Political Public Opinion and Civil Society”, which forms part of the series “The Habsburg Monarchy 1848–1918”, formed the centre of the Commission’s activities. Two volumes, namely “Political Public Opinion and Civil Society, Part 1: Associations, Parties, and Bodies representing Interests as Agents for Political Representation” and “Political Public Opinion and Civil Society, Part 2: the Press as a Factor for Political Mobilization” were presented to the public in the autumn of 2006. Examining associations, parties and newspapers of local importance or transcending nations and regions in the Habsburg Monarchy, 43 scholars from 11 different countries have assessed the question of the degree of and the potential for democratization in (East)Central Europe, an area in which the social and cultural development varied to a great extent. They tried to weigh the influence of these associations and newspapers which – although competing with one another – were at the same time closely interrelated, and also disclosed systems of communication. Thus new dimensions of the political process have been revealed. The development of political public opinion



Fig. 1: Reading newspapers in a coffee-house around 1900. After the introduction of constitutional provisions the “common man” was expected to have a say in politics, although only if his opinion would be an “informed” one. Gaining information by reading newspapers conformed to the liberal demand for education, it was the basis for political public opinion.

which resulted in the “politicization of the masses” took place in milieus situated outside and beyond the world of politics organized by political elites. These milieus were dominated by associations and local organizations and maintained by a communications-system of a primarily local press (Fig. 1). In summing up the two parts of this volume, it is fair to say that on the troublesome road from constitutionalism to mass-democracy the Habsburg Monarchy was certainly not in the lead among the European states, but also did not bring up the rear. It is true that the course of “conservative modernization”, a fundamental explanatory model followed by the Habsburg Monarchy, retarded the otherwise vehement development of political public opinion but did not prevent political mobilization from spreading to the most backward parts of the crownlands. It thus laid the basis for a tradition of civil society that, in spite of the dramatic upheavals of the last century, has maintained its influence up to the present day.

The edition of the thoroughly revised German version of the book by Jiří Kořalka “František Palacký (1798–1876). Historian of the Czechs in the Austrian multinational Empire” – part of the series “Studien zur Geschichte der österreichisch-ungarischen Monarchie” – was completed. At the awarding of the Anton-Gindely-Prize to the author the book was presented to the public in the autumn of 2007 (Fig. 2).

### Preview for 2008–2009

Work on the volume “Social Structures” has been delayed for reasons which repeat themselves periodically (dilatatoriness of authors and the necessity to assign absolutely indispensable themes to new authors). Notwithstanding, up to the end of 2008 all manuscripts are expected to be in; editorial work has already begun on those that have been submitted so far.

On account of a methodically necessary extension of the programme to 90 maps, completion of the volume “Thematic Maps on Administrative, Social and Economic Structures of the Habsburg Monarchy”, originally planned as an additional supplement and support for the volume on “Social Structures”, had to be postponed until 2008. The final workshop, which took place in October 2007 under active participation, resulted not only in a number of corrections in detail but also led to suggestions that are very valuable on material grounds, the realization of which will however take another year. The processing and editing of contemporary statistical data, as well as their presentation in the form of maps, breaks new ground because – as far as Austria is concerned – there is nothing to draw on, either with respect to thematically specific social



Fig. 2: František Palacký and his son-in-law Ladislav Rieger, Austrian National Library, Picture Archive.

Palacký was one of the most influential European historians of the 19<sup>th</sup> century. He created the Czech conception of history, still influential until today, by showing that in the past the “Češi” (Bohemians and at the same time Czechs) had been an important element in the family of European nations and that in the future they would claim their place as a nation in their own right. But he was also a Czech Austrian, an advocate of the idea of the Austrian multinational empire and an adherent to a federalist order in (East)Central Europe.

statistics or to preliminary works of historical cartography (Fig. 3).

A first round of editing the texts of volume IX/1 “Social Structures” (without bibliography and indices) will mainly be finished by 2008–2009, volume IX/2 “Thematic Maps” will be going to the press in 2009.

In cooperation with Austrian and foreign experts preparatory work on the conception of volume X “Culture and Civilization” will be brought to an end in the course of 2008 whereupon authors for the various chapters will be recruited. Owing to the present state of research on the thematic field of “material civilization” (Alltagskultur) a specific research programme will be



formulated and young scholars will be internationally invited to apply for a grant under a DOC-programme. Within the scope of the project “The members of the Austrian/Cisleithanian Parliament 1848–1918. A Collective Biography” first results have been presented as regards the changing social composition of Parliament, continuity or changes within that body, its network, as well as the political status of the members of Parliament. A data bank containing information on more than 3,500 parliamentarians and filling more than 10,000 pages forms the basis for further research. These studies will result in a “Biographical Handbook of the Members of the Austrian/Cisleithanian Parliament 1848–1918”, which is in preparation.

The renewed revision of the manuscript on the militia in Croatia-Slavonia by Catherine Horel/Paris has been finished (including bibliography). After minor

improvements and the production of the indices the manuscript will be ready for press by 2008. The book draws on a large number of contemporary sources and offers – apart from a discussion of the Hungarian-Croat conflict – a valuable contribution to the social history of the military.

The University of Cluj/Napoca, Faculty of Foreign Languages, German Department, proposed to the Commission to translate a selection of contributions to “The Habsburg Monarchy 1848–1918” into Rumanian. The conception for a textbook-edition of volumes I–VII and the financial procedure for the implementation of the project are still to be worked out. In view of the difficulties arising from the production of a 2-volume German manuscript serving as basis for the translation an outline devised by the Commission is under consideration.

## Historical Commission

Head: ARNOLD SUPPAN



### Aims and Functions

Thematic relevance, innovation, and an international dimension determine the activity of the Historical Commission in its three main centres of research. This is primarily the result of the acceleration of processes of integration and globalization that are increasingly narrowing the sovereignty of nation-states and challenging the traditional national paradigms which oriented historiography. The focal concern entitled “Die Höfe des Hauses Österreich” is thematically, institutionally, and organisationally closely connected to the European debate about “absolutism”, leading to a fundamentally new understanding of power and the state- in the early modern period. A global discussion comprehends the second centre of research: “Die internationalen Beziehungen in Europa im Kalten Krieg”. International research into empires, conducted principally in the Anglo-Saxon world, has suggested the third focal point “Kontinentale europäische Imperien im Vergleich”. These main concerns promise – also as a counterpoint to the traditional history of relations between states – insights into various structures of “international” politics.

Of great importance is the use of new source material. This applies equally to current and planned editorial projects as to individual research initiatives that will be concluded with book-length studies.

The orientation of the Historical Commission toward and beyond the German-speaking world derived from the presentation of research results at international conferences at home and abroad, from lectures by international experts invited to Vienna, and not least from a “mailing list” open to all interested parties for unrestrained intellectual exchange.

Beyond its three main areas of interest, the Wissenschafteraustausch (exchange of scholars) enabled the Historical Commission to maintain its international contacts. The lecture series “Werkstatt Geschichte” has likewise been continued. As in earlier years, it is

intended to allow younger researchers to present intermediate results of their work for discussion.

### Results for 2006–2007

A) The thematic focus “*Die Höfe des Hauses Österreich im Spannungsfeld von ständischer Mitbestimmung und europäischer Großmachtpolitik, 1550–1850*” treats central questions raised since the 1990s in the international discussion about “absolutism”:

*Edition of the reports of the Venetian envoys to the imperial Court during the first years of the reign of the Emperor Rudolf II (1576/77):* The reports provide insights into the confessional and political conditions of the individual Habsburg territories at the time of the inauguration of the new ruler.

*Edition of the correspondence of the office of the papal nuncio in Graz (1599–1602):* The project concentrates on the process of re-Catholicization in the Inner Austrian lands around 1600. These regions were the main points of the Counter-Reformation soon implemented in all Habsburg territories. As a capital and residence, Graz was, together with Prague (and more so than Vienna), a Central European political focus.

*Dominationn and political culture in the Habsburg Monarchy: Court, Estates, and Government in Lower Austria ca. 1648–1848:* This project concentrates on central early modern processes of state-building: taxation and military administration. How did the sharply increasing costs of war influence the relationship between central and local authority in one of the monarchy’s central territories, Lower Austria? To what extent were aristocratic and ecclesiastical elites mobilized towards the implementation of state-authority? How did this relationship change in the course of time? How were decisions made at the centre of power implemented in the countryside? The following volume is an initial result of this work: Gerhard Ammerer, *William D. God-*



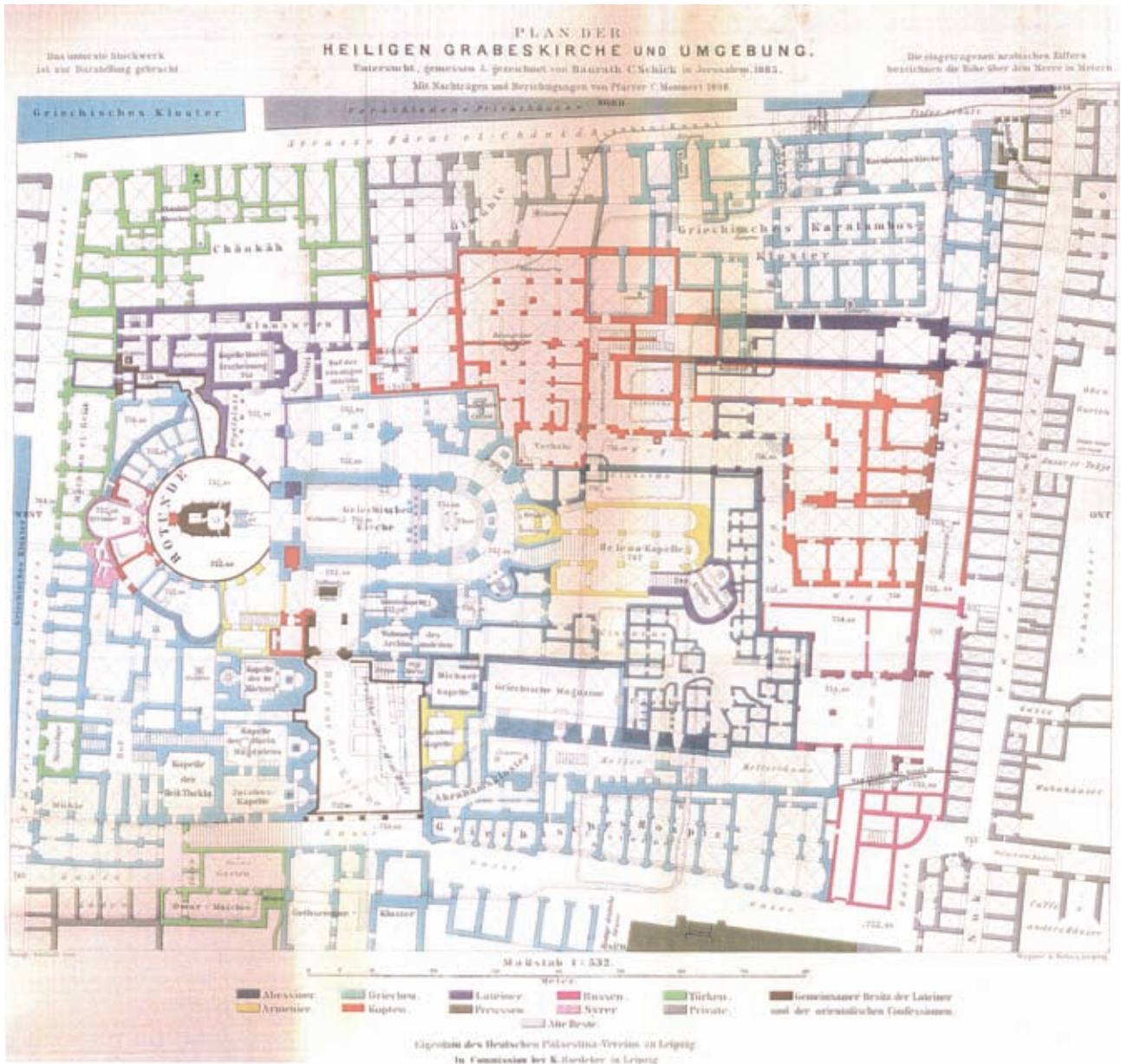


Fig. 1: Layout of the Church of the Holy Sepulchre in Jerusalem (taken from: F. v. Verdy du Vernois, Die Frage der Heiligen Stätten Palästinas [Berlin 1901]). The so-called “question of the Holy Sites” had its origins in conflicts about property relations of the various confessions, as shown in the Church of the Holy Sepulchre in Jerusalem. The continual “squabbling of the monks” often had diplomatic ramifications of global dimensions.

sey, Jr., Martin Scheutz, Peter Urbanitsch und Alfred Stefan Weiß (Hgg.), *Bündnispartner und Konkurrenten der Landesfürsten? Die Stände in der Habsburgermonarchie* (2007).

*Careers in the Kingdom of Hungary: New Requirements and Old Practices in Enlightened Absolutism*

Questions of the social background, education, recruitment, and careers of Hungarian administrative officials in the second half of the eighteenth century concern this project. These officials were not merely passive sub-

jects, but active participants in changes usually understood as “reform from above”.

Additionally, the “Arbeitskreis der Höfe des Hauses Österreich” organizes annual workshops, the results of which have been or are being published.

B) Comparison between continental European empires

An original contribution to the international global discussion on empires has not been feasible. Several of the otherwise acceptable contributions to the planned volume



D) Several other publication projects approached completion in the period under consideration. Of particular interest in this context is: *Arnold Suppan, Besatzung, Vergeltung, Erinnerung. Deutsch-tschechoslowakische und deutsch-jugoslawische Konfliktgeschichte im und nach dem Zweiten Weltkrieg.*

#### **Preview for 2008–2009**

Apart from running projects and lecture series and workshops the Historical Commission is planning the following events for the coming years:

- September 2008: Co-organizer (in collaboration with the Commission for the History of Art) of the 11<sup>th</sup> Symposium of the Residenzenkommission of the Academy of Sciences in Göttingen with the theme: “Vorbild, Austausch, Konkurrenz. Höfe und Residenzen in der gegenseitigen Wahrnehmung”.
- October 2008: As part of the study group “Die Höfe des Hauses Österreich,” co-organizer (together with the University of Budweis) of the workshop in Krumau on the theme “*Ein Bruderzwist im Hause Habsburg*”.
- 2009: Workshop as part of “Die Höfe des Hauses Österreich” (together with the research project on the history of the Residenz in Salzburg): “*Höfe und Residenzen geistlicher Fürsten*”.
- Oktober 2009: Vienna: international conference on the occasion of the *20th anniversary of the East European revolutions of 1989* (together with the University of Hildesheim and the BMEIA).

## Austrian Biographical Encyclopaedia and Biographical Documentation

Head: HELMUTH GRÖSSING



### Aims and Functions

The Institute's main area of research, in accordance with the directions of the Austrian Academy of Sciences, is the publication of the Austrian Biographical Encyclopedia, covering the period from 1815 to 1950. As far as the scientific engagement and its orientation are concerned, this Encyclopedia can be regarded as the most important Austrian biographical dictionary of the 19th and 20th centuries and is also internationally classified on these terms.

The continuation of the Encyclopedia, covering the years from 1951 to 2000, which is a matter of particular interest not only for Austrian historiography, has been scheduled for a long time and is accordingly prepared through the collections of material and datasets in the Institute's database, ÖBLDOC.

Future perspectives and the modern state of lexical biographical research require digitalization and online release of data on Europe's cultural heritage, (as stipulated in the EU "Lund Declaration"), which ÖBL had to consider when it assigned priorities. As a result, the initial online publication contains the complete digital index, accessible free of charge, as well as volumes 1–10 (fee required). Besides improvements on the printed edition of the Encyclopedia, the Institute is also engaged on additions and supplements as well as on selected anticipations, (letters T–Zz), which are to constitute the electronic version of the Encyclopedia, (e-cross line), and will be offered online.

The Austrian Jewish Biography (ATJB), initiated in 1989 by the Institute for the History of Jews in Austria and prepared by Anna L. Staudacher, has been continued since 1996 at the Institute under the title "Austrian Jewish Biographical Encyclopedia". As sources are systematically examined for this encyclopedia, it also offers basic research on Jewish social history in the Austro-Hungarian empire. The ATJB is primarily a biographical encyclopedia, the criterion for inclusion is Jewish birth, a Jewish mother. The geographical scope

is determined by Austria's historical borders, with an emphasis on the years 1782 to 1914, the period from the emancipation to the end of the monarchy.

### Results for 2006–2007

The Austrian Biographical Encyclopedia comprises individuals of exceptional accomplishment who were born and lived or worked on Austrian territory and deceased between 1815 and 1950. In this way a representative cross section of Austrian society in this period is established. Currently the listing has advanced to "Staudigl Joseph, the elder".

In 2006 the 59th issue was finished and work on volume (13) thirteen was begun. The issues published so far contained 17,498 biographies and numerous short biographies.

#### *Projects and main research*

Besides its biographical lexical and editorial work, the Institute intends to classify the published and aggregated data under different topics, where the focus has been on regional provenance as well as on migration and exile, musicology, history of science, educational background and career. These results are manifested in the ÖBL-series, of which volume 10 has lately been published.

#### *Exile and Emigration Research*

This project is intended to investigate Austrian and German emigration during the NS period from a biographical aspect. It is also concerned with organisations that aided escape and which served as identifying missions abroad in addition to offering social and charitable support.

#### *Historical-biographical musical research*

As a comparison with current or completed studies shows, the application and use of heuristic techniques developed by the Austrian Biographical Encyclopedia for biographical work in the fields of music and thea-

tre have so far not been fully accepted. The project is to engage in the propagation of practices and methods especially as regards the obtainment and analysis of source material.

