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AAVSO Newsletter

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The AAVSO is an international non-profit organization of variable star observers whose mission is: to observe and analyze variable stars; to collect and archive observations for worldwide access; and to forge strong collaborations and mentoring between amateurs and professionals that promote both scientific research and education on variable sources.

FROM THE DIRECTOR'S DESK

ARNE A. HENDEN (HQA)

The U.S. government "sequester" impacts the NSF and NASA budgets, with the immediate impact of delaying any awards for the current fiscal year. This means that all proposals turned in by the November 15 astrophysics deadline, or the education deadlines in January, or even the Major Research Instrumentation deadline of February 21, will not be awarded for many months, if at all. This affects much of the scientific research done in the U.S., so I hope Congress is successful at crafting a compromise budget that can be passed quickly.

In the meantime, the AAVSO does have supplemental funding for the Citizen Sky grant to hold a workshop to write a DSLR photometry manual. Researchers from around the world will be gathering at HQ in March to pool their expertise and produce a manual that we can use to support this new observational technique. I've seen some really good photometry being done with these inexpensive cameras, and have high hopes that their use will expand the membership and help continue our decades of monitoring for bright variables.

Don't forget the upcoming Spring meeting for the AAVSO in Boone, North Carolina. This meeting is being hosted by Appalachian State University; I have some longtime friends on their faculty. Boone is a pretty area in the foothills of the mountains, and the research observatory has one of the largest active telescopes on the east coast. It should be a fun and fruitful meeting!

I want to thank the many observers who are participating in the large HST effort to obtain UV spectra of dozens of cataclysmic variables. Without your diligent monitoring, the HST schedulers would not permit observations of these potentially outbursting objects. We have about one object per week to observe, so it is a lot of work for both the team of scientists studying these CVs and the ground-based observers trying to catch that most recent negative estimate and get it reported. This is a really good demonstration of the synergy between amateur and professional in today's astronomy.

The first two BRITE (BRight Target Explorer) Constellation satellites were launched in late February. They are Canadian and Austrian components of this international suite of satellites studying the most luminous stars; other Austrian and Canadian satellites and two Polish satellites will be launched later. These six microsatellites will monitor the ~400 stars brighter than fourth magnitude in Johnson B and V pass-bands. The results will be extremely interesting, as these bright stars are also some of the closest to our Sun,

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PRESIDENT'S MESSAGE

MARIO MOTTA, M.D. (MMX)

Tale of a Large Telescope Mirror

I have always been interested in both building and using telescopes.The following is the life history of one of my mirrors. In the early 1980s I had built a 16-inch telescope that I was quite happy with. By the late '80s, however, after observing through some larger telescopes, I developed the urge, the aptly named "aperture fever," for a larger telescope. I was considering a 24-inch class mirror, and was searching for a suitable blank to grind and polish. Janet and Michael Mattei learned of my interest for a large mirror blank. You can imagine my complete surprise one evening when Michael Mattei showed up at my home quite unannounced and deposited a 32-inch Pyrex mirror blank. At the time Michael was very secretive, telling me I could not say where it came from and simply to make a great telescope with it. It was only years later that he informed me that the secret of the mirror was now declassified and the tale could be told.

This 32-inch mirror blank was apparently cast specifically for the U.S. Air Force, to be used

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and ground-based support will be needed to fully characterize their results. This will be an ideal time to develop that DSLR system or install the high-resolution spectrograph!

One of the AAVSO online forum discussions pondered the mystery of why there have been no bright novae in recent years. I remember first-magnitude Nova Cyg 1975 and how it changed the appearance of a familiar constellation. Hopefully our diligent monitoring of the sky will find the next naked-eye nova! In the meantime, we can look forward to the two bright comets this year; luckily they will be around long enough that even people in cloudy climates are likely to get a view or two. The recent passage of 2012 DA14 and the Russian superfireball sparked public interest in the sky. Let's foster that interest and show people that the constantly changing sky can be fun to watch! ★

Ed. note: the Spanish language version of Arne's message can be found on page 13.

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in a satellite surveillance program. The project eventually came to a close as the Air Force moved on to other surveillance methods to which I am not privy, and this leftover blank was scheduled for destruction, so that the secret of the size of the optics used would not be revealed. All this is now declassified. Michael had saved this mirror from being in broken into pieces and thrown into a landfill by gifting it to me. At the time the thought of grinding and successfully figuring a 32-inch mirror, I felt quite correctly, was a daunting task. Michael reassured me, and stated he would give me guidance and help to complete the project. Without his help and instruction in fact, I am not sure I could have completed it properly.

Coring the mirror with Mike Mattei

Grinding the mirror

The first thing to do, I decided, was to lightweight the mirror, given that it weighed 160 pounds and I planned to grind it in my basement, and I needed to be able to lift it and flip it with as little help as possible. I devised the plan of bringing the mirror blank to a gravestone company, where they had sandblasting equipment to carve figures on headstones and monuments. It turns out they use carborundum 60 grit for these jobs, perfect for use on a Pyrex blank, as that is in fact the normal starting grit in grinding. After four hours of work and careful application, a very nicely etched pattern of ridges and lightweighted cavities emerged. The original 160-pound blank now weighed 80 pounds, and could be handled much more easily. Sandblasting, however, produces strain and micro-cracks in glass, which would jeopardize the final mirror shape and potentially lead to the mirror cracks propagating as well. For that reason the next step was to bathe the entire glass in a warm solution of hydrofluoric acid. This etches the glass to relieve the millions of tiny surface cracks the sandblasting produced. A friend in the optics industry and fellow AAVSOer, Paul Valelli, was instrumental in obtaining this acid for me, as it is considered toxic and highly dangerous and generally is not available. We built a plastic pool to submerge and bathe the mirror with the acid, which was heated to 50°C, for 60 minutes. At the end of this time the glass was well etched, and now weighed 78 pounds.

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The *AAVSO Newsletter* is published in January, April, July, and October. Items of general interest to be considered for the *Newsletter* should be sent to eowaagen@aavso.org. Photos in this issue courtesy of Appalachian State Univ., S. Beck, M. Motta, National Solar Observatory, S. Oatney, K. Paxson, and E. O. Waagen.

Membership in the AAVSO is open to anyone who is interested in variable stars and in contributing to the support of valuable research. Members include professional astronomers, amateur astronomers, researchers, educators, students, and those who love variable star astronomy.

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PRESIDENT'S MESSAGE
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Next I built a homemade mirror grinder to handle this large size mirror. With a surface area of 800 square inches, the surface pressure of a 32-inch mirror can be more than human hands can push. Parts were obtained from mostly scrap, and some parts from an old mirror grinder the ATMOB (Amateur Telescope Makers of Boston) were discarding. Over 2-1/2 years of work, the blank was crafted into a quarter-wavefront 32-inch F4 telescope mirror. This was accomplished with a lot of help from Michael Mattei, Paul Valelli, and other members of the ATMOB. Of course, my wife was drafted to help lift, flip, and handle the mirror on a regular basis. My three children to this day have "fond" memories of trying to fall asleep to the sound of grinding glass in the basement.

After completion, the mirror was installed in a homemade telescope and observatory I built at a dark sky site in New Hampshire. I was thrilled

The rear lightweighted surface

In use as my original 32-inch telescope

with the views, and used it happily for a number of years. I was hoping for 1/8 wave or better, but could never achieve that due to the lightweighted nature of the mirror blank that I had created. Some years later I was able to obtain a second 32-inch mirror, of slightly better quality, and swapped the mirrors in the telescope. I learned from that experience that despite building an 18-point cell suspension the real issue was lateral support. Once a sling was added for lateral support, the mirror actually performed much better. At that point the original mirror being discussed in this article was put aside for use later in life.

In 2004 I moved to Gloucester on the coast of Massachusetts. It was my original plan to possibly refigure this mirror for another Newtonian F4 telescope. At about that time a close friend of mine, Scott Milligan, convinced me to build instead a telescope of a radical, vastly improved design, a relay telescope that utilized a spherical primary with a Mangon secondary, and multiple corrector lenses. This proved to be a stroke of genius, as this telescope now achieves roughly 1/12 wave front, yielding very crisp beautiful views. The only problem was that it required a completely different design for the primary mirror, a conical-shaped cast mirror. I've never regretted that decision, but that left the original mirror unused. I contemplated various options, but with the other telescopes performing well I never got around to implementing any action on these plans for it. (Besides, how many 32-inch telescopes does one need?).

Now fast forward to 2012, and a visit on a sabbatical to the AAVSO by Dr. Ulisse Munari of Padua University in Italy. He described to our Director, Arne Henden, how he has been advising and mentoring the Schiaparelli Observatory located above Lake Varese in Italy. This is a professional-amateur collaboration that had a nearly-completed, dedicated spectroscopy telescope. It had a finished observatory, complete with a telescope, missing one minor detail: the main mirror. He was developing plans to have a mirror commissioned to complete this project and make this observatory operational. Arne notified me that he was seeking a 32-inch F4 mirror. Dr. Munari was very surprised when we notified him that I just happened to have one lying around unused. After showing him the mirror after a dinner at my home, he exclaimed that this mirror would be perfect as a spectroscopy mirror in the observatory in Varese. Since it would be a dedicated spectroscopy telescope, a quarter-wavefront mirror was more than adequate.

So with everyone in agreement, I formally donated this mirror to the AAVSO this past year, and it has now been permanently loaned

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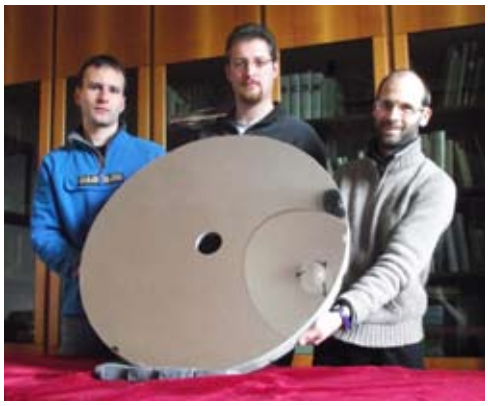
THANKS TO OUR SPONSORS!

PRESIDENT'S MESSAGE
CONTINUED...

So with everyone in agreement, I formally donated this mirror to the AAVSO this past year, and it has now been permanently loaned by the AAVSO to the Schiaparelli Observatory. It arrived there in December of 2012, where the observatory staff, led by Paolo Valesa, promptly began working on a large mirror cell to attach this to the existing built telescope. They are also working on a cassegrain secondary. (Way back during the polishing phase, Mike Mattei and I had cored out a central hole in case we ever wanted to turn the mirror into a cassegrain telescope). Paulo, the lead engineer, assures me that they should be operational early the summer of 2013. I look forward to visiting this summer and seeing this completed operational spectroscopy observatory.



Mirror in Italy (Paolo Valesa on right)

Schiaparelli Observatory amidst the panorama of the Alps

The net result of this long tale of a telescope mirror's life history is that AAVSO members will be able to obtain a slice of time to use this fully robotic operational and dedicated spectroscopy telescope located in the foothills of the Alps in Italy, overlooking beautiful Lake Varese. I have the personal satisfaction knowing that a mirror I ground and polished will be going to very good use in research. I especially feel very good that Mike Mattei's original intent to save the needless destruction of a perfectly good mirror blank has been accomplished. This mirror has gone through several iterations since it was originally cast: from spy satellite, to amateur observatory use, and now to professional research. I am pleased it will be actively used productively for many years to come. And finally, I have a great excuse to visit Varese, Italy. ★

New telescope in place, Schiaparelli Observatory, Varese, Italy

Ed. note: the Spanish language version of Mario's message can be found on page 13.

A PERSPECTIVE ON A METEOR—KUDOS TO MANKIND

BOB STINE (SRB), NEWBURY PARK, CALIFORNIA

February 18, 2013, three days after the stony superbolide explosion over the city of Chelyabinsk, Russia, that injured over 1,500 people and caused widespread damage across an impact region over 100 km long: Astronomy is a pursuit of mine. The intangible benefits of studying astronomy are certainly manifold; they include expansion of the mind, understanding of the universe, spiritual appreciation, appreciation of God's creation and majesty, etc. Yet I will readily admit that astronomy seldom, if ever, yields tangible results for mankind.

Despite astronomy having no tangible economic reward, mankind has, over the millennia, sponsored the pursuit. Sponsors have been the likes of kings, princes, captains of industry, governments, and caring parents supporting a child's passion for looking skyward. Despite there being no evident tangible economic return, these sponsors saw fit to make the investment. Why? It is surmised that they sensed something of inherent value in the endeavor.

My hypothesis is that, on February 15, 2013, the heretofore intangible pursuit of astronomy yielded an immeasurable economic return; arguably, that return is the greatest return on investment of all time. Why? Because mankind's long study of astronomy has led us, collectively, to be in a position to understand what happened over the clear morning Russian skies and accept that it was an act of nature and not a thermonuclear attack by a foreign enemy.

The intangible became tangible; I believe Mankind's collective understanding of astronomy prevented World War III.

Let's give ourselves a collective pat on the back, with special nods to the likes of Aristarchus, Tycho Brahe, Johannes Kepler, Isaac Newton, our many teachers, and astronomy enthusiasts—all those who have "spread the word" for astronomy. As I see it, we AAVSO'ers deserve a share of that special nod.

