



Olli Lehto

LARS AHLFORS

At the Summit of Mathematics

Olli Lehto

LARS AHLFORS

At the Summit of Mathematics

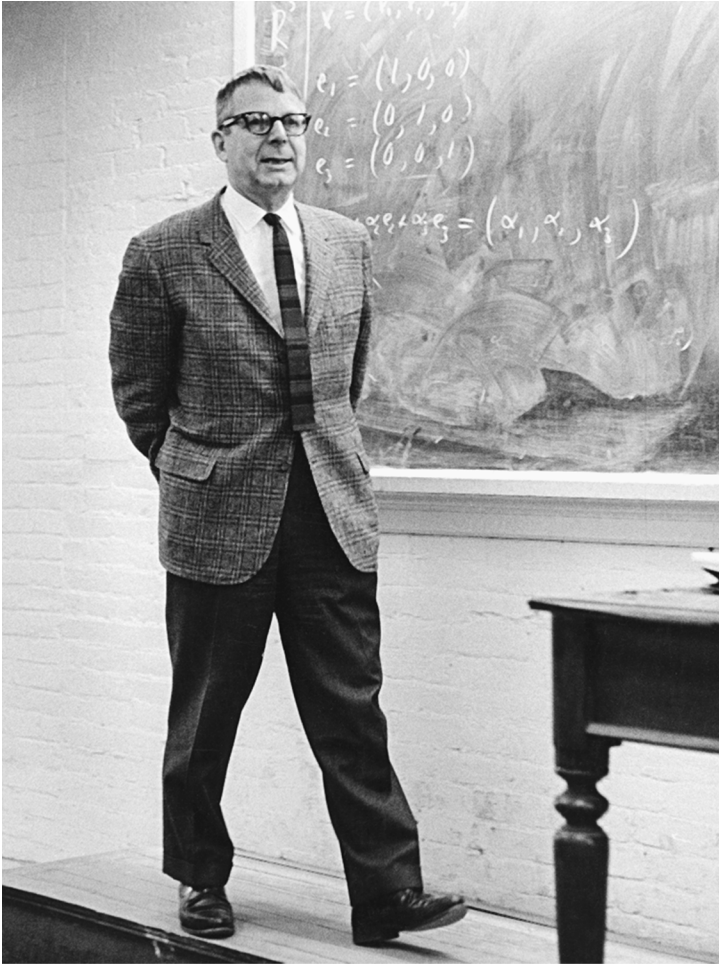


Photo courtesy of the Ahlfors family.

Lars V. Ahlfors

Olli Lehto

LARS AHLFORS

At the Summit of Mathematics

Translated by
William Hellberg



AMERICAN MATHEMATICAL SOCIETY
Providence, Rhode Island

Originally published in the Finnish language by Suomen Tiedeseura—
Societas Scientiarum Fennica as “Tieteen Huipulla: Lars Ahlforsin Elämä”,
© Suomen Tiedeseura—Societas Scientiarum Fennica and Olli Lehto.

The photo of Lars Ahlfors on the front cover was taken by Patrick Bertrand
and is from the private collection of Olli Lehto.

The photo from the Lars Ahlfors Centennial Celebration
on the back cover is by Erkki Lehto.

The photo of Olli Lehto on the back cover is by Erkki Lehto.

2010 *Mathematics Subject Classification*. Primary 01-XX.

For additional information and updates on this book, visit
www.ams.org/bookpages/mbk-92

Library of Congress Cataloging-in-Publication Data

Lehto, Olli.

[Tieteen huipulla. English]

Lars Ahlfors : at the summit of mathematics / Olli Lehto.

pages cm

Includes bibliographical references and index.

ISBN 978-1-4704-1846-5 (alk. paper)

1. Ahlfors, Lars V. (Lars Valerian), 1907–1996. 2. Mathematicians—Finland—Biography.
3. Mathematicians—United States—Biography. I. Title. II. Title: At the summit of mathe-
matics.

