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ISSUE NO. 67 JANUARY 2016 WWW.AAVSO.ORG

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

STELLA KAFKA



The year in review

As we wrap up another year at the AAVSO, I look at our accomplishments with pride. Our journey started fighting a rough winter in Boston, and at the same time, planning a new year focused on improving our services and engaging a wider community to our activities.

The AAVSO is a family of people who are working hard to understand some of the most dynamic phenomena in the universe. It is a living organism of observers, members, and volunteers who, supported by HQ staff, push forward the limits of science, enabling everyone to actively participate in scientific discovery. You will read details of our achievements in this year's annual report. A glance is enough to recognize how much teamwork and passion went to realizing our goals for the year.

We started by joining the International Year of Light and as part of it, inviting our observers to share with us their excitement and motivation of studying the night sky. We received contributions from younger astronomers all over the world, who enthusiastically expressed their fascination with astronomy through art and music. We tested the waters of astro-science among high school students, motivating them to use AAVSO data and present variable star science

projects in international and national competitions. In the process, we found groups of youngsters thirsty to learn about variable stars, become involved in astronomical observations, and contribute their own data to our database. We also approached new groups of professional astronomers in need of data for their projects, who somehow didn't know the power of our observing collective and the value of our database for their research.

Our meetings are places where our members build new collaborations, present their results, and brainstorm on campaigns and objects of interest. Our journal is an outlet for the citizen science community to share new results. Our new membership tool enables our members worldwide to connect, and facilitates collaborations within our community. At a time when new technology dictates our means of communication and data presentation, we are channeling our resources into updating our services, modernizing our mode of operation, and becoming more and more relevant to observers and researchers around the world.

As the time domain will be dominating the astro-science scene for the next couple of decades, it is becoming obvious that we will become an even more precious resource for researchers worldwide. Moreover, we are the only citizen science association in the world that does it all: we provide data, we provide training to researchers (professionals or not), we provide active peer mentoring, we provide scholars, we have our own data analysis and reduction

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PRESIDENT'S MESSAGE

KRISTINE LARSEN



A New President and a New Year's Resolution/Challenge

First of all, I'd like to give a personal thanks to the Council for affording me the honor of serving this organization as President. I have been a member of the AAVSO for 25 years, and firmly believe that it is one of the finest organizations I have ever had the pleasure of being affiliated with.

For those of you who do not know me in person, I am an astronomy professor at Central Connecticut State University. Despite the fact that my thesis dissertation was in the esoteric fields of black holes and inflationary cosmology, I have had a passion for putting eyeball on glass—visual observing—for decades. In fact, my "gateway drug" to the AAVSO (and to this day my favorite type of variable observation) was solar observing. While in graduate school I met the unique personality who was Casper Hossfield at Stellafane one year, displaying his famous Hossfield pyramid solar projection system. He easily convinced me to buy a solar filter for my 6-inch SCT and the rest, as they say, is history. Stellafane also holds a special place in my heart (as a 30+ year attendee of this

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DIRECTOR'S MESSAGE CONTINUED...

resources, and we enable our astronomers to publish their own results in a peer-review journal. We are an intelligent and enthusiastic workforce that contributes scientific results and actively moves science forward. Quite priceless.

As I write this newsletter piece, I think of what lies ahead—the people we will work with, new challenges we will face, introducing observing and variable star research to the younger generation. I am looking forward to the new science we will produce on known and new variable objects: new observing requests, new phenomena to understand, new alerts, new campaigns. BRIT targets, Gaia alerts, getting ready for LSST, and anticipating PLATO and TESS. And in the middle of the challenge, technology that always changes, new means of communicating results, and our community of members and observers that is as always dynamic and relevant.

A new year is beginning, and I am looking forward to writing a new chapter in the AAVSO's history with you. I wish you and your families a healthy

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and peaceful new year and I hope I will have the opportunity to meet and talk to you in person.

Best wishes—clear skies,
Stella ★

Ed. note: the Spanish language version of Stella's message can be found on page 16.

PRESIDENT'S MESSAGE CONTINUED...

annual convention in Vermont), and as a member of the Springfield Telescope Makers (Stellafane's hosts) I have ground an 8-inch f/5.6 mirror (now mounted in a Newt-Dob) and am now working (albeit slowly) on a 12.5-inch f/4.5 mirror.

Like many observers, I am torn between the comfort of my old favorite objects (such as M 27 and the Double Cluster) and the desire to challenge myself to observe new objects or see old objects in different ways. Why else would I subject myself to a Messier Marathon, for example. Okay, so it was actually three – two attempts abandoned midway through the Virgo Cluster and one successfully completed dusk-to-dawn event yielding 103 objects.

The AAVSO CHOICE courses (<https://www.aavso.org/choice-astronomy>) are an excellent way to expand your observing horizons as it were. I've completed two myself—Developing a Visual Program and Variable Star Classification and Light Curves—and am eager to complete the How to Use VStar course the next time it is offered.

Another resource that I've taken advantage of is the Observing Programs of the Astronomical League. So far I've completed the Messier and Binocular Messier Programs (as well as fulfilled the basic levels of the Meteor Observing and Outreach Programs) and am currently working on the Binocular Double Star and Deep Sky Binocular Programs.

But there is another Astronomical League Binocular Observing Program that is a natural fit for my interests—and hopefully yours—the Binocular Variable Star Program (<https://www.astroleague.org/programs/binocular-variable-star-program>). For although the sun is my favorite variable star, I have completed over 100 visual observations of nighttime variable stars, including over a dozen in the AAVSO Binocular program.

So here is where the New Year's Resolution/Challenge of my title comes in. My New Year's Resolution—and my challenge to any of you who will accept it—is to complete the AL Binocular Variable Star Observing Program before the AAVSO Spring Meeting in St. Louis in May. In fact, I'd like to have my pin in hand

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS

DIRECTOR	Stella Kafka
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The *AAVSO Newsletter* is published in January, April, July, and October. Items of general interest to be considered for the *Newsletter* should be sent to eowaagen@aavso.org. Photos in this issue courtesy of K. Jahaandideh and J. O'Neill.

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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by the meeting so I can proudly wear it alongside my 25-year AAVSO pin. How many of you are also up for the challenge? You only need to contribute a total of 60 observations from 15 different binocular program variables (besides being an AL member). Like any New Year's Resolution, we may require some group reinforcement; I will start a topic in the "Visual Observing" Forum so we can encourage each other and share helpful tips.

I look forward to meeting many of you both virtually on the Forums and in the Chatroom and in person at upcoming meetings. Please do not hesitate to contact me (<https://www.aavso.org/contact>) if you have ideas about how I and the rest of Council can best serve you. Until then, it's time to go count some sunspots! ★

Ed. note: the Spanish language version of Kris's message can be found on page 16.

THE 105TH AAVSO SPRING MEETING

The 105th AAVSO Spring Meeting will be held in St. Louis, Missouri, May 5–7, 2016. The venue will be the Crowne Plaza Hotel in downtown St. Louis and guest rooms have been reserved there at a reduced rate for the use of attendees.



McDonnell planetarium

The theme of this year's meeting is Pulsating Stars, and we expect that only the Saturday afternoon session will be dedicated to general variable star astronomy. Three distinguished astronomers will be our keynote speakers, one on each day. The meeting will begin on Thursday evening with a keynote address by Dr. Horace Smith, Professor Emeritus of Michigan State University and a noted expert on RR Lyrae stars. Friday's schedule includes a keynote address by Dr. Lee Anne Willson, Professor Emerita of Iowa State University and expert theoretician on pulsating variables and a past AAVSO President, a special session on pulsators, and an evening visit to the St. Louis Science Center and Planetarium. Saturday will include the Membership meeting in the morning, and a multi-topic paper and poster session in the afternoon which will feature a keynote address by Dr. Virginia Trimble, Professor of Astronomy at the University of California, Irvine, who specializes in the history of astronomy and in stellar and galactic structure and evolution. The meeting will conclude with a banquet at the hotel on Saturday night.



St. Louis botanical garden



St. Louis at night

If you have never attended an AAVSO meeting before, now is your chance! St. Louis was chosen partly because of its central location (a mere 450 miles from the geographic center of the continental US!) and convenience to a major airport. It is also home to a fantastic science museum with planetarium, two local astronomy organizations, and plenty of interesting things for spouses to see and do.

As with all AAVSO meetings, we are working to ensure a very full program of talks given by both professionals and amateurs with something of relevance for everyone interested in variable stars. It is also a good opportunity for students to gain experience with presentations and mingle with members of the community. If you would like to deliver a talk or display a poster yourself, you will be invited to submit your abstract closer to the time.

The other important feature of all AAVSO meetings is that they provide a perfect opportunity to meet and chat with others who share a similar interest. No one leaves an AAVSO meeting without making new friends, connecting with old ones, finding solutions to observing problems, or becoming inspired with new projects.

We are still working on the program, but plan to post further details along with a preliminary schedule on our website in the next few weeks (<https://www.aavso.org/meetings>). The AAVSO has reserved a number of rooms at the hotel, but if you wish to book yours, please contact the Crowne Plaza Hotel in downtown St. Louis (not the Crowne Plaza at the airport!) at 314-621-8200. Please be sure to mention that you are with the AAVSO Meeting in order to receive our special discounted rate.

Hope to see you there! ★

INTERNATIONAL YEAR OF LIGHT CONTEST WINNERS

We are pleased to announce the AAVSO's International Year of Light 2015 youth contest winners for each category:

Video Jashleen Kaur and Low Mun Shuen from Singapore for their informative and very creative travel video entitled "A Holiday Tour to the Planet Saturn" which cleverly includes facts about the planet and its moons to describe what visitors would see and do on such a trip.

Essay Anwesha Sahu, an Indian national residing in Dar es Salaam, Tanzania, for her thought-provoking essay "A Quantum Thinking: Light from the Cosmos." In her essay, Anwesha ponders questions about the origin of the universe, loop quantum gravity theory, and the relationship between black holes, white holes, and quasars.



Winners of the International Year of Light contest's Drawing and Painting category are the children of the Shiraz, Iran "Society of Students Against Poverty" center. (photo courtesy of Kiyanoush Jahaandideh).

Drawing/Painting The winners of this category are the children of the Shiraz "Society of Students Against Poverty" center in Shiraz, Iran (shown in photo above) who took part in a special art and astronomy workshop. By combining what they learned of both subjects from their instructors, the students created four wonderful paintings depicting stars, planets, spaceflight, and our place in the universe.

All of the winners were announced at the AAVSO Annual Meeting and sent award certificates for their work. To see their entries, please visit <https://www.aavso.org/iyl-youth-contest> ★

ATTENTION ALL CCD USERS

If you are ready to take that next step and learn how to improve your photometry skills and data quality, this video series is for you! Through a series of lectures delivered during the 2014 AAVSO CCD School, by our former Director and renowned photometrist, Dr. Arne Henden, you will learn not only best practices, but the theory behind how everything works.

Some of the topics include:

CCD Camera Selection and Calibration	Filter Systems
CCD Detectors	Transformation
Bias and Dark Current	Statistics
Flat Fielding	

The videos lessons (in streaming form only) are available for individual purchase or as a complete package. AAVSO members will receive a 30% discount.

For more information and the links to access the videos please visit:

<https://www.aavso.org/2014-aavso-ccd-school> ★

1.5 MILLION OBSERVATIONS!

Josch Hamsch (HMB) informed us that he has reached the 1.5 million observations mark in the AAVSO International Database! A remarkable accomplishment—and Director Stella Kafka adds, "Isn't that great?"

Thank you, Josch, and *thank you* to all of our dedicated observers around the world, whatever personal milestone you might achieve. ★

BRINGING AAVSO VOTING INTO THE MODERN ERA

BY RICHARD “DOC” KINNE (KQR)

This year we tried something somewhat radical for the AAVSO, but what could be seen as increasingly mainstream across the board—electronic voting for the 2015–2016 Council ballot.

We had a couple of specific reasons for trying this transition, and they all worked out very well. First, we were interested in seeing if we could increase the number of our voting participants. This ended up working very well. For the last 3 years our average voting participant rate was 217. This year, using the electronic voting method, we had 385 participants, an increase of 44%.

Second, we felt that using electronic voting would end up being a win financially as well. This also proved true. The cost for the electronic voting, up front, was a bit over \$800. While that sounds like a lot of money—and it is!—it has to be realized that just the postage cost today of sending out 1,174 envelopes is \$575. Add in the paper and the envelopes to that, as well as toner, and you come out near to \$800. Then calculate in staff time. It ended up taking a majority of the staff two days to assemble, stuff, stamp, and then post the ballots (which were included with the Annual Meeting announcements). We saved money with the electronic voting.

How was the electronic voting accomplished, then? After reviewing four different outfits, we ended up going with BigPulse based both on research and Doug Welch’s recommendation. We wanted to replicate the paper experience as much as possible, both for the voter and HQ. Toward that end, we created electronic ballots for each official candidate, but also allowed electronic write-ins for the voters. Both our web site, and the voting web site, had biographies of the official candidates.

On the HQ side, we set up the poll so that we could not see who had been voted for, or even who had voted, until the close of the poll. This was actually a bit more restrictive than the paper method—all we could see electronically

was how many votes had come in. With paper ballots, in addition to counting the envelopes to learn how many had voted, we could see, via return address, who had voted (we never recorded that information), but could not see who they voted for (we never paid attention to that when we opened the envelopes; ballots were separated from the envelopes before reading) until the ballots were opened during counting.

One difference and advantage, in my opinion, we had was that we could send “reminders” to vote at times only to those who had not voted, not bothering the people who had. This was very advantageous to us in increasing our voter rates, which was one of the aims of this project. We ended up doing this three times.

On Saturday, 14 November, during the AAVSO Membership Meeting, Elizabeth Waagen, Roger Kolman, Dave Turner, and myself as technician, got together to count the votes. With just a few clicks we had access to the needed data. We could also gain access to how each individual voted, etc. if we needed to (which we did not). The few paper ballots were opened and tallied. The votes were quickly counted, checked, and given to the AAVSO President for verifying and announcing. The entire process took about 10 minutes instead of 30–45 minutes of intense opening, unfolding, reading, recording, totaling, and checking by three tellers.

