

## IN THIS ISSUE:

### ★ NEWS AND ANNOUNCEMENTS

THE ANNUAL ADOPT A VARIABLE STAR PROGRAM . . . . .	3
2017 SPRING MEETING OF THE AAVSO . . . . .	3
SESQUICENTENNIAL! ASTRONOMY IN THE VAST, FROZEN NORTH, 1867–2017 . . . . .	4
WANTED: ASTRONOMICAL GURUS . . . . .	6



### ★ ALSO

SCIENCE SUMMARY: AAVSO IN PRINT . . . . .	5
2017 ANNUAL MEETING OF THE AAVSO . . . . .	5
TALKING ABOUT THE AAVSO . . . . .	7
PEP PROGRAM UPDATE . . . . .	10
LPV SECTION UPDATE . . . . .	11
OBSERVING CAMPAIGNS UPDATE . . . . .	11

Complete table of contents on page 2

ISSUE NO. 72 APRIL 2017 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



*Looking ahead—how about new observers?*

We talk a lot about the role of the AAVSO in the 21st century, which is considered the golden era of variable star discoveries. We discuss ways that our observers are contributing, and the need for a continuous stream of data on variable stars. We are presented with new projects and we are in communication with big surveys who are eager to use our observers' capabilities for target follow-up. Citizen astronomy is now part of research, citizen astronomers are collaborators in projects and co-authors in papers. Our work is important for researchers worldwide, and will be more important in the upcoming decades.

The AAVSO's work is valued and celebrated, and we would like to see it continuing. We all understand that variable star observations will always be needed, as there will always be a new star with unusual characteristics, a strange behavior to unveil in old favorites, a surprising new category to be revealed. Variable stars will always be varying in ways we will not be able to unveil within our lifetimes, but our lifetime's work will greatly contribute to understanding those unusual behaviors. Part of our work at the AAVSO is to ensure that observers are well trained now and in the future, and that data

will continue to flow in our database in support of various projects.

This is where the AAVSO brings great value to this community: We have easy-to-follow training material for both novice and seasoned observers, material that can be easily read and followed by young scientists. We provide knowledgeable and skilled mentors who help observers of all levels to sharpen their skills. At HQ, we conduct data checks and communicate with observers who produce discrepant observations, helping them improve their data acquisition and reduction skills. We produce finding charts and star sequences, we offer data reduction and analysis software, and a library of variable star information through VSX. Overall, we enable anyone in our community to participate in any level of scientific discovery—from acquiring data to analyzing them and submitting a manuscript reporting results to the scientific community through our journal. We are building an engaged and vivid community of citizen scientists, working on and understanding variable stars. We truly enable science for everyone, everywhere.

Those tools that are so valuable to our observers worldwide can also be used to train younger observers. Actually, we are looking forward to attracting more young people in our activities, and engaging them in variable star work. We are already working with high school, college, and university teachers showcasing how they can use astronomy projects in

CONTINUED ON NEXT PAGE

## PRESIDENT'S MESSAGE

KRISTINE LARSEN



Friends—  
The last time we spoke (virtually), I asked you to join me in working to increase and diversify the membership of our organization. I thank you for the many thoughtful brainstorming comments on the Forums, and look forward to discussing some of your ideas

in person at the June meeting in Ontario, California. This quarter I thought I would share a personal story with you, in order to demonstrate the power of being a mentor to someone of the younger generation, in this particular case, a student of mine. Some of you have met Jessica before at one of the Fall meetings she attended in Massachusetts, where she presented her research on BY Draconis stars. The rest of you will soon meet her virtually, through the solar eclipse page she helped write for our website. But none of you would have ever met her if it hadn't been for that critically important first step—mentoring. I'll let her pick up the story here:

*I was first introduced to solar observing in the fall of 2012 while taking Dr. Kristine Larsen's Observational Astronomy class. As part of the class we had to learn how to solar observe, including*

CONTINUED ON NEXT PAGE

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

their classrooms. We are continuously looking for new ways of interactions with young rising stars. This is where all you, our members, who appreciate and actively support our work and mission, can help: do you know of any young scientists who could be interested in observing the night sky? Are there any new members in your local club that crave to participate in science and, with some guidance, could become excellent observers? Can you recommend the AAVSO to a neighbor or a friend who admires your passion for observations and wants to understand more about the wonders of the night sky?

I would love to hear your ideas, and I welcome any feedback you may have on how we can diversify and increase our membership. I am convinced there are many people who would love to be actively engaged, but they don't know how to get started, and are intimidated by the learning curve that is involved. But this is where the AAVSO can uniquely help. Astronomy is fun, and astronomy research opens one's mind into the wonderful world of the universe around us. Let's continue this discussion in the upcoming SAS/AAVSO meeting and talk more about how we will spread the mission of the AAVSO to all, and ensure that the AAVSO's work, your work, will be continued in perpetuity.

Best wishes—clear skies,  
Stella ★

*Ed. note: the Spanish language version of Stella's message can be found on page 10.*

**CONTENTS**

From the Director's Desk	1
President's Message	1
AAVSO Spring Meeting	3
The Annual Adopt a Variable Star Program	3
Sesquicentennial! Astronomy in the Vast, Frozen North, 1867–2017	4
2017 Annual Meeting of the AAVSO	5
Science Summary: AAVSO in Print	5
Wanted: Astronomical Gurus	6
Talking About the AAVSO	7
Mensaje del Director	8
Mensaje del Presidente	8
In Memoriam	9
Photoelectric Photometry Program Update	10
LPV Section Update	11
AAVSO Observing Campaigns Update	11
Looking at Legacy Stars	18
Julian Date/Moon Phase Calendars	20

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



*Jessica Johnson (l) and Kris Larsen at an AAS meeting in front of Jessica's poster on her BY Dra variables research.*

*setting up and taking down the telescope. I remember how daunting it seemed, being responsible for the integrity of this piece of equipment as well as for the safety of my eyes; I did not wish to go blind. As the semester progressed it got easier and eventually I looked forward to solar observing. It was fun to count all of the spots and so simple. I realized then that it was really easy to obtain this important data and that it was incredibly enjoyable!*

*About half way through the following semester I had toyed with the idea of asking Dr. Larsen if I could solar observe and submit observations to the AAVSO like she had been doing. I do not believe I will ever forget her reaction when I asked her if I could do this; with huge smile on her face she enthusiastically said, "Yes, absolutely!" With that she had me follow her upstairs and we set up an AAVSO account and a notebook to record my observations. I have been observing ever since and there is not a day I do not enjoy it; there is something really special about peering into an eyepiece and counting sunspots. It is a chance to really think about and connect with something that has such a huge impact on well, everything!*

*I cannot stress how important it is to have a mentor to guide you through the process of learning to solar observe. Dr. Larsen and I would spend a few minutes on sunny days solar observing together, which was great for building my confidence in identifying more complicated groups and distinguishing from lone pores or lone spots. We would discuss our observations*

<b>DIRECTOR</b>	Stella Kafka
<b>PRESIDENT</b>	Kristine M. Larsen
<b>PAST PRESIDENT</b>	Jennifer Sokoloski
<b>1ST VICE PRESIDENT</b>	Roger S. Kolman
<b>2ND VICE PRESIDENT</b>	Kevin B. Marvel
<b>SECRETARY</b>	Gary Walker
<b>TREASURER</b>	Bill Goff

**COUNCILORS**

Richard Berry	Katrien Kolenberg
Tom Calderwood	Richard S. Post
Joyce A. Guzik	Gregory R. Sivakoff
Michael Joner	William Stein

**NEWSLETTER**

<b>EDITOR</b>	Elizabeth O. Waagen
<b>PRODUCTION EDITOR</b>	Michael Saladyga

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@aaavso.org](mailto:eowaagen@aaavso.org). Photos in this issue courtesy of Kristine Larsen and Dick Post

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.

AAVSO  
49 Bay State Road  
Cambridge, Massachusetts, 02138, USA  
617-354-0484 / 1-888-802-STAR(7827)  
[www.aaavso.org](http://www.aaavso.org)

*afterwards, and this was an incredible part of the learning process, to grow as an observer, because it made me think about why or why not something was a group or a pore.*

*There are obvious reasons for having a mentor, such as safety (which is very important in this line of work) and helping to guide the identification process of these sunspots. But in my experience I think the greatest reason a mentor is so important for solar observing is really portraying the importance and elegance of solar observing, and to build passion and inspiration for it. Dr. Larsen has done that for me and I do not foresee my passion ever waning.*

Cap Hossfield was my mentor for solar observing, back in the late 1980s. If it hadn't been for him, I would never have gotten involved with solar observing,

CONTINUED ON NEXT PAGE

## PRESIDENT'S MESSAGE CONTINUED...

and given that he was also my introduction to the AAVSO, I certainly wouldn't be serving as your President today.

Each journey begins with a single step. Be the person who helps someone start their personal journey to becoming a variable star observer and AAVSO member. Each of us has the power to change lives. Consider becoming a mentor today.

If you are an experienced observer who is interested in becoming a mentor, please contact AAVSO Mentor Program Coordinator Donn Starkey ([mentor@aaavso.org](mailto:mentor@aaavso.org)). If you need a mentor, the program (<https://www.aaavso.org/mentor-program>) is open to all members; again, please contact Donn. ★

*Ed. note: the Spanish language version of Kris's message can be found on page 10.*

## AAVSO SPRING MEETING

The AAVSO's 106th Spring Meeting will be held June 15–17, 2017, in Ontario, California. This will be an AAVSO-SAS joint meeting (SAS is the Society for Astronomical Sciences). It's sure to be an exciting and informative meeting, with many very experienced speakers discussing observing techniques, equipment, and observing programs.

Registration will be opening soon. Further information about the meeting and accommodations will be announced via the AAVSO website.

Watch for your AAVSO Annual Campaign email coming soon!!

## THE ANNUAL ADOPT A VARIABLE STAR PROGRAM (AAVSP)

**The Annual Adopt a Variable Star Program (AAVSP)** is a fundraising program designed to encourage small donations to the AAVSO from a large number of donors each year. The concept is very simple and has been used by other non-profits to raise money for children, animals, and other good causes. In our program you can "adopt" any variable star listed in VSX for one year, for a donation to the AAVSO of \$30.00 US (tax-deductible in the US).

When you adopt a star for a year you will receive a star chart of that variable star and a certificate showing either your name or the name of the person you specify on it. Also, at the end of your year you will receive a light curve of your star for that year. Whenever a light curve of your star is created on the Light Curve Generator during your year, your name as an "adopter", or the name you designate, will appear above the light curve.

There is no limit to the number of variable stars a person can adopt (at \$30.00 per star). There is also no limit to the number of people who can adopt a specific variable star.

We have created a simple web form (<https://www.aaavso.org/apps/adopt-a-star/>) that will handle the adoptions and donations.

An associated web page (<https://www.aaavso.org/apps/adopt-a-star/adopted-stars/>) lists all the adopted stars and the donors who have adopted them. The stars will be listed alphabetically by constellation. Stars with no GCVS designation will be listed at the end of the list in alphanumeric order.

To be perfectly clear, you are not buying a star, you are not becoming the owner of anything pertaining to that star (except bragging rights), we are not naming



Dick Post with two AAVSO star adopters

it after you or your cat or your dog—you are simply donating to the AAVSO in the name(s) of your favorite variable star(s).

Adopt a variable star as a gift to yourself! Adopt a variable star in celebration of a birthday, anniversary, wedding, graduation, promotion, retirement or other milestone! Just think, for those of you who perpetually procrastinate buying Holiday gifts for your friends and loved ones, AAVSP adopted stars will make excellent last-minute stocking stuffers, New Year's gifts, etc.

