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AAVSO Newsletter

SINCE 1911...

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

FROM THE DIRECTOR'S DESK

STELLA KAFKA

Tribute to our volunteers

I was reading an article on volunteer involvement in non-profit associations (Hager, 2004), in which about 80% of organizations report engaging volunteers in their activities. All non-profits rely on volunteers, from public safety to K-12 education, cultural arts, and health services. The role of volunteers in the 21st century AAVSO is essential. Our work at HQ is to curate our database, maintain research programs, build relevant software, connect with the professional astronomical community, provide direction and information on objects of interest, enable communication among our observers and members, ensure data quality, advise and help improve our observers' output, attract and train new observers, archive data from other databases, publicize our work, publish our Bulletin and Journal, contribute to the astronomical literature, and define the direction of the association based on our international community's needs—and all this with a staff of nine individuals. Our volunteers give us the extra hands and expertise we need to move forward, and we are grateful to be working with dedicated, smart, skilled, and fun individuals on various projects. I would like to spend this issue's Director's column paying tribute to the individuals whose hard work and dedication boosts the association and helps us move forward to better serve you, our community.

Thinking about it, the AAVSO was established by volunteers collecting variable star data, populating the freshly created AAVSO International Database. Now, with technology taking over all aspects of our lives, your contribution is becoming more and more essential. We rely on your expertise, wisdom, knowledge, incredible work ethic, and collaborative spirit. Through working with our volunteers, we are in continuous collaboration with the community we serve, we connect with our members, we understand our observers' needs, we identify new directions, and we improve our products and services. Our Council members are volunteers. While my role as a Director is to oversee the day-to-day operations and activities of the organization making sure it serves its community, our Council is responsible for defining our association's mission and vision, outline the AAVSO's long-term strategic plan following our mission, define policies and our bylaws, and ensure we have adequate resources to do our job.

Our mission, to "enable anyone, anywhere to participate in scientific discovery through variable star astronomy" dictates that we need to serve a wide citizen astronomer community. As observations of variable objects is our main focus, we need to ensure that our observers are well equipped to do their jobs. We use volunteers to train our observers

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PRESIDENT'S MESSAGE

KRISTINE LARSEN

How Many Hats Can One Head Wear?

Sounds like the start of a bad joke, doesn't it? But for most of us—I would suspect almost all of us—in the AAVSO, it's reality! Think about how many different ways you are involved in astronomy. You are an AAVSO member, and potentially an observer. You might also be an officer or Council member (if not—consider becoming one in the future!). You might also belong to a local astronomy club, or teach astronomy at a local high school or college. Some of you volunteer to help your local Cub Scout den work on their astronomy belt loop. For the really adventurous, you might be on the organizing committee of a local star party, or even convention. However you are involved in astronomy, you are familiar with how much hard work it can be, and as well the big rewards at the end (whether it be the gasp of "WOW!" when a child sees Saturn for the first time, a thank you card from a teenager who won first place in their science fair by observing a variable star, or a hearty handshake from the former student who is sure you won't remember

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The *AAVSO Newsletter* is published in January, April, July, and October. Items of general interest to be considered for the *Newsletter* should be sent to eowaagen@aavso.org. Photos in this issue courtesy of D. Conti and M. Simonsen.

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

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DIRECTOR'S MESSAGE CONTINUED...

(new and seasoned alike) in a multitude of ways: our volunteers run our very popular CHOICE courses. Our volunteers act as mentors and advisors for observers (I am really grateful to my mentors for my binocular observations). Our manuals were written with input from volunteers, and volunteers translate our manuals to multiple languages, ensuring that astronomy is beyond borders, observations of the night sky is possible by everyone, even if their knowledge of English is minimal or non-existent. Thanks to our volunteers, we provide two excellent pieces of software (VPhot and VStar) which are extremely popular within the astronomical community, as they are easy to understand and use. The software Transform Generator and Transform Applier were written by our volunteers to enable observers to convert their magnitudes to values most efficiently used by researchers. Also for our observers, our Sequence Team consists of volunteers, key individuals who create lists of standard stars customized for each variable star and used for photometry. We work with volunteers to maintain and expand VSX, a database that is used by hundreds of astronomers worldwide for up-to-date information on variable objects.

Our observers are volunteers—without you we wouldn't be able to have such a rich repository of variable star data, a treasure chest for scientists worldwide. Our observing section leaders are volunteers whose dedication, knowledge, and continuous work make those sections valuable resources for observers interested in specific types of objects. Committees and task forces are formed by volunteers, overseeing our scientific and governance portfolio. Our robotic telescope network, AAVSOnet, could not function without the group of volunteers who manage the telescope cameras at the sites or review the images for technical issues. Volunteers digitize published historical variable star data to make these precious early data accessible through the AID, thus keeping alive the work of these early variable star observers. The list is endless!

We work with tens of individuals who provide the expertise, knowledge, and the skillsets we need, complementing those we currently have at HQ. For us at HQ, this is a way to exchange information and grow. Our work, everything we build at the AAVSO, aims at serving you, our community. By using members of this community in our projects, we get feedback on our performance, learn about your needs, and work towards improving ourselves and your association. Furthermore, our volunteers keep us motivated and inspired: we get fresh ideas on new projects from our discussions, we learn to work in new ways, we are continuously connected with our community. By actively participating in the AAVSO's work, our volunteers help us build a stronger community, which in turn provides a key scientific service to observational astrophysics. You are our colleagues, our teammates, and our friends. I communicate with our volunteers every day on various aspects of our scientific portfolio, and I am becoming a better scientist because of our interactions. Indeed, this is the best part of my job!

So, on behalf of the AAVSO staff and for myself, I would like to take this opportunity to thank all you who have contributed, are contributing, and will be contributing to the growth of this Association. It is a privilege being part of this community!

Best wishes—clear skies! ★

Ed. note: the Spanish language version of Stella's message can be found on page 6.

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them—but you do—who is now in a Ph.D. program in Astrophysics). Astronomers—both those who do it for a hobby and those who are fortunate enough to be paid to do it—aren't half-hearted sorts of people. We are passionate about what we do, and we are INVOLVED!

That's why we are always on the go, trying to squeeze in our own observing projects between doing things for others, always with the goal of sharing the night sky with anyone who is willing to look through our telescope, appreciate our astrophotos, or utilize our CCD data to further our understanding of the universe. My head juggles many hats—President of the AAVSO, Assistant Editor of the Astronomical League's Reflector, Astronomy Professor at Central Connecticut State University, member of the Springfield Telescope Makers, and co-coordinator of Programming for the annual Stellafane Convention on Breezy Hill in Springfield, Vermont (https://stellafane.org/convention/2016/index.html). There are others I am forgetting, but when you wear too many hats, it tends to squeeze your brain a bit. But I digress…. Those of you who frequent the AAVSO Forums (and if you don't, you should!) know that I had asked at one point how many AAVSO members attend Stellafane each year. A good number replied that

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PRESIDENT'S MESSAGE
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they do, or that they have wanted to but haven't had the chance. If you haven't attended in the past, this year might be the one to do it, because, frankly, I need your help. On Saturday, August 6, I will be playing the "Big Room" at Stellafane (the Flanders Pavilion) from 4:30 to 5:30 PM, presenting a talk on the Observing Programs of the AAVSO. Not only is this a chance to advertise our organization to the attendees, but directly after the program we will have a meet and greet of AAVSO members and observers with potential members and observers. Please attend! Help me share the word about our world-class organization and all that we do for astronomy. Proudly wear your AAVSO hat (metaphorically, or literally, if you have one!) and join me in welcoming new members to the most addictive and rewarding sport I know – hunting down and observing variable stars! Perhaps I should find a suitably adorned safari hat for this occasion…. ★

Ed. note: the Spanish language version of Kris's message can be found on page 7.

PRESENTATIONS MADE BY DENNIS CONTI

Dennis Conti, Chair of AAVSO's Exoplanet Section, gave a presentation at this year's Northeast Astro Imaging Conference (NEAIC) entitled: "Exoplanet Observing by Amateur Astronomers." His talk on April 7, 2016, reviewed the methods that amateur astronomers can use to detect exoplanets, including a case study of an actual exoplanet detection. The status of an active pro/am collaboration with a Hubble exoplanet science team was also reviewed.

Immediately following NEAIC was the annual Northeast Astronomy Forum (NEAF). There, Dennis also presented at two sessions as part of the Pro/Am Collaboration portion of the conference. On April 9 and 10 he spoke on "Exoplanet Observations by Amateur Astronomers." ★

Pictured along with Dennis (far right), are from left to right, Alice Bowman, Mission Operations Manager (MOM) for the Pluto New Horizons program, and Dr. Mary Lou West, coordinator of the Pro/Am Collaboration program.

SCIENCE SUMMARY: AAVSO IN PRINT

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

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

In the past, we have listed in the *Newsletter* the publications appearing during the previous quarter on the 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 2016 April 8 through June 21, the arXiv.org preprint server included the following numbers of publications:

—Publications using the AAVSO International Database (AID): 48
—Publications using the AAVSO Photometric All-Sky Survey (APASS): 43
—Publications using the International Variable Star Index (VSX): 15
—Publications using other AAVSO resources:
—*AAVSO Alert* and/or *Special Notices*: 3
—AAVSO software VStar: 1
—AAVSOnet telescope(s) cited as data source: 1
—AAVSO Solar Section analysis references: 1
—used *Advancing Variable Star Astronomy, the Centennial History of the American Association of Variable Star Observers* (Williams and Saladyga): 1
—AAVSO member(s) among authors: 2

Note: Many variable star publications include AAVSO members among their authors. The number here refers to publications on non-variable star subjects.

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. ★

105TH AAVSO ANNUAL MEETING—COMING IN NOVEMBER!

Plans are continuing to progress for the 105th AAVSO Annual Meeting, which is being held November 10-12, 2016, at the Boston/Burlington Marriott in Burlington, MA. The hotel is very comfortable and is much more conveniently located than the site in Woburn we have used for the past few years. Stay tuned to the AAVSO Meetings webpage (https://www.aavso.org/aavso-meetings) for details and registration information. ★

THE 2016 SPRING MEETING IN REVIEW

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

The 105th spring meeting of the AAVSO was held at the Crowne Plaza in downtown St. Louis, Missouri, Thursday, May 4, to Saturday, May 7. St. Louis was chosen due to its location in the middle of the continental United States. Council hoped this would encourage people to attend who don't normally come to the fall meetings on the east coast. About a quarter of the attendees were first time attendees or people who don't normally attend the fall (annual) meetings in Massachusetts.

Another sign this was going to be a great meeting was the number of people who made it a point to arrive early on Thursday, so they could attend the invited talk by Dr. Horace Smith, Thursday evening. When Horace took the podium the room was full.

