



SOCIETY FOR CULTURAL ASTRONOMY IN THE AMERICAN SOUTHWEST

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SCAAS Turns 10 in 2021

By Greg Munson

The tenth anniversary of the establishment of our Society as a Colorado Nonprofit Corporation with federal tax-exempt status is this year on September 26, 2021. With its roots in the Conference on Cultural Astronomy in the American Southwest (CAASW), established by Todd Bostwick, Bryan Bates and Ken Zoll, the Society for Cultural Astronomy in the American Southwest, Inc. (SCAAS) came to symbolize the effort to bring research on cultural astronomy into the mainstream of anthropological studies. The Society has a strong focus and mission to support well-designed research and education on astronomical and traditional cultural knowledge regarding the cultures of the

Greater American Southwest, past and present. CAASW conferences and workshops in 2009, 2010 and 2011 formed the foundation for the association of the group that came together to form the Society. Continued conferences and workshops in 2014, 2016, 2017 and 2019 built upon the prior successes and formed lasting ties with major academic institutions. But it was the 2016 conference at Crow Canyon Archaeological Center that marked a fundamental shift in how the Society approached our work in cultural astronomy. There we had a greater focus on taking note of the perspective of Native American and Indigenous peoples and devoted a full “Day of Listening” to the endeavor. The seeds planted in 2016 blossomed into a full set of traditional knowledge conferences held at the Native American Cultural Center of Northern Arizona University, Flagstaff in April 2019. Significant recognition and support made this multi-disciplinary conference a huge success where we hosted about 100 participants many of whom represented eight different tribal and indigenous groups.

We have much to be proud of from our last ten years of effort. Most important are the number of researchers, professional and avocational, that we have helped develop their craft and approach to conducting meaningful research. Publication of peer-reviewed research results is an integral part of the success of an organization such as ours. Here we have excelled; first with the publication of *Astronomy and Ceremony in the Prehistoric Southwest: Revisited – Collaborations in Cultural Astronomy* from our 2011 CAASW conference at the University of New Mexico. We ultimately grew to create our own publishing house – SCAAS Multimedia Publications. Its first publication, *Beyond Borders: Revealing the Greater Southwest’s Ancestral Cultural Landscape*, is from the 2016 Crow Canyon conference and is currently available on Amazon. With the importance of traditional cultural knowledge forcing a change in approach during our 2019 conference, we edited videos of native speakers, recorded with permission, into the SCAAS 2019 Conference Video Series now available on the Society’s new YouTube Channel, [SCAAS.Connects2U](https://www.youtube.com/channel/UC...). The educational videos are available free of charge and the books are available at the [SCAAS Bookstore](https://www.scaas.org/bookstore).

The next ten years look to be even brighter. We are now embarking on special projects to digitize the archival collections of Dr. Jesse Walter Fewkes and increase our partnerships with other organizations and events. We are now working with Grand Canyon National Park to sponsor their upcoming 2021 Star Party – stay tuned. Such growth necessitates an inward look at improving operations and member services. New ideas include developing a semi-annual publication series. Of course, we will continue to plan for future conferences and workshops in whichever technological or personal format the day permits. Zoom membership meetings and group events will lead the way to the days where we can gather again under the skies of the Greater American Southwest to once again share the stories of the people and places that continue to bring us humans together.

Fewkes Digital Archive Project – Update

By Greg Munson and Ray Williamson

With its relaunch in fall 2020, the Fewkes Digital Archive Project strives to digitize the records of Dr. Jesse Walter Fewkes held at the National Anthropological Archives (NAA) of the Smithsonian Institution in Washington, D.C. These records contain notebooks, photograph collections and associated manuscripts that shed an important light on the early days of Southwestern archaeology and ethnography in the latter nineteenth and early twentieth centuries. Much of the data in these records is unpublished in anthropological reports of the era. As raw data, much of it can be used in the documentation and stabilization of the archaeological sites excavated by Fewkes. More important, they are a record of the peoples he studied. His published interpretations were limited, whereas the records themselves reveal a richer fabric of traditional knowledge preserved in their pages. This project's goal is to recover those pages and return them to the indigenous peoples Fewkes studied and to researchers who can use them to further illuminate Southwestern archaeology and anthropology.