We hope you will enjoy this fun new way of supporting the AAVSO mission and will come up with your own ideas how this can be used.

Adopt A Variable Star Now! ★

# SESQUICENTENNIAL! ASTRONOMY IN THE VAST, FROZEN NORTH, 1867–2017

**JOHN PERCY (UNIVERSITY OF TORONTO,  
AND EDITOR: JAAVSO)**

Canada celebrates its 150th birthday on July 1, 2017. It's therefore appropriate that I should introduce you to astronomy in your neighbour (yes, we spell it that way) to the north. Vast, yes; frozen, probably not, most of the time; southern Canada is level with northern California!

In Canada, astronomy revolves around three organizations (RASC, FAAQ, CASCA), many university departments, a federal government institute, a space agency, dozens of unaffiliated local clubs, and planetariums and science centres—and it's firmly present in the compulsory school science curriculum. All of these groups partnered effectively during International Year of Astronomy 2009, organizing over 3,600 events reaching almost two million people face-to-face, plus millions more through circulating stamps, engaging transit posters, and more (Hesser et al. 2010, *JRASC*, 104, 51–56).

The Royal Astronomical Society of Canada (RASC: [rasc.ca](http://rasc.ca)) was founded in 1868—one year after Confederation—and has over 5,000 members and 29 Centres (branches); the newest is the Yukon Centre in Whitehorse. The RASC has an exemplary balance between local and national initiatives and activities such as its annual *Observers Handbook* and *Observers Calendar*, and its bimonthly *Journal*. A decade ago, it was the winner of the Michael Smith Award, a prestigious national award for excellence in science communication. Appropriately, the Ottawa Centre is hosting the 2017 RASC General Assembly on the Canada Day weekend, which includes Canada's 150th birthday on July 1. Delegates will be gathering on Parliament Hill that day, but probably without telescopes, lest they be mistaken for weapons of mass destruction! Celebratory star parties are planned for across the country, throughout the summer. There will also be nationwide viewing of the August partial eclipse of the sun.

The francophone Fédération des Astronomes Amateur de Québec (FAAQ) has almost 2,000 members in 41 branches. Other astronomy clubs include the North York Astronomical Association, which organizes StarFest, one of the biggest annual star parties on the continent. Canadian amateur astronomers have a long history of interest in variable stars, going back a century to the enigmatic J. Miller Barr (Percy 2015, *JRASC*, 109, 270–2). They contribute to the AAVSO, both as observers and in leadership roles.

The Canadian Astronomical Society/Société Canadienne d'Astronomie (CASCA: [casca.ca](http://casca.ca)) is our counterpart to the AAS, with about 500 professional astronomer and graduate student members. They come mostly from university departments, including the rapidly-growing Dunlap Institute at the University

of Toronto ([www.dunlap.utoronto.ca](http://www.dunlap.utoronto.ca)), and the McGill Space Institute at McGill University ([msi.mcgill.ca](http://msi.mcgill.ca)). Toronto and McGill are Canada's top-ranked universities. In 2015, Professor Art McDonald from Queen's University in Kingston (Ontario) shared the Nobel Prize in Physics for his leadership of the Sudbury Neutrino Observatory, as it solved the “solar neutrino problem”. This year, McGill astronomer Professor Vicki Kaspi was appointed a Companion of the Order of Canada, the highest rank and the equivalent of knighthood, for her research on pulsars.

Government astronomy is carried out in the National Research Council's Herzberg Institute of Astrophysics ([astroherzberg.org](http://astroherzberg.org)), which operates Canada's share of national observatories (notably Canada France Hawaii Telescope, Gemini North and South, and Atacama Large Millimetre Array) and data centre, helps plan for future facilities (notably the Thirty Metre Telescope and the Square Kilometre Array), participates in some collaborative scientific projects, and develops advanced instrumentation in partnership with industry. The Canadian Space Agency ([asc-csa.gc.ca](http://asc-csa.gc.ca)) supports, among other things, Canada's innovative balloon-borne astronomy program, the variable-star satellites MOST (Microvariability and Oscillations of STars) and the BRITE Constellation of five nanosatellites, and Canada's partnership in the James Webb Space Telescope. CASCA effectively contributes to the coordination and planning of astronomy, and gives astronomy a strong voice.

Our previous federal government was rather unfriendly to basic science and science communication, and one of the casualties was the “Centre of the Universe” visitor centre at the Dominion Astrophysical Observatory in Victoria, BC, which, when it opened in 1918, housed the second-largest telescope in the world. Fortunately, “Friends of the DAO” ([www.observatoryhill.org](http://www.observatoryhill.org)), a non-profit community organization, has sprung up to restore public and school programming, and revitalize the visitor centre. The future of the David Dunlap Observatory, near Toronto, is uncertain. In 1935, as part of the University of Toronto, it boasted the second-largest telescope in the world (DAO was third-largest).

Surveys show that Canadians' interest in science—including astronomy—is very high, and we have many ways of meeting that interest. Canada's popular astronomy magazine SkyNews ([www.skynews.ca](http://www.skynews.ca)), founded by the Canada Science and Technology Museum in 1995, was recently purchased by the RASC. Gary Seronik is the editor. Terence Dickinson, founding and long-time editor, continues as Editor Emeritus. We are fortunate to have three prominent astronomy authors—Dickinson, Dan Falk, and Ray Jayawardhana. Astronomer/journalist Ivan Semeniuk is the award-winning science reporter for the *Globe and Mail*, “Canada's national newspaper”. They follow in the footsteps of outstanding astronomy communicators Clarence A. Chant (1865–1956) and Helen S. Hogg (1905–1993), a former president of the AAVSO.

That's just a taste. I could write a much longer article, or a whole book about all the creative, exciting developments in astronomy, up here in the not-so-frozen north. Check out our websites! ★

## 2017 AAVSO ANNUAL MEETING TO BE HELD AT VANDERBILT UNIVERSITY

The 106th Annual Meeting of the AAVSO will be held November 3–4, 2017, at Vanderbilt University in Nashville, Tennessee.

The theme of the meeting will be *Stellar Transits: From Eclipsing Binaries to Exoplanets*.

All the events of the meeting, including the Banquet, will take place at Vanderbilt. The hotel selected for the meeting is located within a few blocks of the campus and has a shuttle that covers a 1.25-mile radius around the hotel.

Online registration opens June 15, 2017.

Please visit the AAVSO meeting page on our website (<https://www.aavso.org/aavso-meetings>) for updates on the 2017 Annual Meeting.



Dyer observatory

Billed as The Music City, Nashville is famous as a center of country music and is home to the Grand Ole Opry House, the Country Music Hall of Fame, and the Johnny Cash Museum, to name just a few places. The history of the Nashville area may also be explored through plantations and other sites that reflect the antebellum South.

Please join us in Nashville in November! ★

## SCIENCE SUMMARY: AAVSO IN PRINT

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

Science Summary: AAVSO in Print  
Elizabeth O. Waagen

AAVSO data are constantly being used by researchers around the world in presentations and publications.

In the past, we have listed in the Newsletter the publications appearing during the previous quarter on the [arXiv.org](http://arXiv.org) server that used AAVSO data or resources and/or acknowledged the AAVSO. This listing has also appeared on the AAVSO website.

Beginning with this issue, we are not listing the publications but instead giving a summary of the numbers of publications from arXiv that used different AAVSO resources. The listing of publications still appears on the AAVSO website at <https://www.aavso.org/aavso-print>. The articles are categorized by AAVSO resource used.

From 2017 January 1 through March 22, the arXiv.org preprint server included the following numbers of publications:

Publications using the AAVSO International Database (AID): 24  
Publications using the AAVSO Photometric All-Sky Survey (APASS): 19  
Publications using the International Variable Star Index (VSX): 5  
Publications using other AAVSO resources:  
AAVSO Alert and/or Special Notices: 2  
AAVSO Data analysis software (VPhot, VStar): 3  
AAVSONet: 1  
AAVSO member(s) among authors: 4

*Note: Many variable star publications not counted here include AAVSO members among their authors. The number here refers primarily to publications on non-variable star subjects.*

Citizen Sky: 1  
JAAVSO (as a resource, not a specific paper therein): 1

We thank these 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. ★

## WANTED: ASTRONOMICAL GURUS

### DONN STARKEY, COORDINATOR, AAVSO MENTOR PROGRAM

When you first started observing, there was most likely a person who helped you learn the observing process. Whether acting formally or informally, that person was your mentor.

The AAVSO Mentor Program is the touchstone for new members. Since the program is a members-only-benefit, it limits the number of people [mentees] in the program. The Mentor Program allows the new observers to get a feel for what variable star observing is all about. Our Mentor Program is composed of seasoned observers in the areas of Visual observing, CCD observing, DSLR observing, and PEP observing. The Mentors act as counselors, consultants, and advisors: Gurus, if you will. Most new members come with at least a modest amount of experience in some type of observing. The most common mentee is a backyard astronomer who has been performing astrophotography for several years and now wants to transition into something more scientific. The CHOICE Program has made a great improvement in the success of the Mentor Program. New members can get up to speed on various aspects of variable star education before being taken on by a Mentor for individualized instruction.

One of the best aspects of the Mentor Program is those mentee successes who eventually become friends. I joined the Mentor Program back in 2011. One of my first mentees was Michael Cook, who is now a valuable CCD observer and is contributing quality data. We still exchange emails, and I look forward to seeing Michael at AAVSO meetings, although I think that he can teach me more than I could teach him, these days. I am proud to announce that Michael has agreed to become himself a Mentor.

Another aspect of the Mentoring Program is that it has made me a better observer. Before I can teach a concept to a mentee, I must feel confident that I understand the concept myself. Because I teach concepts like comp stars, flat fielding, and dark frames to mentees, I know that I must first be confident in my own knowledge of these concepts. And I end up being a better observer by being a Mentor.

We try to match up mentees with Mentors who are in their same geographic location or region. We currently have 38 mentors in the AAVSO Mentor Program. Although most are in the contiguous 48 United States, 12 are located in Europe, Asia, South America, Australia, and in Canada. Mentoring is not a full-time job. Most mentors are only called upon one or twice a year. Right now, we are in dire need of Mentors who have experience in DSLR photometry. It is one of the least expensive methods to get into deep sky photometry, and therefore, it is one of the most popular. Barbara Harris is one of the few DSLR photometrists who is also a Mentor, and I end up calling on her much too often. Thanks, Barb!

Our Mentoring Program is based on taking a new member with at least some astronomical skills and turning them into a proficient variable star observer capable of making repeated accurate observations for the AAVSO International Database (AID). The training is usually via email, sometimes phone conversations and the occasional video chat session. Some Mentors even travel to the mentee's observatory, when they are close by, or have the mentee come to the Mentor's facility for some intensive training.

So, this is a call for AAVSO members who are willing to go that extra step and become Mentors to new members. The Mentor Program is one of the best services the AAVSO provides to ensure that new members become productive members and provide accurate data for the AID. If you have an interest in becoming a Mentor, becoming a better observer, and making new friends, please contact me at [mentor@aavso.org](mailto:mentor@aavso.org). ★

## TALKING ABOUT THE AAVSO

### Events

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

*January 4, 2017*—**Kristine M. Larsen** (LKR, New Britain, Connecticut) gave the poster presentation “Caroline Furness and the Evolution of Visual Variable Star Observing” at the 229th meeting of the American Astronomical Society (AAS), Grapevine, Texas (Abstract at <http://adsabs.harvard.edu/abs/2017AAS...22915803L>). This poster compared advice on observing variable stars between 100 years ago and today.