Dr. Smith's talk reviewed the history and our current understanding of pulsating stars, the theme for this year's meeting. He paid particular attention to RR Lyrae, delta Scuti, and Cepheid variables, and how observations by AAVSO members have provided insight into several questions regarding the behavior of these stars.

Horace Smith's talk is available to members at: https://www.aavso.org/105th-spring-2016-meeting-talks

Friday morning began with another invited talk by Dr. Lee Anne Willson. She discussed mass loss in Mira variables and how this eventually depletes the envelope, revealing the ash from nuclear burning left at the core, a new white dwarf star. The Sun's eventual devastating mass loss and its effect on the solar system and Earth was then discussed.

The entire day on Friday was devoted to pulsating variables. The paper sessions included talks from professional and non-professional authors. Papers ranged from discussion of delta Scuti, Cepheids, and RR Lyrae variables to Semiregular and Irregular variables. During the afternoon session the authors of the posters displayed at the meeting were given five minutes to introduce the topics in their posters. Several of these were authored by students.

St. Louis is well known for its fine dining, especially barbecue. Many of the members took advantage of the long lunch breaks to visit some of the local eateries, and even more took advantage of the free time they had Friday evening to check out some of the nationally known gourmet barbecue establishments.

After dinner, people who had signed up for the field trip to the St. Louis Science Center and Planetarium met in the lobby and then took several cars and vans to attend the 'First Friday' event held each month at the science center.

Stella Kafka

Saturday morning began with the AAVSO Membership meeting. Reports were given by Secretary Gary Walker, Treasurer Bill Goff, and Director Dr. Stella Kafka. All these reports are available online for members at: https://www.aavso.org/105th-spring-2016-meeting-talks

Meeting attendees

Awards were given for observing to both visual and CCD observers as well as three special awards for 25 years of membership to Wayne Clark, Horace Smith, and Lee Anne Willson.

Virginia Trimble

After the coffee break, the first talk of the day was a fascinating invited talk from Dr. Virginia Trimble. She talked about how our perception of what is a planet and what is a universe have evolved over time. From the ancients, to whom the Earth was the Universe, to realizing over time that groups of planets and stars formed galaxies outside our own Milky Way, and finally to our discovering multiple exoplanets and considering the existence of multiple universes. Dr. Trimble received a standing ovation at the end of her presentation. This journey through time and the human imagination is also available to members at: https://www.aavso.org/105th-spring-2016-meeting-talks

Before lunch on Saturday we paused for the traditional group picture with the St. Louis Arch in the background.

Meeting attendees at the St. Louis Arch

The first talk of the general paper session Saturday afternoon was presented by James Small, President of the St. Louis Astronomical Society. His talk, "The SLAS Library Telescope Program" showed how his society had developed a program to supply specially modified small telescopes to libraries to loan out

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SPRING MEETING
CONTINUED...

for free to kids and families in the St. Louis area. Since 2014 they have placed 88 telescopes in libraries around St. Louis and are expanding the program across the river into Illinois.

The remaining general paper sessions discussed Z Cam stars, photometry, and transformation coefficients, and an eclipsing binary in a triple system.

That evening, people mingled and socialized around the cash bar preceding the banquet. Once everyone was settled at their tables the trivia questions, based on the talks given during the meeting, were presented. After a fine St. Louis barbecue buffet, winners of the trivia contest were awarded prizes and bragging rights and then Stella drew winning tickets for the raffle prizes. The meeting was adjourned at 10pm by AAVSO President Dr. Kristine Larsen.

The fall (annual) meeting will be held November 10–12, at the Boston/Burlington Marriott in Burlington, Massachusetts. We hope to see you there! ★

CHANGES TO THE AAVSO ADOPT A STAR PROGRAM

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

This summer we will be making some changes to the AAVSO Adopt A Star Program (https://www.aavso.org/apps/adopt-a-star/) in hopes of making it more appealing, fun, and useful to our members, as well as a more successful fundraising program.

The biggest change will be the development of an Adoption Certificate that will be issued when a star is adopted. This can be issued in your name or you can adopt a star for someone else, like your spouse, children, nieces, nephews, or grandkids, and have their name on the certificate.

We hope you will use this opportunity to get someone you love interested in astronomy and exploring the Universe through variable star science.

Adoptions will still be for a one-year period and renewal notices along with light curves of your star(s) for the previous year will be sent prior to the expiration date each year so you can renew your adoptions. If there is enough interest in the new program, we may even consider additional rewards, like star maps, mugs, or t-shirts for subsequent years of adoptions.

To cover the additional costs of postage, printing, and administration we will be raising the price of adoptions from $20.00 to $30.00 US.

When these changes have been finalized we will announce the new program on the website, in the Newsletter and through *AAVSO Communications*. Stay tuned! ★

MID-YEAR FUNDRAISING UPDATE

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

We need your help.

We are struggling to hit our Annual Campaign goal of $40,000 this year. We have extended the campaign to July 11th in hopes of adding another full week of fundraising efforts to get our members to contribute.

Membership dues are only a small portion of the revenue the AAVSO needs to collect each year to continue providing the services and resources our members, observers, and the astronomical community rely on.

The AAVSO's Annual Campaign is conducted each year for the purpose of raising money to assist in paying AAVSO's regular, ongoing expenses. It is one of the few sources of unrestricted income that can be applied to any purpose.

Many of you have been very generous in the past. Most people give what they can afford when asked. But many of our members have never made a donation to the AAVSO in all the years they have been members.

We need everyone to pitch in, not just the 15–20% of our members and observers who regularly make generous donations. Please show your support for the AAVSO by making as generous a donation as you can afford today.

You can make a donation online with a credit card—

https://www.aavso.org/apps/donate/

Or send a check to—

AAVSO
49 Bay State Rd.
Cambridge, MA 02138 USA

Please be sure to select "annual campaign" from the drop down menu provided online, or make a note on your check specifying it is for the annual campaign.

If you can't contribute before July 11, please email aavso@aavso.org to pledge an amount you can send at a later date. That way it will still be counted towards the annual campaign goal.

As always, thank you very much for your generosity and support. ★

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

MENSAJE DEL DIRECTOR

STELLA KAFKA

Tributo a nuestros voluntarios

Estaba leyendo un artículo acerca de la participación de voluntarios en asociaciones sin fines de lucro (Hager, 2004) que dice que el 80% de las organizaciones cuentan con voluntarios en sus actividades. Todas las asociaciones sin fines de lucro confían en ellos, desde la seguridad pública hasta la educación primaria y secundaria, las artes y los servicios de salud. El rol de los voluntarios en la AAVSO del siglo XXI es esencial. Nuestro trabajo en la sede central es conservar nuestra base de datos, mantener programas de investigación, generar software relevante, conectarnos con la comunidad profesional, proveer dirección e información sobre objetos de interés, permitir la comunicación entre nuestros observadores y miembros, asegurar la calidad de los datos, aconsejar y ayudar a mejorar los resultados de nuestros observadores, atraer y entrenar nuevos observadores, archivar datos de otras bases de datos, publicitar nuestro trabajo, publicar nuestro Boletín y nuestro Journal, contribuir con la literatura astronómica y definir el rumbo de la asociación basándonos en las necesidades de la comunidad internacional –y todo esto con un grupo de trabajo de nueve individuos–. Nuestros voluntarios nos dan manos extras y la experiencia que necesitamos para ir hacia adelante y estamos agradecidos de poder trabajar en varios proyectos con personas dedicadas, divertidas, inteligentes y con muchas capacidades. Me gustaría aprovechar esta edición de la columna de la Directora para rendirles un tributo a los individuos cuyo arduo trabajo y dedicación sostiene a la asociación y nos ayuda a movernos hacia adelante para darles un mejor servicio a ustedes, nuestra comunidad.

Si lo pensamos, la AAVSO fue fundada por voluntarios que recolectaban datos de estrellas variables, sumándolos a la recién creada Base de Datos Internacional de AAVSO. Ahora, con la tecnología controlando todos los aspectos de nuestras vidas, su contribución se ha vuelto más y más esencial. Confiamos en su experiencia, sabiduría, conocimiento, su increíble ética de trabajo y espíritu de colaboración. Gracias a que trabajamos con voluntarios, estamos en continua colaboración con la comunidad a la cual servimos, nos conectamos con nuestros miembros, entendemos las necesidades de nuestros observadores, identificamos nuevos rumbos y mejoramos nuestros productos y servicios. Los miembros de nuestro Consejo son voluntarios. Mientras que mi rol como Directora es supervisar las operaciones y actividades de la asociación en el día a día, asegurándome de que sirve a su comunidad, nuestro Consejo es responsable de definir la misión y la visión de nuestra asociación, delinear el plan estratégico a largo plazo de AAVSO siguiendo nuestra misión, definir nuestras políticas y estatutos y asegurar que tengamos los recursos adecuados para realizar nuestro trabajo.

Nuestra misión, "permitir que todos, en todas partes, participen en el descubrimiento científico a través de la astronomía de estrellas variables", nos dice que tenemos que servir a una amplia comunidad de astrómomos ciudadanos. Como las observaciones de objetos variables son nuestro principal foco, es necesario que nos aseguremos de que nuestros observadores estén bien equipados para realizar sus tareas. Utilizamos voluntarios para entrenar a nuestros observadores (tanto nuevos como experimentados) de muchas formas diferentes: nuestros voluntarios dirigen populares cursos CHOICE. Nuestros voluntarios actúan de mentores y consejeros para los observadores (estoy muy agradecida a mis mentores por mis observaciones con binoculares). Nuestros manuales se escribieron con material de voluntarios y son voluntarios quienes los traducen a múltiples idiomas, asegurando que la astronomía traspase las fronteras, que las observaciones del cielo nocturno sean posibles para todos, incluso si su conocimiento del Inglés es mínimo o inexistente. Gracias a nuestros voluntarios, ofrecemos dos excelentes paquetes de software (VPhot y VStar) que son extremadamente populares en la comunidad astronómica, ya que son fáciles de entender y de usar. Los programas Transform Generator y Transform Applier fueron desarrollados por voluntarios para permitir que los observadores conviertan sus magnitudes a valores más útiles para los investigadores. También para nuestros observadores, nuestro equipo de secuencias está formado por voluntarios, personas clave que crean listas de estrellas estándar adecuadas para cada variable y que se usan para fotometría. Trabajamos con voluntarios para mantener y expandir VSX, una base de datos que utilizan cientos de astrónomos de todo el mundo en busca de información actualizada de objetos variables.