That was what went right. Did anything go wrong? Not really. I spent a semi-sleepless night wondering what would happen if I pressed a wrong button and deleted all the data before they were counted. There were a couple of concerns from members about security, which were taken very seriously and specifically replied to. Some people were uncomfortable clicking on a link given to them via email. In today’s world that is understandable. The reason BigPulse does this is to provide each voter with simplicity and specificity with their voting ballot. Some thought that sending people an email with a username and password would have been safer, but probably not since, by necessity, these usernames and passwords would have to be randomly generated, difficult to enter in, and still, potentially, could have been intercepted.

In the end we felt that the AAVSO 2015 Election, insofar as the ballots went, was enormously positive and we look forward to repeating the experience during the next election cycle. ★

AN IMPROVED JAAVSO WEB-PRESENCE

Beginning last spring and through most of the past year, the AAVSO staff has restructured the JAAVSO web pages and methods of operation. Here is a summary of what is new and what has been improved.

The JAAVSO web pages

If you scroll down the main AAVSO web page, and click on the large JAAVSO icon on the right, it will take you to the main JAAVSO page (<https://www.aavso.org/apps/jaavso/>).

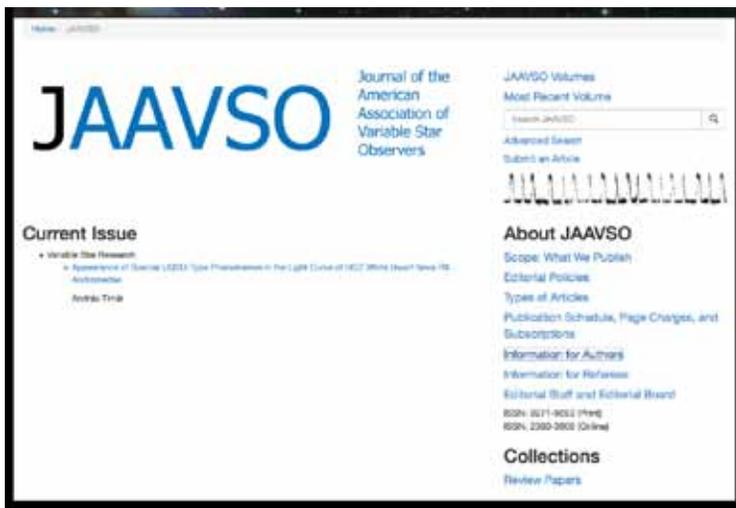
Here you will find a listing of articles that have been accepted, as well as other helpful links:

- Current Issue
- JAAVSO Volumes
- Most Recent Volume
- Search and Advanced Search
- Submit an Article

- Scope: What We Publish
- Editorial Policies
- Types of Articles
- Publication Schedule, Page Charges, and Subscriptions
- Information for Authors
- Information for Referees
- Editorial Staff and Editorial Board
- Collections

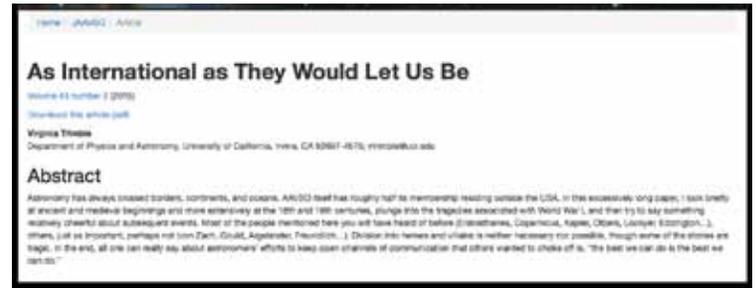
The main JAAVSO page

On the main JAAVSO page, under the large heading “Current Issue,” you can see at a glance, and classified by subject, all the articles that have been accepted for the upcoming JAAVSO issue as of that moment.



The accepted article’s Abstract page

A click on any of the individual articles will show its abstract, and from there you may click on a link to download the article’s pdf.



The JAAVSO Volumes

Once the issue under development has been declared “published,” that listing of accepted papers is moved to make way for the next issue’s accepted papers. The just-published issue can be found by clicking the “Most Recent Volume” or the “JAAVSO Volumes” link near the top of the main JAAVSO page (<https://www.aavso.org/apps/jaavso/volumes/>). All earlier JAAVSO issues may be found at that link as well.



Informational links

Information for contributors and referees, information about the journal, policies, and other helpful matter is now readily accessible from one location through links on the main JAAVSO page.

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NEWS AND ANNOUNCEMENTS

JAAVSO CONTINUED...

The submission procedure

Also changed is the submission procedure. By clicking on the “Submit an Article” link, the contributor is prompted to enter their paper title, abstract, and other information; the author may then upload a copy of their paper.

The screenshot shows a web form titled "Submit an Article to the JAAVSO". It includes fields for "Title", "Abstract", and "Authors" (with a sub-field for "Name" and "Affiliation, Address, and Email"). There is an "Add Another" button for authors. Below the authors section is an "Article" section with a "Browse" button and a note: "IMPORTANT: Please submit your manuscript without identifying details for the author(s) of the paper. (Blind submission process)". There are also fields for "Category" and "Subjects" (with a list of subject codes like 001: AAVSO, 002: AAVSO MEETINGS, etc.). A "Submit" button is at the bottom.

The editorial processes interface

Although not publicly accessible, a major component of the JAAVSO user interface involves the several editorial steps that a submitted paper must go through; preliminary editorial appraisal, referee assignment and contact, referee review, author revisions, final approval, editing, and publication. ★

The screenshot shows the "AAVSO Website Administration" interface. It features a search bar and a table of articles. The table has columns for "Title", "First author", "Volume", "Page", and "Status". The "Status" column is set to "Published".

Title	First author	Volume	Page	Status
Appearance of Special LC30-Type Phenomena in the Light Curves of M22 White Dwarf Nova RR Astronomers	Arshid Tandi	Volume 48.1	899	Published
Variable Stars and Science and Math Education	John S. Hogg	Volume 48.2	119	Published
A Photometric Study of the Misclassified Variable RR Ursae Minors	Horace A. Dea W	Volume 48.2	123	Published
Pulsation Properties of Carbon and Oxygen Red Giants	John S. Hogg	Volume 48.2	128	Published
Observations and Analysis of Three Field RR Lyrae Stars Selected Using Single-epoch SDSS Data	W. Ian Pavell, Jr.	Volume 48.2	125	Published
Investigation of Structure in the Light Curves of a Sample of Newly Discovered Long-Period Variable Stars	Six S. Casse	Volume 48.2	131	Published
Period Analysis, Photometry, and Astrophysical Models of the Eclipsing Binary TR Crvis	David J. W. Morley	Volume 48.2	131	Published
Validation of "Clean Magnitudes for the Brightest Stars" and Suggestions for Observing with Small Telescopes	Anthony Malone	Volume 48.2	138	Published
Discovery of an "Eclipsed" in the WC3d-Type Wolf-Rayet Star WR 52	Reel Sutcliffe	Volume 48.2	144	Published
A Photometric Study of the Eclipsing Variables Star RR5 3066801	Robert C. Braggins	Volume 48.2	181	Published
Early Sixty-Day Observations of V1089 for Using a DSLR Camera	Shahid Durrani	Volume 48.2	177	Published
Studies of RR Taqr1 and RR Variables	John S. Hogg	Volume 48.2	176	Published
Recently Solved Periods for the High Amplitude δ Scuti Stars V1328 Cassiopea, V1430 Scorpion, and V1337 Virgo	Ray Andrew Bellamy	Volume 48.2	187	Published

The screenshot shows the "AAVSO Website Administration" interface for editing an article. It includes fields for "Title", "Volume", "Page", and "Category". There is a "Subjects" section with a list of subject codes and a "Change of" field. A "Remove all" button is at the bottom.

Over the past nine months, under the guidance of Director Stella Kafka, the AAVSO staff contributed many hours of work to develop and write the content contained in this improved JAAVSO user interface; special thanks go to past AAVSO webmaster Will McMain who wrote the extensive computer coding necessary to make all of this run smoothly.

THE ARGELANDER SOCIETY GAINS TWO NEW MEMBERS

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

Friedrich Argelander

Friedrich Wilhelm August Argelander is generally considered the father of variable star astronomy. He was the first astronomer to begin a careful study of variable stars. At the time, only a handful of variables were known, and he was responsible for introducing the modern system of naming them using the capital letters R–Z. It was believed that variability was a rare phenomenon and that this would provide plenty of names for the variables yet to be discovered. In a few years this proved inadequate and the naming system was extended to double letters, and then a numbering system. Today, tens of thousands of variable stars are cataloged, with more being discovered all the time.

The “Argelander Step Method” is a visual method of estimating the magnitude of a variable star. It involves comparing the variable with comparison stars of known constant magnitude, and assigning a step value that reflects the brightness of the variable as distinguished from that of the comparison stars. The magnitude of the variable can then be calculated from the known magnitudes of the comparisons. This is very similar in practice to methods still used today by visual observers of variable stars.

Argelander is probably best known for the Bonner Durchmusterung, the largest and most comprehensive of the pre-photographic star catalogs. He began mapping the exact positions of the stars in the northern sky in 1852, a monumental task before the use of photographic plates. When finally completed in 1863, it listed the positions of 324,198 stars down to ninth magnitude.

The Argelander Society

In 2007, the AAVSO created the Argelander Society to recognize AAVSO supporters who had made significant financial contributions to the organization over a lifetime. Once a benefactor has donated a cumulative total of \$35,000.00 to the AAVSO, they become members of the Argelander Society. As such, they are eligible for a lifetime membership in the organization, free registration to annual meetings, invitations to special events, special awards, and tokens of the association’s appreciation.



John Centala

By 2014 the number of members had grown to 12. They are William B. Albrecht, Marvin E. Baldwin, Charles E. Curry, Margaret Doleman, Clinton B. Ford, Martha L. Hazen, Arne and Linda Henden, E. Dorrit Hoffleit, James Molnar, Theodore H. N. Wales, and Thomas R. Williams.

In December 2015 two benefactors, John Centala and Gary Walker, crossed the \$35,000 threshold and became the latest members of the Argelander Society. John joined the AAVSO in 2002 as a visual observer and has begun CCD observations of relatively bright objects. Gary joined the AAVSO in 1992 as a CCD observer; he was co-chair, and



Friedrich Argelander

then chair, of the CCD Committee 1994–2008. Serving on the AAVSO Council 1993–2001, Gary was President of the AAVSO 1997–1999. In 2005 Gary became Secretary of the AAVSO Council, and this year he begins his second decade of service as Secretary.

I had the chance to interview Gary recently and asked, “You’ve been a member for a long time. Has the change and growth of the AAVSO impacted your view of the importance of giving?”

Gary answered, “The growth of the AAVSO has shown the need for giving. Most organizations can keep the status quo with their income, however just like in business, when you want to expand, outside capital makes things really move. You can’t take it out of the profit, because there is usually not enough of it there.

“I have seen the AAVSO grow from all visual observations submitted on paper, to 100 CCD observations every six months to several hundred observations from dozens of observers each night. This has been aided by WebObs, charts, good sequences, lots of HQ support, and good fortune beyond anything we could have imagined in 1993, when I first became interested in CCD photometry. Many volunteers have contributed greatly, but the money to support HQ provides the glue, the continuity, and the vision to get things coordinated and done correctly.”

Gary continued, “There have been other initiatives into citizen science, but funding AAVSO insures that our mission will continue for another hundred years. While grants will focus attention on certain areas of astrophysics, they tend to go away after a few years, and of course the efforts follow the money, and so things move into the next hot topic, and the old effort drops off the table.”

“Now that we have begun a new year,” I asked, “what are your hopes and vision for the AAVSO going forward?”

“My hope,” said Gary, “is that we can all come together as observers and scientists and spend our efforts understanding variable stars, and not waste our efforts worrying about whether the data was taken visually, or with a CCD, or with the next generation technology. I hope that those who observe visually will continue, and those that observe manually or remotely, with a CCD, will continue with renewed interest, and that we all focus on the science and make their observations scientifically meaningful. And sometimes, we need to realize that we are going fishing here, and we don’t always know what to expect and many discoveries are made by accident or while looking for something entirely different. But most of all, do what you enjoy, and enjoy what you do!”

Thank you for your commitment, your service, and your support of the AAVSO, and welcome to the Argelander Society, John and Gary! ★



Gary Walker

AWARDS AND HONORS FOR 2015

The following awards and honors were announced or presented at the 104th Annual Meeting of the AAVSO on November 14, 2015, Woburn Massachusetts, and at the 104th Spring Meeting of the AAVSO on June 6, 2015:

The *Merit Award* was given to **Richard Berry** "...for his tireless devotion to the support of the amateur digital imaging and photometric communities"



Richard Berry receives the AAVSO Merit Award from Director Stella Kafka and President Kristine Larsen.

The *William Tyler Olcott Award* was given to **Edward F. Guinan** "...for his promotion of variable star research and astronomy education globally...."

Solar Observer Awards were made to **56 solar observers**

50-Year Membership Award was presented to **Mike Mattei** at AAVSO Headquarters in December.

Special Recognition was given to:

James H. Fox "...in grateful recognition of his dedicated service to the AAVSO as Chair of the AAVSO Photoelectric Photometry Committee and Section since 2006...."

Tessa Hiscox of Palmerston North, New Zealand, "...in recognition of her accomplishment as the recipient of a unique Distinction Award for her Astronomy science fair project Star Light Star Bright on UU Muscae at Freyberg High School...."

Carl Knight "...for his contributions as a mentor to Tessa Hiscox, helping her to achieve her goals for her Astronomy science fair project...."

Staff Recognition Awards were presented to **Sara Beck** (25 years) and **Will McMain** (5 years).