#### *Biographical research on economic history*

The history of science is investigated in two institutions in Austria: the Austrian Association for Economic History (ÖGW) and the Commission for the History of Science, Mathematics, and Medicine of the Austrian Academy of Sciences. The former intends to cooperate with the Academy and in particular with the Austrian Biographical Encyclopedia in the future. For this reason the Institute has introduced a project on the history of science with special regard to the biographical perspective into its research activities.

#### *ATJB – Austrian Jewish Biography: Edition of sources, biographical collection – Encyclopedia*

The research programme ATJB combines a number of individual projects; the databank ATJB-Lexikon functions as an index that can provide biographical references for the editions of sources.

#### *Digital Register – e-Transversale – e-OEBL*

The analysis of the contents of the collected material in the printed and in the online Encyclopaediae from historical, sociological and supranational perspectives is another major concern of the Institute.

The prerequisite for this research work is the “digital index” which has been online since 2003 and allows prompt access to the data stored in the print medium. After the entire biographies have become electronically available, (volumes 1–10), individual biographies will be inserted into the so called e-cross line (“elektronische Biographien A–Z”).

In cooperation with the Bavarian Academy of Sciences, historical commission, “new german biography” (NDB) and the Bavarian National Library a joint biographical portal is planned which will render the data of ÖBL, NDB (Neue Deutsche Biographie) and ADB (Allgemeine Deutsche Biographie) accessible online on an EU-domain. In the future work on the printed as well as on the online versions of the Encyclopedia will be supported by the “new information management system” (e-OeBL). Work on its basic module has started in 2006, its completion is scheduled for 2007. The entire project is to finish in 2009.

#### **Preview for 2008–2009**

The years 2008–2009 will be mainly dedicated to the completion of ÖBL issues 61 and 62, covering 75 per-



Fig. 1: Detail of Johann Knapp, Jacquin's Monument, Vienna 1821. Österreichische Galerie, Belvedere, Vienna.

The more than two metres high portrait was displayed on 26 October 1821, the fourth anniversary of Nikolaus von Jacquin's death, in the “alte Universitätssaal”, (today the home of the Austrian Academy of Sciences, Dr. Ignaz Seipel-Platz 2, Vienna I). The outsize picture was commissioned as a monument of a great scientist, but also as an act of homage to the science of botany. Each plant in the picture represents a biography and was in each case named after an important scientist.

cent of volume 13 of the Encyclopedia. In addition to its biographical-lexical and editorial engagements, the Institute will be concerned to evaluate the published as well as the collected data from a functional point of view.

In this connection, the main topics, besides the regional and biographical themes, will be migration and exile, musicology, history of science, as well as educational background and career. The results appear in “Schriftenreihe des ÖBL”, of which volume 10 (Daniela Angetter, Gott schütze Österreich. Wilhelm Zehner. 1883–1938. Porträt eines österreichischen Soldaten) has been published lately.

In 2008 volume 11 of “Schriftenreihe des ÖBL” will be brought out (Elisabeth Lebensaft – Christoph Mentzschl: Are you prepared to do a dangerous job?). For the year 2009, further publications are scheduled, currently prepared by staff members of the Institute.

Besides work on the printed edition of the Encyclopedia, the analysis of the collected material in the printed and electronic editions from historical and supranational perspectives will be another focal point of the Institute.



Fig. 2: Under the title "Are you prepared to do a dangerous job?" the participation of a group of Austrian and German exiles in the activities of the British Secret Service Special Operations Executive (SOE) is investigated at the Institute. The study is to shed light on the escape to Britain, recruitment by the SOE, training and deployment in Austria in 1945, and subsequent activity with the British occupation troops. The picture shows the last survivor of the mission "Historian", Captain Frank Kelly as an officer of the British Army of the Rhine in Germany.

The prerequisite for this work is access to the "digital index" (published online in 2003), which allows a speedy search of all data contained in the printed edition. After electronic availability of the complete biographies as pdf-files, (volumes 1–10), individual biographies will be posted in the so called "e-cross line". In order to assure full digitalization and the capacity for integral linking of volumes 1–10, these volumes will be re-written in 2008.

In the future work on the printed as well as on the on-line versions of the Encyclopedia will be supported by the "new information management system" (e-OeBL). Work on its basic module has started in 2006, its completion is scheduled for 2007. In the years 2008–2009 the last components of this system are to be generated and will be available internally as well as semi externally.

## Commission for Austrian Legal History

Head: WERNER OGRIS



### Aims and Functions

The primary concern of the *Commission for Austrian Legal History* (KRGÖ) is research into the legal history of Austria and its neighbouring countries in the larger context of the development of European law. By editing and publishing historical documents, following the methods of both historical and legal science, it carries out basic research relevant not only to legal history, but to many arts disciplines and social sciences, from art history and economic history to folklore. The Commission aims to develop the long-established field of legal history in the direction of a multi-disciplinary and independent science between legal and historical studies, nationally and in international co-operation. Current partners include the Austrian State Archives (Vienna), the Academy of Sciences (Göttingen), the Case Law Academy (Amsterdam), the Hungarian Academy of Sciences (MTA) Budapest, the Institute of Legal History at Charles University (Prague) and the Municipal Archives (Bratislava). In this regard the KRGÖ can fulfil scientific and organizational tasks which cannot be met by the corresponding institutes at Austrian universities.

The series *Fontes Iuris*, section 3 of the ÖAW series *Fontes Rerum Austriacarum*, is the principal organ for the KRGÖ's publications. It comprises editions of significant sources of Austrian legal history from early medieval up to modern times. So far both normative texts like municipal statutes, *Weistümer*, early modern criminal laws and civil orders (*Polizeiordnungen*) or *guild bylaws*, and pragmatic texts of judicial life such as court records or collections of wills have been edited in the series.

In addition to the continued publications of source material, the KRGÖ's activities increasingly include the organization of symposia, the supervision of research projects and the launching of an internet forum on legal history. Such engagements as the reviewing of publications and grant applications, the hosting of guests

and exchange partners et al., which have already been important in the past, may be expected to increase further in the future.

### Results for 2006–2007

In 2007 the KRGÖ's process of reorientation was continued by setting up one, and subsequently two, positions for research assistants for engagements formerly carried out under temporary work contracts or on an honorary basis.

Most notably, work on the *Fontes Iuris* has intensified considerably. In 2006, the third volume of the *Wiener Stadtbücher (1406–1411)* (vol. 10/3 of *Fontes Iuris*) was published. At the end of 2007, Thomas Winkelbauer's voluminous *Gundaker von Liechtenstein als Grundherr in Niederösterreich und Mähren* was accepted by the *Publications Commission of the Austrian Academy of Sciences*; it will go into print in the first half of 2008. Two further editions, H. Feigl's *Maissauer Urbare* and W. Platzgummer's *Das Verhörprotokoll des Inquisiten Johann Georg Grasel*, are prepared for submission to the *Publications*



Fig. 1:  
The publication of sources of legal history in the series *Fontes Iuris* is the primary concern of the KRGÖ. The picture shows vol. 3 of the Viennese municipal record books (1406–1411), published in 2006 (*Fontes Iuris*, vol. 10/3, Wien: Böhlau 2006)  
© Böhlau



Fig. 2: The records of the Imperial Aulic Council in the *Austrian State Archives*: scarcely catalogued until recently  
© Michael Göbl, Haus-, Hof- und Staatsarchiv

*Commission and the Austrian Science Fund (FWF).* During the period, work continued on the ASF-financed project *Formierung des Reichshofrats (Karl V, Ferdinand I)* (“The Formation of the Imperial Aulic Council under Charles V and Ferdinand I”) by various project assistants. The duration of the project was extended to May 2008. Preliminary results were presented to the scientific community by the head of the Commission in his capacity as project chairman and by the project team in lectures and publications at home and abroad. The papers presented at the international conference on Supreme Courts in Early Modern Europe (*Höchstgerichte im Europa der Frühen Neuzeit*) in April 2006 were published in book form in the following year. Co-operation with the Case Law Academy, Amsterdam, towards a projected EU-financed documentary on legal history (*Supreme Courts in Europe*) has recently been agreed. At the end of 2007, the KRGÖ and the Austrian State Archives jointly organized the symposium *Jüdisches Heiliges Römisches*

*Reich*, contributions from which are also scheduled for publication.

*A meeting of all project team members took place in connection with the ordinary meeting of the KRGÖ on 18 and 19 January 2007.*

A selection of recent publications:

- Leopold Auer/Werner Ogris/Eva Ortlieb (eds.): *Höchstgerichte in Europa. Bausteine frühneuzeitlicher Rechtsordnungen*, Cologne, 2007.
- Jürgen Busch/Alexander Besenböck: *Von Mailand bis Czernowitz. Die Einführung des österreichischen ABGB, Gesamtstaatsidee und nationaler Partikularismus*, in: Andreas Bauer/Karl H. L. Welker (eds.): *Europa und seine Regionen. 2000 Jahre Rechtsgeschichte*, Vienna, 2007, pp. 535–597.
- Werner Ogris: *Die Zensur in der Ära Metternich*, in: Bernd-Rüdiger Kern (ed.): *HUMANIORA. Medizin – Recht – Geschichte. Festschrift für Adolf Laufs zum 70. Geburtstag*, Berlin, 2006, pp. 243–256.



- Eva Ortlieb: Die Entstehung des Reichshofrats in der Regierungszeit der Kaiser Karl V. und Ferdinand I. (1519–1564), in: *Frühneuzeit-Info* 17 (2006), pp. 11–26.

### Preview for 2008–2009

Among the projected volumes for the series *Fontes Iuris* (which are in various stages of completion) the previously mentioned publications by Winkelbauer, Feigl and Platzgummer will appear in 2008. Other projects which may with some probability be expected to attain publication in 2008 or 2009 include *Pressburger Testamentenbücher* (Judit Majorossy/Katalin Szende eds.), *Rechtsquellen der Stadt Hartberg* (A. Kernbauer ed.), vol. 4 of the *Wiener Stadtbücher* (C. Neschwara/G. Jaritz eds.) and *Quellen zum Rechtsleben der Stadt Tulln* (J. Ramharter ed.).

A special focus will concern the history of the *Kommission für die Savigny-Stiftung*, the predecessor (along with the *Weistümer- und Urbarkommission*) of the KRGÖ until 1995. Its main aim is to investigate and evaluate the role and significance of this commission established in 1867 in the Austrian Academy of Sciences. In furtherance of this goal the article by Werner Ogris *Zum Erscheinen von Band 125 der Zeitschrift der Savigny-Stiftung für Rechtsgeschichte*, in: *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte, Germanistische Abteilung* 125 (2008), pp. 1 et sqq., is to appear in 2008.

ASF Project *Formierung des Reichshofrats* will continue until its scheduled end in May 2008. The application for a successor project entitled *Appellationen an den RHR (1519–1740)* (“*Appeals to the Imperial Aulic Council*”) is under review at the ASF. The decision on the project will determine the future development of this aspect of the KRGÖ’s activity.

Four international symposia are planned for 2008 and 2009:

- *Die Habsburgermonarchie auf dem Wege zum Rechtsstaat?* (= *The Habsburg Monarchy on its way to a constitutional state?*), May 2008.



Fig. 3: Prince Gundaker von Liechtenstein (1580–1658) is held to be the House of Liechtenstein’s savviest manager, organizer and bureaucrat in the 17th century. His administrative instructions, edited by Th. Winkelbauer, will appear in 2008 (*Sammlungen des Fürsten von und zu Liechtenstein, Vaduz – Wien, Inv.-Nr. GE 213*).

© Sammlungen des Fürsten von und zu Liechtenstein, Vaduz–Wien

- *Die Autobiographie als Quelle der Rechtsgeschichte* (= *Autobiography as a source for legal history*), Autumn 2008.
- *Ist der Finger beringet, so ist die Jungfrau bedinget – Verlöbniß und Eheschließung in Geschichte und Gegenwart* (= *Engagement and marriage in past and present*), Spring 2009.
- *Hans Kelsen – Leben, Wirken, Werk* (= *Hans Kelsen. Life and Works*), Autumn 2009.

## Social Sciences Research Centre (SSRC)

### Vienna Institute of Demography

Head: WOLFGANG LUTZ



#### Aims and Functions

Combining excellence in research with politically relevant issues is the principle guiding all research activities carried out by the VID's international team of around 20 researchers.

The group working on *demography of Austria* deals with population issues in the national and European context. Topics of interest are the structure and development of the Austrian population, in particular demographic ageing, as well as trends in fertility, mortality and migration.

The group specialising on *comparative European demography* focuses on fertility, with special regard to mothers' rising age at childbearing. Particular subjects of interest at the macro-level are comparative analyses of time series in various countries in Europe. At the micro-level, the emphasis has been on fertility intentions and ideals. The extent to which policies can influence fertility was yet another key issue addressed in 2007 in close advisory collaboration with the European Commission.

The group dealing with *population dynamics and forecasting* is engaged in groundbreaking work by methodologically advancing population forecasts and simulations of demographic processes. Its main fields of work include probability forecasts, the increased use of multi-state models, in particular in connection with human capital, and the development of software for forecasts. In 2007, the group also developed new methods for forecasting households and mortality.

The *population economics* group studies the economic consequences of demographic ageing in Europe, focusing on its impact on the labour market, productivity and economic growth. Other areas of research include the use of age- and duration-structured models for population dynamics and demo-economic issues, as well as the development of agent-based models in demography.

The scientific results are published, among others, in the refereed *Vienna Yearbook of Population Research* and other scientific series.

#### Results for 2006–2007

The four examples given below illustrate the broad range of scientific work carried out by the four research groups in the past two years, which was published in numerous renowned international publications. All examples explicitly relate to the European dimension of the VID's work.

In October 2006, the journal *Science* published "The Demography of Growing European Identity", an article by W. Lutz, S. Kritzinger and V. Skirbekk, which caused quite a stir, in particular in European Commission circles. The authors used demographic age-period cohort models to analyse data from a series of Eurobarometer surveys on national and European identity. They showed that the comparatively emphasised European identity found among young Europeans in addition to their national identity is a cohort effect. It is rooted in the attitudes they acquired in their youth, which they by and large preserve throughout their lives. Based on these findings, the researchers were also able to make projections up to 2030. They show that the share of adults with a European identity will have risen considerably by that time.

The interrelation between the population's age structure and economic growth was studied in the context of a project directly subsidised by the European Commission (DG Employment). Based on an empirical growth model (1950–2005) for EU 15, the VID computed economic growth scenarios for EU 25 for different scenarios of population growth (Fig. 1). As the share of older population groups increases in relation to that of productive age groups below 65, we can expect a decline of economic growth in all EU Member States. However, these findings have to be interpreted as *ceteris*

*paribus* scenarios, in which rising life expectancy has no impact on the economic behaviour of individuals. Yet, higher life expectancy will affect the ways in which people save and invest their money as well as the age at which they retire. Hence, in the long run, population ageing might not necessarily be interlinked with a decline in economic growth.

In another EU project, the VID analysed the Eurobarometer 2006 results on fertility intentions and ideals in all EU Member States. From an Austrian viewpoint, the “ideal family size” is of particular interest, as Austria has the lowest value of all 27 EU Member States in this category. It was already very low in 2001 and has declined further during the past five years (Fig. 2). Compared with other countries, this is the first empirical confirmation of the “low fertility trap hypothesis” formulated at the VID. This hypothesis is based on the assumption that young people who were socialised in an environment with few children also develop low ideals as regards their own family size. This also explains why both the birth rate and the ideal family size are stable at a high level in northern Europe and in France.

Last but not least, the VID produced the first *European Demographic Datasheet* (in collaboration with IIASA and the Population Reference Bureau) in 2006.

Structured as a poster display it features a synopsis of key demographic data for 49 countries. It also contains such new indicators as the tempo-adjusted fertility rates for all countries which were assessed by the VID. All projections for non-EU countries were computed by the VID, while Eurostat projections were used for EU Member States.

In 2006, the VID’s annual December conference dealt with the issue of causality in population studies. The 2007 conference tackled the question whether political measures can enhance fertility in Europe. Both conferences attracted more than 100 participants to Vienna, among them very renowned demographers (also from overseas). A selection of papers presented at the two meetings will be published in two volumes.

#### Preview for 2008–2009

In Europe, demographic change has become an increasingly relevant topic in public debates. The VID will concentrate on developing the requisite theories and on the European-wide coordinated collection of data.