The ultimate goal of the project is to digitize all of the records at the NAA. This is a serious undertaking expected to cost over \$150,000.00. A pilot project is needed to go the NAA to establish the working relationships, establish the project scope and processes and examine records that we think may provide the most benefit to the Native American tribes where Fewkes worked in the 1890s. With an estimated cost of \$7,500.00, this pilot project will send three people to the NAA in the fall of 2021. We anticipate the group including a Native American consultant to advise on the appropriate processes and sensitivity of information. Our goal for SCAAS donations is \$5,000.00. To date we have raised \$1,330.00 from our membership for this project. The project was featured in our Winter 2020 newsletter. So that you can have up-to-date information on the progress of the project, our Society website now has a Fewkes Archive page. Here we detail the project, track fundraising goals, provide a link to make online donations and a form for donations by mail. Soon we will be revealing some of the records that we digitized such as Fewkes' 1915 notebook on the excavation and repair of Sun Temple at Mesa Verde National Park, correspondence between Fewkes and Alfred Kidder exploring the beginnings of what is now known as Southwestern Archaeology and documents that reveal what may be some of the first scientific instruments used in the indigenous Southwest. Please visit this page often and support the project. [Fewkes Digital Archive Project](#)

Member Recognition

By Greg Munson, SCAAS Membership Chair

The Society would like to welcome and thank our newest Patron level member, Gerald Vincent of Cortez, CO. Gerald has been a long enthusiast of the Society and we want to thank him for his continued support. Additional Patron members are Bryan Bates, Ray Williamson and Michael Zeilik. Each Patron has supported the Society with a \$500.00 three-year membership. The Society has two Lifetime members, Travis Ambruster for donations of more than \$5,000.00 to the Society and Gregory Munson for a life of service to the organization.

The membership of the Society is a strong and diverse group spanning the nation from coast-to-coast. Eight Founder level members remain, the others have converted to other membership levels or departed for now. Carol Ambruster and Bernard Bell will forever remain in our hearts as perpetual In-Memoriam members of the Society. Three Full and 45 Associate members form the foundation of the Society that will carry us forward into the future. We thank each and every one of you for your support over the last ten years and look forward to serving you in the future.

Is the Hopi Ceremonial Cycle Seasonally Marked by Male and Female Responsibilities?

Bryan Bates

I have spent innumerable hours reading ethnographies of the Hopi and had come to the conclusion, based on available documents, that the Kivas and ceremonial cycle of the Hopi was controlled by men. This seemed



reasonable, even after my conversations with different Hopi cultural leaders. Yet, as we know, “seeming reasonable” and “being true” are very different.

In the spring of 1997, Shelby Coody, U.S. Forest Service, led me to a little known and difficult to get to petroglyph site. While the main panel captured my eyes, off to the side was a large spiral petroglyph (“spiral”) inscribed into a basalt boulder. (Photo 1) It was evident from the near perfect-circle grooves that the creator had tremendous patience and taken great care.

Photo1: Larry Hendricks. Bryan Bates Mar. 21, 2014 at the Solar calendar at Rarick Canyon.

Leah Coffman, a high school junior who attended one of my lectures, asked to learn archaeoastronomy and joined me in documenting this site. Besides the hours at the site, we also read innumerable archaeological articles at the Museum of Northern Arizona (MNA) archives where she happened upon an article addressing the women’s ceremonies. (Fewkes & Owens, *The LalaKonTo: A Tusayan Dance*, *American Anthropologist*, Vol.15, 1892.) Leah continued researching with me and, with her supportive mother as chaperone, she became the youngest presenter in archaeoastronomy as of the 1999 VI Oxford Conference in Tenerife, Canary Islands.

Leah’s discovery led me to review my research documentation finding that all of the late 1800’s and early-mid 1900’s ethnographers and archaeologists were men. I imagined an 1890 white U. of Chicago man in a suit and tie asking a traditional Hopi (or other Puebloan) woman about women’s ceremonies or puberty rights. How accurate of a story might that male ethnographer have gotten? It became obvious that our ethnographic records were biased.



Photo2: Bryan Bates, Mar 21, 1999

At the site we were researching, a shadow dagger, casted by a rock finger above the petroglyph, rises directly through the center of the spiral petroglyph on the day of spring and fall equinox. (Photo 2.) If the date is before the spring equinox or after the fall equinox, then the shadow dagger rises to the west of center because the azimuth of sunrise at the site is further south. If the date is after spring equinox and before fall equinox, the Sun’s azimuth is further north and the shadow cast is east of center. (Figure 1.)