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

<https://www.aavso.org/honors-and-awards>

CONGRATULATIONS TO ALL! ★



2015 Annual Meeting attendees

2015 ANNUAL MEETING SCHEDULE

Meeting Schedule for the 104th Annual Meeting of the AAVSO, Woburn, Massachusetts, November 12–14, 2015

Thursday, November 12th

- 8:00 a.m.–6:00 p.m. AAVSO Council Meeting (council members only)
- 5:00 p.m.–5:30 p.m. First-time Attendee Gathering

Friday, November 13th

- 9:00 a.m.–10:15 a.m. **General Paper Session Part Ia**
- 10:15 a.m.–10:25 a.m. **Poster Introductions**
- 10:25 a.m.–10:55 a.m. Coffee Break
- 10:55 a.m.–12:00 p.m. **General Paper Session Part Ib**
- 12:00 p.m.–2:00 p.m. Lunch Break
- 2:00 p.m.–3:20 p.m. **General Paper Session Part IIa**
- 3:20 p.m.–3:50 p.m. Coffee Break
- 3:50 p.m.–5:00 p.m. **General Paper Session Part IIb**

Saturday, November 14th

- 9:00 a.m.–10:30 a.m. **AAVSO Membership Meeting**
- 10:30 a.m.–11:00 a.m. Group Photo and Coffee Break
- 11:00 a.m.–12:00 p.m. **AAVSO Membership Meeting** (continued)
- 12:00 p.m.–2:00 p.m. Lunch Break
- 2:00 p.m.–3:20 p.m. **General Paper Session Part IIIa**
- 3:20 p.m.–3:50 p.m. Coffee Break
- 3:50 p.m.–5:00 p.m. **General Paper Session Part IIIb**
- 6:00 p.m. Cash Bar
- 7:00 p.m. **Special Presentations, Trivia Game, Raffle, and Banquet**

IN MEMORIAM

MEMBERS, OBSERVERS, COLLEAGUES,
AND FRIENDS OF THE AAVSO



James Aldrich

in aeronautics. Jim's astronomical interests were very wide-ranging, and he loved using his favorite 17-inch Planewave telescope for astrophotography. His telescope collection was often in use during public outreach events, and he was in frequent demand as a mentor especially to new telescope or camera owners. In addition to the AAVSO, he was a member of the Springfield (Missouri) Astronomical Society. We extend our deepest condolences to Jim's wife Cindy, family, and friends.

JAMES F. ALDRICH

(AJFA, Walnut Grove, Missouri) died on March 3, 2015, at the age of 62. Jim became an observer for the AAVSO in 2012 and had not yet contributed observations to the AAVSO International Database.

A United States Air Force veteran, his career was in aeronautics. Jim's astronomical interests were very wide-ranging, and he loved using his favorite 17-inch Planewave telescope for astrophotography. His telescope collection was often in use during public outreach events, and he was in frequent demand as a mentor especially to new telescope or camera owners. In addition to the AAVSO, he was a member of the Springfield (Missouri) Astronomical Society. We extend our deepest condolences to Jim's wife Cindy, family, and friends.



Emilia Belserene

From September 1978 through September 1991, Lee was the Director of MMO, as well as the Astronomer of the Maria Mitchell Association (which operates MMO). Continuing the program directed by Margaret Harwood and then Dorrit Hoffleit for decades, under Lee's guidance and direction several undergraduate students worked at MMO each summer, carrying out variable star research, taking and analyzing photographic plates for the ongoing astronomical

EMILIA PISANO BELSERENE

(Port Angeles, Washington) died December 11, 2012, one day before her 90th birthday. An AAVSO member for a number of years, Lee was a close colleague of the AAVSO through her work on Nantucket Island at the Maria Mitchell

Observatory (MMO), which has had a close association with the AAVSO for decades. From September 1978 through September 1991, Lee was the Director of MMO, as well as the Astronomer of the Maria Mitchell Association (which operates MMO). Continuing the program directed by Margaret Harwood and then Dorrit Hoffleit for decades, under Lee's guidance and direction several undergraduate students worked at MMO each summer, carrying out variable star research, taking and analyzing photographic plates for the ongoing astronomical

plate collection, giving public talks, etc. Several of her MMO students gave presentations on their research at AAVSO annual meetings, and published papers in *JAAVSO*. Lee also brought computerized data reduction and direct access to larger mainland astronomical facilities to MMO, overseeing the addition of a new wing at MMO so dedicated, and mentoring her assistants in using these new resources.

A variable star astronomer with a strong mathematical bent, and being interested in pulsating stars—particularly RR Lyr stars in globular clusters—Lee was a specialist in the period analysis of variable stars. Also a skilled computer programmer, she wrote or implemented numerous algorithms for computerized variable star data period analysis that could be used by relatively simple computers, giving access to increased research opportunities to students and amateur astronomers. She discussed period analysis in more than one paper in *JAAVSO* and was always more than willing to answer questions.

After her graduation from Smith College in 1943, she earned her Ph.D. at Columbia University. Her degree research included using the 36-inch refractor at Lick Observatory; *she was the first woman to be assigned observing time on this telescope*. While raising her family in New York City, she did research part-time at Columbia and taught part-time at Hunter College, then taught astronomy and physics full-time at Lehman College before going to MMO.

Lee truly loved the outdoors and all of nature, and she loved to share the excitement and beauty of astronomy – being so close to nature and working with the public and students were aspects of her position at MMO that particularly appealed to her. She described herself as “a professional astronomer with the heart of an amateur.”

After retirement in 1991, Lee continued to be very involved in many ways in her community in Port Angeles long after reducing vision limited (but didn't stop) the hiking and camping she so loved. We extend our sincere sympathy to Lee's daughter Rita, and to her family and friends.



Ian Middelmist

In 1998 he received an AAVSO Observer Award for contributing over 10,000 visual observations. Extremely interested in astronomy from an early age, Ian found a way to observe wherever he was. Ian's son Alastair writes of his father that “his love of astronomy was a passion he took with him everywhere [and he was] always known to be with binoculars or a telescope.” He was particularly interested in variable stars, and they became his main focus. One of Ian's favorite stars was AB Aur, which he observed 572 times over nearly 30 years, catching a very rare eclipse of the then-poorly understood UXOR in the 1970s. Ian and Colin Henshaw founded the North Western Association of Variable Star Observers in 1976 in order to promote variable star observation in that region of the UK. The NWAVSO prospered, and had many participants from Eastern Europe, and became part of the BAAVSS in 1980. In addition to the BAA, Ian was a member of the Manchester Astronomical Society. In his career, he was a Patent Agent; besides astronomy, he enjoyed bird watching and walking. We extend our deepest condolences to Ian's wife and son, family, and friends.

IAN ALASTAIR MIDDLEMIST

(MDI, Stockport, Cheshire, England) died December 25, 2015, at the age of 71 of bowel cancer. Ian submitted 46,309 visual observations to the AAVSO International Database, either directly between 1986 and 2000, or via the BAA database upload in 2014.



Kevin Paxson

An AAVSO member since 2001, Kevin observed visually and used remote telescopes for CCD photometry, mainly observing Miras and cataclysmic variables and contributing 7,781 observations to the AAVSO International Database. His other main passion was ham radio. He was an Amateur Radio Extra Class Licensee.

KEVIN BOYD PAXSON

Kevin Paxson (PKV, Centerville, Ohio) (September 1, 1956–November 7, 2015) passed away after a decade-long battle with melanoma. He was a retired petroleum geologist.

An AAVSO member since 2001, Kevin observed visually

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TALKING AAVSO CONTINUED...

He worked with Aaron Price on the AAVSO 2011 Demographic and Background Survey and generated the worldwide Google Map of AAVSO Members. Kevin organized and reported on the results of the 2012 AAVSO Strategy and Operations Survey. He also conducted, analyzed, and published the results of the AAVSO Professional Survey of 2013.

Kevin served proudly on the AAVSO Council from 2012 to 2014, and was deeply honored to receive

the AAVSO Director's Award in November 2014. He believed in the AAVSO and its mission. Kevin wrote, "My fondest wish is that AAVSO members not merely observe, but serve, lead and contribute tirelessly to our organization. Do more than just submit your observations to the AID."

In recent years, Paxson dove head first into digital archiving, where old observations in the astronomical literature are captured and entered into the AAVSO

AID. Kevin mainly concentrated on pre-1911 archival observations. He digitized and submitted over 107,000 archival observations. He was most proud to have captured all of the observations of omi Cet and khi Cyg going back to their discovery.

Kevin will be profoundly missed by his family and friends.

— obituary courtesy of Mike Simonsen

—Obituaries compiled by Elizabeth O. Waagen

TALKING ABOUT THE AAVSO ELIZABETH O. WAAGEN (WEO), AAVSO HQ

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

July 17, 2015—**Paul Temple** (TPV, Espanola, New Mexico) spoke on the "Central Stars of Planetary Nebula" at the monthly meeting of the East Valley Astronomy Club in Mesa, Arizona. The first 15 minutes was an overview of the AAVSO and what it does, the rest was on his research.

September 18–20, 2015—**Laurent Corp** (CLZ, Rodez, France) gave both oral and poster presentations at the IV International Pro-Am Meeting: Binary and Multiple Stars, held in Vilanova i la Geltru (Spain). His oral presentation was "Why Amateurs Have to Observe Variable Stars," and his poster was "How to Measure the Minimum of Eclipsing Binaries and the Maxima of RR Lyrae."

September 30, 2015—**Kristine Larsen** (LKR, New Britain, Connecticut) gave a live interview with WTIC 1080 AM in Farmington, Connecticut, concerning the discovery of intermittent water features on Mars.

October 24, 2015—**Kristine Larsen** presented a meteorite display and demonstration at the ESPN Family STEAM (Science, Technology, Engineering, Arts, and Math) Fest in Bristol, Connecticut.

October 28, 2015—**Damien Lemay** (LMA, Saint-Anaclet, Quebec, Canada) spoke at the monthly meeting of the Club d'astronomie maskoutain in Saint-Hyacinthe, Quebec, Canada.

October 29, 2015—**Damien Lemay** spoke at the monthly meeting of the Club d'astronomie de Drummondville, Quebec.

October 30, 2015—**Kristine Larsen** gave a live interview with WATR 1320 AM in Waterbury, Connecticut, concerning space debris.

November 6, 2015—**Kristine Larsen** gave a talk on "Medieval Computing: The Astrolabe's Contributions to Science and Religion" at the Geological Sciences Brown Bag Lunch Series, Central Connecticut State University, New Britain, Connecticut.

November 7, 2015—**Damien Lemay** Annual General Meeting of the New Brunswick Center of the RASC, at Mt-Allison U.

November 14, 2015—**Damien Lemay** gave a talk at the 18th CCD Colloquium of the Fédération des Astronomes Amateurs du Quebec, in Montreal, Quebec, Canada. He spoke specifically about the use of the CCD camera for variable star observing and where/how to report observations. Damien has been asked to make a video of his presentation; it will be made available on the web.

November 18, 2015—**Kristine Larsen** gave a public talk titled "New Discoveries in Our Solar System (and Others)" at the Simsbury Public Library, Simsbury, Connecticut.

December 17, 2015—**Kristine Larsen** gave a taped interview with WTIC 1080 AM in Farmington, Connecticut, concerning the Winter Solstice and a related special planetarium event.

January 16, 2016—**Chris Stephan** (SET, Loudonville, Ohio) will give a talk on "How to Select a Telescope" at the 2016 Winter Sky Festival, held at the Buehler Planetarium at Seminole State College in Sanford, Florida. This event is for the public and beginning amateur astronomers.

February 10, 2016—**Barbara G. Harris** (HBB, New Smyrna Beach, Florida) will speak on "Science with your DSLR Camera: Variable Star Photometry" to her astronomy club, the Central Florida Astronomical Society. The meeting time is 7 p.m. at the Emil Buehler Planetarium at Seminole College Sanford/Lake Mary Branch, 100 Weldon Blvd., Sanford, Florida.

March 3, 2016—**Gary Poyner** (PYG, Birmingham, England) will speak on "Historic Novae" at the Mexborough and Swinton Astronomical Society, South Yorkshire, England.

March 5, 2016—**Gary Poyner** will speak on the "BAA Variable Star Section and an Introduction to observing Variable Stars" at the BAA Back to Basics meeting, Cheltenham, Gloucestershire, England.

May 10, 2016—**Gary Poyner** will speak on "Historic Novae" at the Leicester Astronomical Society, Leicester Space Centre, East Midlands, England.

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TALKING AAVSO CONTINUED...

May 12, 2016—**Gary Poyner** will speak on “Historic Novae” at the Worcester Astronomical Society, Worcestershire, England.

June 13, 2016—**Gary Poyner** (PYG, Birmingham, UK) will give an “Introduction to Variable Star Observing” to the Wolverhampton Astronomical Society, West Midlands, England. As past President of this Society, Gary says he has visited many times to give talks—“all Variable Star related of course.”

October 6, 2016—**Gary Poyner** will speak on “Historic Novae” at the Rugby Astronomical Society, Worcestershire, England.

Our Director, **Dr. Stella Kafka** (KKS, Cambridge, Massachusetts), has been very busy this past quarter with speaking engagements (in addition to her presentations at the AAVSO Annual meeting, of course)! Stella’s recent presentations include:

October 2015

“Research with the AAVSO”, Workshop on Student Astronomical Research, Institute for Student Astronomical Research and the Collins Educational Foundation

“Student Research with the AAVSO”, Rooftop Variables Meeting, Columbia University

“Variable Stars and their Stories”, Public talk, Columbia University

“AAVSO engaging students in Astronomical Research”, Skype presentation for Commanche Springs Observatory—Three Rivers Foundation for Arts and Sciences

November 2015

“The AAVSO as a resource for Research”, Skype Presentation at the annual Conference of Variable Star and Exoplanets of the Czech Astronomical Society, link: <https://www.youtube.com/watch?v=Sz52do4M9iQ>

December 2015

“Discussing the Elusive Progenitors of SNeIa”, Amateur Telescope Makers of Boston (ATMOB) talk, Cambridge, Massachusetts

“Variable Stars” (presented in Greek), Athens Planetarium event in celebration of the 170th anniversary of the Observatory of Athens’ Newall Telescope

Other outreach—For over nine years, **Lew Cook** (COO, Concord, California) has written a monthly astronomy column called “Stars over Ka’u” for the Ka’u Calendar newspaper, where his house was located in Hawaii. He lived in Pahala—the same little town that **Bill Albrecht** (AB) lived in. The January 2016 article (on page 12 of the issue) can be found online at <http://www.kauacalendar.com/>.

Several of our members and observers are authors or co-authors of papers on variable star-related subjects. Thank you for your research and its publication, demonstrating the importance of variable star observing by amateur astronomers and their valuable contributions to the field of variable star astronomy.