The VID was commissioned to coordinate the most important EU (FP7) project on fertility. In this project, which will start in 2008, we collaborate with the most renowned demographic institutes in Europe. Regard-

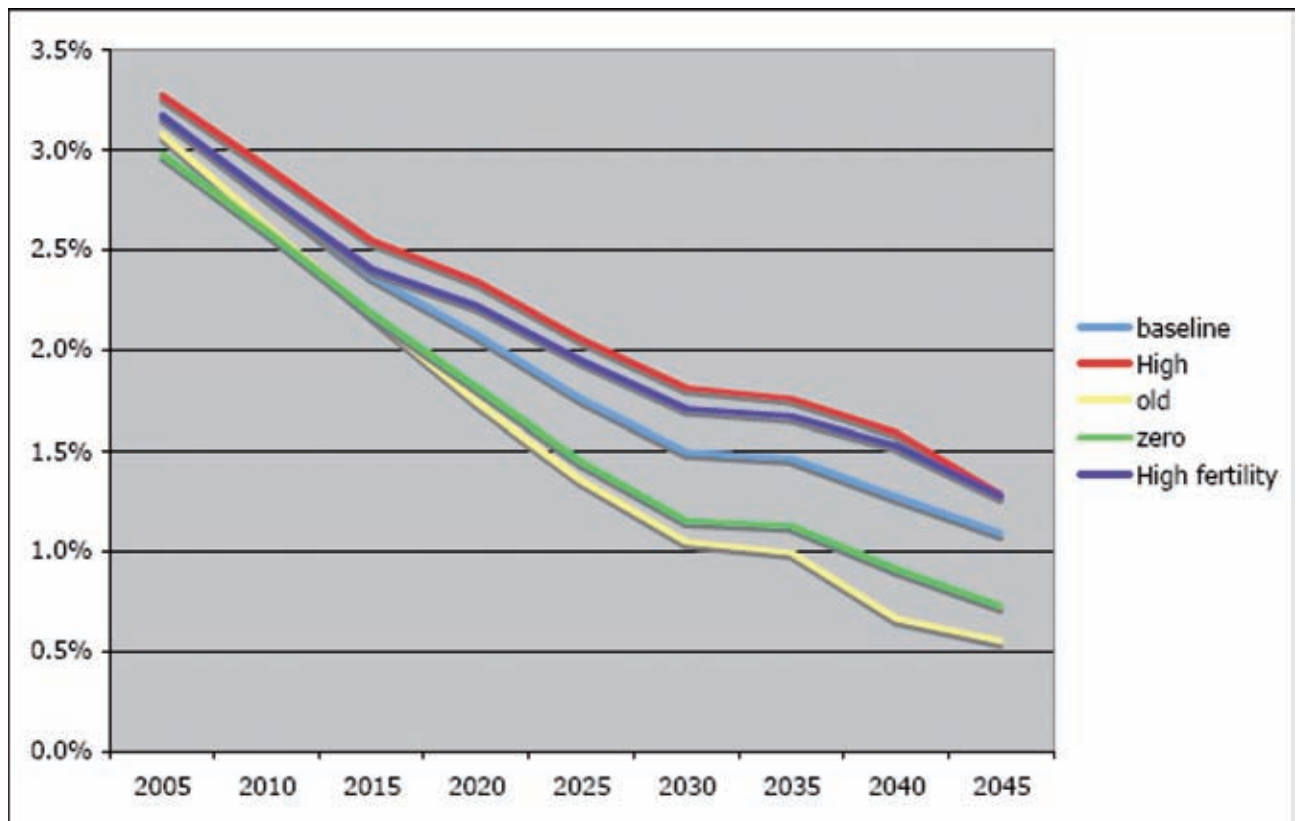


Fig. 1: Average GDP growth in EU 25, *ceteris paribus* for different population scenarios



## Institute for European Integration Research (EIF)

Head: SONJA PUNTSCHER RIEKMANN



### Aims and Functions

The Institute for European Integration Research (EIF) of the Austrian Academy of Sciences serves to analyse the European integration process and its democratic quality. The main focus of our projects are European statehood, the development of a supranational order, the inter-institutional co-operation within the European multi-level-system and the formation of European legal systems.

Complementary to this research field, the development of European democracy was also analysed with regard to European citizenship and the European public sphere during the reported period. European citizenship defines both a legal status and civil rights in a supranational context. Research on the European Public Sphere deals with the areas and media of European communication and their structural conditions.

Due to staff changes, the research field “European citizenship” has mainly been dealt with at the “Commission for Migration and Integration” and the “Institute for Urban and Regional Research” since 2007. Research fellows at EIF cooperate in individual projects with these institutions.

From January 1st, 2008 the EIF will have a new director. This change will lead to the development of new research foci.

### Results for 2006–2007

EIF is project partner in the EU Network of Excellence “The Institutional Architecture of Multi-level Governance (CONNEX)” and in the integrated Project “Eurosphere. Diversity and the European Public Sphere. Towards a Citizens’ Europe”. Until mid-2007, EIF was also a member of the Network of Excellence “Immigration, Integration and Social Cohesion in Europe (IMISCOE)”; these activities have been transferred to the Commission for Migration and Integration. In 2007, a project on “Representative Claims in the European Union” (RECLAIM) was

proposed with the 2<sup>nd</sup> Call of the 7<sup>th</sup> EU-Framework Programme.

For the CONNEX network, a workshop of the research group “Institutional Dynamics and the Transformation of European Politics” was held in Vienna; furthermore, EIF took part in other CONNEX conferences. Articles for journals and contributions to collections of essay derived from these conferences were published in 2007 or will be published in 2008.

Within the project “Eurosphere”, basic theoretical works on diversity and the European public sphere were completed in 2007.

In March 2006, the project “The Referenda on the European Constitution: A Crucial Moment for the European Public Sphere” was concluded. Currently, a book publication at Campus Publishers is in progress.

A database on the integration of the second generation of migrants in eight European countries within an ASF project financed as part of the Collaborative Programme of the European Science Foundation has been continued. A closely related EU-project for pre- and post-docs was approved. In this project, EIF analyses the influence of national education systems and migration regimes on educational achievements.

EIF has worked conceptually on the Common Foreign and Security Policy (CFSP) of the EU. Analyses have



focused on the transformation of diplomacy through European integration in general and the CFSP in particular. With regard to these questions, Jozef Bátora contributed a chapter to a collection of essays published in May 2007 by Diplo Publishers in Geneva. Furthermore, he presented a paper at the ECPR Standing Group on International Relations.

A project on the implementation of EC competition law in four new Member States and Austria dealt with the decentralisation of European competition regulations and the new obligations for national judges arising from this development. The international team set up guidelines for judges and analysed problems of the implementation of EC competition law. The results will be published in the "Review for Central and East European Law". Furthermore, constitutional judicature on EC law in Austria, the Czech Republic, and Hungary was analysed.

In the second half of 2007 a project on "European Agencies. Enhanced Efficiency or Compounded Administration" was commissioned by the Austrian Federal Chancellery. The impact of European agencies on the efficiency of decision making and the democratic quality of the EU was analysed with regard to selected case studies (European Medicines Agency, European Defence Agency, Europol, Frontex).

The habilitation thesis of Johannes Pollak on structures of representation in the EU and the dissertation of Isabella Eiselt on solidarity in the EU were approved in 2006. In 2007 the habilitation thesis of Johannes Pollak was published by Springer publishers.

Early in 2007 the results of the project "The Fabric of Governance. Interinstitutional Agreements in the European Union" were published as a special issue of the "European Law Journal". Two volumes of the book series "Europa Kompakt" came out during the research period. A book on "The Constitutionalisation of the EU" was published in 2006. A publication on the implementation of EC-law on accident hazards of industrial activities came out in 2007.

#### **Preview for 2008–2009**

By January, 1<sup>st</sup>, 2008, a new phase will have started for EIF. The Director is now Gerda Falkner (Professor at the University of Vienna and outgoing Head of the Department of Political Science at the Institute for Advanced Studies).

Within the next months a new research agenda will be developed in the field of European studies oriented towards international standards. It will be especially concerned with:

- The concentration of EIF research on the academic subject of political science, which will be open to project-specific interdisciplinary co-operation with external partners.
- Empirical-analytical studies with an intensified focus on EU policy areas and comparative methodology.

Existent focuses of research will be partly continued in a cross-sectional way.

## Research Unit for European Tort Law

Head: HELMUT KOZIOL



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### Aims and Functions

The Research Unit for European Tort Law was founded on 2 July 2002 by the Austrian Academy of Sciences and has been directed by Prof. emeritus Dr. Dr. h.c. Helmut Koziol since then.

The Research Unit conducts projects in the field of comparative (in particular European) tort law. The results are intended to advance and facilitate the further development as well as the harmonisation of tort law in Europe. The Research Unit works in close cooperation with the European Centre of Tort and Insurance Law (ECTIL), which is a private association seated in Vienna that also engaged in research in the field of European tort law. The studies of the Research Unit are carried out exclusively on an international basis with the participation of leading academics and practitioners from the Member States of the European Union and other countries.

In particular, the Research Unit for European Tort Law supports the “European Group on Tort Law” in their efforts to draft the “Principles of European Tort Law”. The Director of the Research Unit as well as its Vice-Director, Prof. Bernhard A. Koch, are both members of this Group. The aim of the Group’s broadly-based comparative research is to establish a foundation for the discussion of a future harmonisation of the law of torts in the European Union, above all with respect to a possible codification of European Private Law. Further, it is hoped that the drafted “Principles” are to function as a stimulus for both academics and practitioners and could serve as a guideline for national legal systems drafting similar provisions, thereby leading to gradual legal harmonisation. Not least, the present regulation of tort law issues at community level, which are particular and at times contradictory, requires a uniform concept for the European Union.

The first version of the “Principles” was published by Springer publishers together with an extensive commentary and has been translated into several languages.

It was presented at an international conference in Vienna in May 2005. Further presentations of the “Principles” have taken place at various events throughout Europe and beyond (including several countries in Asia and the United States of America). In 2008 the Group will commence the revision and supplementation of the “Principles.”

### Results for 2006–2007

During 2006 the “Principles of European Tort Law” and the Commentary were presented at conferences in Belgium (Leuven) and Spain. An international conference co-organised by ECTIL and held at the Academy of European Law in Trier (Germany) at the beginning of November 2006 served as another platform for a discussion of the “Principles” project. Early in 2007 the “Principles” were presented and discussed at a conference in the USA (Washington, DC). The results of these discussions will then be considered in a revised version of the “Principles”.

The work of the Research Unit has already led to a series of other representative publications – about 40 in number – with both Kluwer Law International and Springer publishers.

In 2006 and 2007 together with *ECTIL*, the Research Unit held the fifth and sixth Annual Conferences on European Tort Law reporting on the most important developments in tort law throughout Europe for each year. The contributions to these conferences are published in the “Yearbook on European Tort Law” edited by both ECTIL and the Research Unit.

In August 2007, the research project on “Tort and Regulatory Law” under the direction of Prof. Meinhard Lukas (Linz University) and Prof. Willem van Boom (Erasmus University, Rotterdam) was completed. This study deals with the relevance of administrative law regulations for tort liability. The book was published in December 2007. After publication a German summary of the Austrian section and of the conclusions



Fig. 1: New Address Reichratsstraße 17

was published in the Austrian journal “Österreichische Gemeindezeitung”.

The Directorate-General (DG) for Agriculture and Rural Development of the European Commission commissioned a study on liability in case of damage due to the admixture of genetically modified organisms (GMOs) in non-genetically modified crops. This was completed in 2007. This study is to be used by the DG for Agriculture and Rural Development itself and by other Commission departments with an interest in these measures. The study will support the Commission in implementing its coordination role concerning co-existence.

Furthermore the results of a research project entitled “National Court Practice and European Tort Law I – Causation” have been published. This study represents the first part of a comprehensive comparative compilation of court rulings on all details of liability in the tort laws of Europe. It is not limited to a mere accumulation of rulings as such, however. The entire body of

cases collected was ordered and analysed (though from a legal perspective), which is essential to avoid single-jurisdictional bias. The selection was guided by a multi-step procedure designed to consider all tort-related aspects of causation throughout Europe. The cases are commented on both from a national as well as from a historical and comparative point of view. Extensive references to the most important proposals for the harmonisation of European tort law make it possible to analyse the present interpretation of causation as a central premiss of liability against the background of tendencies towards standardization.

#### **Preview for 2008–2009**

The Research Unit will continue its work on a study on “Human Rights and Tort Law”. This project aims at a general overview and thorough analysis of how the European Court of Human Rights deals with tort law issues that infringe constitutional rights, such as causa-



tion, attribution of liability, types of damage as well as the assessment and award of damages - namely in applying Article 41 of the Convention on Human Rights. These issues will be treated on the basis of a comprehensive and detailed assessment of the judgements of the Court and a thorough study of the most important literature dealing with the topic.

In March 2008 the first follow-up project to the above mentioned study on National Court Practice and European Tort Law will commence. This will abide by the same academic procedure. The concept of damage, an

equally vital aspect of tortious liability, is to be examined and analysed against a collection of judicial cases. The project will be carried out in cooperation with Prof. *Bénédict Winiger* (University of Geneva, Switzerland), a leading expert in comparative tort law and the history of law, and with Prof. *Reinhard Zimmermann*, director of the Max Planck Institute of Comparative and International Private Law (Hamburg, Germany). In the coming years, other key elements such as fault, contrariety, and strict liability are to be dealt with in follow-up projects

## Research Unit Mountain Research: Man and Environment

Head: AXEL BORSODORF



### Aims and Functions

The Research Unit Mountain Research: Man and Environment (IGF) in Innsbruck was founded in 2006 with the goal to consolidate and sustainably secure on a high level Austria's status within international mountain research. The existence of a research cluster of various university institutes, a competence centre as well as private research organisations (SMEs, Spin-Offs) make Innsbruck an opportune location for this endeavour. The Research Unit is an interdisciplinary team, works on a transdisciplinary level and has an international orientation.

The research interest of the Unit is oriented towards the central questions of global change in alpine regions, its effect on society and environment, an evaluation of these processes as well as the development of strategies to meet these challenges.

Within the field of *Climate Change/Climate Change Consequences* the changes of climate and the ecosystem are documented and discussed on the bases of data, which are currently recorded in 178 monitoring stations on mountain peaks within 54 GLORIA monitoring areas worldwide. By means of models and scenarios,

effects on the biodiversity of high mountain regions are estimated and verified in recurring field observations. The theme *Man and Environment* analyses spatial and social processes in high and middle mountain ranges of the earth with social science and spatial monitoring methods. Especially the effects of climate warming and socio-economic globalisation on alpine societies and mountain economy are analysed and adaptation strategies developed. The IGF has developed scenarios and monitoring systems that facilitate permanent spatial monitoring.

### Results for 2006–2007

Exemplification of the most important results:

In the field *Climate Change/Climate Change Consequences* the following tasks were carried out: within the issue of network-coordination the programme of GLORIA ([www.gloria.ac.at](http://www.gloria.ac.at)) was expanded from 37 to 54 monitoring areas. New monitoring stations were established especially in North and South America. The coordination and central data administration of the worldwide research network is located in Austria (University of Vienna and IGF).

In the field of data analysis a climatically induced decline in the diversity of species in alpine regions of the Alps was documented for the first time in a comparison with 10 year old data (published in the peer review journal *Global Change Biology*). On the basis of GLORIA data fine scale distribution patterns of alpine plant species were analysed in the context of competition and advancement between species along a climatic stress gradient (published in *Journal of Ecology*). A model study concerning climatic gradients and species change (migratory growth and loss) of European mountain ranges and a further study concerning species diversity subject to the exposition of alpine locations are in progress.

Within the field of *Method Development*, the emphasis lay on the assessment of the variability of investigations



Fig. 1: In co-operation with research institutions in Innsbruck the IGF forms a competence-triangle in the area of the Alps.



Fig. 2: Public Relations is an important issue for the IGF. The poster was presented at various conferences. The research unit is well represented in the international press, radio and television.

into species' dominance and on the refinement of field-work methodology for recursive surveys. In various test areas (on lime substrate at the Hochschwab and siliceous substrate in the High Tatras) numerous parallel inventories were carried out.

As regards the theme *Man and Environment*, the following operations were carried out in 2006–2007: within the field of *Analysis and Monitoring*: The Alpine Information System GALPIS was further refined and updated. Within the scope of the post-doctoral qualification of a team member (published in 2007) a new method for cadastral based geo-information systems of mountain regions was developed. In an international project, an indicator system for global change in the Alps was co-developed. This led to multivariate analyses and their interpretation as well as the development of a new Atlas of the Alps with more than 320 thematic maps. Furthermore, a study concerning the effect of climate warming on settlement and economy of the Tyrolean Oberland was established. To this end elaborate

downscaling methods were developed that transferred IPCC scenarios of climatic change onto the specific area. A detailed, community related demographic projection and an equally detailed projection of economic development allowed the estimation of expected water and energy requirements. The value of this study lies in its entirely new methodological approach: For the first time IPCC scenarios were applied to a comparatively small area of interest and the findings contextualised with demographic and economic projections.

In a smaller study, the scrub and wood encroachment of the alpine altitudinal belt was explored. The positive and negative consequences of climate warming and the subsequent scrub encroachment were balanced.

Within the field of *Strategies* studies concerned with sustainable regional development of various regions in the Alps and Andes were continued. Currently results are only available for the Austrian Mostviertel. In co-operation with decision makers and citizens a regional concept for the eleven communities comprised in the

labour market region Waidhofen/Ybbs was here developed to stop the 'brain drain' of well educated local youth. This issue was discussed on an interdisciplinary level, and sustainable regional development strategies were explored in two international conferences with more than 500 participants from more than 20 countries.

#### **Preview for 2008–2009**

2008 marks the beginning of the realisation phase of the EU project DIAMONT. An Atlas of the Alps and five further book publications on indicator systems, context analyses, regional development strategies, and regional planning instruments as well as best practice databases will be published. A "follow-up" project will be submitted followed by further proposals. Two large EU funded international conferences addressing sustainable regional development will be held in Innsbruck. Cooperation within the Centre for Social Sciences of the Austrian Academy of Sciences will be intensified.

In case of acceptance of some of the proposed projects the following years will be dedicated to an improvement of spatial monitoring concerning global change

processes and the search for alpine space related strategies to meet these challenges. The focus will to some extent lie on Alpine Biosphere Parks as model regions for sustainable development. Starting in 2008 the IGF will issue a new international journal dedicated to conservation area research. The first issue will be published in 2009.

Furthermore, it is planned to expand the web information system GALPIS by incorporating linear data (traffic, etc.) and to transfer the system to Open-Source technology.

In the field *Climate Change/Climate Change Consequences* the first large scale GLORIA recursive field study of 18 European mountain regions is planned. Currently a comprehensive transfer of the database management system to more efficient structures is under way.