QA29.A34L4413 2015

510.92—dc23

[B]

2015006617

Copying and reprinting. Individual readers of this publication, and nonprofit libraries acting for them, are permitted to make fair use of the material, such as to copy select pages for use in teaching or research. Permission is granted to quote brief passages from this publication in reviews, provided the customary acknowledgment of the source is given.

Republication, systematic copying, or multiple reproduction of any material in this publication is permitted only under license from the American Mathematical Society. Permissions to reuse portions of AMS publication content are handled by Copyright Clearance Center's RightsLink® service. For more information, please visit: <http://www.ams.org/rightslink>.

Send requests for translation rights and licensed reprints to reprint-permission@ams.org.

Excluded from these provisions is material for which the author holds copyright. In such cases, requests for permission to reuse or reprint material should be addressed directly to the author(s). Copyright ownership is indicated on the copyright page, or on the lower right-hand corner of the first page of each article within proceedings volumes.

© 2015 by the American Mathematical Society. All rights reserved.

Printed in the United States of America.

∞ The paper used in this book is acid-free and falls within the guidelines established to ensure permanence and durability.

Visit the AMS home page at <http://www.ams.org/>

10 9 8 7 6 5 4 3 2 1 20 19 18 17 16 15

Contents

Preface to the English Edition	vii
To the reader	vii
Acknowledgements	vii
Family Background	1
The tale of career choice	1
Father's side of the family	1
Mother and her family	3
Father and professor	7
Exceptional Talent Emerges	9
The first years of life	9
Wunderkind	11
Student of mathematics	13
Mathematical breakthrough	16
Mathematical Renown Secured	21
Doctor and academic teacher	21
Marriage	22
Active researcher	26
Masterwork	27
To America and Back Again	31
First impressions at Harvard University	31
Fields Medal	32
Research in a cultural milieu	35
Return to Finland	37
War Years in Finland	41
André Weil	41
The Winter War	42
The Continuation War	44
Leaving Finland	47
In Sweden and Switzerland	51
Waiting in Sweden	51
Professor at the University of Zürich	54
Visiting the Copenhagen Congress	57
Professorship at Harvard University	59
To the United States permanently	59

Collaboration with Arne Beurling	61
Invitation to Sweden	62
International Congress of Mathematicians at Harvard	64
Social talent	65
Educator	67
The Legacy of Riemann and Teichmüller	71
The idol Bernhard Riemann	71
Classification of open Riemann surfaces	72
Clearing up Teichmüller's work	73
Teichmüller spaces	75
An interlude concerning Riemann surfaces	76
The boundary function of quasiconformal mapping	76
Complex analysis colloquium in Helsinki	77
Rapid development of the theory of quasiconformal mappings	78
Quasiconformal mappings come to Finland	80
New Research and Return to the Old	83
The Beltrami differential equation	83
Quasicircles and literature	84
Contacts with Soviet mathematicians	85
Kleinian groups	86
Seminar in Romania	88
Monograph on conformal invariants	88
Complex analysis at the University of Maryland	89
Distinctions	91
Wihuri International Prize	91
Summer place in Maine	91
International Congress in the native city	93
Wolf Prize	96
Honorary president of ICM-86	98
Other honors	100
Additions to the Portrait	103
Research work ends	103
Direction indicator for complex analysis	105
Cultural pursuits	106
Final years	107
Epilogue in Finland	111
Fields Medal to Helsinki	111
Lars' and Erna's ashes to the Ahlfors family grave	111
Lars Ahlfors Centennial Celebration	113
Sources	119
Books and journals	119
Archives	121
Private sources	121
Index	123

Preface to the English Edition

To the reader

This biography of the Finnish American mathematician Lars Ahlfors (1907–1996) is a slightly modified translation of my Finnish biography, which was published in the spring of 2013. That book was not intended only for members of the scientific community, but for any reader with an interest in science or scientists.