*January 5, 2017*—**Kristine M. Larsen** gave the poster presentation “Identification of Misclassified Rotational Variables in the ASAS Catalog”, with co-authors Jessica M. Johnson and Corwin Hoover, at the 229th meeting of the AAS, Grapevine, Texas. This poster summarized the work by two of her students using VSX and VStar.

*January 13, 2017*—**Simone Santini** (SSIM, Prato, Italy) gave a talk for a general public astronomy course entitled “Variable stars” (Le Stelle Variabili, in Italian) at the Associazione Astronomica “Quasar” c/o Centro di Scienze Naturali, Via di Galceti 74, 59100, Prato, Italy. Topics covered included general information about variable stars, star evolution and the role of amateur astronomers and related organizations (including AAVSO).

*February 1, 2017*—**Bill Goff** (GFB, Sutter Creek, California) spoke on “Variable Stars and why to observe them” to the Lincoln Hills Astronomy Group, Lincoln, California.

*March 28, 2017*—**Gary Poyner** (PYG, Birmingham, England) spoke on “Historical Novae” to the Birmingham Astronomical Society.

*April 8, 2017*—**Gary Poyner** will speak on “A variable star hop around eta Cygni” during the BAA Winchester Weekend, Winchester, England.

*May 5, 2017*—**Gary Poyner** will speak on an “Introduction to Variable Star Observing” to the Stanion and Northants Astronomical Society, Northamptonshire, England.

*June 28, 2017*—**Gary Poyner** will speak on “Variable Stars, how and why they vary” to the Hibaldstow Astronomical Society, Lincolnshire, England.

*September 7, 2017*—**Gary Poyner** will speak on “Historical Novae” to the Walsall Astronomical Society, West Midlands, England.

*October 15, 2017*—**Gary Poyner** will speak on “The monster in the Crab—the story of OJ+287” to the Rugby Astronomical Society, Warwickshire, England.

*December 14, 2017*—**Gary Poyner** will speak on “Legends in the sky” at the Canwell Womens Institute, Canwell, Sutton Coldfield, Staffordshire, England.

**Dennis Conti** (CDEC, Annapolis, Maryland), Chair, AAVSO’s Exoplanet Section, made the following outreach presentations:

Exoplanet Detection via Microlensing - to Amateur Astronomers, Inc. (AAI) of New Jersey, Cranford, New Jersey, December 16, 2016.

Exoplanet Observing Techniques - to a group of high school students in Hawaii doing an astronomy research project.

In addition, Dennis conducted the inaugural session of the Exoplanet Observing CHOICE course. The course was a four (4) week online course that included video and written material covering everything from high precision photometry to the use of AstroImageJ for exoplanet analysis. Over 40 individuals participated in the course, which took place February 6—March 4, 2017.

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 July 2017 AAVSO Newsletter (submission deadline June 15, 2017). Many thanks for your education and outreach efforts on behalf of the AAVSO and variable star observing! ★

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

## MENSAJE DEL DIRECTOR STELLA KAFKA

Mirando al futuro – ¿Y los nuevos observadores?

Hablamos mucho acerca del rol de la AAVSO en el siglo XXI, considerado como la era dorada de los descubrimientos de estrellas variables. Discutimos las formas en que nuestros observadores están contribuyendo y la necesidad de un flujo continuo de datos de estrellas variables. Se nos presentan nuevos proyectos y estamos en comunicación con los responsables de grandes relevamientos de datos que están ávidos de usar las habilidades de nuestros observadores para el seguimiento de sus objetos. La astronomía ciudadana ya es parte de la investigación, los astrónomos ciudadanos colaboran en proyectos y son coautores de papers. Nuestro trabajo es importante para los investigadores de todo el mundo y será más importante aún en las décadas que vienen.

El trabajo de la AAVSO es valorado y nos gustaría ver que continúe. Todos sabemos que las observaciones de estrellas variables siempre serán necesarias, ya que siempre habrá una nueva estrella con características inusuales, un comportamiento extraño que revelar en alguna vieja favorita, una sorprendente nueva categoría por descubrir. Las estrellas variables siempre estarán variando en formas que no seremos capaces de entender en nuestro tiempo de vida, pero nuestro trabajo contribuirá sobremanera a entender esos comportamientos extraños. Parte de nuestro trabajo en la AAVSO es asegurar que los observadores estén bien entrenados ahora y en el futuro y que los datos continúen fluyendo en nuestra base de datos en apoyo de diferentes proyectos.

Ahí es donde la AAVSO le da un valor agregado a esta comunidad: tenemos material de entrenamiento fácil de seguir tanto para novatos como para observadores experimentados, material que puede ser leído con facilidad por científicos jóvenes. Contamos con mentores con mucho conocimiento y destrezas que ayudan a observadores de todos los niveles a mejorar sus habilidades. Desde la sede central llevamos a cabo chequeos de datos y nos comunicamos con los observadores que producen observaciones discrepantes, ayudándolos a mejorar su forma de recolectar y reducir datos. Producimos cartas y secuencias, ofrecemos software de reducción y análisis de datos y una biblioteca de información de estrellas variables a través de VSX. En resumen, posibilitamos que cualquiera en nuestra comunidad

participe en cualquier nivel del descubrimiento científico – desde adquirir datos y analizarlos hasta enviar un manuscrito reportando sus resultados a la comunidad científica a través de nuestro journal. Estamos construyendo una comunidad comprometida de científicos ciudadanos, que trabajan y entienden a las estrellas variables. Realmente acercamos la ciencia a todos, en todas partes.

Estas herramientas que son tan valiosas para nuestros observadores de todo el mundo también pueden ser usadas para entrenar a observadores más jóvenes. En realidad, esperamos poder atraer más gente joven a nuestras actividades y que se enganchen a trabajar con estrellas variables. Ya estamos trabajando con profesores de escuelas secundarias, colegios y universidades mostrándoles cómo pueden aplicar proyectos de astronomía en sus clases. Estamos buscando continuamente nuevas formas de interacción con las nuevas “estrellitas”. Esto es algo en lo que ustedes, nuestros miembros, que aprecian y apoyan activamente nuestro trabajo y nuestra misión, pueden ayudar: ¿conocen a algún joven que pudiese estar interesado en observar el cielo nocturno? ¿Hay miembros nuevos en su club local que tengan ganas de participar en ciencia y, con algo de guía, pudiesen convertirse en excelentes observadores? ¿Pueden recomendar la AAVSO a un vecino o amigo que admire su pasión por las observaciones y quiera entender más acerca de las maravillas del cielo?

Me encantaría escuchar sus ideas, y quedo a la espera de cualquier sugerencia que puedan tener sobre cómo podemos diversificar y aumentar el número de nuestros miembros. Estoy convencida de que hay muchas personas a las cuales les encantaría estar comprometidas en serio pero no saben por dónde empezar y se sienten intimidadas por la curva de aprendizaje que hace falta. Pero es ahí donde la AAVSO puede ayudar como nadie. La astronomía es diversión y la investigación astronómica le abre a uno a la cabeza al maravilloso mundo del universo que nos rodea. Continuemos esta charla en el próximo encuentro de SAS/AAVSO y hablemos más acerca de cómo difundir la misión de la AAVSO a todos y de asegurarnos de que el trabajo de la AAVSO, su trabajo, continuará por toda la eternidad.

Los mejores deseos – cielos claros,  
Stella. ★

## MENSAJE DEL PRESIDENTE KRISTINE LARSEN

Amigos: La última vez que hablamos (virtualmente), les había pedido que se unieran a mí en la tarea de aumentar y diversificar el número de miembros de nuestra organización. Les agradezco por los muchos comentarios reflexivos de intercambio de ideas en los foros y tengo ganas de discutir algunas de sus ideas en persona en la reunión de junio en Ontario, California. Este trimestre quiero compartir con ustedes una historia personal, con el fin de demostrarles el poder de ser mentor de alguien de la generación más joven, en este caso particular, una de mis estudiantes. Algunos de ustedes ya han conocido a Jessica antes en una de las reuniones de otoño que asistió en Massachusetts, donde presentó su investigación sobre las estrellas BY Draconis. El resto de ustedes pronto se encontrará con ella virtualmente, a través de la página sobre el eclipse solar que ayudó a escribir para nuestro sitio web. Pero ninguno de ustedes la hubiese conocido nunca si no hubiera sido por ese primer paso sumamente importante: la tutoría. Les voy a dejar su historia aquí, en sus propias palabras:

La observación solar me fue presentada, por primera vez, en el otoño de 2012, mientras participaba del curso de Astronomía Observacional de la Dra. Kristine Larsen. Como parte del curso tenía que aprender a observar el sol, incluyendo el montar y desmontar el telescopio. Recuerdo que parecía desalentador, ser responsable de la integridad de ese equipo, así como la seguridad de los ojos; yo no quería quedar ciega. A medida que avanzaba el semestre se hizo más fácil y, finalmente, tenía ganas de hacer observación solar. Me divertía contando todas las manchas y era muy sencillo. Entonces me di cuenta que era muy fácil obtener esos datos tan importantes y ¡que era muy agradable!

Hacia la mitad del semestre siguiente ya había jugado con la idea de pedir a la Dra. Larsen si podía hacer observaciones solares y presentarlas a la AAVSO, como ella había estado haciendo. Creo que nunca voy a olvidar su reacción cuando le pregunté si podía hacer eso: con una enorme sonrisa en su cara ella dijo con entusiasmo: “Sí, ¡por supuesto!” De inmediato me pidió que la acompañara al piso de arriba para que activáramos una cuenta de AAVSO y un cuaderno para registrar mis observaciones. He estado observando desde entonces y no hay un día que no lo disfrute; hay algo realmente especial

CONTINUED ON NEXT PAGE



## MENSAJE DEL PRESIDENTE CONTINUED

en observar por un ocular y contar las manchas solares. Es una oportunidad para realmente pensar y conectarse con algo que tiene un enorme impacto, en fin, ¡en todo!

No puedo enfatizar lo importante que es tener un mentor que a uno lo guíe a través del proceso de aprendizaje de la observación. Con la Dra. Larsen hemos pasado unos minutos en días soleados haciendo juntas observación solar, que fue estupendo para construir mi confianza en la identificación de los grupos más complicados y distinguir poros solitarios de manchas solitarias. Posteriormente podíamos discutir nuestras observaciones y eso fue una parte increíble del proceso de aprendizaje para crecer como observadora, ya que me hizo pensar acerca de por qué o por qué no algo era un grupo o un poro. Hay razones obvias para tener un mentor, tales como la seguridad (que es muy importante en esta línea de trabajo) y la ayuda para orientar el proceso de identificación de estas manchas solares. Pero en mi experiencia creo que la mayor razón de lo importante que es tener un mentor para la observación solar es que realmente retrata la importancia y la elegancia de la observación solar y construya la pasión y la inspiración sobre ella. La Dra. Larsen ha hecho eso por mí y no creo que mi pasión se torne menguante. Cap Hossfield fue mi mentor de observación solar, allá por vuelta de finales de 1980. Si no hubiera sido por él, nunca me habría involucrado en la observación solar y además el también me introdujo en la AAVSO y, ciertamente, si no hubiese sido por él no estaría sirviendo como vuestra Presidente en la actualidad. Cada viaje comienza con un único paso. Sea la persona que ayude a alguien a iniciar su viaje personal para convertirse en un observador de estrellas variables y miembro de AAVSO. Cada uno de nosotros tiene el poder de cambiar vidas. Considere la posibilidad de convertirse hoy mismo en un mentor.

