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AAVSO Newsletter

SINCE 1911...

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 holiday season is upon us again. This means a lull in the workload at the AAVSO as staff members take vacations to visit family and friends. It also gives me a chance to reflect on the past year, with its many highlights. There is never a dull moment at headquarters! The *Annual Report* will contain the entire year's worth of changes, and is one of my primary tasks over the next few weeks. I'll just mention some of those that have occurred since the last newsletter.

Another couple of Internet attacks took place during the quarter. The one that got the most attention was "shellshock," which exploited a hole in the popular Bash command processor shell. Because of the increased number of attacks, we revamped many of our computer procedures. The website login was improved; all computers were placed behind our firewall and only available through a Virtual Provider Network access. We reviewed our security procedures, and added features to our backup procedures. We also took the opportunity to combine internal databases (the "unification project") and to improve the development website.

Changes have taken place with the AAVSONet robotic telescope network. A new camera was purchased for BSM_NM, and its original camera moved to BSM_HQ. A new MoonLite focuser was sent to BSM_South. New filters and gratings were purchased. BSM_Berry is nearing "first light" in Perth at Greg Bolt's house. The queues are being reviewed to remove completed objects, with new projects being implemented. With new funding from the Robert Martin Ayers Sciences Fund, we are in the process of refurbishing the APASS cameras.

Other happenings at HQ include the import of the BAA database of 2.5 million observations. Andy Wilson and Roger Pickard of the BAAVSS have been kind enough to provide those observations to us. About half are duplicates (observers submitted observations to both organizations), but half are new and extend many light curves. A new version of VSP is in beta release, promising to enable faster access, flexible photometry table formatting, and new options. Photometry transformation tools by Gordon Myers and George Silvis are now a cohesive pair and available on the website.

Elsewhere in the variable-star universe, Bob Naeye has left *Sky & Telescope*, and Peter Tyson has taken over as editor in chief. Tom Richards

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PRESIDENT'S MESSAGE

JENO SOKOLOSKI



Introducing our incoming Director, Dr. Stella Kafka

When AAVSO's incoming Director, Dr. Stella Kafka, published her first astronomical research paper 15 years ago, Janet Mattei was one of her co-authors. Thus Stella and the AAVSO have been linked since the start of her astronomical career. Moreover, collaboration between professional and amateur astronomers has continually shaped her development as a researcher. Now, we are fortunate to be able to solidify Stella's connection to the AAVSO as she prepares to take the helm from Arne on February 1st. Given Stella's special combination of talents, skills, and experience, I expect the coming decade to be one of vigorous growth, modernization, and community-building for the AAVSO.

As those in the cataclysmic variable star community know, Stella has an outstanding scientific reputation and research track record. After obtaining her Bachelor's of Science degree at the University of Athens, in Greece, she moved to Indiana University, where she

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**DIRECTOR'S MESSAGE
CONTINUED...**

has retired as Director of Variable Stars South, with Stan Walker taking over as interim Director.

We're starting to better support our observers who are interested in spectroscopy. The first step in that direction was taken earlier in the year, when we implemented a Spectroscopy Forum. More recently, we placed a group order for the SA200 diffraction gratings that go directly into filter wheels. Bob Hawksley gave us a substantial discount, and Robin Leadbeater donated his royalties for the gratings to our project, making the cost of these gratings quite affordable. We have several more steps to take for our users, but the wheel is turning!

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Several interesting campaigns are underway. Of course, the two bright novae of 2013 (V339 Del and V1369 Cen) are still easily observable, and continued monitoring is requested. EE Cep underwent its 6-year eclipse, well covered by AAVSO observers, with coverage a couple of months prior and subsequent to the event. Alpha Comae Berenices is due for an eclipse in January. As it comes out from behind the Sun, our observers are getting early observations to form a baseline for that possible eclipse. Deanne Coppejans has done an excellent job with her research campaign on radio jets in dwarf novae, asking observers to inform her when specific stars go into outburst.

What will 2015 bring? Stella has lots of ideas and will provide some new excitement for the AAVSO. Projects like AAVSONet and APASS will remain strong, and I'll stay involved in the day-to-day management of them. I think you are going to enjoy the "new" AAVSO—I sure am looking forward to it! I'm also looking forward to becoming a researcher again and contributing some data to campaigns. Let's all work together and make the AAVSO the premier research and education institution that everyone wants and needs. Clear skies, everyone! ★

Ed. note: the Spanish language version of Arne's message can be found on page 15.

**PRESIDENT'S MESSAGE
CONTINUED...**

earned a Master's and a Ph.D. in Astronomy, with a double minor in Physics and Geophysical Sciences. There she received the Hollis and Grete Johnson Award for Excellence in Graduate Student Research. After completing her Ph.D., Stella held a series of prestigious postdoctoral positions and fellowships, first at the Cerro Tololo Inter-American Observatory in Chile (CTIO, where she received the National Optical Astronomy Observatory Excellence Award), then at Caltech, and finally as a NASA Astrobiology Institute Fellow at the Carnegie Institution of Washington. She has extensive experience gathering, reducing, and analyzing photometric and spectroscopic data; has helped commission two different instruments at the WIYN Observatory in Arizona; and written a data-reduction manual along with more than 40 refereed papers. As a member of the "Stellar Populations" working group for the Large Synoptic Survey Telescope (LSST, the large professional facility that will image the whole sky every few nights starting around 2020), she contributed to

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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 ewaaagen@aaavso.org. Photos in this issue courtesy of C. Beaman, S. Beck, A. Holm, R. Kinne, J. Percy, K. Paxson, C. Stephan, R. Turner.

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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the LSST science book. As the Director of the AAVSO, Stella will draw upon her connections and stature in the professional community to make sure that amateur astronomers contribute, thrive, and generally benefit from professional investments in time-domain astronomy during the upcoming golden age of time-domain astrophysics.

But Council did not select Stella as our next Director solely because of her scientific credentials. Equally important, if not more important, is her experience as a manager. In addition to serving as the Director of two research and mentorship programs for undergraduates while in Chile, for the past three years Stella has been managing editorial, marketing, financial, business development, operations, and production aspects of journals at the American Institute of Physics (AIP). As a journal manager at AIP, Stella successfully oversaw the launch of a new journal and served as a liaison between publishing and research communities.

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PRESIDENT'S MESSAGE CONTINUED...

I can personally attest to her organizational skills, and to her love of careful planning. In fact, she has already channeled her passion and vision for the AAVSO into drafting business and marketing plans for consideration by Council. The rare combination of research prowess and management skills that Stella brings to the AAVSO will help us flourish in the ever-changing astronomical world.

On top of her research and management abilities, Stella brings to our international organization a very international perspective. After growing up in Greece, obtaining a Proficiency Diploma in the French language (she has one in English, too), pursuing higher education in the US, and working and traveling in South America (including Chile, Argentina, and Brazil), Stella is fluent in Greek and English, and speaks Spanish and French. Seeing our international membership as one of our key strengths,

Stella plans to use her tricontinental background to help her deepen the international scope of the AAVSO, and to build even stronger relationships between the AAVSO and the international community.

But those of you who have spoken with Stella for even five minutes know that I have not yet touched upon what is perhaps her most immediately obvious talent—communication. Stella's exuberance is irrepressible and contagious. She has a knack for putting this energy into ideas and clearly articulated plans. And because Stella enjoys interacting with people of every age and background, she has honed her communication skills through mentoring students, classroom teaching, lectures to professional and public audiences, and all sorts of professional writing (including scientific press releases with engaging titles such as, "Calling Dr. Frankenstein: Interactive Binaries Show Signs of Induced Hyperactivity"). And then, like all good communicators, she knows when to stop and listen.

This week, Stella arrives at Headquarters to spend two weeks working with Arne to prepare for the official Directorial transition on February 1. Although we are sad to see Arne go, he leaves the AAVSO in a strong state. We all wish him the very best in "retirement." Because of Arne's vision, fundraising agility during a tough economic period, and tireless work on behalf of our organization, Stella will be able to immediately focus on growth and new initiatives. Feel free to drop her a line. Stella wrote her first paper with Janet; perhaps she can write her next paper with you. ★

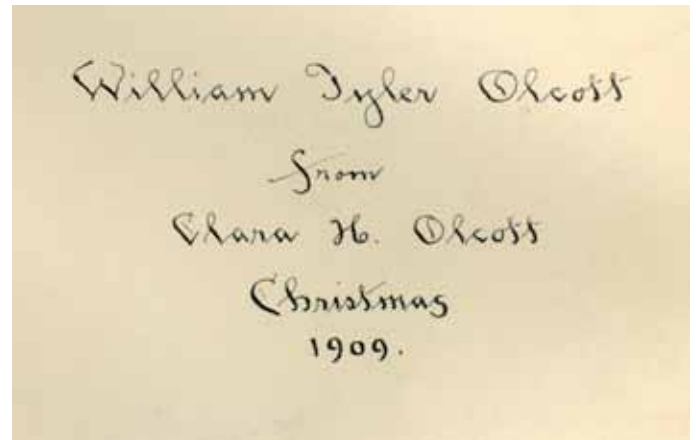
Ed. note: the Spanish language version of Jenó's message can be found on page 15.

A CHRISTMAS TO REMEMBER

MICHAEL SALADYGA, AAVSO HEADQUARTERS

As it so often happens to us here at AAVSO Headquarters, we are taken ably surprise by a discovery made while looking for something entirely else. Case in point: while going through a shelf of books in the AAVSO C. Y. McAteer Library, I stopped to pull out an old volume titled *The Moon*, published in New York by Doubleday, Page, and Company, 1904. The book's subtitle is "A summary of the existing knowledge of our satellite, with a complete photographic atlas." Its compiler was William H. Pickering, brother of Harvard College Observatory Director Edward C. Pickering. It is what today might be called a "coffee table book."

The AAVSO's copy is somewhat worn and battered—it has seen better days. But here is a surprise: inside, written on the flyleaf, is a carefully penned inscription: "William Tyler Olcott from Clara H. Olcott, Christmas 1909." And on the inside cover opposite, carefully placed and centered, is William Tyler Olcott's personal bookplate. One can just imagine the Christmas morning that Clara Olcott lovingly presented this gift to her husband Tyler (they had been married just seven years earlier), and imagine his delight on opening the package. One can also imagine Clara shopping for just such a "perfect gift" for her husband who, she knew, was so interested in astronomy, and who had just recently, in 1907, published his first book, *A Field Book of the Stars*. Also, earlier in 1909, Tyler Olcott's interest took a scientifically serious turn when he met Edward Pickering and learned about variable stars. Then, just two years later William Tyler Olcott founded the AAVSO. ★



Tyler and Clara Olcott on their wedding day, 1902

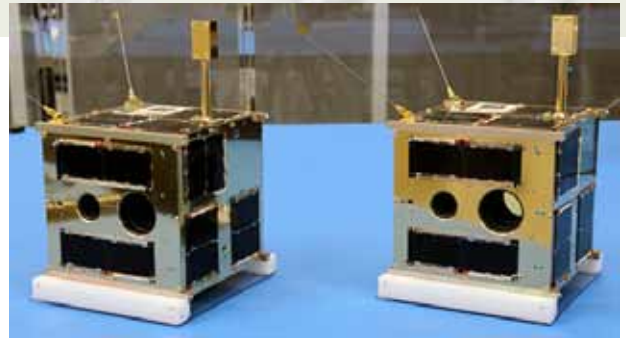
BRITE CONSTELLATION—SHOEBOX SATELLITES FOR VARIABLE STAR ASTRONOMY

JOHN R. PERCY, UNIVERSITY OF TORONTO

I hope that many of you have heard of MOST (Microvariability and Oscillations of STars), Canada's suitcase-sized "humble space telescope" (because it cost only a few million dollars to build and launch). It went up on June 30, 2003, and gathered data of the highest quality for over a decade. Its claim to fame was its very precise photometry, and the fact that it was the first satellite devoted to variable star astronomy. In many ways, MOST was the pathfinder for the European CoRoT and NASA Kepler satellites.

BRITE (BRiGht Target Explorer - not the world's most imaginative acronym) is "the child of MOST"—a constellation of six 10kg, 20cm-cube "shoebox satellites" whose purpose is to study the variability of the brightest stars, ones which are too bright for MOST, Kepler, HST etc. but accessible to spectroscopy with medium-sized ground-based telescopes. They will study micropulsations, wind phenomena, and other forms of variability—perhaps even exoplanet transits. BRITE was conceived in Canada a decade ago by Professor Slavek Rucinski, University of Toronto, and operated by a consortium of universities from Canada, Austria, and Poland. There are six satellites: Canadian BRITE-Toronto and BRITE-Montreal, Polish BRITE-PL1 and 2 (called Lem and Heweliusz), and Austrian UniBRITE-1 and BRITE-Austria (aka TUGSAT-1 as it is operated by the Technical University of Graz). Polish astronomer Heweliusz is better known to English-speaking astronomers as Johannes Hevelius (1611–1687). Lem is the great Polish science fiction writer Stanislaw Lem (1921–2006).

The BRITE satellites are based on several pioneering Canadian space technologies, including advances in precise attitude control which are difficult but necessary for such small spacecraft. The 30mm telescope has a field of view of 24 degrees, and the detector provides sub-millimag precision per observation. Much smaller signals can be detected, if periodic, with time-series analysis. Three satellites have blue filters, three have red. The constellation thus provides color information, as well as superior time and sky coverage.



Two of the six nanosatellites making up BRITE Constellation.

The Austrian satellites were launched in 2013 from India, and are busy collecting data. Lem was launched in 2013 from Russia, Heweliusz in 2014 from China. The Canadian satellites were launched in 2014 from Russia, but BRITE-Montreal did not detach from its third rocket stage, and is probably lost. The satellites are in polar dusk-dawn sun-synchronous low-earth (600-800 km) orbits. Data are downloaded to ground stations in Toronto and in Europe but, according to Canadian Project Scientist Tony Moffat (University of Montreal), "Both BRITE ground stations in Europe continue to suffer from severe UHF radio interference, which started suddenly on October 2013 from an unknown (military?) source." Such are the problems of space astronomy these days. ★

For more information, see:

Weiss, W.W. et al., 2014, *Publ. Astron. Soc. Pacific*, 126, 573.

[http://en.wikipedia.org/wiki/MOST_\(satellite\)](http://en.wikipedia.org/wiki/MOST_(satellite))

http://utias-sfl.net/?page_id=407

<http://www.asc-csa.gc.ca/eng/satellites/brite/>

<http://www.brite-constellation.at>

<http://en.wikipedia.org/wiki/BRITE>



CONGRATULATIONS MVAS!