Mathematics could not be ignored, as it was the leading theme of Lars Ahlfors' life. But since the book was not aimed at mathematicians only, I refrained from going into detail and restricted my description to Ahlfors' impact on the development of complex analysis in the twentieth century.

The book was intended to prevent Lars Ahlfors from slipping into oblivion in Finland. It was surprisingly well received and has gone into a second edition.

The majority of readers of the English edition are probably non-Finnish mathematicians. For that reason I have removed passages of interest primarily to Finns, while adding a bit more to the portion of mathematics and to the Finnish history relating to Ahlfors' life.

There exists an excellent source of Ahlfors' mathematical works: Birkhäuser's extensive *Lars Valerian Ahlfors: Collected Papers*, Volume I, 1929–1955, and Volume II, 1954–1979, published in 1982. With only a few exceptions, it comprises Ahlfors' complete mathematical production. In addition it contains historical background to his studies as well as Ahlfors' own comments on almost every work.

There is also a lot to tell about Ahlfors other than his mathematics. His life was marked by political events, in particular World War II, and he was a colorful personality, which brought about many stories about him. Narrating them is limited by source criticism and the risk of giving a distorted image of his person. Lars Ahlfors was above all a hardworking toiler whose diligence was fueled by his love for mathematics.

Acknowledgements

Interest on the part of the American Mathematical Society (AMS) in an English edition of the biography of Ahlfors was first expressed by AMS Executive Director Donald E. McClure. He advised me to contact Senior Editor Edward Dunne. I do not know what party gave the decisive go-ahead to publish, but in any case the interaction with Edward Dunne proceeded well. Later, Dunne was followed by Sergei Gelfand, the head of the book department of the AMS. Marcia Almeida and Arlene O'Sean also had an active part in the editing of the English Ahlfors biography.

Arranging the translation remained my concern. The publisher of the Finnish book, the Finnish Society of Sciences and Letters, said they would be only pleased if

the book were to appear in English, and the University of Helsinki gave me without hesitation the permission to publish the English book and to use all required Ahlfors material in its possession. For covering the translation costs I turned to the Niilo Helander Foundation since its founder, Niilo Helander, was Lars Ahlfors' uncle. The funding decision came through in short order thanks to the chair of the Helander Foundation, my friend the historian Matti Klinge.

The first English text was produced by William Hellberg, an American translator of Finnish ancestry. By the agreement prepared by the AMS, I am also a translator. I am greatly indebted to William Hellberg because it was not difficult for me to revise his English text, and the end result was better than it would have been if I had translated the book alone from Finnish.

In Finland my foremost assistant was my son Erkki Lehto. He played an important role in preparing the illustrations, most of which are the same in the Finnish and English books, and was actively participating at the final stage in the editing of the book. Erkki took some photographs himself, searched for pictures on the Internet, clarified the permissions of their use, and prepared all into printable form. The majority of the pictures are from Ahlfors' daughters, who donated them to the University of Helsinki.

From Finns I also received assistance from Axel Ahlfors Jr., Bengt Ahlfors, Carl G. Gahmberg, Mats Gyllenberg, Martti Helminen, Aimo Hinkkanen, Leena Lehto, Olli Martio, Susanna Pennanen, Eini and Seppo Rickman, Dan-Olof Riska, Mika Seppälä, Olli Tammi, Jaana Tegelberg, Urpo Vento, Iikko Voipio, and John Westerholm. For details, I refer to my Finnish Ahlfors biography.

Concerning the half-century Lars Ahlfors lived in the United States, Lars' daughters Vanessa Gruen and Caroline Mouris as well as Caroline's husband, Frank Mouris, have been an irreplaceable source of information. They responded promptly and tirelessly to many specific questions that came to me as I was working on the book. Especially with Vanessa Gruen countless emails have crossed the Atlantic. Information has also been provided by the mathematicians David Drasin, Peter Duren, and Albert Marden from the United States and from Lennart Carleson and Ari Laptev from Sweden.

My heartfelt thanks goes to all who participated in producing the English edition of my Ahlfors biography.