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 2016 *AAVSO Newsletter* (submission deadline March 15, 2016). Many thanks for your education and outreach efforts on behalf of the AAVSO and variable star observing! ★

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 2015 September 24 through 2016 January 15 on the arXiv.org preprint server and used AAVSO data or resources and/or acknowledged the AAVSO. To access these articles, click on the highlighted link or type the preprint number into the “Search or Article-id” box at <http://www.arXiv.org>.

Beginning with this issue, the articles are divided by AAVSO resource used.

Publications using the AAVSO International Database (AID)

M. Wittkowski, A. Chiavassa, B. Freytag et al., “Near-infrared spectro-interferometry of Mira variables and comparisons to 1D dynamic model atmospheres and 3D convection simulations” (arXiv:1601.02368)[Jan 11, 2016]

Josep Martí, Pedro L. Luque-Escamilla, and María T. García-Hernández, “Multi-colour optical photometry of V404 Cygni in outburst” (arXiv:1601.01941)[Jan 8, 2016] (also used APASS)

Y. T. Tanaka, R. Itoh, M. Uemura et al., “No Evidence of Intrinsic Optical/Near-Infrared Linear Polarization for V404 Cygni During its Bright Outburst in 2015: Broadband Modeling and Constraint on Jet Parameters” (arXiv:1601.01312) [Jan 6, 2016]

Joseph E. Rodriguez, Keivan G. Stassun, Michael B. Lund et al., “An Extreme Analogue of ϵ Aurigae: An M-giant Eclipsed Every 69 Years by a Large Opaque Disk Surrounding a Small Hot Source” (arXiv:1601.00135)[Jan 2, 2016] (also used APASS)

E. de Miguel, J. Patterson, D. Cejudo et al., “Accretion-disc precession in UX Ursae Majoris” (arXiv:1512.08687)[Dec 29, 2015] (also used APASS)

Taichi Kato, Elena P. Pavlenko, Alisa V. Shchurova et al., “V1006 Cygni: Dwarf Nova Showing Three Types of Outbursts and Simulating Some Features of the WZ Sge-Type Behavior” (arXiv:1512.05459)[Dec 17, 2015]

Bruce Margon, J. Xavier Prochaska, Nicolas Tejos et al., “The Bright Symbiotic Mira EF Aquilae” (arXiv:1512.04075)[Dec 13, 2015]

Joseph E. Rodriguez, Phillip A. Reed, Robert J. Siverd et al., “Recurring Occultations of RW Aurigae by Coagulated Dust in the Tidally Disrupted Circumstellar Disk” (arXiv:1512.03745)[Dec 11, 2015]

R. Hounsell, M. J. Darnley, M. F. Bode et al., “Nova light curves from the Solar Mass Ejection Imager (SMEI) - II. The extended catalog” (arXiv:1512.03321) [Dec 10, 2015]

Laurits Leedj arv, Rudolf G alis, Ladislav Hric et al., “Spectroscopic view on the outburst activity of the symbiotic binary AG Draconis” (arXiv:1512.03209) [Dec 10, 2015]

Franz-Josef Hamsch, Stefan H ummerich, Klaus Bernhard and Sebasti an Otero, “New Photometric Observations and the 2015 Eclipse of the Symbiotic Nova Candidate ASAS J174600-2321.3” (arXiv:1512.01467)[Dec 4, 2015]

D. J. Armstrong, J. Kirk, K. W. F. Lam et al., “K2 Variable Catalogue II: Machine Learning Classification of Variable Stars and Eclipsing Binaries in K2 Fields 0-4” (arXiv:1512.01246)[Dec 3, 2015]

E. Benitez, J.I. Cabrera, N. Fraija et al., “An eclipsing binary black hole candidate system in the blazar Mrk 421” (arXiv:1512.01219)[Dec 3, 2015]

Corinne Rossi, Flavia Dell’Agli, Andrea Di Paola et al., “The variable V381 Lac and its possible connection with the R CrB phenomenon” (arXiv:1512.0146) [Dec 1, 2015]

Kateryna D. Andrych, Ivan L Andronov, Lidia L. Chinarova et al., “Asymptotic Parabola’ Fits for Smoothing Generally Asymmetric Light Curves” (arXiv:1512.00065) [Nov 30, 2015]

Vladyslava I. Marsakova, Ivan L. Andronov, Lidia L. Chinarova et al., “Impact of Pulsation Activity on the Light Curves of Symbiotic Variables” (arXiv:1511.09385) [Nov 30, 2015]

D. Tasselli, “New CCD Photometry Study of RV UMa” (arXiv:1511.08457) [Nov 26, 2015] (also used V SX)

M. Kennedy, P. M. Garnavich, P. J. Callanan et al., “The Evolved Main-Sequence Channel: HST and LBT observations of CSS120422:111127+571239” (arXiv:1511.07439)[Nov 23, 2015]

Izumi Hachisu, Mariko Kato, “Light Curve Analysis of Neon Novae” (arXiv:1511.06819)[Nov 21, 2015]

Mariko Kimura, Taichi Kato, Akira Imada et al., “Unexpected Superoutburst and Rebrightening of AL Comae Berenices in 2015” (arXiv:1511.06596)[Nov 20, 2015]

Mike Watson, Alastair Bruce, Chelsea MacLeod et al., “The nature of the cataclysmic variable PT Per” (arXiv:1511.05726)[Nov 18, 2015]

P. Kervella, E. Lagarde, M. Montarg es et al., “The close circumstellar environment of Betelgeuse - III. SPHERE/ZIMPOL visible polarimetry of the inner envelope and photosphere” (arXiv:1511.04451)[Nov 13, 2015]

S. Uttenthaler, R. Greimel, and M. Templeton, “Is the semi-regular variable RU Vulpeculae undergoing a helium-shell flash?” (arXiv:1511.03224)[Nov 10, 2015]

S. Uttenthaler, S. Meingast, T. Lebzelter et al., “LX Cygni: A carbon star is born” (arXiv:1511.02159)[Nov 6, 2015]

P. C. Schneider, H. M. G unther, J. Robrade et al., “The nature of the 2014-2015 dim state of RW Aur revealed by X-ray, optical, and NIR observations” (arXiv:1511.01688)[Nov 5, 2015]

Paul N. Stewart, Peter G. Tuthill, Philip D. Nicholson et al., “An atlas of bright star spectra in the near infrared from Cassini-VIMS” (arXiv:1511.01670)[Nov 5, 2015]

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SCIENCE SUMMARY CONTINUED...

Ori D. Fox, Joel Johansson, Mansi Kasliwal et al., “An Excess of Mid-Infrared Emission from the Type Ia SN 2014dt” (arXiv:1510.08070)[Oct 27, 2015]

Se-Hyung Cho, Jaehoon Kim, and Youngjoo Yun, “KVN Monitoring Observations toward the Recent Outburst Symbiotic Star V407 Cygni” (arXiv:1510.07387) [Oct 26, 2015]

Jennifer H. S. Weston, J. L. Sokoloski, Laura Chomiuk et al., “Shock-powered radio emission from V5589 Sagittarii (Nova Sgr 2012 #1)” (arXiv:1510.06751) [Oct 22, 2015]

D. P. K. Banerjee, Mudit K. Srivastava, N. M. Ashok and V. Venkataraman, “Near Infrared studies of the carbon-monoxide and dust forming nova V5668 Sgr” (arXiv:1510.04539)[Oct 15, 2015]

Publications using the AAVSO Photometric All-Sky Survey (APASS)

M.A. Corti, G.L. Baume, J.A. Panei et al., “The embedded clusters DBS 77, 78, 102, and 160-161 and their link with the interstellar medium” (arXiv:1601.02718) [Jan 12, 2016]

R. Raddi, S. Catalan, B. T. Gaensicke et al., “A search for white dwarfs in the Galactic plane: the field and the open cluster population” (arXiv:1601.02019) [Jan 8, 2016]

Josep Martí, Pedro L. Luque-Escamilla, and María T. García-Hernández, “Multi-colour optical photometry of V404 Cygni in outburst” (arXiv:1601.01941)[Jan 8, 2016] (also used AID)

Joseph E. Rodriguez, Keivan G. Stassun, Michael B. Lund et al., “An Extreme Analogue of ϵ Aurigae: An M-giant Eclipsed Every 69 Years by a Large Opaque Disk Surrounding a Small Hot Source” (arXiv:1601.00135)[Jan 2, 2016] (also used AID)

E. de Miguel, J. Patterson, D. Cejudo et al., “Accretion-disc precession in UX Ursae Majoris” (arXiv:1512.08687)[Dec 29, 2015] (also used AID)

Dongwon Kim, Helmut Jerjen, Dougal Mackey et al., “Kim 3: an Ultra-faint Star Cluster in the Constellation of Centaurus” (arXiv:1512.03530)[Dec 11, 2015]

Daniel Huber, Stephen T. Bryson, Michael R. Haas et al., “The K2 Ecliptic Plane Input Catalog (EPIC) and Stellar Classifications of 119,000 Targets in Campaigns 1-7” (arXiv:1512.02643)[Dec 8, 2015]

Andrew W. Mann, Eric Gaidos, Gregory N. Mace et al., “Zodiacal Exoplanets In Time (ZEIT) I: A Neptune-sized planet orbiting an M4.5 dwarf in the Hyades Star Cluster” (arXiv:1512.00483)[Dec 1, 2015]

Adam Rubin, Avishay Gal-Yam, Annalisa De Cia et al., “Type II supernova energetics and comparison of light curves to shock-cooling models” (arXiv:1512.00733) [Nov 30, 2015]

Evan Sinukoff, Andrew W. Howard, Erik A. Petigura et al., “Ten Multi-planet Systems from K2 Campaigns 1 & 2 and the Masses of Two Hot Super-Earths” (arXiv:1511.09213)[Nov 30, 2015]

S. Ciceri, L. Mancini, T. Henning et al., “HATS-15 b and HATS-16 b: Two massive planets transiting old G dwarf stars” (arXiv:1511.06305)[Nov 19, 2015]

D. J. Armstrong, C. E. Pugh, A.-M. Broomhall et al., “The Host Stars of Keplers Habitable Exoplanets: Superflares, Rotation and Activity” (arXiv:1511.05306) [Nov 17, 2015]

Vasily Belokurov and Sergey Koposov, “Stellar streams around the Magellanic Clouds” (arXiv:1511.03667)[Nov 11, 2015]

Giovanni Carraro, Anton F. Seleznev, Gustavo L. Baume et al., “The complex stellar populations in the lines of sight to open clusters in the third Galactic quadrant” (arXiv:1511.03182)[Nov 10, 2015]

S. Valenti, D.J. Sand, A. J. Barth et al., “Robotic Reverberation Mapping of Arp 151” (arXiv:1510.07329)[Oct 26, 2015]

Quan-Zhi Ye, Peter G. Brown, Charles Bell et al., “Bangs and Meteors from the Quiet Comet 15P/Finlay” (arXiv:1510.06645)[Oct 22, 2015]

M. Hackstein, M. Haas, Á. Kóspál et al., “Light curves of the latest FUor: Indication of a close binary” (arXiv:1510.06612)[Oct 22, 2015]

R. Brahm, A. Jordán, G. Á. Bakos et al., “HATS-17b: A Transiting Compact Warm Jupiter in a 16.3 Days Circular Orbit” (arXiv:1510.05758)[Oct 20, 2015]

Myungshin Im, Changsu Choi, Sung-Chul Yoon et al., “The Very Early Light Curve of SN 2015F in NGC 2442: A Possible Detection of Shock-Heated Cooling Emission and Constraints on SN Ia Progenitor System” (arXiv:1510.02084) [Oct 7, 2015]

AAVSONet data Noel D. Richardson, Anthony F. J. Moffat, Raphaël Maltais-Tariant et al., “Spectroscopy, MOST Photometry, and Interferometry of MWC 314: Is it an LBV or an interacting binary?” (arXiv:1510.00324)[Oct 1, 2015]

Joseph E. Rodriguez, Knicole D. Colon, Keivan G. Stassun et al., “KELT-14b and KELT-15b: An Independent Discovery of WASP-122b and a New Hot Jupiter” (arXiv:1509.08953)[Sep 29, 2015]

Guillermo Torres, Claud H. Sandberg Lacy, Kresimir Pavlovski et al., “Absolute dimensions of the metallic-line eclipsing binary V501 Monocerotis” (arXiv:1509.07873) [Sep 25, 2015]

Publications using the International Variable Star Index (VSX)

J. Liska, M. Skarka, P. Hajkova, R. F. Auer, “RR Lyrae stars in eclipsing systems - historical candidates” (arXiv:1601.03082)[Jan 12, 2016]

K. Bernhard, S. Huemmerich, E. Paunzen, “Magnetic, chemically peculiar (CP2) stars in the SuperWASP survey” (arXiv:1512.03875)[Dec 12, 2015]

Riccardo Furgoni, “Seventeen New Variable Stars Detected in Vulpecula and Perseus” (arXiv:1512.03014)[Dec 9, 2015]

D. Tasselli, “New CCD Photometry Study of RV UMa” (arXiv:1511.08457) [Nov 26, 2015] (also used AID)

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SCIENCE SUMMARY CONTINUED...

Gang Li and Jianning Fu and Xuanming Liu, “Variable stars observed with the AST3-1 telescope from dome A of Antarctica” (arXiv:1510.06134)[Oct 21, 2015]

D.Tasselli, “New CCD Photometric Study of AM Cnc” (arXiv:1510.02837) [Oct 9, 2015]

P. Klagyivik, Sz. Csizmadia, T. Pasternacki et al., “The Berlin Exoplanet Search Telescope II Catalog of Variable Stars. II. Characterization of the CoRoT SRc02 field” (arXiv:1510.01936)[Oct 7, 2015]

Publications using other AAVSO resources

AAVSO Special Notices

N. G. Kantharia, Prasun Dutta, Nirupam Roy et al., “Insights into the evolution of symbiotic recurrent novae from radio synchrotron emission: V745 Scorpii and RS Ophiuchi” (arXiv:1510.02203)[Oct 8, 2015]

AAVSO American Sunspot Numbers (Ra)

J.O. Stenflo, “Transition of the Sunspot Number from Zurich to Brussels in 1980: A Personal Perspective” (arXiv:1512.06229)[Dec 19, 2015]

AAVSO member(s) among authors

R.E. Mennickent, S. Otero and Z. Kolaczowski, “Interacting binaries W Serpentids and Double Periodic Variables” (arXiv:1510.05628)[Oct 19, 2015]

Richard W. Schmude Jr., Ronald E. Baker, Jim Fox et al., “Large Brightness Variations of Uranus at Red and Near-IR Wavelengths” (arXiv:1510.04175) [Oct 14, 2015]

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. ★

Ed. note: following are the Spanish language texts of the Director's and President's messages.