CHRIS STEPHAN (SET), WOOSTER, OHIO

AAVSOer Chris Stephan (SET) presented a certificate from the AAVSO and signed by Director Arne Henden congratulating the Mahoning Valley Astronomical Society (Newton Falls, Ohio) on its 75th Anniversary. The presentation was made on October 18, 2014, the 75th anniversary of the Society. Chris is an honorary MVAS member.

Chris says, "MVAS has a rich history of variable star observing for AAVSO. That would include folks like myself, Phil Plante, Allen Heasley, Bob Clyde, Bob Andress, John Beavers, Richard Andrews, Ron Domen, Bette Heasley, John Hoyness, Dan Galdun, Andy Jackson, and many more. Even Art Stokes was one of our members!" Chris reports that the certificate will hang on the wall in the Mahoning Valley Cortese Observatory next to the 50th anniversary certificate that then Director Janet A. Mattei sent on behalf of the AAVSO. ★



Chris Stephan with the AAVSO's certificate for MVAS

KRISTINE LARSEN: OBSERVER, EDUCATOR, VOLUNTEER, AND COUNCILOR

**MIKE SIMONSEN (SXN), AAVSO HQ,
MEMBERSHIP DIRECTOR/DEVELOPMENT OFFICER**

Like many people in the AAVSO, Dr. Kristine Larsen (LKR) contributes to the organization in a number of important and valuable ways. She is an active solar observer and a generous donor. She has served as an instructor for our CHOICE online educational courses, and after serving on the AAVSO Council from 1997 to 2001, she is again helping to lead the organization by serving as 1st Vice President of the Council.

Her contributions to the Variable Star of the Season—Novae and Chi Cygni—are informative, well-written, and engaging, and her research paper on Martha Stahr Carpenter, “Reminiscences on the Career of Martha Stahr Carpenter: Between a Rock and (Several) Hard Places” (*AAVSO* Volume 40, 2012) is the most complete biographical study of her to date.

Outside the AAVSO, Kristine is a Professor of Astronomy at Central Connecticut State University and has taught online classes in general astronomy and earth science for over a decade. Her favorite instruments are Dobsonians—and she always starhops! In fact, her favorite university class to teach is an observational astronomy course centered around starhopping.

Professor Kristine Larsen, on the right, with Jessica Johnson, one of her students from Southern Connecticut State College, at the AAVSO's 2014 Annual Meeting



She is a member of the Springfield Telescope Makers (Stellafane) and after grinding an 8-inch mirror, she is now working on a 12.5-inch mirror. She has earned Messier, Binocular Messier, Outreach, and Meteor observing certificates from the Astronomical League, and currently serves as assistant editor for the League's magazine *The Reflector*.

It's very hard to keep people from noticing this kind of exceptional effort, regardless of how unassuming the person is, and that is true for Dr. Larsen as well.

On September 23, 2014, Kristine was named the recipient of the 2014 Women in Science Leadership Award from the Petit Family Foundation and the Connecticut Science Center. Visit www.ctsciencecenter.org/things-to-do/women-in-science for information.

Congratulations, Kristine, and thank you for all you do for the AAVSO and the astronomical community. ★

HAVE YOU SEEN THIS TELESCOPE?

**DAVID H. DEVORKIN—SENIOR CURATOR
NATIONAL AIR AND SPACE MUSEUM**

We are looking for this 4-inch Clark refractor, used for years by Walter Scott Houston.

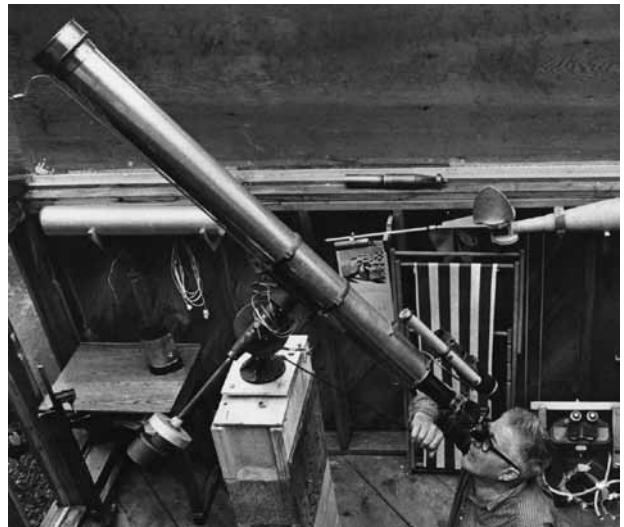
Markers: 4-inch (approx.) Clark refractor from the early 1890s. The equatorial head is slightly unusual. This telescope also has a nickel-plated brass tube.

History: The AAVSO lent it to Walter Scott Houston in the 1960s for his use. Houston added the large dark finderscope. According to a 1995 police report covering the possible theft of a separate telescope from the home, Houston's widow recalled that the Clark had gone missing in 1994, and could possibly have been loaned to someone.

If you have information about this telescope, please contact:

David H. DeVorkin—Senior Curator
National Air and Space Museum
Smithsonian Institution P.O. Box 37012
NASM 3559, MRC 311
Washington, DC 20013-7012

Voice: 202-633-2425; Fax: 202-786-2947
email: devorkind@si.edu



Walter Scott Houston with 4-inch Clark telescope at his observatory in East Haddam, Connecticut, about 1965

or contact:

William Thomas—Senior Historian, History Associates Incorporated
300 North Stonestreet Avenue, Rockville, MD 20850-1655

Voice: 301-279-9697; Fax: 301-279-9224;
email: wthomas@historyassociates.com; www.historyassociates.com

50 YEARS WITH THE AAVSO

ROGER KOLMAN (KRS), GLEN ELLYN, ILLINOIS

It was quite a surprise at the Fall 2014 Meeting when Art Pearlmutter, Barry Beaman, and I were presented with the gold AAVSO pins recognizing our 50 years of AAVSO membership. I, for one, am most appreciative of this honor. It does represent a long-term dedication to the organization we all love.

When I think back over the 52 years I have been a member, I look at the pioneers who significantly affected my life. It was an article written by Clint Ford in the December 1961 issue of *Sky & Telescope*, entitled “Sidelights on Variable Star Observing” that piqued my interest. As a teenager, I could not believe that I could contribute to science with my 60-mm refractor from my backyard!

Over the years, aperture grew. I went from the 60-mm Tasco refractor to a 6-inch reflector, a 10-inch reflector. At the same time, I went from a high school student to college. I became a physics major and ultimately went on to teach physics, but my first love remained astronomy.

While in high school, Margaret Mayall and Clint Ford became my first mentors. During this time, I met Dick Wend via our membership list. Following our meeting, things exploded. We visited Leslie Peltier and Carolyn Hurlless. All of this led to the meetings at Lima (they were called the August Orgy, but rarely met at that time).

In 1980, Dick Wend and I attended the Astronomical League meeting in Dallas. Two important events occurred there: Peltier had passed away in May of that year, and I had been elected Secretary of the AL. I proposed the idea of the Leslie Peltier Award to be given to those giving significant contributions to observational astronomy. The League charged me with developing and implementing the award. It was done and I remain the Chair of the award committee to this day. Over the 34 years, we have honored those who have made these significant contributions, including many AAVSO members.

The other event changed my observing life. Bob Cox (of *Sky & Telescope*) was there representing Coulter Optics. They offered a 13.1-inch Dobsonian telescope, ready for delivery, but also offered 17.5-inch kits. Dick and I each ordered a set. Once delivered, we constructed a pair of the telescopes. We used them for many years until Dick was no longer able to observe. He then had me move his to my site. I now have my original in a shed in my back yard and Dick’s in my garage. This gives me coverage of much more of the sky (I love trees, but NIMBY).

Since then, I have acquired a collection of telescopes of various apertures that I use under varying conditions. I have been told that I never met a telescope that I did not love! I presume that is true, but they all serve a purpose.

I consider myself to be the luckiest man alive because of all of those in the AAVSO and ALPO who guided me over the years. This I chronicled in a presentation at the 100th Annual meeting. The article appears as “Walking With AAVSO Giants—a Personal Journey (1960s)” (*JAASO*, Volume 40, No. 1, p. 189, 2012). For new members, I hope this will give inspiration.

Being a member of the AAVSO Council and now elected as 2nd Vice President of the AAVSO gives me the opportunity to work with our new Director to help lead us to the next century of our contributions to the world of Variable Star Astronomy. I consider this a great honor. ★



Recipients of the AAVSO 50-Year Membership Award:
Art Pearlmutter, Barry Beaman, and Roger Kolman

A SPECIAL MOMENT

ARTHUR PEARLMUTTER (PN), WORCESTER, MASSACHUSETTS

I was not expecting the 50-year pin and was very pleasantly surprised to receive it. I was well aware of how long I have been a member—I joined the weekend of Sputnik—so I have known many members over the years. These included important leaders of the organization such as Margaret Mayall and Janet Mattei. Memories of these people and all the others not mentioned are amongst my fondest memories of the organization. I also have to mention the so-called New York Group—Amateur Astronomers’ Association of New York (AAA) members all.

I cherish the memories of these people and of the meetings that I have been able to attend. Even though I may not be a contributor in the future, my greatest astronomical interest remains variable stars and I expect that the interest and I will continue on this path in the future. I also hope to enjoy my time with people I like - the other AAVSO members.

Again my thanks for this special moment at a very special meeting. ★

50 YEARS?!!

BARRY BEAMAN (BBA), ROCKFORD, ILLINOIS

Wow! I’ve been a member of AAVSO for 50 years...?! Gee, am I really that old? I guess I must be because the copy of my first AAVSO Report that Arne Henden sent me clearly says that I observed V Bootis at magnitude 8.4 on JD 2,438,587.7 and the JD translator says that was July 11, 1964, and 2014 – 1964 = 50. Hmm. The report also says I observed RS Herculis 19 nights later at mag. 9.0. This all began about a year earlier when David Williams said to me, “I’ll join your fraternity if you join my astronomy club.” We did and a year later he helped me make that first observation with Bill Blunk’s 60-mm refractor at the Twin Cities Amateur Astronomers’ “Beehive” Observatory along with Bill and several other club members. Later that year the AAVSO Council voted me into membership. My membership certificate was signed by George Diedrich and Clint Ford on October 9.

So, what happened during intervening 50 years? Well, more than 28 thousand observations have joined those first two and I frequently wonder if any of them

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50 YEARS CONTINUED...

are any good. I also became friends with Ed Halbach and he told me that he thought all of his observations ended up in the AAVSO waste basket! I'm sure all of Ed's one hundred thousand observations are still in the data base as are mine. By the way, I didn't get to ten thousand observations until 2003 (I was kind of a piker)—retirement is great for observing!

In my defense I will say that I had a lot of interruptions during the first forty years. I spent four years with almost no observing while I served as president of the Astronomical League. Also, I can recall many clear nights that I spent sitting in the car waiting for my sons to come out of the high school after rehearsals or myself walking out of the school after plays, concerts, or special events and meetings and seeing a beautiful starry sky. Even worse, I had to get home and go to bed so I could get up at 5:30 a.m. to get to work on time. My mistake was living in a town dominated by early risers! But, I do believe family obligations are important and I have no regrets and no longer make apologies for my observing totals. So if you are having trouble getting observing time because of family or other activities, enjoy those activities because that period of life is really not that long and you will revel in all the time you have for observing when the nest is empty.

Then there are those wonderful people I have met and worked with during my association with AAVSO, Astronomical League, the Twin Cities Amateur Astronomers, and my local astronomy club, the Rockford Amateur Astronomers. People who have established, maintained, and led amateur astronomy during the past fifty years. When I started my venture into the Universe, I was twelve years old and lived in a very small town on the central Illinois prairie. There was only my neighborhood playmate to share my new interest with. No adults in the community seemed to share our interest in the mysteries of the night sky and, obviously, no astronomy club. Interestingly, I lived only 30 miles from Urbana where fifty years earlier, Joel Stebbins had established photoelectric photometry as a viable scientific tool. I was a solitary astronomer until my junior year at Illinois Wesleyan University. That's when Dave Williams asked me to join his astronomy club and later the AAVSO. It was also at IWU that I discovered *Sky & Telescope* and began to learn about Amateur Astronomy on a national level. For example, in the early 60s *S&T* ran a story about the opening of the Racine (Wisconsin) Astronomical Society Observatory and featured William DuVall with the Racine Telescope on the magazine cover. I remember admiring that cover and thinking it must be nice to be able to do great things for astronomy.

I had no clue that ten years later I would meet Mr. DuVall and his wife, Katherine, we would become good friends, and another 17 years later he would ask me to run for president of the Astronomical League. About that same time at IWU I met Carol Gray. We were both physics majors and seemed to share the same interests. In 1966 she became Mrs. Carol Beaman and we set off into the Universe to find our fortune. We never found the fortune and our ship got broadsided by McLean County in 1995 but it didn't completely sink and we won the war in 2008...but that's another story. Oh yes, we still haven't found the fortune!

Carol and I quickly became a team supporting each other tremendously while working together on all sorts of astronomy activities and events as well as a huge astronomy outreach program to schools, church groups, scouts, service and business clubs, and so forth. This has been mostly in Rockford, Illinois, where we have lived since 1973. But, we have, also, been called upon to consult with national outreach activities through the Astronomical League, AAVSO, and Astronomical Society of the Pacific.

And then there are those chance rare events that happen to all of us from time to time. One morning I was at work walking down stairs to the engineering department when a tall, distinguished looking gentleman came through the door and started up the stairs. We greeted each other and went on our respective ways. That afternoon Carol and I drove to St. Louis to attend the 1976 AAVSO Spring Meeting. The next day, I encountered the same gentleman at the meeting. We recognized each other and introduced ourselves. It was Danie Overbeek and we were both pleasantly startled by the encounter. Danie worked for South African Airways and was at Woodward Governor Company, where I worked, to discuss fuel systems issues. It was a onetime event and I don't recall ever meeting Danie again.

In 1981 we were returning home from a three week vacation on the East Coast that included Stellafane and the Kutztown ALCon. Carol had notified Carolyn Hurlless that we would be passing through Lima, Ohio, and wanted to visit. Carolyn was pleased to have us and it was a thrill to get together and see her observatory. But the big thrill was when Carolyn's husband, Don invited our oldest son, Kelly, then thirteen, to join him in a short jam session. With Don on piano and Kelly on trombone, we enjoyed about a half hour of beautiful music.

OK, I told a story about Kelly so I guess I should tell a story about our younger son, Alan. When he was seven years old he discovered that older brother

Kelly was observing variable stars with me and decided that he should do that as well. The next clear night he joined Kelly and me at the telescope. We each observed a star and then compared results and, wow, Alan was within 0.2 magnitude of my observation. We tried another star with similar results. To be sure, I did a lot of coaching and questioning with both boys to make sure they were seeing what I was seeing and using the right comparison stars. But I never suggested a magnitude to them. After several nights of observing I decided to send their observations in with mine. I included an explanatory note to Janet. She replied to my note that she was pleased with the boys' work and sent observer codes for them. We continued this family activity for several years, but the heavy schedules of high school ended it. Many years later Janet confided to Carol and me that she was still carrying a picture of Alan with his 4.25-inch telescope (completed by him when he was 8 years old) that she showed in outreach presentations. It seems that Alan was the youngest person (at that time) to make variable star observations and submit them to AAVSO. Carol and I were stunned!