Helsinki
April 2015
Olli Lehto

Sources

Books and journals

- Abikoff, William (1995). Lipman Bers. *Notices of the American Mathematical Society*, Volume 42, Number 1.
- Ahlfors, Lars V. (1953, 1966, 1979). *Complex Analysis*, first, second, and third editions. McGraw-Hill.
- Ahlfors, Lars V. & Sario, Leo (1960). *Riemann Surfaces*. Princeton University Press.
- Ahlfors, Lars V. (1966). *Lectures on Quasiconformal Mappings*. Van Nostrand Mathematical Series. Second edition (2005). *University Lecture Series*, Volume 38. Additional chapters by C. J. Earle & I. Kra, M. Shishikura, and J. H. Hubbard. American Mathematical Society.
- Ahlfors, Lars V. (1973). *Conformal Invariants: Topics in Geometric Function Theory*. McGraw-Hill. Second edition (2010). Writers of the Foreword: Peter Duren, F. W. Gehring, and Brad Osgood. American Mathematical Society. Chelsea Publishing.
- Ahlfors, Lars V. (1982). *Lars Valerian Ahlfors: Collected Papers*, Volume 1, 1929–1955 & Volume 2, 1954–1979. Birkhäuser.
- Ahlfors, L. V. (1989). The Joy of Function Theory. An article in the book *A Century of Mathematics in America*, Part III, edited by Peter Duren. American Mathematical Society.
- Ahlfors, Lars (1993). The Story of a Friendship: Recollections of Arne Beurling. *The Mathematical Intelligencer*, Volume 15, Number 1.
- Ahlfors, Lars & Gehring, Frederick (eds.) (1982). *Oswald Teichmüller, Gesammelte Abhandlungen Collected Papers*. Springer-Verlag, New York.
- Ahlfors Memorial Conference (1996). Program. Harvard University, Department of Mathematics.
- Ahlfors, Lars. List of publications and writings about him. *The MathNet Korea, Information Center for Mathematical Sciences (ICMS)*.
- Albers, Donald J. (1998). An interview with Lars V. Ahlfors. *The College Mathematics Journal*, Vol. 29, No. 2.
- Beckman, Bengt (2006). *Svenska kryptobedrifter*. Bonnierpocket. English translation (2002). *Codebreakers: Arne Beurling and the Swedish Crypto Program during World War II*. American Mathematical Society.
- Castrén, Kaarlo (1965). *Niilo Helanderin säätö 1927–1965* (Niilo Helander Foundation). A new edition complementing Kaarlo Castrén's account of 1936, edited by Urpo Vento in 1995.