We—Mankind—made ourselves a bit smarter, so that this time around, we understood what happened and did not blame each other. ★

AAVSO MEETINGS

Registration is open for the AAVSO 2013 Spring meeting! This meeting will be held on May 17–18 at Appalachian State University in Boone, North Carolina. Transportation will be provided between the Charlotte Douglas airport (CLT) and the meeting hotel on Thursday, May 16, and Sunday, May 19. Sleeping rooms have been reserved at the Boone Holiday Inn Express for AAVSO meeting attendees at a special group rate of $81 plus tax. The deadline to reserve hotel rooms is Monday, April 15. This year our closing awards banquet will be a bit more informal than usual, will feature a menu of southern BBQ, and will be held on the grounds of Appalachian State University's Dark Sky Observatory just off of the beautiful Blue Ridge Parkway. Don't miss this very special meeting! Please visit the AAVSO website for more details and to register (http://www.aavso.org/102nd-spring-meeting-aavso).

Appalachian State University's Dark Sky Observatory

The 102nd Annual Meeting of the AAVSO will be held on October 11–12, 2013, at the Woburn Hilton Hotel in Woburn, Massachusetts. ★

THANK YOU ONCE AGAIN

MIKE SIMONSEN (SXN), MEMBERSHIP DIRECTOR AND DEVELOPMENT OFFICER

AAVSO members and supporters were very generous and made 2012 another good year. We raised over $100,000.00 in donations over the calendar year. Over 10% of our members now pay dues at the sustaining level, which translated into 7.9% of total contributions last year. If everyone paid at the sustaining level we would bring in another $53,000.00 in donations from sustaining dues alone.

Every dollar adds up. Just as our observations combine to produce beautiful light curves, when combined with your fellow members' donations the money you give helps to support the AAVSO each year.

We had over 170 people contribute between $5 and $99 in 2012. When summed up, those modest donations amounted to almost $8,000. We are extremely grateful to these supporters. Another 45 friends of the organization gave between $100 and $249. Those 45 donations alone netted the AAVSO $7,200. 14 contributors gave between $250 and $499, while another 11 made contributions between $500 and $2,499. This level of generosity always surprises me because I know these people. They are not rich or particularly well off. The simply believe in the mission and goals of the AAVSO and choose to support it year after year. Each year we have another ten or so individuals who give between $2,500 and $25,000. Many of them are the same names year after year.

We can't think you, our donors, enough. There are not adequate words to describe how much we appreciate your generosity. We do recognize you all by name in our annual reports and on the website at http://www.aavso.org/benefactors, something we have been doing now since 2007. On behalf of the Director, the Council, the staff, and your fellow members, thank you once again for your generosity and devotion to the AAVSO. ★

TALKING ABOUT THE AAVSO

ELIZABETH O. WAAGEN (WEO), AAVSO HQ

Are you an AAVSO member, observer, or friend giving a presentation about the AAVSO? Have you given one recently? Recent presentations about the AAVSO include the following:

March 15, 2013—**Chris Stephan** (SET, Avon Park, Florida) co-organized and hosted a star party to observe Comet PANNStars and several other objects in the night sky. About 50 people attended, and one of them looked up Chris' email address so he could send the following:

"Thank you so much for the time you spent setting up your telescopes and helping local folks to see the comet and to appreciate astronomy. It was great to have a happening such as this right here on our own lake… I am the one who told you that I live under the 2nd street light here on the lake. My grandson, who lives 3 doors from me, called and told me that people were setting up telescopes near his house. He and I had looked for the comet a few days ago, but I didn't realize an interest had been kindled. It was a great experience that he and I shared as you generously shared your resources.

"My own interest started in high school in 1960. A friend had a telescope with which we learned a lot - all self-taught. A local (Tennessee) doctor, with a larger telescope, took an interest in us and met with us from time to time. It appears that astronomers are basically really nice guys. You have reconfirmed that opinion.

"I think that you pure scientists have more fun than we applied scientists (I am an anesthetist) do. We have to be so specialized that we sometimes miss the forest for the trees. Thanks again for taking your time to spend with local folks. I saw many people there who seemed to really appreciate what you did."

Let us help you spread the word or tell your story! Send us information about your event (upcoming or past) for inclusion in the July *AAVSO Newsletter* (submission deadline June 15). Many thanks for your education and outreach efforts on behalf of the AAVSO and variable star observing! ★

3RD SOLAR SUNSPOT WORKSHOP

AAVSO Solar Section chair Rodney Howe and AAVSO solar observer Susan Oatney attended the 3rd Solar Sunspot Workshop in Tucson, Arizona, in January 2013. Below are their reports on this interesting and important meeting. A brief description of the workshop is available at http://www.nso.edu/node/171, and the agenda is online at http://www.nso.edu/node/169). Meeting attendees are shown in the accompanying photo (photo courtesy of National Solar Observatory).

3rd Solar Sunspot Workshop attendees

Tucson Trip Report

RODNEY HOWE (HRHA), AAVSO SOLAR SECTION CHAIR, FORT COLLINS, COLORADO

The 3rd Solar Sunspot Workshop, held in Tucson, Arizona, was sponsored by the National Solar Observatory (NSO), and the Air Force Research Laboratory (AFRL). The Tucson workshop focused on the progress and additional evidence addressing the key problems of understanding solar indices as identified in previous workshops in Brussels and Sunspot, New Mexico. Invited were European experts and NSO experts in the field of long-term tracers of solar activity for most recent use of ground-based and statellite instruments. One goal was to make a synthesis of archival data and progress in defining solar indices in order to define and update the action list in view of the next workshop, which will be in October 2013 (location to be determined but possibly in Europe). Another goal of this workshop (from Ed Cliver) was to extend the reconciled SSN time series backwards from Schwabe (1826) through Staudacher (1750), as well as:

—Develop a standard SSN time series that includes estimates of uncertainty or variance.

—Issue a statement (or warning) on the reality (or not) or long-term trends.

—Publish explicit and justified recipe for calculating the standard SSN time series, which includes adjustments, from the original (unadjusted) data.

—Publish or present for wide dissemination the original (unadjusted) data (from Jeffrey Love).

General observations

The agenda and list of presentations and agenda for the Tucson meeting can be found at the website given above. There were many differing views, but they were all based on the same kind of common-sense approach to the above goals, and all were seeking concrete social, political, and scientific reforms to solve the standard SSN time series.

Purpose of the workshop:

—Reconcile/understand the discrepancy between G and I SSN series (1610-present).

—Document tools that can be used to keep track of the SSN for the foreseeable future (regular ionospheric variation, F10, sunspot area).

—Understand what happened during the recent solar minimum (and perhaps the Maunder Minimum).

—Publish a vetted and agreed-upon single SSN time series, with error bars, that can be used as a bridge to the millennia of proxy solar data in ice cores and tree rings (from Ed Cliver).

Additional topics covered in the workshop

Also given during the workshop were presentations on topics including: progress on the understanding of sunspot weighting, calibration of the sunspot area time series, the distribution of sunspots during the most recent solar minimum, new results on the Livingston-Penn effect, an update on the relationship between the SSN and F10.7 cm (radio) flux, correlation of cosmic ray and geomagnetic data with the sunspot number, and sunspot measurements from space. (from Alexei Pevtsov)

Ad hoc requests for AAVSO sunspot data sets

I have sent the AAVSO raw sunspot data (2009–2013) and an image of data collected from the SunEntry header form to Laurence Wauters and Frederic Clette of the Royal Observatory of Belgium (ROB). They have an interest in polling their observers on the following information: observing setup, optical resolution, how long the current telescope configuration has been in use, observing technique, etc., and also, the "neutrality" of observations, i.e., is there any external reference used to settle the group splitting or to verify the existence of small spots or of new spots near the East limb.

Marching orders for the AAVSO

I was asked to assist (co-author) in the calibration of visual observers, which may appear as a section of the final document on a standard for the SSN time series.

SSN workshop website

The website for the Solar Sunspot Workshops is http://ssnworkshop.wikia.com/wiki/Home. Here you can find general information, announcements, and presentations related to the 1st, 2nd, and 3rd SSN Workshops. All presentations from the 3rd Workshop will be added after the meeting. Leif Svalgaard is the curator for the website so please contact him with any questions or suggestions (leif@leif.org). ★

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SOLAR WORKSHOP
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Report on the 3rd Solar Sunspot Number Workshop

Observations from one of the American Association of Voluntary Solar Observers

SUSAN N. OATNEY (OATS), PARTRIDGE, KANSAS

The 3rd Solar Sunspot Number (SSN) Workshop was held at the National Solar Observatory (NSO) in Tucson, Arizona, January 22–25, 2013. The scientists in attendance included those from Belgium, Switzerland, Italy, France, Hungary, Russia, Colombia, Argentina, and the United States. This workshop was a continuation of two previous workshops, the first held in Sunspot, New Mexico, and the second in Brussels, Belgium.

NOAO building—site of the meetings

The primary goal of this workshop was to re-examine the historic series of solar sunspot numbers from Staudacher (1750) through Schwabe (1826) and to reconcile these historic SSN with modern SSN series. This re-examination was done with much gusto! Most scientific paper presentations I have attended have been moderated with questions and comments mostly attended after the presentation, but that was not so with these presentations. As each paper was being presented, the comments and questions often came like bullets. Much was usually accomplished during this firing of questions and answers to clarify and aid in not covering the same ground too often. Time constraints were not rigid and it seemed that clarity was extremely important to each one in the conference room. Each of the attendees seemed intent on accomplishing this goal of re-examining and reconciling SSN data sets.

One very active contributor to the meetings was Jeffrey Love of the U.S. Geological Survery (USGS) in Boulder, Colorado. He had been invited to attend, and indicated that his use of SSN was occasional. I had to wonder as the meetings progressed if it was clear even to him why he was in attendance (although he did make a presentation entitled "Reservations on the Use of the Magnetic Needle" (http://www.nso.edu/sites/www.nso.edu/files/files/workshops/3rdSSN/Love-Tuesday.pdf)). However, he did much to advance consistency in the direction of the meeting and the clarity of the presentations. I felt that his input was invaluable. Perhaps because he was unbiased in his assessment of each presentation, his sharp questions and comments were easily heard by all.

Rodney Howe, Chair of the AAVSO Solar Section for the past several years, gave a presentation explaining how sunspot data have been acquired for the

Conference room at NOAO

organization and analyzed by the various Solar Chairs up to the present. He showed that sunspot numbers have been collected continuously by what he termed The American Association of Voluntary Solar Observers. It was a very fitting tribute to the many diligent observers from around the world who have contributed to the American Relative Sunspot Number. It should be noted that prior to 1944, only Zurich Observatory counts were used by the United States. After 1945, the AAVSO became responsible for this American Number.

Rodney showed (http://www.nso.edu/sites/www.nso.edu/files/files/workshops/3rdSSN/Howe_3rd_SSN.pdf) that since 1951 data reduction methods have changed, and along with this also referenced Grant Foster's paper (1997, *JAAVSO*, Vol. 26, p. 50) about the inflation of sunspot numbers and also explained the way the k factors are calculated. In addition to his own graphs and analysis, Rodney also presented three graphs and analysis from Theirry DuDok du Wit, whom he had met in Belgium. Theirry used the AAVSO data for his own analysis and his graphs showed a remarkable correlation among the Solar Observers. The most impressive of Rodney's own graphs was his graph of the raw data of the Solar Observers showing how closely they agree in their observations. At one point, one of the attendees asked: "Wait! What... are the observers talking to each other?" It was a quiet moment when Rodney reiterated that this graph represented the raw data with no k factors being used and explained that even though it is called the American Number, observers from all over the world contribute to it. It was clear that this concept had not been fully understood by all. This graph seemed to be a good indicator of the value of the data that are collected by AAVSO Solar Observers.

Certainly not secondary in interest, but secondary to the primary reason for the Workshop, were the many presentations that were made by the well-versed group of Solar Scientists in the area of progress of sunspot weighting, calibration of the sunspot area time series, the distribution of spots during the most recent solar minimum, new results on the Livingston-Penn effect, an update on the SSN and the F10.7 cm (radio) flux, correlation of cosmic ray and geomagnetic data with the SSN, and sunspot measurements from space.

A highlight of the meeting was the trip to Kitt Peak to visit the McMath-Pierce Solar Observatory. We were given a very thorough tour of the facility by the local scientists in attendance. At one point, while touring the innermost workings of the structure, we were standing in the long tunnel of the McMath with its many mirrors. This was very disorienting because of the angle—and there were no handrails! We were invited to try our hand at drawing sunspots at the projection table, which I did ask to do.

One of the many interesting people I met while in Tucson was Gary Chapman. Gary was the first observer on Kitt Peak! As a 19-year old with an interest in astronomy, he was recruited to make measurements of seeing conditions on

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SOLAR WORKSHOP
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Kitt Peak while the conditions were also being assessed at four other sites. He told me about driving a tractor up the mountain part way (because there were no roads at that time). At some point he had a trailer on the mountain in the area that the gift shop is now. There was no electricity and no running water. Listening to his story was fascinating! I am sure there would have been many other histories to learn in this setting of familiar names within the solar community.