And finally, I can't resist including this. In 2004 en route to the Spring Meeting and AstroCon at Berkley, California, we were on the trail up to Bridalveil Falls in Yosemite National Park. We saw a vaguely familiar shape coming toward us, but without a beer bottle in hand it was hard to be sure. A few steps farther and we were sure, it was Gerry Samolyk! Fast forward to 2007 and we are returning from a waterfall in Banff National Park on the way to the Spring Meeting at Calgary, Alberta, Canada. I walk around a corner and there's Gerry again walking to the falls. About ten days later we are in Glacier National Park returning from a walk at Logan Pass and we meet Gerry again. But this time Gerry was expecting to see us because he had spotted our van with its AAVSO64 license plates in the parking lot. I really believe that all of this started with my membership in AAVSO. If I had never encountered the AAVSO, I'm not sure any of this would have happened. And that's not even the whole story. There has been so much astronomy that Carol and I have done that it's hard to believe and when I was in high school or college I could never have even imagined what my life would later become. I have walked with giants, and I never expected it. And so I want to thank Elizabeth Waagen for inviting me to write these thoughts and I want to thank all of you in the AAVSO, the Astronomical League, Twin Cities Amateur Astronomers, and the Rockford Amateur Astronomers for allowing me to spend the past fifty years observing variable stars and doing all sorts of "great things" for astronomy. *Good seeing, Barry.* ★

SCENES FROM THE 2014 ANNUAL MEETING



Elizabeth Waagen and Gerry Samolyk



Meeting attendees



John Martin



Arne Henden (l), and Stella Kafka (r), with their thesis advisor Kent Honeycutt of Indiana University



Stella Kafka, Paula Szkody, and Kevin Marvel



"That was not a dark pixel, that was a black hole, I tell you!" Dale Mais and Marlin Costello



150 years of observing: Barry Beaman, Roger Kolman, and Art Pearlmutt



Larry Krozel, Bob Bucheim, and Scott Tracy



John Toone, Roger Kolman, and Kevin Paxson



Director Arne Henden with his portrait to be displayed at headquarters, presented by Vice President Kristine Larsen



Pro-Am conference: Arlo Landolt with John O'Neill

Thanks to Al Holm, Carol Beaman, Rebecca Turner, and Sara Beck for the meeting photos

AWARDS AND HONORS FOR 2014

The following awards and honors were announced or presented at the 103rd Annual Meeting of the AAVSO on November 8, 2014, Woburn Massachusetts, and at the 103rd Spring Meeting of the AAVSO on June 14, 2014:

The *Merit Award* was given to **Ronald E. Royer** "...for his devoted service to the AAVSO...."

Honorary Membership was awarded to **Kevin B. Marvel** "In recognition of his invaluable contributions to the AAVSO...."

and to *Howard J. Landis* "In recognition of his contributions to variable star astronomy and faithfulness to the AAVSO...."

The *Director's Award* was presented to **Kevin B. Paxson** "...In recognition of his invaluable contributions to the AAVSO...."

Observer Awards were made to **102 observers**

Solar Observer Awards were made to **40 solar observers**

50-Year Membership Awards were presented to **Barry Beaman, Roger Kolman, and Arthur Pearlmutter** (see article elsewhere in this issue)

Staff Recognition Awards were presented **Elizabeth O. Waagen, Michael Saladyga, Gloria Ortiz Cruz, and Arne A. Henden**

The full text of citations, and more information about other awards made over the years, can be found on the AAVSO's Awards and Honors page at <http://www.aavso.org/honors-and-awards>

CONGRATULATIONS TO ALL! ★



AAVSO Merit Award honoree Monsignor Ronald Royer in 1954 (left) and at the Ford Observatory, California, in more recent times (right)



AAVSO Director's Award recipient Kevin Paxson (right) and director Arne Henden



AAVSO Headquarters staff recognized at the Annual Meeting: (from left) Elizabeth O. Waagen for 35 years of service (with director Arne Henden); Michael Saladyga for 30 years of service (with director Henden); Gloria Ortiz Cruz for 15 years of service; and Arne Henden for 10 years of service

2014 ANNUAL MEETING SCHEDULE

Meeting Schedule for the 103rd Annual Meeting of the AAVSO,
Woburn, Massachusetts, November 6–8, 2014

Thursday, November 6, 2014

Morning AAVSO Council Meeting (council members only)
Morning First-time Attendee Gathering
2:00 p.m.–5:00 p.m. **Spectroscopy Workshop**

Friday, November 7, 2014

9:00 a.m.–10:15 a.m. **General Paper Session and Posters Part I**
10:15 a.m.–10:45 a.m. Coffee Break
10:45 a.m.–12:05 p.m. **General Paper Session and Posters Part II**
12:05 p.m.–2:00 p.m. Lunch Break
2:00 p.m.–3:15 p.m. **General Paper Session and Posters Part III**
3:15 p.m.–3:45 p.m. Coffee Break
3:45 p.m.–4:45 p.m. **General Paper Session and Posters Part IV**

Saturday, November 8, 2014

9:00 a.m.–noon AAVSO Membership Meeting
noon–2:00 p.m. Lunch break

2:00 p.m.–5:00 p.m. **Special Paper Session Honoring Arne Henden**

11:15am – 12:00 p.m. **Special Paper Session Part I**

Kent Honeycutt: “Why do some Cataclysmic Variables Turn Off?”

12:00 p.m.–2:00 p.m. Lunch Break

2:00 p.m.–3:10 p.m. **Special Paper Session Part II**

Ulisse Munari: “Before the Giants: APASS support to ambitious ground-based Galaxy investigations and space missions searching for exo-Earths”

Stephen Levine: “APASS and Galactic Structure”

Mike Joner: “Astronomical Photometry and the Legacy of Arne Henden”

3:10 p.m.–3:45 p.m. Group Photo and Coffee Break

3:45 p.m.–5:00 p.m. **Special Paper Session Part III**

Richard Berry: Brief remarks

Paula Szkody: “Collaborations with Arne on Cataclysmic Variables”

Mike Simonsen: “The History of AAVSO Charts, Part III: The Henden Era”

Gary Walker: “Arne’s Decade”

6:00 p.m. cash bar

7:00 p.m. **AAVSO Closing Banquet**

Trivia Contest

Dinner

Awards

The response “it depends” is one of Arne’s favorite answers to questions, so we made up mugs to give as prizes to the winning Trivia Contest team—particularly appropriate since the trivia questions were taken from the talks in the special “Arne Session.”



AAVSO/CBA/SAS COMBINED MEETING IN ONTARIO, CALIFORNIA, REVISITED



AAVSO HQ staff Rebecca Turner and Mike Simonsen



AAVSO Councillors (left to right) Roger Kolman, Bob Stine, Kevin Paxson, Bill Goff, with Mike Simonsen from AAVSO Headquarters



AAVSO Council

Thanks to Kevin Paxson for the photos

CLIMATE CHANGE

MIKE SIMONSEN (SXN), AAVSO HQ, MEMBERSHIP DIRECTOR/DEVELOPMENT OFFICER

When I gave my first development report to Council in April 2008, the first line of the first slide in my presentation on the new strategy for development at AAVSO was “Create a ‘climate of giving’ in the organization.” I admit I wasn’t 100% sure how we were going to do this, but I had met and talked to enough AAVSO members and observers to believe they had the commitment to the organization this was going to require.

In those first couple years, there weren’t a lot of donations, and most of them were very modest. We didn’t have a high percentage of sustaining members either. What I discovered was that people didn’t think the AAVSO needed their help.

They thought we had an endowment with millions of dollars in it with which we could run the organization indefinitely. Every treasurer’s report I had ever seen showed the books were balanced. It wasn’t clear to many people where the money came from, what it paid for, and what the annual shortfall was that needed to be made up somewhere. Besides, they hadn’t been asked to donate in several years, so why would they?

Slowly, almost imperceptibly at first, things began to change. The message the AAVSO sent out began to change. We were no longer shy about asking for help. We started to explain in more detail how your donations helped make the things we were doing possible. In response to this, people’s perceptions about the financial health and future of the organization began to shift.

First, more people began paying dues at the sustaining rate. This was a simple way to support the AAVSO. You only had to think about it once a year when

you renewed your membership, and half your sustaining dues counted as a tax-deductible donation. Then more and more of you began to make contributions at renewal time. Most of these were unrestricted donations to the General Fund, but many of you also began supporting the other programs paid for out of the special funds we have set up for the Endowment Fund, the Janet A. Mattei Research Fellowship Program, the Margaret Mayall Assistantship Fund, and the Member Sponsorship Fund.

I thought we might have too many funds to choose from, but you asked us to create even more funds, so we did. People like to have a say about what their money goes to support, so we now have a Solar Fund, an AAVSONet Fund, and a Student Meeting Scholarship Fund.

People started supporting the AAVSO in fun and interesting ways, like adopting stars and making online purchases through our Amazon.com portal.

It used to be easy keeping up with the thank you emails and IRS letters. Most of the year was a slow trickle, and I could send acknowledgements out within 48 hours of a donation. Now, during renewal time, and at the end of the year it is all I can do to send out these personal messages within two weeks of receiving a donation. There are just so many.

The biggest evidence for climate change came in 2014, when we ran our first-ever hands-on annual campaign, in which Council and staff members contacted each of our members personally. We raised over \$33,000 from 311 individual donors, exceeding our goal by more than 10%. That kind of support is exactly what will be needed in the next ten years to get the AAVSO to where we are steering her now.

Thank you for your confidence and trust. I have faith that you will continue to find what we are doing worthy of your support. ★

A VISIT TO THE LONDON BAA OFFICES

RICHARD “DOC” KINNE (KQR), AAVSO HEADQUARTERS

Last October I got to take a trip that had been in the works, well, largely my whole life.

Those of you who have known me for a while might have some indication of the sort of Anglophile I am. My name, “Doc,” comes from the British science fiction series, *Doctor Who*. I go to bed listening to the BBC News, I am a great fan of BBC Radio 4’s Friday night comedy programs, and I probably have a better handle on UK politics than US. I keep up on the British astronomical news via the *Journal of the British Astronomical Association* and its *Variable Star Section Circular*.

As you might imagine, spending nearly a fortnight in London meant that, at one point, Morgan Johnstone and I had to at least try to visit the offices of the BAA and the British Royal Astronomical Society, located in Burlington House, Piccadilly, London. The astronomically-themed Annenberg Courtyard is open to the public on a daily basis, as are the exhibitions of the Royal Academy of Arts, but the West Wing of Burlington House, where the astronomical organizations are housed, is not usually open to the public, so I wasn’t quite sure what kind of reception we’d get.

Getting to Burlington House was quite easy via the Tube, London’s subway system. I had to admit being quite impressed with this facet of transport in London. In the entire fortnight we were there I don’t think we waited for more than four minutes for a train, including Sundays. Several comparisons were made with the Boston “T” in this regard. The Courtyard was indeed open, and in short order we found the door for the Royal Astronomical Society. I knew that the BAA rented offices from the Royal Astronomical Society, but I had no idea of the layout of the building or how we might get in. Fortunately, in short order someone came by and with no problem not only let us in but instructed us where to sign in and brought us up to the BAA offices.



Madeleine Crow, BAA administrative assistant



Morgan (on left) and Doc at the BAA’s headquarters

We were greeted by BAA secretary Madeleine Crow, and we walked into a single room with very high ceilings and tall windows on the opposite wall. All the other wall space seemed to be covered in bookcases. Save for the high ceilings, it strongly reminded me of the photos I’d seen of the AAVSO’s Brattle Street offices with Margaret Mayall.

Madeleine was probably the most gracious host I’d yet encountered. We had dropped in on her out of the blue, yet she had made tea and talked with us for what must have been over an hour. We discussed the history of the building, the various parts of the BAA, the current issue of the *Journal of the BAA*, and the BAA’s relationship with the AAVSO. I brought up that it had been Gary Poyner who had actually gotten me started in robotic telescope observing. Madeleine even showed us where the latest *Journal of the AAVSO* was kept in the office. We helped her move a few boxes of the new *BAA Handbook* so we could take some pictures. Indeed, the only disappointment was that we were going to miss the annual meeting by a week or so.

A meeting was taking place in the RAS offices so we weren’t able to tour any of those areas, but it didn’t matter. I’d come to see the BAA, and it was the best visit we had while in London. Leaving, I just stopped walking for a bit while crossing the courtyard, finally a bit overwhelmed at where I was. We’d been in England perhaps half a week at that point, but it was at that moment when it finally hit me. It was a good feeling. ★

SPRING 2015 MEETING NOTE

The Spring 2015 meeting location has not yet been determined. Details will be posted on the AAVSO website as soon as they become known. Watch the website’s front page slider for meeting announcements.