Nuestros observadores son voluntarios –sin ustedes no seríamos capaces de tener semejante depósito de estrellas variables, una caja del tesoro para los científicos del mundo entero–. Los líderes de nuestras secciones de observación son voluntarios cuya dedicación, conocimiento y trabajo continuo hacen que estas secciones sean valiosos recursos para los observadores interesados en tipos específicos de objetos. Los comités y equipos de trabajo están formados por voluntarios, supervisando nuestras actividades científicas y de gobierno. Nuestra red de telescopios robóticos, AAVSOnet, no podría funcionar sin el grupo de voluntarios que manejan las cámaras de los telescopios en los diferentes sitios o revisan las imágenes en busca de problemas técnicos. Voluntarios digitalizan datos históricos publicados de estrellas variables para que estos valiosos datos antiguos sean accesibles a través de la AID y, por lo tanto, se mantenga vivo el trabajo de estos pioneros observadores de variables. ¡La lista es interminable!

Trabajamos con decenas de individuos que nos dan la experiencia, el conocimiento y el conjunto de virtudes que necesitamos, complementándolas con las que actualmente tenemos en la sede central. Para nosotros aquí, esta es una forma de intercambiar información y crecer. Nuestro trabajo, todo lo que construimos en la AAVSO, tiene como fin servirlos a ustedes, nuestra comunidad. Al hacer que miembros de esta comunidad formen parte de nuestros proyectos, obtenemos un ida y vuelta acerca de nuestro desempeño, aprendemos acerca de sus necesidades y trabajamos para mejorar nosotros mismos y a su asociación. Más aún, nuestros voluntarios nos mantienen motivados e inspirados: de nuestras conversaciones surgen ideas novedosas para nuevos proyectos, aprendemos a trabajar de nuevas formas, estamos continuamente conectados con nuestra comunidad. Al participar activamente en el trabajo de la AAVSO, nuestros voluntarios nos ayudan a construir una comunidad más fuerte, lo que, a su vez, provee un servicio científico clave para la astrofísica observacional. Ustedes son nuestros colegas, nuestros compañeros de equipo y nuestros amigos. Me comunico con nuestros voluntarios cada día por varios aspectos de nuestra agenda científica y me estoy convirtiendo en una mejor científica gracias a nuestras interacciones. En efecto, ¡esa es la mejor parte de mi trabajo!

Así que, en nombre del staff de AAVSO y del mío propio, me gustaría aprovechar esta oportunidad para agradecer a todos ustedes que han contribuído, están contribuyendo y contribuirán al crecimiento de esta Asociación. ¡Es un privilegio ser parte de esta comunidad!

Saludos – ¡cielos claros! ★

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MENSAJE DEL PRESIDENTE

KRISTINE LARSEN

¿Cuántos sombreros se puede usar en una cabeza? Suena como el comienzo de una mala broma, ¿verdad? Sin embargo, para la mayoría de nosotros - yo sospecho que casi todos nosotros – en AAVSO ¡es realidad! Piense de cuántas maneras diferentes se ve involucrado en la astronomía. Usted es miembro de AAVSO y, potencialmente, un observador. También puede ser que sea un directivo o un miembro del Consejo (si no lo es, considere convertirse en uno en el futuro). También puede que pertenezca a un club de astronomía local o enseñe astronomía en una escuela secundaria o en una universidad local. Algunos de ustedes quizá actúen como voluntarios para ayudar en su grupo Scout en astronomía. Los que realmente tienen espíritu aventurero, es posible que participen en el comité organizador de una Star Party local o, incluso, de una convención. Sin embargo usted que está involucrado en astronomía, está familiarizado con la cantidad de trabajo duro que puede significar y las grandes recompensas que se encuentran al final (ya sea el grito "¡GUAU!" cuando un niño ve Saturno por primera vez, una tarjeta de agradecimiento de un adolescente que ganó el primer lugar en su feria de la ciencia mediante la observación de una estrella variable, o un afectuoso apretón de manos de un ex estudiante que está seguro que Ud. no lo recuerda pero realmente si y que ahora está en un programa de doctorado en astrofísica). Los astrónomos - tanto los que lo hacen por afición como los que tienen la suerte de recibir una paga para hacerlo - no somos esa clase de gente medias-tintas. ¡Nos apasiona lo que hacemos y estamos INVOLUCRADOS!

Es por eso que estamos siempre en movimiento, tratando de apretar nuestros propios proyectos de observación entre cosas que hacemos por los demás, siempre con el objetivo de compartir el cielo nocturno con cualquiera que esté dispuesto a mirar a través de nuestro telescopio, apreciar nuestras astrofotos o utilizar nuestros datos de CCD para mejorar nuestra comprensión del universo. Mi cabeza usa muchos sombreros: Presidente de la AAVSO, Asistente de Edición de la revista Reflector de la Astronomical League, profesora de astronomía en la Universidad Central del Estado de Connecticut, miembro de la asociación de constructores de telescopios Springfield Telescope Makers y co-coordinador de Programación para la convención anual Stellafane, en Breezy Hill, Springfield, Vermont (https://stellafane.org/convention/2016/index.html). Hay otros que estoy olvidando pero, cuando uno se pone demasiados sombreros, tiende un poco a exprimirse el cerebro. Pero ya estoy divagando….

Aquellos de ustedes que frecuentan los foros de AAVSO (y si no lo hace, ¡debería!) saben que había preguntado, en algún momento, cuántos miembros de AAVSO asisten a Stellafane cada año. Un buen número contestó que lo hacen o que han querido pero no han tenido oportunidad. Si usted no ha asistido en el pasado, este año podría hacerlo porque, francamente, necesito su ayuda. El sábado 6 de agosto voy a estar en el "Salón Principal" de Stellafane (el Pabellón de Flandes) de 16:30-17:30, presentando una charla sobre los programas de observación de AAVSO. Esto no sólo es una oportunidad para hacer publicidad de nuestra organización entre las personas que asistan, sino que después del programa tendremos oportunidad que los miembros y observadores de AAVSO se conozcan y saluden con otros posibles miembros y observadores. ¡Por favor, asista! Ayúdeme a compartir el mensaje sobre nuestra organización de clase mundial y todo lo que hacemos por la astronomía. ¡Sienta orgullo de llevar el sombrero de AAVSO (¡metafórica o literalmente, si lo tiene!) y ayúdeme a darle la bienvenida a nuevos miembros al deporte más adictivo y gratificante que sé la caza y la observación de las estrellas variables! Tal vez debería encontrar un sombrero de safari convenientemente adornado para la ocasión... ★

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.

IN MEMORIAM

MEMBERS, OBSERVERS, COLLEAGUES, AND FRIENDS OF THE AAVSO

This quarter we have only one death to report, that of our member/observer Bob Manske. Gerry Samolyk (SAH), Neil Simmons (SNE), and David Weier (WEI) have written the remembrance below.

Robert P. Manske

ROBERT P. MANSKE (MKE, Waunakee, Wisconsin) passed away on May 10, 2016, at the age of 74. A variable star observer since 1987, Bob made 11,225 visual, CCD, and DSLR (mostly visual and DSLR) observations. Starting off as a visual observer, Bob had a particular interest in long period and red variables. He latter added eclipsing and RR Lyr type variables to his program. As technology changed, Bob began a program observing EB stars using a DSLR.

In 2014 Bob received a special AAVSO Observer Award in recognition of having contributed over 1,000 visual observations to the AAVSO International Database. This special award was made to observers active in the preceding five years who had contributed over 1,000 visual variable star observations before that level of recognition was added in 2009 to the Observer Award program. In 2016 he was to have received an AAVSO Observer Award for contributing over 1,000 DSLR variable star observations to the AID.

Bob's interest in variable stars started later in life after being introduced to them by long-time friend and AAVSO observer Dave Weier. Bob joined the Madison Astronomical Society and soon became president. During that time meetings of the Astronomical Society of the Pacific and Astronomical League took place in Madison. Bob was instrumental in organizing variable star workshops at both meetings. Bob also was one of the organizers for the AAVSO Spring Meeting in 2001.

In addition to variable star observing, Bob was active in observing lunar grazing occultations. He drove the public outreach at the Madison society during his tenure, carrying out displays at local malls, an outdoor Shakespearean theater, and local farmer's markets. When the Division of Planetary Science of the American Astronomical Society came to town, he found a way for members at Madison to attend at a reduced price and assist in outreach there (including for this author (SNE), who had a brief stint standing watch over a Lucite-encased fragment of a piece of Mars fallen to earth). Bob later served a year as president of the Milwaukee Astronomical Society.

Outside of astronomy, Bob's interests were many and he had earned degrees in History and the Classics. He recently begun work on a Ph.D. in Ancient Roman History. Anyone expressing an interest in learning anything that he knew about gained immediate support from Bob, who had a wealth of advice on how to get started on a number of subjects. In addition to his academic acquisition of Latin and Greek, Bob had developed an interest in Egyptian hieroglyphics and spent time teaching online courses in its complex grammar. As a historian he was attracted to ancient and military history and often took time out to travel to Revolutionary and Civil War battle sites while traveling to AAVSO meetings. His service also included time in the U.S. Air Force and six years on the Waunakee school board.

Because of his experience and a penchant for storytelling, Bob would often be found at the center of attention during the local meeting-after-the-meetings held at the nearest tavern. There he would regale those in attendance with his experiences in the Air Force and college life, but he would also magnanimously hand the floor over to anyone better suited for telling the tale of more recent adventures in asteroid or graze occultation, public outreach, or of odd happenings at the observatory. ★

TALKING ABOUT THE AAVSO

ELIZABETH O. WAAGEN (WEO), AAVSO HQ

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

April 26, 2016—**Stella Kafka** (KKS, Cambridge, Massachusetts) gave a presentation on "AAVSO as a resource for research" at Vanderbilt University.

April 27, 2016—**Stella Kafka** spoke on "Discussing Supernova Ia Progenitors" at Vanderbilt University.

May 10, 2016—**Gary Poyner** (PYG, Birmingham, UK) spoke on "Historic Novae" at the Leicester Astronomical Society, Leicester Space Centre, East Midlands, England.

May 12, 2016—**Gary Poyner** spoke on "Historic Novae" at the Worcester Astronomical Society, Worcestershire, England.

May 17, 2016—**Stella Kafka** spoke on "Variable Stars" at Rolnick Observatory as speaker at the Westport Astronomical Society's meeting, Westport, Connecticut.

May 26, 2016—**Stella Kafka** held a seminar titled "Living with a star" at Girls Inc. in Lynn, Massachusetts.

June 1, 2016—**Stella Kafka** spoke on "Variable stars and their stories" at an evening talk for the public at Maria Mitchell Observatory (MMO) on Nantucket, Massachusetts.

June 2, 2016—**Stella Kafka** gave a presentation titled "Discussing Supernova Ia Progenitors" to the MMO Research Experiences for Undergraduates (REU) program participants on Nantucket.

June 3, 2016—**Stella Kafka** gave a presentation titled "Professional development for students" to the MMO REU program participants on Nantucket.