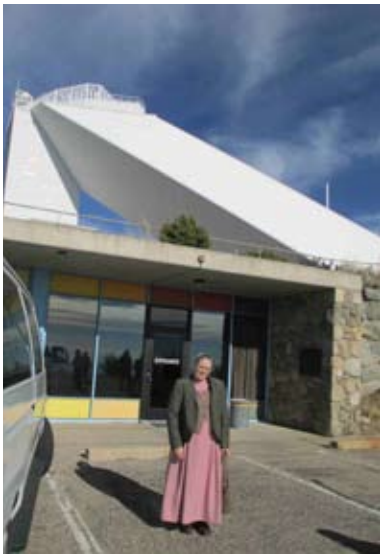
Kitt Peak Observatory

Looking down in the McMath

Looking up in the McMath

William Herbst at the projection table, pointing to a sunspot

Now that I am back in Kansas, I find that my observing struggles to go on with a snowstorm that dumped 14 inches one night, and up to a foot around the area under blizzard conditions another. Having to wait to roll the roof off when the snow melts is frustrating—heat tape in the tracks makes it easy to roll the roof off, but keeping it shut is a necessity when the new snow begins to blow around. Just getting to the observatory is a challenge when the snow is about up to your knees! I didn't have many observations for February, but each one counted and will now work together with the many other Voluntary Solar Observers from the distant past and into the future with the update of the k coefficients. All this helps to create a steady and reliable data source for research in many areas. Solar observers have contributed to around 400 years of continuous data. One scientist in Tucson aptly referred to this 400 years of sunspot numbers as a "treasure." The sunspots that I observed at the McMath do not count towards this number: I count only what I am able to continue to do in the same careful way that I and other solar observers do from our humble stations around the globe. What a pleasure and privilege it is to be able to contribute to this continuing treasure of data points: The American Sunspot Number. It was with great relish and interest that I observed the group of people at Tucson, Arizona, in their quest to preserve it. ★



Author Susan Oatney at the McMath Observatory and a view of the Oatney Observatory, Partridge, Kansas

MEET THE STAFF: SARA BECK

REBECCA TURNER (TRMB), AAVSO HEADQUARTERS

With this issue we continue the intermittent column on getting to know the AAVSO staff. In this column, the previous subject creates the questions for and interviews the present subject. Last time (*AAVSO Newsletter No. 49*, July 2011) Rebecca Turner, AAVSO Project Manager and Sponsored Research Officer and Meetings Coordinator, was the subject. Now she turns the tables on Sara Beck, AAVSO's longtime Technical Assistant for Special Projects. Sara's duties have ranged far and wide over the years, from programming to writing to organizing many kinds of information and materials to shepherding meeting attendees to…—and she's a skilled hand at construction, painting, improvising solutions to many kinds of problems, and finding the fun in it all (well, most of it).

Rebecca: Tell us about how you came to be on the AAVSO staff.

Sara: My involvement with the AAVSO actually started in 1978 when I was a summer student at the Maria Mitchell Observatory in Nantucket. Dr. Dorrit Hoffleit, our wonderful Director/mentor, wanted to be sure that we lowly students gained valuable exposure by introducing us to some professional astronomers, giving a talk at the Annual meeting of the AAVSO, and writing a scientific paper on our summer research for the *Journal of the AAVSO*. All of this I did and through these activities, I had the good fortune to get to know the personable Director of the AAVSO at the time, Dr. Janet Mattei. One year later, when my good friend and fellow Astronomy major from Smith College, Elizabeth Waagen, began working at the AAVSO, I had even more of an excuse to keep in touch with the organization, drop in for lunch once in awhile and attend a couple of meetings. Flash forward about ten years…. After a very interesting stint at NASA in Houston and a couple years of roaming in Australia and the South Seas, I found myself back in Massachusetts and looking for a job. As it happened, the AAVSO was looking for a Technical Assistant at the same time. It must have been a good match, because twenty-three years later, I am still working here!

Rebecca: Your duties at AAVSO have varied over the years. What are some of the duties you've performed and projects you've worked on, and which did you enjoy most?

Sara: As with most AAVSO employees, I have done a lot of different things over the years. At times, the projects could be rather tedious like checking reports for keypunching errors, digitizing Max/Min information, or more recently, processing APASS data. Other duties have been much more interesting, such as putting together the *Manual for Visual Observing of Variable Stars* and working with translators to create versions in different languages. I also enjoy the challenges of writing Java applications (after just one formal course in Java at the Harvard Extension School) or teaching myself Perl in order to help with utility programs. Interacting with members and observers through email is another fun part of my job.

Rebecca: Many of the staff members have the AAVSO to thank for valuable professional relationships and even strong personal friendships. You made another very special connection thanks to the AAVSO. Tell us about that.

Sara: It all began at the Annual meeting in 1996. In attendance that year was a shy fellow from Ireland named John O'Neill. Since he was one of the few attendees from abroad and this was his first AAVSO meeting, he didn't know anyone and I felt that we should make a special effort to make him feel welcome. One evening I organized an outing to the nearby Burren Irish pub for dinner, along with Mike Saladyga. The three of us had a great time and it must have sparked something in John and I because for the next twelve years, we exchanged Christmas cards and the occasional post card from our various travels. On a few other occasions, John attended AAVSO meetings that I didn't go to and in each case, either you (Rebecca) or other AAVSO staff members would come back and report that John was asking about me. Finally, in 2008 we both attended the same meeting in Nantucket. Almost immediately, things started going well and two years later, we were married.

Sara Beck

Rebecca: Since getting married you have been spending some time telecommuting from Ireland. Any special challenges? Has it been easier or more difficult than you thought it would be?

Sara: I love telecommuting! Having spent most of the past twenty-two years either taking public transportation or driving to AAVSO HQ from my home in Topsfield, Massachusetts, through rush hour traffic and wasting two to three hours per day doing so, telecommuting is like a dream come true. I know that it is a privilege, so I never take it for granted, but have managed to organize my work and my workstation in such a way that there is really no difference in what I can accomplish from home versus what can be done from the office. The interesting aspect of working from Ireland is the fact that my work day begins five hours before that of everyone else at Headquarters. I actually find this to be an advantage as I can enjoy a nice quiet morning, free from interruptions, during my most productive hours of the day. I also make an effort to stay in close touch with everyone at HQ through email, chat, Skype, and telephone (VOIP works from Ireland). Since I know the staff and workings of the AAVSO so intimately, I am able to "read between the lines" to have a sense of what is really going on even when people are too busy to communicate. Telecommuting is much easier than I thought it would be.

Rebecca: What do you do for fun/relaxation?

Sara: For many years, the answer to this question was sailing. Sometimes professionally—I hold a mate's license and have worked on several sail training ships—and at other times for fun with my own 1936 Friendship Sloop, mostly on the lovely coast of Maine. Now *Flying Jib* has found a new home/owner/slave and I am free to pursue my other great love—travel. Since my husband is an avid eclipse chaser, we have plenty of interesting destinations to explore together and have already had several great adventures in different parts of the world.

Rebecca: Is there anything else you would like to tell us about yourself?

Sara: Only that I enjoy and appreciate my job at the AAVSO and working with the fantastic team of Staff members who I consider to be friends as well as colleagues. ★

SCIENCE SUMMARY: AAVSO IN PRINT

AAVSO data are constantly being used by researchers around the world in presentations and publications. Below is a listing of some of the publications that appeared 2012 December 30 through 2013 March 27 on the arXiv.org preprint server and used AAVSO data and/or acknowledged the AAVSO. To access these articles, type the preprint number into the "Search or Article-id" box at http://www.arXiv.org/.

Michal Siwak, Slavek M. Rucinski, Jaymie M. Matthews et al., "Photometric variability in FU Ori and Z CMa as observed by MOST", (arXiv: 1303.2568) [Mar 11, 2013]

Gordon McIntosh and Balthasar Indermuehle, "A Comparison of the Velocity Parameters of SiO v=1, J=1-0 and J=2-1 Maser Emission in Long Period Variables", (arXiv:1303.2397) [Mar 10, 2013]

Paula Szkody, Anjum S. Mukadam, Edward M. Sion et al., "HST and Optical Data on SDSSJ0804+5103 (EZ Lyn) One Year after Outburst", (arXiv:1303.1876) [Mar 8, 2013]

Taichi Kato and Hiroyuki Maehara, "Analysis of Kepler Light Curve of the Novalike Cataclysmic Variable KIC 8751494", (arXiv:1303.1237) [Mar 6, 2013]

Mathieu Servillat, S. Tang, J.E. Grindlay et al., "DASCH 100-yr light curves of high-mass X-ray binaries", (arXiv:1303.1179) [Mar 5, 2013]

Joseph Patterson, Arto Oksanen, Berto Monard et al., "The Death Spiral of T Pyxidis", (arXiv:1303.0736) [Mar 4, 2013]

Matthew J. Graham, S. G. Djorgovski, Ashish A. Mahabal et al., "Machine-assisted discovery of relationships in astronomy", (arXiv:1302.5129) [Feb 20, 2013]

W. Nowotny, B. Aringer, S. Hoefner et al., "Synthetic photometry for carbon-rich giants. III. Tracing the sequence of mass-losing galactic C-type Miras", (arXiv:1302.3715) [Feb 15, 2013]

R. Pereira, R. C. Thomas, G. Aldering et al., "Spectrophotometric time series of SN 2011fe from the Nearby Supernova Factory", (arXiv:1302.1292) [Feb 6, 2013]

Jae Woo Lee, Tobias Cornelius Hinse, and Jang-Ho Park, "The Eclipsing System EP Andromedae and its Circumbinary Companions", (arXiv:1302.0358) [Feb 2, 2013]

L. W. Piotrowski, T. Batsch, H. Czyrkowski et al., "PSF modelling for very wide-field CCD astronomy", (arXiv:1302.0145) [Feb 1, 2013]

B. Rani, T. P. Krichbaum, L. Fuhrmann et al., "Radio to gamma-ray variability study of blazar S5 0716+714", (arXiv:1301.7087) [Jan 29, 2013]

Stephane Sacuto, Sofia Ramstedt, Susanne Höfner et al., "The wind of the M-type AGB star RT Virginis probed by VLTI/MIDI", (arXiv:1301.5872) [Jan 24, 2013]

N. Kameswara Rao, D. L. Lambert, D. A. Garcia-Hernandez et al., "The changing nebula around the hot R Coronae Borealis star DY Centauri", (arXiv:1301.5773) [Jan 24, 2013]

Eric Broens, "Light curve analysis and orbital period change of the extreme mass-ratio overcontact binary AW CrB", (arXiv:1301.5021) [Jan 21, 2013]

A. J. Pickles and W. E. Rosing, "Cloud Computing with Context Cameras", (arXiv:1301.3926) [Jan 16, 2013]

N. A. Tomov, M. T. Tomova and D. V. Bisikalo, Institute of Astronomy and National Astronomical Observatory, Bulgarian Academy of Sciences et al., "Symbiotic Stars with Similar Line Profiles during Activity", (arXiv:1301.2762) [Jan 13, 2013]

L. Rimoldini, P. Dubath, M. Süveges et al., "Automated classification of Hipparcos unsolved variables", (arXiv:1301.1545) [Jan 8, 2013]

Kelly Lepo and Marten van Kerkwijk, "Rapidly accreting white dwarfs as supernova type Ia progenitors", (arXiv:1301.1368) [Jan 7, 2013]

Á. Kóspál, P. Ábrahám, J. A. Acosta-Pulido et al., "Exploring the circumstellar environment of the young eruptive star V2492 Cyg", (arXiv:1301.0898 [Jan 5, 2013]

Kent Honeycutt, Stella Kafka, Jeff Robertson, "Wind Variability in BZ Camelopardalis", (arXiv:1301.0452) [Jan 3, 2013]

D. Klotz, C. Paladini, J. Hron et al., "Catching the fish - Constraining stellar parameters for TX Psc using spectro-interferometric observations", (arXiv:1301.0404) [Jan 3, 2013]

Vitalii V. Breus, Ivan L. Andronov, Tibor Hegedus et al., "Period variations in the intermediate polars EX Hya, FO Aqr and RXS J180340.0+401214", (arXiv:1212.6712) [Dec 30, 2012]

We thank the above researchers for including the AAVSO and its resources in their work, and for acknowledging the AAVSO in their publication. We urge all those writing for publication to include the word "AAVSO" in their list of keywords. ★

IN MEMORIAM

MEMBERS, OBSERVERS, COLLEAGUES, AND FRIENDS OF THE AAVSO

Leonard Abbey and Frieda

LEONARD B. ABBEY, JR.

