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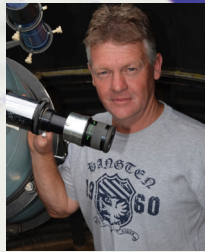
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ISSUE NO.60 | APRIL 2014

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# AAVSO Newsletter

SINCE 1911...

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

## FROM THE DIRECTOR'S DESK

ARNE A. HENDEN (HQA)



Four novae are easily visible in the sky right now: V339 Del (Nova Del 2013) has come out from behind the Sun and remains at 11th magnitude; V1369 Cen (Nova Cen 2013) has been visible in the southern hemisphere for months, is 7th magnitude, and is now optimally placed for even binocular viewing; Nova Sgr 2014 has faded to 11th magnitude, but still easily measured with a small telescope; and the new Nova Cep 2014 has faded to  $V=12.5$  after being briefly stuck around  $V=11.7$ . You should all go out and measure one of these stars—they won't last long!

We ran a contest to see who could guess the date/time of the 25-millionth submitted observation. When I wrote this column on March 18 the totals stood at 24.9 million. On March 23, Josch Hamsch (HMB) submitted the 25-millionth observation (ASAS J180536-4351.8), and John Rock (RJWB) of Great Britain was the winner of the contest.

The spectroscopy group is getting better established. We had a good telecon with a small group of amateurs and professionals to see

what steps the AAVSO should take to support spectroscopy. We're looking into databases now, and will continue to pursue this new observing method in the upcoming months. The spectroscopy forum is reporting new spectra from the novae mentioned above.

Newly named asteroids (133537) *Mariomotta* and (367732) *Mikesimonsen* were announced. These two individuals join a surprisingly long list of similarly honored AAVSO members/observers (see <http://www.aavso.org/minor-planet-names-honor-aavso-members-and-observers>).

Jordan Gibson has been selected as our new Administrative Assistant. He started work at the end of January, and with Lauren's help, has gotten up to speed quickly. He is computer savvy, knows forums inside and out, and is learning about variable stars and our membership. Please welcome him if you get a chance to call HQ!

The City of Cambridge is getting ready for their big sewer separation project through our area. They've protected all of the trees so that the heavy machinery is less likely to damage them, and are stockpiling materials in a nearby construction yard. Soon life in the Cambridge area will be noisier than normal! Winter is winding down, so I guess we will have Construction Season next.

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## PRESIDENT'S MESSAGE

JENO SOKOLOSKI



According to BoardSource, a group of experts on non-profit governance, "the handoff from one chief executive to the next is...a watershed moment for an organization." In February 2015 we will experience such a handoff. At that time, Arne will pass the reins of

the AAVSO over to one of a short list of candidates that is currently in the final stages of being evaluated by the Search Committee. Because we have had enough advance notice to carefully plan for this transition, it provides an opportunity to evaluate the direction of our organization and how successfully we are accomplishing our mission.

To make the most of this upcoming change in leadership, I asked a diverse group of seven amateur members, professional members, and staff to serve on a Transition Committee. This Transition Committee has two important jobs. The first is to identify legacy issues (i.e., problems) that the new Director is likely to face, and opportunities for the AAVSO in the near future. The second job will be to manage communications

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## DIRECTOR'S MESSAGE CONTINUED...

Doc has been working with Geir Klingenberg to move VPHOT onto a larger Windows cloud instance to give more reliable access. Geir is working with a new volunteer (Paul York) to bring another programmer into the group. Doc is also working on our new Virtual Astronomy Observatory (VAO) portal, with APASS DR7 being the first database to be served. Rebecca continues her role as grants administrator, is coordinating several upcoming meetings, and is working with Matt and me on several administrative fronts. Matt is helping me with AAVSONet, getting the pipeline more automated, writing a couple of papers, and supervising some International Database imports. Donna continues her support of the Chandra E/PO program. Sara is working with David Benn on the latest VStar release, and is also writing some HQ database software. Mike Saladyga and Elizabeth are working on several publication and data projects. Gordon Myers and George Silvis are working on sections of the photometric transformation project, in which we will supply you with the tools to both calculate your transformation coefficients and apply them. I'm training Bart Staelens to operate OC61, our most complex AAVSONet telescope (he is learning really fast!).

Our *Annual Report*, documenting the 2013 fiscal year, was released and is available from the website.

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We're working on the new DSLR tutorial manual, and hope to have that released in about a month.

We're offering a new CHOICE course this spring, on using VPHOT. Mike Simonsen, Geir Klingenberg, and Ken Mogul have been working tirelessly to produce a manual for VPHOT that will be "tested" by the class participants.

The second version of the Bright Star Monitor (BSM) epoch photometry database (EPD) was released, incorporating a few million observations from BSM South. All told, about 21 million datasets are in the EPD, covering a few thousand square degrees of sky. We expect to have new EPDs for other AAVSONet telescopes in the near future. Both VStar and a members-only webpage give you access to these datasets.

We are gearing up for an exciting spring meeting, held jointly with the Society for Astronomical Sciences—I hope everyone can attend! We will also have a strong presence at the June AAS meeting in Boston, with an exhibit booth as well as a special session on Long Time Domain Astronomy. I hope to see some familiar faces there, too! I wish everyone clear weather, and lots of free time to enjoy the night sky. ★

*Ed. note: the Spanish language version of Arne's message can be found on page 9.*

## PRESIDENT'S MESSAGE CONTINUED...

and organizational changes associated with the arrival of the new Director. I expect the Transition Committee's candid assessment of the state of the AAVSO to help Council select a new Director who is well equipped to lead us into the next decade. It will also help the new Director set informed priorities.

The Transition Committee consists of the following people:

- Kristine Larsen (2nd Vice President; professional astronomer): leading creation of the Legacy Issues and Opportunities document
- Rebecca Turner (AAVSO staff-Operations Director): will lead communications and operational preparations for the transition
- Bob Stine (recent councilor, past chair of Mission-Statement Committee; amateur astronomer)

## THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS

<b>DIRECTOR</b>	Arne A. Henden
<b>PRESIDENT</b>	Jennifer Sokoloski
<b>PAST PRESIDENT</b>	Mario Motta
<b>1ST VICE PRESIDENT</b>	Jim Bedient
<b>2ND VICE PRESIDENT</b>	Kristine M. Larsen
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Chryssa Kouveliotou	David Turner
John Martin	Doug Welch

### NEWSLETTER

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

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 [ewaagen@aavso.org](mailto:ewaagen@aavso.org). Photo in this issue courtesy of G. Williams.

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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- Gerry Samolyk (past councilor, Merit Award winner; amateur astronomer)
- Paula Szkody (past President; professional astronomer)
- Elizabeth Waagen (AAVSO staff-Senior Technical Assistant; past Interim Director)
- Matthew Templeton (AAVSO staff-Science Director)

To ensure a balance of input from amateur members, professional members, and staff, the Legacy Issues and Opportunities document will be written by Kris, Bob, Gerry, Paula, Elizabeth, and Matt. Once these authors have completed the bulk of the work on their report, Rebecca will lead

CONTINUED ON NEXT PAGE

## PRESIDENT'S MESSAGE CONTINUED...

the Committee's efforts to prepare for and support the new Director.

In fact, the Transition Committee is already making great progress. Those working on the Legacy Issues and Opportunities document have reviewed a collection of reports and surveys (including a candid and insightful exit report from Arne) and crafted a preliminary list of items that the new Director will need to address. They have also determined that the issues and opportunities in the coming years naturally divide into several distinct categories, such as the role of the AAVSO in a changing astronomical landscape, growth of the AAVSO, constraints on resources, and our diverse culture.

Before completing their report, however, the Transition Committee would like to hear from you, the membership. What do you think the new Director should tackle first? What problems must be solved, or what programs strengthened? What new direction do you want the AAVSO to explore? Please send your ideas to Kris Larsen at [Larsen@mail.ccsu.edu](mailto:Larsen@mail.ccsu.edu) within the next few weeks.

As we continue the rigorous process of screening candidates to be our next Director, and harness our collective wisdom and energy to plan for this change, I am optimistic about the future of the AAVSO. Luckily for us, Arne will leave his position after a decade of tremendous accomplishments. The infrastructure is in good shape, with better tools, and improved sequences, calibrations, and manuals. With undertakings such as the Second Generation Synoptic Survey (2GSS), Arne has, in his own words, striven to provide "the groundwork necessary for the large amateur community to be an essential part of the [coming large professional surveys]." AAVSONet and a new spectroscopy section are also up and running. For my own part, I am thrilled with the way the Transition Committee has tackled its first task. BoardSource suggest that we ask ourselves, "How can we use the...leadership change as an opportunity to strengthen our organization and get even better results down the road?" This is exactly the question that the Transition Committee will answer at this watershed moment for the AAVSO. ★

*Ed. note: the Spanish language version of Jenó's message can be found on page 9.*

## UPCOMING MEETINGS

### 103rd Spring Meeting of the AAVSO

The AAVSO's 2014 Spring Meeting will be held jointly with The Society for Astronomical Sciences (SAS) and the Center for Backyard Astrophysics (CBA). The meeting will take place in Ontario, California, on Thursday, June 12, through Saturday, June 14. All events will be held at the recently renovated Ontario Airport Hotel. As its name suggests, the hotel is conveniently located near the airport, and the property does provide free shuttle service. Registration will be handled through SAS. More information can be found on our website at: <http://www.aavso.org/103rd-spring-meeting-aavso>

#### Dates to Remember

*Early registration cut-off: May 10th*

*Hotel reservation deadline: May 12th*

We look forward to welcoming you to this joint meeting of AAVSO, SAS, and CBA!

### 103rd Annual Meeting of the AAVSO

Mark your calendars! The AAVSO's next annual meeting will be held on November 7–8, 2014, at the Woburn Hilton in metro-Boston. **This will be Arne Henden's last meeting as Director of the AAVSO. (He will be retiring in early 2015.)** We hope that many of you will attend and help make Arne's last meeting as Director a special one. Stay tuned to the AAVSO web site and upcoming issues of the Newsletter for schedule and registration details as they are available.