- Comptes Rendus du Congrès International des Mathématiciens, Oslo 1936*, Tome I (1937).
- Gehring, Frederick (1998). Quasiconformal mappings. A part of the article “The Mathematics of Lars Valerian Ahlfors”. *Notices of the American Mathematical Society*, Volume 45, Number 2.
- Gehring, Frederick (2005). Lars Valerian Ahlfors 1907–1996: Personal and professional history. *National Academy of Sciences, Biographical Memoirs*, Volume 87.
- Kaskimies, Einari (1947). Matematiikan ihmelapsi L. V. Ahlfors (Prodigy of mathematics). An article in the book *Suuria suomalaisia tiedemiehiä* (Great Finnish scientists). Oy Kivi.
- Kra, Irwin (1998). Kleinian groups. Part of the article “The Mathematics of Lars Valerian Ahlfors”. *Notices of the American Mathematical Society*, Volume 45, Number 2.
- Kra, Irwin & Bass, Hyman (2001). Lipman Bers 1914–1993. *National Academy of Sciences, Biographical Memoirs*, Volume 80.
- Krantz, Steven G. (editor and writer) (1998). Lars Valerian Ahlfors (1907–1996). The other writers of the untitled articles are Raoul Bott, Clifford Earle, Dennis Hejhal, James Jenkins, Troels Jorgensen, Albert Marden, and Robert Osserman. *Notices of the American Mathematical Society*, Volume 45, Number 2.
- Lehto, Olli (1998). On the Life and Work of Lars Ahlfors. *The Mathematical Intelligencer*, Volume 20, Number 3.
- Liesto, Martti (1988). *Teknillinen korkeakoulu 1908–1988* (The University of Technology). Karisto Oy.
- Lindh, Erik, Brenner, Alf & Cronström Lundén, Ingegerd (eds.) (1941–1958). *Släktbok, Ny följd I* (Genealogy, New series), the article Halleen. Svenska Litteratursällskapet i Finland (Society of Swedish Literature in Finland).
- Mattsson-Eklund, Benita (2008). Mattesnillet Ahlfors växte upp i en Mariehamns-gård (Mathematical genius Ahlfors grew up in a house in Mariehamn). *Ålandstidningen*, April 24, 2008.
- Myrberg, P. J. (1942). *Differentiali-ja integralilaskennan oppikirja* (Differential and integral calculus). Otava.
- Nevanlinna, Rolf (1976). *Muisteltua* (Memoirs). Otava.
- Nya Svenska Samskolan 1888–1938* (New Swedish coeducational school) (1938). Helsingfors.
- Osserman, Robert (1998). Conformal geometry. Part of the article “The Mathematics of Lars Valerian Ahlfors”. *Notices of the American Mathematical Society*, Volume 45, Number 2.
- Pietiläinen, Kimmo (1978). Lars Ahlfors—perin juurin matemaatikko (—thoroughly a mathematician). *Suomen Kuvalehti* (magazine) 34.
- Proceedings of the International Congress of Mathematicians*, Cambridge, Massachusetts, U.S.A., August 30–September 6, 1950, Volume I (1952). American Mathematical Society.
- Proceedings of the International Congress of Mathematicians*, Helsinki, Finland, August 15–23, 1978, Volume I (1980). Academia Scientiarum Fennica.

Proceedings of the International Congress of Mathematicians, Berkeley, California, August 3-11, 1986, Volume I (1987). American Mathematical Society.

Strebel, Kurt (1991). Die finnische mathematische Schule an der Universität Zürich, Erinnerungen an Rolf Nevanlinna (The Finnish mathematical school at the University of Zürich, remembering Rolf Nevanlinna). Article in the book *Bausteine—Die Schweiz und Finnland im Spiegel ihrer Begegnungen*, edited by Ingrid Schellbach-Kopra and Marianne von Grünigen. Jahrbuch für finnisch-deutsche Literaturbeziehungen Nr. 23/1991. Verlag Neue Zürcher Zeitung. Zürich.

Vesa (1936). Missä ovat maailman kuuluisimmat matemaatikot? — Suomessa (Where are the world's leading mathematicians? — in Finland). *Suomen Kuva-lehti* (magazine) 31.

Archives

Brages Pressarkiv

Newspaper articles concerning Axel and Lars Ahlfors.

Harvard University Archives

Papers of Lars Valerian Ahlfors, 1929–1987. Processed November 2002.

Helsingin kaupunginarkisto (Helsinki City Archives)

Addresses of Aina, Alma, Axel, and Lars Ahlfors.

Helsingin yliopiston keskusarkisto (Central Archives of the University of Helsinki)

Programs of the university, 1933–1944.

Documents concerning Lars Ahlfors.

Rolf Nevanlinna's archives, correspondence Nevanlinna-Ahlfors.

Helsingin yliopiston museo (Museum of the University of Helsinki)

Documents concerning Lars Ahlfors.

Photographs.

Niilo Helanderin säätiön arkisto (Archives of the Niilo Helander Foundation)

Matti Klinge, Opening address at the eightieth anniversary of the Niilo Helander Foundation, September 20, 2007.

Kansalliskirjasto (National library)

Minutes of the meetings of the student organization Nylands Nation 1924–1929.