SCIENCE SUMMARY: AAVSO IN PRINT

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

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 2014 October 8 through December 15 on the arXiv.org preprint server and used AAVSO data or resources 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>

Jeremy Shears, Pavol Dubovsky, Colin Littlefield, Ian Miller, Etienne Morelle, Roger Pickard, Javier Ruiz, Richard Sabo, “Optical outbursts of the cataclysmic variable 1RXS J140429.5+172352”, (arXiv:1412.4768) [Dec 14, 2014]

Jeremy Shears, David Boyd, Graham Darlington, Ian Miller, Roger Pickard, Gary Poyner, Richard Sabo, Mike Simonsen, William Stein, “HW Bootis: an enigmatic cataclysmic variable star”, (arXiv:1412.4364)[Dec 14, 2014]
A. Banzatti, K. M. Pontoppidan, S. Bruderer et al., “Depletion of molecular gas by an accretion outburst in a protoplanetary disk”, (arXiv:1412.1824) [Dec 4, 2014]

Matthew W. Muterspaugh and Gregory W. Henry, “Predicting Alpha Comae Berenices Time of Eclipse I: A 26 Year Binary will Eclipse within 2 weeks of 25 January 2015”, (arXiv:1412.1432) [Dec 3, 2014]

Ramkrishna Das, Dipankar P. K. Banerjee, Arpita Nandi et al., “Near-infrared studies of V5558 Sgr: an unusually slow nova with multiple outbursts”, (arXiv:1411.6524) [Nov 24, 2014]

U. Munari, A. Henden, D.P.K. Banerjee et al., “The hybrid, coronal lines nova V5588 Sgr (2011 N.2) and its six repeating secondary maxima”, (arXiv:1411.6297) [Nov 23, 2014]

G. Bruno, J.-M. Almenara, S. C. C. Barros et al., “SOPHIE velocimetry of Kepler transit candidates XIV. A joint photometric, spectroscopic, and dynamical analysis of the Kepler-117 system”, (arXiv:1411.3934) [Nov 14, 2014]

P. Longa-Peña, D. Steeghs and T. Marsh, “Emission line tomography of the short period cataclysmic variables CC Scl and V2051 Oph”, (arXiv:1411.3732) [Nov 13, 2014]

T. W.-S. Holoien, J. L. Prieto, O. Pejcha et al., “Discovery and Observations of the Unusually Bright Type-Defying II-P/II-L Supernova ASASSN-13co”, (arXiv:1411.3322) [Nov 12, 2014]

J. G. Fernández-Trincado, A. K. Vivas, C. E. Mateu et al., “Searching for tidal tails around ω Centauri using RR Lyrae Stars”, (arXiv:1411.3004) [Nov 11, 2014]

John Southworth, C. Tappert, B. T. Gaensicke et al., “Orbital periods of cataclysmic variables identified by the SDSS. IX. NTT photometry of eight eclipsing and three magnetic systems”, (arXiv:1411.2385) [Nov 10, 2014]

Larisa S. Kudashkina, Ivan L. Andronov, Vladislava I. Marsakova et al., “Statistical Studies of Long - Period Variable Stars in Odessa”, (arXiv:1411.1384) [Nov 5, 2014]

R. E. Firth, M. Sullivan, A. Gal-Yam et al., “The Rising Light Curves of Type Ia Supernovae”, (arXiv:1411.1064) [Nov 4, 2014]

Costantino Sigismondi, Graziano Ucci, Vanessa Zema et al., “Photometry of Delta Scorpis from 1996 to 2013 using SOHO LASCO C3 coronagraph”, (arXiv:1410.8492) [Oct 30, 2014]

Izumi Hachisu, Mariko Kato, “A Light Curve Analysis of Classical Novae: Free-free Emission vs. Photospheric Emission”, (arXiv:1410.7888) [Oct 29, 2014]

M.A. Kenworthy, S. Lacour, A. Kraus et al., “Mass and period limits on the ringed companion transiting the young star J1407”, (arXiv:1410.6577) [Oct 24, 2014]

M. Rocchetto, J. Farihi, B. T. Gaensicke et al., “The frequency and infrared brightness of circumstellar discs at white dwarfs”, (arXiv:1410.6527) [Oct 23, 2014]

Megan Ansdell, Eric Gaidos, Andrew W. Mann et al., “The Near-Ultraviolet Luminosity Function of Young, Early M-Type Dwarf Stars”, (arXiv:1410.6488) [Oct 23, 2014]

L. Sabin, G.A. Wade and A. Lèbre, “First detection of surface magnetic fields in Post-AGB stars : the cases of U Monocerotis and R Scuti”, (arXiv:1410.6224) [Oct 23, 2014]

Mizuki Isogai, Akira Arai, Atsunori Yonehara et al., “Optical Dual-Band Photometry and Spectroscopy of the WZ Sge-Type Dwarf Nova EZ Lyn during the 2010 Superoutburst”, (arXiv:1410.5822) [Oct 21, 2014]

R. F. Díaz, G. Montagnier, J. Leconte et al., “SOPHIE velocimetry of Kepler transit candidates. XIII. KOI-189 B and KOI-686 B: two very low-mass stars in long-period orbits”, (arXiv:1410.5248) [Oct 20, 2014]

Ryan J. Oelkers, Lucas M. Macri, Lifan Wang et al., “Difference Image Analysis of Defocused Observations with CSTAR”, (arXiv:1410.4544) [Oct 16, 2014]

Sandip V. George, G. Ambika and R. Misra, “Effect of uneven sampling on correlation dimension computed from time series data”, (arXiv:1410.4454) [Oct 16, 2014]

Mohamad Abbas, Andrew Layden, Katherine Guldenschuh et al., “Variable Stars in Metal-Rich Globular Clusters. IV. Long Period Variables in NGC 6496”, (arXiv:1410.3305) [Oct 13, 2014]

Solen Balman, “Pre-outburst $\text{\$Chandra\}$ Observations of the Recurrent Nova T Pyxidis”, (arXiv:1410.2758) [Oct 10, 2014]

Yangping Luo, “Variable stars in the open cluster NGC 2141”, (arXiv:1410.2178) [Oct 8, 2014]

Stefan Huemmerich, Klaus Bernhard, Gregor Srdoc, “1SWASP J022916.91-395901.4 - a Possible New VY Sculptoris Variable in Eridanus”, (arXiv:1410.0607) [Oct 2, 2014]

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. ★

TALKING ABOUT THE AAVSO

ELIZABETH O. WAAGEN (WEO), AAVSO HQ

Events—AAVSO members, observers, and friends have given presentations about the AAVSO and variable stars at the following venues:

August 2, 2014—**Al Holm** (Columbia, Maryland) gave a presentation titled “Skygazing” at Bruneau Dunes State Park, Mountain Home, Idaho, to about 30 members of the general public.

August 14, 2014—**Al Holm** gave a presentation on exoplanets titled “Got Planets” at the Iron County Historical Museum, Caspian, Michigan, to about 50 members of the general public.

September 2014—**Jaime R. Garcia** (GAJ, Mendoza, Argentina) gave a talk which specifically included variable stars during the presentation of his book *Estrellas y Matemática (Stars and Mathematics)* at the 8° Ateneo de Instituciones de Formación Docente y Técnica del Sur Mendocino, San Rafael, Mendoza, Argentina.

October 11, 2014—**Jaime R. Garcia** gave a workshop about variable stars and the AAVSO at the 5° Encuentro de Jóvenes Astrónomos at Malargüe, Mendoza, Argentina.

October 12, 2014—**Jaime R. Garcia** gave a talk titled “El Universo ¿es discreto?” (The Universe—is it discrete?)” at the 5° Encuentro de Jóvenes Astrónomos at Malargüe, Mendoza, Argentina.

October 22, 2014—**Dave Cowall** (CWD, Nanticoke, Maryland) gave a presentation about variable stars and the AAVSO to the students in the senior seminar at Salisbury University, Salisbury, Maryland. Dave reports that there was considerable interest from the students (sophomores and juniors as well) about working on astronomy research projects through the AAVSO.

October 25, 2014—**Sebastian Otero** (OSE, Buenos Aires, Argentina) gave a talk titled “Eta Carinae, la variable más interesante y la más aburrida (visualmente)” (Eta Carinae, the most interesting and most boring (visually) variable star) to 98 attendees at the First Casilda Star Party, Casilda, Santa Fe province, Argentina. The event was organized by COCAdeE (Comisión Casildense del Espacio) and Asociación Amigos del Observatorio Astronómico y Planetario Municipal de Rosario, the third largest city in Argentina.

November 5, 2014—**Sebastian Otero** gave a talk titled “El estudio de las estrellas variables en el siglo XXI” (The study of variable stars in the XXI century) at the 2014 Semana del Planetario in Rosario, Santa Fe province, Argentina. The week-long event featured talks every day in the Rosario Planetarium and was organized by Asociación Amigos del Observatorio Astronómico y Planetario Municipal de Rosario.

November 8, 2014—**Jaime R. Garcia** gave his talk titled “El Universo ¿es discreto?” (The Universe—is it discrete?)” at the 2014 Semana del Planetario in Rosario, Santa Fe province, Argentina.

November 17, 2014—**Al Holm** gave a presentation titled “Variable Stars: Stepping Stones to the Universe” to the Royal Astronomical Society of Canada Center in Saskatoon, Saskatchewan, via WebEx.

Thank you, speakers!

We know many of you are involved in outreach related to the AAVSO and variable stars - let us help you spread the word! Send us information about your event (upcoming or past) for inclusion in the April 2015 AAVSO Newsletter (submission deadline March 15, 2015). Many thanks for your education and outreach efforts on behalf of the AAVSO and variable star observing! ★

IN MEMORIAM

MEMBERS, OBSERVERS, COLLEAGUES,
AND FRIENDS OF THE AAVSO



Robert Stachnik

ROBERT V. STACHNIK

(Newark, Delaware) died on November 29, 2014, at the age of 67. Bob was not an AAVSO member or observer, but he was a colleague of and good friend to the AAVSO. An astrophysicist, his primary interest was in modern astronomical image processing, and he

was a pioneer in the use of speckle interferometry to measure the diameter of stars blurred by the Earth’s atmosphere (the process of de-twinkling). After more than ten years in research at the Harvard-Smithsonian Center for Astrophysics,

Bob moved to NASA Headquarters, where he was a senior scientist and the Astrophysics Division Program Manager. In his years there managing astrophysics research programs funded by NASA, he was an invaluable guide and advisor to then AAVSO Director Janet A. Mattei. He completed his career as a scientist in the private sector. Bob was a member of several professional astronomical organizations, committees, and working groups. A cheerful, kind, and generous man, Bob had friends around the world, and was committed to numerous social and political causes that promoted justice for all. We extend our sincere sympathies to Bob’s wife, Mary Ellen, their son, and families.

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

MENSAJE DEL DIRECTOR

ARNE A. HENDEN (HQA)

Ya tenemos las vacaciones encima una vez más. Esto significa que baja un poco la cantidad de trabajo en la AAVSO ya que los miembros del staff se toman vacaciones para visitar a la familia y amigos. Esto también me da la oportunidad de reflexionar sobre el año que pasó y pensar en varios de sus momentos destacados. ¡Nunca hay un momento de tranquilidad en los cuarteles generales! El *Reporte Anual* contendrá todos los cambios del año y será una de mis tareas principales durante las próximas semanas. Aquí sólo mencionaré alguno de los cambios que ocurrieron desde el último newsletter.

En este cuatrimestre ocurrieron otros dos ataques en Internet. El que recibió más atención fue “shellshock”, que se aprovechó de un agujero en la consola del popular procesador de comandos Bash. Debido al creciente número de ataques, remodelamos varios de nuestros procedimientos informáticos. Se mejoró el ingreso al sitio web; se puso a todas las computadoras detrás de nuestro firewall y ahora sólo están disponibles a través de un acceso de Red Privada Virtual. Revisamos nuestros procedimientos de seguridad y agregamos funciones a nuestros procedimientos de back-up. También aprovechamos la oportunidad para combinar bases de datos internas (el “proyecto unificación”) y mejorar el desarrollo del sitio web.

Ha habido cambios en la red de telescopios robóticos AAVSONet. Se compró una cámara nueva para

BSM_NM y se trasladó su cámara original a BSM_HQ. Se envió un nuevo enfocador MoonLite a BSM_South. Se adquirieron nuevos filtros y redes de difracción. BSM_Berry está a punto de ver su “primera luz” en Perth, en la casa de Greg Bolt. Se están revisando las colas para remover los objetos completados, permitiendo la implementación de nuevos proyectos. Con nuevos fondos provenientes del Robert Martin Ayers Sciences Fund, estamos en proceso de restaurar las cámaras de APASS.

Otros sucesos en HQ incluyen la importación de la base de datos de 2,5 millones de observaciones de la BAA. Andy Wilson y Roger Pickard de la BAAVSS han sido muy gentiles en proveernos de esas observaciones. Cerca de la mitad son duplicados (los observadores enviaron las observaciones a ambas organizaciones), pero la mitad son nuevas y extienden muchas curvas de luz. Una nueva versión de VSP está en su fase beta y promete dar un acceso más rápido, un formato flexible para la tabla de fotometría y nuevas opciones. Las herramientas de transformación fotométrica de Gordon Myers y George Silvis ya se unificaron y están disponibles en el sitio web.

En otros lugares del universo de las estrellas variables, Bob Naeye ha dejado Sky & Telescope y Peter Tyson es ahora el editor en jefe. Tom Richards se retiró como Director de Variable Stars South y Stan Walker se ha convertido en el Director interino.

Estamos empezando a apoyar mejor a nuestros observadores interesados en espectroscopía. El primer paso en esa dirección se dio a principios de año cuando implementamos un Foro de Espectroscopía. Más recientemente, hicimos un pedido grupal por

las redes de difracción SA200 que van directo en las ruedas de filtros. Bob Hawksley nos hizo un descuento sustancial y Robin Leadbeater donó sus ganancias por las redes a nuestro proyecto, haciendo que el costo fuese muy accesible. Tenemos varios pasos más que dar para nuestros observadores, ¡pero la rueda está girando!

Hay varias campañas interesantes en vigencia. Por supuesto, las dos novas brillantes de 2013 (V339 Del y V1369 Cen) todavía se observan fácilmente y se requiere un monitoreo continuo de las mismas. EE Cep atravesó el eclipse que tiene cada 6 años y fue bien cubierto por los observadores de AAVSO, con observaciones un par de meses antes y después del evento. Se espera que alpha Comae Berenices atraviese un eclipse en enero. Como recién sale de atrás del Sol, nuestros observadores están obteniendo observaciones tempranas para formar una línea de base para el posible eclipse. Deanne Coppejans ha realizado un excelente trabajo con su campaña de investigación de jets de radio en novas enanas, pidiéndoles a los observadores que le informen cuando determinadas estrellas entran en erupción.

¿Qué nos traerá 2015? Stella tiene muchas ideas y le dará un nuevo entusiasmo a la AAVSO. Proyectos como AAVSONet y APASS seguirán siendo fuertes y yo seguiré siendo parte en el día a día de su gestión. Creo que van a disfrutar la “nueva” AAVSO – ¡de seguro yo estoy ansioso por que llegue!– También estoy esperando volver a ser un investigador de nuevo y contribuir con algunos datos a las campañas. Trabajemos todos juntos y hagamos de la AAVSO la institución líder en investigación y educación que todos quieren y necesitan. ¡Cielos claros para todos! ★

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

MENSAJE DEL PRESIDENTE

JENO SOKOLOSKI

Les presento a nuestra nueva Directora, la Dra. Stella Kafka

Cuando la directora entrante de AAVSO, la Dra. Stella Kafka, publicó su primer trabajo científico de investigación astronómica, hace 15 años, Janet Mattei estaba entre sus co-autores. Así, Stella y la AAVSO están vinculados desde el inicio de su carrera astronómica. Más aún, la colaboración entre astrónomos profesionales y aficionados ha dado forma continua a su desarrollo como investigadora. Ahora,

tenemos la suerte de poder afianzar la conexión de Stella con AAVSO mientras se prepara para tomar el mando de manos de Arne, el 1 de febrero próximo. Dada la especial combinación de talentos, habilidades y experiencia que Stella presenta, espero que la próxima década sea de vigoroso crecimiento, modernización y construcción de la comunidad para AAVSO.