MENSAJE DEL DIRECTOR

STELLA KAFKA

Resumen del año

Al hacer el balance de otro año en la AAVSO, contemplo nuestros logros con orgullo. Nuestro viaje comenzó combatiendo un duro invierno en Boston y, al mismo tiempo, planeando un nuevo año con el foco puesto en mejorar nuestros servicios e involucrar a una comunidad más grande en nuestras actividades.

La AAVSO es una familia de gente que trabaja para entender algunos de los fenómenos más dinámicos del universo. Es un organismo vivo de observadores, miembros y voluntarios que, con el apoyo del staff de HQ, desafían los límites de la ciencia, haciendo posible que todos participen activamente en el descubrimiento científico. Podrán leer detalles de nuestros logros en el reporte anual de este año. Una mirada es suficiente para reconocer todo el trabajo en equipo y la pasión que se puso en alcanzar las metas de este año.

Comenzamos uniéndonos al Año Internacional de la Luz y, como parte del mismo, invitamos a nuestros observadores a compartir con nosotros su entusiasmo y motivación en estudiar el cielo nocturno. Recibimos contribuciones de jóvenes astrónomos de todas partes del mundo, que expresaron su fascinación con la astronomía a través del arte y la música. Probamos las aguas de la astro-ciencia con alumnos de secundaria, motivándolos a usar datos de AAVSO y a presentar proyectos científicos sobre estrellas variables en competencias nacionales e internacionales. En el proceso encontramos grupos de jóvenes sedientos de aprender acerca de las estrellas variables, involucrarse en observaciones astronómicas y contribuir con sus datos propios a nuestra base de datos. También nos acercamos a nuevos grupos de astrónomos profesionales que necesitaban datos para sus proyectos y que aún no conocían el poder de nuestro colectivo de observadores y el valor de nuestra base de datos para sus investigaciones.

Nuestros encuentros son el medio para que nuestros miembros construyan nuevas colaboraciones, presenten sus resultados, proyecten campañas y hablen sobre objetos interesantes. Nuestro journal es un canal

para que la comunidad científica ciudadana comparta nuevos resultados. Nuestra nueva herramienta de miembros permite que nuestros miembros de todo el mundo puedan conectarse y facilita las colaboraciones en el seno de nuestra comunidad. En un tiempo en que las nuevas tecnologías marcan nuestra forma de comunicarnos y de presentar los datos, estamos canalizando nuestros recursos en actualizar nuestros servicios, modernizar nuestro modo de operación y volvernos más y más relevantes para los observadores e investigadores alrededor del mundo.

Ya que el dominio del tiempo será dominante en la escena científico-astronómica por el próximo par de décadas, es obvio que vamos a convertirnos en un recurso aún más precioso para los investigadores de todas partes. Aún más, somos la única asociación científica del mundo que lo hace todo: proveemos datos, ofrecemos entrenamiento a los investigadores (profesionales o no), ofrecemos tutorías activas, generamos investigadores, proveemos nuestros propios recursos de análisis y reducción de datos, y permitimos que nuestros astrónomos publiquen sus resultados en un journal con revisión por pares. Somos una fuerza de trabajo inteligente y entusiasta que contribuye con resultados científicos y activamente empuja la ciencia hacia adelante. Impagable.

Al momento que escribo este artículo, pienso en lo que se viene: la gente con la que trabajaremos, los nuevos desafíos que enfrentaremos, presentándoles la observación y la investigación de estrellas variables a la próxima generación. Espero con ansias la nueva ciencia que produciremos acerca de objetos variables nuevos y conocidos, nuevos pedidos de observaciones, nuevos fenómenos por entender, nuevas alertas, nuevas campañas. Objetivos de BRITE, alertas de Gaia, preparativos para el LSST y anticiparnos a PLATO y a TESS. Y en medio del desafío, la tecnología que siempre cambia, nuevas formas de comunicar los resultados, y nuestra comunidad de miembros que es, como siempre, dinámica y relevante.

Un nuevo año está comenzando y espero escribir con ustedes un nuevo capítulo en la historia de la AAVSO. Les deseo un Año Nuevo con salud y paz a todos ustedes y a sus familias y espero tener la oportunidad de que nos encontremos en persona y charlemos.

Saludos y cielos claros,
Stella ★

MENSAJE DEL PRESIDENTE

KRISTINE LARSEN

Una nueva Presidente y la resolución/el desafío de un nuevo año

Primero que nada, deseo expresar un agradecimiento personal al Consejo por permitirme el honor de servir a esta organización como Presidente. Soy miembro de AAVSO desde hace 25 años y creo firmemente que es una de las organizaciones de mayor calidad de las que he tenido el placer de estar afiliada.

Para aquellos de ustedes que no me conocen personalmente, soy profesora de astronomía en la Universidad Central Connecticut State. Más allá del hecho que mi tesis fue en los esotéricos campos de los agujeros negros y la cosmología inflacionaria, tengo la pasión, desde hace décadas, de poner el ojo en el vidrio (observación visual). De hecho, mi “droga de entrada” a la AAVSO (y hasta hoy mi tipo favorito de observación de variables) fue la observación solar. Mientras cursaba mi carrera de grado conocí, un año en Stellafane, a esa personalidad única que fue Casper Hossfield, desplegando su famoso sistema de proyección solar: la pirámide Hossfield. El me convenció, fácilmente, que comprase un filtro solar para mi telescopio Schmidt-Cassegrain de 6 pulgadas (15 cm) y el resto, como él dice, es historia. Stellafane también tiene un lugar especial en mi corazón (como una participante de más 30 de sus convenciones anuales en Vermont), y como miembro de la asociación de constructores de telescopios de Springfield (anfitriona de Stellafane) tallé un espejo de 8 pulgadas (20 cm) f/5,6 (montado ahora en un Newton-Dobsonian) y estoy trabajando ahora (aunque despacio) en un espejo de 12,5 pulgadas (32 cm) f/4,5.

Como muchos observadores, me divido entre el confort de mis viejos objetos favoritos (tales como M 27 y el Cúmulo Doble) y el deseo de auto-desafío al observar nuevos objetos o ver a los viejos de diferentes maneras. Por qué entonces no someterme a una Maratón Messier, por ejemplo. Bien, realmente participé en tres: dos intentos fueron abandonados a mitad camino a través del Cúmulo de Virgo y uno fue completado exitosamente en el evento desde el anochecer al amanecer cuando completé 103 objetos.

Los curso AAVSO CHOICE (<https://www.aavso.org/choice-astronomy>) son un excelente medio para expandir sus horizontes observacionales de modo que completé dos de esos cursos: Desarrollando un programa de observación visual y Clasificación de estrellas variables y curvas de luz, y estoy ansiosa

CONTINUED ON NEXT PAGE

MENSAJE DEL PRESIDENTE CONTINUED...

por realizar el curso Cómo usar VStar la próxima vez que se ofrezca.

Otros recursos que trato de aprovechar son los Programas de Observación de la Astronomical League. Hasta ahora completé los Programas Messier y Binocular Messier (así como completé los niveles básicos de los Programas de Observación de Meteoros y Extensión) y estoy actualmente trabajando en los Programas de Estrellas Dobles con Binoculares y Cielo Profundo con Binoculares.

Pero hay otro de los programas para observación con binoculares de la Astronomical League que es un de un interés natural para mi y seguramente para ustedes: el Programa de Estrellas Variables con Binoculares (<https://www.astroleague.org/programs/binocular-variable-star-program>). Más allá de que el Sol es mi estrella variable favorita, he completado más de 100 observaciones visuales

de estrellas variables nocturnas, incluso más de una docena del programa AAVSO Binocular.

Aquí es donde entra el título de esta columna: la resolución/el desafío de un nuevo año. Mi resolución del nuevo años (y mi desafío para aquellos de ustedes que lo acepten) es completar el Programa de Observación de Estrellas Variables con Binoculares de la AL antes del Encuentro de Primavera de AAVSO en St. Louis en mayo próximo. De hecho, deseo tener mi pin en manos para el Encuentro así podré lucirlo orgullosa junto al de mis 25 años de miembro de AAVSO. ¿Cuántos de ustedes aceptan también este desafío? Sólo necesitan contribuir con un total de 60 observaciones de 15 variables diferentes del programa con binoculares (además de ser miembro de la AL). Como toda resolución de año nuevo, deberá requerir algún refuerzo grupal, voy a iniciar un tópico en el foro “Visual Observing” (observación visual) así podremos animarnos entre todos y compartir asuntos que nos ayuden en nuestro desafío.

Espero encontrarme con muchos de ustedes tanto virtualmente en los Foros o en el Chatroom como en persona en los próximos Encuentros. Por favor, no duden en contactarme (<https://www.aavso.org/contact>) si tienen ideas acerca de cómo tanto yo como el resto del Consejo podemos servirle mejor. Hasta allí, ¡es hora de ir a contar algunas manchas solares! ★

A NOTE ON THE TRANSLATIONS

We are grateful to Sebastián 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.

AG PEG OUTBURST OBSERVING CAMPAIGN

GAVIN RAMSAY (ARMAGH OBSERVATORY, NORTHERN IRELAND); G. JUAN M. LUNA (INSTITUTE OF ASTRONOMY AND SPACE PHYSICS (IAFE), CONSEJO NACIONAL DE INVESTIGACIONES CIENTÍFICAS Y TÉCNICAS (CONICET) AND UNIVERSIDAD DE BUENOS AIRES, ARGENTINA); NATALIA NUNEZ (INSTITUTE FOR EARTH AND SPACE SCIENCES (ICATE), CONICET, ARGENTINA); AND JENO SOKOLOSKI (COLUMBIA UNIVERSITY, NEW YORK CITY)

In *AAVSO Alert Notice 521* the AAVSO requested observations of the symbiotic nova AG Peg, which had gone into optical outburst for the first time since an eruption which took place in the last 4 decades of the 19th century. The effects of the previous eruption were long lasting since AG Peg took many decades to return to quiescence.

This current outburst has been well studied by AAVSO observers and the accompanying figure shows its light curve from late June to December 2015. It took less than two weeks to brighten from ~ 8.7 mag to nearly ~ 7 mag, after which it declined to ~ 8 mag. However, in early Oct, AG Peg exhibited a re-brightening event, reaching ~ 7.5 mag over the next few weeks after which it declined in brightness (Figures 1 and 2).

The term “Symbiotic” Binaries covers a diverse group of objects, but essentially they are composed of a compact star (generally a white dwarf, but sometimes a neutron star) orbiting together with a red giant star on a timescale of roughly a year to many years. The signature of the orbital period can be seen in the light curve, as can pulsations from the giant star and variations in the amount of material which is channeled onto the compact star from the wind from the giant star or an accretion disk. They have a wider significance, since some fraction of symbiotic binaries are thought to produce supernovae Ia outbursts, which are used as cosmological probes.

We were successful in obtaining observations made using NASA’s Swift satellite which started just before AG Peg reached maximum brightness. Our goal was to determine how the X-ray flux varied over the course of the outburst which would give us insight to the physical processes occurring in the system. Unlike some cataclysmic variables where the X-ray flux appears to be suppressed during an optical outburst, AG Peg shows stronger X-ray emission (most of which is soft X-rays) during maximum optical brightness. As we were initially obtaining X-ray measurements every day we were able to detect highly variable X-ray emission on a day timescale which may indicate that material in the system (perhaps from the red giant wind) was very patchy. As the system went into its rebrightening event, the X-rays appeared to be depressed but gradually reappeared as the optical flux declined. A paper is being prepared and will be submitted to the *Monthly Notices of the Royal Astronomical Society*.

We thank the many amateur astronomers (including many AAVSO members) for their observations and NASA’s Swift team for scheduling our requests for observations. It is an excellent example of amateur and professional astronomers working together. AG Peg will get too close to the Sun to observe by the end of 2015 but will become visible in the morning sky in April. We encourage AAVSO members to observe AG Peg when it re-emerges in the Spring sky. ★

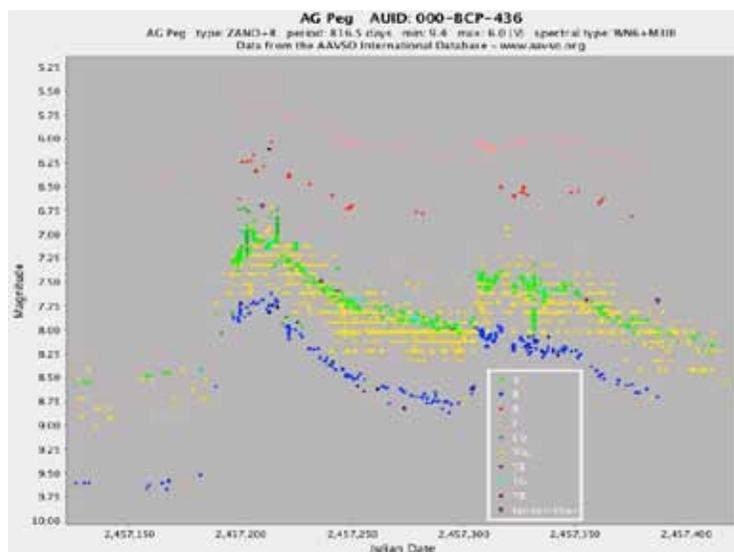


Figure 1. AAVSO multicolor light curve of AG Peg, April 2013-January 2016. 123 observers worldwide contributed 2,608 observations to this light curve.