Ernst Lindelöf's archives, letters of Ahlfors and Nevanlinna to Lindelöf 1928–1929.

Sota-arkisto (Military archives)

Lars Ahlfors' enrolment for military service.

Lars Ahlfors' liberty license.

Statens utlänningskommission (Swedish commission for foreigners)

Documents concerning Lars and Erna Ahlfors.

Iikko Voipio's Archives

Esipolvikertomukset Ahlforsin suvusta (Ancestors of Lars Ahlfors).

Niilo Helander's family.

Private sources

In the “Acknowledgements” of the Preface, persons are mentioned who in various ways have given information.

Index

- Abikoff, William, 110
Ahlfors, Aina, 2, 9, 10
Ahlfors, née Palmroth, Alice, 10
Ahlfors, Alma, 2, 9, 10
Ahlfors, née Halleen, Anna, 2, 7
Ahlfors, Aune, 9, 113
Ahlfors, Axel, 1–3, 5–11, 15, 16, 46, 112
Ahlfors, Axel, Jr., 49, 112, 114, 115
Ahlfors, Bengt, 2, 112, 113
Ahlfors, Caroline, *see* Mouris, Caroline
Ahlfors, Christoffer, 26, 47, 48, 53
Ahlfors, Cynthia, 26, 43, 48, 55, 59, 64, 65, 92, 109, 112
Ahlfors, Einar, 2
Ahlfors, née Lehnert, Erna, 19, 23–26, 31, 43, 46–48, 55, 57, 59, 61, 64–67, 86, 90–93, 95, 98, 99, 103, 104, 106–109, 111, 113, 114
Ahlfors, Gustaf, 49
Ahlfors, Isa, 9, 113
Ahlfors, Richard, 2, 9
Ahlfors, née Helander, Sievä, 3–7, 9, 10, 113
Ahlfors, Sven, 1, 2, 6, 7
Ahlfors, Vanessa, *see* Gruen, Vanessa
Aleksandrov, Pavel, 42
Alexander II, Emperor, 1
Andreian Cazacu, Cabiria, 88
Anttila, née Helander, Selma, 5
Archimedes, 32

Bauer, Friedrich, 108
Becker, Gösta, 49
Behnke, Heinrich, 94
Beltrami, Eugenio, 83
Bergman, Stefan, 67, 73
Bers, Lipman, 78–80, 83, 84, 87, 88, 110
Beurling, Arne, 18, 31, 44, 51–53, 57, 61, 62, 66, 76–78, 89, 104, 105
Beurling, Karin, 105
Bhutto, Benazir, 102
Birkhoff, G. D., 35
Birkhoff, Garrett, 35, 64
Bohr, Harald, 65
Bojarski, Bogdan, 84

Borel, Émile, 94
Bott, Raoul, 108
Bourbaki, Nicolas, 42

Cajander, A. K., 29
Cantor, Georg, 15
Carathéodory, Constantin, 31, 33, 47, 99
Carleman, Torsten, 62
Carleson, Lennart, 28, 66, 77, 108, 114
Carlsson, Fritz, 64
Cartan, Élie, 34, 47
Cartan, Henri, 86, 94
Cauchy, Augustin Louis, 13, 14, 69
Chern, S. S., 84
Coolidge, J. L., 35
Crofton, Morgan William, 44

Denjoy, Arnaud, 16, 19, 78
Donaldson, Simon, 71, 99
Douglas, Jesse, 33, 34, 98, 99
Duren, Peter, 89

Earle, Clifford, 68, 85, 108
Elfving, Gustav, 65, 90
Erola, Ulrika, *see* Helander, Ulrika

Faddejev, Ludwig, 99
Fields, John C., 32
Finsler, Paul, 48, 49, 51, 54–56
Fricke, R., 86
Fueter, Rudolf, 48, 49, 54–56