### Third Annual AAVSO CCD School

Once again the AAVSO will be holding a week-long CCD School taught by AAVSO Director Arne Henden. The school will run August 4–8, 2014, and all classes will take place at AAVSO Headquarters in Cambridge, Massachusetts. Arne will be retiring in early 2015, so this may be your last chance to take this in-depth course.

The CCD school is designed for those who have some experience with a CCD system, and who want to learn how to take professional-quality data. The classes will cover calibration of the equipment, observing guidelines, photometric and image processing techniques, transformation of data, statistics and basic data-mining concepts. Projects will be assigned using AAVSONet data. Laptops are not needed for participation, but can be

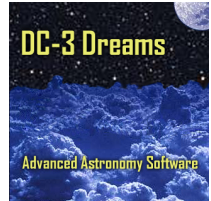
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useful in following the classroom examples. Bring any questions and imaging problems that you might have—this is the perfect venue to get help!

The registration fee includes a textbook, M–F daily classes, daily breaks, and lunches. The cost is \$500 for members and \$585 for non-members (includes AAVSO membership). Class size is limited, so registrations will be accepted on a first-come, first-served basis. The 2012 CCD School sold out, so register early to ensure a spot!

For more information on accommodations or to register please visit: <http://www.aavso.org/third-annual-aavso-ccd-school> ★

## STORIES FROM THE ADOPT A STAR PROGRAM

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

I was pretty sure when we launched the Adopt A Star Program that it would be a fun and successful way of raising money for the AAVSO while providing a way for people to show their appreciation for the AAVSO and the stars we know and love. When you adopt a star for a year you receive a star chart of that variable star and at the end of your year you receive a light curve of your star for that year. Whenever a light curve of your star is created on the Light Curve Generator during your year, your name as an “adopter,” or the name you designate, will appear in a list below the observer listing.

There is no limit to the number of variable stars a person can adopt (at \$20.00 per star). There is also no limit to the number of people who can adopt a specific variable star.

After three months the verdict is in. People like the program and when I asked, they were happy to share their stories about the stars they chose to adopt. As I began to collect these, a few common themes stood out. First, there are a lot of people who feel some variable stars are already like their children, so adopting them seemed a natural thing to do.

Barbara Harris wrote, “Most of them I adopted because they were some of the first stars I performed photometry on and still follow regularly so they are like my ‘kids’ that I visit regularly. SS Cyg is one of my favorites because of the class of variable star and I love the field. Every time I take an image of the field, I just love seeing the 3 little galaxies to the east of the variable. Of course, U Sco is my ‘child’ so I had to adopt it officially! No matter who else adopts it, it is my child.”

AAVSO President Jenő Sokolowski told me, “I have spent so much time with data from some variable stars that I feel like I have a close personal relationship with them. When Mario got to CH Cyg (on which I have written 3 papers) before I did, I couldn’t believe it! I grabbed my other two babies—Z And and RS Oph—as quickly as I could.”

“The behavior and special antics of S Ori is what started me looking seriously at variable stars,” said Frank Schorr, “and also focus on LPVs. To me observing S Ori is like keeping an eye on my favorite ‘child’ to see what it’s going to do next. It was just natural for me to adopt my favorite ‘child!’”

Some people adopted stars because they were important to their research or career. AAVSO Senior Technical Assistant Elizabeth Waagen has a special place in her heart for Y Cap. She wrote, “Y Cap was the first star I researched and gave a paper on at an AAVSO meeting. Janet offered it to me about 6 months after I started working at HQ in August 1979; it had a problem seemingly simple to resolve so it was a good starter project to learn the Mira variable star research/analysis process...I gave my paper at the 1980 Annual meeting and published it in *JAAVSO*. My bit of hubris related to it is that the current GCVS period value for Y Cap is mine.”

She also adopted R CrB, “because when I started at the AAVSO and learned about the different types of variables I thought the R CrB stars were such



fascinating enigmas (I still do, despite the fact that we know more about them than we did in 1979!), and R CrB was the second variable star I observed.”

Stella Kafka made her choices based on her research interests. “By adopting QU Car, I hope to encourage more observations of this object. It is a fascinating and unpredictable system, whose properties have already advanced our knowledge of a category of stars that could be progenitors of the most popular explosions in our universe, Type Ia supernovae.”

Stella’s other adoption was AM Herculis. “AM Her was one of the first CVs I ever studied. Hundreds of nights of telescope time, countless hours of pondering over data, endless discussions with colleagues and seven papers later, I am still puzzled by the richness of its behaviors and the knowledge gained by studying this one system. Trying to understand the underlying physics of AM Her is one of the best adventures of my career, and I am grateful for the data and support provided by the AAVSO observers.”

AAVSO Councilor Kristine Larsen had her own special reasons for adopting omicron Ceti. “Why Mira? I think I can relate to her. Not in her ‘wonderfulness’ mind you, but in being reliable yet still able to surprise people. We’re both mature, yet fun, and have that middle-age spread going on. Sometimes we’re bright, and other times...well, we’ll just leave it at that. Blame it on a lack of caffeine. On my part, not hers. I wouldn’t want to see a LPV on caffeine.”

“I chose UX Ori because it’s in one of my favorite constellations,” AAVSO observer Bruno Billiaert explained. “As a visual observer, it is also a very rewarding object: it’s not as predictable as a Mira, not too weak at minimum as a CV can be, you don’t have to wait 6 days between observations and it’s easy to find! It’s my first goal every bright evening, at least when Orion is above the horizon. Finding it suddenly brighter or weaker is always a thrill. Adopting UX Ori is like an engagement to observe: Even if conditions are bad or enthusiasm is lacking, I try to find courage, drag my telescope out, and pay it a visit.”

Some people had very specific criteria, and only chose stars that fit a particular mold. Carlos Adib shared his criteria with me. He said they had to be: “1. Stars of southern sky (my latitude is 30 deg. south); 2. LPV; 3. Stars that I used to observe frequently; 4. Stars that are not ‘famous’; 5. Stars with a little or modest number of observations at AAVSO (up to 10,000)”.

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## ADOPT A STAR CONTINUED...

Carlos was also one of the people who adopted a variable star in memory of someone they knew or cared about. He wrote, "One of the stars, I decided to adopt in memory of a dear person who belonged to our group of amateur astronomers. He died some time ago."

Thom Gandet had a similar story about his brother. "I adopted CG Cam in memory of William J. Gandet. Billy was my younger brother, who died recently. Billy was a tortured soul and deserved infinitely more from life than he got. A variable star seemed a fitting way to memorialize him and perhaps stimulate interest in a neglected variable star."

Merit Award recipient Tim Crawford adopted stars that held a meaning to him because of his experience observing them. "My first choice for the Adopt A Star program was pretty easy in as much as SS Cyg was my first visual observation," said Tim. "I was living in Anchorage, Alaska at the time and this target was high enough so I could catch it, although it was a long learning curve to figure out which type of chart to use with my equipment and then how to identify the target; all good stuff."

Tim continued, "Then I chose U Gem because it was my first CCD observation. I have to laugh thinking about this as I probably tried to get three or four other targets on the chip but failed to. I finally got lucky and managed to stumble onto U Gem as my next try for my first CCD observation."

Roger Kolman, AAVSO councilor, mentor, and speakers bureau representative, adopted a couple of stars that had special significance in his observing career also. "The first star I adopted was SS Cyg. This has always been my favorite variable, primarily because I can observe it throughout the year. When it goes into outburst, it is like an old friend saying, 'Here I am, look at me'. It also brings back memories of the time that Carolyn Hurlless and I had a race as to who could find it first."

The second variable Roger adopted was R Leo. "This was the first variable I observed as a newbie to the AAVSO in 1962. Each time I observe it, I think of the legacy of others who logged it in as their first observation, including Leslie Peltier. It always reminds me of the opportunity that I have been given to contribute to science from my backyard."

It's clear that this program means a lot of different things to different people. Our reasons for adopting specific stars are as varied as the stars themselves. I adopted Z Cam because it's the prototype of my favorite class of stars. Why don't you adopt your favorite variable star and contribute to the AAVSO General Fund? You'll find a quick link to the adoption program in the 'Support' block on the left side of the home page. Or you can go to <http://www.aavso.org/annual-adopt-variable-star-program> ★

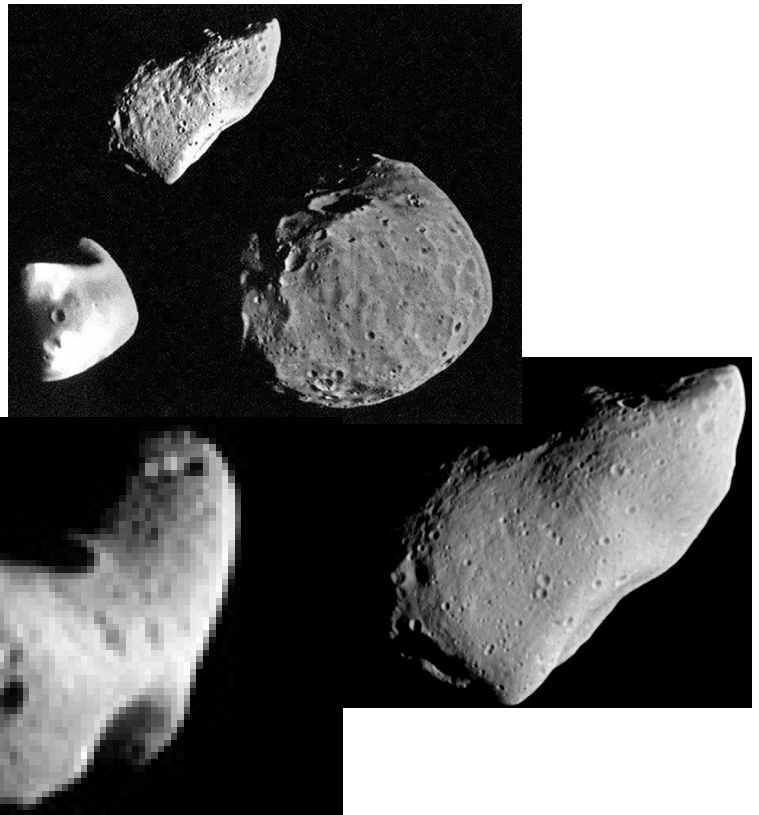
## AAVSOERS IN THE SKIES

As Arne Henden mentioned in his column on page 1 and has been announced on the AAVSO website homepage, AAVSOers Mario Motta and Mike Simonsen have had minor planets named after them. Mario's was actually named a while ago, but Mario didn't believe it was named for him until we showed him the citation.