If one continues observing the site through the year, the light-shadow line falls along the western edge of the spiral on the October and February “Cross-quarters day”, i.e., “X-1/4s”. (Figure 3.) This marks the Sun’s azimuth half-way between a solstice and an equinox. Euro-Americans know the October and February dates as Halloween and Groundhog’s day. Correspondingly, the May and August X-1/4 dates are marked by the light-shadow line falling along the eastern edge of the spiral, which we call May Day and historically called Lammas in Europe. This is a precursor for a future article.

Photo3: Bryan Bates Mar 21, 1999

Each of these dates are each marked by the Hopi. The new moon close to or following Feb 2nd marks the beginning of “Powamuya” or the re-emergence of life as symbolized by bean seeds planted in the Kiva germinating with the lengthening of daylight and the arrival of Spring. In Hopi, the X-1/4 time periods mark the temporal transition between women’s and men’s ceremonies. Most, if not all, Hopi ceremonies begin with the first crescent of a new moon. (Stephen, A. Hopi Journals, 1936, Ed. E. Parsons.) Other documented Hopi

calendar sites mark these time periods. (Bates, B. 2005, *Cultural Interpretation Astronomical Calendar*, 1996, V Oxford Conference, Ed. Fountain and Sinclair.)

Men’s ceremonies occur during the winter (Nov to Feb) and summer (May to Aug). The key times are the Soyal winter and Niman summer solstices. Women’s ceremonies occur from Feb-May with the Mam’zura at the Spring Equinox and the Lalakontu marking the fall equinox, though these ceremonies may switch places per former MNA Archaeology Curator Barton Wright.

The difference in length of time is due to the analemma which the Hopi may have recognized by careful observation of the Sun, but I’ve not found documentation supporting this. If it does exist, it might be found in Fewkes documents stored in the Museum of American Archaeology. Your SCAAS Board is raising funds to digitize and then research these fragile documents.

I have, since reading *LalaKonTo*, said that the spiral petroglyph marks the women’s ceremonial cycle because the shadow dagger marks the key points in time for women and the X-1/4 shadow casts mark the transition. I’ve observed the site year-round and the summer solstice sunrise casts a shadow across the bottom of the spiral and is anticipatory. I’ve also visited the site at winter solstice but was blocked by cloudy skies. However, astronomer and SCAAS member, Barry Malpas, visited the site at winter solstice and found the light-shadow line follows along the inscribed tail of the lower spiral at the very place it intersects a crack that enters deep into a rock crevasse. (Photo 4.) I had noticed the same pattern happening at the X-1/4s dates and equinox. (Photo 3.) Thus, it appears that the light-shadow line terminates at the entry to a deep crevasse throughout the year.

Dr. Todd Bostwick, a founder of SCAAS, former City of Phoenix Archaeologist and currently Director of the Verde Valley Archaeological Center, joined me for a visit to the site following the 2004 VII Oxford Conference in Flagstaff. His interpretation is that the light entering the crevasse may indicate a spiritual journey of a shaman or other significant person. It has been documented that leaders of different native tribes spiritually journey via “out-of-the-body” vision quests. Dr. Bostwick went on to call the zig-zag line going into the crevasse a “Shaman’s wandering path”. While I’ve not found documentation that Hopi people participate in vision quests, keep in mind that the Hopi seriously protect their traditional knowledge and have been one of the few SW tribes to escape the genocide of the Spanish and US Calvary.