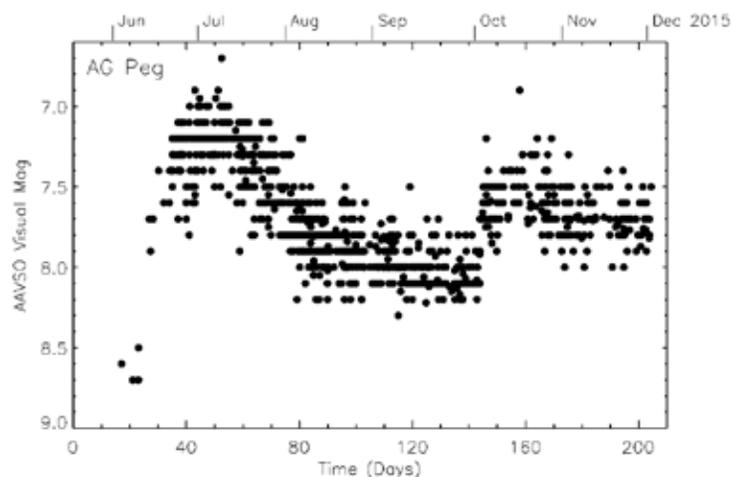


Figure 2. AAVSO visual observations of AG Peg for the first 200 days post-outburst. 87 visual observers worldwide contributed 1,189 observations to this light curve.

V5668 SGR (NOVA SGR 2015 NO. 2) CAMPAIGN—BRIEF REPORT OF HST OBSERVATIONS

PAUL KUIN, MULLARD SPACE SCIENCE LABORATORY OF
THE UNIVERSITY COLLEGE LONDON

AAVSO Alert Notice 533 requested ground-based optical observations of V5668 Sgr (Nova Sgr 2015 No. 2) from the AAVSO in support of scheduled HST observations. Here is a report from the Principal Investigator, Dr. Paul Kuin, originally posted with Figure 2 on 2015 November 11 to the AAVSO Forum on Campaigns and Observation Reports.

Thanks to the support from ground observations (Figure 1) as well as ongoing monitoring by the Swift UVOT, the nova was successfully observed by the STIS spectrograph on board the Hubble Space Telescope.

The nova is currently just a bit too bright for normal observations with Swift. It is too bright for normal aperture photometry as the image of the nova itself is too bright to be measured. However, the image is read out while the telescope keeps feeding photons to the detector while it is shifting the image off the CCD to the readout area. This means that for such a bright source the UVOT shows a line through the source from those photons collected during the readout of the CCD, and that has been calibrated. This was used to get UV magnitudes to monitor the UV. However, if the nova had become any brighter, we would not have been able to follow that, so for safety reasons we needed ground-based data as well.

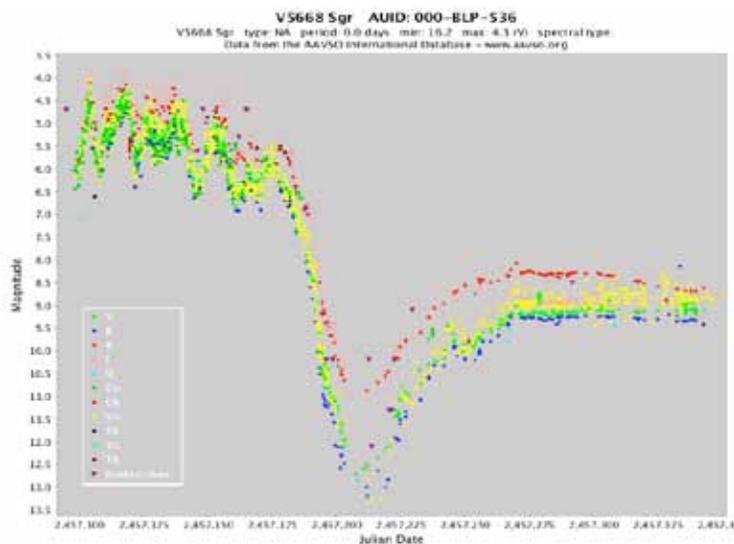


Figure 1. AAVSO multicolor light curve of V5668 Sgr, March–November 2015 (JD 2457095–2457350). 128 observers worldwide contributed 3,809 observations to this light curve.

Fortunately, all went as expected, and the nova kept its brightness, and actually showed a small 0.2 mag decrease in the UV over the past two weeks.

The optical nova spectrum has also been observed at R=28,000 with the Chiron on the SMARTS telescope at CTOI. We have now a spectroscopic snapshot of the state of the nova after the dust formation was done. The question of how the enormously strong dust signature has affected the gas we observe can now be tackled. For we would expect that when carbon is captured in dust, there will be less left in the gas, or perhaps silicon is affected more.

The HST STIS spectrum also shows interstellar line absorption. The most prominent is that from the primary line from Hydrogen, the Lyman-alpha line at 1215.67 Ångstroms. It can be used to infer how many neutral Hydrogen atoms are present between us and the nova. It is a huge number: 1.4×10^{21} per cm squared. That large number is mostly so because of the large distance, because the space density is pretty low (how much exactly is not known exactly as we do not have a good measurement of the distance). I include a plot of the spectral region around the Hydrogen Lyman-alpha line to show you what we got (Figure 2). The plot shows the brightness as an energy flux per wavelength bins on a logarithmic scale as the lines are so bright.

We also see bright lines of C III and N V. Notice the three peaks in the N V line, which are evidence for some kind of structure in the outflow. Not all lines show the same structure, so hopefully we can learn about the structure in the outflow from those differences.

Sincere thanks again to all who helped! ★

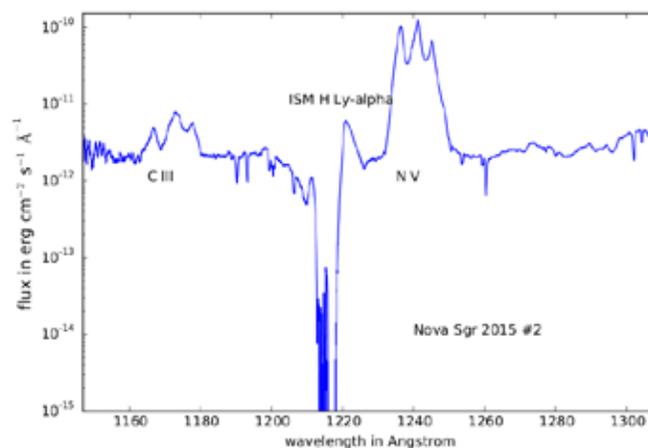


Figure 2. HST STIS spectrum of V5668 Sgr, region around Hydrogen Lyman-alpha line.

AAVSO OBSERVING CAMPAIGNS UPDATE

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

Each campaign is summarized on the AAVSO Observing Campaigns page (<https://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, 2015

Dr. George Wallerstein's (University of Washington) campaign on **X Cyg**, **SZ Cyg**, **TX Cyg**, **VX Cyg**, and **MZ Cyg** (*AAVSO Alert Notice 529* and below) requesting AAVSO observations for correlation with spectra to be obtained on these stars has been concluded. He has obtained his spectra and is now analyzing them and your observations to complete the radial velocity curves for these stars. Since 2015 October 15, 59 observers contributed 2,561 visual and multicolor observations to this campaign.

Campaigns initiated since October 1, 2015

In mid-October, Dr. George Wallerstein (University of Washington) requested AAVSO assistance in monitoring **X Cyg**, **SZ Cyg**, **TX Cyg**, **VX Cyg**, and **MZ Cyg** through December 2015 (*AAVSO Alert Notice 529*). He is working to complete the radial velocity curves for these stars, and needs optical light curves for correlation with the spectra he will be obtaining. Nightly visual and V observations (no time series) were requested. This campaign has been concluded (see above).

Also in October, the enigmatic variable object **KIC 8462852** was discovered and the AAVSO issued a request for observations beginning immediately and continuing through at least early 2016 (*AAVSO Alert Notice 532*). Filtered time-series observations (BVRI) were requested in order to study the variations occurring at all timescales. This interesting star shows aperiodic dips (cause unknown) of a few tenths of a magnitude, which can last for days but show variations on very short timescales, and is rotating. Not known to be a close binary or a young stellar object, and without infrared emission, it is a puzzle, and observations are needed to further characterize the star's variability. Since the campaign began October 20, 53 observers have submitted 15,520 visual and multicolor observations.

In January 2016, Dr. George Wallerstein (University of Washington) requested AAVSO coverage of the long period/symbiotic variable **R Aqr** in support of high-resolution spectroscopic observations (*AAVSO Alert Notice 535*). Coverage was requested to continue at least for the next several years to cover the eclipse predicted for 2022 (but which may come early and which may be about to begin). Several other astronomers are also studying R Aqr closely and will be carrying out multi-mode, multiwavelength observations in the near future. R Aqr, both a Mira and a symbiotic variable, is a close binary system consisting of a hot star and a late-type star (the Mira), both enveloped in nebulosity. The period of Mira variation is 387.0 days; the eclipse period is 43.6–44 years (Figures 1, 2). The cause of the eclipse, which lasts for years, is unknown; several theories have been proposed, and careful investigation of this upcoming event should help to resolve this question. R Aqr varies between visual magnitudes ~6.0–6.5 and ~11.5. Nightly BVRI CCD, DSLR, and PEP photometry and visual observations were requested. Ongoing spectroscopy over the next several years was recommended.

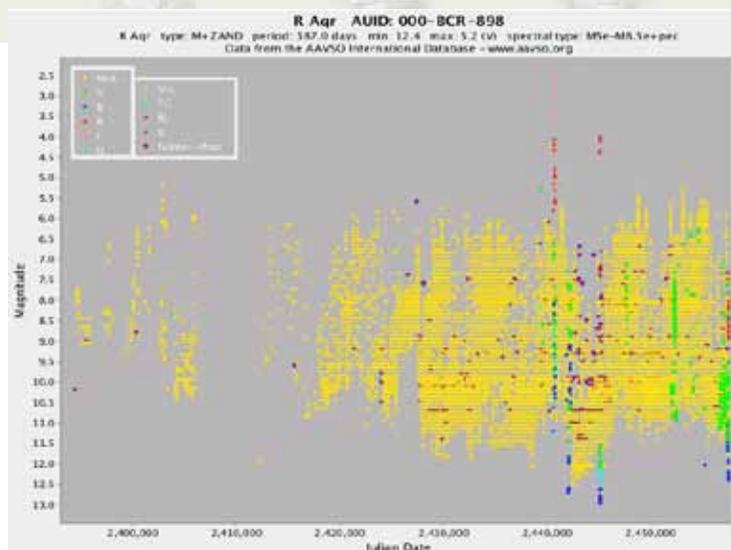


Figure 1: AAVSO historical light curve of the symbiotic Mira R Aqr JD 2394441–2457417 (28 August 1843–29 January 2016). 959 observers worldwide contributed 20,380 visual and multicolor observations to this light curve.

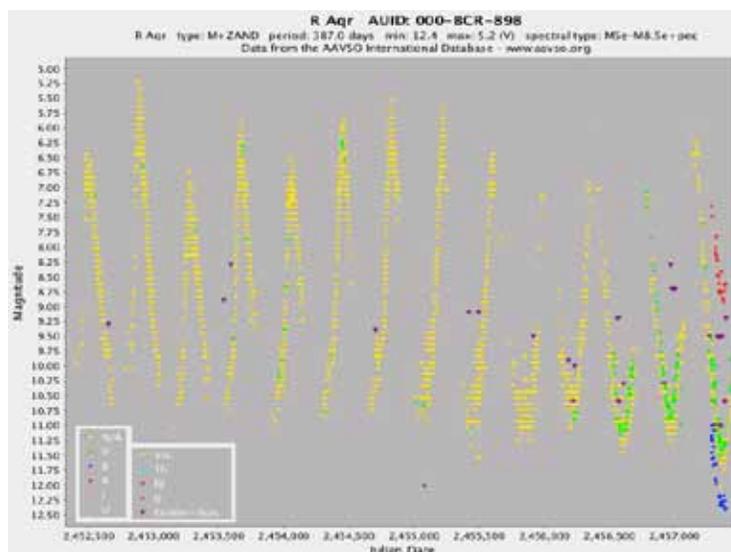


Figure 2: AAVSO light curve of the symbiotic Mira R Aqr JD 2452388–2457417 (19 April 2002–29 January 2016). 202 observers worldwide contributed 3,134 visual and multicolor observations to this light curve.

Campaigns in progress

The campaign on the X-ray black hole binary **V404 Cyg** (*AAVSO Alert Notice 520*) was officially concluded once it returned to minimum by 2015 July 23—August 1 after its spectacular outburst on 2015 June 15. However, it subsequently had another, shorter and fainter outburst December 30—January 3 (Figures 3, 4). As its behavior following the major outburst in June is clearly unpredictable, AAVSO observers are asked to continue obtaining multicolor photometry as well as visual observations.

Dr. Margarita Karovska's (Harvard-Smithsonian Center for Astrophysics) HST and Chandra campaign on **CH Cyg** (*AAVSO Alert Notice 454* and *AAVSO Special Notices #267, 294, and 320*) continues at least through the 2016 observing season. Cygnus is difficult to observe at present, but please continue

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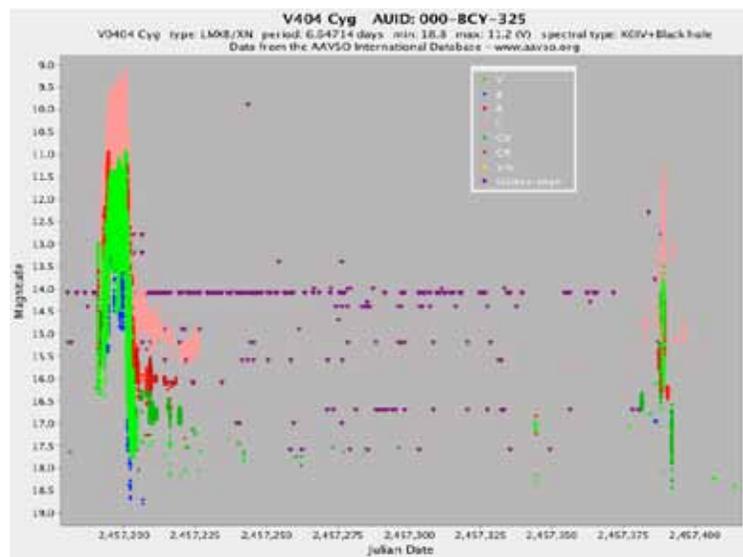
CAMPAIGNS UPDATE
CONTINUED...