They join a remarkably long list of AAVSO-related individuals with minor planets named after them. We recently checked the IAU Minor Planet Center's records (<http://www.minorplanetcenter.net>), and added over 30 names to the list on our website (<http://www.aavso.org/minor-planet-names-honor-aavso-members-and-observers>), bringing the total to 160!!

Perhaps the most unusual is minor planet (3342) Fivesparks, named in honor of Margaret and Newton Mayall. Why not call it Mayall? Well, there already was a minor planet Mayall, named in honor of astronomer Nick Mayall (no relation). Why Fivesparks? That was the address of Margaret and Newton's home near the Charles River in Cambridge, Massachusetts – 5 Sparks Street!

If you or someone you know of with an AAVSO connection has a minor planet "of their own" but is not on our list, please let us know! ★



## ROD STUBBINGS—PATIENCE, PERSISTENCE, AND PURPOSE MIKE SIMONSEN (SXN), AAVSO HQ

In early February of this year, Rod Stubbings wrote to me to tell me he had discovered a new Z Cam star. Since this was his independent discovery, he wanted to write a paper on it, and asked if I would be a co-author, since I was, as he put it, the “Godfather of Z Cam stars.”

He explained in an email that he had selected this star, OQ Carinae, from a list of CVs whose optical behavior was essentially unknown at the time. “I just noticed OQ Car in one of the CV catalogs when I was adding more dwarf novae to my observing list,” Rod explained. “Being an under-studied dwarf nova is what interested me. I was searching for every dwarf nova that was basically ignored and wanted to find out how they behaved.”

No one else was paying attention to what seemed to most a garden-variety dwarf nova. Nearly all the data ever collected on this star were Rod’s visual observations. “My first observation of OQ Car was on July 16, 2000, so it’s been almost 14 years.”

So, what motivates an observer to keep observing a star that no one else thinks is interesting or worthy of their time? “I like detecting outbursts and I soon realized that OQ Car was very active, so it was always good for an outburst,” said Rod.

But in January OQ Car began to behave differently. Rod was the only one watching. “I knew the star very well and after a normal outburst around 14.2 it had its usual fade to around 14.6. I expected it to fade further the next night. It didn’t; it stayed at 14.7 for a few nights and I thought, ‘now this could be interesting.’ After a week at the same brightness I knew it was in standstill. Two weeks later there was no doubt.”

His patience and persistence had paid off. By the time Rod contacted me OQ Car had been in standstill for 30 days. There wasn’t any doubt in my mind he had discovered a new Z Cam star.

Now Rod wanted to write his first paper as a primary author. He explained the motivation: “I knew no one else was observing OQ Car. Basically, 90% of the observations were mine over a 14-year study. I have always wanted to write a paper myself, so this was the perfect opportunity to present what I had found.”

Rod learned it takes some patience and persistence when it comes to getting a paper accepted by a peer-reviewed journal, too. “When the first remarks came back from the referee I was a bit surprised,” said Rod. “It was so obvious to me it was a Z Cam, as I had observed this star for over 14 years. What I learned is that you can have all the observational data you think is necessary, but you still have to make your case and prove it in the paper.”

After some minor revisions were made and additional data were added, the paper was accepted to the *JAAVSO* and the pre-print was published on arXiv March 4, 2014. “OQ Carinae: A New Southern Z Cam Type Dwarf Nova,” by Rod Stubbings and Mike Simonsen, <http://arxiv.org/abs/1403.0754>

Rod’s discovery story is a testament to the value of patience, persistence, and visual observations. He has given his visual observing program purpose by learning about the potential targets that are out there to observe, and what there is to learn from them. Then, by consistently, purposefully observing those objects year after year he has contributed to science and made a discovery only he can claim. It doesn’t matter that a CCD might have been more precise, or been able to measure OQ Car at fainter magnitudes. You can’t go back and measure the outbursts, quiescences, and the one standstill in the history of this star with a CCD. It’s too late. It’s a good thing Rod was observing with his eye at the eyepiece night after night.

He has some advice for visual observers who might be feeling overwhelmed by the digital detector revolution. “I know we are in the era of so many robotic surveys covering the sky but there is still plenty of work for visual observers. Instead of wondering what to do, make up our own projects on variable stars. For example, ASAS3 has been around for a long time and collected data on so many stars you might ask, why observe them? I have been looking at the ASAS3 light curves and noticed a lot of stars with incomplete light curves or in some cases no observations.”

I asked him recently what other under-observed or under-appreciated stars he might be monitoring. He told me, “I started to observe SY Vol in July 2000 (also 14 years ago) which has never been monitored well. But so far it has shown typical dwarf nova behavior, although not as active as OQ Car.”

“The Wolf Rayet star WR 53 is a total mystery to me,” he added. “It’s not listed in VSX because it is a constant star as observed by ASAS and other CCD data, yet I see variations as...[do] other visual observers. At one stage my observations were showing an RR Lyrae star, but it’s a Wolf Rayet star. Then I have a stage where it was constant at 10.6 for months, and lately it’s started to vary again. I don’t understand this one, but I will keep watching.”

Who knows what other interesting behavior might be detected by visual observers patiently and persistently observing their objects of interest night after night, year after year? One thing is certain. If you’re not looking, you won’t see it. ★



*Rod Stubbings and his Meade DS-16 Newtonian*

## 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:

*March 2014*—**Al Holm** (Columbia, Maryland) gave a talk titled “Behind the Scenes at the Hubble Space Telescope” to the RASC club in Saskatoon, Saskatchewan, remotely via Webex. Al writes, “Jim Goodridge, the program chair there, said 40 to 50 people were present. Mike Simonsen arranged for me to connect with the Saskatoon club. I am planning to give another talk to this group in the fall.”

*March 2014*—**John Percy** (Toronto, Ontario, Canada) has been busy! He writes, “I gave talks on ‘Variable Stars: Action in the Sky’ to the Kingston Centre of the Royal Astronomical Society of Canada on March 13 (various members expressed an interest in starting, or resuming observation of variable stars!) and to the York University Astronomy Club on March 4. York University is the ‘other’ large university in Toronto, and its undergraduate astronomy club is very active in its excellent public outreach program, and in some research with its campus observatory. I also gave a talk on ‘A Half-Century of Astronomy Outreach: Stories, Reflections, and Lessons Learned’ to the astronomy group at Queen’s University in Kingston. These and other EPO presentations and resources are on his outreach webpage: <http://www.astro.utoronto.ca/~percy/EPOindex.htm>.”

**Gary Poyner** (PYG, Birmingham, England) has the following talks scheduled for 2014:

*April 28, 2014*—Bradford Astronomical Society—“Historical Novae

*September 18, 2014*—Mexborough Astronomical Society—“Introduction to Variable Star Observing”

Thank you, speakers!

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

## IN MEMORIAM

MEMBERS, OBSERVERS, COLLEAGUES,  
AND FRIENDS OF THE AAVSO



*Elizabeth Pyle Whitney*

**ELIZABETH PYLE WHITNEY**, of Weston, Massachusetts, wife of longtime member and former *JAAVSO* Editor Charles Whitney, died February 17, 2014, at the age of 82. Chuck and Betty were married for nearly 19 years, a second marriage for both of them, and shared 10 children—5 apiece—and 23 grandchildren. Born in Brooklyn, New York, and following graduate school at Harvard University, Betty taught in the Lexington, Massachusetts, school system before leaving to raise her family. After the death of her first husband, Dr. Hugh Pyle, she returned to work in Financial Aid at Wellesley College and then Brandeis University. Her interests included her community, gardening, camping (she was a Girl Scout leader for many years), and the Boston Red Sox. Our sincere condolences go to Chuck and their families and Betty’s many friends.



*Lillian Berger Zissell*

**LILLIE BERGER ZISSELL**, of Lexington, Massachusetts, died January 16, 2014, shortly before her 103rd birthday. Lillie was the mother of longtime AAVSO member/observer Ron Zissell and Nancy Zissell Marsden, widow of longtime AAVSO colleague and friend Brian Marsden. Born in LaCrosse, Wisconsin, she was the fifth of six children of a Baptist minister and a remarkable mother. She grew up in Indianapolis, Indiana, and then Bridgeport, Connecticut, and trained as a teacher, later earning a Master’s Degree in Education; she taught third grade and reading and headed a portable classroom Reading Lab in Bridgeport. In Bridgeport she met and married Everett Zissell. Faith was the central pillar of Lillie’s life from early childhood; she was always very active in

her church in many capacities. Community was important to her as well, and she welcomed the many Boy Scout leader meetings held at their home. Lillie moved to Peabody, Massachusetts at the age of 90 to be near her children and medical resources, and continued to be active in her new community. She later developed memory problems but was always cheerful and appreciative. We extend our sincere sympathy to Ron and Nancy and their families and to Lillie’s friends.