June 10, 2016—**Michael Cook** (CMJA, Newcastle, Ontario, Canada) gave the talk "Doing Astronomical Science" at the general meeting of the Hamilton Ontario Astronomers.

June 12, 2016—**Stella Kafka** spoke about "Spectroscopy projects for students" at the Student Astronomical Research Opportunities Seminar, part of the 228th Meeting of the American Astronomical Society (AAS), San Diego, California.

June 12, 2016—**Stella Kafka** spoke about "*The Journal of the AAVSO*" at the Student Astronomical Research Opportunities Seminar, AAS meeting, San Diego, California.

June 13, 2016—**Gary Poyner** gave an "Introduction to Variable Star Observing" to the Wolverhampton Astronomical Society, West Midlands, England. As past President of this Society, Gary says he has visited many times to give talks—"all Variable Star related of course."

June 13, 2016—**Stella Kafka** gave a presentation titled "The AAVSO as a Community of Practice" at the Meeting-in-meeting "Small Telescope Research Communities of Practice: Pro-Am Communities of Practice" that was part of the AAS meeting, San Diego, California.

June 16, 2016—**Stella Kafka** spoke about "Spectroscopy with Small Telescopes" at the Society for Astronomical Sciences (SAS) Symposium, Ontario, California.

August 5, 2016—**Jessica Johnson** (JJMA, New Britain, Connecticut) will give the talk, "Breezy Hill Rocks!", at the 2016 Stellafane Convention, Breezy Hill, Springfield, Vermont.

August 5, 2016—**Mario Motta** (MMX, Gloucester, Massachusetts) will speak on the "Human and Environmental Effects of LED Street Lighting" at Stellafane, Breezy Hill, Springfield, Vermont.

August 6, 2016—**John O'Neill** (ONJ, Topsfield, Massachusetts, and Rush, Ireland) will speak on "Where Have All the (Bright) Novae Gone?" at Stellafane, Breezy Hill, Springfield, Vermont.

August 6, 2016—**Mario Motta** will speak on "WD1145+017, a White Dwarf Destroying a Planet. How Pro-Am Collaboration Helped Solve a Mystery" at Stellafane, Breezy Hill, Springfield, Vermont.

August 6, 2016—**Jessica Johnson** will repeat her talk, "Breezy Hill Rocks!", at Stellafane, Breezy Hill, Springfield, Vermont.

August 6, 2016—**Kristine Larsen** (LKR, New Britain, Connecticut) will speak on "Observing Programs of the AAVSO" at Stellafane, Breezy Hill, Springfield, Vermont.

August 6, 2016—**Kristine Larsen** will be the Shadowgram speaker ("You Never Forget Your First Time") at Stellafane, Breezy Hill, Springfield, Vermont.

September 29–October 2, 2016—**Chris Stephan** (SET, Newton Falls, Ohio), will be an invited speaker and a vendor at Michigan's largest star party, the Great Lakes Star Gaze (http://www.greatlakesstargaze.com/). Chris will be speaking on "The AAVSO and Visual Variable Star Observing". Several hundred people attend this annual event. Chris mentions that he is looking for a helper at the vendor table; contact him via his AAVSO webacount if you are interested.

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

Other outreach—**Dennis Conti** (CDEC, Annapolis, Maryland) wrote an article for Astronomy magazine that has just came out in the July issue. It is entitled: "Seek exoplanets from your backyard: Learn how amateur astronomer can help professional study worlds outside our solar system." AAVSO is mentioned in several places in the article. Congratulations, and thank you, Dennis!

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

UPDATED LPV SECTION WEB PAGE

ANDREW PEARCE (PEX), SECTION ADMINISTRATOR

As some of you may be aware, we have updated the AAVSO Long Period Variable (LPV) Section web page. It has been migrated from the Google web page platform into the AAVSO system. We've also used this opportunity to commence a revamping of the Section.

Our thanks go to Matthew Templeton who maintained the page up until the end of 2015. I volunteered to assist in early 2016 and I'm fortunate that Mike Soukup and Frank Schorr have kindly agreed to also provide assistance going forward. Our goal is to reinvigorate the observation and analysis of long period variable stars within the AAVSO. This is an important class of variable star and it is LPVs upon which the foundations of the AAVSO were built over 100 years ago. We hope to encourage both visual and CCD observers. We plan to keep the web page up to date, live, and interesting, so please come back often! You can find it at https://www.aavso.org/aavso-long-period-variable-section.

Please bear with us over the next few months as we migrate all data across and tidy up the formatting.

There are a few initiatives that we're hoping to kick off and sustain going forward to promote interest in the observation of LPVs:

1. We've started by adding a specific page which will highlight a particular LPV (or group of LPVs) per month to hopefully encourage observations of these and/or discussion in the LPV Forum. Being based in the southern hemisphere, I'll hopefully be able to add a southern flavor to the LPVs we present and discuss. The first one on the interesting semi-regular star L2 Puppis has been published.

2. Frank has been maintaining some really interesting pages and discussion on LPVs with humps in their light curves and this will continue. We encourage observers to follow the stars listed by Frank on the LPV Hump page.

3. We'll also maintain a list of target stars in both the northern and southern hemispheres which are currently well placed for observing and we will encourage all observers to add to their current lists. Visual and multi-color photometry will be encouraged. The target stars will have an interesting feature or peculiarity in their light curves. It's appreciated that the very nature of LPVs is that the subtleties and interesting features of their light curve only become apparent over many years.

4. We'll also revisit the LPV Legacy Star List and Program to see if we can broaden this to ensure as many LPVs as possible with long observational records (dating back to the early days of the AAVSO) in both northern and southern hemispheres are captured and promoted to all observers so these long observational records can be maintained.

5. We'll also maintain close contact with other international variable star groups where they may also have in place interesting LPV programs. For example, Variable Stars South (VSS) is following a variety of interesting LPVs and there is great value in encouraging close collaboration between the AAVSO and these other groups.

The current list of target stars that we would encourage observation of as are as follows:

Northern Stars
S Cep, R Aur, T UMi, RS Cyg, U UMi

Southern Stars
KK Car, TT Cen, V415 Vel, L2 Pup, RZ Sco

There's much to look forward to in the world of LPVs and we hope that you'll get involved! We're always seeking contributions from members, so feel free to drop us a line if you'd like to promote your favorite LPV to others. ★

YOUNG STELLAR OBJECTS SECTION UPDATE

MICHAEL POXON (POX), YSO SECTION CHAIR

Following the success of the embryonic UXOR hunt, I am announcing another campaign. Most of the stars in the current UXOR list (http://www.starman.co.uk/ysosection/uxors.php) are either quite faint or of small amplitude, sometimes both. They are probably better suited to observers with CCD equipment on the whole. But we visual types need not feel left out!

This new campaign revolves around stars on the NSV list. Whilst I am aware that many of these stars—and the NSV list is pretty long—will turn out not to be variable, I have pulled out a selection of objects which have (a) been categorized as I type and (b) have decent amplitudes. Most are suitable for medium-sized instruments and tend to have amplitudes in excess of one magnitude, so are appropriate visual targets. Some observers have already requested a list but I shall be putting the list up on the YSO site (http://www.starman.co.uk/ysosection/) shortly. I am currently in the process of drawing up sequences for these stars as they rise (June 2016). ★

DIGITIZING THE OLD SOLAR BULLETINS

RODNEY HOWE (SOLAR INITIALS HRHA), SOLAR SECTION CHAIR

We have a volunteer, Stuart Morris, who has recently begun to digitize some of the older *Solar Bulletins* into yearly Excel spread sheets which look just like the old *Solar Bulletins* from the 1950s and 1960s. Elizabeth Waagen is supervising this effort. At this time we have 6 months of monthly observations from 1967 digitized. Here is an example from January 1967:

These monthly documents were compiled at AAVSO when Harry Bondy (1949 –1961) and Casper Hossfield (1961–1984) were the Solar Chairs. There are many of these documents to be digitized.

So, why is it important to have these monthly group and sunspot counts digitized? There have been questions about how well the American Relative (R_a) index has been "reconstructed" in the past. Only by digitizing these sunspots counts from the many solar observers of the past, can we determine what the American Relative R_a was during those years. The international community of solar scientists has been working hard to re-normalize their indices. For example: "The new correction of the international sunspot number [ISN], called the Sunspot Number Version 2.0, led by Frédéric Clette (Director of the World Data Centre [WDC]–SILSO), Ed Cliver (National Solar Observatory) and Leif Svalgaard (Stanford University, California), nullifies the claim that there has been a Modern Grand Maximum." This comes from the International Astronomical Union (IAU) press release, August 2015 (http://www.iau.org/news/pressreleases/detail/iau1508/). This ISN re-construction raises some questions for the AAVSO: should we try to re-construct the American Relative Index (R_a) to go along with the ISN reconstruction?

If the AAVSO decides to re-construct the American R_a Index, then it will be important to digitize all available data back to 1947 and up to 2000, for those months were data are available (the AAVSO currently has digitized data from 2000 to present). These archives exist at AAVSO HQ in different formats of raw observations from many observers over the past 70 years. And by starting with the year 1967 and going both forward and backward these raw group and sunspot counts will help decide how best to re-construct what Grant Foster (1997) found to be some pretty anomalous data!

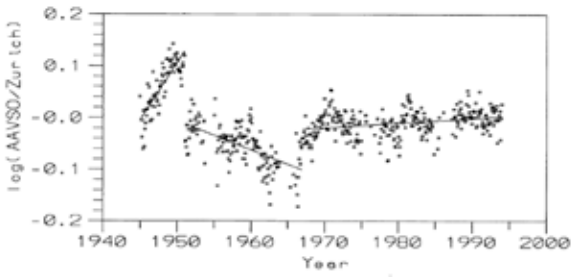


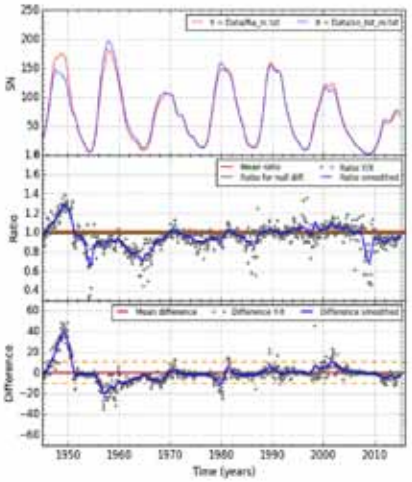
Figure 2. Logarithm of the ratio of AAVSO to Zurich sunspot numbers, $\log(R_a/R_z)$, for the last 50 years. The straight lines are linear regression fits, showing the dramatic increase until 1951, an apparent decrease from 1951 to 1967, and a slow increase from 1967 to 1995.