Garabedian, Paul, 67
Gauss, Karl Friedrich, 26, 28, 72, 83
Gehring, Frederick W. (Fred), 74, 80, 81, 84, 88–90, 96, 99, 104, 108
Gehring, Lois, 89
Gleason, Andrew, 99
Graustein, William Caspar, 35, 102
Greenberg, Leon, 87
Griffiths, P. A., 36, 44
Grötzsch, Herbert, 28, 83, 96
Gruen, née Ahlfors, Vanessa, 6, 26, 43, 48, 55, 59, 64, 65, 92, 105, 109, 111, 112, 114–116

- Grunsky, Helmut, 66
- Hadamard, Jacques, 94
- Halleen, Anna, *see* Ahlfors, Anna
- Halleen, Carl Johan, 2
- Hayman, Walter, 108
- Helander, Kaarle, 3–5, 7
- Helander, Niilo, 5, 7
- Helander, Richard, 4
- Helander, Sievä, *see* Ahlfors, Sievä
- Helander, Teodor, 4, 5
- Helander, née Erola, Ulrika, 3, 5, 7
- Helander, Valerian, 4, 9
- Hilbert, David, 16, 26
- Hitler, Adolf, 22, 32, 34, 53, 64
- Hubbard, John H., 85
- Hurwitz, Adolf, 28
- Illman, Sören, 90
- Julia, Gaston, 78
- Kallio, Kyösti, 38
- Karhunen, Kari, 65, 67
- Keen, Linda, 110
- Kennedy, John F., 15
- Kissinger, Henry, 90
- Klein, Felix, 86, 94
- Kline, J. R., 64
- Kneser, H., 78
- Kolmogorov, Andrei, 65
- Kra, Irwin, 71, 85, 87, 110
- Künzi, Hans, 75, 78
- Lavrentjev, Mihail, 28, 78, 84
- Lehnert, Erna, *see* Ahlfors, Erna
- Lehnert, Gertrud, *see* Söderhielm, Gertrud
- Lehnert, Hugo, 23
- Lehnert, née Müller, Paula, 23, 47
- Lehtinen, Matti, 77
- Lehto, Eva, 85, 90
- Lehto, Olli, 5, 22, 25, 46, 59, 65–67, 80–82, 84–86, 88, 90, 91, 95, 99, 100, 107, 108, 111, 114, 115
- Lindelöf, Ernst, 13–18, 21, 29, 33, 35, 37, 39, 68, 69, 82, 90, 94, 99, 102, 106
- Lindelöf, Lorenz, 13, 15, 82, 97
- Lindelöf, Uno, 15
- Lindfors, Signe, *see* Mittag-Leffler, Signe
- Lohwater, Jack, 81
- Macmillan, née Wishard, Audrey, 36
- Mannerheim, Gustaf, 54
- Marden, Albert, 68
- Martio, Olli, 83, 111, 112
- McMichael, John, 91
- McMullen, Curtis, 114
- Mikkola, Jaakko, 36
- Mittag-Leffler, Gustaf Magnus (Gösta), 13, 62, 63
- Mittag-Leffler, née Lindfors, Signe, 62
- Montel, Paul, 78
- Mori, Akira, 80
- Morrey, C. B., 80, 83, 84
- Morse, Marston, 65
- Moser, Jürgen, 99
- Mouris, née Ahlfors, Caroline, 26, 54, 55, 59, 65, 66, 78, 103, 105, 107, 109, 111, 112, 114–116
- Mouris, Frank, 103, 105, 107, 109, 115, 116
- Müller, Paula, *see* Lehnert, Paula
- Myrberg, P. J. (Pekka), 13, 37–39, 46, 72, 73, 76
- Nevanlinna, Frithiof, 13, 35
- Nevanlinna, Rolf, 13, 14, 16–19, 27, 28, 33–37, 39, 42, 44, 46, 49, 50, 56, 57, 65, 67, 72–78, 82, 86, 87, 91, 96, 97, 99, 100, 106
- Nevanlinna, Sinikka, 86
- Niculescu, Miron, 88
- Nixon, Richard, 90
- Öhquist, Nils (Nisse), 23
- Oppenheimer, Robert, 65
- Osgood, Brad, 89
- Osserman, Robert, 35, 36, 68
- Pflugger, Albert, 66, 75, 80, 88
- Picard, Émile, 13, 94
- Poincaré, Henri, 16, 86, 87, 94
- Pólya, Georg, 17, 18
- Queen Elizabeth The Queen Mother, 100
- Raivio, Kari, 115
- Reed, J., 77
- Reitz, Irja, 23
- Rickman, Seppo, 95, 96, 108
- Riemann, Bernhard, 13, 15, 26, 39, 69, 71, 72, 75, 76, 84, 89
- Royden, Halsey, 68, 73
- Rudin, Mary Ellen, 98, 99
- Saarinen, Eliel, 5
- Sario, Leo, 72, 73, 76
- Schiffer, Max, 59, 73
- Schwartz, Laurent, 65
- Schwarz, Hermann Amandus, 15
- Selberg, Atle, 65
- Severi, Francesco, 32
- Shishikura, Mitsuhiro, 85
- Söderhielm, Eric, 23, 43, 51
- Söderhielm, née Lehnert, Gertrud, 23, 43, 64
- Speiser, Andreas, 27, 48, 51
- Stalin, Josif, 32, 85
- Stoilow, Simion, 78
- Stone, M. H., 35
- Strebel, Kurt, 54–57, 59, 79, 88, 95