*Photo courtesy of Gareth Williams*

## SCIENCE SUMMARY: AAVSO IN PRINT

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

**AAVSO** data are constantly being used by researchers around the world in presentations and publications. Below is a listing of some of the publications that appeared 2013 December 21 through 2014 March 31 on the arXiv.org preprint server and used AAVSO data or resources and/or acknowledged the AAVSO. To access these articles, type the preprint number into the “Search or Article-id” box at <http://www.arXiv.org>

- D.Yu. Tsvetkov, V.G. Metlov, S.Yu. Shugarov et al., “Supernova 2014J at maximum light”, (arXiv:1403.7405)[Mar 28, 2014]
- Shane B. Vickers, David J. Frew, Ouentin A. Parker and Ivan S. Bojicic, “New light on Galactic post-asymptotic giant branch stars. I. First distance catalogue”, (arXiv:1403.7230)[Mar 27, 2014]
- K. A. Stoyanov, R. K. Zamanov, M. F. Bode et al., “Emission line variability in the spectrum of V417 Centauri”, (arXiv:1403.6603)[Mar 26, 2014]
- D. W. Hoard, Knox S. Long, Steve B. Howell et al., “Novalike Cataclysmic Variables in the Infrared”, (arXiv:1403.6601)[Mar 26, 2014]
- R. Smolec, P. Moskalik, “Chaos in hydrodynamic BL Herculis models”, (arXiv:1403.4937)[Mar 19, 2014]
- Costantino Sigismondi, Tony George, Thomas Flattrès, “Data analysis of 2005 Regulus occultation and simulation of the 2014 occultation”, (arXiv:1403.4926)[Mar 19, 2014]
- Balthasar T. Indermuehle and Gordon C. McIntosh, “A Phase Dependent Comparison of the Velocity Parameters of SiO  $v=1$ ,  $J=1-0$  and  $J=2-1$  Maser Emission in Long Period Variables”, (arXiv:1403.4697)[Mar 19, 2014]
- Riccardo Furgoni, “Variability Type Determination and High Precision Ephemeris for NSVS 7606408”, (arXiv:1403.4122)[Mar 17, 2014]
- R. B. Baxter, P. D. Dobbie, Q. A. Parker et al., “Component masses of young, wide, non-magnetic white dwarf binaries in the SDSS DR7”, (arXiv:1403.4046)[Mar 17, 2014]
- U. Munari, P. Ochner, S. Dallaporta et al., “Study of three 2013 novae: V1830 Aql, V556 Ser and V809 Cep”, (arXiv:1403.3893)[Mar 16, 2014]
- V. Belokurov, M. J. Irwin, S. E. Koposov et al., “ATLAS lifts the Cup: Discovery of a New Milky Way satellite in Crater”, (arXiv:1403.3406)[Mar 13, 2014]
- U. Munari, E. Mason, P. Valisa, “The narrow and moving HeII lines in nova KT Eri”, (arXiv:1403.3284)[Mar 13, 2014]
- L. Casagrande, V. Silva Aguirre, D. Stello et al., “Stroemgren survey for Asteroseismology and Galactic Archaeology: let the SAGA begin”, (arXiv:1403.2754)[Mar 11, 2014]
- David G. Turner, “Towards a Determination of Definitive Parameters for the Long Period Cepheid S Vulpeculae”, (arXiv:1403.1968)[Mar 8, 2014]
- Brian D. Metzger, Romain Hascoet, Indrek Vurm et al., “Shocks in nova outflows. I. Thermal emission”, (arXiv:1403.1579)[Mar 6, 2014]
- Rod Stubbings and Mike Simonsen, OQ Carinae: “A New Southern Z Cam Type Dwarf Nova”, (arXiv:1403.0754)[Mar 4, 2014]
- B. Smalley, J. Southworth, O.I. Pintado et al., “On the incidence of eclipsing Am binary systems in the SuperWASP survey”, (arXiv:1402.7168)[Feb 28, 2014]
- Tomohito Ohshima, Taichi Kato, Elena Pavlenko et al., “Study of Negative and Positive Superhumps in ER Ursae Majoris”, (arXiv:1402.5747)[Feb 24, 2014]
- C. L. Smith, A. A. Zijlstra and G. A. Fuller, “A new HCN maser in IRAS 15082-4808”, (arXiv:1402.2895)[Feb 12, 2014]
- Riccardo Furgoni, “Nine New Variable Stars in Cygnus and Variability Type Determination of [Wm2007] 1176”, (arXiv:1402.1708)[Feb 7, 2014]
- Riccardo Furgoni, “Eighteen New Variable Stars in Cassiopeia and Variability Checking for NSV 364”, (arXiv:1402.1705)[Feb 7, 2014]
- F. Surina, R. A. Hounsell, M. F. Bode et al., “The Detailed Photometric and Spectroscopic Study of the 2011 Outburst of the Recurrent Nova T Pyxidis from 0.8 to 250 Days after Discovery”, (arXiv:1402.1109)[Feb 5, 2014]
- Mike Simonsen, Terry Bohlsen, Franz-Josef Hamsch et al., “ST Chamaeleontis and BP Coronae Australis: Two Southern Dwarf Novae Confirmed as Z Cam Stars”, (arXiv:1402.0210)[Feb 2, 2014]
- Mike Simonsen, David Boyd, Bill Goff et al., “Z Cam Stars in the Twenty-First Century”, (arXiv:1402.0207)[Feb 2, 2014]
- Izumi Hachisu, Mariko Kato, “The UBV Color Evolution of Classical Novae. I. Nova-Giant Sequence in the Color-Color Diagram”, (arXiv:1401.7113)[Jan 28, 2014]
- Monika Soraisam and Marat Gilfanov, “Constraint on Recurrent Novae as progenitors of Type Ia Supernovae”, (arXiv:1401.6148)[Jan 23, 2014]
- L. E. Ellerbroek, L. Podio, C. Dougados et al., “Relating jet structure to photometric variability: the Herbig Ae star HD 163296”, (arXiv:1401.3744)[Jan 15, 2014]
- O. Chesneau, A. Meilland, E. Chapellier et al., “The yellow hypergiant HR 5171 A: Resolving a massive interacting binary in the common envelope phase”, (arXiv:1401.2628)[Jan 12, 2014]
- M. Kun, M. Rácz, and L. Szabados, “V1117 Her: A Herbig Ae star at high Galactic latitude?”, (arXiv:1401.1952)[Jan 9, 2014]
- E. Plachy, L. Molnár, Z. Kolláth et al., “On the interchange of alternating-amplitude pulsation cycles”, (arXiv:1401.1429)[Jan 7, 2014]
- Louis-Gregory Strolger, Andrew M. Gott, Michael Carini et al., “The RCT 1.3-meter Robotic Telescope: Broad-band Color Transformation and Extinction Calibration”, (arXiv:1312.6272)[Dec 21, 2013]

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



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

## MENSAJE DEL DIRECTOR

**ARNE A. HENDEN (HQA)**

Cuatro novas son fácilmente visibles en el cielo en estos momentos: V339 Del (Nova Del 2013) ha reaparecido del otro lado del Sol y permanece en magnitud 11; V1369 Cen (Nova Cen 2013) sigue visible en el hemisferio Sur desde hace meses y está en magnitud 7, actualmente en posición óptima para observarla con binoculares; Nova Sgr 2014 ha bajado de brillo a magnitud 11 pero todavía se la puede medir con facilidad con un pequeño telescopio; y la nueva Nova Cep 2014 ha descendido a  $V=12.5$  después de pasar un breve tiempo alrededor de  $V=11.7$ . Todos deberían salir y observar alguna de estas estrellas, ¡no se van a ver por mucho tiempo más!

Realizamos un concurso para ver quién podía adivinar la fecha y hora en que se enviaría la observación número 25 millones. Cuando escribí esta columna el 18 de marzo, el total era de 24,9 millones. El 23 de marzo, Josch Hamsch (HMB) reportó la observación 25.000.000 (ASAS J180536-4351.8) y John Rock (RJWB) de Gran Bretaña fue el ganador del concurso.

El grupo de espectroscopía va tomando forma. Tuvimos una buena teleconferencia con un pequeño grupo de aficionados y profesionales para ver qué pasos debería seguir la AAVSO para apoyar la espectroscopía. Ahora estamos chequeando bases de datos y continuaremos dedicándonos a este nuevo método de observación en los próximos meses. El foro de espectroscopía está reportando nuevos espectros de las novas recién mencionadas.

Se anunció el nombramiento de los asteroides (133537) Mariomotta y (367732) Mikesimonsen. Estos dos individuos se unen a una lista sorprendentemente larga de miembros de AAVSO que han recibido el mismo honor (ver <http://www.aavso.org/minor-planet-names-honor-aavso-members-and-observers>).

Jordan Gibson ha sido seleccionado como nuestro nuevo Asistente Administrativo. Comenzó a trabajar a fines de enero y, con la ayuda de Lauren, se ha adaptado rápidamente. Es experto en computación, conoce los foros por dentro y por fuera y está aprendiendo acerca de estrellas variables y nuestros miembros. Por favor, déle la bienvenida si llegan a llamar a HQ.

La Ciudad de Cambridge se está preparando para el gran proyecto de separación de sumideros en nuestra área. Han protegido todos los árboles para que la maquinaria pesada no los dañe y están acumulando materiales en un patio de construcción cercano. ¡Pronto la vida en la zona de Cambridge va a ser más ruidosa que lo normal! El invierno se está yendo, así que me parece que la próxima va a ser la Estación de la Construcción.

Doc ha estado trabajando con Geir Klingenberg para trasladar VPHOT a una instancia de Windows en la nube para asegurarle un acceso más confiable. Geir está trabajando con un nuevo voluntario (Paul York) para traer otro programador al grupo. Doc también está trabajando en nuestro nuevo portal del Observatorio Astronómico Virtual (VAO) y APASS DR7 va a ser la primera base de datos allí alojada. Rebecca continúa con su rol de administradora de donaciones, está coordinando varios encuentros por venir y está trabajando conmigo y con Matt en varios frentes administrativos. Matt me está ayudando con AAVSONet, logrando que la reducción esté más automatizada, escribiendo un par de papers y supervisando algunas adiciones a la Base de Datos Internacional. Donna continúa apoyando al programa Chandra E/PO. Sara está trabajando con David Benn en la más reciente versión de VStar y también está escribiendo software para la base de datos de HQ. Mike Saladyga y Elizabeth están trabajando en varios proyectos de publicaciones y datos. Gordon Myers y George Silvis están trabajando en secciones del proyecto de transformación fotométrica, a través del cual les vamos a proveer de las herramientas tanto para calcular como para aplicar sus coeficientes de transformación. Estoy entrenando a Bart Staels para que pueda operar OC61, nuestro telescopio más complejo de AAVSONet (¡está aprendiendo realmente rápido!).

Nuestro Reporte Anual, documentando el año fiscal 2013, ya se puede ver en nuestro sitio web. Estamos trabajando en el nuevo manual tutorial de DSLR y esperamos que salga en aproximadamente un mes.