Interdisciplinary projects under vegetation-ecological and climatological headings as well as on permafrost research in high mountain regions have been initiated. The establishment of the worldwide GLORIA network in Asia will be consolidated; in South America a doubling of monitoring stations by the end of 2009 is intended.

## Commission for Migration and Integration Research

Head: HEINZ FASSMANN



### Aims and Functions

The Commission for Migration and Integration Research (KMI) serves as an interdisciplinary platform for integrating Austrian research on migration and linking it to the international scientific community. That means that the KMI is not a research institution in the strict sense of the term but mainly aims to bring together migration researchers from different disciplinary backgrounds. Like other complex scientific issues, migration and integration research has become increasingly specialised and divided. Several disciplines, such as sociology, geography, political science, cultural and social anthropology, law as well as linguistics and literary studies deal with different aspects of this field. The KMI facilitates the exchange of information and cooperation across disciplinary boundaries.

These aims involve the following concrete tasks: the KMI administers the participation of the Institute for European Integration Research (EIF) and the Institute for Urban and Regional Research (ISR) in the European network of excellence IMISCOE (the acronym for Immigration, Integration and Social Cohesion in Europe); it organises public lectures and seminars and informs the wider scientific community about projects, events, calls for papers and job vacancies. In 2007 it additionally coordinated the preparation and publication of the Second Report on Migration and Integration in Austria (*2. Österreichischer Migrations- und Integrationsbericht*).

### Results for 2006–2007

In the years 2006 and 2007, the activities of the KMI focused on three areas:

#### *The Second Report on Migration and Integration in Austria*

The publication of the Second Report on Migration and Integration in Austria in 2007 significantly increased the national prominence of both the KMI in particular

and Austrian migration research in general. Conceived and edited by Heinz Fassmann, the report provides extensive information on the legal regulations and the socioeconomic structures of immigration to Austria and deals with selected topics relevant for the integration of immigrants and their descendants, such as education and employment. In both of these sections, the authors focus on changes since about 2000. The report contains 15 chapters and 18 shorter contributions that

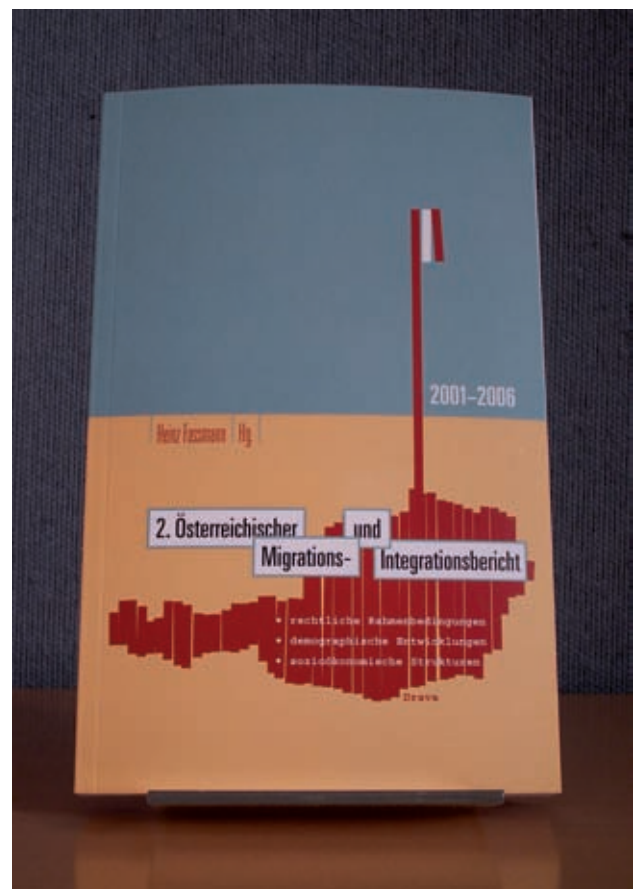


Fig. 1: Second Report on Migration and Integration in Austria edited by Heinz Fassmann and published by Drava



Fig. 2:  
Discussion on  
"Immigration and  
Integration: A  
European Dilemma?"  
held at the IMISCOE  
Annual Conference  
2006 in Vienna (from  
left to right: Sandra  
Pratt, European  
Commission, Rainer  
Bauböck, KMI, Sarah  
Spencer, COMPAS,  
Oxford and Rinus  
Penninx, IMISCOE  
coordinator, Amster-  
dam)

are presented in text boxes. The texts were written by more than 50 authors, who were either invited to write a chapter or responded to a publicised call for contributions. Financed by five ministries and the Austrian Integration Fund, the report was published by Drava and received with great interest when it was presented to the media.

#### *The European network of excellence IMISCOE*

Participation in the European network of excellence IMISCOE guarantees the international prominence of the KMI. Established in April 2004, IMISCOE aims to integrate migration research in Europe and to foster new international research initiatives. The network

brings together 23 distinguished research institutes from 13 European countries with more than 300 established migration experts and more than 100 PhD students, including ten researchers based at the Austrian Academy of Sciences.

IMISCOE is organised in nine thematically differentiated clusters, two of which are coordinated by members of the KMI: Heinz Fassmann is responsible for Cluster A1 on "International Migration and its Regulation", Rainer Bauböck for Cluster B3 on "Legal Status, Citizenship and Political Mobilisation". The KMI supports the two cluster leaders by organising workshops, editing joint book publications and administering the complex financial accounts to the coordinator in Amsterdam.

Apart from conferences within the two above-mentioned clusters, the KMI organised the Third Annual IMISCOE Conference held in Vienna in September 2006. More than 250 members of the network participated in this event. Moreover, public sessions comparing immigration and integration policies in Europe and Canada and considering the need for common standards with regard to national legislations in the European Union also attracted much attention in the Austrian scientific community and the wider public. 2006 also saw the publication of the first results of the network in the IMISCOE series. These include a book on the state of the art in European research on migration and integration with chapters written by members of



Fig. 3: Books published in the IMISCOE series that include KMI contributions

clusters A1 and B3, as well as three volumes on citizenship policies in the European Union that document to what extent admission to citizenship, and thereby also to Union citizenship, varies in the EU Member States.

*The integration of Austrian migration research*

A central and permanent obligation of the KMI is to integrate Austrian migration and integration research. To fulfil this aim, the KMI in 2005–2007 organised five public lectures, two workshops (dealing with migration and health as well as migration research at the Austrian Academy of Sciences), four presentations and discussions and, jointly with Prof. Max Haller, Graz University, one international conference entitled “Migration and People Movement in Europe: Threat or Benefit?”. Moreover, the KMI published five Working Papers on its website, hosted two guest researchers and sent about 40 newsletters to more than 320 subscribers informing about current research projects, seminars, calls for papers and job vacancies.

**Preview for 2008–2009**

In the coming two years, the KMI will continue working on the commitments laid down at its establish-

ment. It will administer the participation of the Austrian Academy of Sciences in the network of excellence IMISCOE. Activities planned for 2008 include a conference in Leipzig that will amongst others deal with migration from Turkey to Europe; a conference in Edinburgh entitled “Substate, Suprastate and National Citizenship in Europe”; and a conference in Florence considering two related theoretical approaches to migration: diaspora and transnationalism. In addition the KMI will continue to organise events that serve to integrate migration research within the Austrian Academy of Sciences and in the national scientific community.

Apart from endeavouring to further establish itself as the institutional home of migration and integration research by integrating related activities, the KMI will expand into research fields that are particularly relevant both thematically and socially. Depending on the available financial resources, the KMI will focus on issues related to the education and political participation of immigrants and their descendants and deal with the complex social processes involving heterogeneous ethnic groups caused by migration in the past and in the present.

## Institute for Urban and Regional Research

Head: HEINZ FASSMANN



### Aims and Functions

The Institute for Urban and Regional Research (ISR) aims to document, analyse, and interpret regional and local disparities both in society and in the use of urban space. We derive these disparities from social action within a given political system and investigate them from an interdisciplinary and comparative international perspective. The spatial perspective of our work focuses on Vienna, Austria and Europe. Our projects usually engage in basic research and have no direct relevance for planning.

Notwithstanding this focus on basic research, our work has always been embedded in contemporary discourses within the disciplines involved in particular, and within society in general. Thus the predecessor institute (the Commission for Regional Research and Reconstruction, founded in 1946) was at first mainly focused

on planning and coordinating reconstruction after the Second World War. After national independence had been regained in 1955, the institute initiated the compilation of a national atlas, a symbol of the new Austria. With Austria's accession to the European Union, questions of international comparison, competitiveness and internationalisation on different levels came to the fore. This changing political framework is reflected in themes such as developmental potentials of European metropolitan regions, culture as a local factor influencing economic choices in a globalised world or the impact of international immigration on European urban development.

### Results for 2006–2007

Apart from other research activities, the Institute continued or completed three major projects in the period:

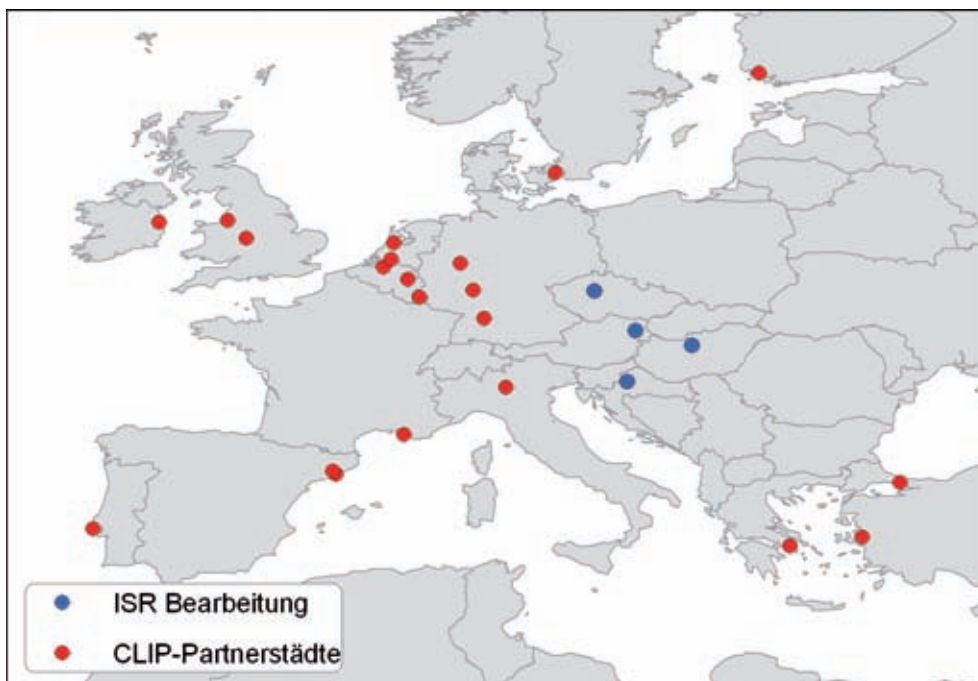


Fig. 1:  
Partner Cities of CLIP.  
Design: Marco Helbich



*The dynamics of ethnic housing areas in Vienna*

The ISR has been monitoring immigration to Vienna and the spatial and social distribution of immigrants within the city for years. Embedded in this research area, the project on the dynamics of ethnic housing, finalised in 2006, investigated whether ethnic housing areas in Austria's capital were stable, had grown or were "retrieved" by native communities. This involved evaluating and mapping the official statistical data of the years 1981, 1991 and 2001. In addition the researchers revisited a sample of around 800 buildings, which had been surveyed in detail in an earlier research project (cf. Lichtenberger, E.: *Gastarbeiter – Leben in zwei Gesellschaften*. Vienna 1984). In 1981, these buildings were partly or mostly inhabited by "guest worker" households from the former Yugoslavia. Our fieldwork aimed to document the current state of these buildings and the composition of their inhabitants and to compare these findings with data gathered in 1981. The main result of our research shows the divergence of patterns between the different residential quarters:

the condition of housing has considerably deteriorated in working class districts over the last 25 years. The investments made are negligible, the condition of the houses is inadequate and the concentration of immigrants has been rising in these areas, in particular in buildings located on the so-called "Gürtel".

In the "bourgeois" districts, on the other hand, a significantly higher contingent of buildings has been rehabilitated and is in good condition. These districts have become increasingly attractive as residential areas. As a consequence, many of the households originating from former Yugoslavia have left these districts, partly on account of the replacement of caretakers by external property management services. The results of this project were recorded in an ISR publication.

*Migration and housing – a comparison of political measures in Europe*

The ISR is involved in an international network of 20 European cities (Network of European Cities for Local Integration Policies for Migrants – CLIP) that aims



Fig. 2: ISR Research report No. 34: Housing of Migrants (2007). Photo: Peter Görgl



Fig. 3:  
Research Report Series

to systematically compare and evaluate political measures focusing on immigration and urban development. The basic tenet of this project is that the local level is of utmost importance for the integration of immigrants. While the state usually determines the regulatory framework for immigration, processes of integration and the legal situation of immigrants, the concrete conditions of their reception and integration are situated on the local level. In cooperation with research and university institutes from Amsterdam, Bamberg, Liège and Oxford, the ISR facilitates the acquisition of knowledge and the exchange of experiences and thereby encourages the systematic discussion of selected topics.

In the reported period, CLIP focused on housing and segregation. Although considerable differences prevail between the participating cities, which exemplify wide geographical divergences from Spain to Finland, we also found some similarities. Ethnically segregated housing areas have developed in all cities, sometimes in the historical centres, sometimes also in residential areas in the suburbs. Moreover, almost all municipalities regard these concentrations as problematic. Hence many cities have adopted measures that aim to reconstitute a social and ethnical mix. However, the extent of these measures depends on the historical and political structures of the particular city. Antwerp, for instance, proposes the sale of council houses to attract middle-class-people to the city's historical centre; Amsterdam is currently redeveloping the extensive blocks of flats in Bijlmermeer in the south of the city in order to lay the foundations for the middle class to return; and German cities, such as Stuttgart, have introduced quotas limiting the number of people from a particular social or ethnic background admitted to council estates.

*Pre-fabricated housing estates in Vienna and Bratislava*  
Prefabricated housing estates form a significant part of the European cultural, social and economic heritage. They represent the ideas developed in modern architecture and modern town planning in the second half of the 20<sup>th</sup> century including all their assets and drawbacks in both the industrial states of the West and the formerly socialist countries. The project, which was finalised in the reporting period, aimed to initiate a new discourse among experts, who usually were critical of the architectural and urbanist ideas of Classic Modernism, and to reconsider these established positions. The results of the project are manifold: although prefabricated housing estates have many deficiencies in terms of construction, design, urban structure, infrastructure, and function, they also have advantages that have rarely been discussed. One of the main points of criticism and a prevalent image of these large estates is that they are mere monofunctional dormitory towns. However, a large number of these estates are predominantly residential areas, but many also have a multiple infrastructure including shops, leisure activities, child-care and schools. In fact, most of the inhabitants are generally content with the range of facilities available in prefabricated housing estates in both Bratislava and Vienna. Project results indicate the significance of assessments of future local demographic and socio-economic developments as an essential precondition for rehabilitation processes. The results of the study show that the architectural, structural and technical preconditions of prefabricated housing estates facilitate their rehabilitation and make a refurbishment to at least low-energy-standards technically and physically feasible. The development of innovative financing concepts which apply to the specific situation in the new EU member states remains an essential task though. There

are substantial ecological, economic and socio-political arguments for a wide-ranging restoration offensive.

#### **Preview for 2008–2009**

The ISR focuses on three major issues within the extensive concerns determining research carried out by the Institute: a) spatial layout and building structures in urban societies, b) post-suburban development tendencies, and c) regional change in (Eastern) Europe.

The first topic will continue to be considered in projects funded by the EU's 7<sup>th</sup> framework programme dealing with the integration of immigrants into the urban context, with segregation and its consequences, as well

as with immigration and integration policies and their expected impact on the local and the national level. In addition, the ISR will be more concerned with regional change in Eastern Europe within the framework of its third research focus. In the future the ISR will be in charge of editing the Atlas East- and Southeast Europe, taken over from the former Austrian Institute of East and Southeast European Studies. Finally, post-suburban developments are currently being researched in projects focusing on the outskirts of Vienna, with special regard to the utilization of social factors and to conflicts arising in the "geosphere-park" Vienna Woods.

## Commission for Comparative Media and Communication Studies

Head: HERBERT MATIS



### Aims and Functions

Investigating media performance in the long term and highlighting the associated opportunities and risks for society, ranks among the most important tasks of independent media research. Since the rise of the mass press in the late 19th century, the media's role has been crucial in the social construction of reality. Not only do media provide information about and raise public awareness of certain issues, more than ever, culture – in the sense of patterns of shared values and norms manifesting themselves in symbols and artefacts – is something which is produced and reproduced, distributed, consumed and gradually changed by means of mass media.

This is especially true for the role of the media in political communication. Political communication can be understood as a two dimensional system: The structural dimension covers the institutional conditions of the media system such as the political systems at macro and meso level, while the cultural dimension concerns the interaction of media and politics, its results and effects. The study of these relationships from a historical and transnational comparative perspective is the main research focus at the Commission for Comparative Media and Communication Studies (CMC), as only a comparative approach allows the identification of potentially influential context factors.