Figure 3: AAVSO light curve of the X-ray black hole binary V404 Cyg JD 2457180–2457413 (6 June 2015–26 January 2016). 82 observers contributed 71,447 visual and multicolor observations to this light curve.



Figure 4: AAVSO light curve of the X-ray black hole binary V404 Cyg JD 2457376–2457413 (19 December 2015–26 January 2016). 18 observers contributed 1,034 visual and multicolor observations to this light curve.

your visual and **especially your V and B observations**. The V and B data are crucial for detecting certain significant system changes key to her research. Visual observations are also very important! See Figure 5.

Dr. Margarita Karovska and colleagues' request continues for AAVSO observer assistance in their campaign on the symbiotic variable **RT Cru** (11.2–12.6 visual magnitude). Chandra and Swift observations took place successfully in November (*AAVSO Special Notice #411*). Continuing weekly or more frequent

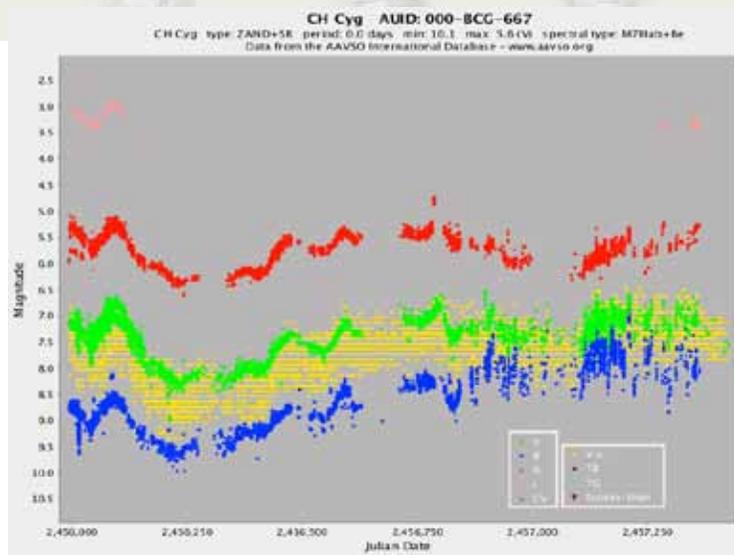


Figure 5: AAVSO light curve of the symbiotic star CH Cyg JD 2455988–2457420 (1 March 2012–1 February 2016). 228 observers contributed 27,400 visual and multicolor observations to this light curve.

monitoring (B and V photometry and visual observations) is requested. High-resolution spectroscopy around H α and the [OIII]5007 Å line, as well as the spectrum of the full range (echelle, for example), would be very helpful and most welcome! Since this campaign began 2014 August 6, 18 observers have contributed 7,157 multicolor observations of this star.

Although the 2014–2015 campaign on **EE Cep** is officially concluded (*AAVSO Alert Notice 502*, *AAVSO Special Notice #387*), Dr. Cezary Galan (Nicolaus Copernicus Astronomical Center) writes that continuing observations, especially in I or even better in near-IR, would be very valuable and very much appreciated. Please continue to monitor EE Cep from now until at least April 2017.

This campaign on the rare FU Ori object **2MASS J06593158-0405277**, begun in April 2015 and concluded in July (*AAVSO Alert Notice 518*), has been re-activated at the request of Dr. Fabienne A. Bastien (Hubble Postdoctoral Fellow, Pennsylvania State University). Please continue your observations at least through the 2016 observing season. Dr. Bastien writes: "...At the moment, only about two dozen of these objects are known, and we have very few constraints on what causes them to undergo their eruptions.... We would like to continue to monitor its behavior from the optical to the infrared (BVRIJHK and/or the equivalent Sloan filters) as it appears to be changing." Since the campaign began in April, 18 observers have contributed 638 multicolor and visual observations.

The outburst of the symbiotic variable **AG Peg** continues. It went into outburst in late May 2015 (*AAVSO Alert Notice 521*) for the first time since its only other known outburst, which occurred in 1860–1870 (it took about 10 years to reach maximum). It was unknown how this outburst would progress, and so far it has been very interesting! After declining to $V=8.0$, in mid-October it abruptly began to brighten again, reaching $V=7.4$, and is now declining again (Figure 6). AG Peg was visual magnitude 8.5 as of 2016 January 29.0424 UT (CKB, B. Cudnik, Houston, Texas). **Please see page 18 for an article on AG Peg by Dr. Gavin Ramsay et al. and an up-to-date AAVSO light curve.**

The campaign continues on the symbiotic nova candidate **ASAS J174600-2321.3** initiated in January by S. Otero, P. Tisserand, K. Bernhard, and S. Hümmelich (*AAVSO Alert Notice 510*). The predicted eclipse has occurred, but the nova is still at maximum. Otero writes that knowing when the eruption starts to

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CAMPAIGNS UPDATE CONTINUED...

fade will be very important, and that ongoing data are essential. Observers are requested to continue visual and instrumental monitoring. Since this campaign began 2015 March 5, 15 observers have contributed 1,439 multicolor and visual observations to the AID.

The campaign organized by Dr. George Rieke (University of Arizona) and colleagues on four stars with developing planetary systems (*AAVSO Alert Notice 511*)—**RZ Psc**, **HD 15407A**, **V488 Per**, and **HD 23514**—continues. The Spitzer Space Telescope observations have been completed, but your observations over the next months will show the stars' behavior following the Spitzer observations, which could be very important in case of unexpected findings from the satellite data. Since this campaign began 2015 March 13, 39 observers have contributed 5,520 multicolor and visual observations to the AID.

The campaign on the classical T Tauri star **RW Aur** (component A) organized by Dr. Hans Moritz Guenther (Massachusetts Institute of Technology) continues but at a less intense level (*AAVSO Alert Notice 514*). Dr. Guenther writes: "RW Aur continues to be an exciting target. How long does the dimming last? Will it come back up to the usual brightness? ... Does the color change, when (if?) RW Aur comes back to normal? ..." Since RW Aur emerged from behind the Sun in August, its brightness, which had been increasing, is now decreasing again (Figure 6).

Dr. Robert Stencel's (University of Denver Astronomy Program) request to monitor **epsilon Aur** (*AAVSO Alert Notice 504*) continues and **has been modified**. Dr. Stencel writes that studies of the system are continuing and ground- and space-based observations are being carried out and proposed. "For these studies, a reasonable coverage of the light curve is important. Furthermore, we are approaching quadrature in a few years, and detailed studies like these are likely to continue, albeit less frequently. ... If skilled observers each could obtain good photometry *ONCE A MONTH*, we should see a reasonably complete light curve continuing, benefiting the long term studies." Observers are asked to carry out CCD, DSLR, or PEP photometry (V, B, R, U; no time series) once a month. Since this post-eclipse campaign began 2014 September 17, 76 observers have contributed 1,420 multicolor and visual observations.

Dr. Eric Mamajek's campaign on **V1400 Cen = J1407 (1SWASP J140747.93-394542.6)** (*AAVSO Alert Notice 462*) continues through 2016. Since the campaign began in July 2012, AAVSO observers have continued to provide excellent coverage in search of the eclipse. Please continue your observations, as they are extremely important in helping to solve the puzzle of this interesting and possibly complex system (*AAVSO Alert Notice 462*). 3 observers have contributed 2,044 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 2016 season and likely "for several more years." Since May 2011, 111 observers have contributed 5,595 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!

My challenge to you observers remains! Since Dr. Arne Henden suggested the very interesting Mira variable **QX Pup** to AAVSO observers in 2008 as an observing exercise (<http://www.aavso.org/qx-pup>), 5+ cycles have been

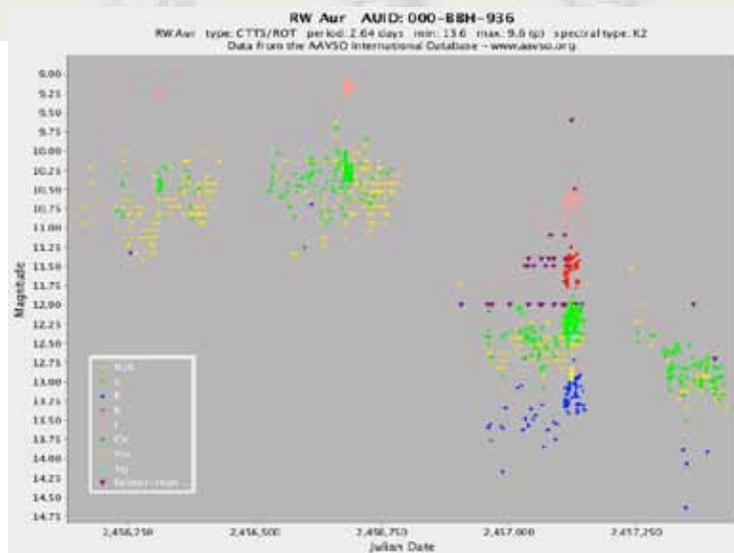


Figure 6. AAVSO light curve of the T Tauri star RW Aur JD 2456156–2457422 (16 August 2012–3 February 2016). 75 observers contributed 2,894 visual and multicolor observations to this light curve.

observed in I, along with a smattering of fainter-thans and a few R and two V observations. A single V observation at/near the minimum shown in I shows the V minimum is 18.2 or fainter (MZK, K. Menzies, Framingham, Massachusetts). **Wouldn't some observer like to take on QX Pup as a challenge to determine the V range?** Arne's page on QX Pup gives a lot of information about this variable embedded in a reflection nebula (the Rotten Egg Nebula).

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>).

Novae and R CrB

Two galactic novae have been discovered since October 1. Also, several recent novae continue to provide good observing opportunities, and R CrB continues at minimum.

V1831 Aql (Nova Aquilae 2015 = ASASSN 15-qd = PNV J19215012+1509248), a faint, highly reddened classical nova, was independently discovered on 2015 October 5 at unfiltered magnitude 12.4 by Koichi Itagaki (Teppo-cho, Yamagata, Japan), and on 2015 October 1 at V=15.2 by the All-Sky Automated Survey for Supernovae (ASAS-SN) as reported by B. J. Shappee (Hubble Fellow, Carnegie Observatories) et al. (*AAVSO Alert Notice 530*). (Itagaki is considered the first discoverer because he reported his discovery much earlier, even though his date of discovery is later than that of Shappee et al.) As of 2015 November 18.0132 UT it was 17.901 V ± 0.598 (HMB, J. Hamsch, Mol Belgium). 210 observations have been contributed by 22 observers to date.

V2949 Oph = Nova Oph 2015 No. 2 (TCP J17344775-2409042), also a faint, highly reddened classical nova, was independently discovered by Koichi Nishiyama (Kurume, Japan) and Fujio Kabashima (Miyaki, Japan) and by

CONTINUED ON NEXT PAGE

CAMPAIGNS UPDATE CONTINUED...

Shigehisa Fujikawa (Kan'onji, Kagawa, Japan) on 2015 October 11 at unfiltered magnitude 11.8–12.1 (*AAVSO Alert Notice 531*). As of 2015 October 22.9830 UT it was magnitude 12.9 $V \pm 0.018$ (HMB, J. Hamsch, Mol Belgium). 28 observations have been contributed by 6 observers to date.

Older novae that are still within observing range include:

V5669 Sgr (Nova Sgr 2015 No. 3 = PNV J18033275-2816054), discovered on 2015 September 27 UT at unfiltered magnitude 9.9–10.5 (*AAVSO Alert Notice 528*), has faded to visual magnitude 11.5 (CKB, B. Cudnik, Houston, Texas) as of 2015 November 19.0194 UT. 35 observers have contributed 262 observations to date.

V1535 Sco (Nova Scorpii 2015 = PNV J17032620-3504140), discovered on 2015 February 11.837 UT (*AAVSO Alert Notice 508*), reached maximum on February 13 at visual magnitude 9.2. The nova continues to fade and as of 2015 November 8.9947 UT was 15.281 $V \pm 0.102$ (HMB, J. Hamsch, Mol, Belgium). 19 observers worldwide have contributed 1,410 observations to date.

V5667 Sgr (Nova Sagittarii 2015 = PNV J18142514-2554343), discovered on 2015 February 12 UT (*AAVSO Alert Notice 509*), reached maximum on February 24 at V magnitude 9.1–9.2. As of October 28.4353 UT it was 13.24 $V \pm 0.02$ (NLX, P. Nelson, Ellinbank, VIC, Australia). 17 observers worldwide have contributed 386 observations to date.

V5668 Sgr (Nova Sagittarii 2015 Number 2 = PNV J18365700-2855420), discovered on 2015 March 15 UT (*AAVSO Alert Notice 512*), has recovered from its dust event and as of 2015 November 23.0090 UT it was fading slowly at visual magnitude 8.8 (CKB, B. Cudnik, Houston, Texas). **Please see page 19 for an article on V5668 Sgr by Dr. Paul Kuin and an up-to-date AAVSO light curve.**

V2944 Oph (Nova Ophiuchi 2015 = PNV J17291350-1846120) was discovered in March and reached maximum on April 14 at magnitude $V=9.2$. After fading with oscillations to about magnitude 12, it plateaued for about three months before brightening slightly and then continuing to fade. As of 2015 November

9.0319 UT it was visual magnitude <13.1 (CKB, B. Cudnik, Houston, Texas). 33 observers worldwide have contributed 1,000 observations to date.

V2659 Cyg (Nova Cygni 2014 = PNV J20214234+3103296), a highly reddened classical Fe II-type nova which had been very active as it declined, continues to fade steadily. As of 2015 December 24.8104 UT 14.886 it was $V \pm 0.019$ (BDG, D. Boyd, Wantage, Oxon., UK). 81 observers worldwide have contributed 3,829 observations through December 24.

V1369 Cen (Nova Centauri 2013 = PNV J13544700-5909080) continues to decline slowly. As of 2016 February 1.8326 UT it was visual magnitude 10.7 (PEX, A. Pearce, Nedlands, W. Australia). 71 observers worldwide have contributed 13,335 observations through February 1.