Como los de la comunidad de estrellas variables cataclísmicas ya saben, Stella tiene una notable reputación científica y un recorrido de investigación científica excepcional. Después de obtener su Licenciatura en Ciencias en la Universidad de Atenas, Grecia, se trasladó a la Universidad de Indiana, donde obtuvo una maestría y un doctorado en astronomía, con una doble mención en Física y Geofísica. Allí recibió el

Premio Hollis y Grete Johnson a la Excelencia en Investigación para Estudiantes Graduados. Después de completar su doctorado, Stella mantuvo una serie de cargos y becas postdoctorales de prestigio, primero en el Observatorio Interamericano de Cerro Tololo, en Chile, (donde recibió el Premio de Excelencia del National Optical Astronomy Observatory), a continuación, en el Instituto Tecnológico de California, Caltech, y finalmente como miembro del Instituto de Astrobiología de la NASA en el Instituto Carnegie de Washington. Tiene una amplia experiencia en la adquisición, reducción y análisis fotométrico y espectroscópico de datos; ha ayudado a la puesta en servicio de dos instrumentos diferentes en el Observatorio WIYN, en Arizona; y ha escrito un manual de reducción de datos, junto con más de 40 artículos científicos con referato. Como miembro del

CONTINUED ON NEXT PAGE

MENSAJE DEL PRESIDENTE CONTINUED...

grupo de trabajo “Poblaciones Estelares” del Gran Telescopio Sinóptico (LSST, el gran observatorio profesional que hará imágenes de todo el cielo, repetidamente, cada pocas noches, comenzando alrededor de 2020), contribuyó al libro de contribución científica del LSST. Como Directora de AAVSO, Stella se basará en sus conexiones y prestigio en la comunidad profesional para asegurarse de que los astrónomos aficionados contribuyan, prosperen y, en general, se beneficien de las inversiones profesionales de la astronomía en el marco temporal durante la próxima época de oro para la astrofísica en el dominio del tiempo.

Pero el Consejo no seleccionó a Stella como nuestra próxima Directora únicamente por sus credenciales científicas. Es igualmente importante, sino quizá más, su experiencia en gestión. Además de servir como directora de dos programas de investigación y tutora de estudiantes de pre-grado, mientras estuvo en Chile, en los últimos tres años Stella se ha dedicado a la gestión editorial, de marketing, de finanzas, de desarrollo de negocios, de operaciones y de aspectos de producción de las revistas del Instituto Americano de Física (AIP). Como gerente de publicaciones de la AIP, Stella supervisó con éxito el lanzamiento de una nueva revista y sirvió como enlace entre las comunidades de publicación y de investigación. Personalmente, puedo dar fe de sus habilidades de organización y de su amor

por una planificación cuidadosa. De hecho, ya ha canalizado su pasión y visión para AAVSO con la elaboración de planes de negocio y de marketing para su consideración por parte del Consejo. La rara combinación de habilidades tanto para la gestión como para la investigación que Stella trae a AAVSO nos ayudará a florecer en un mundo astronómico en constante cambio.

En el tope de sus capacidades de investigación y de gestión, Stella trae a nuestra organización internacional una perspectiva muy internacional. Después de crecer en Grecia, obtuvo un Diploma de Aptitud en el idioma francés (ella tiene, también, uno en Inglés), continuó su educación superior en los EE.UU., y trabajó y viajó por América del Sur (incluyendo Chile, Argentina y Brasil). Stella tiene fluidez en griego y en inglés, y habla español y francés. Al ver nuestra membresía internacional como uno de nuestros puntos fuertes, Stella planea utilizar su base tricontinental para ayudar a profundizar el alcance internacional de AAVSO y para construir relaciones más fuertes entre AAVSO y la comunidad internacional.

Pero aquellos de ustedes que han hablado con Stella menos de cinco minutos sabrán que aún no me he ocupado lo que es quizá su talento más obvio e inmediato: la comunicación. La simpatía y verborragia de Stella es incontenible y contagiosa. Ella tiene

un don para poner esta energía en ideas y planes claramente articulados. Y debido a que a Stella le gusta interactuar con gente de todas las edades y antecedentes, ha perfeccionado sus habilidades de comunicación a través de orientar a estudiantes, enseñar en el aula, dar conferencias públicas y para profesionales, y toda suerte de escritura profesional (incluyendo comunicados de prensa científicos con títulos atractivos tales como, “Calling Dr. Frankenstein: Interactive Binaries Show Signs of Induced Hyperactivity”, que se puede traducir como “Llamando al Dr. Frankenstein: las binarias interactivas muestran signos de hiperactividad inducida”). Y entonces, como todos los buenos comunicadores, ella sabe cuándo parar y escuchar.

Esta semana, Stella llega a la Sede para pasar dos semanas trabajando con Arne para prepararse para la transición oficial de la Dirección, el 1 de febrero. Aunque estamos tristes de ver irse a Arne, deja la AAVSO fuerte. Todos le deseamos lo mejor en su “retiro”. Debido a la visión de Arne y la agilidad de la recaudación de fondos durante un período económico difícil y a su trabajo incansable en nombre de nuestra organización, Stella será capaz de concentrarse, de inmediato, en el crecimiento y en nuevas iniciativas. Siéntase libre de escribirle una línea. Stella escribió su primer trabajo científico con Janet; tal vez ella pueda escribir el próximo con usted. ★

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.

STARS AT THE EDGE

MATTHEW R. TEMPLETON (TMT), SCIENCE DIRECTOR

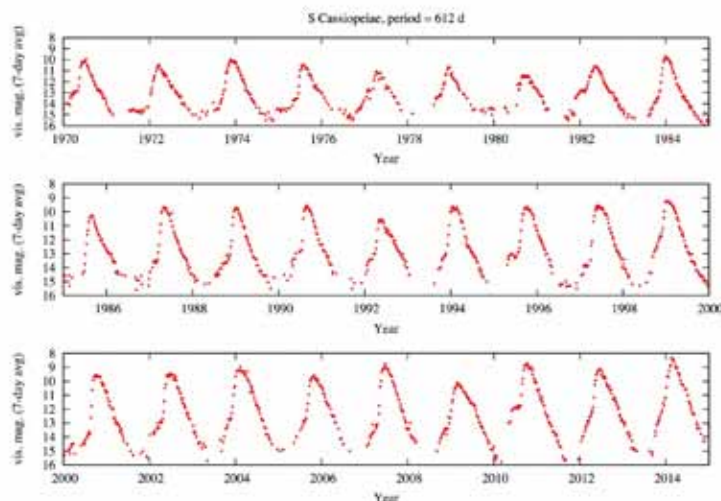
The Mira and semiregular (SRa) stars are a fascinating group, and have long been favorites of AAVSO observers. They have periods of hundreds of days, and some have enormous amplitudes—more than ten magnitudes in the optical in some cases. Several Miras have been observed for more than a century, and for a few select stars—like Mira itself—the observational records extend back in time to before the telescope was invented.

These stars are highly evolved, and won't last long (in cosmic terms) before they end their lives as white dwarfs, returning most of their mass to the galaxy in the form of dust and gas. In fact, the asymptotic giant branch (AGB) is the point in their evolution when their mass loss rate increases dramatically. Learning more about how these stars behave is important to help us better understand how the stellar and chemical content of galaxies evolve. However, we have an interesting quandy: the longest-period stars, which are believed to be losing mass the fastest, are also fewer in number. One prominent example, S Cassiopeiae, has a period over 600 days, and is currently losing 1/100,000th of a solar mass per year. That may not sound like a lot, but on the timescales of stellar evolution, it's huge—it means it loses one solar mass in just 100,000 years! The clock is definitely ticking for S Cas.

The light curve of S Cas is beautiful, and our archives on it extend back to the 1860s, but this is a rarity among data sets for these stars. Relatively few very long period stars are well-observed compared to their shorter-period brethren. Part of the reason is that the very long period stars are just rarer—very long period stars probably have more massive progenitors, and higher-mass stars are less common than lower-mass stars. But they're probably also harder to see, precisely because of their higher mass loss rates. As an example, visual observers haven't had much chance to observe a star like IK Tau, which doesn't become brighter than $V=16$ very often. However, IK Tau is a very bright infrared star in our skies. If you can look in the right wavelengths, very long period stars are easy to observe. This is where our optical CCD and IR photoelectric photometrists have a great opportunity to carve out some new and interesting territory with their equipment—not just continuing the work that visual observers do, but expanding the reach of the amateur community by going after targets that many visual observers can't.

AAVSO Councilor John Martin and I are putting together a campaign to study these stars in greater detail using the unique capabilities of our instrumental observers. One aspect of this project is photometry: we want to look at the light curves of these stars right now, and we also want them to become the well-observed stars of the future. Observers with CCD cameras and a near-IR Cousins Ic filter can observe many of these stars very easily. Observers with the Optec SSP-4 J- and H-band photometer should have an even easier time, since many of these stars rank among the brightest IR stars in the sky even while they're optically faint.

We'll be talking more about our campaign in the coming months, but until then, we hope you'll consider giving one or more of the following stars a try with your CCD camera or infrared photometer. Most of these are bright enough that they can be observed in V-band, and VRcIc photometry is encouraged; otherwise, even Ic alone would be great. We've included comparison stars for SSP-4 J- and H-band observers, but CCD observers doing optical photometry should obtain comparisons via VSP.



AAVSO light curve for S Cas

Observers should follow these stars like any other LPVs, with observations every 1 to 2 weeks when possible. When making an observation, please average together 2 to 3 observations per filter made in a single night and submit the averaged data point instead of the individual measurements.

Because the IR comparison stars can be very distant from the targets, SSP-4 observers in particular should be aware of sky conditions; even if you never have truly photometric skies at your site, you may still be able to reach rms errors of around 0.1 magnitude, particularly if you can observe the comparison and targets when they're both close to the same airmass. CW Leo will be a better target later into February, but even at its best, it will be a tough target at $J=6.7$. Note also these comparisons are strictly for SSP-4 (J- and H-band) observers; as mentioned above, CCD observers should use comparisons available via VSP.

Comparison stars were drawn both from Arne Henden's 2002 JAAVSO paper (*JAAVSO* 31, 11) and from the longer UKIRT bright standards list. Comparisons for R Lep, TX Cam, and CW Leo should be considered preliminary; bright stars are hard to come by, and if we find that the comparisons don't work at all, we'll revisit them. ★

IR campaign targets and comparisons for early 2015

Star	R. A.	Dec.	V	J	H
IK Tau	03 53 28.86	+11 24 21.7	13	1.55	0.12
C: SAO 110920	03 02 16.77	+04 05 23.1		-0.65	-1.60
K: SAO 112106	04 49 50.41	+06 57 40.6		2.35	2.15
R Lep	04 59 36.34	-14 48 22.5	5.5	1.7	0.7
C: SAO 112106	04 49 50.41	+06 57 40.6		2.35	2.15
K: SAO 151881	06 45 08.92	-16 42 58.0		-1.30	-1.32
TX Cam	05 00 51.2	+56 10 54.5	14.7	1.0	0.5
C: SAO 40186	05 16 41.36	+45 59 52.77		-1.33	-1.71
K: SAO 38787	03 24 19.37	+49 51 40.25		0.87	0.62
W Ori	05 05 23.71	+01 10 39.3	6.0	1.34	0.35
C: SAO 112740	05 25 07.86	+06 20 58.9		2.17	2.23
K: SAO 112106	04 49 50.41	+06 57 40.6		2.35	2.15
CW Leo	09 47 57.42	+13 16 43.2	16	6.8	3.7
C: SAO 118735	11 14 01.83	+08 03 38.5		3.88	3.30
K: SAO 135896	08 25 39.63	-03 54 23.1		3.92	3.92

INVESTIGATING IR LIGHT LEAKS IN OPTEC B-BAND FILTERS

TOM CALDERWOOD (CTOA)

Jim Kay and I have been investigating an infra-red leak in the B filters used in Optec photometers. It began in June when I noticed that my B magnitudes for CH Cyg seemed too bright. I then began B measurements for R Lyr, which is a star regularly monitored by Gerry Persha, inventor of the SSP. If anyone would have reliable data, it would be Gerry! His B magnitudes were about 0.25 fainter than mine, while our V magnitudes were in good agreement. I had written my own data reduction program, so I naturally assumed that I had a software bug. However, my check star B magnitude, computed using the same algorithm as for the variable, was reasonable.

Confused, I contacted Gerry to ask what might be going on. He suggested that there there might be a red leak in the B filter. R Lyr is very bright in the red, but the comparison star is not. If the B filter were allowing red light to get

through, it would make the variable look brighter in B than it really was. The important twist was this: Gerry uses an SSP5, which is insensitive to red light. If both our B filters were leaking in the red, his photometer would not see it, and, all other things being equal, my B magnitudes would be brighter than his.

I contacted PEP observer Jim Kay and asked him to try the same observations of R Lyr. He confirmed a mismatch between his B magnitudes, taken with an SSP3, and those of Gerry Persha. Jim then conducted a number of experiments with different filters and photometers. By stacking an IR-blocking filter with his B filter, he was able to get R Lyr B magnitudes close to Gerry's. He then put an SSP4 J band filter in his SSP3 and demonstrated that the SSP3 could detect light in J. Further, he put the suspect B filter into his SSP4, and demonstrated that it passed enough IR light to be detected by the SSP4 sensor.

Optec agrees that the evidence points to an IR leak in the B filter, and they are working on a new glass formulation for this filter. If you have been observing red-bright stars with an SSP3 in B band, you should revisit your data to look for potential problems. In addition to CH Cyg and R Lyr, XY Lyr would be affected. ★

PHOTOELECTRIC PHOTOMETRY PROGRAM UPDATE

MATTHEW TEMPLETON (TMT), AAVSO SCIENCE DIRECTOR

The last quarter of 2014 was another productive one for AAVSO PEP observers, with 538 observations of 25 different stars, made by six observers.

Gerald Persha (PGD) continued his intensive monitoring program of two short period variables, V376 Persei and KP Pegasi, submitting B- and V-band time-series of these stars, along with BVRc photometry of a dozen other stars as well; he submitted a total of 418 observations for the quarter ending December 15. James Kay (KJMB) submitted 79 observations of four different stars, including his own time-series on V376 Andromedae. Next was PEP section chair Jim Fox (FXJ), who contributed 22 observations of seven different stars, including B- and V-band monitoring of the campaign target CH Cygni. Carl Knight (KCD) is starting to use one of the AAVSO's SSP-4 IR photometers at his observatory in New Zealand, and during the commissioning process made four observations in each of the J- and H-bands of alpha and delta Ori (Betelgeuse and Mintaka), for a total of 16. AAVSO Councillor John Martin (UIS01) contributed a B- and V- observation of the red supergiant miu Cephei, and Tom Calderwood (CTOA) made a V-band observation of R Lyrae.