### Results for 2006–2007 and Preview for 2008–2009

To mark the occasion of its renaming and new positioning, CMC jointly hosted a workshop on “Media and Communication Research in Comparative Perspective” with the Department of Journalism and Mass Communication (University of Mainz) in November 2006. The event attracted numerous renowned experts from this specialized field to Vienna to discuss the current status of comparative media and communication studies. A proceedings volume, edited by Gabriele Melischek, Josef Seethaler and Jürgen Wilke, has been

published by *VS Verlag für Sozialwissenschaften*. The research activities at CMC are focused on four research areas:

#### *Media Systems: Theories, Models, History*

Due to historical comparative perspectives, research at CMC has concentrated on the daily newspaper as a central medium of political communication since the extension of the right to vote at the turn of the 20<sup>th</sup> century. The results of these long term studies not only show the development of the Austrian press under the differing political conditions in the last one and a half centuries, they are also incorporated into comparative analyses of media systems, which are central to the research focus “Media Systems: Theories, Models, History”. (A selection of the compiled data will be included on the Commission's expanded website in 2008: <http://www.oeaw.ac.at/cmc/hypress>.)

As a result of the conflict between the nation-state tradition and the ongoing technological and economic globalization, it has become virtually impossible to analyse the media system of one individual country without taking an international comparative perspective into account. Based on its involvement in European comparative studies, CMC takes up this challenge by applying a twofold methodical approach. This is, namely, an international comparative analysis of the current situation in combination with an analysis of transfer relationships (in the context of a *cross-national history*). First results confirm, on the one hand, the Austrian affinity to the “democratic-corporatist model” – dominant in Central and Northern Europe – as postulated by Daniel C. Hallin and Paolo Mancini in their *three models of media and politics* (see Fig. 1). However, on the other hand, there is evidence that the coexistence of seemingly incompatible features for this model (e. g. the coexistence of a press-party-parallelism on the one side and a powerful mass press as well as a high degree of journalistic professionalization on the

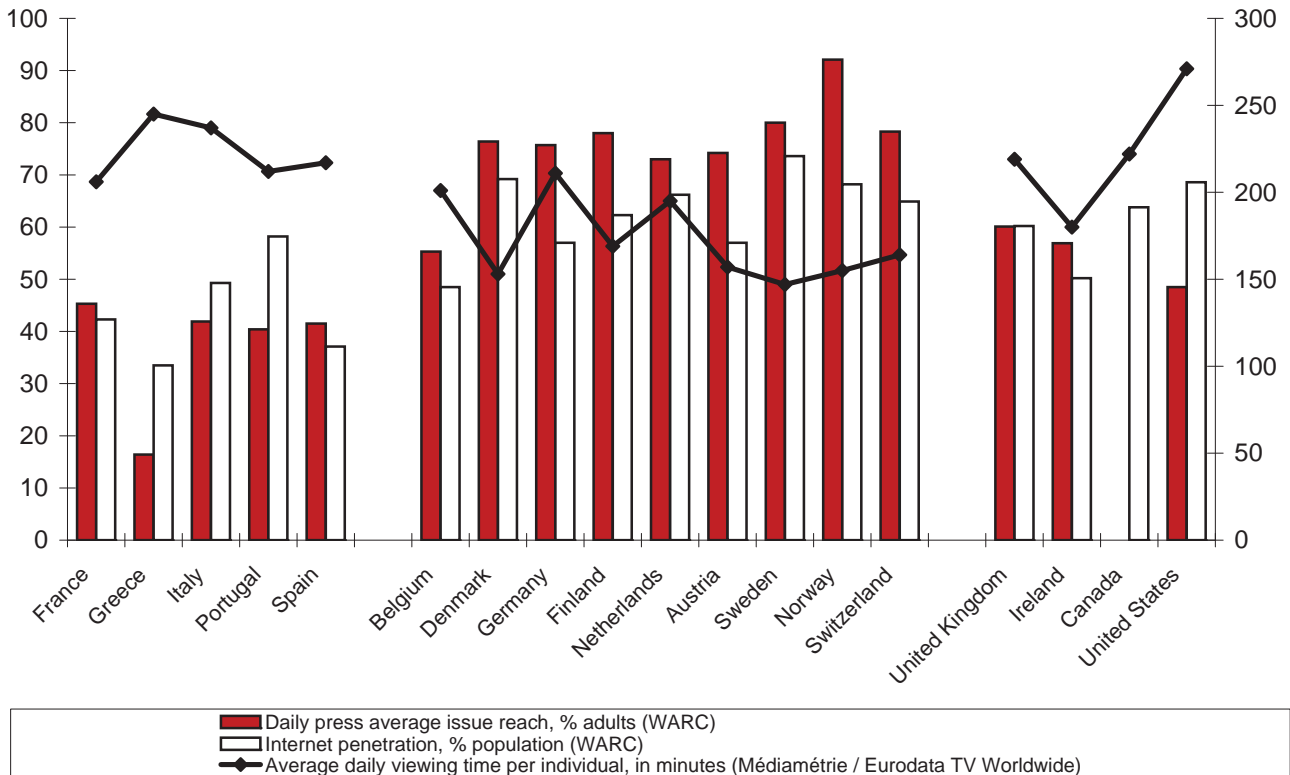


Fig. 1: Newspaper, Television and Internet in Western Europe and North America: In Central and Northern European countries high newspaper penetration correlates with the share of Internet users among the population, while there is a comparatively moderate level of television consumption ("newspaper-centric societies")

other side) are the results of convergent developments resulting from transfer processes, above all from the Anglo-American sphere, which were superimposed on existing structures.

#### *Media Markets: Structures, Products, Usage*

The structures that make up the Austrian media system, of which an extremely salient press-party-parallelism is characteristic, require a high degree of external diversity. Since the prevalence of press concentration in Austria could be viewed as a danger to the democratic functions of the media, CMC found it necessary to establish a continuous monitoring of the Austrian press market in 2003. The underlying concept of this monitoring considers the relevant markets and also the specific character of the media operating on a dual-market (advertising and consumer market).

In recent years, the research focus "Media Markets: Structures, Products, Usage" has been expanded in two aspects. The first aspect links the continuous monitoring with an analysis of current developments, for example with accompanying research on the market launch of the newspaper "Österreich" and a project that reappraises the standard of journalistic quality. Regarding "Österreich", research will be carried out on

the particularly innovative cross-medial strategies the newspaper employs in comparison with its competitors (see Fig. 2). The second aspect will widen the previous focus on issues of media diversity to include the user's perspective. In an initial phase, media use data from the Austrian "Media-Analyse" will be assessed through a long-term perspective, applying secondary analysis, as has been done in Germany for decades.

#### *Mass Media and Elections*

Subsequent to comparative studies on campaign communication during the First Republic in Austria and the German Weimar Republic, research in the focus area of "Mass Media and Elections" is concentrating on a three-year research project by the ASF, which started in 2007. Its aim is to investigate continuity and change in the relationship between political parties and media in Austrian campaign communication since 1966. There have been fundamental changes in election campaigns in Western democracies in the second half of the 20th Century. The role of the media has also changed internationally from merely functioning as a communication organ to operating as an independent actor. This has ultimately led to a permanent "struggle" between politicians and the media as to who exercises control

	Krone	KURIER	Die Presse	derStandard.at	24h.at
Multimedia Elements	++	+++	+	++	+++
Interactivity	+++	++	+	+++	++
User Generated Content	+++	+	+	+	+++
Personalized offerings and mobile services	++	+++	++	+++	++
Entertainment	+++	++	+	+	++
Service for subscribers	++	+++	++	+++	+
General service information	++	++	++	+++	++

Fig. 2: Multimedia presentation of content on the websites of Austrian national daily newspapers: None of the five newspapers make the most of the multimedia-potential of presenting their journalistic content on the Internet. Moreover, cross-media linkages can be found frequently in the service section, whereas hyperlinks in the editorial area are very rare.

over the issues raised during an election campaign. Accordingly, the methodical approach of the project is based on the “agenda building” concept, whereby assessment over a period of forty year allows research into the dynamics of the relationship between the parties and the media, depending on the structural changes of both the party and media systems in Austria.

#### *The Media and U.S. Presidential Elections – Transatlantic Perspectives*

Similar to the analysis of media systems, research into the role of media in international relations requires transnational methodological approaches such as a constructivist framework for analyzing international politics or a network model for supranational communication as proposed by Juergen Habermas. Both approaches are applied to a long-term analysis of European media reporting on U.S. presidential elections. In the light of the importance of the transatlantic alliance, but also recalling the recent differences between Europe and America, U.S. presidential elections provide a unique opportunity for a comparative analysis of foreign policy coverage. The aforementioned approach does not reduce cross-national relations to rational actions under material or institutional constraints, but rather lets them be understood as a pattern of action that shapes and is shaped by social identities, i. e., how states see themselves in relation to other states. It is apparent that the media play an important role in this



Fig. 3: Transnational orientation of elite media in Germany, France, United Kingdom and Italy (during U.S. election coverage in 2004): The media in leading European countries pay considerable attention to each other, while ignoring, to a great extent, the public discourse in other countries.

process, as most people receive nearly all their information about political actors and policies of foreign countries from media coverage.

From a European point of view, it could be argued that a commonly shared perspective in international relations, elucidating the distinctive values of the European Union, is one of the main forces of the integration process. In this respect, Habermas advocates – against the notion of a “super-public sphere” – a networking of national public spheres, whose communication circuits should remain intact while remaining open to one another. The task of noticing, translating and mediating the controversies conducted in other countries could be taken on by national elite media (thus, by the way, alleviating the otherwise momentous language problem). However, the results of an analysis carried out using the example of 2004 U.S. election coverage in the elite media of leading European states tend to suggest that this network remains somewhat of a utopia, which the main political power structures are opposed to (see Fig. 3). Moreover, the faint hope of finding a collective European voice in relation to global affairs seems to fade away in times of international conflicts. In fact the most challenging foreign policy situations (as apparent in the coverage of the Iraq War) are still covered primarily in terms of national government policies.

## Centre for Linguistics and Audiovisual Documentation (LAVD)

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### Commission for Balkan Studies

Head: GERHARD NEWEKLOWSKY



#### Aims and Functions

The aims and tasks of the Commission for Balkan Studies comprise three main sections:

- 1) study of cultures, languages, and literatures of the Balkans (Southeastern Europe) with special regard to their cultural history and ethnography,
- 2) critical edition and study of (Old) Church Slavonic texts,
- 3) documentation and (mostly linguistic) research of "Slavica Austriaca"

Section 1 focuses on the study of phenomena resulting from the contact between Balkan languages (*Balkansprachbund*), such as Bulgarian, Macedonian, Romanian, Albanian, and Greek, and other South-Eastern European languages, mainly Bosnian / Croatian / Serbian and Turkish. These studies document interrelations of living languages that are not closely related genetically. On the other hand, section 1 is also concerned with the development of the above mentioned languages as literary languages, their cultural history, and ethnography. Moreover, non-comparative projects of research are worked on dealing with certain aspects of language, literature, and culture of the Balkans in general. Section 2 comprises research on and edition of (Old) Church Slavonic texts written in the Balkans after the 9th century. The subject of section 3 are "Slavica Austriaca", i. e. languages of the Southern Slavic minorities of Southern and Eastern Austria and the Slavic substratum on the territory of contemporary Austria. These studies focus on the history of language and culture of Southern Slavic minorities and the documentation of the extinct Slavic language in medieval Austria so as to obtain information concerning the history of settlement, culture, and languages in Austria.

#### Results for 2006–2007

In all three sections of the Commission for Balkan Studies research continued. Several projects of research financed by external sources have been finished: "So-

ciety' and 'economy': Bosnian, Croatian, Serbian", "Political discourse in Greece during the reign of George I (1863–1913): the consolidation of terms and concepts"; "Processes of standardization of the socio-economic vocabulary in the Ottoman Empire after 1839"; "Translations of German texts into the Slovenian and the Croatian languages in the years 1848–1918" and "Slav names of persons in sources concerning the history of Austria and Slovenia". Most of these projects are summarised in extensive final reports. The results are being evaluated and prepared for publication.

Furthermore, work on the following projects is in progress: "Thesaurus of the Slovenian vernacular spoken in Carinthia" (in September 2007 a three-year cooperation was set up with the Slovenian Academy of Sciences and Arts and the Slovenian Institute in Vienna), editions of "Euchologii Sinaitici pars nova", "Missale Sinaiticum" and "Codex Zographensis", "Greek and Slavic tradition and critical edition of the Dioptra of Philippos Monotropos", "Terminology of migrant shepherds at the beginning of their settlement in the border region of South Albania, North West Greece, and South West Macedonia (concerning the Albanian, Aromunian, Greek, and Macedonian languages)", "Encyclopedia of Slovenian written documents and literature in Carinthia, part 1: up to 1938", "Archival records on the Vienna Greeks", preparation of the books "The Regions of South-East Europe" and "The new Sandfeld". The edition of K. H. Menges' manuscript "Etymological Dictionary of Turkish and other oriental elements in Serbo-Croatian" has made considerable progress.

Members and collaborators of the Commission continued their research, gave several papers at home and abroad concerning their work, and brought up noteworthy results and problems related to their investigations. The following publications may be mentioned:

- Linguistic and cultural historical aspects of government, state, and society in South-Eastern Europe.

# БОСАНСКИ ВЈЕСТНИК.

Босански Вјестник издаван сваког Четвртка. Годишња му је за цјелу годину 60 гроша турских или поштанске. Поштанска такса у овом вилајету износи за цјелу годину 8 гроша. Предјеројницима у Аустрији или Србији стане овај лист 8 фор. у банкнотама заједно с поштарницом, по без штењца.

Број 2.

Предјеројницима Сопронова Печатња у Сарајеву за сву Босну, Херцеговину и Стару Србију. За Бугарску, Влашку и Аустријску царевину: Сопронова Печатња у Земуну. За Србију: књижара гг. Велимира Валовића и А. Добровојевића. Огласи примају се и на турском језику по 1 грош од стубног реда.

У Сарајеву, 13. Априла.

Овдје је нимусе установљено акционарско подвозно друштво. Из статута друштвених, који су ередетном литографије обнародовани и од стране власти потврђени, видимо да ће му дјелокруг прострап бити, почем намјерава како све главне скеде на Сави, тако и нека знаменитија мјеста на хрватско-далматинској граници лежећа са унутрашњим важнијим тачкама Босне свезати.

У задатку друштва говори тачка прва и друга поменутих штатута као што сљедеће:

§. 1 У Босанским предјелима имамо најглавније скеде на Сави: Брод, Брчко и Градишка; а од стране Мљетак и Крфа: Габелу и Царицу.

Што има путова из Брода до Сарајева, из Брчког, поред Саве до Брода, и из Травника, сви су за коловоз довршени; а скороће се довршити и пут који се гради од Брчког до Маглаја. На овим путовима за сад ће се кола поставити. Кад путови к Мостару и Лијевцу буду готови, биће и па њима возидба.

Дакле у ком се правцу овог вилајета одсад путови саграде, одма ће се поставити и потребни број кола.

Овом је друштву име: „Друштво Босанског вилајета.“ (Ваља да је „подвозно“ погрјешно изостављено?)

Да се пак неби какво друго друштво склопило, које би овоме штету проузроковати могло, моли речено друштво и владу Босанског вилајета, да му се дозволи слободан течај возидбе за десет година и да буде осигурано, да никакво друго друштво за ово врјеме неће возидбу предузети, осим појединих мјестних кола.

§. 2. Да би се трговина распротршила, нуждна је уредна пошта, како би трговина лакше и с мањим трошковима пролазила могла, и један се с другим брже споразумјевати; а како сада од Сарајева до Брода пошта одлази само по једнашут у недељи дана, то је природно, да ни трговина неможе напредовати. Кад буде поштански течај уредији, то

ће и царско-поштански приход већи бити. Доцније ће се устроити да пошта сваки дан у Брод и отуд долази, а за сад ће ићи само двапут на недељу дана из Сарајева у Брод, Травник и Брчко и обратно.

Друштво прима на себе дужност да пошту носи на својим колима, а за то неће већу плату тражити, јер што су плаћивали некадашњи поштански закупац. Кад би било аманета, који се кочијашу појерити не би могли, онда ће бити нуждно да од поштанске стране иде уз аманете по један мемури (спроводитељ) на путу од Сарајева до Брода и обратно, за које такође друштво моли да се одобри. — За аманете пак од Брода и Маглаја за Брчко и од Бусоваче за Травник, молимо нека се одреде заштите као спроводитељи, па на ту цјел да се нада налог бусовачкој, маглајској и бродској власти.

У сваком поштанским колима биће по четири мјеста за сједњење и по један сандук за поштанску зашту, од та четири мјеста једно је за поштанског мемура, а остала три су за путнике. Зато поштански мемури неће моћи ни подकोји начин кога другог са собом у колима водити, осим путника.....“

Установљење тог друштва мора се као знаменит корак на пољу обрта учињен забележити, и без сумње биће и акционарима, којих је патриотизам то похвално подузеће установио, отуда лепих користи. Ево опет доказа, шта се све заједничким силама извршити даде, само ако се хоће, и кад висока влада своју заштиту томе поклони.

Склопом овога друштва заиста је се одклонила велика и осетљива оскудица у дојакошњем обрту. — У земљи, у којој нити има рјека за пловидбу лађа, нити пак гвоздених путова, али при том има добрих друмова, или се овакови непрестанце граде, може поспјешан обрт само с колима да буде, а да то боље и јевтиније ередетвом друштвеним бити може, него од појединих људи, зна сваки.

Предузеће друштвено није само корисно за трговину него и за акционере, ако буде друштвом људски управљано.

Јевтиноћа, брзина и тачност три су условија, која превелику важност имају за обрт трговине; друштву треба дакле да је поглавити задатак тај, да ове услове испуни. Оно му ваља тим више да одговара, што има искључиву повластицу за тај посао од стране државе, те се нема у том обзиру конкуренције бојати. И друштву ће бити од користи, ако буде руковање његово просто трговачко, без бирократичног одуговлачења; јер има довољних примјера, који доказују, да је оваква искључива овлашћеност акционарског друштва често уирипастила, што су ова, ослањајући се на та искључива права своја, занемарива првобитни задатак свој.