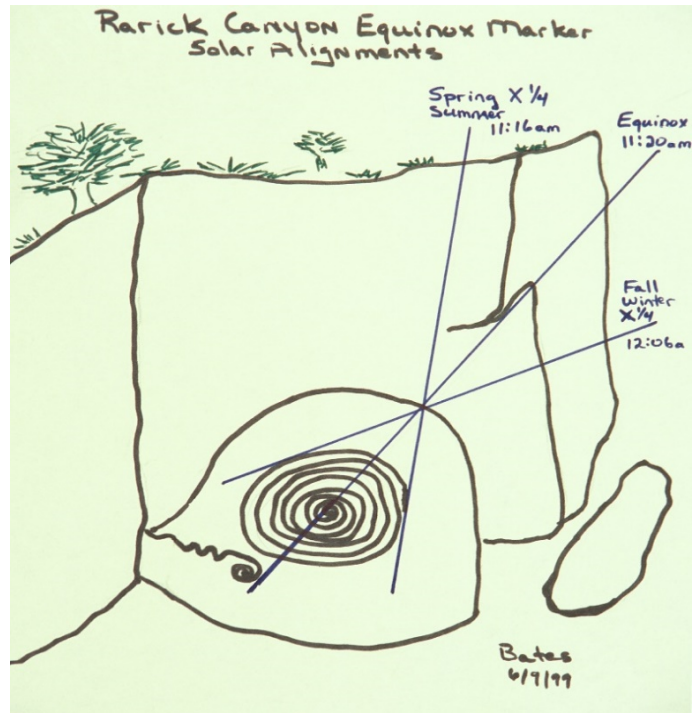


Diagram 1, Bryan Bates

If there is a kernel of truth here, it maybe that this spiral petroglyph is a sacred site and is one reason I’ve not revealed its location. Should you know of the site, I ask that you too protect its’ integrity by sharing its reflection of native knowledge without revealing its location.

Kwa’ Kwah!! (Thank you)

A demonstration: How Chaco Canyon's Pueblo Bonito's East-West alignment could have been accurately established

by Tony Hull¹ and Ray Williamson² ¹University of New Mexico ²Seven Horizons, Inc.

ABSTRACT

Worldwide, cardinality is exhibited in early public architecture. This seems to be an unambiguous reference to the celestial hemisphere. Rather than following the alignments suggested by natural features of rivers and canyons, alignments to east-west and north-south are common. Such alignments are seen at such diverse cultures and horizons as at the pyramids of the Giza Plateau, Egypt, and Taj Mahal on the southern bank of the Yamuna River in Agra, India. One such structure is Pueblo Bonito in Chaco Canyon, New Mexico is the “D-shaped” great house, in which about half of the south wall is aligned east-west with remarkable precision. Our question is not WHY such alignments were imposed on the architecture, but HOW this could be done to high precision. We report on a simple accurate method to determine east-west using only the shadow of a gnomon, where the trajectory of its tip over the course of the day of equinox constitutes a straight line, oriented accurately east-west [1]. This method is demonstrated with a simple gnomon placed just south of the southwest wall at Pueblo Bonito, with the results presented here. We suggest that the ancient Chacoans who constructed this remarkable structure may have used a gnomon technique to help them align their structures to the observable cosmos.

THE GNOMON'S SHADOW LOCUS



A well-known method for referencing the sun's daily motion across the sky involves the use of a gnomon, or vertical construction [2, 3]. If the observer attends to the shadow cast on the ground by the gnomon and marks the tip of the shadow with a pebble every 20 minutes or so, it will soon become apparent that this shadow forms a trajectory that represents the sun's daily path across the sky. We have modeled this shadow formation using the equations of spherical astronomy and some trigonometry. An example of a gnomon is illustrated at an installation at the 480-acre Cuyamungue Institute north of Santa Fe (Figure 1).

Figure 1: Gnomon installation at the Cuyamungue Institute [4] (Latitude 35.9° N) showing the curved line from the June solstice that the shadow tip portrays throughout the day and the contrasting straight line at the equinox.

In this picture small rocks have been placed to mark the tip of the shadow as it progresses across the ground. The curved locus was made at the June solstice, and the straight line at the equinox. The December solstice is not shown in this construction.

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PUEBLO BONITO’S ALIGNMENT

Pueblo Bonito: The Ancestral Pueblo people of Chaco Canyon built a number of large multistoried structures referred to as Great Houses. Pueblo Bonito is the largest of all Chaco Great Houses, occupied between A.D. 828 and 1126 and with an iconic D shape. The first excavation started in 1896 by the Hyde Expedition. Figure 2 is a Chaco Archive photograph of Bonito. The approximate latitude of Chaco Canyon is 36° N.



Figure 2: Pueblo Bonito (nps.gov). The white superimposed line indicates true east-west. The southwest length of the flat side is accurately East-West. The Southeast section of the south wall deviates from east-west by a few degrees. The approximate location of this Equinox Gnomon confirmation experiment is indicated by the white bracket. Since Pueblo Bonito was first found in ruins, then was excavated, we may never know the original slope of the ground.