From Grant Foster, 1997, Inflation of AAVSO Sunspot Counts, JAAVSO, Vol 26, 1997

Here we see a comparison of the SILSO international Index with the American Relative R_a index:

Early drifts identified by Grant Foster, et al. Otherwise the indices track fairly well to the original (ISN) Ri over entire interval 1970–2010, where the average k ~ 1. Conclusions: Suggests that the scale has been slowly adjusted to remain in agreement with the international SN R_i.

And there is a recent jump in 2010, which requires investigation.



Graph courtesy of Frederic Clette, SILSO.

If you would like to assist with this digitization project, please contact Elizabeth Waagen (eowaagen@aavso.org). Thank you! ★

AAVSO OBSERVING CAMPAIGNS UPDATE

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

Many papers are published that utilize AAVSO data and/or other information obtained by you in response to a call for observations made via an AAVSO Alert or Special Notice. This quarter I would like to draw your attention to two such papers that have appeared on the astro-ph section of arXiv (http://arxiv.org/list/astro-ph/recent). Both of these papers—on GW Lib and AG Peg—are extremely interesting and show the need for as active participation as possible in observing campaigns and for ongoing observations (using all observational methods) of the variable stars in our programs. Your observations really are crucial!

"GW Librae: Still Hot Eight Years Post-Outburst" (Paula Szkody, Anjum S. Mukadam, Boris T. Gaensicke, Paul Chote, Peter Nelson, Gordon Myers, Odette Toloza, Elizabeth O. Waagen, Edward M. Sion, Denis J. Sullivan, Dean M. Townsley) has been accepted for publication in the *Astronomical Journal* (arXiv link arxiv.org/abs/1606.00945). Since a very rare large-amplitude outburst of GW Lib was reported in 2007 by Peter Nelson (*AAVSO Special Notices #40* and *#42, AAVSO Alert Notice 349)*, this star has been closely studied by Drs. Paula Szkody and Boris Gaensicke and numerous colleagues. Several times AAVSO observing campaigns have been carried out in support of observations being made by HST, including in 2010 (*Alert Notice 417* and *Special Notice #199*), 2011 (*Alert Notice 433* and *Special Notice #238*), 2012–2013 (*Alert Notice 471 in 2012 and Special Notice #354 in 2013), and 2015 (Alert Notice 513 and Special Notice #403*). Not only were ongoing observations of value, but AAVSO coverage was essential to verify that GW Lib had not brightened prior to the HST observations in order to protect the sensitive on-board instrumentation.

"Swift observations of the 2015 outburst of AG Peg—from slow nova to classical symbiotic outburst" (Gavin Ramsay, J. L. Sokoloski, G. J. M. Luna, N. E. Nunez) has been accepted for publication in Monthly Notices of the Royal Astronomical Society (http://arxiv.org/abs/1606.07397). The AAVSO and BAA,VSS light curve of AG Peg was the optical data source in the analysis of this outburst, along with spectroscopy from the Liverpool Telescope and X-ray data from Swift. The outburst of AG Peg was announced in *AAVSO Alert Notice 521* (see below under Campaigns Concluded). In this extremely interesting publication the authors determine that and discuss how the nature of the outburst in AG Peg has changed. Last winter Gavin wrote a short article on preliminary findings from this campaign, which was published in the January 2016 AAVSO Newsletter (https://www.aavso.org/aavso-newsletter).

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.

Campaigns concluded since April 1, 2016

In early February, Dr. James Miller-Jones (International Centre for Radio Astronomy Research, Curtin University, Perth, Western Australia) and colleagues requested AAVSO assistance in monitoring the dwarf nova **SS Cyg** monitoring for a complex radio campaign. As in previous radio campaigns on SS Cyg with Dr. Miller-Jones and his colleagues, extremely close monitoring and immediate reporting was essential in order to catch the very start of an outburst in order to trigger radio observations with the e-MERLIN radio array located across the UK and the Arcminute Microkelvin Imager—Large Array (AMI-LA; a radio telescope based in Cambridge, UK). NASA's Swift x-ray satellite was later added to the satellite mix! The duration of the campaign depended on when the next outburst of SS Cyg occurred, whether its onset occurred suitably timed for detection by AAVSO observers, and whether the type of outburst was suitable for the campaign (*AAVSO Alert Notice 536*). The first outburst that could be observed was an anomalous one, so the e-MERLIN observations were not carried out (because no anomalous outburst had been observed in radio before) but the AMI-LA ones were carried out (for the very same reason), and the AAVSO observed this outburst very closely, as a result obtaining the first radio data on an anomalous outburst of SS Cyg. The campaign was continued in order to catch an outburst that all the instrumentation could follow (*AAVSO Special Notice #414*). The normal outburst of SS Cyg in April was successfully observed. The very interesting thread on this campaign, with numerous substantial comments from the astronomers, is at the AAVSO's Campaigns and Observation Reports forum at (https://www.aavso.org/ss-cyg-radio-campaign).

In late February, Dr. Jeno Sokoloski (Columbia University) and graduate student Adrian Lucy (Columbia University) requested multicolor time series observations of the jet-driving symbiotic star **V694 Mon (MWC 560)**, which was in outburst, in support of upcoming Chandra observations to investigate the state of the inner accretion disk during the outburst. Coverage was requested through April 30 (*AAVSO Alert Notice 538*). 49 observers worldwide contributed 40,183 multicolor and visual observations to this campaign.

The May campaign by Ph.D. candidate Roque Ruiz-Carmona (Institute of Mathematics, Astrophysics and Particle Physics, Radboud University Nijmegen, The Netherlands) on **20 cataclysmic variables** (see below under Campaigns Initiated and *AAVSO Alert Notice 543*) concluded but not as originally planned. AAVSO observers were requested to obtain one image per star per observer within a specific window on two specific nights, and submit their images to Ruiz-Carmona by specific times. However, technical problems with the William Herschel telescope altered the way Ruiz-Carmona carried out his program, and he requested an additional three nights of coverage (*AAVSO Special Notice #416*). Weather was bad for most participating observers, particularly during the campaign extension, but 17 targets were observed at least once, with four observers contributing.

The outburst of the symbiotic variable **AG Peg** appears to be over and the campaign is officially concluded, but observations are still strongly encouraged as it completes its return to minimum. It went into outburst in late May 2015 (*AAVSO Alert Notice 521*) for the first time since its only other known outburst, which occurred in 1860–1870 (it took about 10 years to reach maximum). It was unknown how this outburst would progress, and it was very interesting! After declining to V=8.0, in mid-October it abruptly began to brighten again, reaching V=7.4, then began to decline again and is still declining and nearly back to minimum. AG Peg was visual magnitude 8.5 as of 2016 June 28.2868 UT (KMA, M. Komorous, London, Ontario, Canada), and 8.506 V ±0.001 as of June 27.3202 UT (SGEA, G. Stone, Auberry, California). The January issue of the newsletter (https://www.aavso.org/aavso-newsletter) contained an article on AG Peg by Dr. Gavin Ramsay et al., and a paper by Ramsay et al. has been accepted for publication in MNRAS (see above).

CONTINUED ON NEXT PAGE

CAMPAIGNS UPDATE
CONTINUED...

Campaigns initiated since April 1, 2016

In early April the AAVSO issued a call to monitor the symbiotic recurrent nova **T CrB**, which has entered a super-active state, and is brighter and bluer than it has been since before its last outburst in 1946. Multicolor and visual ongoing observations were requested. Visual and multicolor observations in the AAVSO International Database show that the average magnitude of T CrB was V ~ 10.2-10.3 until early February 2015. Its average magnitude then brightened to V ~ 10.0 and remained there until early February 2016, when it began brightening again and reached V ~ 9.2. It faded to V ~ 9.7 and has remained there (Figure 1). T CrB has been observed twice in outburst, in 1866 and 1946. Each time it brightened rapidly to V ~2.0, then declined back to pre-outburst levels. 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.

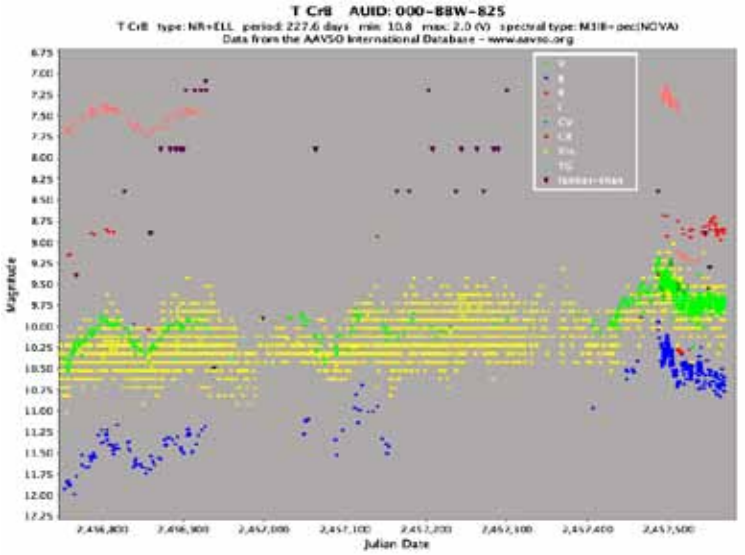


Figure 1. AAVSO light curve of the symbiotic recurrent nova T CrB JD 2456744–2457567 (27 March 2014–27 June 2016).

In May, Ph.D. candidate Roque Ruiz-Carmona (Institute of Mathematics, Astrophysics and Particle Physics, Radboud University Nijmegen, The Netherlands) requested images of 20 cataclysmic variables in order to determine his final target list for observations with the William Herschel Telescope (AAVSO Alert Notice 543, AAVSO Special Notice #416). The original plan of this campaign was similar to others conducted on behalf of Ruiz-Carmona. AAVSO observers were requested to obtain one image per star per observer within a specific window on two specific nights, and submit their images to Roque by specific times. The stars were **GP CVn, OV Dra, SDSS J143317.78+101123.3, SDSS J150137.22+550123.4, NZ Boo, OV Boo, SDSS J154453.60+255348.8, QZ Ser, BT CrB, V844 Her, SDSS J162520.29+120308.7, V592 Her, SDSS J164248.52+134751.4, V1239 Her, MASTER OT J172758.09+380021.5, V344 Lyr, V1504 Cyg, SDSS J204817.85-061044.8, QT Aqr,** and **QU Aqr.** This campaign was concluded in a modified way (see above under Campaigns Concluded).

Campaigns in progress

The campaign begun in March from Ms. Deanne Coppejans (PhD candidate, Radboud University Nijmegen (Netherlands) and University of Cape Town) and colleagues to monitor the Northern dwarf novae **RX And, Z Cam, YZ Cnc, U Gem,** and **SU UMa** through June 2016 in support of observations to be made with the Very Large Array (VLA) (*AAVSO Alert Notice 539*) continues. Four of the five targets have been successfully observed by the VLA, thanks to monitoring from AAVSO observers. **The fifth target, RX And, was badly placed for observing and will likely be observed with the VLA in August, so AAVSO observations are needed** to know the quiescence/outburst status of RX And at the time of VLA observations and to help schedule the VLA observations, as well as for correlation with the VLA data. The AAVSO forum thread on this campaign is at (https://www.aavso.org/northern-dwarf-novae-campaign).