Si usted es un observador experimentado que está interesado en convertirse en un mentor, por favor, póngase en contacto con el Coordinador del Programa de Mentores de AAVSO Donn Starkey ([mentor@aavso.org](mailto:mentor@aavso.org)). Si necesita un mentor, el programa (<https://www.aavso.org/mentor-program>) está abierto a todos los miembros. De nuevo, por favor, póngase en contacto con Donn. ★

## IN MEMORIAM

MEMBERS, OBSERVERS, COLLEAGUES,  
AND FRIENDS OF THE AAVSO



**PETER L. COLLINS** (COL, Flagstaff, Arizona) died on January 16, 2017, after collapsing the day before from a heart attack, at the age of 67. An AAVSO

member for nearly 30 years, he contributed 19,199 visual observations to the AAVSO International Database from March 1975 through November 2016. In 1995 he received an AAVSO Observer Award at the 10,000 visual observations level. An avid amateur astronomer since childhood, Peter was an expert visual nova searcher (he memorized the appearance of the sky down to magnitude 8), and, working with small binoculars, over the decades discovered four galactic novae: Nova Cygni 1978 (V1668 Cyg; independent discovery—Warren Morrison was the other discoverer), Nova Vulpeculae 1984 No. 2 (QU Vul), Nova Vulpeculae 1987 (QV Vul; independent discovery - Kenneth Beckmann was the other discoverer), and Nova Cygni 1992 (V1974 Cygni). Peter received AAVSO Nova Awards (given for the visual discovery of a nova) for his discoveries of QU Vul, QV Vul, and V1974 Cyg. With four novae to his credit, Peter was considered the world's second greatest visual nova discoverer—only George E. D. Alcock had more, with five visual discoveries. Peter wrote an article about his visual nova-search program not long after he began searching (but after his first discovery); “One Man’s Nova Patrol” appears in JAAVSO, Vol. 7, No. 2, p. 64. In it he says: “The nova hunter must cultivate the patience of a stone Buddha, maintaining his enthusiasm through the reaches of time and starry space.” At the time of his death Peter was a software developer at Lowell Observatory, where he had been for many years. He was part of the team that made the first exoplanet transit observation with the Stratospheric Observatory for Infrared Astronomy (SOFIA);

they observed HD 189733 b in 2013. Peter didn’t attend very many AAVSO meetings, but when he did it was always a pleasure to see him and to have a quiet conversation that ranged across observing techniques, astronomy and other nature, and whatever interesting and varied books he had been reading. We send our deepest sympathy to Peter’s sisters and brothers and other family, colleagues, and friends.



**ARTHUR R. UPGREN, JR.** (Middletown, Connecticut) died February January 21, 2017, at the age of 83 of heart failure. He was a former member of the AAVSO and an advocate for the AAVSO and its work. He credited his lifelong interest in astronomy to his childhood neighbor,

astronomer Dr. Willem Luyten, who pointed out to him at age seven the five naked-eye planets visible in the twilight sky. Luyten further influenced him in college by encouraging Arthur to switch his major to astronomy. After research and teaching at other institutions, Arthur served on the faculty of Wesleyan University for 34 years, as Director of the Van Vleck Observatory from 1973 to 1993, and as the John Monroe Van Vleck Professor of Astronomy. His specialties included astrometry and stellar parallax, Galactic structure, and the luminosity function of nearby stars. An environmentalist, Arthur was deeply concerned about the damaging effects of light pollution (he taught the first-ever college credit course on light pollution), and he was active in raising public awareness about the subject. He wrote four books for the public on astronomy, climate, and nature. He also very much enjoyed music and travel. We extend our deepest sympathy to Arthur’s wife Joan, their family, and his many friends and colleagues.

### 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.

## PHOTOELECTRIC PHOTOMETRY PROGRAM UPDATE

JIM KAY (KJMB, AAVSO PEP SECTION LEADER)

**Observations** The first quarter of the year (in keeping with our astronomical roots I am defining the first quarter to be from winter solstice to spring equinox) was one of uncooperative weather for many of our observers, with cloudy conditions for observers in Europe, North America, and New Zealand. Despite these conditions 8 intrepid PEP observers managed to acquire a total of 201 observations of 38 stars, in 5 bands (B,V,R,J,H).

The stars with the greatest number of observations included CC Lyn (43), RZ Ari (11), alf Ori (10), eps Aur (10), CK Ori (8), W Ori (8), X Cnc (8), and V614 Mon (7).

Observation counts by observer are given below:

*AAVSO International Database PEP data contributors Q1 2017*

BVE	Erwin van Ballegoij	Netherlands	4
CTOA	Tom Calderwood	Oregon	14
DFR 3	Frank Dempsey	Canada	3
FXJ	James Fox	New Mexico	42
KCD	Carl Knight	New Zealand	6
KJMB	James Kay	Vermont	2
LPD	Patrice LeMarchand	France	5
PGD	Gerald Persha	Michigan	125

Average error reported was an impressive 0.005 magnitude. A well-deserved thank you goes to all these observers for continuing to provide highly accurate observations of bright stars, along with commiseration for those who have been clouded out.

**PEP CHOICE Course now open for registration** The PEP CHOICE course entitled “PEP in the 21st Century” is now open for enrollment. It will be offered from May 8 through June 2 and will cover fundamental photometric measurement using single channel Photoelectric Photometers. I encourage both PEP and CCD observers to sign up if they would like an overview of photometric theory and observing technique. This newly developed course will use the PEP observing manual as the main text (see <https://www.aavso.org/pep-observers-guide>). A syllabus is available on the CHOICE course pages at <https://www.aavso.org/2017-choice-course-schedule>.

**Infrared Photometry** Two observers provided a total of 8 observations in the J and H bands, 2 of R Leo and 6 of Betelgeuse. We still have a bit of an observing window for Betelgeuse and I encourage both IR and visual observers

to continue measurements as this section is the only source I am aware of for high precision measurements of this star.

Calibration issues continue to plague this subsection likely due to the highly variable nature of the IR sky that makes measurements of transformation coefficients difficult. As the number of observations increases we will be able to do more robust comparisons among observers to quantify these issues and determine our overall accuracy and precision in these bands.

**Transformation Challenge** AAVSO recently announced a campaign (with prizes) for observers to measure and post their transformation coefficients. Since all of the PEP observers transform their measurements the section could have 100% participation in this challenge. I encourage everyone to check out this challenge at <https://www.aavso.org/transform-campaign-2017-includes-prizes> and post your transformation coefficients.

**Unusual Observing Challenge** As mentioned earlier the PEP team had a bit of a challenge with the weather in the first quarter of 2017, but that was not the only natural condition that got in the way. I recently received this report from Carl Knight of New Zealand that describes a situation generally not covered in manuals on observing techniques and error sources:

“Early European settlers nicknamed New Zealand ‘The Shaky Isles.’ 2016 saw a record number of earthquakes, with over 32,000 recorded. In reality, several per week are strong enough to be felt, the vast majority are not. This trend makes for some interesting observing issues. For example, last night, up a ladder making sure beta Ori was in the reticle on the guide scope whilst taking PEP J&H counts on the 12” SCT, the star suddenly started to dance, I then realized the ladder was too. A magnitude 4.8 earthquake had struck near Paraparaumu, about an hour’s drive away from the observatory. Never-the-less, clear skies having been so rare of recent, I carried on the observations and now have some ‘outlier’ counts to prune!”

Best of luck to Carl with his shaky observations!

As always, an open invitation goes out to anyone wanting to try PEP. We have a range of long term and new observers, but could always use more. More information is available at the AAVSO PEP webpages at: <https://www.aavso.org/aavso-photoelectric-photometry-pep-program> ★

## LPV SECTION UPDATE

ANDREW PEARCE (ADMINISTRATOR)

It's been a busy few months since late 2016 for the LPV Section. Along with continuing to promote LPVs through our monthly articles on a specific interesting LPV, we have also recently completed and publicised two new initiatives as described in further detail below:

**Update of the LPV Legacy Program List** We completed a review of the LPV Legacy stars list. Mike Simonsen and Kate Hutton originally developed this list back in 2009. They did a great job in identifying important LPVs to follow to ensure that we continue the long observational history of these stars and they reflect the long tradition of the AAVSO.

Using the same 2009 criteria developed by Mike and Kate for defining the Legacy list, we identified a further 21 stars which have been added to the Legacy list. The current list of AAVSO Legacy Stars can be found in our AAVSO LPV Section File Downloads page (the file is titled "AAVSO Legacy LPVs 2017 Update").

The vast majority of LPVs in the Legacy list are north of the celestial equator, which is understandable given most observers have been located in the northern hemisphere. However to ensure there is sufficient coverage south of the celestial equator, a separate legacy list has been developed for LPVs south of declination 20S (southern stars in the existing legacy list will remain there, so this new list just contains additional stars). The selection criteria as first proposed by Mike and Kate remains, however, it is necessary to relax the criteria somewhat. All stars on this southern list have been under observation since before 1950, have over 5,000 observations in the AID, and have been referenced in over 50 scientific publications over the years. This resulted in a list of approximately 30 stars and again is a subset of the original Pickering program list. The current list of AAVSO Legacy Stars South can be found on our AAVSO LPV Section File Downloads page (the file is titled "AAVSO Legacy South").

The LPV Legacy star list and LPV Legacy South list can all be searched in VSX under "Campaign or Program".

**John Percy's list of interesting Pulsating Red Giants (PRGs)** One of the LPV Section Science Advisors and JAAVSO Editor, Dr. John Percy, has put together a list of pulsating red giants (PRGs) that have and continue to show interesting and/or unusual behavior. The LPV Section would like to promote the stars that appear on John's list as worthy of intense coverage for all observers, visual observers in particular. The list includes many stars that are currently on the LPV Legacy and Legacy South lists as well (highlighted in yellow in the file).

The list has been designated "The Percy List" and can be found on our AAVSO LPV Section File Downloads page (the file is titled "The Percy List.pdf"). ★

## AAVSO OBSERVING CAMPAIGNS UPDATE

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

Each campaign is summarized on the AAVSO Observing Campaigns page (<http://www.aavso.org/observing-campaigns>), which also includes complete lists of all AAVSO Alert and Special Notices issued for each campaign. AAVSO Alert Notices are indexed at <https://www.aavso.org/alert-notice-archive> and AAVSO Special Notices at <https://www.aavso.org/special-notice-archive>.

It's been an extremely busy quarter for our observers!

*Campaigns concluded since January 1, 2017*

In mid-July 2016, Dr. Colin Littlefield (University of Notre Dame) and colleagues requested AAVSO observers' assistance in providing time-series observations of the intermediate polar cataclysmic variable **FO Aqr** until the system returned to maximum or went into conjunction and was no longer observable. FO Aqr, which in its high state (maximum) is  $V \sim 13.4$ , was  $V \sim 15$  in mid-July. The observations were requested to support the study of multiple periods and their evolution as FO Aqr returned to maximum (*AAVSO Alert Notice 545*). By early January 2017 FO Aqr had returned to maximum and the campaign was concluded. 39 observers contributed 61,951 multicolor observations to this campaign.