Estamos ofreciendo un nuevo curso CHOICE esta primavera sobre el uso de VPHOT. Mike Simonsen, Geir Klingenberg y Ken Mogul han venido trabajando incansablemente para producir un manual de VPHOT que será “testado” por los participantes de las clases.

La segunda versión de la base de datos de la fotometría de época (EPD) de Bright Star Monitor

(BSM) vio la luz, incorporando unos pocos millones de observaciones de BSM South. En total, cerca de 21 millones de sets de datos están en la EPD, cubriendo varios miles de grados cuadrados de cielo. Esperamos tener nuevas EPDs para otros telescopios de AAVSONet en el futuro cercano. Tanto VStar como una página de acceso exclusivo para miembros, ofrecen acceso a estos datos.

Nos estamos preparando para un excitante encuentro de primavera, a realizarse junto a la Society for Astronomical Sciences – ¡espero que todos puedan concurrir! También vamos a tener una fuerte presencia en el encuentro de junio de la AAS en Boston, con un stand de exhibición y también una sesión especial sobre Astronomía del dominio temporal a largo plazo. Espero ver algunas caras conocidas allí también. Les deseo a todos buen clima y mucho tiempo libre para disfrutar del cielo nocturno. ★

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

## MENSAJE DEL PRESIDENTE

**JENÓ SOKOLOSKI**

Según BoardSource, un grupo de expertos en materia de gobierno de entidades sin fines de lucro, “el traspaso de un director ejecutivo al siguiente es...un momento decisivo para una organización”. En febrero de 2015 vamos a experimentar esa transferencia. En ese momento, Arne pasará las riendas de la AAVSO a uno de una corta lista de candidatos que está, actualmente, en la etapa final de evaluación por parte del Comité de Selección. Debido a que tenemos suficiente antelación para planificar cuidadosamente esta transición, se nos ofrece la oportunidad de evaluar la dirección de nuestra organización y cuán exitosamente estamos logrando nuestra misión.

Para sacar el máximo partido de este próximo cambio de liderazgo, le pedí a un grupo diverso de siete miembros aficionados, miembros profesionales y personal, para que sirvan en un Comité de Transición. Este Comité de Transición tiene dos trabajos importantes. El primero consiste en identificar los asuntos heredados (es decir, los problemas) que el nuevo Director es probable que se enfrente y las oportunidades para AAVSO, en un futuro próximo. El segundo trabajo será el de gestionar las comunicaciones y los cambios, en la organización, relacionados con la llegada del nuevo Director. Espero la evaluación franca del

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## MENSAJE DEL PRESIDENTE CONTINUED...

Comité de Transición del estado de la AAVSO para ayudar al Consejo a elegir un nuevo Director, que esté bien dotado para conducirnos a la próxima década. También ayudará al nuevo Director a establecer prioridades informadas.

El Comité de Transición se compone de las siguientes personas:

- Kristine Larsen (vicepresidenta segunda; astrónoma profesional): liderando la creación del documento Problemas Heredados y Oportunidades
- Rebecca Turner (personal de AAVSO—Directora de Operaciones): conducirá las comunicaciones y los preparativos operacionales para la transición
- Bob Stine (consejero reciente, ex presidente del Comité para la Declaración de la Misión; astrónomo aficionado)
- Gerry Samolyk (ex consejero, ganador del Premio al Mérito; astrónomo aficionado)
- Paula Szkody (ex Presidente; astrónoma profesional)
- Elizabeth Waagen (personal de AAVSO—Asistente Técnica Senior y ex Directora Interina)
- Matthew Templeton (personal de AAVSO—Director Científico)

Para garantizar el equilibrio de los aportes de miembros aficionados y profesionales y del

personal, el documento Problemas Heredados y Oportunidades será escrito por Kris, Bob, Gerry, Paula, Elizabeth, y Matt. Una vez que estos autores hayan completado la mayor parte del trabajo en su informe, Rebecca liderará los esfuerzos de la Comisión para preparar y apoyar al nuevo Director.

De hecho, el Comité de Transición ya está haciendo grandes progresos. Los que trabajan en el documento Problemas Heredados y Oportunidades han revisado un conjunto de informes y encuestas (incluyendo un informe de salida de Arne, franco y profundo) y han elaborado una lista preliminar de los elementos que necesitará el nuevo Director de abordar. Ellos también han determinado que los problemas y las oportunidades en los próximos años se dividen, de forma natural, en varias categorías diferentes, tales como el papel de la AAVSO en un panorama astronómico cambiante, el crecimiento de la AAVSO, las limitaciones en los recursos y nuestra cultura diversa.

Antes de completar su informe, sin embargo, el Comité de Transición le gustaría saber de usted, de nuestros miembros. ¿Qué le parece que el nuevo director debe abordar en primer lugar? ¿Qué problemas hay que resolver o qué programas fortalecer? ¿Qué nueva dirección es lo que quiere que explore la AAVSO? Por favor, envíe sus ideas a Kris Larsen en [Larsen@mail.ccsu.edu](mailto:Larsen@mail.ccsu.edu), en las próximas semanas.

A medida que continuamos el riguroso proceso de selección de candidatos para ser nuestro próximo director y aprovechamos nuestra sabiduría colectiva y la energía para planificar

este cambio, me siento optimista sobre el futuro de AAVSO. Por suerte para nosotros, Arne dejará su cargo tras una década de grandes logros. La infraestructura está en buena forma, con mejores herramientas y mejoras en las secuencias, calibraciones y manuales. Con proyectos como el Estudio Sinóptico de Segunda Generación (2GSS), Arne, en sus propias palabras, se ha esforzado para proporcionar “las bases necesarias para que la gran comunidad de aficionados sea una parte esencial de los próximos grandes estudios detallados profesionales”. AAVSONet y una nueva sección de espectroscopia también están en marcha y funcionando. Por mi parte, estoy encantada con la forma en que el Comité de Transición ha abordado su primera tarea. BoardSource sugiere que nos preguntemos: “¿Cómo podemos utilizar el...cambio de liderazgo como una oportunidad para fortalecer nuestra organización y obtener resultados aún mejores en el futuro?” Esta es exactamente la pregunta que el Comité de Transición responderá en este momento decisivo para la AAVSO. ★

### A NOTE ON THE TRANSLATIONS

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

## VISUAL OBSERVING MANUAL IN SPANISH—2013 EDITION

The Spanish version of the 2013 edition of the *Manual for Visual Observing of Variable Stars—Manual para la Observación Visual de Estrellas Variables*—is now available for download here:

<http://www.aavso.org/visual-observing-manual-spanish>

It is hoped that people who speak Spanish will find this translation useful and it will encourage them to learn the art and science of variable star observing. The Manual is available free-of-charge and may be reproduced and distributed as needed.

Many thanks to Jaime García for all his hard work translating both the original version and this updated version of the Manual.

La versión en español de la edición de 2013 del *Manual para la Observación Visual de Estrellas Variables* ya está disponible para bajar aquí:

<http://www.aavso.org/visual-observing-manual-spanish>

Esperamos que esta traducción le resulte útil a la gente que habla español y los incentive a aprender al arte y la ciencia de observar estrellas variables. El Manual está disponible sin cargo y puede reproducirse y distribuirse como sea necesario.

Muchas gracias a Jaime García por su arduo trabajo traduciendo tanto la versión original como esta versión actualizada del Manual. ★

## VARIABLE STARS WITH COMPANIONS

SEBASTIAN OTERO (OSE), AAVSO HQ

The sky is full of stars. Some of them are alone, some come in pairs. Some of these pairs are physical while some are only optical, i.e., the two stars just happen to be in the same line of sight from our perspective. There may even be more than two stars in a physical or optical multiple system. When the presence of two stars close to each other is just a geometrical coincidence, they may be so close that it might be impossible to resolve them, or they may be easy to resolve with one instrument but not with another. Since these celestial optical alignments are random it is easy to realize that variable stars can not be the exception and sometimes they will be seen very close to another, unrelated star.

The presence of companions has been an issue since long ago. Tom Cragg called attention to Miras with shallow minima as early as 1963 (see his paper here: [https://sites.google.com/site/aavsolpvsection/Home/lpv-files/cragg\\_flat\\_mira.pdf?attredirects=0](https://sites.google.com/site/aavsolpvsection/Home/lpv-files/cragg_flat_mira.pdf?attredirects=0)).

In the AAVSO LPV Section we have an article by Matthew Templeton on the subject (<https://sites.google.com/site/aavsolpvsection/Home/lpv-zoo/campaigns-and-projects>). He mentions Z Tau as a good example of a light curve in which some observers are able to split the variable and its optical companion and others are not.

Indeed, as you can see in Figure 1, over the years most visual observers were not able to follow Z Tau when it became fainter than its 13.7 V-mag.

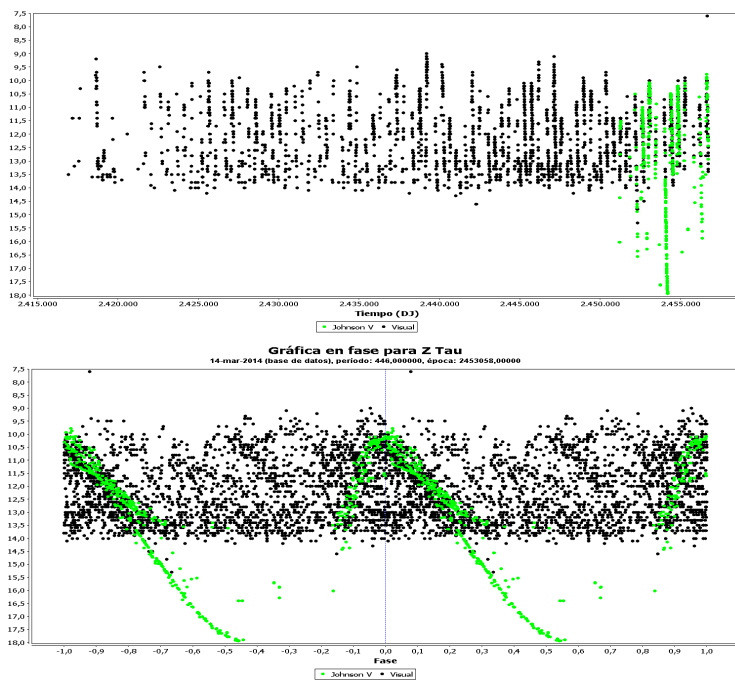


Figure 1. Z Tau light curves made with VStar (in Spanish because that is the author's native language!). The upper plot (JD versus magnitude) shows all the observations submitted to the AAVSO and how until recent times, the 13.7-mag. companion was confused with the variable at minimum. The lower light curve (phase versus magnitude) is a phase plot which clearly shows this effect and also how Z Tau undergoes strong period changes. The current period of 446 d. is only valid for the last several years.

companion lying only 5" away from it. They reported the magnitude of this other star instead of that of the variable. In recent times, CCD observers were able to record Z Tau all the way down to its actual minimum, which is around mag. 18 V, four magnitudes fainter than what the early data implied. However, if you take a close look at the phase plot, you'll see that some CCD observers, too, are not splitting the two stars and are reporting blended magnitudes to the AAVSO International Database (AID).