(ABL, Atlanta, Georgia), AAVSO member/observer since 1953, died December 14, 2012, at the age of 74. Len contributed 249 visual observations to the AAVSO International Database from 1954 through 1963. He had careers in physics, photography, and software programming (for Microsoft). An avid amateur astronomer all his life and knowledgeable about telescopes, optics, and the history of astronomy, Len was a member of several astronomy organizations besides the AAVSO, including the Association of Lunar and Planetary Observers (Uranus and Neptune sections coordinator), the Astronomical League, and the British Astronomical Association. He was elected a Fellow of the Royal Astronomical Society in recognition of his contributions to astronomical science. The membership he valued most highly was in the Atlanta Astronomy Club, to which he had belonged for over 60 years and of which he was elected a lifetime member. Len remained active in the AAVSO as a volunteer programmer, and together with former AAVSO Assistant Director Aaron Price created and updated valuable programs widely used by AAVSO observers, including PCObs (for variable star data entry), SolObs (for solar data entry), MagPlot (for plotting variable star light curves), and Appulse (for determining when variable stars will be close to solar system objects). Len received special recognition at the AAVSO 96th Annual Meeting "...in appreciation of more than 50 years of service to the AAVSO, not only through his contribution of variable star observations, but also through his devotion of numerous hours as a volunteer and programmer to create and maintain important software packages that have been used by hundreds of observers and researchers worldwide." As Aaron described him, Len was a "great example of someone with the AAVSO in their heart and who grew with the field." Aside from astronomy, Len's interests included history, gourmet cooking, cats, and classical music. Our condolences go to Len's wife Eugenia and all of his family and friends.

Martha Stahr Carpenter

MARTHA ELIZABETH STAHR CARPENTER

(SME, Charlottesville, Virginia), former three-term president of the AAVSO, passed away on February 12, 2013, after a brief illness. She was 92 years old. "Patty" Carpenter was born in Bethlehem, Pennsylvania, on March 29, 1920, and received a B.A. from Wellesley, and M.S. and Ph.D. degrees in astronomy from the University of California-Berkeley. While at Wellesley she joined the AAVSO (becoming a life member in 1946) and built a telescope with help from the Amateur Telescope Makers of Boston. Under the observer code SME she contributed 396 visual observations to the AAVSO between 1940 and 1950. After completing her Ph.D. in 1945 she taught at Wellesley for two years, and encouraged her students to contribute observations to the AAVSO. The 1947 Spring meeting of the organization was held at Hood College, where her father was president.

Carpenter joined Cornell University as a radio astronomer in 1947, the first woman faculty member in the College of Arts and Sciences. During her two decades at Cornell she studied radio emissions from the Sun and produced a series of bibliographic compendiums of radio astronomy research from around the world, the first time such work had been collected for use by the growing radio astronomy community. In 1954 she spent a sabbatical in Australia using the Potts Hills' radio telescope to observe 21-cm radio emissions from the Milky Way. The resulting papers by her and collaborators F. J. Kerr and J. V. Hindman produced the first Southern Hemisphere mapping of the spiral structure of our galaxy. After the retirement of her husband, Cornell political economist Jesse Thomas Carpenter, they and their two daughters moved to Charlottesville, Virginia, where she became a faculty member at the University of Virginia in 1969. She retired in 1985 but remained very active in the community.

Carpenter's service to the AAVSO spanned the critical period in which the organization left Harvard and became an independent entity. She was elected to the Council in 1946 and became President in 1951. During her second term it became clear that the organization would have to find a new headquarters and a new source of funding; Carpenter was seen by her fellow officers and others as a valuable champion for the organization during this difficult time. Given the sensitive politics involved with the split between Harvard and the AAVSO and the resignation of the then First Vice President, the Council took the history-making step of asking Carpenter to serve for a third consecutive term. This third term largely centered on acquiring financial independence, an important step in securing the future of the AAVSO. She served on the Endowment Committee from 1954 to 1964 and later a second stint on the Council (1970–1973). While at UVA she encouraged then graduate student Janet Akyüz (later Mattei) to become involved with the AAVSO, and was a vocal supporter of Janet's application to become Director of the organization. Carpenter lost touch with the organization afterwards, but was delighted to be contacted in 2011 in the run-up to the Centennial celebration. She and her elder daughter, Alice Moat, were guests of the organization at that meeting, and Moat is now an AAVSO member herself.

For more information on Carpenter's life, career, and service to the AAVSO, see JAAVSO *40 (2012): 51–64.*

Fred Ellis

FREDERICK E. ELLIS, SR.

(Shaw Island, Washington), AAVSO member since 1934, died February 5, 2013, at the age of 93 of congestive heart failure. Fred did not contribute variable star observations to the AAVSO, but his interest in astronomy and the work of the AAVSO was reflected in his lifetime membership. Starting life as an avid amateur astronomer, he made his own telescope, and while studying for his Ph.D. in educational philosophy at Harvard University served as a Pickering Assistant at Harvard College Observatory. His service in World War II as a medic and ambulance driver

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IN MEMORIAM
CONTINUED...

led him to be a confirmed pacifist thereafter. He taught philosophy at Western Washington University, retiring in 1978. Fred loved sailing and made four trans-Atlantic voyages. He was also a pianist and organist and a dedicated environmentalist. He bought large amounts of land on Shaw Island (one of the San Juan Islands) to protect it from development, and was very active in the preservation of all of the islands and their flora and fauna. We extend our sincere sympathy to his family.


Douglas Hall

DOUGLAS S. HALL (HLL, Nashville, Tennessee), colleague and former AAVSO observer, died March 16, 2013, at the age of 72 after a brief illness. Doug contributed 5 visual observations to the AAVSO International Database in 1967. A professor of physics and astronomy and former Director of Vanderbilt Dyer Observatory, Doug's specialty was double stars, in particular young stars and RS CVn variables. He was the co-discoverer of star spots, and proposed that they could be responsible for stellar brightness variation. He was a respected and admired teacher and mentor to his students. As Director of Dyer Observatory for more than 15 years, Doug was very involved in public outreach and education, and encouraged inquiries from the full spectrum of observatory open night attendees. He also fostered amateur-professional relationships in astronomical research, and was the founder and leader for many years of the International Amateur–Professional Photoelectric Photometry Group (IAPPP). He was also an early advocate of robotic telescopes. He and Russ Genet wrote *Photoelectric Photometry of Variable Stars*, and with Russ Genet and Betty Thurston Doug co-edited *Automatic Photoelectric Telescopes* (proceedings of the 7th annual IAPPP symposium). Among Doug's non-astronomical interests were reading, classical music, caving, and Civil War history. Our condolences go to his wife, Mimi, and all of Doug's family and friends.


Samuel Hellenbrand

SAMUEL H. HELLENBRAND (New York, New York), an AAVSO member 1996 to 2003, died July 26, 2011, at the age of 94. Not an observer, Mr. Hellenbrand was a complimentary member of the AAVSO from 1996 to 2003. By profession he was a lawyer specializing in real estate law, particularly in connection with railroads. He had been the Vice Chairman of Amtrak and a member of the boards of directors of the U.S. Chamber of Commerce and Security Capital Corp. He was Vice President of Real Estate for International Telephone & Telegraph Corp. and had been Vice President of Real Estate for the Penn Central Railroad. Our sincere condolences go to his family and friends. [*Ed. note: Actually, the circumstances of his complimentary membership in the AAVSO are somewhat mysterious. It was certainly Janet Mattei who offered him complimentary membership, and it was almost surely in connection with fundraising or fundraising advising, but no details are known. If anyone has any information on Mr. Hellenbrand's connection to the AAVSO, please let the Editor know.*]


Edwin Morris

EDWIN H. MORRIS (MRE, Birmingham, Alabama), AAVSO member/observer 1970–2012, died October 8, 2012, at the age of 85. Edwin contributed 445 visual observations to the AAVSO International Database from March 1970 through April 2001. An electrical engineer by training and profession, and quiet and retiring of personality, Edwin built his own observatory and greatly enjoyed his astronomical interests. Our condolences go to Edwin's sister Ann and all of his family and friends.


Arline Waagen

ARLINE OTTO WAAGEN (Arlington, Massachusetts), mother of longtime AAVSO staff member Elizabeth Waagen, died March 7, 2013, at the age of 93 after a few months of declining health. Arline was a familiar face at AAVSO annual meetings and over the years at AAVSO Headquarters celebrations, particularly since 2002, when she moved from Charlottesville, Virginia, to live with Elizabeth. She enjoyed so much meeting and talking with AAVSOers, not only because of their connection to Elizabeth but really because she was genuinely interested in people. She always appreciated how warmly she was received by the AAVSO family even though astronomy was not her field. The second eldest of seven, Arline's career in social work began in World War II in the Red Cross in Duluth, Minnesota, and Omaha, Nebraska. After graduate school she did child protection work, then pediatric medical social work at Children's Hospital in Buffalo, New York, and pediatric neurological medical social work at Columbia-Presbyterian Hospital in New York City, and then school social work with the Buffalo public and parochial schools. She held Master's degrees in Social Work and Education, and was an adjunct professor of education and psychology at Erie County Community College, and a field placement mentor/advisor for the Buffalo State College social work graduate study program. After retirement Arline traveled extensively for several years, enjoying the world cultures, and was an "American mother" to numerous international graduate students in Buffalo, Charlottesville, and Arlington. Our condolences go to Elizabeth and her brothers and all of Arline's family and friends.

Ed. note: following is the Spanish language text of Arne's Director's message.

MENSAJE DEL DIRECTOR

ARNE A. HENDEN (HQA)

Los recortes del Gobierno de los Estados Unidos afectan los presupuestos de la NSF y de la NASA con el resultado inmediato de la demora de las asignaciones para el año fiscal en curso. Esto significa que todas las solicitudes de fondos enviadas para la fecha límite de astrofísica del 15 de noviembre o las de educación de enero, e incluso la fecha límite del 21 de febrero para propuestas de Instrumentos de Investigación Mayor, no serán aceptadas por varios meses, si es que alguna vez lo son. Esto afecta a gran parte de la investigación científica llevada a cabo en los Estados Unidos, por lo que espero que el Congreso tenga éxito en elaborar un presupuesto de compromiso que pueda ser aprobado con rapidez.

Mientras tanto, la AAVSO tiene fondos suplementarios a la beca de Citizen Sky para llevar a cabo un taller con el objetivo de redactar un manual de fotometría DSLR. Investigadores de todo el mundo se reunirán en la sede de AAVSO en marzo para ofrecer sus conocimientos y producir un manual que podamos usar para apoyar esta nueva técnica de observación. He visto que se ha hecho fotometría muy buena con estas cámaras baratas y tengo muchas esperanzas de que su uso se expandirá entre los miembros y ayudará a continuar con nuestro monitoreo de décadas de variables brillantes.

No se olviden que se viene el Encuentro de Primavera de AAVSO en Boone, NC. La entidad anfitriona será la Appalachian State University. Tengo viejos amigos en su facultad. Boone es una zona hermosa al pie de las montañas y el observatorio de investigación tiene uno de los telescopios activos más grandes de la costa este. ¡Debería ser un encuentro divertido y fructífero!

Quiero agradecer a todos los observadores que están participando del gran esfuerzo del HST para obtener espectros UV de docenas de variables cataclísmicas. Sin su abnegado seguimiento, los organizadores del HST no obtendrían observaciones de estos objetos potencialmente eruptivos. Tenemos cerca de un objeto por semana para observar, por lo cual hay muchísimo trabajo, tanto para el equipo de científicos que estudian estas CVs como para los observadores que desde Tierra intentan realizar esa estima negativa más reciente y reportarla. Esta es una demostración realmente buena de la sinergia entre aficionados y profesionales en la astronomía de hoy en día.

Los dos primeros satélites BRITE (BRight Target Explorer) Constellation fueron lanzados a fines de febrero. Son los componentes canadiense y austríaco de este conjunto internacional de satélites que estudian las estrellas más luminosas; otro satélite austríaco y otro canadiense y dos satélites polacos serán lanzados más adelante. Estos seis microsatélites van a monitorear las ~400 estrellas más brillantes que magnitud 4 en las bandas B y V de Johnson. Los resultados serán extremadamente interesantes, ya que estas estrellas brillantes son también algunas de las más cercanas a nuestro Sol, y se necesitará apoyo desde Tierra para poner los resultados en contexto. ¡Este será el momento ideal para implementar ese sistema DSLR o para instalar aquel espectrógrafo de alta resolución!

Uno de los foros de discusión online de la AAVSO presentó el misterio de por qué no ha habido novas brillantes en los años recientes. Recuerdo a la Nova Cyg 1975, que llegó a primera magnitud, y cómo cambió la apariencia de la conocida constelación. ¡Tengo esperanza de que nuestro dedicado escrutinio del cielo revelará la próxima nova a simple vista! Mientras tanto, podemos observar los dos cometas brillantes de este año; por suerte serán visibles suficiente tiempo como para que incluso la gente en climas nublados posiblemente pueda verlos un par de veces. El reciente paso de 2012 DA14 y el superbólido ruso atrayeron el interés del público en el cielo. Fomentemos ese interés y mostrémosle a la gente que el cielo, que constantemente está cambiando, puede ser muy divertido de mirar. ★

Ed. note: following is the Spanish language text of Mario's President's message.

MENSAJE DEL PRESIDENTE

MARIO MOTTA, M.D. (MMX)

Historia de un gran espejo de telescopio

Siempre he estado interesado tanto en la construcción como en el uso de telescopios. Lo que sigue es la historia de vida de uno de mis espejos. A principios de 1980, construí un telescopio de 400 mm (16") con el que era bastante feliz. Hacia fine de los años 80, sin embargo, después de observar a través de algunos telescopios más grandes, desarrollé un deseo por un telescopio más grande, la bien llamada "fiebre de apertura". Pensaba en uno de 600 mm (24") y anduve buscando un disco de vidrio adecuado para devastar y pulir. Janet y Michael Mattei se enteraron de mi interés por un gran disco de vidrio. Se pueden imaginar mi sorpresa una noche cuando Michael Mattei se presentó en mi casa, casi sin previo aviso, y depositó un disco de vidrio Pyrex de 800 mm (32"). Michael se mostró muy reservado, diciéndome que no podía decir de dónde venía y simplemente que haga un gran telescopio con él. Años después, él me informó que el secreto del disco de vidrio había sido desclasificado y que la historia podía ser contada.