The campaign begun in mid-October at the request of graduate students Kelly Gourdji and Marcella Wijngaarden (University of Amsterdam/Anton Pannekoek Institute for Astronomy) was successfully concluded. They had requested AAVSO observers' assistance in providing optical multicolor photometry of **CI Cam** (the B[e] optical counterpart of a HMXB system) in support of their high-resolution spectroscopy with the Mercator telescope + Hermes spectrograph in La Palma through January 2017 (*AAVSO Alert Notice 559*). 25 observers contributed 1,847 multicolor observations to this campaign.

In mid-December, Dr. Christian Knigge (University of Southampton) and colleagues requested AAVSO coverage of the SU UMa-type dwarf nova **YZ Cnc** in support of Chandra X-ray observations to be carried out via a Target of Opportunity (TOO) triggering when the system was in a suitable outburst (*AAVSO Alert Notice 565*). Observers were asked to observe YZ Cnc one to a few times, widely spaced, per night, visually and in V or CV, continuing until the Chandra observations were carried out and the end of the campaign was announced. After some delays caused by Chandra technical issues, the monitoring provided by AAVSO for two months allowed successful observations by Chandra in February. In a post to the AAVSO Campaigns forum in early March, Dr. Knigge wrote: "Just a final update on the YZ Cnc campaign, i.e. the time-critical Chandra observations for which you helped provide the key optical trigger info. As you may recall, the Chandra observations – together with the ones on RX And late last year – were designed to be pathfinders for a much larger program where we would try to get simultaneous, more or less uninterrupted, time-resolved, multi-wavelength coverage of a dwarf nova eruption covering everything from X-rays to radio wavelengths. The purpose of the pathfinder was to check if RX And or YZ Cnc were suitable targets for this – the point being that we need to be able to detect the very softest X-ray emission with Chandra for any system that would work for the big program.

CONTINUED ON NEXT PAGE

CAMPAIGNS UPDATE  
CONTINUED...

“In this context, the headline news is slightly frustrating: as was the case for RX And, it appears that we did not see significant (very) soft X-ray emission from YZ Cnc. As with RX And, I suspect at the moment that this is simply because interstellar absorption is too strong. The data we obtained is still interesting, of course, and I do intend to publish it and will get back to everybody who contributed at that time. The bigger picture, of course, is that it’s sort of back to the drawing board for me now in terms of finding a suitable target for the big program. On the other hand, the whole point of the pathfinder was to provide this sanity check and avoid us wasting lots of observatory time on unsuitable targets. I expect I’ll be hassling you again with pleas for observations once I have figured which object to try next. Thanks, as always, for your help!” 84 observers contributed 26,075 multicolor observations to this campaign.

The campaign from early February on the symbiotic-type recurrent nova **IM Nor** requested by Dr. Ed Sion (Villanova University) and colleagues in support of their upcoming HST Cosmic Origins Spectrograph (COS) observations (*AAVSO Alert Notice 567*) was successfully concluded. Observers obtained nightly V snapshots, determining the status of the target, both to protect HST instrumentation and monitor the target brightness, and the HST COS observations were obtained. 2 observers contributed 17 multicolor observations to this campaign.

Dr. Elmé Breedt’s (University of Warwick) campaign from mid-February was successfully concluded. She had requested AAVSO monitoring of the eclipsing cataclysmic variable **1SWASP J162117.36+441254.2** through March 2017 in support of HST COS observations scheduled for late February - early March (*AAVSO Alert Notice 569*). Nightly V snapshots had been requested to determine the status of target in order to protect HST instrumentation and to monitor the brightness of the target. The HST COS observations were obtained; 15 observers contributed 521 multicolor observations.

Dr. Fred Walter’s (Stony Brook University) campaign from early March was successfully concluded. He had requested time series observations of the compact eclipsing system **NR TrA** (Nova TrA 2008; V~16.5 out of eclipse) in support of XMM Newton observations scheduled for mid-March (*AAVSO Alert Notice 570*). The XMM observations were obtained; 3 observers contributed 875 multicolor observations.

*Campaigns initiated or re-activated since January 1, 2017*

The BRiGht Target Explorer Constellation (BRITE-Constellation) satellite suite is studying the “stellar structure and evolution of the brightest stars in the sky and their interaction with the local environment.” The AAVSO is part of the BRITE-Constellation Ground Based Observations Team (GBOT), supporting cutting-edge science from the BRITE-Constellation satellites and coordinating with BRITE-Constellation scientist Dr. Konstanze Zwintz (Universitaet Innsbruck) and her team. The delta Scuti star **beta Pic** (NSV 16683) (3.80-3.86V) is one of the BRITE stars being focused on during this season and through 2017-2018 as a transit of the star’s planet’s Hill sphere (the region around a planet in which it dominates the attraction of satellites) is expected. The AAVSO’s webpage on the BRITE target stars (<https://www.aavso.org/aavso-brite-targets>) was updated in November 2016 with information on bet Pic from Dr. Zwintz, and AAVSO observers are encouraged to observe this star (*AAVSO Alert Notice 566*). Its brightness makes bet Pic

well suited to PEP and DSLR photometry; CCD photometry is also possible. As the amplitude of this star is very small, visual observations are very difficult but are welcome. High-precision BVR photometry and time-series have been requested; details and instructions are in the Alert Notice. Another campaign on bet Pic that is underway is being coordinated by Dr. Iva Luginja (Leiden Observatory, The Netherlands). Dr. Luginja writes “that observations are requested beginning now to help build a photometric baseline in preparation for the transit across the star of debris surrounding the planet predicted to occur between March 2017 and March 2018.” For details, please see [http://home.strw.leidenuniv.nl/~luginja/documents/beta%20Pic%20photometry\\_ENG.pdf](http://home.strw.leidenuniv.nl/~luginja/documents/beta%20Pic%20photometry_ENG.pdf)

In early February, Dr. Ed Sion (Villanova University) and colleagues requested AAVSO support of their upcoming HST Cosmic Origins Spectrograph (COS) observations, asking observers to obtain nightly V snapshots of the symbiotic-type recurrent nova **IM Nor** through late February in order to determine the status of the target, both to protect HST instrumentation and monitor the target brightness (*AAVSO Alert Notice 567*). The campaign was successfully concluded (see above).

In mid-February, Dr. Elmé Breedt (University of Warwick) requested AAVSO monitoring of the eclipsing cataclysmic variable **1SWASP J162117.36+441254.2** through March 2017 in support of HST COS observations scheduled for late February - early March (*AAVSO Alert Notice 569*). Nightly V snapshots were requested to determine the status of target in order to protect HST instrumentation and to monitor the brightness of the target. This campaign was successfully concluded (see above).

In early March Dr. Fred Walter (Stony Brook University) requested time series observations of the compact eclipsing system **NR TrA** (Nova TrA 2008) in support of XMM Newton observations scheduled for mid-March (*AAVSO Alert Notice 570*). The XMM observations were obtained, and the campaign was successfully concluded (see above).

In mid-March Dr. Karen Collins (Vanderbilt University) requested observations of the transits of Proxima Centauri’s exoplanet, **Proxima Centauri b** (*AAVSO Alert Notice 571*) through 2017 or until further notice. This exoplanet is a suspected Earth-size planet orbiting in the habitable zone of our nearest stellar neighbor, Proxima Centauri (V645 Cen). There exists a rough ephemeris of this target based on radial velocity measurements, so the predicted mid-transit times can vary +/- 6 hours. The expected duration of the transit is less than two hours long. The transit depth is expected to be 5 mmag. However, because Proxima Centauri itself is a flare star, there may be large variations in the light curve. These observations are most suitable for those with prior experience conducting exoplanet observing. Proxima Centauri has a magnitude range of 11.1 - 11.3 V. Observers are requested to please contact Dennis Conti, AAVSO’s Exoplanet Section Chair, at [dennis@astrodennis.com](mailto:dennis@astrodennis.com) if they are interested in participating in such observations and would like the predicted transit times.

*Campaigns in progress*

The campaign begun in October 2016 at the request of Dr. Ashley Pagnotta (Louisiana State University) to monitor the recurrent nova **V2487 Oph** in order to catch and observe its next outburst continues (*AAVSO Alert Notice 556*). The next outburst is expected in the next year or two, as the system has outbursts 18-20 years apart and it is 18 years since the last outburst. As of 2017 March 28.8319 UT, it was visual magnitude <15.2 (PEX, A. Pearce,

CONTINUED ON NEXT PAGE

## CAMPAIGNS UPDATE CONTINUED...

Nedlands, W. Australia). Since this campaign began October 4, 9 observers have contributed 27 multicolor observations to it.

The call by the AAVSO in early April to monitor the symbiotic recurrent nova **T CrB** continues. T CrB, which entered a super-active state in February 2016, and was brighter and bluer than since before its last outburst in 1946, has faded somewhat after a very interesting episode (January 2017 *AAVSO Newsletter*, Figures 2 and 3). However, it has not returned to its normal minimum, and **it is important to continue the multicolor and visual observations**. The most recent observations in the AAVSO International Database show T CrB at visual magnitude 10.0 on 2017 March 30 (LMK, M. Linnolt, Volcano, HI) and 9.5 on March 31 UT (DMIB, M. Deconinck, Artignosc sur Verdon, France). T CrB has been observed twice in outburst (maximum at V~2.0), in 1866 and 1946. Extremely interesting research by U. Munari et al. reveal an interesting correlation between the pre-outburst activity in previous outbursts and the current behavior. Please see *AAVSO Special Notice #415* for details.

The campaign from Dr. Jenő Sokoloski (Columbia University) and graduate student Adrian Lucy (Columbia University) on the jet-driving symbiotic star **V694 Mon (MWC 560)**, which had concluded at the end of April 2016 (*AAVSO Alert Notice 538*) and was re-opened, has been modified. **Photometry is no longer requested, but spectroscopy is**. Ms. Lucy requests: “**spectroscopic monitoring at H-alpha (6562 angstroms) and H-beta (4861 angstroms), on a cadence of a week or two**, to monitor changes in the disk outflow. Any wavelength resolution is useful. A wavelength range that can accommodate a blueshift of at least 140 angstroms (6000 km/s) from the rest wavelengths of these lines is ideal, though spectra with a smaller range can still be useful.” 6 observers worldwide have contributed 42,579 multicolor and visual observations of this star since the campaign began 26 February 2015.

Ready The campaign on the bright (V~6.7) colliding-winds binary **V1687 Cyg (WR 140, HD 193793)** from Dr. Noel Richardson (University of Toledo) and colleagues continues. Optical photometry was requested in support of multi-wavelength campaign studying dust behavior as the system passed through periastron. Periastron has passed, and **AAVSO data are showing evidence of a dust event underway (Figure 1)! Observations are urgently requested to continue**. The campaign will run until at least August 2017 (*AAVSO Alert Notice 546* and *AAVSO Special Notices #419* and *#429*). 18 observers have contributed 366 multicolor observations to this campaign since it began 3 August 2016.

Dr. George Wallerstein’s (University of Washington) request continues for AAVSO coverage of the long period/symbiotic variable **R Aqr (AAVSO Alert Notice 535)**. Optical and spectroscopic coverage is requested and recommended, respectively, to continue at least for the next several years to cover the eclipse predicted for 2022 (but which may come early). Several other astronomers are also studying R Aqr closely and will be carrying out multi-mode, multiwavelength observations in the near future. The minimum of December 2015 was indeed faint, and the minimum in December 2016 was not as faint but still faint. Thus R Aqr needs to be watched closely! A historical light curve dating from 1843 was shown as Figure 1 in the January 2016 issue of the newsletter (<https://www.aavso.org/aavso-newsletter>).