The eleven most-observed stars this quarter were: V376 Per (130 observations), KP Peg (110), V376 And (66), R Lyr (29), P Cyg (27), TX Psc (24), and HK Lyr, EU Del, V398 Lyr, U Del, and XY Lyr, each with 16 observations. Other notable stars include g Her (12 observations), Z Psc (12), CH Cyg (12), Betelgeuse (8), Mintaka (8), and X Her (6).

We note there are still campaigns on CH Cyg, eps Aur, and P Cyg, and we also have a new campaign on alpha Comae Berenices, and encourage observations of these stars and all others in the AAVSO PEP Program. John Martin and I are launching a new campaign to investigate the longest-period LPV stars—those with periods in excess of 450 days. I have a short note on this campaign in this

newsletter. Many of these stars will be very difficult targets for PEP (and even CCD) observers at B- and V-bands, but they are IR-bright and therefore very well suited to observation with the SSP-4 IR photometer. We're encouraging both SSP-4 observers and CCD observers using at least the V- and Ic-band filters to give these stars a try.

We made a few minor changes to the list of PEP targets, and the physical data for their comparison stars. Specifically we corrected errors in the values of delta (B-V) [var-comp] for two stars: W Boo and lambda And. Observers using PEPObs on the AAVSO website do not need to adjust any data submitted, but observers who reduce their own data may need to recalculate their transformed magnitudes. Contact me by email (matthewt@aavso.org) with any questions.

We also remind observers to make sure you're using the current comparison stars for these objects: SAO 83427 for W Boo and SAO 53355 for lambda And. A number of observers appear to be using the older comparison star (particularly for W Boo), which is causing your data to be offset from other observers. Again, please contact me if you have questions.

Finally, we'll note that Tom Calderwood has invited PEP observers to join an online community mailing list hosted on his own personal server:

<http://lists.cantordust.net/listinfo.cgi/peptalk-cantordust.net>

This is not an official AAVSO list and not hosted on our server, but we are subscribed and will be participating in the discussions. We also encourage observers to use the AAVSO's online photometry forum:

<http://www.aavso.org/forums/variable-star-observing/photometry>

or any of the other appropriate forums on the AAVSO website.

Clear skies, and Good observing! ★

DESCRIPTION OF THE AAVSO'S CALCULATION OF THE AMERICAN RELATIVE SUNSPOT INDEX R_g AND THE CORRESPONDING k PERSONAL SCALING FACTORS OF CONTRIBUTING OBSERVERS

RODNEY H. HOWE (HOWR VARIABLES, HRHA SOLAR), AAVSO SOLAR SECTION CHAIR

1. The k factor

The k factor is an “observatory constant” given to various observatories (observatory = observer). This “constant” is used to adjust an observation within an interval of days on a day missing from any of the contributing observatories (Shapley 1949). An observer must have over 100 observations since the previous k factor update to be included among observers having a k factor (Taylor 1991). Observers who have not had enough experience (fewer than 100 observations within the previous two years) or have been found to be inconsistent in their submissions during previous years will not have a k factor in the solar database. We compute a value of $c \times k$ (k -corrected Wolf number: $kc = \log(10g+s) \times k$), which is based on an observer’s k factor from the past two years of observations. K factors are those values (between 0 and 1 generally, but may go as high as 1.5) which represent the observer’s commitment to daily observation submissions into the AAVSO’s SunEntry solar database for the previous two years (Taylor 1991). The k factor also includes the observer’s instrument stability over the past couple of years of daily submissions.

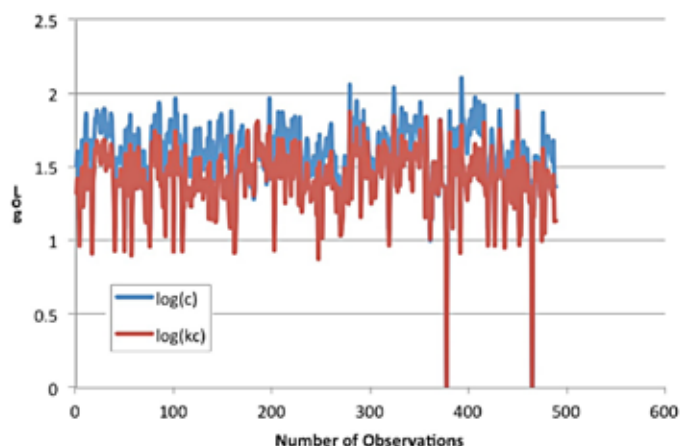
2. Computing the two-year k factor for each observer

The k factor table in the AAVSO solar database should only be updated about once every three years or so. For example, the Obsconst table with the current k factors was updated in 2012; the next update will be in 2015. To do this update we compute a value of $c*k$ (k -corrected Wolf number: $kc = \log(10g+s)*k$), which is based on observer’s k factor from the past two years of observations.

2.1. K factor computation assumes raw counts are a log normal distribution
For the monthly R_g number we compute the log-corrected Wolf number as: $kc = \log(c \times k)$, where c = Wolf number ($10g + s$, and k = current k factor) over all days of observations from each observer for the month. All these data are then written to an intermediate file and sorted by Julian day and by observer.

Daily counts for each observer are determined and allow raw values to be computed to the same Log scale. Errors and abnormal values in the daily raw observations are filtered based on their log values (kc), which, if there are null values or zero submissions, will become 0.1 where the Log of 0.1 = -1.

Daily log values of c and kc where negative values (0 groups or sunspots) are still included (data for February 2012)

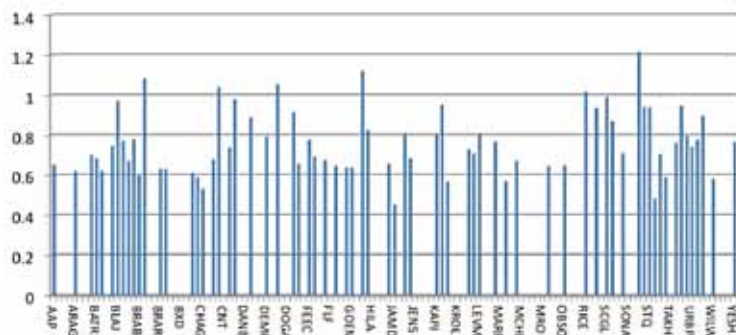


At this stage there are still daily gaps where observers had no observations, which gaps are given values of 0.1 for calculations of $\log(kc)$.

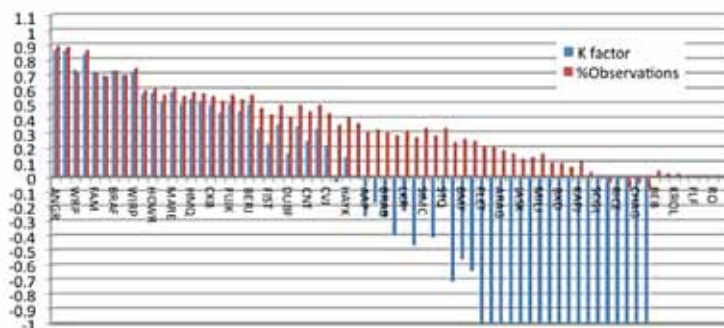
2.2. Special monthly “spotless” cases

Although a monthly $\log(kc)$ can be computed as a negative value, the observer with such a $\log(kc)$ is not dropped.

Observers with and without k factors (Obsconst table)



Identifying observers' k factors during solar minimum (May 2010 - April 2011)



This happens for some observers in the network, mainly during low solar activity when there are many spotless days. The k substitution (0.1) should only happen massively when the sun is truly spotless during a whole month. At that time R_a is inevitably close to 0, however, the $\log(kc)$ scaling is still possible as we use 0.1 values for zero sunspot days.

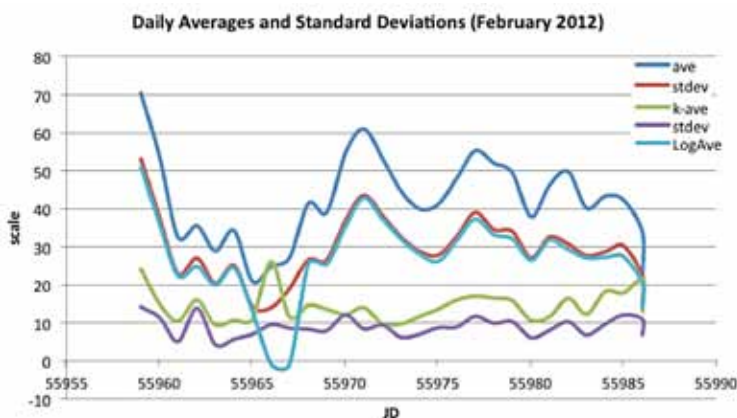
3. Averages of all daily sunspot $\log(kc)$ values create a normal distribution

For each day of the month, all log values are inverse-computed by $\exp(kc)$, and these values are then averaged as daily values, so we can compute the standard error and standard deviation of these averages from all observers: $R_a(d)$, $S_e(d)$. This gives a first estimate of the daily sunspot index.

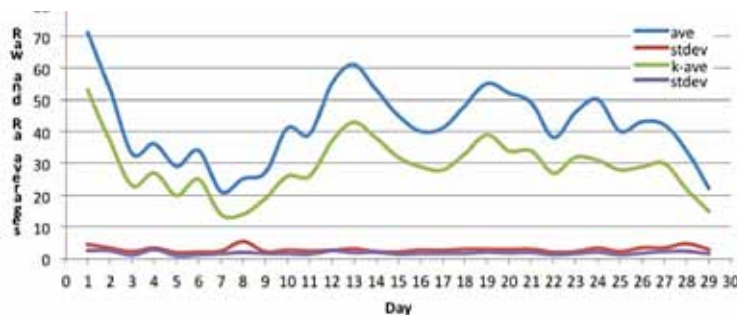
4. The American Relative number (R_a)

4.1. Daily and Monthly numbers

We now have Wolf values for all days of the month and the average R_a , which is the average $\exp(kc)$. This information can be considered reliable for reporting the daily American R_a , even when there are zero sunspot observations.



Below, the final R_a (k -ave as $\exp(kc)$), has been calculated for each day. The procedures described here yield an improved monthly R_a number, reduced errors in the resulting daily R_a values, and an R_a number entirely defined by all observers' submissions.



4.2. Timescales longer than one month

As pointed out above, the R_a scaling for each month corresponds to the average $\exp(kc)$ delivered by those observers with an approximately 3-year adjusted k factor. Therefore, the stability over long duration rests entirely on the stability of estimating each observer's k factor. This is a robust measure based on the following:

- Same observer, same site, same telescope, and same observing principles for more than two years
- Statistical estimates of the observer's commitment for submissions during the solar minimum
- Cross-comparison of personal k factors of each observer and all other contributing observers

The k_{sta} factors resulting from the 3-year assessments are adjusted during solar minimum and solar maximum, as they contain a long-term record of the ratios and possible drifts of each individual observer.

4.3. Observer history tracked in the archived sunspot indices

Observer information, including K factor values, is archived in the Obsconst table of the AAVSO solar database. When new k factors are calculated every three years, based on the previous two years of data, the new k factors, which may be different from previous values, are also archived. Updates to the Obsconst table also happen as new observers submit data, but no k factor is given to new observers with less than 100 observations.

4.4. Reporting the k factor to observers

In reporting the k factor to the observers, instead of taking the exact values resulting from the main calculation, new k_{sta} factors are calculated by a simple average monthly ratio between $W_{sta}(d)$ and the definitive R_a for that month. However, as this does not involve the complex log value calculation, the set of daily values used in this reported calculation can be different from the true values. The reported k_{sta} can thus differ slightly from the actual k_{sta} used in the monthly R_a calculation.

4.5. Results of one-time correction to all observers' k factor

The statistical processing for the AAVSO R_a has only been adjusted once, during the mid-1990s, mainly to correct for what was believed to be inflation in the yearly estimates of observers' k factors. Now, looking back with a 15-year perspective, we can see that correcting for the AAVSO R_a number was appropriate and the results have been shown to match the Sunspot Index and Long-term Solar Observations (SILSO) international index. However, the inflation problem implies a vulnerability of the R_a index, as it still rests mainly on a 3-year update of observer k factors.

5. Conclusions

By using all observations from the AAVSO network, the procedure described above allows us to detect and eliminate abnormal daily values from each observer and to fill in gaps in the observations for zero sunspot counts. This leads to an improved monthly American Relative (R_a) number average and reduces the errors in the resulting daily R_a values. As each observer is re-scaled to all the other observers' daily averages $\exp(kc)$ over the whole month, (there is no absolute scaling based on a standard reference observatory), the American Relative number is entirely defined by all observers' submissions.

References

- Shapley, A. H. 1949, "Reduction of Sunspot-Number Observations", *Publ. Astron. Soc. Pacific*, 61, 358, 13.
Taylor, Peter O. 1991, *Observing the Sun*, Cambridge University Press.



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 October 1, 2014

The campaign on the long-period eclipsing variable **EE Cep** (*AAVSO Alert Notice 502*) has essentially concluded. EE Cep was well observed before, during, and after the August eclipse, with 92 AAVSO observers contributing 27,398 visual and multicolor observations to the AAVSO International Database from July 9 through 2015 January 10. The mid-point of the asymmetrical eclipse of this Be star—the star to be eclipsed by an orbiting dusty disk belonging to an unseen companion—occurred on approximately 24 August 2014, reaching $\sim 11.52V$. EE Cep has since returned to its maximum magnitude, at 10.832V on January 10.9922 UT (WGR, G. Walker, N. Groton, Massachusetts).

Campaigns initiated since October 1, 2014

In late October, Ms. Deanne Coppejans (Ph.D. candidate, Radboud University Nijmegen (Netherlands) and University of Cape Town) and colleagues requested AAVSO observer assistance in monitoring several Northern dwarf novae in support of their campaign to observe them in outburst with the Very Large Array (VLA) to search for radio jets (*AAVSO Alert Notice 505*). Ms. Coppejans wrote: “The relation between accretion and outflow is one of the basic problems in modern astrophysics. It has long been thought that CVs are the only accreting systems that do not produce jets, and this notion has even been used to constrain jet models. However, there are now some indications that CVs do show jets, possibly allowing a universal link between accretion and ejection. Radio observations provide the best unambiguous tracer of the corresponding jet or directed outflow, but there are only two clear detections. By observing a more extensive sample of cataclysmic variables in outburst we will determine the existence of jets or other outflows in these accreting binary systems. These observations will decide if either CVs do show jets and thus support a universal link between accretion and ejection, or if they do not show jets, further constraining future jet models. The radio jet, if it exists in any of these nine systems, is expected to be seen shortly after the beginning of the outburst (as it was in SS Cyg [the first dwarf nova discovered to be a radio source; see Miller-Jones et al. 2013, *Science*, 340, 950 2013Sci...340..950MJ and the AAVSO Observing Campaigns page (<http://www.aavso.org/observing-campaigns> for links to *AAVSO Alert* and *Special Notices* regarding the related campaigns in 2010 and 2011]). Catching the outburst as it is just starting and reporting that information to AAVSO HQ immediately is crucial.”