Is the equinox locus of gnomon shadow tip parallel to Pueblo Bonito’s south-west sector of the flat wall? Our experiment at the September equinox involved placing a gnomon adjacent to a section of this wall. The gnomon tip was elevated and placed to cast a shadow approximately 60cm south of the wall.

The experiment was accomplished with a portable light stand constituting the gnomon (extended just over 2-meters), pebbles, a ruler and tape measure. White pebbles were placed at the shadow tip at unspecified

intervals. Both the distance from each pebble to the wall as well as the length along the locus were measured and recorded. Subsequently, the method of least squares was used to solve for two equations in two unknowns to determine the line's direction. The wall and the line are found to be virtually parallel to each other, within a three-standard deviation of +/- 0.26 deg.

SUMMARY

Unlike using a gnomon and constructions as often assumed to first define the north-south direction, we have demonstrated that the simple gnomon, and an observant Sun Watcher with a few pebbles can accurately define cardinal directions in a way that is conducive to public and ceremonial architecture. Although we have no ethnographic evidence that this method was used, our experiment shows that it could have been used. The appearance of the straight-line shadow locus at equinox would be appealing for three reasons:

1. This straight line only occurs only on the date of the equinox; thus, the equinox is different from all other days of the year in gnomon shadows.
2. This is a direct, one-step observation. The manifestation of this singularity is a line also defining cardinality.
3. All that is required is that the observer be on a flat, level piece of land, and indicate a shadow tip from time to time with pebbles.

We present this experiment as establishing a viable answer to the HOW question to the cardinality exhibited at Pueblo Bonito. It also defines the date of the equinox without the need for level horizons. We hope to extend this experiment over a greater length of Pueblo Bonito, and over other worldwide public architecture of early cultures.

NOTE: The complete argument for the potential use of this method for determining the direction of the equinox is presented in our article of the same name, which is available by [downloading the full paper here](#). That article also contains the equations for calculating the shape of the line defined by a gnomon shadow tip at any latitude and time of year. .

ACKNOWLEDGEMENTS

We would like to acknowledge evocative discussions and/or useful editing support from Dr. E. C. Krupp, Dr. Cherilynn Morrow, Dr. Elizabeth Jewell and Paul Robear of The Cuyamungue Institute.

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- [3] Williamson, R.A., [Living the Sky: The Cosmos of the American Indian](#), University of Oklahoma Press (1987)
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Memorial Tribute

SCAAS passes on some sad news from Dr. Ed Krupp:

"I am saddened to report the passing of archaeologist Euan MacKie. This morning I learned about his death from Pete Glastonbury, in Devizes, England. I first met Euan at the Hunterian Museum in Glasgow, where he was responsible at the time for the prehistoric collection. Most of his research involved antiquities in Scotland, but he also carried out excavations in Belize. Although he was the first to spotlight and promote the term archaeoastronomy, the focus of most of his work was conventional archaeology. His publications are extensive and include substantive contributions to archaeoastronomy. In particular, Science and Society in Prehistoric Britain (1977) attempted to evaluate megalithic astronomy in a cultural context. The Megalith Builders was directed to the general reader and was, at the time, a pioneering effort to present the monuments efforts of people, not just relics in the landscape. His Scotland: An Archaeological Guide was a singular resource at the time and helped me locate and reach sites with relative ease. Undaunted by controversy, Euan attempted to bring an anthropological perspective to megalithic astronomical alignments when few others did. He supported some of Alexander Thom's work with independent archaeological investigations and brought the impressive Minard alignment at Brainport Bay to the attention of the archaeoastronomical community. Throughout his career, MacKie favored the idea that at least some megalithic alignments operated as authentic observatories. While that notion is not proven and not favored today, MacKie recognized that specialized knowledge and specialists played a role in prehistoric society. As an prehistorian interested in ideology, he made the archaeoastronomical conversation more lively and more interesting".