The campaign begun in October 2015 continues on the enigmatic variable object **KIC 8462852 (AAVSO Alert Notices 532 and 542)**. Filtered time-series

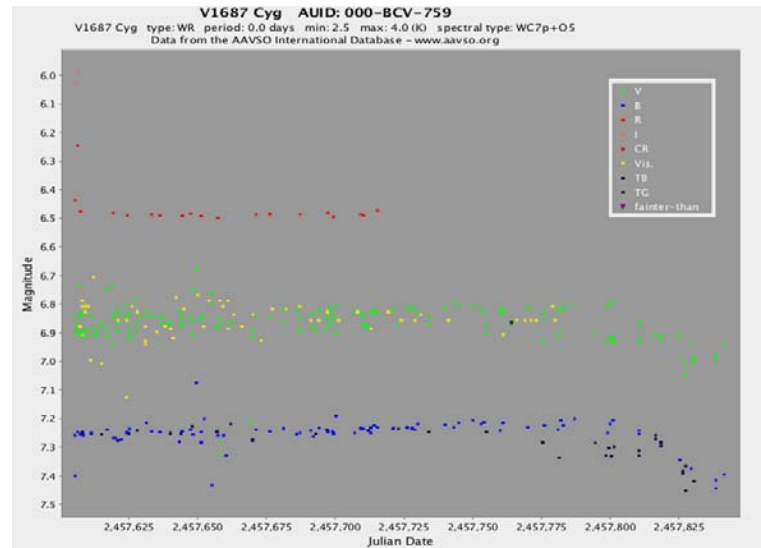


Figure 1: AAVSO light curve of the colliding-winds binary V1687 Cyg (WR 140) JD 2457600 – 2457843 (2016 July 30 – 31 March 2017).

observations (BVRI) are 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. Since the campaign began 2015 October 20, 80 observers have submitted 32,121 visual and multicolor observations.

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. After a subsequent shorter and fainter outburst December 30 - January 3, it again returned to minimum; as of 2016 December 29.742 UT, it was <16.7 CV (SFY, J. Shears, Bunbury, Cheshire, England). As its behavior following these outbursts is clearly unpredictable, AAVSO observers are asked to continue obtaining multicolor photometry as well as visual observations. Since the campaign began 2015 June 18, 90 observers have submitted 69,050 multicolor and visual observations.

Dr. Margarita Karovska’s (Harvard-Smithsonian Center for Astrophysics) campaign on **CH Cyg (AAVSO Alert Notice 454 and AAVSO Special Notices #267, 294, and 320)** continues at least through the 2017 observing season. Please continue 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 on this fascinating system (Figures 2 and 3). Visual observations are also important!

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 2015 (*AAVSO Special Notice #411*). Follow-up **continuing weekly or more frequent monitoring (B and V photometry and visual observations) is requested. High-resolution spectroscopy around Halpha and the [OIII]5007 A 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, 20 observers have contributed 9,003 multicolor observations of this star.

CONTINUED ON NEXT PAGE

**CAMPAIGNS UPDATE  
CONTINUED...**

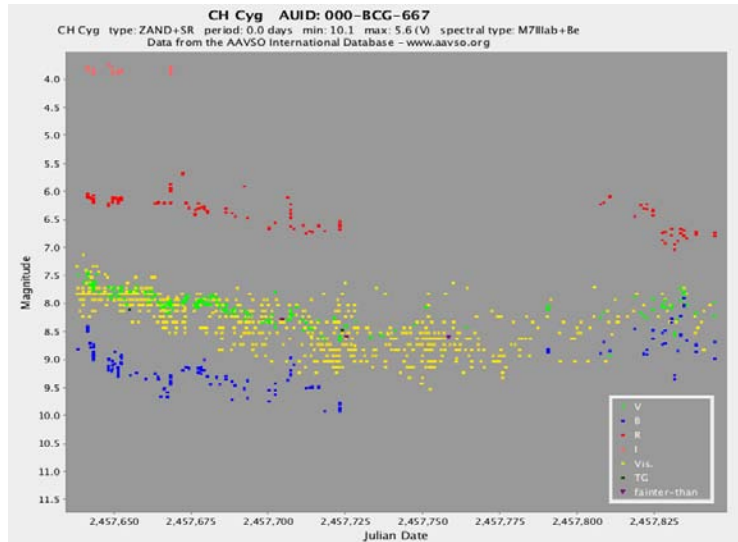


Figure 2: AAVSO light curve of the symbiotic star CH Cyg JD 2456737 – 2457843 (20 March 2014 – 31 March 2017). 197 observers contributed 12,940 visual and multicolor observations to this light curve.

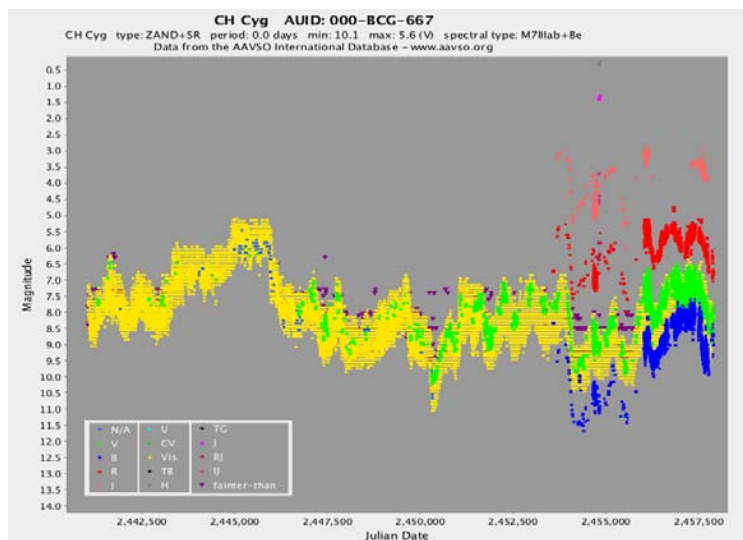


Figure 3: AAVSO long term light curve of the symbiotic star CH Cyg JD 2441000 – 2457843 (17 February 1971 – 31 March 2017). 1,221 observers contributed 127,853 visual and multicolor observations to this light curve.

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 until at least August 2017.

This campaign on the rare FU Ori object **2MASS J06593158-0405277 (V960 Mon)**, which originally ran April-July 2015 (*AAVSO Alert Notice 518*), continues after being re-activated by Dr. Fabienne A. Bastien (Hubble Postdoctoral Fellow, Pennsylvania State University). Please continue your

observations at least through the 2017 observing season. Dr. Bastien writes: “...We have very few constraints on what causes [these rare objects] 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.” After plateauing from its slow decline (that was underway when the campaign began) for a few months, the star was more active and appeared to be resuming its decline, very slowly, shortly before disappearing behind the Sun in early May 2016. When it returned in September, the decline was continuing, but the star been plateauing again from early October to late 2017 January, when it began to decline slowly again. As of 2017 March 26.1056 UT, it was visual magnitude 12.6 (CKB, B. Cudnik, Houston, TX) and as of March 26.1411-1457 UT it was 12.481 V +/-0.009, 13.849 B +/-0.011, and 10.614 I +/-0.007 (DKS, S. Dvorak, Clermont, FL). Since the campaign began, 21 observers have contributed 3,324 multicolor and visual observations.

The campaign continues on the symbiotic nova candidate **ASAS J174600-2321.3** initiated in January by S. Otero, P. Tisserand, K. Bernhard, and S. Hümmerich (*AAVSO Alert Notice 510*). The predicted eclipse occurred in March-July 2015, but the nova was still at maximum until October 2016. A slight decline had been seen since then, but when the star emerged from opposition it had returned to its previous maximum magnitude. As of 2017 March 22.3874 UT it was 12.223 V +/-0.009 (DKS, S. Dvorak, Clermont, FL). **Following this star to see what is happening – is this the beginning of the decline or normal pulsation - is very important, and ongoing visual and instrumental data are essential.** Since this campaign began 2015 March 5, 15 observers have contributed 1,830 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 throughout at least the 2017 observing season will be appreciated. Since this campaign began 2015 March 13, 42 observers have contributed 5,803 multicolor and visual observations to the AID.

**RW Aur** still continues to surprise! The campaign on this classical T Tauri star (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 wrote: “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 2015, its behavior has been complex. As of 2017 March 30.788 UT it was visual magnitude 11.5 (BOZ, B. Bago, Piliscsaba, Hungary). See Figures 4 and 5. **Please continue to follow RW Aur closely.**

Dr. Robert Stencel’s (University of Denver Astronomy Program) request to monitor **epsilon Aur** (*AAVSO Alert Notice 504*) continues as 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)

CONTINUED ON NEXT PAGE

**CAMPAIGNS UPDATE  
CONTINUED...**

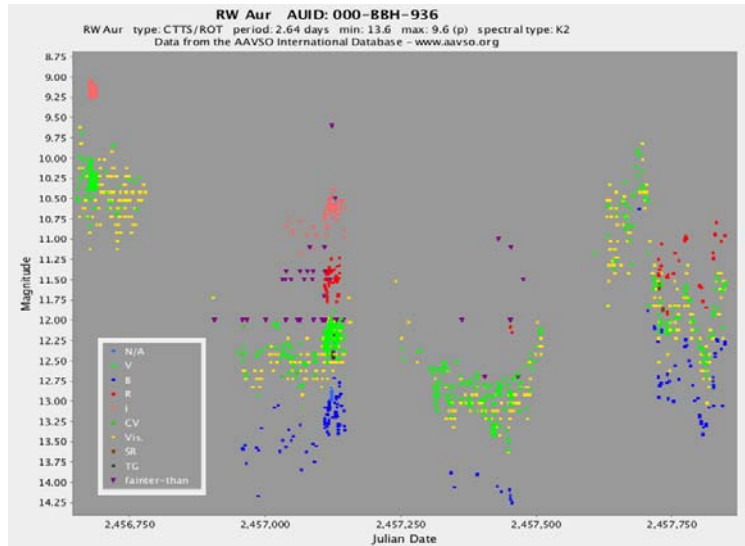


Figure 4. AAVSO light curve of the T Tauri star RW Aur JD 2456650 – 2457843 (23 December 2013 – 30 March 2017). 81 observers worldwide contributed 3,053 visual and multicolor observations to this light curve.

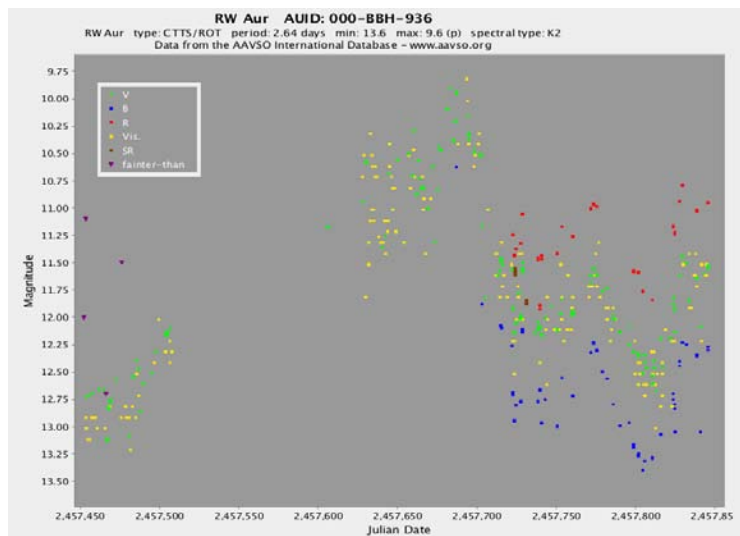


Figure 5. AAVSO light curve of the T Tauri star RW Aur JD 2457452 – 2457843 (4 March 2016 – 30 March 2017). 31 observers worldwide contributed 470 visual and multicolor observations to this light curve.

once a month. Since this post-eclipse campaign began 2014 September 17, 98 observers have contributed 2,524 multicolor and visual observations.