Of the nine possible targets on their list, five were to be observed. Three of the targets—**RX And**, **YZ Cnc**, and **Z Cam**—went into outburst/superoutburst soon after the campaign was announced and, thanks to your very prompt notification to AAVSO HQ and so to the PIs, were observed by the VLA! The fourth target, **SU UMa**, went into outburst on December 28. For VLA to observe the system, a superoutburst was needed. What first looked like a superoutburst began to fade too soon and so was thought to be a bright normal outburst. It turned out to be a precursor outburst—a brief outburst that sometimes precedes a superoutburst by

a day or so. SU UMa then brightened again into a superoutburst, and the VLA observations were carried out on January 5. The remaining target is **U Gem**. We are well into the window during which U Gem could erupt, so close monitoring and very fast notification are needed.

Ms. Coppejans has been keeping in touch with our observers via a thread on the AAVSO Campaigns and Observations Reports Forum (<http://www.aavso.org/northern-dwarf-novae-monitoring-campaign>). It is wonderful for our observers to have such immediate feedback from the PI, and is very much appreciated! In January, Ms. Coppejans wrote about the VLA observations: “For our observations, hopefully the DN will be bright enough to see in the radio and we’ll get a clear detection. In that case we will look at other things to determine what produced the radio emission. The variability, amount of polarization and the spectral index are all really useful. Essentially what you need to do to get this information is to split the observations up into different frequency ranges or time ranges and then make images with just that selected data.

“Radio astronomy differs from optical astronomy in that you don’t get an image from the telescope. Take the VLA for example—it’s comprised of 27 dishes. Each of these measures voltages, so you get a very large table of values out. Then by using computer algorithms we stitch that all together to make an image. So, for example, if we want to find out how bright the target was between 1.20 and 1.30, we select only those 10 minutes in the table make an image of it. There are other ways of getting information out of radio data, but this is what I’m doing. A non-detection is still useful. From the image we can get upper-limits on the brightness of the radio emission and place some constraints on the timing of the expected radio flare—both of which help us narrow down what could have produced the radio emission.”

In December (before SU UMa went into superoutburst) she wrote: “The observers have been really great! :) Please tell them...that we are really excited to have three dwarf novae complete already and that I will let them know as soon as I know whether we detected radio emission.” Look for some very encouraging comments from her in the *AAVSO Annual Report* for 2013–2014 to be published in the coming weeks.

In January 2015 Drs. Matthew W. Muterspaugh and Gregory W. Henry (Tennessee State University) requested AAVSO observers’ assistance in monitoring with precision V and R photometry the possible Algol-like binary star **alpha Com** before, during, and after the eclipse they have predicted for mid-to-late January 2015 (January 25 \pm three days). The PIs will be using the Fairborn Observatory automated photometric telescopes on Mt. Hopkins in Arizona to monitor the event, but they requested additional observations not only to supplement theirs but also specifically to have good coverage in the event of bad weather at Mt. Hopkins. In addition to continuous coverage during the eclipse itself, they requested precision photometry in the weeks before and after the eclipse in order to catch possible evidence for planets or other materials around the eclipsing star. (*AAVSO Alert Notice 506*)

In January 2015, a campaign was announced in response to the request of Dr. Robert Zavala (USNO-Flagstaff) and collaborators for time-series observations of the bright ($V=4.598$, $B-V=0.054$) variable star **b Persei** (not beta Per) for several weeks, in hopes of catching a predicted eclipse on 2015 January 15 UT (*AAVSO Alert Notice 507*). Dr. Zavala wrote: “Our goal now is to get good time resolution photometry as the third star passes in front of the close ellipsoidal binary. The potential for multiple eclipses exists. The close binary has a 1.5 day orbital period, and the eclipsing C component requires about 4 days to pass

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CAMPAIGNS UPDATE CONTINUED...

across the close binary pair.... For AAVSO observations a single filter would be fine, as our goal is to improve the timing resolution for the eclipse of the primary, and if possible detect an eclipse of the B component by C. The primary eclipse depth is 0.15 magnitude. V photometry to 0.02 or 0.03 mag would be fine to detect this eclipse.”

This campaign is a follow-up to their campaign of February 2013 (*AAVSO Alert Notice 476* and *AAVSO Special Notice #333*), during which the eclipse of the main components of b Per was successfully detected. Data obtained will be used for correlation with upcoming interferometric observations with the Navy Precision Optical Interferometer (NPOI) in Arizona. Information on the b Per system may be found on the PIs' eclipse web page at <http://inside.warren-wilson.edu/~dcollins/bPersei/>. Five observers have contributed 1,982 multicolor DSLR, PEP, CCD, and visual observations of b Per since the beginning of December.

Note added in press: Photometry by P. Benni (AAVSO observer code BPAD; Massachusetts), D. Collins (CDK; North Carolina), F. Campos (CFRA; Catalunya, Spain), and F. Melillo (MFR; New York) indicate that b Per may have entered eclipse around JD 2457033.6 (2015 January 11.1 UT). (*AAVSO Special Notice #394*).

Campaigns in progress

Several campaigns which were on hold while the stars were unobservable are now active again. Please see the appropriate *AAVSO Alert Notices* and *Special Notices* for details. These campaign targets are:

- **BD+20 307, HD 15407A, and HD 23514** (*AAVSO Alert Notice 482, AAVSO Special Notice #373*);
- **S Dor** (*AAVSO Alert Notice 453, AAVSO Special Notices #280, #293*);
- **AA Tau** (*AAVSO Alert Notice 488*);
- **BP Tau** (*AAVSO Alert Notice 493*);
- **BP Tau, DN Tau, FK2, V1068 Tau (LkCa4), and V1264 Tau** (*AAVSO Alert Notices 473 and 494*); and
- **T Ori** (*AAVSO Alert Notice 490*).

In September, Dr. Robert Stencel (University of Denver Astronomy Program) requested that AAVSO observers monitor **epsilon Aur** through the end of the observing season, carrying out nightly CCD, DSLR, or PEP photometry (V, B, R, U; no time series) rather than visual observations because of the very small amplitude of the expected variations (0.1 magnitude in U, 0.05 in V, timescale 60–100 days). Dr. Stencel wrote, “Studies of the long-term, out-of-eclipse photometry of...eps Aur suggest that intervals of coherent pulsation occur at roughly 1/3 of the 27.1-year orbital period,” with the next interval possibly being ~JD 2457000 (December 2014; Kloppenborg et al., 2012 *JAAVSO* 40, 647).” The AAVSO light curve data to the present (Figure 1) indicate that this coherent phenomenon has begun, and continued observations are requested. Additional data can help deduce whether these events are internal to the F star, or externally-driven by tidal interaction with the companion star. (*AAVSO Alert Notice 504*)

Dr. Margarita Karovska's HST and Chandra campaign on **CH Cyg** (*AAVSO Alert Notice 454* and *AAVSO Special Notices #267, 294, and 320*) **has been extended** and continues at least through the **2015** observing season. As before,

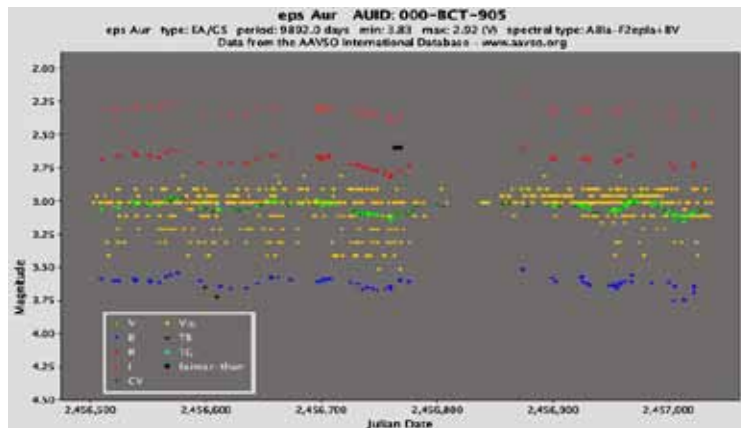


Figure 1. AAVSO light curve of the eclipsing binary eps Aur JD 2456500–2457035 (27 July 2013–12 January 2015). 56 observers worldwide contributed 1,008 multicolor observations to this light curve.

Dr. Karovska expresses her gratitude for your ongoing observations, and asks observers please to continue, especially in V and B. **The V and B data are crucial** for detecting certain significant system changes key to her research. Since this campaign began in March 2012, 198 observers have contributed 22,293 visual and multicolor observations. Thank you and please keep on keeping on!

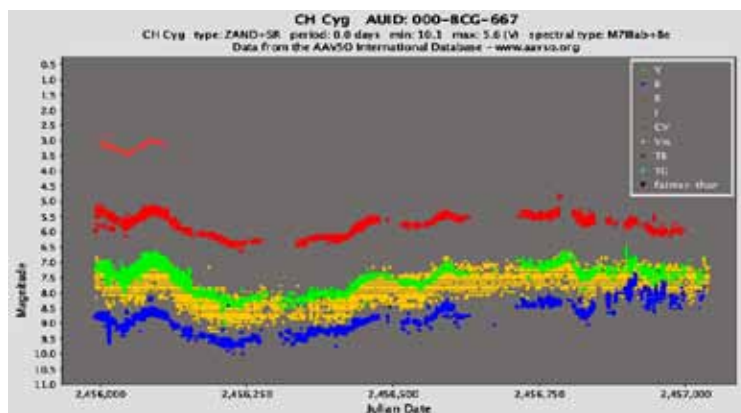


Figure 2. AAVSO light curve of the semiregular variable CH Cyg JD 2455987–2457035 (1 March 2012–12 January 2015). 198 observers have contributed 22,293 multicolor observations to this light curve.

Dr. Margarita Karovska and colleagues' request for AAVSO observer assistance in their campaign on the symbiotic variable **RT Cru**, which varies between 11.2 and 12.6 visual and is a fascinating member of a new class of hard X-ray emitting symbiotic binaries, continues. Weekly or more frequent monitoring (B and V photometry and visual observations) is requested in support of upcoming Chandra observations still to be scheduled (*AAVSO Alert Notice 503*). 15 observers have contributed 1,095 multicolor observations of this star through 2015 January 10.

Dr. Eric Mamajek's campaign on **J1407 (1SWASP J140747.93-394542.6)** (*AAVSO Alert Notice 462*) has been extended through 2014. He writes: "... Thus far [since 2012] there is no sign of eclipse.... This introduces the interesting possibility that the 2001 dip was from another body in the J1407 system.”

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CAMPAIGNS UPDATE CONTINUED...

Since that was written a year ago, AAVSO observers have continued to provide excellent coverage and no eclipse has been observed, so please continue your observations—they are extremely important in helping to solve the puzzle of this interesting and possibly complex system (*AAVSO Alert Notice 462*). Three observers have contributed 1,606 multicolor observations to date.

Ernst Pollmann's campaign on **P Cyg**, an S Dor (= Luminous Blue Variable) variable (*AAVSO Alert Notice 440*), continues at least through the 2014 season and likely "for several more years." Since May 2011, 96 observers have contributed 4,177 observations to this campaign ideally suited to PEP and DSLR observers. See Alert Notice 440 for comparison and check star information. Many thanks for your observations, and please keep on observing P Cyg!

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 *JAASO*, 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/aavso-alert-notice-353>)

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

Novae and Supernovae

No new galactic novae were discovered since March 2014, but two Type-Ia supernovae were discovered.

SN 2014dt (PSN J12215757+0428185) in NGC 4303 (M61) was discovered on October 29.838 UT at unfiltered magnitude 13.6 and announced in *AAVSO Special Notice #389*. Determined to be a Type-Iax., as of December 30.4176 UT it was V magnitude 16.022 (BJAA, J. Boardman, De Soto, Wisconsin).

ASASSN-14lp in NGC 4666 was discovered on 2014 December 9.61 UT at 14.3 V and announced in *AAVSO Special Notice #392*. Determined to be a Type-Ia supernova, it was V magnitude 12.533 on 2015 January 12.3748 UT (HMB, J. Hamsch, Mol, Belgium).

Recent novae that are still within observing range include:

V5666 Sgr = Nova Sagittarii 2014 (PNV J18250860-2236024)—This very interesting nova continues to fade slowly. As of November 13.0024 UT, V5666 Sgr was 13.577V (HMB, J. Hamsch, Mol, Belgium).

V962 Cep = Nova Cephei 2014 (TCP J20542386+6017077)—This classical nova is also continuing to fade. As of December 31.0135 UT V962 Cep was 17.985V (BJAA, J. Boardman, De Soto, Wisconsin).

Nova Scorpii 2014 (TCP J17154683-3128303)—This very interesting symbiotic nova declined quite fast, and since April 2014 has been about 16.3V. The latest observations in the AAVSO International Database show it at 16.35V on July 21.5604 UT (HKEB, K. Hills, Hartford, England) and <15.537V on August 3.9167 (GCO, Carlo Gualdoni, Como, Italy).

V2659 Cyg = Nova Cygni 2014 (PNV J20214234+3103296)—This highly reddened classical Fe II-type nova continues to be very active as it fades. As of 2015 January 6 UT, it was visual magnitude 13.3 (6.762 UT, PYG, G. Poyner, Birmingham, England) and V magnitude 13.227 (6.7952 UT, BDG, D. Boyd, Wantage, England). 78 observers worldwide have contributed 3,376 observations through 2015 January 8.

V1369 Cen = Nova Centauri 2013 = PNV J13544700-5909080 continues to decline slowly. As of 2015 January 8 UT it was visual magnitude 9.1 (8.2569 UT, SWQ, W. De Souza, Sao Paulo, Brazil) and V magnitude 9.207 (8.3808 UT, HMB, J. Hamsch, Mol, Belgium). 71 observers worldwide have contributed 11,786 observations through 2015 January 8.

V339 Del = Nova Delphini 2013 = PNV J20233073+2046041—This very fast classical nova (class NA) continues to fade, most recently at visual magnitude 12.7 (Jan. 6.742 UT, PYG, G. Poyner, Birmingham, England) and V magnitude 12.926 (Jan. 8.7519 UT, BDG, D. Boyd, Wantage, England). 530 observers worldwide have contributed 74,518 multicolor observations through 2015 January 8.