Este disco de vidrio Pyrex de 32", al parecer, fue producido específicamente para la Fuerza Aérea de los EE.UU., para ser utilizado en un programa de vigilancia por satélite. Finalmente, el proyecto llegó a su fin debido a que la Fuerza Aérea adoptó otros métodos de vigilancia de los que no estoy al tanto, y este disco sobrante fue programado para ser destruido, de modo que el secreto del tamaño de la óptica utilizada no fuese revelado. Todo esto está ahora desclasificado. Michael salvó este disco de ser roto en pedazos y arrojado a un vertedero, regalándomelo. Cuando comencé a pensar en el devastado y figurado con éxito de un espejo de 32" percibí claramente que era una tarea de enormes proporciones. Michael me tranquilizó diciéndome que me iba a dar orientación y ayuda para completar el proyecto. Sin su ayuda e instrucción, de hecho, no estoy seguro que hubiese podido completarlo correctamente.

Lo primero que decidí que debía hacer era lograr que el disco fuese más liviano, ya que pesaba 80 kg (160 libras). Como planeaba devastarlo y pulirlo en mi sótano, tenía que ser capaz de levantarlo y darlo vuelta con la menor ayuda posible. Pensé, entonces, enviar el disco de vidrio a una empresa especializada en el tallado de lápidas, pues poseían equipos de arenado para tallar figuras en lápidas y monumentos. Resulta que ellos utilizaban carborundum 60 para estos trabajos, lo cual era ideal para usarlo en un disco de Pyrex, puesto que, de hecho, es el grano normal de arranque en el devastado. Después de 4 horas de trabajo y de cuidadosa aplicación, surgió un agradable patrón, muy bien grabado, de nervaduras y cavidades. De los 72,6 kg originales, el disco pesaba ahora 36,3 kg y podía ser manipulado con mayor facilidad. El arenado, sin embargo, produce tensiones y micro-grietas en el vidrio, lo que pondría en peligro la forma final del

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MENSAJE DEL PRESIDENTE
CONTINUED...

espejo y potencialmente, también, conducir a la propagación de grietas por todo el espejo. Por esa razón el siguiente paso fue a bañar todo el vidrio en una solución tibia de ácido fluorhídrico. Esto sella al vidrio alivianado las millones de pequeñas grietas de la superficie producidas por el arenado. Un amigo perteneciente a la industria de la óptica y también colega de AAVSO, Paul Valelli, jugó un papel decisivo en la obtención de este ácido, ya que se lo considera tóxico y altamente peligroso y generalmente no se encuentra disponible. Construimos una piscina de plástico para sumergir y bañar el espejo en el ácido que calentamos a 50° C, durante 60 minutos. Al final de este tiempo, el vidrio estaba bien sellado y pesaba 35 kg.

A continuación construí una máquina de devastado casera para aplicarla a este espejo de gran tamaño. Con una superficie de 0,51 metros cuadrados, la presión en la superficie de un disco de vidrio de 800 mm puede ser más de lo que las manos humanas puedan empujar. Algunas piezas fueron obtenidas principalmente a partir de chatarra y otras de una vieja máquina de devastado de espejos desechada por la ATMOB (la sociedad de aficionados constructores de telescopios de Boston). Luego de más de dos años y medio de trabajo, el disco de vidrio se convirtió en un espejo astronómico de 800 mm F4 de un cuarto de longitud de onda. Esto se logró con muchísima ayuda de Michael Mattei, Paul Valelli y otros miembros de la ATMOB. Por supuesto, mi esposa colaboró ayudándome regularmente a levantar, girar y manipular el espejo. Hasta hoy, mis tres hijos tienen "buenos" recuerdos de intentar quedarse dormidos con el sonido de un vidrio esmerilándose en el sótano.

Una vez terminado, el espejo fue instalado en un telescopio y observatorio caseros que construí en un sitio con cielo oscuro en New Hampshire. Me quedé encantado con lo que podía ver y lo utilicé, muy feliz, durante varios años. Yo buscaba 1/8 longitud de onda o mejor, pero nunca pude lograrlo debido a la naturaleza del espejo alivianado que había creado. Algunos años más tarde, tuve oportunidad de obtener un segundo espejo de 800 mm, de una calidad un poco mejor y cambié los espejos del telescopio. Aprendí, de esa experiencia, que a pesar de haber construido una celda suspendida en 18 puntos el verdadero problema era el soporte lateral. Una vez que añadí un cabestrillo al soporte lateral el espejo tuvo, realmente, un comportamiento mucho mejor. En ese momento, el espejo original que se discute en este artículo, fue dejado de lado para su posterior uso.

En 2004 me mudé a Gloucester, en la costa de Massachusetts. Mi plan original era volver a figurar este espejo para otro posible telescopio newtoniano F4. Por ese tiempo, un gran amigo mío, Scott Milligan, me convenció que, en cambio, construyese un telescopio de un diseño radicalmente diferente y muy mejorado, un telescopio que utiliza un espejo primario esférico con un secundario Mangon y múltiples lentes correctoras. Esto resultó ser un golpe genial, ya que este telescopio ahora alcanza aproximadamente 1/12 de longitud de onda, produciendo hermosas imágenes, muy nítidas. El único problema era que se requería un diseño completamente diferente para el espejo primario, un vidrio fundido de forma cónica. Nunca me he arrepentido de esa decisión, pero dejó de lado al espejo original. Pensé en varias opciones, pero con los otros telescopios funcionando bien nunca llegué a implementar nuevos planes para él. (Además, ¿cuántos telescopios de 800 mm uno necesita?).

Ahora, avancemos rápido hasta 2012 y a una visita por año sabático a AAVSO por parte del Dr. Ulisse Munari, de la Universidad de Padua, en Italia. El describió a nuestro Director, Arne Henden, cómo ha estado asesorando y tutelando al Observatorio Schiaparelli localizado sobre el lago de Varese, en Italia. Se trata de una colaboración profesional-amateur que tenía un telescopio dedicado a la espectroscopia casi listo. Tenía un observatorio terminado y un telescopio casi listo pero que le faltaba un pequeño detalle: el espejo principal. Él estaba desarrollando planes para encargar un espejo para completar este proyecto y hacer este observatorio operacional. Arne me notificó que estaba buscando un espejo de 800 mm F4. El doctor Munari quedó muy sorprendido cuando le informamos que acaba de pasar a tener uno sin usar. Después de mostrarle el espejo luego de una cena en mi casa, él exclamó que ese espejo sería perfecto para espectroscopia en el observatorio de Varese. Dado que sería un telescopio dedicado a la espectroscopia, un espejo de un cuarto de longitud de onda era más que adecuado.

Así que, con todo el mundo de acuerdo, formalmente doné este espejo a AAVSO el año pasado y, ahora, AAVSO se lo prestó permanentemente al Observatorio Schiaparelli. Llegó allí en diciembre de 2012, donde el personal del observatorio, dirigido por Paolo Valesa, inmediatamente comenzó a trabajar en una celda para que el gran espejo sea adosado a ese telescopio existente. También están trabajando en un seundario Cassegrain (durante la fase de pulido, Mike Mattei y yo le habíamos hecho un agujero central en caso de que alguna vez hubiésemos querido convertir el espejo en uno para un telescopio Cassegrain). Paulo, el ingeniero jefe, me aseguró que debería entrar en funcionamiento a principios del verano boreal de 2013. Tengo ganas de visitarlo este verano y ver este observatorio de espectroscopia completamente operacional.

El resultado neto de este largo relato de la historia de la vida de un espejo de telescopio es que los miembros de AAVSO obtendrán una porción de tiempo para usar este telescopio totalmente operado en forma robótica y dedicado a espectroscopia, situado en las estribaciones de los Alpes, en Italia, con hermosa vista al lago Varese . Tengo la satisfacción personal de saber que un espejo que devasté y pulí va a temer muy buen uso en la investigación. En especial, me siento muy bien porque se ha logrado la intención original de Mike Mattei de salvar de la destrucción innecesaria a un disco de vidrio en blanco en perfectas condiciones. Este espejo ha pasado por varias iteraciones desde que fue fabricado originalmente: desde el satélite espía, al uso en un observatorio aficionado y, ahora, a la investigación profesional. Me complace que se utilice activa y productivamente durante muchos años por venir. Y, por último, tengo una buena excusa para visitar Varese, en Italia. ★

A NOTE ON THE TRANSLATIONS

We are grateful to Sebastian Otero and Jaime García for providing, respectively, the Spanish language versions of the Director's and President's messages, We hope that readers of the *Newsletter* will enjoy this feature.

ROD STUBBINGS (SRX)—VARIABLE STAR OBSERVING DOWN UNDER

KEVIN PAXSON (PKV)—CENTERVILLE, OHIO

Rod Stubbings (SRX) is 57 years old and he lives about 140 km (84 miles) east of Melbourne, Australia, in the state of Victoria, with his wife of 32 years, Cheryl. He has four daughters (two of whom still live at home). Rod has been a self-employed licensed plumber now for over 38 years. He is also one of the most prolific visual variable star observers in the southern hemisphere and leading cataclysmic variable star observers in the world. As of February 2013, Rod has a total of 214,188 visual observations in the AAVSO International Database. Rod is well published and either has authored or co-authored 67 papers from 1995 to present, according to a recent search of the NASA ADS system.

Rod's interest in astronomy started in 1986 while reading a magazine in which he noticed a 60mm telescope for sale to observe Saturn and Jupiter. "I ordered the telescope and once it arrived I headed outside to find these planets. I could barely focus on the stars let alone find anything, but eventually I spotted one and went in to tell my family. Embarrassingly, I had to tell them later that it was not a planet after all, but some dust on the lens! I later read up on astronomy and bought a book called *Stargazing—Astronomy Without a Telescope* by Patrick Moore. Over the next few years, I slowly began to learn the names of the stars, the constellations, well-known objects, and where to find those planets."

Rod was introduced to variable stars by attending a meeting of the Latrobe Valley Astronomical Society. "At that meeting, Peter Nelson was giving a talk on variable stars and how observations can contribute to science. I decided to give it a go. Peter had been trying for years to get people interested in variable stars and I have been his only pupil. I read the book *The Observations of Variable Stars* from the Royal Astronomical Society of New Zealand (RASNZ) and made my first visual observation of the naked-eye Cepheid variable star l Carinae in May 1993. I made 10 observations during my first month of observing and this number has steadily increased to over 1400 observations per month, often with 30 to 50 dwarf novae outbursts per month."

Rod became a member of the RASNZ in May 1993 and he soon gravitated to observing cataclysmic variables. "Over the next few years, I was detecting numerous CV outbursts, which were kept in my log book and sent to RASNZ every month. I came across the VSNET alert mailing lists in 1997, which reported the outbursts of CV stars. I also decided to send every detected outburst to VSNET, which was often a few per night! A few weeks later I received an email from Frank Bateson that said, 'You may receive e-mail messages resulting from your alert messages requesting additional data. If you do I suggest you tell the enquirer to contact me so they can obtain our complete record. I have already received such requests from those who know you are one of our observers, but others may not know of this connection.'"

Two months later another email came from Frank Bateson: "I returned at the end of last week from the meeting in Switzerland. You will be pleased to know that your alert notices are being well regarded worldwide. Keep up the good work."

"In July 1997, I received an email from Janet Mattei regarding my alert notices on VSNET. 'If you would be interested in sending your observations directly to the AAVSO, in addition to the other networks to which you send them, we would very much like to include your observations in the *AAVSO News Flashes*.' Thus my association with the AAVSO began. I have been a member of the AAVSO now for the past two years."

Rod Stubbings and his Meade DS-16 Newtonian.

Rod started observing with simple equipment and it has been a progression over time. "It all started from naked-eye to binoculars, a 60mm refractor, 150mm, 250mm, 320mm, and 400mm Newtonian reflecting telescopes. Each aperture gain was used to study fainter variable stars. Next on the list is a 22-inch!"

Rod's Tetoora Road Observatory is "situated in the foot hills of the Strzelecki Ranges in a rural area at 260 meters (806 feet) above sea level. I have an unobstructed 360 degree view. I can see snow in the mountain ranges north and water views in the distance from Westernport Bay (also called Western Port Bay) in the direction of Melbourne. All my variable star fields are found from memory, but I do grab a chart on certain outbursts to double check, especially when they are important or rare.

"I have a reasonably dark site being out in the country. I have sky glow from towns 20 km (12 miles) away and city glow 140 km (84 miles) away low along the horizon. I have no trouble seeing magnitude 15.4 on any night, even if some haze is present. On better nights, I get down to magnitude 16.0 to 16.6 quite often and magnitude 17.0 stars can be seen on very good nights when I boost up the magnification."