V339 Del (Nova Delphini 2013 = PNV J20233073+2046041) continues to fade. As of 2016 January 7.748 UT it was visual magnitude 13.4 (PYG, G. Joyner, Birmingham, UK). 549 observers worldwide have contributed 77,774 multicolor observations through January 7.

R CrB

Since July 2007, when it began fading from its maximum visual magnitude of 6.0, the prototype variable **R CrB** has been in some state of minimum. In July 2015 it appeared to be brightening, but it turned around again and has been slowly but steadily fading. As of 2016 January 30.4597 UT it was visual magnitude 13.8 (CKB, B. Cudnik, Houston, Texas) and as of February 1.3786 UT it was 13.984 $V \pm 0.029$ (PWD, W. Pellerin, Houston, Texas). Keep on watching R CrB—how will it behave next?

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! ★

PHOTOELECTRIC PHOTOMETRY PROGRAM UPDATE

JIM KAY, AAVSO PEP SECTION LEADER

As the new PEP Section Leader I wanted to briefly introduce myself. I have had a lifelong interest in astronomy having built my first telescope at the age of 14. Although I had originally planned to be an astronomer, I quickly switched to electrical engineering once in college, and recently retired after 30 years in the aerospace industry. I have had the privilege of working on a variety of aircraft and spacecraft systems both as an electrical and system engineer. I have lived in Vermont since 1982 and enjoy hiking and being outside both during the day, and of course on any clear night. I am settling back into life at home after hiking 1,300 miles on the Appalachian Trail this summer. I use a C14, along with SSP3 and SSP4 photometers for my variable star observations. I look forward to working with all current and new PEP observers. I was impressed by how supportive and helpful the PEP community was when I started PEP observations several years ago, and hope to carry on this tradition as Section Leader.

Observations

The section continues to provide high accuracy photometry of bright stars with eight observers making 915 observations of 53 stars in 7 bands (B, V, RJ, R, I, H, J).

Charles Calia (CCB, Ridgefield, Connecticut) contributed a total of 38 V band observations of EG And, II Peg, AB Cyg, P Cyg, V395 Vul and R Lyr.

Former PEP Section Chair Jim Fox (FXJ, Mayhill, New Mexico) submitted a total of 18 V observations of CE Tau, X Per, Rho Per, XZ Psc, TX Psc, RZ Ari, V442 And, TV Psc, P Cyg, V973 Cyg, V1070 Cyg.

Carl Knight (KCD, New Zealand) submitted 10 near IR observations of alpha Ori, 5 H and 5 J.

Frank Melillo (MFR, New York) submitted 42 observations of V1488 Cyg, 21 in V and 21 in B.

Gerald Persha (PGD, Lowell MI) used his semi-automated system to produce a total of 656 observations in the V, B, R bands. Stars included V2119 Cyg, X Cyg, TX Cyg, P Cyg (11 V and 11 B each), SZ Cyg (11V, 11R), XZ Psc, TX Psc, HK Lyr (9 V and 9 B each), RZ Psc and Z Psc (9 V and 9 R each), AG Peg (13 V, 13 B), V376 Per (40 V, 40 B), Eps Aur (1 V, 1 B), HD 23514 (2 V, 2 B), U Del and EU Del (7 V and 7 B each), V398 Lyr (10 V, 10 B), XY Lyr (9 V, 9 B, 9 R), R Lyr (11 V, 11 B, 11 R), AG Peg (13 V, 13 B), U Peg (47 V, 47 B), V636 Her and G Her (8 V, 8 B each), DM Del (49 V, 49 B), ST Her and X Her (3 V and 3 B each).

John Martin (UIS01, Springfield Illinois) contributed 4 V and 4 B measurements of mu Cep.

Erwin van Ballegoij (BE, Netherlands) contributed 12 observations of rho Cas, 6 each in V and B.

Ken Sikes (SKED) contributed 131 observations. Stars include V0711 Tau, WW Aur, RT Aur (4 V, 4 B, 4 RJ, 4 I each), NSV 1182 and YZ Cas (6 V, 6 B, 6 RJ, 6 I each), delta Cas (6 V, 6 B, 5 RJ, 6 I), V465 Cas (1 V, 1 B, 1 RJ, 1 I).

Thanks go to everyone for a very productive quarter.

Campaigns

The multi-year campaigns on CH Cyg, P Cyg, and epsilon Aur continue and fall into the sweet spot for PEP observing. Although Cyg is getting low in the west it may still be possible to get observations in the early evening, while epsilon Aur will be well placed for much of the night for the next several months. These campaigns are detailed in *AAVSO Special Notice #320* (CH Cyg), *AAVSO Alert Notice 440* and *Special Notice #131* (P Cyg), and *Alert Notice 504* (epsilon Aur). These stars remain unpredictable and their bright magnitudes allow high accuracy PEP measurements that are important to the professionals trying to model these systems.

PEP Survey

PEP observers were sent a survey in January 2016 to determine common interests and to facilitate collaboration. Preliminary communication with several observers indicates that there is interest in refining methods of determining extinction and transformation coefficients, as well as determining any systematic errors between observers. Interest is also increasing in near IR photometry, which within AAVSO is unique to the PEP section. The results of this survey will be reported in the next newsletter. Thanks in advance for taking the time to provide this input, which will allow us to focus our efforts to support PEP observers.

We encourage participation from PEP observers of all levels. Additional information is available at the AAVSO PEP webpages at:

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

LOOKING AT LEGACY STARS

STARS OBSERVED RECENTLY AND RECOMMENDATIONS FOR THE NEXT FEW MONTHS

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

SARA J. BECK (BSJ), AAVSO TECHNICAL ASSISTANT

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

We encourage observers to keep a smaller subset of variables at the top of their observing planning via the Legacy and Program lists for LPVs and CVs (see <https://sites.google.com/site/aavsolpvsection/Home/lpv-files> for the LPV lists, and <https://sites.google.com/site/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.

Seventeen best-covered stars of the LPV Legacy program, as measured (mainly) by number of nights observed (both visual and CCD observing considered), 2015 September 16 through December 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
T Cas	Cas	00:23:14.27	+55:47:33.2	38	64	7	30
W Cas	Cas	00:54:53.85	+58:33:49.2	34	51	8	26
R Ari	Ari	02:16:07.1	+25:03:23.6	25	44	7	25
W And	And	02:17:32.95	+44:18:17.7	9	20	6	32
omi Cet	Cet	02:19:20.78	-02:58:39.5	47	68	4	15
U Ori	Ori	05:55:49.16	+20:10:30.6	16	39	4	76
Z UMa	UMa	11:56:30.22	+57:52:17.6	41	77	3	10
g Her	Her	16:28:38.54	+41:52:53.9	30	64	2	15
R Lyr	Lyr	18:55:20.1	+43:56:45.8	28	69	5	26
CH Cyg	Cyg	19:24:33.06	+50:14:29	53	90	8	47
AF Cyg	Cyg	19:30:12.84	+46:08:52	42	79	4	13
RT Cyg	Cyg	19:43:37.77	+48:46:41.3	38	74	4	16
khi Cyg	Cyg	19:50:33.91	+32:54:50.6	77	84	6	20
S Aql	Aql	20:11:37.47	+15:37:14.5	16	21	5	28
U Del	Del	20:45:28.23	+18:05:24	40	75	4	20
T Cep	Cep	21:09:31.78	+68:29:27.1	51	73	4	14
W Cyg	Cyg	21:36:02.49	+45:22:28.4	40	80	3	15
miu Cep	Cep	21:43:30.49	+58:46:48	51	82	3	17
R Peg	Peg	23:06:39.17	+10:32:36	12	20	6	27
R Aqr	Aqr	23:43:49.45	-15:17:04.1	16	42	5	27
rho Cas	Cas	23:54:23.03	+57:29:57.8	43	79	5	18

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

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)*).

Eighteen least-observed stars of the LPV Legacy program (both visual and CCD observing considered), 2015 September 16 through December 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
W Per	Per	02:50:37.89	+56:59:00.3	11	27	3	5
X Cnc	Cnc	08:55:22.87	+17:13:52.5	12	24	1	1
R Car	Car	09:32:14.59	-62:47:19.9	4	29	0	0
S Car	Car	10:09:21.88	-61:32:56.3	3	24	0	0
VY UMa	UMa	10:45:04.02	+67:24:40.9	11	32	0	0
SS Vir	Vir	12:25:14.4	+00:46:10.9	3	6	0	0
R Vir	Vir	12:38:29.94	+06:59:18.9	5	11	0	0
RS UMa	UMa	12:38:57.54	+58:29:00.2	10	17	0	0
R Hya	Hya	13:29:42.77	-23:16:52.7	3	6	0	0
T Cen	Cen	13:41:45.55	-33:35:50.5	2	6	0	0
R CVn	CVn	13:48:57.05	+39:32:33.2	5	14	0	0
R Cen	Cen	14:16:34.31	-59:54:49.2	4	15	0	0
R Cam	Cam	14:17:51.03	+83:49:53.7	16	31	0	0
S Boo	Boo	14:22:52.91	+53:48:37.2	8	13	0	0
R Boo	Boo	14:37:11.57	+26:44:11.6	23	35	1	1
V CrB	CrB	15:49:31.31	+39:34:17.9	17	28	2	4
R Ser	Ser	15:50:41.73	+15:08:01.1	28	28	3	7
RU Her	Her	16:10:14.52	+25:04:14.3	5	9	1	1
RS Her	Her	17:21:42.35	+22:55:15.9	16	31	2	3
TZ Cyg	Cyg	19:16:04.06	+50:09:36.6	9	29	2	2

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.

CONTINUED ON NEXT PAGE

LEGACY STARS
CONTINUED...

Eighteen best-covered stars of the CV Legacy program, as measured (mainly) by number of observers and nights observed (both visual and CCD observing considered), 2015 September 16 through December 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
WW Cet	Cet	00:11:24.72	-11:28:42.9	4	10	7	65
EG And	And	00:44:37.19	+40:40:45.6	35	78	5	21
RX And	And	01:04:35.52	+41:17:57.8	42	82	18	63
HT Cas	Cas	01:10:12.95	+60:04:36.2	13	75	6	12
TY Psc	Psc	01:25:39.35	+32:23:09.2	10	65	5	18
KT Per	Per	01:37:08.51	+50:57:20.4	19	68	6	23
TT Ari	Ari	02:06:53.09	+15:17:41.7	15	56	6	23
TZ Per	Per	02:13:50.94	+58:22:52.7	15	71	9	29
GK Per	Per	03:31:12	+43:54:15.4	22	74	13	20
FO Per	Per	04:08:34.95	+51:14:48.2	13	57	8	32
SS Aur	Aur	06:13:22.47	+47:44:25.6	24	70	3	18
HL CMa	CMa	06:45:17.21	-16:51:34.7	4	7	2	74
BX Pup	Pup	07:54:15.55	-24:19:36.3	1	2	4	80
Z Cam	Cam	08:25:13.18	+73:06:39	31	76	6	12
CH Cyg	Cyg	19:24:33.06	+50:14:29.1	53	90	8	47
EM Cyg	Cyg	19:38:40.11	+30:30:28.4	21	67	11	41
SS Cyg	Cyg	21:42:42.78	+43:35:09.8	79	89	14	66
AG Peg	Peg	21:51:01.97	+12:37:32	60	87	12	59
RU Peg	Peg	22:14:02.57	+12:42:11.4	27	75	3	16
DX And	And	23:29:46.7	+43:45:04.6	15	64	6	21

Stars in CV Legacy list with no visual or CCD observations (both visual and CCD observing considered), 2015 September 16 through December 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
SY Mus	Mus	11:32:10.01	-65:25:11.6	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
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
V504 Cen	Cen	14:12:49.18	-40:21:37.5	0	0	0	0
FQ Sco	Sco	17:08:04.45	-32:42:02	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
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
NQ Vul	Vul	19:29:14.75	+20:27:59.7	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
QU Vul	Vul	20:26:46.02	+27:50:43.2	0	0	0	0
CP Lac	Lac	22:15:41.15	+55:37:01.4	0	0	0	0

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

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JULIAN DATE / MOON PHASE CALENDARS

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

JANUARY 2016

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1 7389	2 7390
3 7391	4 7392	5 7393	6 7394	7 7395	8 7396	9 7397
10 7398	11 7399	12 7400	13 7401	14 7402	15 7403	16 7404
17 7405	18 7406	19 7407	20 7408	21 7409	22 7410	23 7411
24 7412	25 7413	26 7414	27 7415	28 7416	29 7417	30 7418
31 7419						

FEBRUARY 2016

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 7420	2 7421	3 7422	4 7423	5 7424	6 7425
7 7426	8 7427	9 7428	10 7429	11 7430	12 7431	13 7432
14 7433	15 7434	16 7435	17 7436	18 7437	19 7438	20 7439
21 7440	22 7441	23 7442	24 7443	25 7444	26 7445	27 7446
28 7447	29 7448					

MARCH 2016

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1 7449	2 7450	3 7451	4 7452	5 7453
6 7454	7 7455	8 7456	9 7457	10 7458	11 7459	12 7460
13 7461	14 7462	15 7463	16 7464	17 7465	18 7466	19 7467
20 7468	21 7469	22 7470	23 7471	24 7472	25 7473	26 7474
27 7475	28 7476	29 7477	30 7478	31 7479		

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, Donn Starkey. Just send us an email (mentor@aavso.org), or call 617-354-0484 to let us know you are interested in this program.

Ideally, Donn 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 2016 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: _____

2016 MEMBERSHIP RENEWAL

On this page is a copy of the AAVSO membership renewal form for 2016. You may also renew your membership online. Safe and secure online payments are possible by visiting <https://www.aavso.org/membership-renew>. If your postal or email address has changed, please also take a minute to update your personal profile online. Simply click "User login" at the upper right of the home page, then go to "My account." In addition to your dues, your contributions to the AAVSO further support the organization's activities and are very much appreciated. Also, on the next page you will find descriptions of the various funds to which you may contribute.



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

Name _____
Address _____
City _____
State/Province _____
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: _____

2016 Membership Dues Renewal Form

Membership Type *(please check one)*

Annual \$75 Sustaining \$150

Student/Limited Income \$37.50

Contributions *(see next page for descriptions)*

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

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.

AAVSO General Fund

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

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.

AAVSO 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!