E.C. Krupp

SCAAS partners with AmazonSmiles and Kroger Community Rewards

Do you use Amazon to shop? Do you shop at a Kroger Family of Companies (Fred Meyer, City Market, Smith's etc.)? The new AmazonSmiles and Kroger Community Rewards programs help you help us. When you shop on Amazon using the link below, 0.5% of your purchases on eligible products is sent to SCAAS. While that may only be pennies on the purchase, pennies add up to nickels, nickels to dimes and dimes to dollars! If we all shop using this [link](https://smile.amazon.com/ch/45-3412899) we can help SCAAS meet its mission to educate people on how the cultures of the Greater American Southwest, past and present, use the day and night sky in their daily lives. Bookmark this link in your browser so you can easily use it again and again. Look for the AmazonSmiles logo in the upper left corner of your Amazon shopping page to know that your purchases are helping to support the Society. Please share this link with all your Friends too! <https://smile.amazon.com/ch/45-3412899>

Grocery and merchandise shopping now helps us when you register your loyalty card and digital account from a Kroger Family of Companies (Baker's, City Market, Dillons, Food 4 Less, Foods Co, Fred Meyer, Fry's, Gerbes, Harris Teeter, King Soopers, Jay C Food Store, Kroger, Pay-Less Super Markets, QFC, Ralphs, and Smith's Food and Drug). Every time you shop a portion of your purchase is sent to us as a donation from the King Soopers/City Market Community Rewards Program. To register your card please follow the appropriate guide on our website at: <http://www.scaas.org/Sign-Up-Guides>

Once registered make sure to use your loyalty card every time you shop.

[SCAAS.Connects2U](#) YouTube Channel

By Greg Munson

SCAAS.Connects2U is the Society's new YouTube Channel and features the videos from our 2019 Traditional Knowledge Conference and the 2019 SCAAS Conference held at the Native American Cultural Center at Northern Arizona University, Flagstaff. The channel has a few playlists to help you navigate the educational videos we feature. Videos from the 2019 conference are in the 2019 Traditional Knowledge Conference and SCAAS 2019 Conference playlists. These are the videos of the presentations we were permitted to record, edit and post on the Channel. The most recent addition of Eric Descheenie's *Cognitive Mapping of Traditional Knowledge* is a real asset to the catalog of videos we have available. The Cultural Astronomy and Southwest Archaeology playlists link you to video presentations from our colleagues around the world on a wide variety of subjects related to studies in cultural astronomy and Southwestern anthropology.

Please use the links in this message to visit our YouTube Channel and **Subscribe** so that you will receive immediate notification when new videos are posted. Having a YouTube account and Subscribing to our channel lets you login into the YouTube app across all your devices including on your Smart TV and Roku device or TV. Watch our conference and video links from the comfort of your chair with a bowl of popcorn! Tell all your friends and family so they too can subscribe to our new channel and learn more about the traditional knowledge of our Native American and Indigenous scholars, conference speakers and researchers in their fields from around the world. [SCAAS.Connects2U](#)

Request for Newsletter Articles and Guidelines for Submitting

The SCAAS quarterly newsletter is for researchers and the public who are seeking to better understand and increase the depth of their knowledge in the role of astronomy in different Southwest cultures. Our objective is to offer insight into current research and/or publications, provide a forum for members to share their research, notify readers of upcoming events, and inform about the activities of the Society's Board, programs and finances.

ARTICLE SUBMISSION GUIDELINES

1. Articles should approx. 300 – 1500 words
2. All articles should be relevant to the mission and purpose of the Society for Cultural Astronomy in the American Southwest community.
3. Articles should include the name of the author, job title, email and SCAAS affiliation.
4. Please take the time to proofread and edit your work.
5. All work should be saved in .doc (Word)
6. Photos and artwork should be sent as high quality .jpg files. We really love to include photos that match your article (or a photo of the author). Feel free to send that with your article!
7. All submissions must be sent to the SCAAS Newsletter Editor – William Seven hunterinthesky7@gmail.com

The deadline to submit articles for consideration is the 1st of March, June, September, and December of each year. We will publish on either the solstice or equinox following those dates.

SCAAS Board of Directors

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SCAAS 2021 First Quarter Financial Summary

Available Cash 12/21/2020	\$ 19,547.76	Last Report
Income	\$ 1,910.70	
Expense	\$ (4,903.48)	
Available Cash 3/13/2021	\$ 16,554.98	
Rev./Exp.	\$ (2,992.78)	

Fund Balances

CAMF	\$ 8,575.37
Conference Fund	\$ 320.36
Fewkes Fund	\$ 1,330.00
Unrestricted	\$ 6,329.25
Total	\$ 16,554.98

Notes from the treasurer:

Highlights of the quarter include payment for conference videos (project expense) reducing the remaining Conference Fund to 320.36.

Operations expenses this quarter include annual insurance policy fees (\$1,612).

The Fewkes Project fund grew by \$580 this quarter to \$1,330.