Rod does not keep clear night statistics. "My total number of observations per year gives me a better indication of clear nights so over 10,000 observations is a reasonable year of clear nights. I always aim for a minimum of 100 to 150 observations a night and if I observe all night over 200."

Rod's main instrument is a Meade DS-16 on an equatorial mount, which is situated in a homebuilt domed observatory. "When I first used my Meade DS-16, I lost half of my variable star fields because I could not get to the eyepiece because it was in a fixed position. This was very quickly remedied by adding a pair of rotating rings so the whole tube could rotate and hence get to the eyepiece at my eye level."

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Rod "star hops" to find his targets. "Through the finder I see more patterns and angles leading directly to my variable star fields all from memory. In most cases, I have a 9th-magnitude star in or close to the variable that I can see through the finder. So after one aim of the finder I'm looking through the eyepiece at the variable star field within a few seconds.

"I only have two eyepieces, a 9mm Nagler (200× and 23.4' FOV) and a 6mm Ethos (300× and 19.8' FOV). The 6mm Ethos is my main eyepiece and the 9mm is used when conditions are a bit off."

Rod has a regular nightly routine. "As soon as it's dark I am outside observing. I start off in the west to catch stars before they set and then I go to the stars I feel are due for an outburst. Then, I follow all the active stars, as I like to complete their rise and fall cycle, and later I cover the entire sky and get acquainted with my list of variables rising in the east. After finishing, I go inside to report new outbursts and current activity to CVNet and VSNet, and that leaves me with around 4 hours sleep before I get up for work.

"I don't really have any favorite variable stars, I just like them all. A few years ago Albert Jones contacted me and asked if I could keep observing some of his symbiotic and Wolf Rayet stars. He was worried about the long term light curve of these stars so I added them to my list. Albert also gave me the contacts of where to send these observations.

"I'm also starting to enjoy observing WW Cet. After years of observations, I knew something was different at the start of 2010 when WW Cet was stuck on 12.0 magnitude. It still hasn't had a bright outburst in three years now and it appears to be a Z Cam star. I also observe the symbiotic stars AE Ara and AR Pav and have been getting some nice light curves of their eclipses. I also have added under-observed Miras to see what I can find about their behavior. One in particular is DM CMa, which was classified as a Mira, but my observations show it to be a UG star with short and long outbursts."

Over the years Rod has "paid close attention to all the known CVs and searched the catalogues for all unobserved CVs and studied their outburst patterns, rise and fall durations." This has led to many first-ever visual outburst detections or outbursts which have revealed the true nature and reclassification of these stars. Here is a listing:

WZ Sge outbursts: SV Ari, GR Ori, GW Lib, CG CMa, and VX For.

New CV's or confirmed SU UMa stars: V591 Cen, V1089 Sgr, FL TrA, V359 Cen, V422 Ara, DT Oct, V383 Vel, CC Scl, LY Hya, V728 CrA, EG Aqr, EX Hya (detection of this known IP in 1998 led to the first-ever RXTE satellite observations), HV Vir (the fifth outburst detection of this known CV), RU Hor, RX Cha, RZ Leo, V1047 Aql, V485 Cen, V877 Ara, XZ Eri, AD Men, AX Cap, BC Dor, KK Tel, V551 Sgr, V699 Oph, AB Hor, EP Car, MM Sco, FQ Mon, V2051 Oph, V344 Pav, TU Crt, EF Eri (this known IP switched off nine years before detection), and SDSS J163722.21-001957.1.

Black hole binary: V4641 Sgr: (this 8th-magnitude detection diverted the RXTE satellite and radio telescopes around the world to observe this outburst event).

New RR Lyrae stars: U PsA (visual observations showed a period of 0.54187 day and a new RRAB Lyrae star) and SW Crt (visual observations showed a period of 0.493164 day and a new RRAB Lyrae star).

While Rod is not credited with discovery of the 2011 outburst of T Pyx, he did catch some interesting pre-outburst behavior. "On April 5, nine days before the outburst, I found T Pyx was brighter than normal at magnitude 14.5. It varied between magnitude 14.4 and 14.7 that night and I decided not to report as it was just brighter than normal state. The following night, on April 6, T Pyx was still above normal brightness at 14.7, April 7 14.8, and April 10 at magnitude 15.0. Mike Linnolt caught T Pyx at magnitude 13.0 on April 14, 2011. I later found out that I had observed a unique brightening before the major outburst. This has only been the fourth known rise or dip closely spaced before a nova eruption."

Rod has participated in nearly two dozen professional/amateur collaborations from 1995 to present. "Collaborations are what make variable star observing so rewarding. Corresponding with professionals, getting requests, and exchanging emails about observing programs knowing your observations are triggering satellite observations." Some of these collaborations and campaigns were with the AAVSO and the RASNZ, but many were arranged privately with CV researchers. Most of these have results in publications and a few are still ongoing.

Of his many publications, Rod's paper on U PsA stands out in his mind. "In 1996, I read an article on U PsA, which was still an unclassified variable despite its early designation. The article stated a magnitude range of 12.5 to <14.0 with possible periods of 117 and 235 days. The advice was to observe it once a week to determine its nature. I decided to observe U PsA; however, I had no sequence so I assigned my own. I observed U PsA every night and I noticed it varied each night. So I stepped it up to observations every few hours per night and my observations found a period of 0.54187 day. CCD data confirmed my period."

Rod received the AAVSO Director's Award in 2002. "When Janet first contacted me to tell me I had received the Directors Award and that she wanted me to attend the meeting in Hawaii, I felt honored. I am a pretty quiet person—I had never been on a plane or around Australia let alone overseas and I was not sure about attending the meeting. I wasn't going to go, but Janet being Janet persuaded me. I was so glad I went because the AAVSO staff was fantastic and Janet was a real people's person. No one knew who I was other than my observer code, and when Janet introduced me to Gamze Menali she said, "Gamze, I would like to introduce you to someone, this is SRX."

When not observing variable stars, Rod enjoys gardening, tending to his five-acre hobby farm and raising pedigree Black Faced Dorper Sheep. He also likes building and construction. "I have built my entire house from the ground up which included all facets of plumbing (of course), timber work, concreting, plastering, painting, tiling, and wiring."

Despite the advancement of CCD technology and numerous all sky surveys, Rod sees himself as a visual observer for now and into the future. "I see variable star observing in the future to be more and more automated with CCD surveys." However, "I believe you cannot overvalue the contribution of visual observing compared to CCD imaging. A CCD camera cannot make instant judgments on a star's state, or call upon experience the way a visual observer can when directly viewing the stars.

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"At present I believe visual observing can still complement the surveys with selected targets. An example of this was with my observations of SW Crt. I observed SW Crt hourly throughout the night and my observations revealed a period of 0.493164 day. The survey data were added and the period confirmed. The survey data [alone] could not [yield] a period because there were too few data points.

"For me, I prefer to be outside observing hands-on and watching what events are taking place rather than waking up in the morning to check my images to see what has happened. There are many targets out there for visual observers to contribute important observations and make discoveries. You just have to be selective in what you are observing.

"I'm still as keen as ever and visual variable star observing will never leave me. I will eventually open my observatory up to the public for monthly observing. I have school groups occasionally visiting my observatory now, but I don't want to slow down on my observing at this stage. I can still improve on what I'm doing once I retire!"

Rod will be celebrating 20 years of variable star observing next month and he does not appear to be slowing down any time soon. For more information about Rod, his observatory, discoveries, and publications, check out his web site at: http://rodstubbingsobservatory.wordpress.com/. Keep up the great work, Rod! ★

AAVSO OBSERVING CAMPAIGNS UPDATE

ELIZABETH O. WAAGEN (WEO),
AAVSO SENIOR TECHNICAL ASSISTANT

Each campaign is summarized on the AAVSO Observing Campaigns page (http://www.aavso.org/observing-campaigns), which also includes complete lists of all AAVSO Alert and Special Notices issued for each campaign.

Campaigns concluded since January 2013

The observing phase of Dr. Michael Rupen (National Radio Astronomy Observatory) and colleagues' campaign on **Nova Oph 2012 No. 1** (**V2676 Oph**, *AAVSO Alert Notice 457*) has concluded, and analysis of the multiwavelength observations of this system, including the excellent multicolor data provided by 20 AAVSO observers, is underway. V2676 Oph has faded below V=18.

Dr. Noel Richardson's (Université de Montreal) campaign on **HD 5980** has concluded. He had requested monitoring in support of his CTIO multiwavelength campaign (*AAVSO Alert Notice 472*) in order to update the eclipse ephemeris for this system to schedule the CTIO observations and then to provide simultaneous optical coverage. Analysis of the data will take place this summer, and he thanks the six AAVSO observers for their solid coverage.

Also concluded is the campaign by Drs. Tony Moffat (Université de Montreal), Michael Corcoran (NASA GSFC), Noel Richardson (Université de Montreal, formerly at Georgia State University) and others, who requested AAVSO assistance in obtaining photometry and spectroscopy of **delta Ori** (**Mintaka**) in support of their Chandra and MOST observations (*AAVSO Alert Notice 474*).

The observing phase of the MOST campaign on the novalike (VY Scl subtype) cataclysmic variable **TT Ari** (*AAVSO Alert Notice 469*) is over. Dr. Nikolaus Vogt is continuing with analysis of his MOST observations and the excellent data contributed by nearly 60 AAVSO observers.

Campaigns initiated since January 2013

Three campaigns were initiated between January 1 and March 31.

In January, Dr. Bob Zavala (U.S. Naval Observatory, Flagstaff) requested AAVSO assistance in obtaining multicolor photometry of the bright (4.5V) triple system **b Per** in order to prepare for and detect a possible eclipse of the AB components by the C component predicted for 2013 January 23 (*AAVSO Alert Notice 476*). The eclipse might last for up to four days, so the coverage requested would provide both a baseline out-of-eclipse light curve and a multi-color eclipse light curve for analysis. 10 AAVSO observers have contributed data so far, and the eclipse was detected and well covered! Follow-up observations are underway.

Also in January, Dr. Péter Ábrahám (Konkoly Observatory, Budapest, Hungary) requested the assistance of AAVSO observers in obtaining calibrated, transformed VRI photometry on eight young stars in Chamaeleon in support of photometry he and his colleagues would be obtaining with the VLT/ISAAC (infrared) and Herschel Space Observatory (far-infrared) during January-February 2013 (*AAVSO Alert Notice 478*). Target stars, ranging from V=11.1 to 15.3 and variable to varying degrees, were **CR Cha**, **CT Cha**, **HP Cha** (**Glass 1**), **VW Cha**, **VZ Cha**, **WW Cha**, **WX Cha**, and **XX Cha**. Unfortunately, no data on these stars have been submitted yet—if you have data that you have not yet reduced, or if you need help with calibrating and transforming your data, please contact headquarters.

In March, Dr. Boris Gaensicke (Warwick University) requested observations of the then-outbursting SU UMa-type cataclysmic variable **MR UMa** in preparation for and support of HST/COS observations scheduled for the week 2013 April 4–7 (*AAVSO Alert Notice 480*). An extra request for observations of this star was made because of the upcoming HST/COS observations as part of the large CV campaign underway, and it was essential to know for sure that the star had returned to minimum prior to the satellite observations. To date 25 AAVSO Observers have contributed to the good coverage of this system. However, some observers are mistaking a nearby 15th-magnitude star for MR UMa, which is 16–17th magnitude.

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OBSERVING CAMPAIGNS
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Campaigns in progress

The large campaign on **cataclysmic variables** organized by Drs. Boris Gaensicke (Warwick University), Joseph Patterson (Columbia University, Center for Backyard Astrophysics), and Arne Henden (AAVSO), and the 13 other consortium members astronomers, including Drs. Ed Guinan, Knox Long, and Paula Szkody, is continuing after a short hiatus at the end of the year (*AAVSO Alert Notice 471* and many *AAVSO Special Notices*). As of the end of March 2013, 18 targets from the original list of 40 have been successfully observed by the Hubble Space Telescope Cosmic Origins Spectrograph (HST COS)—10 targets were observed during this quarter alone! These observations were possible thanks to the efforts of AAVSO observers worldwide who monitored the targets to be sure they would be faint enough for HST to observe safely. Observers are urged to continue their multiband photometry, spectroscopy, and visual observations as best their equipment and schedules permit. Dr. Gaensicke and colleagues continue to be very grateful for the excellent AAVSO support that is enabling the consortium's research, and they look forward to this fruitful collaboration continuing.

Darryl Sergison's (University of Exeter) campaign to study the environments of **six T Tauri stars** (*AAVSO Alert Notice 473*) continues. Coverage of the first three stars—**RY Tau, DN Tau,** and **DR Tau**—is winding down for the observing season. Please continue with your visual observations, multiband photometry, and spectroscopy as long as possible. Dr. Sergison writes, "The photometry collected this season is great, I have been working with it and would be very keen to continue with these objects again next season." This campaign will run through 2014 at least, and the other three stars will be announced when they have been selected.

The campaign organized by Dr. Michael Shara (American Museum of Natural History, Columbia University) to monitor the dwarf nova **U Gem** to enable and support HST/COS ultraviolet observations (*AAVSO Alert Notice 475*) continues. The next outburst of U Gem is anticipated at any time, so please do your best to follow this star though the end of its observing season.