- Sullivan, Dennis, 96
- Tammi, Olli, 46
- Teichmüller, Oswald, 28, 73–76, 84
- Thurston, William, 96
- Tienari, Martti, 84
- Tukia, Pekka, 77
- Uosukainen, Riitta, 108
- Väisälä, Jussi, 77, 96
- Veblen, Oswald, 64
- Vekua, I. N., 84
- Virtanen, K. I. (Kalle), 73, 80–82, 84, 85
- Walsh, J. L., 35
- Weil, André, 41, 42, 47
- Weil, Simone, 41
- Weill, G., 90
- Werner, Wendelin, 114
- Westerholm, Victor, 2, 3
- Weyl, Hermann, 16, 36, 43, 55, 71, 104
- Weyl, Joachim, 43
- Whitney, H., 35
- Wiener, Norbert, 34
- Wihuri, Antti, 91
- Wihuri, Jenny, 91
- Wihuri, Rakel, 92
- Wishard, Audrey, *see* Macmillan, Audrey
- Wittich, Hans, 74, 75
- Wolontis, Vidar, 67
- Wu, H., 44
- Zariski, Oscar, 96, 108

This book tells the story of the Finnish-American mathematician Lars Ahlfors (1907–1996). He was educated at the University of Helsinki as a student of Ernst Lindelöf and Rolf Nevanlinna and later became a professor there. He left Finland permanently in 1944 and was professor and emeritus at Harvard University for more than fifty years.

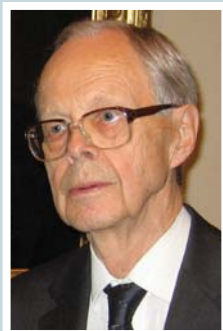


Photo of Olli Lehto

Already at the age of twenty-one Ahlfors became a well-known mathematician having solved Denjoy's conjecture, and in 1936 he established his world renown when he was awarded the Fields Medal, the "Nobel Prize in mathematics". In this book the description of his mathematics avoids technical details and concentrates on his contributions to the general development of complex analysis.

Besides mathematics there is also a lot to tell about Ahlfors. World War II marked his life, and he was a colorful personality, with many interesting stories about him.

Olli Lehto, the author of the book, first met Lars Ahlfors and his family as a young doctor at Harvard in 1950. Numerous meetings after that in various parts of the world led to a close friendship between them.



ISBN 978-1-4704-1846-5



9 781470 418465

MBK/92



For additional information
and updates on this book, visit

www.ams.org/bookpages/mbk-92

AMS on the Web
www.ams.org