In 2012, the LPV Double-Trouble Campaign (<https://sites.google.com/site/aavsolpvsection/aavso-lpv-program/lpv-double-trouble-list>) conducted by Mike Simonsen became the most recent example of our attempts to approach this issue. The Double-Trouble Campaign is underway and some observers, such as Ken Mogul (MQE), are providing nice data that will help us to determine the true light curve parameters of some variables with companions.

However, all those efforts were mainly focused on long period variables and we needed to approach the issue as a whole.

The problem is also not restricted to telescopic variables. Delta Cep's V range is 3.49–4.36. However, visual observers report brighter magnitudes and a smaller amplitude (3.42–4.19). Is it a visual response issue? No. Delta Cep has a 6.3 companion 41" away that can't be resolved with the naked eye so the observers report the combined brightness of the pair. A typical observer won't be able to split stars closer than 160 arc seconds with the naked eye (I have tested this myself).

A similar star is alpha Her, with a 5.4-mag. companion 5" away (combined range 2.64–3.36, corrected range 2.73–3.60). In this case, there may also be a visual response issue due to the red color of the variable that will offset the difference caused by blending.

Blending will depend on the detector's resolution. What you can't solve with the naked eye can be solved with binoculars and what can't be solved with binoculars can be solved with a telescope. However, you can't make a reliable estimate of a naked-eye star using binoculars (it is too bright for your eyes and the comparison stars you need won't fall inside the binocular field of view), and the same thing happens if you try to estimate the brightness of a binocular star with a telescope.

Let's go fainter. The Northern Sky Variability Survey's resolution is such that all stars placed 50 to 60 arc seconds from the variable will be included in the same photometric aperture.

With The All-Sky Automated Survey (ASAS) things are two times better but if two stars are less than 23 to 40" apart (the brighter the stars, the worse the problems are), they will be measured as one.

Z Pup, a Mira with a bright 10.8-mag. companion, is a good example. Even though they are 24" apart, the ASAS light curve includes both objects (Figure 2).

Each survey has its own resolution. The AAVSO Photometric All-sky Survey (APASS) can solve stars about 10 to 15" apart and the Catalina Real-Time Transient Survey (CRTS) has a resolution close to 5 to 8".

In the case of our observers we determined that problems start to arise when we get to the 15" limit. This figure can certainly be improved and depends on the star's brightness and the observer's set up.

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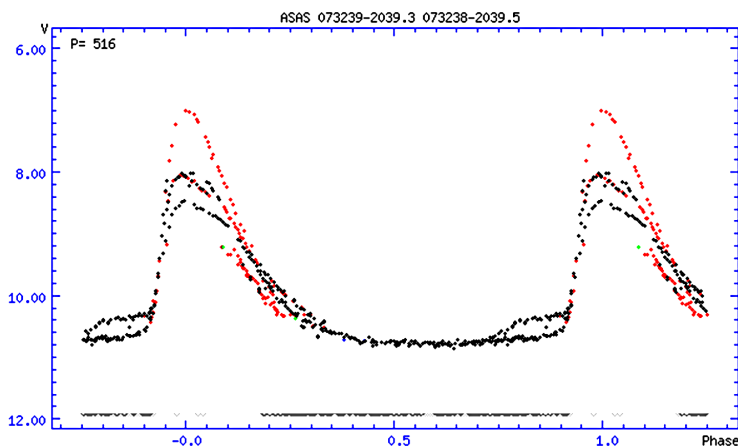
COMPANIONS  
CONTINUED...

Figure 2. Z Pup light curve with ASAS-3 data showing the flat minima caused by the presence of a 10.8 mag. companion.

When the stars are closer than 1 arc second you will probably never be able to separate them. There is no problem in submitting data for these stars since the results will not be dependent on your resolution. Physical systems such as Mira itself, X Oph, and R Aqr belong to this group. When the companion is brighter than the variable at minimum, the blended light curve appears flat-bottomed and that is a proof of the companion's existence. The carbon Mira R Vol might be one of these stars, since its faintest minima in the AID are flat. Another Mira, RR Equ might be another one because its color gets bluer at minimum according to APASS data.

One amazing case is the double Cepheid CE Cas in the open cluster NGC 7790. The two Cepheids (CE Cas A and CE Cas B) have very similar magnitudes and are only 2.4" apart so one would think that it would be impossible for amateur observers to measure them properly. However, we have nice light curves with both visual and CCD observations for each of the stars (Figure 3). This means that by applying the correct techniques and using the proper equipment it is possible to do accurate photometry of close pairs. The key is to be aware of the problem so as to be able to act in consequence.

The sky doesn't care about the variability type of the stars when it plays these games! And we have a lot of CVs and other variable types suffering from this problem. CVs are usually very faint in quiescence and the fainter we go, the easier it is to find a faint companion to make our life more difficult. Thus we searched for the well-documented problematic cases and tried to detect new ones in order to put them all together in one place so you can check them.

One outstanding example is KM Lac, a faint CV (14.8–<17.4 p) that has a 14.5 V-mag. companion only 5" to its SE. The AAVSO light curve (Figure 4) shows how this companion is being reported as the variable by CCD observers while the visual observers correctly ignore the companion and observe the variable.

Accompanying is a Top 10 list of some of the companion stars that cause or have caused more trouble in their nearby variable stars' light curves due to their proximity or their high brightness (C Vmag is the magnitude of the companion; F indicates whether the magnitude is photographic or Johnson V).

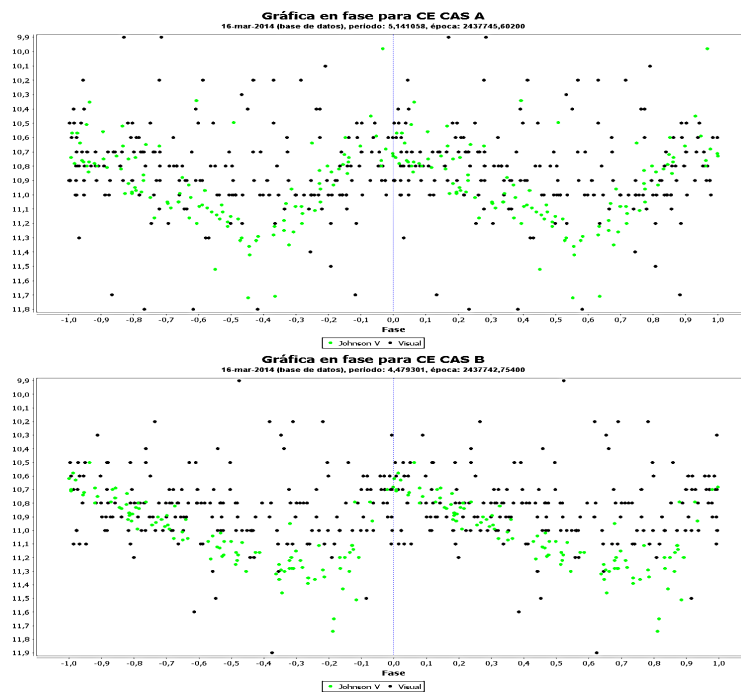


Figure 3. CE Cas A and CE Cas B phase plots, showing how the AAVSO observers are able to split this 2.4" binary Cepheid and submit data for its individual components.

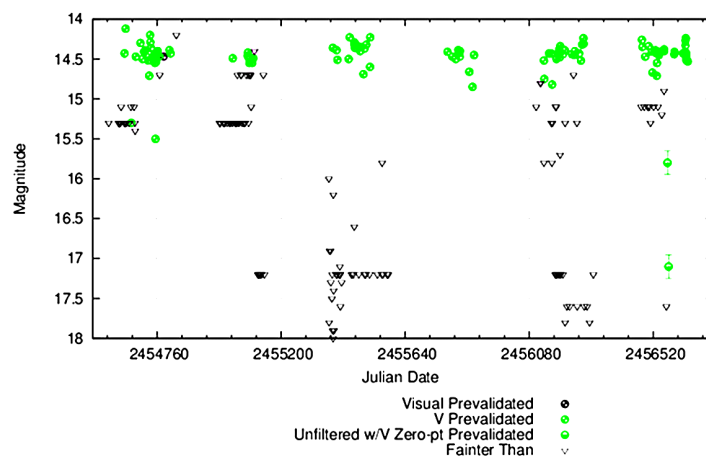


Figure 4. KM Lac AAVSO light curve. The visual observers correctly identify the faint CV while the CCD observations correspond to the 14.5-mag. companion which is only 5" away.

However, there are many more stars that have problematic companions. Some have observations in the AID. These have all been included on a webpage that we will be updating as we find more cases. You can visit it at: <http://www.aavso.org/variable-stars-companions>

There you can see a list of stars with observations in the AID and download a spreadsheet with a complete list of all stars that have a VSP note (that is displayed on charts to warn observers) about the presence of companions in VSX.

CONTINUED ON NEXT PAGE

COMPANIONS  
CONTINUED...