Dr. Margarita Karovska's HST and Chandra campaign on **CH Cyg** (*AAVSO Alert Notice 454* and *AAVSO Special Notices #267*, *294, and 320*) continues. Dr. Karovska has been very pleased with all of the coverage so far and is urging continued coverage, especially in V and B. Please pick up coverage of CH Cyg when it becomes observable again.

Dr. Noel Richardson's multiwavelength campaign on the luminous blue variable prototype **S Dor** continues at least through the 2012–2013 observing season (*AAVSO Alert Notice 453*, *AAVSO Special Notice #280*, *AAVSO Special Notice #293*, and S Doradus *Telegram* on organizer's website).

Ernst Pollmann's campaign on the S Dor (—Luminous Blue Variable) variable **P Cyg** (*AAVSO Alert Notice 440*) continues "for several more years," at least through the 2014 season.

J1407 (1SWASP J140747.93-394542.6)—determine eclipse behavior of transiting ringed substellar companion (*AAVSO Alert Notice 462*)

3C 273 and 3C 279—blazar-type quasars (*AAVSO Alert Notice 430*, AAVSO campaign page http://www.aavso.org/campaign-blazars-3c-273-and-3c-279)

HBC 722 and **VSX J205126.1+440523**—Young Stellar Objects (*AAVSO Alert Notice 425*)

HMXBs and **SFXTs**—High-Mass X-ray Binaries and Super Fast X-ray Transients, Dr. Gordon Sarty's list (*AAVSO Alert Notices 348, 354,* and *377, AAVSO Special Notices #118, #129, #143, #213,* and *#220*, and description of research program in *JAAVSO*, Vol. 35, p. 327; article viewable at

http://adsabs. harvard.edu/abs/2007JAVSO..35..327S)

Blazars—Dr. Markus Boettcher's list (*AAVSO Alert Notice 353*

at http://www.aavso.org/node/1555/451)

QX Pup—Mira variable (http://www.aavso.org/qx-pup)

Novae and notable outbursts

One galactic nova was discovered between January 1 and March 31. **Nova Cep 2013** (**V809 Cep**) was discovered by Koichi Nishiyama and Fujio Kabashima of Japan at magnitude 10.3 U on 2013 February 2.4119 UT. Excellent multicolor and visual data obtained by nearly 50 AAVSO observers show the nova peaking at visual/V magnitude ~11.2 around February 3 and as of March 31 at V~16.

On 2013 February 11 Rod Stubbings of Australia reported **GR Ori** (**Nova Ori 1916**), in outburst at visual magnitude 13.0; confirmation was provided by Stephen Hovell of New Zealand. Subsequent observations indicate that, rather than a classical or recurrent nova, GR Ori is most likely a WZ Sge-type dwarf nova. Nearly 40 AAVSO observers have contributed multicolor data, mostly CV and V, to produce a beautiful light curve.

In mid-March 2013 **GK Per** (**N Per 1901**) had one of its dwarf nova outbursts, its first since March 2010. From its minimum visual magnitude ~13.0 on March 11, GK Per brightened to 12.2 and returned to min ~April 3. Over 30 AAVSO observers contributed data in providing solid and valuable coverage of this popular star that in recent years has been quite unpredictable.

With all the campaigns and stellar activity, 2013 is proving to be a very active year—please keep observing and participating in as many campaigns as your schedule and equipment permit!

The astronomers and we at AAVSO Headquarters are grateful to all of you who are participating in AAVSO Observing Campaigns, and we thank you for your contributions. You have been and continue to be a vital part of variable star research, so stay tuned, get plenty of rest, and keep your equipment at the ready! ★

PHOTOELECTRIC PHOTOMETRY PROGRAM UPDATE

MATTHEW TEMPLETON (TMT), AAVSO SCIENCE DIRECTOR

AAVSO PEP observers provided interesting data for a number of targets for the quarter starting January 1, 2013, with six AAVSO PEP observers making 168 observations of 33 different stars.

Our most prolific observer of the season was Section Chair Jim Fox (FXJ), who tallied 59 V-band measures and 10 B-band measures during the quarter for a total of 69. Charles Calia (CCB) was next with 48 V-band measures, followed by Patrick Rochford (RPT) with 30 V-band measures. These were followed by Thomas Rutherford (RTH) with eight measures in each of the infrared J- and H-bands for a total of 16, John Martin (UIS01) with two V- and one B-band measure, and Adrian Ormsby (OAD) with one V- and B-band measure.

Campaign target b Persei (*AAVSO Alert Notice 476,* January 4, 2013) received the most concentrated PEP observations this quarter with a total of 20 observations. We're happy to say that the combination of PEP and DSLR data for this campaign provided confirmation of a tertiary eclipse in the b Persei system. There were many other stars observed, with the best-covered objects including RZ Arietis (14 observations), epsilon Aurigae (11), CE Tauri (11), alpha Orionis (11), X Persei (10), rho Persei (7), V614 Monocerotis (7), EG Andromedae (7), IS Geminorum (6), RS Cancri (6), eta Geminorum (5), II Pegasi (5), and BC Canis Minoris (5).

Epsilon Aurigae will remain high enough for good photometry for a little while longer this season; as of late March, it's still above an airmass of 2 until about 0300 UT, but it won't be around for too much longer. This star will likely always be an interesting target, at least until it gives up the last of its many secrets. Any southern PEP observers should note that the bright Mira BH Crucis is coming into its best season this coming quarter. The AAVSO has substantial historical data for this star, particularly from the Auckland Photometric Observers Group. It's a fascinating star with a strongly varying light curve and probably chemical changes in its spectrum. Photoelectric observers (and other bright star observers doing transformed, filtered photometry) are encouraged to keep observing this star.

For a list of other PEP targets, visit "Suggested Stars for PEP Observers" on the AAVSO website http://www.aavso.org/suggested-stars-pep-observers.

New (or curious) members can learn more about photoelectric photometry on the main section site

http://www.aavso.org/aavso-photoelectric-photometry-pep-program.

Clear skies! ★

LOOKING AT LEGACY STARS

STARS OBSERVED RECENTLY AND RECOMMENDATIONS FOR THE NEXT FEW MONTHS

MATTHEW TEMPLETON (TMT), AAVSO SCIENCE DIRECTOR
SARA J. BECK (BSJ), AAVSO TECHNICAL ASSISTANT
ELIZABETH O. WAAGEN (WEO), AAVSO SENIOR TECHNICAL ASSISTANT

This column, introduced in *AAVSO Newsletter 54* (October 2012), is a quarterly summary of popular and important targets of the previous quarter as observed by the AAVSO community. This will help keep the observers up to date on the observations being submitted to the AAVSO archives, and more importantly on what stars may need improved coverage by the community.

We encourage observers to keep a smaller subset of variables at the top of their observing planning via the Legacy and Program lists for LPVs and CVs (see https://sites.google.com/site/aavsolpvsection/Home/lpv-files for the LPV lists, and https://sites.google.com/site/aavsocvsection/aavso-legacy-cvs for the CV list). These lists were established to provide guidance on which stars had the best-observed light curves and thus had greatest potential for science if those stars continued being observed. There are thousands of other stars that are still regularly observed, and many objects not on the lists above remain worthy targets for variable star observers, visual and CCD alike.

Target lists for observers vary throughout the year, and the number of observations received changes depending upon a star's observability in a given season as well as whether there is special interest—for example, an observing campaign or recent notable activity. Quarterly totals also help to highlight what new and interesting data sets the AAVSO how holds.

Below are the most- and least-observed stars of the LPV and CV Legacy lists, showing the number of visual and CCD observers ($N_{(vo)}$ and $N_{(co)}$) along with the total number of nights observed ($N_{(von)}$ and $N_{(con)}$).

Top ten best-covered stars of the LPV Legacy program, as measured by number of nights observed, 2013 January 1 through 2012 March 18:

Name	*Con*	*R. A. (J2000)*	*Dec. (J2000)*	$N_{(vo)}$	$N_{(von)}$	$N_{(co)}$	$N_{(con)}$
R Leo	Leo	09:47:33.48	+11:25:43.7	63	76	4	9
alf Ori	Ori	05:55:10.3	+07:24:25.4	40	76	4	16
eta Gem	Gem	06:14:52.66	+22:30:24.5	33	73	2	12
Z UMa	UMa	11:56:30.22	+57:52:17.6	38	72	0	0
W Ori	Ori	05:05:23.71	+01:10:39.3	31	67	0	0
U Ori	Ori	05:55:49.16	+20:10:30.6	44	65	4	16
rho Cas	Cas	23:54:23.03	+57:29:57.8	36	61	2	10
R Gem	Gem	07:07:21.27	+22:42:12.7	29	61	6	21
RY UMa	UMa	12:20:27.32	+61:18:34.6	25	61	0	0
UU Aur	Aur	06:36:32.83	+38:26:43.8	24	60	1	12

$N_{(vo)}$ = number of observers making visual observations
$N_{(von)}$ = number of nights with visual observations
$N_{(co)}$ = number of observers making ccd observations
$N_{(con)}$ = number of nights with ccd observations

CONTINUED ON NEXT PAGE

LEGACY STARS
CONTINUED...

Ten least-observed stars of the LPV Legacy program for the quarter 2013 January 1 through 2012 March 18:

Name	*Con*	*R. A. (J2000)*	*Dec. (J2000)*	$N_{(vo)}$	$N_{(von)}$	$N_{(co)}$	$N_{(con)}$
R Cyg	Cyg	19:36:49.38	+50:11:59.4	4	7	1	2
S Del	Del	20:43:04.87	+17:05:17.3	6	7	1	5
S Her	Her	16:51:53.91	+14:56:30.6	3	7	1	5
Z Cyg	Cyg	20:01:27.46	+50:02:32.6	4	4	1	7
SS Vir	Vir	12:25:14.4	+00:46:10.9	3	5	1	7
alf Her	Her	17:14:38.85	+14:23:25.1	2	5	0	0
X Oph	Oph	18:38:21.12	+08:50:02.7	4	5	0	0
R Vul	Vul	21:04:22.5	+23:49:18	5	5	1	1
R Aql	Aql	19:06:22.24	+08:13:48	3	2	1	2
S Aql	Aql	20:11:37.47	+15:37:14.5	2	2	1	1

Observations are strongly encouraged as these stars become observable. Observers should consider adding any of these stars to their observing programs to improve coverage of the legacy stars.

Top eleven best-covered stars of the CV Legacy program, as measured by number of observers and nights observed, 2013 January 1 through 2013 March 18:

Name	*Con*	*R. A. (J2000)*	*Dec. (J2000)*	$N_{(vo)}$	$N_{(von)}$	$N_{(co)}$	$N_{(con)}$
U Gem	Gem	07:55:05.21	+22:00:04.8	31	70	32	80
GK Per	Per	03:31:12.01	+43:54:15.2	23	69	15	74
VW Hyi	Hyi	04:09:11.26	–71:17:41	8	72	3	61
SS Aur	Aur	06:13:22.47	+47:44:25.6	21	69	8	26
RX And	And	01:04:35.53	+41:17:57.6	28	65	13	64
Z Cam	Cam	08:25:13.18	+73:06:39	28	63	5	40
T Pyx	Pyx	09:04:41.5	–32:22:47.4	5	19	5	63
TZ Per	Per	02:13:50.94	+58:22:52.8	13	47	7	62
EG And	And	00:44:37.18	+40:40:45.6	18	60	2	8
SS Cyg	Cyg	21:42:42.77	+43:35:09.7	35	60	9	52
AT Cnc	Cnc	08:28:36.89	+25:20:02.9	6	23	9	60

Stars in CV Legacy list with no visual or CCD observations during the quarter from 2013 January 1 through 2013 March 18:

Name	*Con*	*R. A. (J2000)*	*Dec. (J2000)*	$N_{(vo)}$	$N_{(von)}$	$N_{(co)}$	$N_{(con)}$
SY Mus	Mus	11:32:10.01	–65:25:11	0	0	0	0
AE Cir	Cir	14:44:51.29	–69:23:34.2	0	0	0	0
EK TrA	TrA	15:14:00.41	–65:05:34.9	0	0	0	0
BR Lup	Lup	15:35:53.09	–40:34:04.6	0	0	0	0
HP Nor	Nor	16:20:49.54	–54:53:22.3	0	0	0	0
IK Nor	Nor	16:25:28.86	–55:20:02.2	0	0	0	0
FQ Sco	Sco	17:08:04.45	–32:42:01.6	0	0	0	0
V2051 Oph	Oph	17:08:19.11	–25:48:30	0	0	0	0
AT Ara	Ara	17:30:33.8	–46:05:58.3	0	0	0	0
MM Sco	Sco	17:30:45.25	–42:11:41.4	0	0	0	0
FV Ara	Ara	17:35:10.04	–63:02:50	0	0	0	0
BF Ara	Ara	17:38:21.32	–47:10:40.9	0	0	0	0
MU Ser	Ser	17:55:52.76	–14:01:16.8	0	0	0	0
V1830 Sgr	Sgr	18:13:50.65	–27:42:20.6	0	0	0	0
V0533 Her	Her	18:14:20.5	+41:51:22.5	0	0	0	0
FM Sgr	Sgr	18:17:18.25	–23:38:27.4	0	0	0	0
V0441Sgr	Sgr	18:22:08.1	–25:28:47	0	0	0	0
CH Her	Her	18:34:46.33	+24:48:01.6	0	0	0	0
LL Lyr	Lyr	18:35:12.7	+38:20:04.7	0	0	0	0
V4021 Sgr	Sgr	18:38:14.86	–23:22:46.7	0	0	0	0
V0344 Lyr	Lyr	18:44:39.17	+43:22:28	0	0	0	0
V0603 Aql	Aql	18:48:54.63	+00:35:02.9	0	0	0	0
V0446 Her	Her	18:57:21.58	+13:14:28.8	0	0	0	0
FO Aql	Aql	19:16:38.09	+00:07:37.3	0	0	0	0
PW Vul	Vul	19:26:05.05	+27:21:57.7	0	0	0	0
DH Aql	Aql	19:26:10.81	–10:15:28.6	0	0	0	0
NQ Vul	Vul	19:29:14.74	+20:27:59.5	0	0	0	0
LV Vul	Vul	19:48:00.7	+27:10:19.3	0	0	0	0
V1819 Cyg	Cyg	19:54:37.45	+35:42:16	0	0	0	0
V0476 Cyg	Cyg	19:58:24.46	+53:37:06.7	0	0	0	0
AW Sge	Sge	19:58:37.06	+16:41:27.7	0	0	0	0
RR Tel	Tel	20:04:18.54	–55:43:32.6	0	0	0	0
QU Vul	Vul	20:26:46.02	+27:50:43.2	0	0	0	0
KK Tel	Tel	20:28:38.46	–52:18:44.8	0	0	0	0
TU Ind	Ind	20:33:10.54	–45:26:00.4	0	0	0	0
TT Ind	Ind	20:33:37.09	–56:33:44.4	0	0	0	0
V0751 Cyg	Cyg	20:52:12.78	+44:19:25.8	0	0	0	0
V1668 Cyg	Cyg	21:42:35.33	+44:01:54.6	0	0	0	0

As above, observations are strongly encouraged as these stars become observable and observers should consider adding any of these stars to their observing programs to improve coverage of the legacy stars. ★

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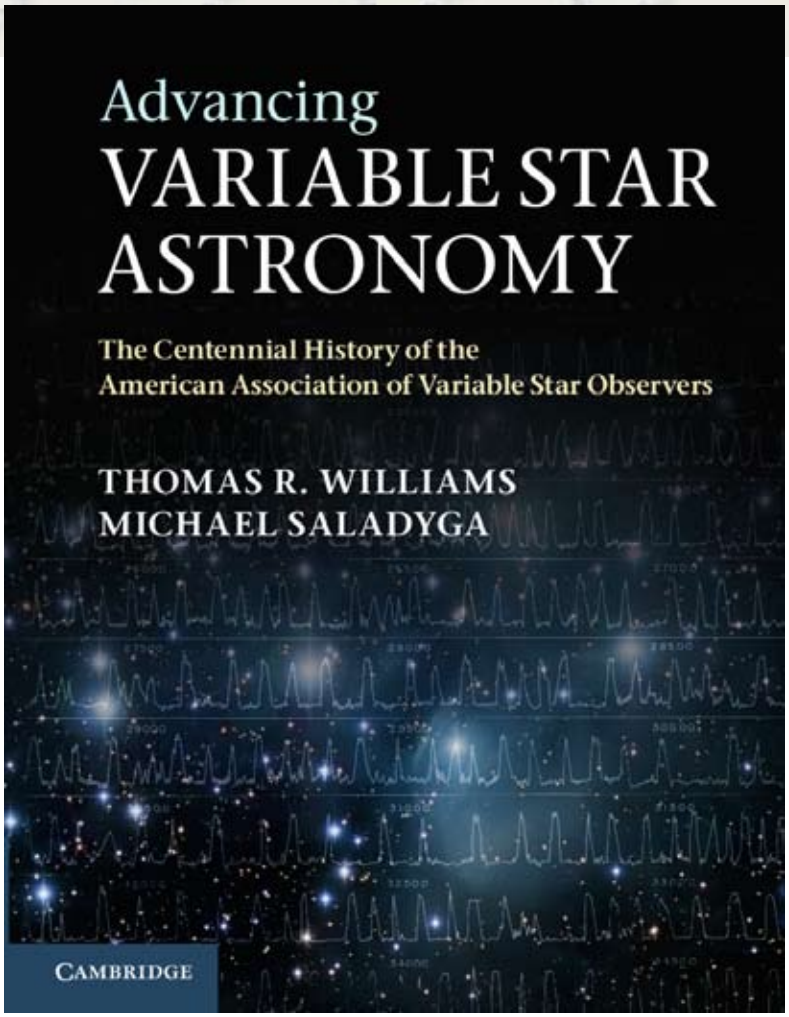
The AAVSO CENTENNIAL HISTORY



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JULIAN DATE / MOON PHASE CALENDARS

2,450,000 plus the value given for each date

APRIL 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
	6384	6385	6386	6387	6388	6389
7	8	9	10	11	12	13
6390	6391	6392	6393	6394	6395	6396
14	15	16	17	18	19	20
6397	6398	6399	6400	6401	6402	6403
21	22	23	24	25	26	27
6404	6405	6406	6407	6408	6409	6410
28	29	30				
6411	6412	6413				

MAY 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
			6414	6415	6416	6417
5	6	7	8	9	10	11
6418	6419	6420	6421	6422	6423	6424
12	13	14	15	16	17	18
6425	6426	6427	6428	6429	6430	6431
19	20	21	22	23	24	25
6432	6433	6434	6435	6436	6437	6438
26	27	28	29	30	31	
6439	6440	6441	6442	6443	6444	

JUNE 2013

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
						6445
2	3	4	5	6	7	8
6446	6447	6448	6449	6450	6451	6452
9	10	11	12	13	14	15
6453	6454	6455	6456	6457	6458	6459
16	17	18	19	20	21	22
6460	6461	6462	6463	6464	6465	6466
23	24	25	26	27	28	29
6467	6468	6469	6470	6471	6472	6473
30						
6474						

Moon calendars courtesy StarDate online
http://stardate.org/nightsky/moon/

THE AAVSO MENTOR PROGRAM

Since the earliest days of the AAVSO, experienced observers have helped new observers by corresponding, answering questions, and even providing personal guidance at the telescope.

If you would like to talk with an experienced variable star observer, contact the AAVSO and we will put you in contact with the mentor program coordinator, Mike Simonsen. Just send us an email (mentor@aavso.org), or call 617-354-0484 to let us know you are interested in this program.

Ideally, Mike will be able to provide you with names, addresses, and phone numbers of active AAVSO observers near you. If there are none located in your area, he can at least provide you with more distant contacts. A simple phone chat with an experienced observer may provide all the feedback you need to continue progressing as an AAVSO observer.

Visit the AAVSO mentor program webpage:

http://www.aavso.org/mentor-program

BY POPULAR DEMAND!

A set of twenty pdf commemorative posters exhibited at AAVSO Headquarters is available for downloading from our ftp site.

The posters show portraits of the AAVSO's Directors, Presidents, Secretaries, Treasurers, Council members, and Staff from 1911 to 2011, and the top Visual, CCD, PEP, and Photographic/ Photovisual observers. For more information go to:
http://www.aavso.org/aavso-100th-anniversary-commemorative-posters
or use this link:
http://tinyurl.com/cge9t9s

THE AAVSO WALTER A. FEIBELMAN SUITE

The Feibelman Suite is available to guests who are in the Boston/ Cambridge area to perform an AAVSO-related task, that is, the purpose of their visit is to do something for or related to the AAVSO. For details about the suite or making a reservation, please visit

http://www.aavso.org/walter-feibelman-guest-suite.

See the following pages for important information about membership renewals and contributions.

JOIN THE AAVSO!

AAVSO 2013 New Member Form

Please send application, first year's dues, and application fee to:
AAVSO, 49 Bay State Road, Cambridge, MA 02138, USA

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_____

_____

Telephone 1: _____ Telephone 2: _____

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Birth Date: _____ Vocation: _____

Telescopic Equipment: _____

_____

Astronomical Experience (if any): _____

_____

How did you learn about the AAVSO? _____

_____

Types of Membership Offered and Dues

Annual:	Adult	US $5.00 per month
	Associate (Under 21)/Pension/Limited Income	US $2.50 per month
Sustaining:		US $10.00 per month

Membership is paid through the end of the year, starting with the current month.
All applicants also add a one-time, $10.00 application fee.

Please consult the following table to find out how much to pay, including application fee.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept*	Oct*	Nov*	Dec*
Annual	$60.00	$55.00	$50.00	$45.00	$40.00	$35.00	$30.00	$25.00	$80.00	$75.00	$70.00	$65.00
A/P/LI	$30.00	$27.50	$25.00	$22.50	$20.00	$17.50	$15.00	$12.50	$40.00	$37.50	$35.00	$32.50
Sustaining	$120.00	$110.00	$100.00	$90.00	$80.00	$70.00	$60.00	$50.00	$160.00	$150.00	$140.00	$130.00

**Please note that if joining in September–December, the following year's dues are already being collected, so we request that you pay for the end of this year and for the following year.*

Dues *(see chart)*: US $_____ **Application fee**: US $__10__

Donation *(optional)*: US $_____ to _____ fund *(see box on right)*

Total payment *(dues + fee + donation)*: US $_____

Contributions *(see last page for descriptions)*:
AAVSO Building Fund $_____
Janet A. Mattei Research Fellowship $_____
Margaret Mayall Assistantship $_____
Member Sponsorship Fund $_____
AAVSO General Fund $_____

_____ I have enclosed a check / money order _____ Please charge my credit card (Visa or Mastercard)

Credit card #:_____ Exp. Date:_____ Security Code (on back of card):_____

Cardholder's Name (as on card):_____

Billing address (if different from above):_____

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Signature:_____

MEMBERSHIP RENEWAL

On this page is a copy of the AAVSO membership renewal form for 2013. You may also renew your membership online. Safe and secure online payments are possible by visiting http://www.aavso.org/membership-renew. If your postal or email address has changed, please also take a minute to update your personal profile online. Simply click "User login" at the upper right of the home page, then go to "My account." In addition to your dues, your contributions to the AAVSO further support the organization's activities and are very much appreciated. Also, on the next page you will find descriptions of the various funds to which you may contribute.

AAVSO
Membership and Subscriptions
49 Bay State Rd
Cambridge, MA 02138-1203

Name _____

Address _____

City _____

State/Province _____

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Country _____

2013 Membership Dues Renewal Form

Membership Type *(please check one)*

____Annual $60 ____Sustaining $120

____Associate (under 21) $30

____Pension/Limited Income $30

Contributions *(see next page for descriptions)*

AAVSO Building Fund	$_____
Janet A. Mattei Research Fellowship	$_____
Margaret Mayall Assistantship	$_____
Member Sponsorship Fund	$_____
AAVSO General Fund	$_____
TOTAL ENCLOSED	$_____

Payment and Contact Information

My ***check*** for $_____ is enclosed. *Checks must be in US funds and made payable to* ***AAVSO***.

For payment by ***credit card*** please complete the section below. *All fields are required*.

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State/Province _____ Zip/Postal Code _____ Country_____

Please make any changes necessary to correct and complete your membership contact information below:

Name: _____

Address: _____

City: _____ State/Province: _____

Zip/Postal code:_____ Country: _____

Phone: _____ Email: _____

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In order to sustain the AAVSO and its operations, we rely on the generous support provided by members, sponsors, donors, and staff. Together we are the AAVSO. Your gift is a way for you to say that you believe in what we are doing and that you want it to continue moving forward. Every dollar given and membership purchased benefits the AAVSO in a necessary and unique way.

AAVSO Building Fund: Contributions to this fund will be used to replenish the Endowment, to refurbish the building, and to cover other costs associated with the purchase of 49 Bay State Road, Cambridge, Massachusetts. We expect the new Headquarters to meet the needs of the AAVSO for decades to come, with sufficient space for growth, for safeguarding our century-long archives, and for giving us the opportunity to hold meetings and workshops at Headquarters.

Janet A. Mattei Research Fellowship Fund: Contributions to this fund help to bring a visiting scientist, postdoctoral researcher, or student to AAVSO Headquarters to perform research using the AAVSO International Database with the goal of disseminating the results throughout the astronomical community.

Margaret W. Mayall Assistantship Fund: Established in honor of the former Director of the AAVSO on the occasion of her retirement in 1974, this fund is used to hire summer research assistants to carry out various important technical projects of the organization.

Member Sponsorship Program: Contributions to this fund go toward paying for the membership dues of an active observer who otherwise would not be able to become a member of the AAVSO. The recipients are chosen by the Director based on the quality and number of observations submitted to Headquarters and the perceived benefit of membership to the observer.

AAVSO General Fund: Contributions to this fund help in the operation of the AAVSO, enabling us better to serve the needs of our members and the astronomical community.

If you wish to contribute to one or more of these funds please fill in the amount on the appropriate line on your renewal form and include it in the total. *All contributions are tax-deductible in the USA.*

You may also donate online at: http://www.aavso.org/support-aavso

Thank you for your support of the AAVSO!