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. R Aqr, both a Mira and a symbiotic variable, is a close binary system consisting of a hot star and a late-type star (the Mira), both enveloped in nebulosity. Figure 2, recent AAVSO data on R Aqr, shows that the most recent minimum was indeed faint and the maximum just concluded was faint but not abnormally so. 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).

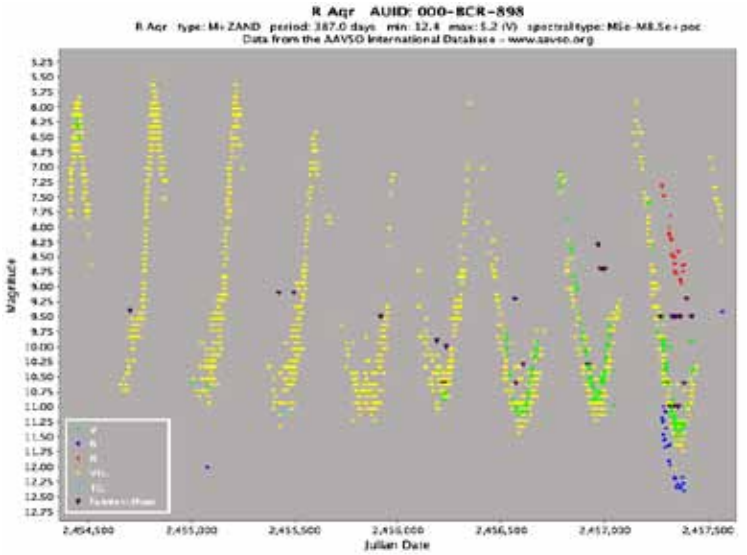


Figure 2: AAVSO light curve of the symbiotic Mira R Aqr JD 2454400–2457561 (27 October 2007–22 June 2016). 109 observers worldwide contributed 1,705 visual and multicolor observations to this light curve.

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CAMPAIGNS UPDATE
CONTINUED...

The campaign begun in October 2015 continues on the enigmatic variable object **KIC 8462852** (**AAVSO Alert Notices 532** and **542**). Filtered time-series 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. **Dr. Tabetha Boyajian (Yale University) has requested a revised observing procedure in order to obtain the extremely high level of precision needed for observations of this star; these instructions will be issued shortly in an *Alert* or *Special Notice***. Since the campaign began October 20, 68 observers have submitted 21,167 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, where it has been since. 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, 88 observers have submitted 71,154 multicolor and visual observations.

Dr. Margarita Karovska's (Harvard-Smithsonian Center for Astrophysics) HST and Chandra campaign on **CH Cyg** (*AAVSO Alert Notice 454* and *AAVSO Special Notices #267, 294,* and *320*) continues at least through the 2016 observing season. 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. Visual observations are also important! See Figure 3.

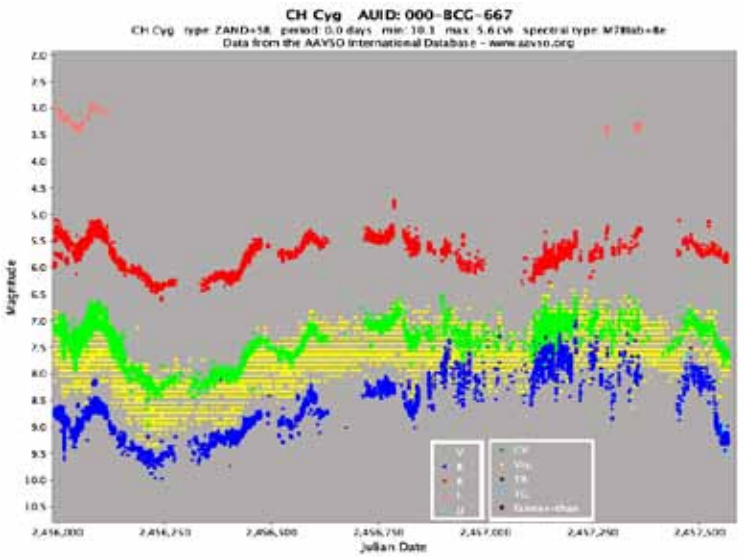

Figure 3: AAVSO light curve of the symbiotic star CH Cyg JD 2455988 – 2457563 (1 March 2012 –24 June 2016). 246 observers contributed 28,981 visual and multicolor observations to this light curve.

Dr. Margarita Karovska and colleagues' request continues for AAVSO observer assistance in their campaign on the symbiotic variable **RT Cru** (11.2–12.6 visual magnitude). Chandra and Swift observations took place successfully in November (*AAVSO Special Notice #411*). Follow-up continuing weekly or more frequent monitoring (B and V photometry and visual observations) is requested. High-resolution spectroscopy around H-alpha 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, 19 observers have contributed 8,330 multicolor observations of this star.

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

This campaign on the rare FU Ori object **2MASS J06593158-0405277**, begun in April 2015 and concluded in July (*AAVSO Alert Notice 518*), continues after being re-activated by Dr. Fabienne A. Bastien (Hubble Postdoctoral Fellow, Pennsylvania State University). Please continue your observations at least through the 2016 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. Since the campaign began, 21 observers have contributed 1,282 multicolor and visual observations. **Please pick up 2MASS J06593158-0405277 when it emerges from behind the Sun.**

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 has occurred, but the nova is still at maximum at 12.219 V ±0.006 on 2016 June 23.1400 UT (DKS, S. Dvorak, Clermont, Florida). Otero writes that knowing when the eruption starts to fade will be very important, and that ongoing data are essential. Observers are requested to continue visual and instrumental monitoring. Since this campaign began 2015 March 5, 15 observers have contributed 1,466 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 the 2016 observing season will be appreciated. Since this campaign began 2015 March 13, 37 observers have contributed 5,252 multicolor and visual observations to the AID.

RW Aur 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?…." This past observing season, since August, its brightness decreased, plateaued, and increased again. Now in its seasonal gap, when last observed at the end of April, RW Aur had brightened from its plateau magnitude of 13.0–13.3 (many observers) to about 12.3 visual (GZN, Alfredo Glez-Hererra, Ferrol, Spain; BOZ, Balazs Bago, Piliscsaba, Hungary; MCPA, Chris Maloney, Helena, Arkansas) and 12.081 V ±0.009 (DKS, S. Dvorak, Clermont, Florida). **Be sure to pick up RW Aur again when it becomes observable.**

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CAMPAIGNS UPDATE
CONTINUED...

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) *once a month*. Since this post-eclipse campaign began 2014 September 17, 85 observers have contributed 1,799 multicolor and visual observations.

Dr. Eric Mamajek's campaign on **V1400 Cen = J1407 (1SWASP J140747.93–394542.6**) (*AAVSO Alert Notice 462*) continues through 2016. Since the campaign began in July 2012, AAVSO observers have continued to provide excellent coverage in search of the eclipse. Please continue your observations, as they are extremely important in helping to solve the puzzle of this interesting and possibly complex system (*AAVSO Alert Notice 462*). 4 observers have contributed 2,575 multicolor observations to date.

Ernst Pollmann's campaign on **P Cyg**, an S Dor (= Luminous Blue Variable) variable (*AAVSO Alert Notice 440*), continues at least through the 2016 season and likely "for several more years." Since May 2011, 114 observers have contributed 5,800 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), 5+ 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 I_c 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, Massachusetts). QX Pup is now just past maximum. I have been challenging you to obtain a V range for QX Pup, which is embedded in a reflection nebula (the Rotten Egg Nebula). 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

One galactic nova has been discovered since April 1. Also, several recent novae continue to provide good observing opportunities, and R CrB is beginning to recover from minimum.

Nova Sco 2016 (PNV J17381927-3725077) was discovered on 2016 June 10.629 UT by Hideo Nishimura (Kakegawa, Shizuoka-ken, Japan) at unfiltered CCD magnitude 12.4 (*AAVSO Alert Notice 544*). It has begun to decline and on 2016 June 20.4404 UT was 12.677 V ±0.047 (KCD, C. Knight, Bulls, New Zealand). 16 observers have contributed 1,358 multicolor observations in the two weeks since its discovery.

Older novae that are still within observing range include:

V3661 Oph (Nova Oph 2016 = PNV 17355050-2934240) was discovered independently on 2016 March 11.8 UT by Minoru Yamamoto (Okazaki, Aichi-ken, Japan) and by Yuji Nakamura (Kameyama, Mie, Japan) at magnitude ~10.6 (*AAVSO Alert Notice 541*). It faded very rapidly to magnitude 15 and fainter, and since at least April has been 16.9–17.0 V. As of June 2.7235 UT it was 16.9 V ±0.15 (NLX, P. Nelson, Ellinbank, VIC, Australia).

V5669 Sgr (Nova Sgr 2015 No. 3 = PNV J18033275-2816054), discovered on 2015 September 27 UT at unfiltered magnitude 9.9–10.5 (*AAVSO Alert Notice 528*), continues to fade, and as of 2016 May 13.7623 UT it was 14.71 V ± 0.09 (NLX, P. Nelson, Ellinbank, VIC, Australia). 36 observers have contributed 285 multicolor observations to date.

V5667 Sgr (Nova Sagittarii 2015 = PNV J18142514-2554343), discovered on 2015 February 12 UT (*AAVSO Alert Notice 509*), continues to fade. As of 2016 June 15.6257 UT it was visual magnitude 13.4 (PEX, A. Pearce, Nedlands, W. Australia). 18 observers worldwide have contributed 427 multicolor observations through June 15.

V5668 Sgr (Nova Sagittarii 2015 Number 2 = PNV J18365700-2855420), discovered on 2015 March 15 UT (*AAVSO Alert Notice 512*), having recovered from its dust event, continues to fade. As of 2016 June 15.6208 UT it was visual magnitude 9.9 (PEX, A. Pearce, Nedlands, W. Australia). 138 observers worldwide have contributed 4,050 multicolor observations through June 15.

V2944 Oph (Nova Ophiuchi 2015 = PNV J17291350-1846120) was discovered in March and reached maximum on April 14 at magnitude V=9.2. After fading with oscillations to about magnitude 12, it plateaued for about three months before brightening slightly and then continuing to fade. As of 2016 May 20.3778 UT it was 15.342 V ±0.068 (DKS, S. Dvorak, Clermont, Florida). 37 observers worldwide have contributed 1,082 multicolor observations through May 20.