If you check your images and detect some problem with a companion, check our list. If the star is not there, let us know so we can add it to the webpage and other observers become aware of the problem. We will add a note to VSP to be displayed on the charts. Some observers have been doing so recently and we really appreciate it!

What should you do if one of your program stars has a companion that is so close to it that you can't resolve them? HQ strongly suggests that, if you can only report a blended magnitude on some target, you delete this target from your observing program. Focus on the stars that can be cleanly observed with your equipment. Also, be careful with the variable identification when it is at minimum. Maybe you can cleanly measure the stars if you identified them by hand, but if the variable gets so faint that it becomes invisible, you (or your

software) might confuse it with the companion. Be sure you use a chart that shows the field in detail that is suitable for the variable's brightness—you need more detail when the star is faint than when it is bright. Also, do not push your observing equipment further than it can go, a problem easy to happen for visual observers with smaller telescopes.

If you have already submitted data for any of these objects to the AID, double-check to see if you reported the correct star and that your results are not blended. If you did observe the wrong object, please delete the observations. If your observations are blended, you can add a comment in your report mentioning that fact (something like "The 14th mag companion to the NE is included in the aperture"). We also are updating WebObs so that you can include a "blended" comment code to further mark the submitted measure as a blend. ★

Top 10 list of stars having troublesome companions

VSX Name	R.A.	Dec.	V type	Max F	Min F	C Vmag	Sep
KM Lac	22 13 49.29	+55 28 26.4	UGSS	14.8 p	<17.4 p	14.5	5
Z Tau	05 52 24.85	+15 47 43.8	M	9.8 V	18.0 V	13.71	5
TU Aql	19 27 36.35	+02 03 10.8	M	8.5 V	14.6 V	10.7	9
EF Peg	21 15 04.12	+14 03 49.2	UGSU	10.7 V	18.5 V	12.6	5
LX Cyg	21 55 57.03	+48 20 52.5	M	9.1 V	15.1 V	13.1	10
LM Cas	23 13 00.08	+56 51 20.6	UGSS	15.8 p	<19.0 p	15.7	6
S Lup	14 53 26.40	-46 36 56.8	M	7.8 V	15.5 V	13.2	12
RZ Nor	16 32 41.66	=53 15 33.2	RCB	10.2 V	<14.2 V	13.8	7
NN Cam	04 12 36.81	+69 29 06.08	UGSU	12.6 V	18.5 V	15.3	8
AO Vir	14 21 51.88	+03 54 28.0	M	9.0 V	13.3: V	11.66	8

4TH SUNSPOT NUMBER WORKSHOP  
ANNOUNCEMENT

The 4th Sunspot Number Workshop will be held in Locarno, Switzerland, May 19–23, 2014. We are going back to the country where the sunspot number (SSN) was born. The workshop is being hosted by the staff of the Istituto Ricerche Solari Locarno (IRSOL) and Specola Solare Ticinese, with Renzo Ramelli serving as the Chair of the Local Organizing Committee.

The goal of this 4th workshop is to conclude the joint work begun in Sunspot, NM, in 2011 to obtain a community-vetted and jointly published SSN time series (1610–present). If more time is needed, a fifth and final meeting will be held in the US, either coming full circle to Sunspot or at the new home of the National Solar Observatory in Boulder, Colorado.

To organize the effort for Locarno, we are breaking the time series into four shorter series with Group Leaders as follows:

1980–present: Frederic Clette and Rodney Howe

1826–1980: David Hathaway

1716–1825: Leif Svalgaard

1610–1715: Jos Vaquero and Ed Cliver

As before, we will consider a broader range of sunspot-related topics (e.g., SSN correlates, sunspots during the recent minimum, SSN data archive) but the main focus will be on reconciling the International and Group SSNs.

Details on travel, lodging, registration, excursion, etc. are given on the workshop website <http://www.specola.ch/ssn4>. Questions on local arrangements can be sent to: [ssn4@specola.ch](mailto:ssn4@specola.ch).

For information on previous workshops, see <http://ssnworkshop.wikia.com/wiki/Home>. For information on AAVSO Solar activities, please contact Solar Section chair Rodney Howe at [solar@aavso.org](mailto:solar@aavso.org). ★

## THE CASE OF THE PHANTOM CLOUDS (OR, AN EMBARRASSING CONFESSION).

TIM CRAWFORD (CTX), AAVSO MENTORING TEAM

The day of March 20, 2014, started out to be quite cloudy and with some rain. As the day progressed the sky became mixed sun and cloud. I kept checking the weather forecasts and satellite images and they both projected some clouds for the night sky but it looked like I might get lucky and be able to open up for a while.

About 7:00 p.m. (PST) I prepared the observatory and cooled the CCD down. I could still see some passing clouds here and there but the sky looked pretty good, or so I thought. My main goal, if nothing else for the evening, was to get a second night of BVRI imaging of M67 for my annual transformation coefficient computations.

At about 7:45 p.m. it seemed to be dark enough and the sky was looking pretty good; lots of crisp stars to be seen. I slewed to M67 and only needed a few nudges to the west to get the FOV I needed centered and was then able to get the required BVRI images. I was content and slewed to my first VS target for the evening, V1062 Tau. Hummm...the image did not look right and I nudged the scope to the west and still did not seem able to get the target centered (this is a fainter target) and after some frustration decided to slew to another option so off to V405 Aur went the scope. I figured that with a bright 97 star nearby and lots of other bright stars in the FOV I should have no problem finding the target. Hummm...the image seemed to also be unrecognizable and the visible stars somewhat faint. I nudged the scope to the west and even tried going north and then south a bit; still could not identify the target. OK, this is getting to be stressful. Let's try KR Aur, which even though a faint target has a bright star nearby. Same frustration, so I stepped out of the observatory and I could tell that there were some thin-looking clouds over in the general direction of this last target. Well, that appeared to explain my problems and it looked to me like it was pretty clear more to the east.

As it was chilly I decided to take a break. Back in the house, I told Jim Jones (JJ), who was also signed on to the AAVSO Chat, that the clouds took me out on the first three targets and I came inside to get warm for a bit before heading back out.

I then went back outside took a good long look at the sky which looked pretty good to me and slewed to RZ Uma, which is a really bright target and pretty hard to miss. No bright star(s)...I nudged every direction of the compass; no luck whatsoever in identifying the target or the FOV; now I was really getting frustrated.

Went back inside and typed Jim on Chat that I was getting tired of chasing sucker holes and was not going to take this any longer. Therefore, I was shutting down. I also embellished how grateful I was that I got my four filter images of M67 first instead of waiting until later.

I shut down and came back inside and checked one of the images of M67. Oh, Oh—I had neglected to insure the last temperature change actually dropped down to  $-25^{\circ}\text{C}$  and discovered that the header showed the images at  $-15^{\circ}\text{C}$ . Dang nab, can't anything go right tonight...grrr.

OK, went back outside, uncovered the scope, plugged in the CCD cables, and got the software opened up so I could take some  $-15^{\circ}\text{C}$  darks. Hummm...this is strange, the scope condition line at the bottom of the imaging software says that the B filter is slotted in front of the CCD, wonder how that...OMG, the last image of M67 was a short string of 4 B filter images. This was the source, mostly, of what appeared to be phantom clouds messing up my FOVs!

I then felt pretty lousy for a number of reasons about this error:

- 1) My failure to see/look at all the available data and then to think about them.
- 2) Ok, this was not my first rodeo with filters and a long time ago (10 years or so) I had attached a red popsicle stick to the top of my red screen frame so that I could pivot it up when imaging with any filter other than V so I would then be reminded to cycle the V back in place when finished with the alternative filter(s). Of course I had failed to use this preventative tool.
- 3) How embarrassing if one of the observers I mentor or any of my friends were to learn about this; heck, even I was embarrassed at myself.

Then I got to thinking that my experience could also be a good learning experience for others, in spite of my embarrassment:

*Never Assume*  
*Never Presume*  
*Check*  
*Double Check*  
*Cross Check*  
*And Verify!*

Always remember to look at the data...all the data, see the data, and then think about them. ★

## YOUNG STELLAR OBJECTS (YSO) SECTION UPDATE

MIKE POXON (POX), SECTION LEADER

We continue to actively engage with the professional community on several observing campaigns. Also, general observation of YSO objects in the AAVSO program continues apace, especially those brighter objects. In this regard, don't forget that we have a dedicated page on the YSO website that summarizes all current observational campaigns, and announces new ones, at: <http://www.starman.co.uk/ysosection/campaigns.php>

However, the highly meritorious coverage of bright YSOs should not discourage those observers who are able to do so from monitoring some of the more obscure or fainter stars. This also goes for the far-southern objects—don't forget, there are just as many Southern YSOs as Northern ones! ★

## CVNET UPDATE—FIRST QUARTER 2014

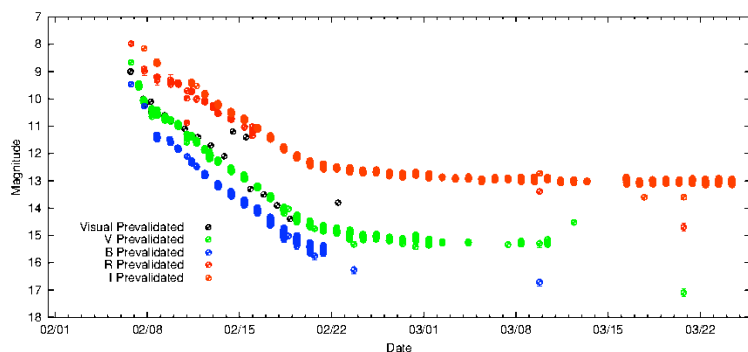
MIKE SIMONSEN (SXN), AAVSO HQ, CV SECTION LEADER

The first quarter of 2014 had several highlights, including bright novae and supernovae discoveries, a recurrent nova eruption, and other unusual or noteworthy cataclysmic variable activity. We also highlighted several interesting papers on cataclysmic variables, concluded a CV campaign, and entered into year five of the Z CamPaign.