Колико је важан овај рад за обрт трговине у обзиру новидбе робе, толико исто је и због тачног и чешћег одправљања писмоношне и аманетске поште чрез друштво. Ми смо и ради папег подоложаја велики пријатељи добре, јевтине и честе поште, и да ту жељу сваки трговац с нама дјели, осведотени смо. Зато нам је оно мјесто, на коме штатути о пошти обећавајући чешћи течај ових говоре, врло мило било читати.

Кад смо имали прилику о предмету за трговину корисном говорити, судимо, да ће бити ту мјеста још коју рећи о потреби, коју осјећају нарочито сада сви трговци мање-више, и које испуњење с топлом се жељом очекује, јер у обзиру на данашње колебање курса аустријских банака нужно је, да не само трговац, који из Аустрије робе довлачи, стање бечке берзе познаје, него и онај који с земаљским произвођима ради, па и самоме је продуценту то од ползе. Сведиљно обнародовање курса бечке берзе у Сарајеву веома је потребно, а несумњиво, да ће се та потреба на надлежном мјесту скоро уважити.

Fig. 1: The first page of number 2 of "Bosanski vjestnik" 1866, the first newspaper printed in Bosnia.



Renewal of the vocabulary of civilization in the 19th century, Proceedings of conference papers, 2<sup>nd</sup> to 3<sup>rd</sup> of March 2006, ed. by Gerhard Neweklowsky, Vienna 2007 (= Schriften der Balkankommission/ Proceedings of the Commission for Balkan Studies, 48)

- Berlinski Sbornik. Srednobalgarski pametnik ot načaloto na XIV vek. S dopälnenija ot drugi räkopisi. Izdanieto e podgotveno ot Chajnc Miklas, Lora Taseva, Marija Jovčeva / Berlinski Sbornik, A Church Slavonic Bulgarian document of the beginning of the 14<sup>th</sup> century, completed by data from other manuscript sources. Ed. by Heinz Miklas, Lora Taseva, Marija Jovčeva (= Proceedings of the Commission for Balkan Studies, 47, Fontes Nr. 3). Sofia: Bulgarian Academy of Sciences, Cyrillomethodian Centre of Research / Vienna: Austrian Academy of Sciences 2006.
- Thesaurus of the Slovenian vernacular spoken in Carinthia, ed. by Stanislaus Hafner (†) and Erich Prunč. Volume 5: I–Ka. Board of editors: Ludwig Karničar (chief editor) and Andrejka Žejn, in cooperation with Tatjana Koren, Vienna 2007 (= Proceedings of the Commission for Balkan Studies, Philological Section, Special Edition)

The Commission for Balkan Studies organized, assisted the organization, or participated in the following conferences:

- “Linguistic and cultural historical aspects of government, state, and society in South-Eastern Europe. Renewal of the vocabulary on civilization in the 19th century” (concerning mostly research in the Commission related to the vocabulary of civilization in the 19<sup>th</sup> century; the Proceedings have been published and are mentioned above).
- “The West of the Balkans, the Adriatic, and Venice in the 14<sup>th</sup>–18<sup>th</sup> centuries” (the Proceedings are ready for publication).
- “The Albanians in the West Balkans – state of the art and future of the research” (the Proceedings of these papers are being prepared for publication).
- “Language – Science – Society. Conference of the Centre for Linguistics and Audiovisual Documentation of the Austrian Academy of Sciences on the occasion of the ‘European Day of Languages’” (26<sup>th</sup> of September 2007)

#### Preview for 2008–2009

Research on the vocabulary of civilization in South Eastern Europe will be continued as well as research



Fig. 2: Cod. Sin. slav. 38. Some of the manuscripts that are being investigated within the scope of research on (Old)Church-Slavonic texts were found in St. Catherine's Monastery only in 1975; during building alterations a room was rediscovered which had up to then been unknown. It contained several baskets with old manuscripts. After the photographic documentation of the manuscripts, most of which were in very poor condition, the partly illegible and scarcely decipherable manuscripts are to be processed by photo-optical methods to render the texts visible and examinable and analyzed. In cooperation with the Institute for Computer Technology of Vienna University of Technology programmes for processing images and scripts will be developed, allowing the identification and systematic investigation of such “latent” texts.

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for the books “The New Sandfeld” and “The Regions of the South-East of Europe”. The team working on the project “Terminology of migrant shepherds at the beginning of their settlement in the border region of South Albania, North West Greece, and South West Macedonia (concerning the Albanian, Aromunian, Greek, and Macedonian languages)” will collect and analyse the local pasture terminology. Research concerning “Slavica Austriaca” will be continued in the project “Encyclopedia of the Slovenian language and literature in Carinthia”, in the “Thesaurus of the Slovenian vernacular spoken in Carinthia”, and through linguistic research on the Slavic substratum in Austria as part of the long-term project “Thesaurus of extinct Slavic dialects in the East Bavarian region”. Work on the editions of Old Church Slavonic texts (inter alia “Euchologium Sinaiticum, New part” and “Dioptra of Philippos Monotropos”) and on the projects “Archival records on the Vienna Greeks” and “Bulgarians in Austria: An ethnological, anthropological, and linguistic study” will be carried on.

## Commission of Linguistics and Communication Research

Head: WOLFGANG U. DRESSLER



### Aims and Functions

The Department of Linguistics conducts theory-driven, longitudinal, systematic research focussing on two main areas, *neuropsycholinguistics*, in particular on language impairments in adults, (i. e. aphasia), and *child language acquisition*. In these research areas, speakers of German are compared with speakers of other languages. The strong interdisciplinary nature of the research draws on the fields of psychology, neurology, special education, computer sciences, and philology. The collected corpora serve as the basis for pure basic research as well as applied basic research in collaboration with national and international research teams.

### Results for 2006–2007

In the area of *neuropsycholinguistics* the main research carried out was on the following four topics:

- 1) *Longitudinal analysis of the recovery of numerous language functions in selected English- and German-speaking aphasic clients, who also received intensive language therapy based on the ELA-picture stimuli:*

The research addressed lexical retrieval of verbs and nouns, oral and written sentence production, dia-

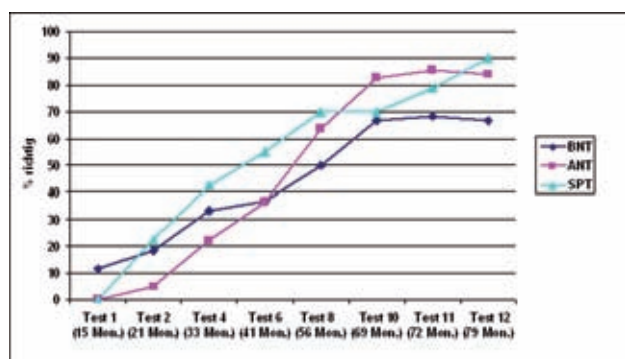


Fig. 1: Longitudinal analysis of the recovery of language functions of a Broca's aphasic (TH) on the basis of three language tests: Boston Naming Test (BNT), Action Naming Test (ANT), and the ELA-Sentence production Test (SPT) across a period of six years. This figure documents the steady recovery in all tests across a period of six years

logue and text production. An illustrative example of the pattern of recovery of a Broca's aphasic (TH) for three language tests is summarized in Fig. 1. Extensive language test and therapy data from other aphasic patients were also analyzed for specific research questions.

- 2) *Data collection and analysis of oral sentence production of healthy Viennese speakers representing different age groups to the ELA- picture stimuli:*

This research project entitled "Norm data for the ELA-picture stimuli produced by healthy Viennese speakers from 4 to 95 years old" is being conducted with financial support from the City of Vienna. Data from ten younger (17 to 19 years old) and ten older (65 to 94 years old) speakers were compared in terms of the grammaticality of their utterances and a hierarchy of the verbs they used to describe the content of the picture stimuli. Based on these subjects, single older persons produced more ungrammatical utterances.

- 3) *The conceptualization and programming of a virtual, adaptive therapy room with artificial intelligence for group therapy for application with aphasics (shown in Fig. 2):*

This project is being carried out in collaboration with Prof. Cecilia Lanyi from the Department of Image Processing of the Faculty of Information Technology of the University of Pannonia in Veszprém, Hungary. In this therapy room the aphasic client interacts with personalized male and female avatars while practicing dialogues and turn-taking behaviour. Three emotions, i. e. facial expressions have been programmed for the avatars' faces: neutral, happy and sad. The therapist can adjust the programmed language responses, which presently include questions and answers regarding pictured stimuli for training dialogues.

- 4) *Verbal perseveration from a theoretical and clinical perspective with analysis of perseveratory responses ob-*

*served in single clients with aphasia and Creutzfeld-Jacob disease*

The phenomenon verbal perseveration as a pathological, unwanted 'getting stuck' on previously produced language units (e. g. phonemes, words, semantic features, syntactic constructions, etc.) is a challenge for the clinician testing and treating of brain damaged patients. This relevant topic was analyzed from various perspectives and the results were published in a special issue of the peer-reviewed journal *Aphasiology* that was edited by Dr. Jacqueline Stark.

In the area of *child language acquisition*, normal and impaired first language acquisition was analyzed psycholinguistically, as well as within a typological comparative framework encompassing several languages.

The *Crosslinguistic Project on Pre- and Protomorphology* was continued with an emphasis on noun and verb inflection, as well as the acquisition of diminutive forms. An analysis of the acquisition of adjectival forms was started in twelve languages. Several comparative studies on the *reformulation of children's utterances by adult caregivers* and on the *acquisition of morphotactics* were published. New test methods were developed for the project funded by the ASF entitled *Development of Nominal Forms from a Comparative Perspective* for examining the acquisition of the plural forms: Semi-standardized interviews on daily life situations (Zoo visit, birthday party, shopping, playing in the snow) were carried out with nursery and elementary school children. The data were transcribed, coded and analysis was begun: With this more natural though structured procedure the children produced more plural forms than in unstructured spontaneous speech. Free conversation and structured conversation (about their own toys) was also collected from triads of children of the same age.

Regarding the production of plural forms, together with the already collected data from spontaneous speech, a lotto game task and a plural elicitation test, a large corpus for Austrian German is now available for further analysis. The next step is to analyze these data with comparable data from Dutch-, Danish- and Hebrew-speaking children. Several analyses on these data have been published or are in print. One of the results from the analysis of this extensive corpus is that plural forms are more predictable in child-centered language than in adult-centered language interactions.

Under the coordination of the CNRS, Paris the project *Grammaticalization processes: studies on nouns and verbs* was initiated with the investigation of the acquisition of the noun phrase according to morphological, syn-



Fig. 2: The virtual therapy room, which allows individualized language therapy for aphasic clients

tactic and semantic criteria in German, Dutch and French.

In collaboration with Prof. Gary Libben (University of Alberta) *Online-experiments* on the plural and *morphotactics* were carried out with children and adults.

For conducting research on *Specific Language Impairment (SLI)* funding was acquired. The Department of Linguistics is participating in the international COST-Action *Cross-linguistically robust stages of children's linguistic performance* and also in the CLAD-Project *Crosslinguistic Language Diagnosis*, for which parallel tests in five countries are planned. Five case studies of children with SLI are being conducted for a Ph. D. thesis. Research on language acquisition in *Down-Syndrome* and *Williams-Syndrome* was continued.

### Preview for 2008–2009

In the area of *Neuropsycholinguistics*, the ongoing longitudinal research on language deficits in patients with aphasia and the collection of language data from healthy control subjects will be continued in 2008 and 2009. The international collaboration in the area of virtual environments with Prof. Cecilia Lanyi will be continued. An international workshop entitled "*Computer-based intervention and diagnostic procedures - Applications for language impaired persons*" will be organized by and held at the Austrian Academy of Sciences in July, 2008.

Ongoing research on number and case for the *Crosslinguistic Project on Pre- and Protomorphology* will be completed. The research on the acquisition of adjectival forms on the verb aspect, as well as on the acquisition of compounds will be carried out. Several publications based on data from the project *Development of Nominal forms from a contrastive perspective*



Fig. 3:  
Guided conversation among children of the same age: Three three-year old boys are organizing a birthday party for twin dolls. Two exemplars of each toy are used to induce the production of more plural forms (balloons, candles, keys, etc.)

*are planned for the termination of the project in 2009.* Following further investigations of the noun and verb phrase, the project *Grammaticization processes* are to be completed. Additional Online-experiments in col-

laboration with Prof. Libben are planned. A proposal for funding of a research project on the acquisition of irregularity and subregularity was submitted to the DFG in Germany.

## Institute of Lexicography of Austrian Dialects and Names

Head: INGEBORG GEYER



### Aims and Functions

The Institute of Lexicography of Austrian Dialects and Names (I DINAMLEX) – set up as the successor of the “Commission for the Conception of the Dictionary of Austrian-Bavarian Dialects and the Research of Dialects (*WBOE*)”, which was founded in 1911, – is the only scientific institution in Austria that researches and documents the entirety of Bavarian-Austrian dialects in its syn- and diachronic context. Linguistic research on Austrian names of the past and present is an additional field of research.

Language and names are essential components of our cultural heritage and contribute to a country’s identity. The varieties of Bavarian-Austrian dialects – from basic dialects in minor areas to the vernacular speech of the megacity Vienna – reflect the dialectal heterogeneity of the investigated area and reveal phenomena deriving from contact to non-German speaking cultural regions. Place, field, and family names offer linguistic evidence on the early eponyms and their cultural achievements.

The staff of the I DINAMLEX also act as consultants and experts for lexicographic and onomastic projects as well as for projects concerned with Austrian German. They observe dialectological research efforts and provide on request specific information on the derivation, meaning and prevalence of names and dialect phrases. In the field of onomastics, the Institute serves as a coordinator for all Austrian federal and communal agencies concerned with geographic names and represents Austria on an international level.

### Results for 2006–2007

In the *research field of dialectology*, following the agenda outlined at the commission’s foundation in 1911, the current IT-developments have made a considerable impact on the lexicographical conception. The *WBOE*-Editor was further developed and supplied with a special function and character bar. It was used

for the first time to compile and prepare the articles of the 38<sup>th</sup> instalment (lemma stretch *Tunst* to *Twasper*). The print-ready double column PDF template with running heads has been installed and serves as a template for the e-book version. The major part of the articles for the 39<sup>th</sup> instalment (*e* to *ein*) are available as a first draft; work on articles of the 40<sup>th</sup> instalment has started.

The internationally evaluated ASF- project “Database of Bavarian dialects in Austria electronically mapped” ([dbo@ema](mailto:dbo@ema); [www.wboe.at](http://www.wboe.at)) started in February 2007. The project aims to geo-reference the basic material of the *WBOE* and to improve the accessibility of the Database of Bavarian dialects in Austria (*DBOE*) in the worldwide web. Besides the development of a new database system for managing heterogeneous diatopic dialect data this project also advances the critical examination of the historical and linguistic sources of the Dictionary.

At the start of the project in February 2007 the critical processing of the references and sources was intensified and the *DBOE* was prepared for its digital cross linking. Entries in the literature database were reallocated and the list of localities in the *WBOE* was supplemented with the data of the special inquiry of 1935–1941. At the same time the dialect text archive was examined with respect to its quality and quantity as well as its scientific use – provided the entries had not been accepted as reference material for the Dictionary. Its documentation was updated.

The cooperation with our partners on project [dbo@ema](mailto:dbo@ema) has resulted in the development of a comprehensive database concept that aims at geo-referencing documents, personal data and bibliographical information as well as providing cross-linked use of all data by means of a differentiated user administration.

As a first result of work on this project, a special-character font, which was developed in co-operation with the Slovenian Academy of Sciences and Arts, was pre-



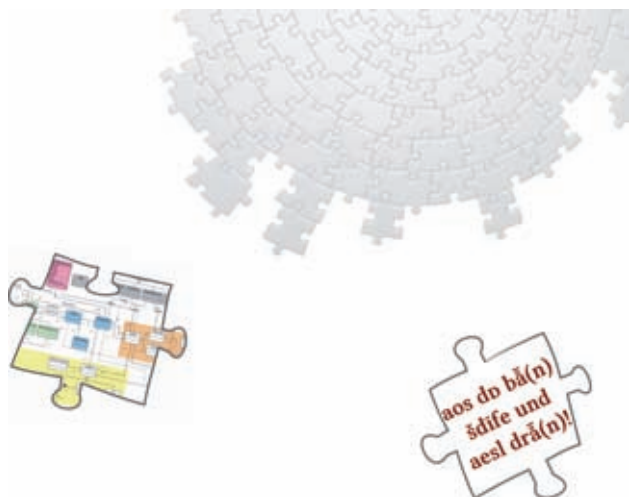


Fig. 2: font *dinamlex*, free of charge and registration, extended by 130 special characters  
 Download: <http://www.wboe.at/de/font.aspx>

In the period under report the members of the staff gave 90 lectures, the results of which were published in 65 papers, and gave 14 lecturing courses at three universities.

**Preview for 2008–2009**

In compliance with the scientific tradition and in maintaining lexicographical (publication) continuity, project *WBOE* will be continued with innovative methods. The *WBOE/DBOE*-reference corpus, which has been improved through geo-referential visualization, will be extended to a modern research infrastructure and so prepared for cross linking with digital dictionaries and linguistic atlases.

With the finalization of the *ANB* a unique onomastic work of reference will be available as of 2008. With its digital source data it provides the basis for further historical place name books. The innovative methods that were used in the pilot project *ALPKULTUR* – linking linguistic and cartographic data – may be used in further onomastic projects and will be further developed. In this way the digital corpora in both fields of research can be used as interdisciplinary tools.