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! ★

LOOKING AT LEGACY STARS

STARS OBSERVED RECENTLY AND RECOMMENDATIONS FOR THE NEXT FEW MONTHS

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

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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 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/aavsolpsection/Home/lpv-files> for the LPV lists, and <https://sites.google.com/site/aavsovcvsection/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 now 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 nineteen best-covered stars of the LPV Legacy program, as measured (mainly) by number of nights observed, 2014 September 16 through December 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	$N(vo)$	$N(von)$	$N(co)$	$N(con)$
CH Cyg	Cyg	19:24:33.06	+50:14:29	55	84	10	49
W Cyg	Cyg	21:36:02.49	+45:22:28.4	39	82	1	1
AF Cyg	Cyg	19:30:12.84	+46:08:52	39	79	0	0
miu Cep	Cep	21:43:30.49	+58:46:48	45	77	4	10
U Del	Del	20:45:28.23	+18:05:24	33	74	2	14
R Tri	Tri	02:37:02.33	+34:15:51.4	47	73	5	14
R Cas	Cas	23:58:24.87	+51:23:19.7	47	72	4	12
omi Cet	Cet	02:19:20.78	-02:58:39.5	42	71	5	15
R Cyg	Cyg	19:36:49.38	+50:11:59.4	42	71	4	14
EU Del	Del	20:37:54.7	+18:16:06.3	27	71	2	14
khi Cyg	Cyg	19:50:33.91	+32:54:50.6	50	69	5	21
T Cep	Cep	21:09:31.78	+68:29:27.1	40	68	4	16
RT Cyg	Cyg	19:43:37.77	+48:46:41.3	33	67	4	11
T Cas	Cas	00:23:14.27	+55:47:33.2	38	58	6	19
W Lyr	Lyr	18:14:55.87	+36:40:13.1	48	57	6	17
Y Per	Per	03:27:42.38	+44:10:36.5	25	54	7	14
R Aqr	Aqr	23:43:49.45	-15:17:04.1	20	52	1	29
W Cas	Cas	00:54:53.85	+58:33:49.2	25	46	7	27
U Ori	Ori	05:55:49.16	+20:10:30.6	16	29	6	84

$N(vo)$ = 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

Nineteen least-observed stars of the LPV Legacy program during the quarter 2014 September 16 through December 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	$N(vo)$	$N(von)$	$N(co)$	$N(con)$
V Boo	Boo	14:29:45.27	+38:51:40.6	14	28	0	0
VW UMa	UMa	10:59:01.79	+69:59:20.5	6	24	0	0
S Boo	Boo	14:22:52.91	+53:48:37.2	10	23	1	3
R Boo	Boo	14:37:11.57	+26:44:11.6	9	23	0	0
W Per	Per	02:50:37.89	+56:59:00.3	9	20	3	4
S Car	Car	10:09:21.88	-61:32:56.3	4	19	0	0
S CMi	CMi	07:32:43.07	+08:19:05.1	8	19	2	2
R Cen	Cen	14:16:34.31	-59:54:49.2	4	18	0	0
X Cnc	Cnc	08:55:22.87	+17:13:52.5	10	17	0	0
R Car	Car	09:32:14.59	-62:47:19.9	3	15	0	0
R Gem	Gem	07:07:21.27	+22:42:12.7	6	15	3	4
R Cnc	Cnc	08:16:33.82	+11:43:34.5	5	12	3	3
TU Cyg	Cyg	19:46:10.67	+49:04:24.4	9	12	4	10
R CVn	CVn	13:48:57.05	+39:32:33.2	4	10	0	0
R Vir	Vir	12:38:29.94	+06:59:18.9	3	9	0	0
T Cen	Cen	13:41:45.55	-33:35:50.5	3	7	0	0
R LMi	LMi	09:45:34.27	+34:30:42.8	1	5	0	0
R Hya	Hya	13:29:42.77	-23:16:52.7	3	4	0	0
SS Vir	Vir	12:25:14.4	+00:46:10.9	1	4	0	0

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.

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LEGACY STARS
CONTINUED...

Top seventeen best-covered stars of the CV Legacy program, as measured (mainly) by number of observers and nights observed, 2014 September 16 through December 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
SS Cyg	Cyg	21:42:42.78	+43:35:09.8	82	87	17	66
CH Cyg	Cyg	19:24:33.06	+50:14:29.1	55	84	10	49
RX And	And	01:04:35.52	+41:17:57.8	51	83	36	84
RU Peg	Peg	22:14:02.57	+12:42:11.4	33	80	4	15
Z And	And	23:33:39.95	+48:49:05.9	36	79	3	10
EM Cyg	Cyg	19:38:40.11	+30:30:28.4	30	73	15	60
IP Peg	Peg	23:23:08.59	+18:24:59.6	15	73	5	22
GK Per	Per	03:31:12	+43:54:15.4	23	71	7	18
Z Cam	Cam	08:25:13.18	+73:06:39	27	71	11	34
AB Dra	Dra	19:49:06.37	+77:44:22.9	18	67	6	17
DX And	And	23:29:46.7	+43:45:04.6	11	64	5	28
SS Aur	Aur	06:13:22.47	+47:44:25.6	24	63	6	34
U Gem	Gem	07:55:05.21	+22:00:04.7	22	61	19	66
TZ Per	Per	02:13:50.94	+58:22:52.7	15	59	9	66
UV Per	Per	02:10:08.03	+57:11:19.7	15	55	7	36
WW Cet	Cet	00:11:24.72	-11:28:42.9	6	50	10	74
TT Ind	Ind	20:33:37.09	-56:33:44.7	2	45	2	84

Stars in CV Legacy list with no visual or CCD observations during the quarter 2014 September 16 through December 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
AH Eri	Eri	04:22:38.04	-13:21:30.3	0	0	0	0
RR Pic	Pic	06:35:36.05	-62:38:24.2	0	0	0	0
BV Pup	Pup	07:49:05.25	-23:34:00	0	0	0	0
CP Pup	Pup	08:11:46.06	-35:21:05	0	0	0	0
RX Pup	Pup	08:14:12.3	-41:42:29	0	0	0	0
BB Vel	Vel	08:36:49.26	-47:22:37	0	0	0	0
CU Vel	Vel	08:58:33.01	-41:47:51.5	0	0	0	0
AG Hya	Hya	09:50:29.75	-23:45:17.2	0	0	0	0
V436 Cen	Cen	11:14:00.18	-37:40:47.4	0	0	0	0
SY Mus	Mus	11:32:10.01	-65:25:11.6	0	0	0	0
TT Crt	Crt	11:34:47.26	-11:45:30.9	0	0	0	0
QZ Vir	Vir	11:38:26.81	+03:22:06.8	0	0	0	0
TW Vir	Vir	11:45:21.16	-04:26:05.7	0	0	0	0
MU Cen	Cen	12:12:53.91	-44:28:15.8	0	0	0	0
EX Hya	Hya	12:52:24.22	-29:14:56	0	0	0	0
V485 Cen	Cen	12:57:23.28	-33:12:06.5	0	0	0	0
V803 Cen	Cen	13:23:44.53	-41:44:29.6	0	0	0	0
BV Cen	Cen	13:31:19.48	-54:58:33.4	0	0	0	0
V504 Cen	Cen	14:12:49.18	-40:21:37.5	0	0	0	0
V2051 Oph	Oph	17:08:19.11	-25:48:30.3	0	0	0	0
MU Ser	Ser	17:55:52.77	-14:01:17.1	0	0	0	0
V1830 Sgr	Sgr	18:13:50.65	-27:42:21	0	0	0	0
FM Sgr	Sgr	18:17:18.25	-23:38:27.8	0	0	0	0
V441 Sgr	Sgr	18:22:08.09	-25:28:47.3	0	0	0	0
V4021 Sgr	Sgr	18:38:14.88	-23:22:47.1	0	0	0	0
PW Vul	Vul	19:26:05.04	+27:21:57.7	0	0	0	0
LV Vul	Vul	19:48:00.7	+27:10:19.5	0	0	0	0
V1819 Cyg	Cyg	19:54:37.44	+35:42:16	0	0	0	0
V476 Cyg	Cyg	19:58:24.47	+53:37:06.7	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. ★

GET THE LATEST
CAMPAIGN NEWS...

Subscribe online to receive AAVSO *Alert Notices* and *Special Notices* directly to your email's inbox. Stay on top of stellar activity and get detailed information on current and upcoming observing campaigns by visiting

<http://www.aavso.org/observation-notification>

to subscribe today!

Sign up for the AAVSO online forums to read about or contribute to discussion on observing campaign targets. Postings will be sent to you by email and will also be available for viewing online. Visit <http://www.aavso.org/forums>

JULIAN DATE / MOON PHASE CALENDARS

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

JANUARY 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 7024	2 7025	3 7026
4 7027	5 7028	6 7029	7 7030	8 7031	9 7032	10 7033
11 7034	12 7035	13 7036	14 7037	15 7038	16 7039	17 7040
18 7041	19 7042	20 7043	21 7044	22 7045	23 7046	24 7047
25 7048	26 7049	27 7050	28 7051	29 7052	30 7053	31 7054

FEBRUARY 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 7055	2 7056	3 7057	4 7058	5 7059	6 7060	7 7061
8 7062	9 7063	10 7064	11 7065	12 7066	13 7067	14 7068
15 7069	16 7070	17 7071	18 7072	19 7073	20 7074	21 7075
22 7076	23 7077	24 7078	25 7079	26 7080	27 7081	28 7082

MARCH 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 7083	2 7084	3 7085	4 7086	5 7087	6 7088	7 7089
8 7090	9 7091	10 7092	11 7093	12 7094	13 7095	14 7096
15 7097	16 7098	17 7099	18 7100	19 7101	20 7102	21 7103
22 7104	23 7105	24 7106	25 7107	26 7108	27 7109	28 7110
29 7111	30 7112	31 7113				

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 centennial 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 at AAVSO Headquarters 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 2015 New Member Form

Please send application, first year's dues, and application fee to:

AAVSO, 49 Bay State Road
Cambridge, MA 02138, USA

Date: _____
 Full Name: _____
 Full Address: _____

 Telephone 1: _____ Telephone 2: _____
 E-Mail: _____
 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 \$75.00 per year
	Associate (Under 21)/Pension/Limited Income	US \$37.50 per year
Sustaining:		US \$150.00 per year
Developing country [†] (for members residing in low income countries):		US \$25.00 per year

Membership is prorated 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	\$75.00	\$68.75	\$62.50	\$56.25	\$50.00	\$43.75	\$37.50	\$31.25	\$100.00	\$93.75	\$87.50	\$81.25
A/P/LI	\$37.50	\$34.38	\$31.25	\$28.13	\$25.00	\$21.88	\$18.75	\$15.63	\$50.00	\$46.88	\$43.75	\$40.63
Sustaining	\$150.00	\$137.50	\$125.00	\$112.50	\$100.00	\$87.50	\$75.00	\$62.50	\$200.00	\$187.50	\$175.00	\$162.50
Developing Country [†]	\$25.00	\$22.92	\$20.83	\$18.75	\$16.67	\$14.58	\$12.50	\$10.42	\$33.33	\$31.25	\$29.17	\$27.08

*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.

[†]Developing countries EXCLUDE Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, the Korean Republic, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, the United States.

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 General Fund	\$ _____
The Endowment Fund	\$ _____
Annual Campaign Fund	\$ _____
Building Fund	\$ _____
Janet A. Mattei Research Fellowship	\$ _____
Margaret Mayall Assistantship Fund	\$ _____
Solar Fund	\$ _____
AAVSONet Fund	\$ _____
Member Sponsorship Fund	\$ _____
Student Meeting Scholarship Fund	\$ _____
Contributor-Specified Restricted Funds	\$ _____

_____ 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): _____

Signature: _____

2015 MEMBERSHIP RENEWAL

On this page is a copy of the AAVSO membership renewal form for 2015. 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. *Developing countries EXCLUDE Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, the Korean Republic, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, the United States.*



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

Name _____
 Address _____
 City _____
 State/Province _____
 Zip/Postal Code _____
 Country _____

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.*

__ Visa __ Mastercard Card Number _____ Exp Date: ____ / ____

Card Security Code (3-digit number on the back of your card): ____ Total to be charged: \$ _____

Name on card: _____ Signature: _____

If the billing address for this credit card is different from your address above, please provide it here:

Billing Address _____ City _____

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: _____

2015 Membership Dues Renewal Form

Membership Type *(please check one)*

___ Annual \$75 ___ Sustaining \$150

___ Associate (under 21) \$37.50

___ Pension/Limited Income \$37.50

___ Developing Country \$25

Contributions *(see next page for descriptions)*

AAVSO Building Fund \$ _____

Janet A. Mattei Research Fellowship \$ _____

Margaret Mayall Assistantship \$ _____

Solar Fund \$ _____

AAVSONet Fund \$ _____

Member Sponsorship Fund \$ _____

AAVSO General Fund \$ _____

The Endowment Fund \$ _____

Contributor-Specified Restricted Funds \$ _____

TOTAL ENCLOSED \$ _____

SUPPORT THE AAVSO

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 Funds

The following is a list of the specific funds to which you may contribute. If you do not wish to specify how you would like your donation to be used, the AAVSO will determine the fund where it is needed most and place it there.

The General Fund This fund is an unrestricted one and supports the general operations of the Association.

The Endowment Fund This is a professionally managed fund, invested for the perpetuity of the AAVSO. From time to time, transfers from this fund into the General Fund are made as necessary to meet operating deficits of the Association.

The Building Fund This fund is dedicated to replenishing the Endowment Fund for the cost of purchasing the new headquarters building (49 Bay State Road, Cambridge, MA 02138), to provide funds to refurbish the building, and to cover other costs incurred with the purchase.

Janet A. Mattei Research Fellowship Program This fund enables a visiting scientist, postdoctoral researcher, or student to perform research at AAVSO Headquarters with the goal of disseminating the results throughout the astronomical community.

Margaret Mayall Assistantship Fund This fund helps finance a summer student at AAVSO Headquarters who works on variable star-related projects and research while learning about the AAVSO and variable stars in general. Only the accumulated interest and not the principal may be used.

Solar Fund This fund helps to pay the staff costs of running the section, publishing the *Solar Bulletin*, and travel expenses for visiting solar researchers.

AAVSONet Fund This fund pays for refurbishment and maintenance of telescopes, cameras, mounts, computers, software, and hardware required to operate the AAVSO's robotic telescope network.

Member Sponsorship Fund Funds donated to this program pay the membership dues for those active variable star observers who want to become members of the Association but cannot afford the dues.

Student Meeting Scholarship Fund Donations to this fund pay for up to 10 student registrations per annual meeting of the AAVSO.

Contributor-Specified Restricted Funds These are gifts and contributions made to the Association for restricted purposes as specified by the donor thereof. All such restricted funds of the Association shall be administered in strict accordance with the instructions of the donor. The Association is not obliged to accept any assets so offered.

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!