V2659 Cyg (Nova Cygni 2014 = PNV J20214234+3103296), a highly reddened classical Fe II-type nova which had been very active as it declined, continues to fade steadily. As of 2016 June 21.1325 UT it was 15.589 V ±0.049 (DKS, S. Dvorak, Clermont, Florida). 81 observers worldwide have contributed 3,846 multicolor observations through June 21.

V1369 Cen (Nova Centauri 2013 = PNV J13544700-5909080) continues to decline slowly. As of 2016 June 15.5868 UT it was visual magnitude 11.2 (PEX, A. Pearce, Nedlands, W. Australia). 71 observers worldwide have contributed 13,401 multicolor observations through June 15.

V339 Del (Nova Delphini 2013 = PNV J20233073+2046041) continues to fade slowly. As of 2016 June 22.1429 UT it was V magnitude 14.049 ±0.017 (DKS, S. Dvorak, Clermont, Florida). 551 observers worldwide have contributed 78,010 multicolor observations through June 22.

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CAMPAIGNS UPDATE
CONTINUED...

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 it began brightening again (Figure 4), and as of 2016 June 23 it was about visual magnitude 13.3 (several observers). Keep on watching R CrB – what is it going to do next?

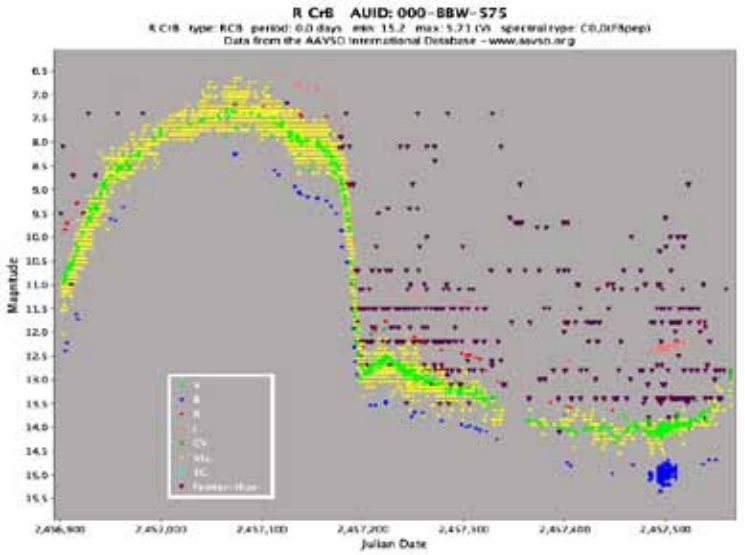

Figure 4: AAVSO light curve of R CrB JD 2456900–2457563 (30 August 2014–23 June 2016). 243 observers contributed 5,824 visual and multicolor observations to this light curve.

Please keep observing and participating in as many campaigns as your schedule and equipment permit. The astronomers and we at AAVSO Headquarters are grateful to all of you who are participating in AAVSO Observing Campaigns, and we thank you for your contributions. You have been and continue to be a vital part of variable star research! ★

PHOTOELECTRIC PHOTOMETRY PROGRAM UPDATE

JIM KAY (KJMB), AAVSO PEP SECTION LEADER

Observations

The section had a productive quarter, providing 604 observations in five different bands (B,V,R,H,J).

Erwin van Ballegoij (BVE, Heesch, Netherlands) contributed 2 observations of rho Cas, 1 each in V and B.

Charles Calia (CCB, Ridgefield, Connecticut) contributed a total of 26 V band observations of W Boo, TV UMa, FS Com, GK Com, RS Cnc, and eta Gem.

Tom Calderwood (CTOA, Bend, Oregon) contributed a total of 12 observations split between the B and V bands for XY Lyr, CH Cyg, and alpha Com.

Former PEP Section Chair Jim Fox (FXJ, Mayhill, New Mexico) submitted a total of 51 observations of FP Vir, FS Com, GK Com, TV UMa, CH Cyg, V533 Oph, V441 Her, CE Tau, BP Cnc, X Cnc, FZ Cnc, tau 4 Ser, FH Vir, SW Vir, RS Cnc, BQ Gem, V614 Mon, BL Cnc, IN Hya, BC CMi, NZ Gem, and U Mon.

Carl Knight (KCD, Bulls, New Zealand) submitted 12 near-IR observations of alpha Ori, 7 H and 7J.

Jim Kay (KJMB, Shelburne, Vermont) contributed 48 observations of beta Lyr and 4 of alpha Com in the B and V bands.

Gerald Persha (PGD, Lowell, Michigan) submitted a total of 531 observations in the V, B, and R bands. Stars included TV UMa, XY Lyr, R Lyr, V636 Her, g Her, ST Her, X Her, T CrB, RT Vir, BK Vir, U CVn, Y CVn, TT Her, X Cnc, T Cnc, RT Cnc, FX Cnc, RW Boo, RV Boo, RV Mon, SX Mon, and epsilon Aur. He captured several nice time series of TT Her.

University of Illinois Springfield (UIS01 Barber Observatory) contributed a total of 4 observations in B and V of tet CrB and alf Ori.

Thanks go to everyone for their time and dedication. The section continues to fill the niche for highly accurate photometry of bright stars.

Campaigns

The section continues to support the ongoing campaigns on CH Cyg and epsilon Aur. These campaigns are detailed in *AAVSO Special Notices #320* (https://www.aavso.org/aavso-special-notice-320) and *#131* (https://www.aavso.org/aavso-special-notice-131). As mentioned previously these stars remain unpredictable and their bright magnitudes allow high accuracy PEP measurements important to the professionals modeling these systems. The section has also begun to participate in the BRITE campaign, contributing 48 observations of beta Lyr. This campaign of ground-based observations to support observations by a constellation of small satellites is described in the following links:

https://www.aavso.org/apps/jaavso/article/2973/

https://www.aavso.org/aavso-brite-targets

Additional observations are encouraged. Do not be discouraged by the high cadence and accuracy request in the campaign announcement. The researchers are happy to get PEP data at a lower cadence, as described by Slavek Rucinski (one of the investigators) in the following correspondence:

"My requirements should be taken as a goal rather than necessity. Any long-term, consistent and well done time monitoring of what is happening in beta Lyr will be useful. Thus, 0.01 mag in one colour—even if once per night—will be very useful if done through the whole summer in the same way. Consistency and constancy of the setup would be my highest priority; single observations in different filters will be almost useless.

"When observing beta Lyr be careful as you may have difficulty excluding a bright field star if your photometric aperture is greater than 1 arc minute. I will be sending out additional notes on the [BRITE] targets as they become available."

PEP Manual

A hearty thanks goes out to Tom Calderwood for creating a PEP observation manual. It is now posted for review at https://www.aavso.org/pep-manual. Tom did a great job resulting in a readable yet fairly rigorous treatment. Please take a look and provide comments.

Accuracy Challenge

An often-quoted advantage of PEP is its accuracy, particularly on bright stars. This accuracy is dependent on a variety of factors, such as measurement and handling of extinction (including second order extinction in the B band) and proper transformation to a standard system, as well as consistency in the data reduction method. Tom Calderwood and I decided to see just how consistent our measurements could be by independently measuring alpha Com, which is a very long period eclipsing binary that is presently out of eclipse and so presents a constant magnitude. We chose HD 113848 and HD 114520 as comparison and check stars, which resulted in a small delta B–V so that transformation and second order extinction errors would be small. Our values differed by at most 0.004 magnitude in both the B and V bands, with the averages demonstrating even better agreement. Tom used a photomultiplier-based system and I used a photodiode-based system. The season for Coma Berenices is coming to a close, but it would be possible to make measurements through July. It would be great to see how well we agree across the PEP community. Send me a note if you would like to participate in this challenge, and make sure you upload your observations to the AAVSO database. Once we get good agreement with small delta B-V we will move to the next level to see how well we can do when there is a larger color difference between the comparison and target stars.

Stars of common interest

In the last newsletter we encouraged observers to add (or continue observing) the following four stars of common interest, CH Cyg, rho Cas, XY Lyr, and W Boo. Please consider adding these stars to your list; most are well placed for summer observations. See the previous newsletter for more information.

New Observers

We encourage participation from PEP observers of all levels. PEP has the advantage of requiring relatively simple equipment and procedures, and we have a number of experienced observers that are happy to help you get started. Please do not hesitate to contact us with questions or concerns. Additional information is available at the AAVSO PEP webpages at: https://www.aavso.org/aavso-photoelectric-photometry-pep-program. ★

LOOKING AT LEGACY STARS

STARS OBSERVED RECENTLY AND RECOMMENDATIONS FOR THE NEXT FEW MONTHS

ELIZABETH O. WAAGEN (WEO), AAVSO SENIOR TECHNICAL ASSISTANT (SCIENCE OPERATIONS)
SARA J. BECK (BSJ), AAVSO TECHNICAL ASSISTANT

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

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

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

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

Eighteen best-covered stars of the LPV Legacy program, as measured (mainly) by number of nights observed (both visual and CCD observing considered), 2016 March 16 through June 15:

Name	*Con*	*R.A.(J2000)*	*Dec.(J2000)*	*N(vo)*	*N(von)*	*N(co)*	*N(con)*
U Ori	Ori	05:55:49.16	+20:10:30.6	51	54	8	59
X Cnc	Cnc	08:55:22.87	+17:13:52.5	40	60	4	11
R Leo	Leo	09:47:33.48	+11:25:43.7	95	80	12	23
R UMa	UMa	10:44:38.46	+68:46:32.7	29	60	4	11
Z UMa	UMa	11:56:30.22	+57:52:17.6	77	85	4	15
R Vir	Vir	12:38:29.94	+06:59:18.9	42	60	6	15
RS UMa	UMa	12:38:57.54	+58:29:00.2	34	66	9	14
S UMa	UMa	12:43:56.67	+61:05:35.4	64	83	4	11
V CVn	CVn	13:19:27.77	+45:31:37.7	39	80	2	8
V Boo	Boo	14:29:45.27	+38:51:40.6	47	77	3	10
R Boo	Boo	14:37:11.57	+26:44:11.6	59	81	6	19
X Her	Her	16:02:39.16	+47:14:25.2	28	68	5	18
g Her	Her	16:28:38.54	+41:52:53.9	33	72	2	10
CH Cyg	Cyg	19:24:33.06	+50:14:29	40	85	15	64
AF Cyg	Cyg	19:30:12.84	+46:08:52	32	74	3	10
R Cyg	Cyg	19:36:49.38	+50:11:59.4	23	57	3	43
khi Cyg	Cyg	19:50:33.91	+32:54:50.6	18	37	2	33
T Cep	Cep	21:09:31.78	+68:29:27.1	47	82	4	6

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

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

Name	*Con*	*R.A.(J2000)*	*Dec.(J2000)*	*N(vo)*	*N(von)*	*N(co)*	*N(con)*
R And	And	00:24:01.94	+38:34:37.3	9	22	0	0
U Per	Per	01:59:35.1	+54:49:19.9	8	24	2	2
R Ari	Ari	02:16:07.1	+25:03:23.6	2	2	0	0
W And	And	02:17:32.95	+44:18:17.7	6	13	1	3
omi Cet	Cet	02:19:20.78	–02:58:39.5	10	10	0	0
S Per	Per	02:22:51.7	+58:35:11.4	16	22	3	4
R Tri	Tri	02:37:02.33	+34:15:51.4	23	24	1	1
W Per	Per	02:50:37.89	+56:59:00.3	7	8	2	3
R Lep	Lep	04:59:36.34	–14:48:22.5	17	23	1	1
W Ori	Ori	05:05:23.71	+01:10:39.3	23	22	1	1
RX Lep	Lep	05:11:22.84	–11:50:57.1	20	23	1	1
Z Pup	Pup	07:32:38.05	–20:39:29.2	4	16	3	5
TZ Cyg	Cyg	19:16:04.06	+50:09:36.6	7	20	2	5
S Aql	Aql	20:11:37.47	+15:37:14.5	7	13	3	3
S Del	Del	20:43:04.87	+17:05:17.3	7	14	3	3
R Vul	Vul	21:04:22.5	+23:49:18	5	9	0	0
R Peg	Peg	23:06:39.17	+10:32:36	2	6	1	2
R Aqr	Aqr	23:43:49.45	–15:17:04.1	3	9	0	0

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

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LEGACY STARS
CONTINUED...