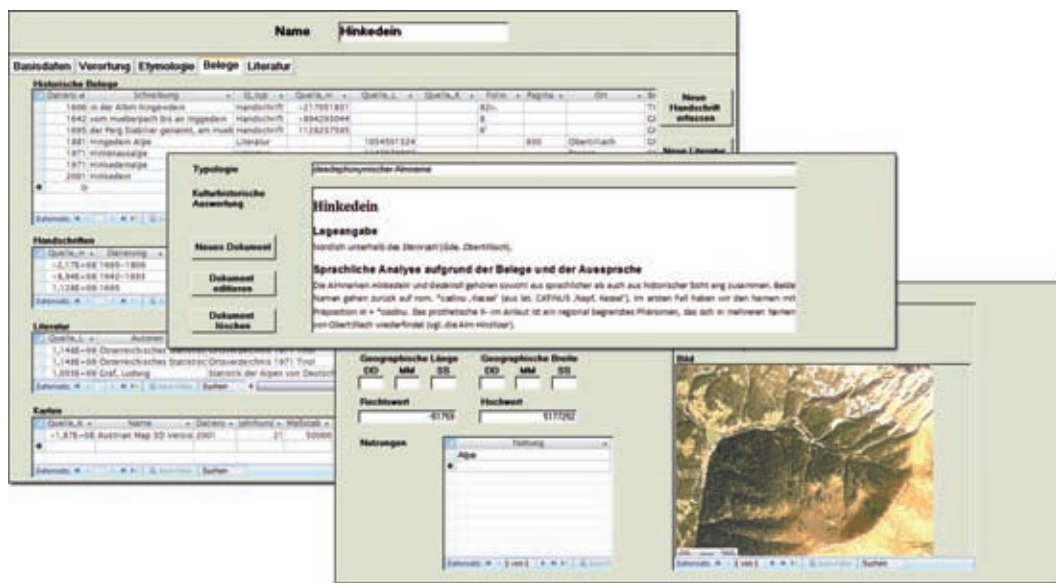


Fig. 3: Excerpts from the database *ALPKULTUR*, on the pasture name *Hinkedein* (East Tyrol)

## Phonogrammarchiv

Head: DIETRICH SCHÜLLER

### Aims and Functions

The Phonogrammarchiv is the Austrian Audiovisual Research Archive. Founded in 1899 as a sound archive, its activities were expanded into video archiving in 2001. The archive's tasks are to produce, collect, preserve and disseminate audiovisual research documents of all disciplines and regions. The collection's forte, however, is related to the wide field of the humanities, with an emphasis on ethnolinguistics, dialectology, ethnomusicology as well as cultural/social anthropology. A smaller part of the holdings comprises medical recordings and wildlife sounds.

The collection is chiefly the result of recording projects conducted by Austrian institutions and scholars with the archive's methodological advice and technical equipment. A smaller part of the collection is the result of the field projects of the curators, who pioneer likewise in content-related and techno-methodological aspects. Experience gained in these undertakings is directly passed on to the projects supported by the archive. Alongside field research and examination of the archival holdings, part of the scholarly and technical work is devoted to further developing audiovisual archiving



Fig. 1: Working session with two speakers of Shumcho in Kanam village; Kinnaur, India, 20 October 2007.



within a framework of international cooperation, a considerable challenge in view of the recent development in information and communication technologies (ICTs) with all its dramatic impact on our profession.

### Results for 2006–2007

#### *The archive's recording projects and field research*

Between August and October 2007, Christian Huber conducted field research in Kinnaur, to continue his *documentation of hitherto undocumented languages in Kinnaur (Himachal Pradesh, India)*. Emphasis was placed on the investigation of Shumcho grammar, but oral literature was also recorded, transcribed and translated. By means of a survey, he succeeded in charting the actual distribution of the Shumcho language and also embarked on a study of Sunnam, a language which has likewise not been documented to date.

The systematic audiovisual documentation of selected cultural events in Vienna – carried out with the City's financial support – was continued, and the *documentation of cultural activities of Bukharian and Georgian Jews* has been successfully completed (project leader: Gerda Lechleitner).



Fig. 2: Jesus Nupe, an informant of central importance for Ernst Halbmayer in his investigation of Yukpa mythology; Yurmutu, Venezuela, 2001.





Fig. 3:  
Franz Ahamer  
interviewing Alhaji Ali  
Bachari in his home  
in Quartier Ali Yaro,  
a district named  
after his grandfather;  
Zinder, Niger,  
1 August 2007.

Wilfried Schabus continued his study of the *language and culture of the descendants of Austrian emigrants*, making additional enquiries in the Colonia Tirol de Santa Leopoldina in Brazil in February 2006. In his book (due to appear in 2008), he describes the impact of Tyrol's large-scale economic aid during the fourteen years that had passed since his first field research in the settlement. Field research carried out in Ingolstadt in August 2007 focused on consequences of migration among the Landler; members of this community had already been researched back in 1991, while still living in Transylvania, from where they were to emigrate to Germany soon afterwards.

In July and August 2007, Julia Ahamer – together with her husband, the Hausa expert Franz Ahamer – carried out *dialectological field research* in Zinder (Niger), with the aim of systematically documenting, for the first time, the Zinder variety of *Hausa*. In terms of gender and age, the composition of the people born and living in Zinder displays a comparatively favourable variation, with female informants accounting for some fifty per cent.

*Supported field research, archiving and additions to collection*

Throughout 2006–2007, a total of 32 field research projects mostly by Austrian scholars and students were supported.

The Phonogrammarchiv has again been entrusted with collections of scholars from outside the archive, including those assembled by Professor Andras Höfer, Heidelberg (Linguistic recordings from Nepal, 1968–1983) and Doz. Ernst Halbmayer, Vienna (Oral tradition of the Yukpa, Venezuela), to name but a few.

On 31 December 2007, the total number of holdings (both audio and video) comprised some 65,000 recordings with a total duration of over 10,000 hours.

*Archival technology, safeguarding audiovisual holdings, database*

In recognition of its expertise, the Phonogrammarchiv was awarded UNESCO's *Jikji Prize* in 2007, the highest international award in the field of document preservation.

In December 2007, the successful completion of the *re-recording of the Quellmalz Collection* (fragile tape recordings from South Tyrol, 1940–1942), begun in 2005, was marked by an international one-day symposium with expert participation. New cooperation projects include the digitisation of the most important holdings of Albanian popular culture (subsidised by the Austrian Development Cooperation) as well as the modernisation of the St Petersburg Phonogrammarchiv of the Russian Academy of Sciences. The Phonogrammarchiv continued to be extensively involved in national and international training programmes, in

the course of which, inter alia, an international seminar was organised in Vienna.

In a project extending over several years, the archive's electronic database – in use since 1990 to document the audiovisual holdings and the archiving process – has been completely reorganised. This included the harmonisation of all descriptive, technical and preservation metadata (until then extant only as free-text entries), an indispensable prerequisite for the transfer to the new relational database. The new Content Management System comprises numerous (hierarchical-) alphabetical lists (languages, musical instruments, ethnic groups, geographical/technical/biographical data etc.), and user copies of the archival recordings can be easily accessed through links. Selected fields from the internal database form the basis of the new *Online Catalogue*, available on the Internet since the end of 2007.

#### *Publications and CDs*

During 2006–2007 a total of 54 publications and 5 CD editions appeared – including a CD presented in Parliament on the occasion of the 100<sup>th</sup> anniversary of the introduction of universal suffrage in 1906, which features comments from contemporary MPs

#### **Preview for 2008–2009**

The cooperation projects in the field of archival technology (Albania and Russia) will be completed. The long-term *safeguarding of the José-Maceda-Collection of the University of the Philippines* (Manila), established by the doyen of Southeast Asian ethnomusicology, will be a new item on the agenda; basic financing is ensured by the sum of 30,000 US \$ received with the Jikji Prize, which the Phonogrammarchiv will dedicate to this purpose.

As for videography, new hard- and software will be introduced to enable transfer from proprietary to open video formats for inclusion in MXF files (a standardised “container”); this represents an important step towards a uniform presentation of archived material, which also permits the integration of some of the vital metadata and comes close to the ideal of a self-contained, easily portable “digital object”.

Videography gains increasingly in importance for the documentation of mechanical music. The new high definition TV format is ideally suited for detailed automata, opening up new possibilities of interpretation through image processing methods.

# Administration

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## International Relations

Head: BERNHARD PLUNGER

The Austrian Academy of Sciences (AAS) maintains worldwide close contacts to Academies of Sciences. On the basis of at present 47 bilateral agreements with foreign partner academies the AAS plays an important role as an open door agency for the Austrian scientific community. In a united Europe bilateral contacts still play a decisive role in strengthening and linking national research interests, and in supporting the mobility of researchers. In this way the AAS contributes considerably to the establishment and realisation of the vision of a *European Research Area*.

Within the frame of the bilateral agreements the AAS operates a scientific exchange programme; in the reporting period 470 foreign guests were hosted. These guests were invited to collaborate in projects of the AAS research units, to participate in conferences, workshops, and symposia organised by AAS research units or were nominated on the basis of invitations from members of the AAS by the particular partner academy. Furthermore 213 visits of co-workers of the AAS and of members of the AAS were realised.

During the last two years the AAS intensified its official bilateral contacts with Academies of Sciences in central- and south-eastern European partner countries. In this connection it was particularly satisfactory that at the end of the year 2007 the signing of bilateral agreements with the Academy of Sciences of Kosovo, the Republic of Moldova and the Vojvodina could be realised. Thereby the traditionally very well established bilateral relations of the AAS with Academies in the West Balkan regions could be further strengthened.

Against the background of a specific focus of the AAS on co-operations with partner academies in the new member states of the European Union the bilateral agreements between the AAS and the Academy of Sciences of Poland, Rumania, Slovakia and the Czech Republic could be extended.

Moreover the AAS has for a considerable time been engaged in bilateral co-operations in Asia. The agreements

with the Mongolian Academy of Sciences and the Tibetan Academy of Social Sciences have been extended. New agreements with the Academia Sinica in Taiwan and with the Korean Academy of Science and Technology (KAST) in South Korea could be established. By these means the AAS expects new and strong incentives for the cooperative activities of its research units in one of the worldwide most innovative research regions.

Through these activities the AAS is continuing a tradition that has been followed since the foundation of the Academy and that has become politically indispensable in the network of international relations and in its function of building bridges and opening doorways.

Partner institutions of the AAS in the frame of the bilateral agreements:

country	institution
Albania	Albanian Academy of Sciences, Tirana
Azerbaijan	Azerbaijan Academy of Sciences, Baku
Belarus	National Academy of Sciences of Belarus, Minsk
Belgium	Royal Academy of Sciences and fine Arts of Belgium, Brussels
Bulgaria	Bulgarian Academy of Sciences, Sofia
Canada	Royal Society of Canada, Ottawa
China	Chinese Academy of Sciences, Beijing
China	Chinese Academy of Social Sciences, Beijing
China	Tibetan Academy of Social Sciences, Lhasa
Croatia	Croatian Academy of Sciences and Arts, Zagreb
Czech Republic	Academy of Sciences of the Czech Republic, Prague

country	institution
Egypt	Academy for Scientific Research and Technology of the Arabic Republic of Egypt, Cairo
Estonia	Estonian Academy of Sciences, Tallinn
Finland	Academy of Finland, Helsinki
France	National Centre of Scientific Research (CNRS), Paris
Georgia	Georgian Academy of Sciences, Tbilisi
Great Britain	Royal Society, London
Great Britain	British Academy, London
Greece	Academy of Athens, Athens
Hungary	Hungarian Academy of Sciences, Budapest
Iran	Academy of Sciences of the Islamic Republic Iran, Teheran
Ireland	Royal Irish Academy, Dublin
Israel	Israeli Academy of Sciences, Jerusalem
Italy	National Academy of Sciences, Rome
Kosovo	Academy of Sciences and Arts of Kosovo, Prishtina
Latvia	Latvian Academy of Sciences, Riga
Lithuania	Lithuanian Academy of Sciences, Vilnius
Macedonia	Macedonian Academy of Sciences and Arts, Skopje
Moldova	Academy of Sciences and Arts of Moldova, Chisinau
Mongolia	Mongolian Academy of Sciences, Ulan Bator

country	institution
Poland	Polish Academy of Sciences, Warsaw
Romania	Romanian Academy, Bucharest
Russia	Russian Academy of Sciences, Moscow
The Netherlands	Royal Netherlands Academy of Arts and Sciences, Amsterdam
Serbia	Serbian Academy of Sciences, Belgrade
Slovakia	Slovak Academy of Sciences, Bratislava
Slovenia	Slovenian Academy of Sciences and Arts, Ljubljana
South Korea	Korean Academy of Sciences and Technology, Seoul
Spain	Council for Scientific Research (CSIC), Madrid
Sweden	Royal Academy of Literature, History and the Antiques, Stockholm
Sweden	Royal Swedish Academy of Sciences, Stockholm
Switzerland	Swiss Academy of Natural Sciences, Bern
Taiwan	Academia Sinica, Taipei
Tajikistan	Tajik Academy of Sciences, Dushanbe
Turkey	Turkish Academy of Sciences (TÜBA), Ankara
Ukraine	National Academy of Sciences of Ukraine, Kiev
Vojvodina	Academy of Sciences and Arts of Vojvodina, Novi Sad

## National and International Research Programmes

Head: GÜNTER KÖCK

The research programmes listed below are financed by the Federal Ministry for Science and Research (BMWF) and administered by national committees established at the Austrian Academy of Sciences. The national committees, consisting of renowned scientists and representatives of several Ministries and federal organizations have, among other things, the following tasks:

- co-ordination of the research activities in their specific research sector
- formulating programme related research strategies
- quality assurance of the funded research projects
- development of new research focuses
- stimulation und funding of new research projects and scientific co-operation

The research proposals submitted in response to invitations are granted by the national committee after an external peer review. Furthermore, the scientific quality of both the results and project reports are also reviewed by the national committee.

Further information on current projects can be obtained from the ÖAW website – (<http://www.oeaw.ac.at/deutsch/forschung/programme/programme.html>).

In order to increase both scientific output and public access to the results of projects financed by the AAS research programmes, the option of online publication (including ISBN and DOI) of project reports was introduced in cooperation with the Austrian Academy of Sciences Press. To date 13 project reports (accessible by full-text search via all WWW search engines) can be downloaded from the Austrian Academy of Sciences Press homepage (<http://epub.oeaw.ac.at/forschungsprogramme>).

All ÖAW research programmes are either part of international scientific programmes (UNESCO, UNO, ICSU, EU) or linked to international research programmes through contracts and scientific co-operations. The ÖAW research programmes are represented at many international scientific conferences and in UNESCO bodies by national committee members and

by the head of the ÖAW research programmes unit (e. g. as delegate to the International Coordinating Council of the Man and Biosphere Programme MAB-ICC)

### *Alpine Research*

This programme established in the year 1999 is part of the research co-operation “International Scientific Committee on Alpine Research (ISCAR)”. The research programme aims to promote alpine-wide and interdisciplinary cooperation in the field of alpine research and the transfer of scientific results into practice and to the public. Main research topics are among others global change, water, transport, natural disasters, biodiversity, social economy and geoscience.

### *Geophysics of the earth's crust*

The research programme “Geophysics of the Earth's Crust” was established in the year 1979 to fund projects of applied geophysics of the shallow crust, e. g. the interpretation of potential fields, the modelling of electromagnetic data, refined recording technologies for seismic measurements as well as investigations of mass movements (e. g. landslides, rockfalls).

### *Global Change Programme*

Established in 1990 this research programme covers three international research networks:

- International Geosphere Biosphere Programme (IGBP)
- World Climate Research Programme (WCRP)
- International Human Dimension Programme (IHDP)

The Global Change programme supports projects dedicated to the investigation of global environmental change (e.g. climate, biodiversity).

### *Hydrology of Austria*

The programme “Hydrology of Austria” is the Austrian contribution to UNESCO's “International Hydrology

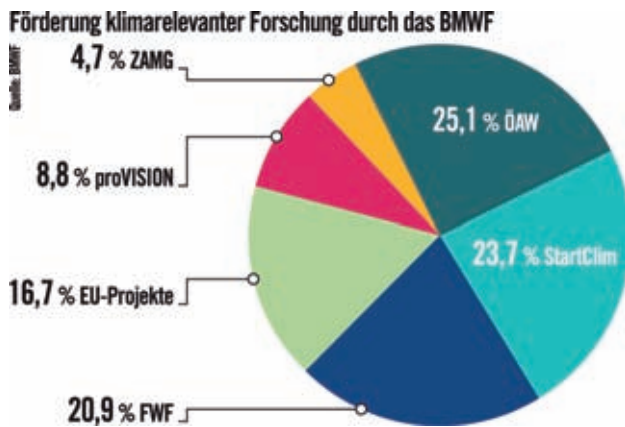


Fig. 1: From 2002 to 2006 the Federal Ministry of Science and Research (BMWF) provided 37 Mio. Euro in support of 215 climate-related research projects. 25,1 % of the total budget were handled by the AAS research programmes.

Source: FORMAT 34/04, p 57; BMWF

Programme (IHP)". Current research topics are soil moisture, modelling and forecasting of precipitation as well as water discharge in Alpine catchment areas.

#### *International Strategy for disaster reduction (ISDR)*

Established in the year 1990 this UN research programme aims to improve our scientific knowledge about causes and risks of natural hazards, and to develop early warning strategies and methods for the reduction, prevention and mitigation of natural disasters.