Dr. Eric Mamajek’s campaign on **V1400 Cen = J1407 (1SWASP J140747.93-394542.6)** (*AAVSO Alert Notice 462*) continues through 2017. 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*). 6 observers have contributed 3,918 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 2017 season and likely “for several more years.” Since May 2011, 123 observers have contributed 6,752 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!

Since Dr. Arne Henden suggested the very interesting and faint Mira variable **QX Pup** to AAVSO observers in 2008 as an observing exercise (<http://www.aavso.org/qx-pup>), 6 cycles have been observed in I, along with a smattering of fainter-thans and a few R and two V observations, and the period in Ic has been determined by Sebastian Otero at 551.0 days. A single V observation at/near the minimum shown in I shows the V minimum may be 18.2 or fainter (MZK, K. Menzies, Framingham, MA). QX Pup is now just past minimum. I have been challenging you to obtain a V range for QX Pup, which is embedded in a reflection nebula (the Rotten Egg Nebula). However, the nebula obscures the Mira itself, and there is a close companion, so making positive observations in V is complicated and very difficult. If you want to try V observations, be sure to read the information and instructions on the webpage referenced above.

**HMXBs and SFXTs** - High-Mass X-ray Binaries and Super Fast X-ray Transients, Dr. Gordon Sarty’s list (*AAVSO Alert Notices 348, 354, and 377, AAVSO Special Notices #118, #129, #143, #213, and #220*, and description of research program in *JAAVSO*, Vol. 35, p. 327; article viewable at <http://adsabs.harvard.edu/abs/2007JAVSO...35..327S>).

**Blazars** – Dr. Markus Boettcher’s list (*AAVSO Alert Notice 353* at <http://www.aavso.org/aavso-alert-notice-353>)

**Novae and R CrB**

UPDATE: One galactic nova has been discovered since January 1. Also, several recent galactic novae continue to provide good observing opportunities, and R CrB may be beginning to fade again.

**V1657 Sco (Nova Sco 2017 = PN V J16521887-3754189)** was discovered by Hideo Nishimura (Shizuoka-ken, Japan) on 2017 February 1.862 UT at unfiltered CCD magnitude 11.7. As of 2017 March 30.8132 UT it had faded to visual magnitude 15.0 (PEX, A. Pearce, Nedlands, W. Australia). 5 observers worldwide have contributed 64 multicolor observations through March 31.

Older novae (galactic and in the SMC) that are still within observing range include:

**V5854 Sgr (Nova in Sgr = ASASSN-16ma = PN V J18205200-2822100)** was independently discovered by ASAS-SN on 2016 October 25.02 UT at V~13.7, and by Yukio Sakurai (Mito, Japan) on October 26.380 UT at unfiltered CCD magnitude 10.4 (*AAVSO Alert Notice 568*). The light curve shown in the January 2017 newsletter (Figure 11) was a composite of data from this nova and another, as an identification mix-up had taken place, and should be ignored. The data in the AAVSO International Database have been allocated to the correct stars. As of 2017 March 23.434 UT V5854 Sgr was visual magnitude 11.2 (L. Shotter, Uniontown, PA).

**MASTER OT J010603.18-744715.8 = Nova in SMC (Tucana)** 2016 October 14.19341 UT was discovered on 2016 October 14.19341 UT at unfiltered CCD

CONTINUED ON NEXT PAGE

## CAMPAIGNS UPDATE CONTINUED...

magnitude 10.9 by the MASTER-OAFA auto-detection system and reported by V. Shumkov et al. in ATel #9621 (*AAVSO Alert Notice 557*). This classical galactic nova in the SMC continues to fade, and as of 2017 January 21.6782-.6930 UT was 15.92 V +/-0.05, 16.04 B +/-0.05, and 15.58 I +/-0.09 (NLX, P. Nelson, Ellinbank, VIC, Australia), and as of January 22.4826 UT it was visual magnitude 15.6 (KEI, E. Kato, Ballandean, QLD, Australia). 13 observers worldwide have contributed 7,818 multicolor observations through 2017 March 31.

**V407 Lup (Nova Lup 2016 = PNV J15290182-4449409 = ASASSN-16kt)**, discovered on 2016 September 24.010 UT by the All Sky Automated Survey for SuperNovae (ASAS-SN) at 9.11 V +/- 0.01 (*AAVSO Alert Notice 553*), continues to fade. As of 2017 2457843.2764 UT it was visual magnitude 14.5 (PEX, A. Pearce, Nedlands, W. Australia). 23 observers worldwide have contributed 223 multicolor observations through 2017 March 31.

**V1655 Sco (Nova Sco 2016 = PNV J17381927-3725077)**, discovered on 2016 June 10.629 UT by Hideo Nishimura (Kakegawa, Shizuoka-ken, Japan) at unfiltered CCD magnitude 12.4 (*AAVSO Alert Notice 544*), continues to fade (Figure 6). As of 2017 March 1.6615 UT it was 18.1 V +/-0.3 (NLX, P. Nelson, Ellinbank, Vic, Australia).

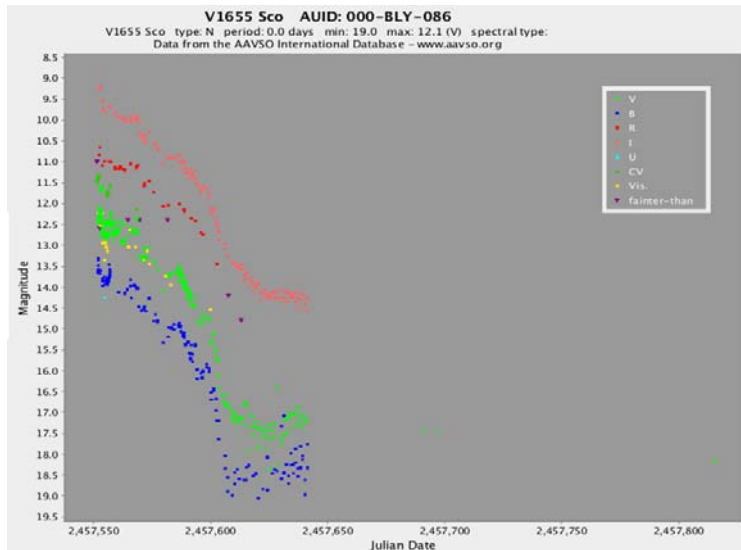


Figure 6: AAVSO light curve of V1655 Sco JD 2457550 – 2457814 (30 August 2014 – 1 March 2017). 20 observers have contributed 2,055 multicolor observations through 2017 March 31.

**V5668 Sgr (Nova Sagittarii 2015 Number 2 = PNV J18365700-2855420)**, discovered on 2015 March 15 UT (*AAVSO Alert Notice 512*) and recovered from its dust event by September 2015, continues to fade. As of 2017 March 30.8458 UT it was visual magnitude 10.9 (PEX, A. Pearce, Nedlands, W. Australia). 143 observers worldwide have contributed 4,595 multicolor observations through 2017 March 31.

**V5667 Sgr (Nova Sagittarii 2015 = PNV J18142514-2554343)**, discovered on 2015 February 12 UT (*AAVSO Alert Notice 509*), continues to fade. As of 2017 March 30.8417 UT it was visual magnitude 13.9 (PEX, A. Pearce,

Nedlands, W. Australia). 19 observers have contributed 450 multicolor observations through 2017 January 23.

**V2944 Oph (Nova Ophiuchi 2015 = PNV J17291350-1846120)**, discovered on 2015 March 29 March (*AAVSO Alert Notice 516*), continues to fade. As of 2017 March 22.3566 UT it was 16.507 V +/-0.171 (DKS, S. Dvorak, Clermont, FL). 38 observers worldwide have contributed 1,107 multicolor observations through 2017 March 31.

**V2659 Cyg (Nova Cygni 2014 = PNV J20214234+3103296)**, discovered on 2014 March 31 UT (*AAVSO Alert Notice 500*), was a highly reddened classical Fe II-type nova which had been very active as it declined, and it continues to fade steadily. As of 2017 March 26.3788 UT it was 16.524 V +/-0.082 (DKS, S. Dvorak, Clermont, FL). 82 observers worldwide have contributed 3,878 multicolor observations through 2017 March 31.

**V1369 Cen (Nova Centauri 2013 = PNV J13544700-5909080)**, discovered on 2013 December 2 (*AAVSO Alert Notice 492*), continues to decline slowly. As of 2017 March 27-30 UT it was visual magnitude 11.9-12.4 (PEX, A. Pearce, Nedlands, W. Australia, and PAW, A. Plummer, Linden, NSW, Australia). 71 observers worldwide have contributed 13,730 multicolor observations through 2017 March 31.

**V339 Del (Nova Delphini 2013 = PNV J20233073+2046041)**, discovered on 2013 August 14 (*AAVSO Alert Notice 489*) continues to fade slowly. As of 2017 March 25.1757 UT it was 14.85 V +/-0.05 (WKL, K. Wenzel, Grossostheim, Germany), and as of March 26.1740 UT it was visual magnitude 14.6 (PYG, G. Poyner, Birmingham, England). 552 observers worldwide have contributed 79,200 multicolor observations through 2017 March 31.

## 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 had been slowly but steadily fading. After plateauing in late March-mid April 2016 it began brightening again and had been continuing to brighten, but appears to have plateaued again and may be starting to decline – as of 2017 March 31 it was about visual/V magnitude 7.6 (several observers; Figure 7). Keep on watching R CrB – what is it going to do 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!

CONTINUED ON NEXT PAGE



## CAMPAIGNS UPDATE CONTINUED...

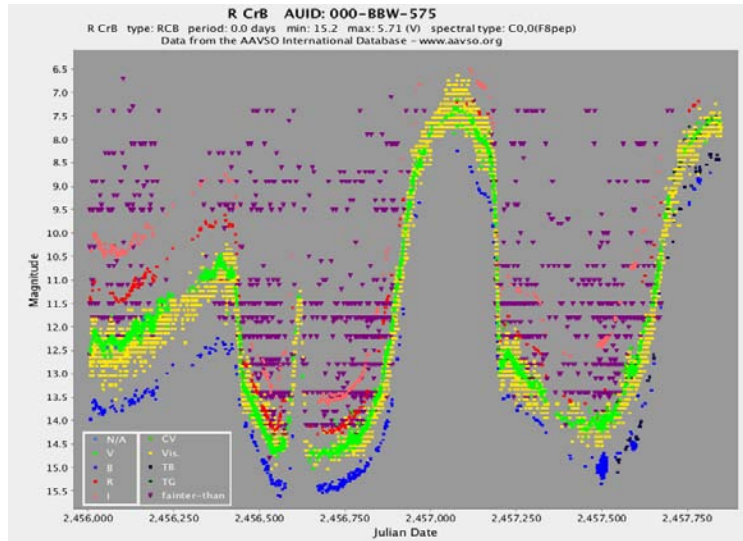


Figure 7: AAVSO light curve of R CrB JD 2456000 – 2457841 (30 August 2014 – 29 March 2017). 349 observers contributed 15,692 visual and multicolor observations to this light curve.