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

Name	*Con*	*R.A.(J2000)*	*Dec.(J2000)*	*N(vo)*	*N(von)*	*N(co)*	*N(con)*
HL CMa	CMa	06:45:17.21	–16:51:34.7	10	36	4	66
UY Pup	Pup	07:46:31.25	–12:57:09.1	2	49	5	71
BX Pup	Pup	07:54:15.55	–24:19:36.3	1	11	3	73
U Gem	Gem	07:55:05.21	+22:00:04.7	39	63	14	43
YZ Cnc	Cnc	08:10:56.63	+28:08:33.2	25	55	17	60
SU UMa	UMa	08:12:28.27	+62:36:22.2	29	71	16	71
Z Cam	Cam	08:25:13.18	+73:06:39	38	88	17	73
AT Cnc	Cnc	08:28:36.89	+25:20:02.9	13	47	10	54
BZ UMa	UMa	08:53:44.15	+57:48:40.6	13	62	5	38
SY Cnc	Cnc	09:01:03.31	+17:53:56	18	51	12	53
X Leo	Leo	09:51:01.41	+11:52:30.2	19	66	9	44
CH UMa	UMa	10:07:00.68	+67:32:47	19	64	2	41
T CrB	CrB	15:59:30.16	+25:55:12.6	109	89	28	84
AG Dra	Dra	16:01:41.01	+66:48:10.1	27	73	5	42
AH Her	Her	16:44:10.01	+25:15:02	20	65	13	50
V426 Oph	Oph	18:07:51.68	+05:51:47.8	5	27	7	55
CH Cyg	Cyg	19:24:33.06	+50:14:29.1	40	85	15	64
SS Cyg	Cyg	21:42:42.78	+43:35:09.8	54	86	17	80

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

Name	*Con*	*R.A.(J2000)*	*Dec.(J2000)*	*N(vo)*	*N(von)*	*N(co)*	*N(con)*
LS And	And	00:32:10.21	+41:58:11.6	0	0	0	0
FN And	And	01:11:57.54	+35:17:24.2	0	0	0	0
FO And	And	01:15:32.09	+37:37:34.2	0	0	0	0
WX Cet	Cet	01:17:04.18	–17:56:22.5	0	0	0	0
TY Psc	Psc	01:25:39.35	+32:23:09.2	0	0	0	0
TT Ari	Ari	02:06:53.09	+15:17:41.7	0	0	0	0
PQ And	And	02:29:29.53	+40:02:40.1	0	0	0	0
AE Cir	Cir	14:44:51.29	–69:23:34.5	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
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
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
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
LV Vul	Vul	19:48:00.7	+27:10:19.5	0	0	0	0
V1819 Cyg	Cyg	19:54:37.44	+35:42:16	0	0	0	0
V476 Cyg	Cyg	19:58:24.47	+53:37:06.7	0	0	0	0
RR Tel	Tel	20:04:18.54	–55:43:33.2	0	0	0	0
QU Vul	Vul	20:26:46.02	+27:50:43.2	0	0	0	0
KK Tel	Tel	20:28:38.46	–52:18:45.2	0	0	0	0
TU Ind	Ind	20:33:10.55	–45:26:00.8	0	0	0	0
V1500 Cyg	Cyg	21:11:36.6	+48:09:02.4	0	0	0	0
CP Lac	Lac	22:15:41.15	+55:37:01.4	0	0	0	0
TY PsA	PsA	22:49:39.84	–27:06:53.7	0	0	0	0
V630 Cas	Cas	23:48:51.95	+51:27:39.3	0	0	0	0

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

GET THE LATEST CAMPAIGN NEWS...

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

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

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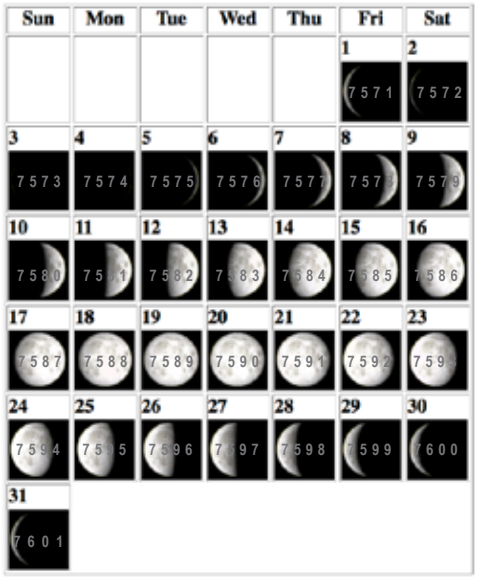
Sign up for the AAVSO online forums to read about or contribute to discussion on observing campaign targets. Postings will be sent to you be email and will also be available for viewing online. Visit http://www.aavso.org/forums

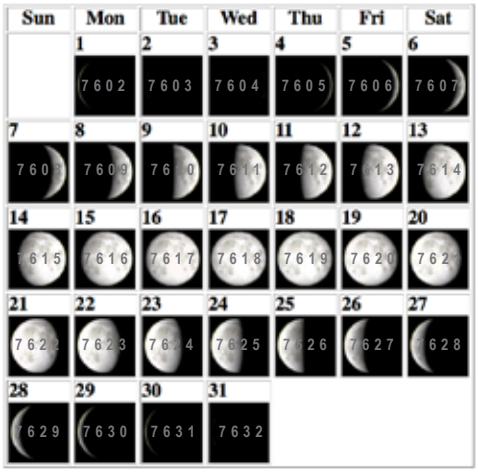
JULIAN DATE / MOON PHASE CALENDARS

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

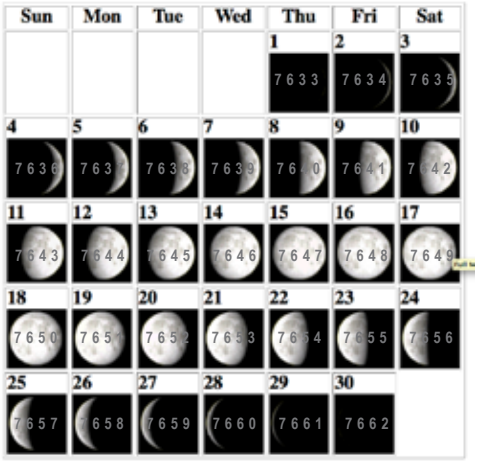
JULY 2016



AUGUST 2016



SEPTEMBER 2016



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

THE AAVSO MENTOR PROGRAM

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

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

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

Visit the AAVSO mentor program webpage:

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

BY POPULAR DEMAND!

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

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

THE AAVSO WALTER A. FEIBELMAN SUITE

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

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

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

JOIN THE AAVSO!

AAVSO 2016 New Member Form

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

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

Date: _____

Full Name: _____

Full Address: _____

_____

_____

Telephone 1: _____ Telephone 2: _____

E-Mail: _____

Birth Date: _____ Vocation: _____

Telescopic Equipment: _____

_____

Astronomical Experience (if any): _____

_____

How did you learn about the AAVSO? _____

_____

Types of Membership Offered and Dues

Annual:	Adult	US $75.00 per year
	Associate (Under 21)/Pension/Limited Income	US $37.50 per year
Sustaining:		US $150.00 per year
Developing country† (for members residing in low income countries):		US $25.00 per year

Membership is prorated through the end of the year, starting with the current month.
All applicants also add a one-time, $10.00 application fee.
Please consult the following table to find out how much to pay, including application fee.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept*	Oct*	Nov*	Dec*
Annual	$75.00	$68.75	$62.50	$56.25	$50.00	$43.75	$37.50	$31.25	$100.00	$93.75	$87.50	$81.25
A/P/LI	$37.50	$34.38	$31.25	$28.13	$25.00	$21.88	$18.75	$15.63	$50.00	$46.88	$43.75	$40.63
Sustaining	$150.00	$137.50	$125.00	$112.50	$100.00	$87.50	$75.00	$62.50	$200.00	$187.50	$175.00	$162.50
Developing Country†	$25.00	$22.92	$20.83	$18.75	$16.67	$14.58	$12.50	$10.42	$33.33	$31.25	$29.17	$27.08

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

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

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

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

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

Contributions *(see last page for descriptions)*:

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

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

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

Cardholder's Name (as on card):_____

Billing address (if different from above):_____

_____

Signature:_____

2016 MEMBERSHIP RENEWAL

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

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

Name _____

Address _____

City _____

State/Province _____

Zip/Postal Code _____

Country _____

Payment and Contact Information

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

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

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

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

Name on card:_____
Signature:_____

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

Billing Address _____ City_____

State/Province _____ Zip/Postal Code _____ Country_____

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

Name: _____

Address: _____

City: _____ State/Province: _____

Zip/Postal code:_____ Country: _____

Phone: _____ Email: _____

2016 Membership Dues Renewal Form

Membership Type *(please check one)*
____Annual $75 ____Sustaining $150
____Student/Limited Income $37.50

Contributions *(see next page for descriptions)*

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

SUPPORT THE AAVSO

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

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

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

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

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

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

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

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

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

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

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

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

2016 Annual Campaign
Your gift will help us continue to supply scientists, amateur astronomers, educators, and students with the data, tools, and services they can get only from the AAVSO.

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!