#### *International geoscience programme (igCp)*

The IGBP programme established in 1973 promotes collaborative projects in several geoscientific research topics exactly defined by UNESCO. Main research topics are among others Quaternary geology, environmental and engineering geology, sedimentology, mineral deposits, geochemistry, geophysics and structural geology.

#### *Man and Biosphere Programme (MAB)*

The UNESCO research programme "Man and Biosphere (MAB)" established in the year 1971, develops the foundations, within the natural and the social sciences, for the sustainable use and conservation of natu-

ral living conditions and biological diversity. The MAB Programme encourages interdisciplinary and internationally linked research, demonstration and training in natural resource management. The concept of the world-wide biosphere reserve network represents the key component of the MAB Programme. The Austrian MAB-Committee has focused its future research activities predominantly on the needs of the Austrian biosphere reserves.

#### *Commission for the Coordination of Nuclear Fusion Research in Austria at the Austrian Academy of Sciences*

When Austria became a member of the European Union, the Commission, established in 1980, laid the foundation for the implementation of the Association Treaty between the Austrian Academy of Sciences and EURATOM, which came into force in 1996. Its main goals are to advise the government on all issues related to the matter and to coordinate the specific research activities in Austria. In addition to its original tasks as regards information dissemination, the Commission at present encourages and grants research projects in the field of fusion technology with special emphasis on the "construction of the experimental fusion device ITER", and fulfils a coordinating function on behalf of the EURATOM office at the Academy as well as for Austrian participation in the European fusion experiment JET. The Association EURATOM- AAS currently pursues R+D projects on physics, technology and socio-economic aspects of relevance for the further development of thermonuclear fusion within the European Fusion Programme and, in this way, significantly contributes to the backflow of means from the European Union to all Austrian institutions participating in the European fusion programme within the framework of the association EURATOM-AAS.

Between 2006 and 2007 about 50 scientific projects were financed through AAS research programmes, thereby adding significantly to Austrian research efforts. According to statistics provided by the Federal Ministry of Science and Research (BMWF), the AAS research programmes in the period of 2002–2006 made the most significant contribution to climate-related research in Austria (see figure).



## Fellowships and Awards

Head: BARBARA HABERL

### Fellowship Programmes

In 2006, the eligibility requirements for the fellowship programmes DOC, DOC-fFORTE and APART were changed. At the same time, the annual payment rates for fellows were raised and one common annual application deadline for all three programmes was set. Thanks to the increase of financial means for APART and DOC as well as for DOC-fFORTE provided by the Federal Ministry for Science and Research (bm:wf) the number of grants could be increased after a decline in the previous years.

Applications for fellowships were invited again in 2006 and 2007 for DOC-team, a fellowship programme for doctoral candidates from diverse disciplines in the humanities, cultural studies and social sciences cooperating on a research project across boundaries with the main emphasis on a team-oriented, inter- and transdisciplinary approach.

The AAS and the research forum of the Austrian Universities reached an agreement of cooperation to enable fellows in all the above mentioned programmes to join institutions where they complete their doctorate or carry out their research projects. From 2006 onward APART-, DOC-, DOC-fFORTE- and DOC-team fellows may be employed at a university or at an external research institution during their fellowships.

### *New Fellowship Programmes*

In cooperation with L'ORÉAL Austria and the Austrian Commission at UNESCO the AAS in 2007 was able to invite applications for two fellowships for young female researchers in medicine, mathematics, and science. On account of the large number of excellent applications, the bm:wf financed two more fellowships through "fFORTE – Women in Science and Technology".

In the same year the EU network ERA-AGE (European Research Area in Ageing) offered fellowships for interdisciplinary projects on ageing research to scientists from all parts of Europe. All applications from

Austria were ranked as absolutely worthy of financial support by an international panel of experts; the bm:wf agreed to fund one research project in the fields of biomedicine and social sciences respectively.

### *Alumni Association*

At the request of many former fellows, the Alumni Association of the Austrian Academy of Sciences was founded in 2006. It is intended to offer a means of exchange to all former fellows of the programmes DOC, DOC-fFORTE, DOC-team, APART and MAX KADE.

### Awards

During the period under review, three new awards targeted at scientists from different fields of research were introduced:

#### *Bader-Preis*

Dr. Alfred Bader – who is one of the most renowned private collectors of Dutch Art from the 17th century – has endowed a prize for doctoral candidates engaged in research on painting and drawing between 1600 and 1750.

#### *Dissertationspreis für Migrationsforschung*

In 2006 Prof. Dr. Rainer Bauböck was awarded the European Latsis-Prize. He donated part of the prize money for an award to be conferred by the AAS on the initiative of the Commission for Migration and Integration Research from 2007 onward.

Young researchers from the humanities, cultural studies and social sciences who deal in their doctoral dissertations with migration, the integration of migrants or with societal changes resulting from migration are invited to apply.

#### *Walther E. Petrascheck-Preis*

On the occasion of the 100<sup>th</sup> birthday of the Austrian geologist Walther Emil Petrascheck the Commission

for Basic Research on Mineral Raw Materials has established an award for young scientists active in the field of mineral raw materials.

*Anniversary Fund of the City of Vienna for the Austrian Academy of Sciences*

In 2006, the call for applications was focused thematically on “Vienna – Identity, Memory, Culture” – in support of projects in all disciplines of the humanities,

social sciences, cultural studies and law. In 2007 researchers in the natural sciences, mathematics, information technology, and all applied sciences were invited to submit projects dealing with “Computational Science”.

Information concerning award winners and the conditions of application for all programmes can be found on the homepage of the AAS.

## Accounting Office

Head: WILHELM HENRICH

### Expenditure 2006–2007

In its “Medium-term Research Programme 2006–2011” the Austrian Academy of Sciences made public its standards of planning and its quality control of research activities. A decisive part of this process – beyond the present “Medium-term Research Programme 2006–2011” – lies in international evaluation. It forms the basis of the standards against which the Academy measures its institutions, providing the same institutions at the same time with important feedback on the quality of their work. In addition, the Austrian Academy of Sciences feels sure to have set an exemplary initiative for Austrian research. The results of the last evaluation cycle, which have now been made public, comprise recommendations that are partly structural and partly thematical. They serve as the basis for such measures as the expansion or reduction in staff numbers, changes in research goals while keeping the par-

ticular institutions unchanged, but also for basic decisions like the closure, fusion, establishment or transfer of institutions. To implement the results of research evaluation it is, however, essential to provide appropriate financial conditions. Upon an initiative from the Austrian Federal Government the Council for Research and Technological Development allocated additional funds to the Academy to undertake improvement measures in the context of the Medium-term Research Programme. Only this special funding enabled the Academy to maintain its research activities, as the government’s budgeting for the institutions had not foreseen any rises. Further means were provided for institutions that had been set up as limited companies: the Institute of Molecular Biotechnology GmbH (IMBA), the Gregor Mendel Institute for Molecular Plant Biology (GMI) and the Centre for Molecular Medicine GmbH (CeMM).

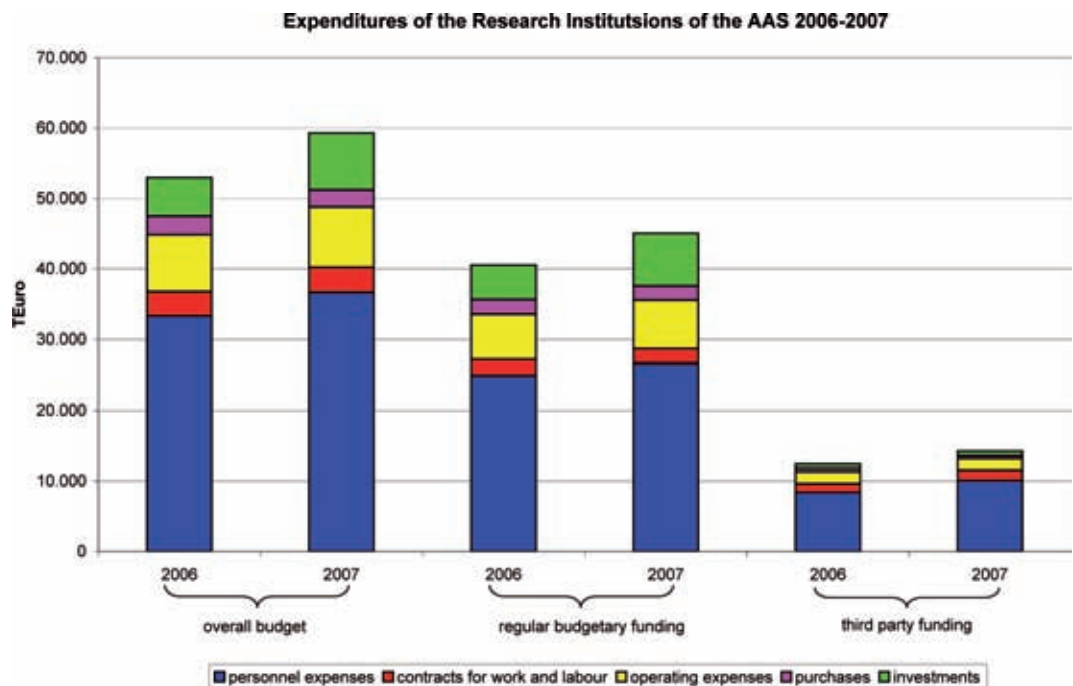


Fig. 1:  
Expenditures of the  
Research Institu-  
tions of the AAS  
2006–2007

	overall budget		regular budgetary funding		third party funding	
	2006	2007	2006	2007	2006	2007
personnel expenses	33.307	36.672	24.947	26.632	8.360	10.040
contracts for work and labour	3.477	3.563	2.250	2.086	1.227	1.477
operating expenses	8.070	8.550	6.370	6.854	1.700	1.696
purchases	2.633	2.425	2.101	1.997	532	428
investments	5.483	8.113	4.869	7.502	614	611
<b>total expenditure</b>	<b>52.970</b>	<b>59.323</b>	<b>40.537</b>	<b>45.071</b>	<b>12.433</b>	<b>14.252</b>

ad Fig. 1

Overall Budget	2006	2007
Academy Budget	58.304.000,00	65.661.000,00
Federal Contribution	28.154.000,00	27.154.000,00
RFTE Contribution	16.150.000,00	24.107.000,00
National Contribution	14.000.000,00	14.400.000,00
IMBA Budget (via Academy)	7.200.000,00	7.200.000,00
<b>Total</b>	<b>65.504.000,00</b>	<b>72.861.000,00</b>

Fig. 2: AAS Overall Budget 2006–2007

Through project contracts from the EU, the federal, provincial, and local governments as well as from funding granted by research councils and other promoting bodies and supporters approximately 30 % of the expenditure was recouped in competition with international and national research institutions.

In the diagrams a distinction is made between “regular budgetary funding” and “third-party funding”. As may be seen from the figures in these tables, more than 60 % of the financial means of the research institutions were spent on personnel. The remainder is allocated to investment, contracts, material, and maintenance.

## Austrian Academy of Sciences Press

Sales Manager: HERWIG STÖGER

The Austrian Academy of Sciences Press has the mission to publish the most recent achievements in Austrian scientific research of the highest standard and to distribute these publications among the international scientific community. The Austrian Academy of Sciences Press also provides research marketing and content management for the Academy. Over the years the number of titles published annually has been continually growing. The Austrian Academy of Sciences Press offers many young scientists and researchers the possibility of presenting their first major work to an international audience.

### *Production and Quality Management*

The annual output of printed and online publications has continued to increase. In 2007 more than 100 new publications were produced by the Austrian Academy of Sciences Press for the first time. A cost-cutting programme for publications of the philosophisch-historische Klasse (the section comprising the Humanities and the Social Sciences), involving standardisation and digital printing, was implemented over the period of one year for the first time and resulted in substantially lower production costs.

The so-called VADEMECUM, offering guidelines for the submission of new manuscripts in the section of the Humanities and the Social Sciences, was updated. In 2006 texts by 733 authors from 24 countries were published; in 2007 the numbers rose to 866 authors from 42 countries.

The quality of the works intended for publication is assessed by two to three experts on international standards before the manuscripts can be submitted to the publication commission of the section.

### *Research and Development*

Editing software was or is being developed and maintained for the *Wörterbuch der bairischen Mundarten*, the *Altdeutsches Namenbuch*, the *Österreichische Famili-*

*ennamendatenbank FAMOS*, the *Österreichisches Biographisches Lexikon*, the *Lexikon der keltischen Archäologie*, the *Oesterreichisches Musiklexikon*, the *Thesaurus der slowenischen Literatur* as well as for the Prehistoric Commission. On January 1, 2007, the ISBN numbering system was converted to a new 13-digit format. Online publications of the Press are indexed in full text by the scientific search engine Google Scholar on an agreement with Google, Inc. Publication metadata are indexed by various search engines, including Microsoft Live Academic, OAISTER and Scientific Commons. Since 2006 the Press has been registered as an Open Archive Data Provider. An agreement was signed with Austrian National Library for long-term archival of the Academy's digital titles. From 2008 onward the Press will take part in LIBREKA, the full text online search portal of the German Booksellers Association. An agreement has also been signed with SUBITO, a German document delivery service for libraries; and the implementation of a new product classification system in VLB (German Books in Print) was achieved.

### *Finance and Business Development*

The Press's total expenditures of € 1.4 million per year were covered in 2006/7 by roughly 60 % income from sales, 15 % from external funding and 25 % from Academy budgeting.

The sales level could be maintained against an increase in the number of free or subsidised scientific publications. Income from electronic publishing has slowly but steadily increased. Almost three-quarters of the Press's publications are distributed abroad, shipped directly to 79 countries worldwide. In 2006 the Press received 53 enquiries concerning publication permission, and in 2007 altogether 52 enquiries were received.

### *Communication and Services*

The Press was represented with its publications at numerous trade fairs, conferences and symposia, organ-

ised 30 book presentations, arranged media releases and distributed about 100,000 catalogues among the scientific community. New distribution contracts were signed with David Brown Book Distribution, USA and with Art Media Resources, Chicago. The distribution agreements with the University of Washington Press, USA, and Vine House Distribution, UK, were terminated. Participation in the ALPSP Learned Journals Collection, a joint marketing effort by some 50 academic publishers, began to show returns. Visits to the Press's website showed a strong increase, rising up to 130,000 visits per month by the end of 2007. The offices of the Press were renovated in 2006.

#### *Cooperations*

Cooperations took place with the Staatliche Museen Berlin – Preussischer Kulturbesitz, with the Istituto Pontificio Vaticano, Miras-e Maktoob, Tehran, the China Tibetology Research Center and Publishing House, Beijing, with Joanneum Research, Graz, and the Verlag Spektrum der Wissenschaften.

#### *Non-remunerated services*

Approximately 10,000 Press publications are annually distributed free of charge to libraries and scholars for academic exchange purposes. In April 2006, the section of the Humanities and Social Sciences decided to offer all new scholarly publications at 20 % below the usual market price. The Press supervises and continues to develop epub.oeaw, the institutional repository of the Austrian Academy of Sciences. The *Vienna Yearbook of Population Research* is now available as an Open Access publication.

#### *Management and Staff*

The Press is an institution of the Austrian Academy of Sciences and is presided over by a board. This supervisory body is headed by the board chairman, Ernst Steinkellner, and his deputy, Otto Kresten, both full members of the AAS. The members of the AAS Presiding Committee are the executive officers of the Press. In 2007 the number of employees at the Press was extended by one half-time position in the section of electronic publications. In 2007 a second employee in charge of book production was engaged by the administrative offices of the two Academy sections for the Humanities and Social Sciences and for Mathematics and Sciences respectively.

#### **Repository epub.oeaw**

As commissioned by the Presiding Committee of the Austrian Academy of Sciences (AAS), the Press has de-

veloped the institutional repository epub.oeaw for electronic publications. epub.oeaw presents research results from AAS activities in a well-structured and linkable format (OAIPMH), facilitates referencing by means of the Digital Object Identifier (DOI) system, and safeguards publications for the future through an agreement with the Austrian National Library.

epub.oeaw fulfils a number of purposes:

The presentation of the research results of the AAS in full text, which provides

- Search capacities
- Citation capability through the use of Digital Object Identifiers (DOI)
- Archiving of research results
- International links with other repositories
- Innovative pilot project for new forms of scientific communication (eScience)
- Support of Open Access Publishing

In a communiqué of the European Research Council (ERC) concerning Open Access published on 17 December 2007 all research funded by the ERC must be archived in a discipline-specific institutional repository. The Austrian Science Fund (FWF) recommends maintaining a repository to archive publications resulting from its funding.

#### *Figures*

The repository epub.oeaw has become one of the most successful repositories in German-speaking countries and, on the basis of its total OAI records (44,000), one of the largest repositories worldwide. Publications from 32 AAS institutions are offered on epub.oeaw and are freely available in the Academy's intranet.

#### *Research and Development*

All publications in epub.oeaw are indexed in full-text by Google Scholar and are displayed as snippets. This has resulted in an increased international visibility for the research results of the AAS. Through the new OAI-PMH-Interface, publication metadata can be read by scientific search engines like OAISTER or Scientific Commons. In 2007 bibliographic export tools for export to Bibtech, Endnote and Zotero format were programmed. In addition, social bookmarking functions have been inserted in Connotea and Delicious.

#### *Management and Staff*

A 150-page User Guide for epub.oeaw has been made available. The guide includes process descriptions as well as the regulations and functions of the repository.

PDF- guide lines are continually observed and maintained. epub.oeaw is maintained by two staff members.

#### *Cooperation*

Press staff members attended conferences on digital publishing at CERN, Geneva and at the Vienna University of Technology. The epub.oeaw-team maintains close contacts with the European open access repository initiative DRIVER and is a member of the Austrian network for digital long-term archiving (Netzwerk Dig:LA).