## 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 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.

Twenty best-covered stars of the LPV Legacy program, as measured (mainly) by number of nights observed (both visual and CCD observing considered), 2016 December 16 through 2017 March 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	33	55	9	22
W Cas	Cas	00:54:53.85	+58:33:49.2	18	45	7	20
R Ari	Ari	02:16:07.1	+25:03:23.6	30	55	6	18
omi Cet	Cet	02:19:20.78	-02:58:39.5	68	81	3	15
Y Per	Per	03:27:42.38	+44:10:36.5	23	46	6	15
W Tau	Tau	04:27:57.18	+16:02:36.1	24	38	5	22
W Ori	Ori	05:05:23.71	+01:10:39.3	53	69	2	8
RX Lep	Lep	05:11:22.84	-11:50:57.1	35	75	1	3
R Aur	Aur	05:17:17.69	+53:35:10.1	30	58	8	23
alf Ori	Ori	05:55:10.3	+07:24:25.4	47	84	3	22
U Ori	Ori	05:55:49.16	+20:10:30.6	36	51	10	61
X Aur	Aur	06:12:13.38	+50:13:40.4	22	42	7	27
R Gem	Gem	07:07:21.27	+22:42:12.7	44	57	5	20
R Leo	Leo	09:47:33.48	+11:25:43.7	55	61	5	6
Z UMa	UMa	11:56:30.22	+57:52:17.6	60	84	5	8
RY UMa	UMa	12:20:27.32	+61:18:34.6	41	77	1	2
CH Cyg	Cyg	19:24:33.06	+50:14:29	48	68	4	15
miu Cep	Cep	21:43:30.49	+58:46:48	41	72	3	19
rho Cas	Cas	23:54:23.03	+57:29:57.8	52	72	5	17
S Per	Per	02:22:51.7	+58:35:11.4	19	35	4	15

*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)*).

Twenty least-observed stars of the LPV Legacy program (both visual and CCD observing considered), 2016 December 16 through 2017 March 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
R Cen	Cen	14:16:34.31	-59:54:49.2	4	31	0	0
V CrB	CrB	15:49:31.31	+39:34:17.9	6	15	1	1
R Ser	Ser	15:50:41.73	+15:08:01.1	6	11	1	1
X Her	Her	16:02:39.16	+47:14:25.2	12	33	0	0
SX Her	Her	16:07:27.24	+24:54:29.8	6	29	0	0
R Dra	Dra	16:32:40.22	+66:45:17.8	15	29	0	0
W Her	Her	16:35:12.31	+37:20:43	4	11	0	0
S Her	Her	16:51:53.91	+14:56:30.6	6	17	0	0
alf Her	Her	17:14:38.85	+14:23:25.1	4	13	0	0
RS Her	Her	17:21:42.35	+22:55:15.9	4	15	1	1
T Her	Her	18:09:06.2	+31:01:16.2	8	23	0	0
W Lyr	Lyr	18:14:55.87	+36:40:13.1	10	24	1	2
X Oph	Oph	18:38:21.12	+08:50:02.7	9	19	0	0
R Lyr	Lyr	18:55:20.1	+43:56:45.8	17	32	0	0
R Aql	Aql	19:06:22.24	+08:13:48	11	23	0	0
TU Cyg	Cyg	19:46:10.67	+49:04:24.4	11	18	1	1
S Aql	Aql	20:11:37.47	+15:37:14.5	3	5	0	0
U Cyg	Cyg	20:19:36.59	+47:53:39	10	28	0	0
S Del	Del	20:43:04.87	+17:05:17.3	6	7	1	2
R Vul	Vul	21:04:22.5	+23:49:18	7	21	1	3

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...

Twenty best-covered stars of the CV Legacy program, as measured (mainly) by number of observers and nights observed (both visual and CCD observing considered), 2016 December 16 through 2017 March 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
RX And	And	01:04:35.52	+41:17:57.8	31	76	13	49
HT Cas	Cas	01:10:12.95	+60:04:36.2	12	65	8	14
AX Per	Per	01:36:22.69	+54:15:02.3	16	58	6	20
TZ Per	Per	02:13:50.94	+58:22:52.7	14	63	3	16
GK Per	Per	03:31:12	+43:54:15.4	23	67	11	36
CN Ori	Ori	05:52:07.79	-05:25:00.5	12	58	9	46
SS Aur	Aur	06:13:22.47	+47:44:25.6	31	78	4	9
IR Gem	Gem	06:47:34.51	+28:06:23.5	13	59	4	23
UY Pup	Pup	07:46:31.25	-12:57:09.1	2	5	3	40
BX Pup	Pup	07:54:15.55	-24:19:36.3	2	7	4	71
U Gem	Gem	07:55:05.21	+22:00:04.7	41	76	8	18
YZ Cnc	Cnc	08:10:56.63	+28:08:33.2	28	67	41	79
SU UMa	UMa	08:12:28.27	+62:36:22.2	18	71	7	33
Z Cam	Cam	08:25:13.18	+73:06:39	34	77	8	29
AT Cnc	Cnc	08:28:36.89	+25:20:02.9	11	55	6	53
BZ UMa	UMa	08:53:44.15	+57:48:40.6	10	57	4	21
SY Cnc	Cnc	09:01:03.31	+17:53:56	16	53	9	51
T CrB	CrB	15:59:30.16	+25:55:12.6	28	72	5	26
CH Cyg	Cyg	19:24:33.06	+50:14:29.1	48	68	4	15
SS Cyg	Cyg	21:42:42.78	+43:35:09.8	54	69	9	41

GET THE LATEST  
CAMPAIGN NEWS...

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

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

to subscribe today!

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

Stars in CV Legacy list with no visual or CCD observations (both visual and CCD observing considered), 2016 December 16 through 2017 March 15:































Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
OY Car	Car	10:06:22.24	-70:14:04.9	0	0	0	0
V504 Cen	Cen	14:12:49.18	-40:21:37.5	0	0	0	0
AE Cir	Cir	14:44:51.29	-69:23:34.5	0	0	0	0
EK TrA	TrA	15:14:00.43	-65:05:35.5	0	0	0	0
BR Lup	Lup	15:35:53.09	-40:34:05	0	0	0	0
IK Nor	Nor	16:25:28.86	-55:20:02.7	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
AT Ara	Ara	17:30:33.8	-46:05:58.8	0	0	0	0
MM Sco	Sco	17:30:45.24	-42:11:41.7	0	0	0	0
FV Ara	Ara	17:35:10.05	-63:02:50.3	0	0	0	0
BF Ara	Ara	17:38:21.33	-47:10:41.4	0	0	0	0
V723 Sco	Sco	17:50:05.29	-35:23:57.9	0	0	0	0
MU Ser	Ser	17:55:52.77	-14:01:17.1	0	0	0	0
V618 Sgr	Sgr	18:07:56.9	-36:29:36.9	0	0	0	0
V1830 Sgr	Sgr	18:13:50.65	-27:42:21	0	0	0	0
V533 Her	Her	18:14:20.51	+41:51:22.6	0	0	0	0
FM Sgr	Sgr	18:17:18.25	-23:38:27.8	0	0	0	0
V441 Sgr	Sgr	18:22:08.09	-25:28:47.3	0	0	0	0
V1017 Sgr	Sgr	18:32:04.46	-29:23:12.5	0	0	0	0
CH Her	Her	18:34:46.32	+24:48:01.6	0	0	0	0
V4021 Sgr	Sgr	18:38:14.88	-23:22:47.1	0	0	0	0
FN Sgr	Sgr	18:53:54.79	-18:59:40.8	0	0	0	0
V446 Her	Her	18:57:21.59	+13:14:29	0	0	0	0
DM Lyr	Lyr	18:58:44.45	+30:15:33.3	0	0	0	0
FO Aql	Aql	19:16:38.11	+00:07:37.4	0	0	0	0
PW Vul	Vul	19:26:05.04	+27:21:57.7	0	0	0	0
DH Aql	Aql	19:26:10.81	-10:15:28.9	0	0	0	0
NQ Vul	Vul	19:29:14.75	+20:27:59.7	0	0	0	0
KX Aql	Aql	19:33:53.65	+14:17:47.7	0	0	0	0
LX Vul	Vul	19:48:00.7	+27:10:19.5	0	0	0	0
V0725 Aql	Aql	19:56:45.03	+10:49:32.6	0	0	0	0
UU Aql	Aql	19:57:18.6	-09:19:19.8	0	0	0	0
V476 Cyg	Cyg	19:58:24.47	+53:37:06.7	0	0	0	0
AW Sge	Sge	19:58:37.07	+16:41:27.8	0	0	0	0
QU Vul	Vul	20:26:46.02	+27:50:43.2	0	0	0	0
TU Ind	Ind	20:33:10.55	-45:26:00.8	0	0	0	0
VZ Aqr	Aqr	21:30:24.59	-02:59:17	0	0	0	0
V1668 Cyg	Cyg	21:42:35.33	+44:01:54.5	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. ★
































## JULIAN DATE / MOON PHASE CALENDARS

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































### APRIL 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1  7843
2  7846	3  7847	4  7848	5  7849	6  7850	7  7851	8  7852
9  7853	10  7854	11  7855	12  7856	13  7857	14  7858	15  7859
16  7860	17  7861	18  7862	19  7863	20  7864	21  7865	22  7866
23  7867	24  7868	25  7869	26  7870	27  7871	28  7872	29  7873
30  7874						

### MAY 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1  7875	2  7876	3  7877	4  7878	5  7879	6  7880
7  7881	8  7882	9  7883	10  7884	11  7885	12  7886	13  7887
14  7888	15  7889	16  7890	17  7891	18  7892	19  7893	20  7894
21  7895	22  7896	23  7897	24  7898	25  7899	26  7900	27  7901
28  7902	29  7903	30  7904	31  7905			

### JUNE 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1  7906	2  7907	3  7908
4  7909	5  7910	6  7911	7  7912	8  7913	9  7914	10  7915
11  7916	12  7917	13  7918	14  7919	15  7920	16  7921	17  7922
18  7923	19  7924	20  7925	21  7926	22  7927	23  7928	24  7929
25  7930	26  7931	27  7932	28  7933	29  7934	30  7935	

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@aaavso.org](mailto:mentor@aaavso.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: <https://www.aavso.org/aaavso-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 2017 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 <sup>†</sup>	(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 <sup>†</sup>	\$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.

<sup>†</sup>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	\$ _____
Director's Discretionary 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: \_\_\_\_\_

# 2017 MEMBERSHIP RENEWAL

On this page is a copy of the AAVSO membership renewal form for 2017. 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: \_\_\_\_\_

## 2017 Membership Dues Renewal Form

### Membership Type (please check one)

Annual \$75     Sustaining \$150

Student/Limited Income \$37.50

### Contributions (see next page for descriptions)

Annual Campaign	\$ _____
AAVSO General Fund	\$ _____
Endowment Fund	\$ _____
AAVSO Building Fund	\$ _____
Janet A. Mattei Research Fellowship	\$ _____
Margaret Mayall Assistantship	\$ _____
Solar Fund	\$ _____
AAVSONet Fund	\$ _____
Member Sponsorship Fund	\$ _____
Student Meeting Scholarship Fund	\$ _____
Director's Discretionary Fund	\$ _____
Contributor-Specified Restricted Funds	\$ _____
<b>TOTAL ENCLOSED</b>	<b>\$ _____</b>

# 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.

## **Director's Discretionary Fund**

The corpus, contributions, and income derived from the investments allocated to the Director's Discretionary Fund are considered temporarily restricted for the unrestricted use by the Director for the benefit of the Organization.

## **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: <https://www.aavso.org/support-aavso>

**Thank you for your support of the AAVSO!**