On January 22, students and staff at the University of London Observatory spotted one of the closest supernovae to Earth in recent decades, SN 2014J. The discovery was a fluke: a 10-minute telescope workshop for undergraduate students that led to a global scramble to acquire confirming images and spectra of a supernova in one of the most unusual and interesting of our near neighbor galaxies, M82 (light curve on p. 24).

On January 26, Sigeru Furuyama of Tone-machi, Ibaraki-ken, Japan, discovered Nova Sagittarii 2014, initially designated PNV J18250860-2236024. At discovery it was unfiltered CCD magnitude 8.7 (light curve on p. 23).

On February 6, Rod Stubbings, Tetoora Road, Victoria, Australia, reported an outburst of the recurrent nova V745 Sco (aka Nova Sco 1937). Stubbings reports the nova at a visual magnitude of 9.0 on 2014 February 6.694 UT. He previously observed the field on February 5.696 and found the star fainter than 13.0, indicating that this outburst began within that 24-hour period.



The AAVSO light curve for the recent outburst of the recurrent nova V745 Sco.

On March 8, Koichi Nishiyama, Kurume, Japan, and Fujio Kabashima of Miyaki, Japan, discovered Nova Cephei 2014, initially designated TCP J20542386+6017077, at unfiltered CCD magnitude 11.7.

On March 9, 792 low-resolution spectra obtained by U. Munari (INAF Astronomical Observatory of Padova) and A. Milani, P. Valisa, F. Castellani, and R. Belligoli (ANS Collaboration) indicated Nova Cep 2014 was a highly reddened Fe II-type classical nova near maximum (light curve on p. 24).

In March, the HST/COS was scheduled to observe the U Gem-type dwarf nova SDSS J100658.40+233724.4. This was the final target in the HST/COS observing program. On March 22, Boris Gaensicke wrote to all the observers involved thanking them for their contributions to the program.

Dear All,

The observations of SDSS1006+2337 went well.

This was the last star in this HST program, and I would like to sincerely thank all of you for the outstanding support you have provided!

I met last week some of the people from STScI involved in the technical implementation of the HST observations, and they said it has been one of the most challenging programs they have done!

Without your help, these HST observations would not have been possible. It has worked beautifully, with just one out of the 41 targets being kicked off the schedule for bad behaviour! But there were a few close calls, and a number of sleepless nights throughout the past 1 1/2 years...as such, I am not too sad we have reached the end of it.

We have begun working on this fantastic data set, and will get back in touch with you later on some of the results we find.

All the best,

Boris

Just as this article was going to press Swift observed a new source in Scorpius, TCP J17154683-3128303, discovered in the optical at unfiltered CCD magnitude 10.1 on UT 2014 March 26, by Koichi Nishiyama, Kurume, Japan, and Fujio Kabashima, Miyaki, Japan. According to *ATel* #6015, “the mean X-ray spectrum can be best fit with an absorbed optically thin emission model.” Most of the x-ray absorption is intrinsic to the source, which is consistent with an expanding nova shell. So the second quarter of 2014 will begin with the story of another relatively bright nova.

The Z CamPaign produced two papers accepted by *JAAVSO* in rapid succession in early February. The first paper, “Z Cam Stars in the Twenty-First Century,” is a summary of the results of the first four years of the campaign. It listed the 19 confirmed Z Cams known to date, as well as the proven imposters and handful of remaining dwarf novae suspected of being Z Cams. The paper also had a historical aspect, explaining how the definition of Z Cams has changed over the decades, leading to the present day confusion in the literature.

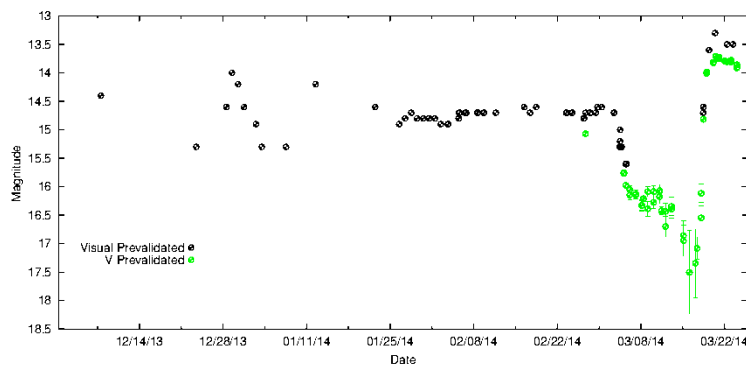
Close on the heels of the first paper, “ST Chamaeleontis and BP Coronae Australis: Two Southern Dwarf Novae Confirmed as Z Cam Stars” was accepted by *JAAVSO*, adding two more confirmed Z Cams to the role.

In March, Rod Stubbings announced the discovery of a previously unknown Z Cam in the paper OQ Carinae: “A New Southern Z Cam Type Dwarf Nova.” The interesting story of that discovery is told in some detail on page 6 of this newsletter.

Entering its fifth year the results of the Z CamPaign show there are now 22 bona fide Z Cams, 27 imposters have been proved to not be Z Cams, and 19 cataclysmic variables that may yet contain a few Z Cams in hiding.

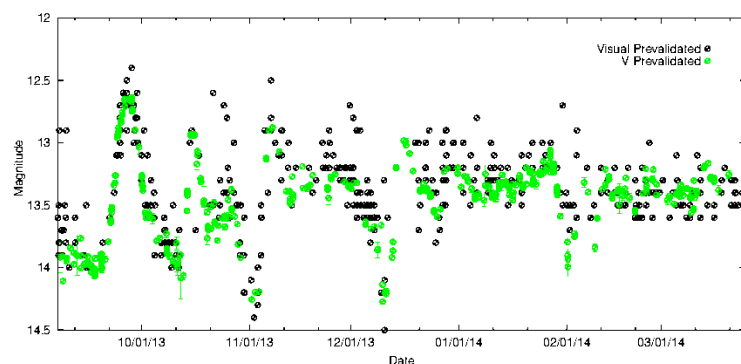
An up-to-date full listing of the Z CamPaign stars and their status can be found at The Z Cam List website <https://sites.google.com/site/thezcamlist/the-list>

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CVNET  
CONTINUED...

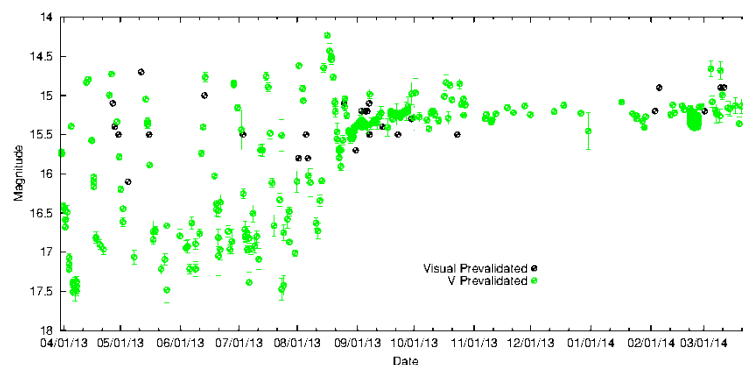
The AAVSO light curve of the first recorded standstill of OQ Car.

Some of the Z CamPaign program stars have performed admirably in the first quarter of 2014. TZ Per entered a standstill at the beginning of the year that has lasted until this writing.



The AAVSO light curve of TZ Per showing the 2014 standstill from January to March.

ES Draconis entered a standstill in September 2013 and also remains in a protracted standstill through March 2014.



The AAVSO light curve of ES Dra, showing the most recent 6-month standstill.

The CVnet website also highlights interesting papers on cataclysmic variables as they are published or become available as pre-prints. Among those papers in the first quarter of 2014 were: “Study of Negative and Positive Superhumps in ER Ursae Majoris,” Ohshima et al., <http://arxiv.org/abs/1402.5747>; “GALEX J194419.33+491257.0: An Unusually Active SU UMA-Type Dwarf Nova with a Very Short Orbital Period in the Kepler Data,” Kato, T. and Osaki, Y., <http://arxiv.org/abs/1403.0308>; and *IBVS* 6097, “Discovery of an SU UMA-type eclipsing cataclysmic variable star inside the CV ‘period gap’,” Cagas, Pavel and Cagas, Petr, <http://www.konkoly.hu/cgi-bin/IBVS?6097>.

You can keep up with the latest CV news and activity on the CVnet website at <https://sites.google.com/site/aavsovcsection/>

and in the Cataclysmic Variable Forum at <http://www.aavso.org/forums/variable-stars/cataclysmic-variables-cvs>. ★

## AAVSO CENTENNIAL HISTORY !

*Advancing Variable Star Astronomy: The Centennial History of The American Association of Variable Star Observers* by Thomas R. Williams and Michael Saladyga, published by Cambridge University Press, is available through the AAVSO at a special reduced price.

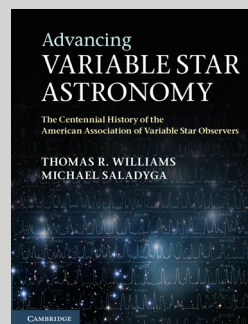
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## SUNSPOT ACTIVITY IN TERMS OF THE WOLF NUMBER FOR FEBRUARY 2014

**ALDRIN B. GABUYA, RIZAL TECHNOLOGICAL UNIVERSITY, MALAMIG, MANDALUYONG, PHILIPPINES**

*Editor's note: this article is adapted from a paper written by the author for an observational astronomy course.*

The most common feature on the Sun is the sunspots. These are dark spots, caused by their cooler temperature compared to the surrounding regions, temporarily seen on the Sun's visible surface or photosphere. As markings of recent solar phenomena, they are the basis for calibration of the solar cycle. Sunspots appear mostly along the Sun's equatorial region, and can last for weeks or even months, depending on their size and behavior. Sunspots can be categorized by size, color, orientation and other visual properties.

Solar observations can be made using filtered telescopes or binoculars, image projection, astrophotography, photometry, spectroscopy and so on. Sunspot counts are the most widely reported type of observation; they are tallied and computed using the International Sunspot Number formula, also known as the Wolf Number (as formulated by and named after the Swiss astronomer Johann Rudolf Wolf in 1848).

The Wolf Number is determined by counting sunspots as groups and spots; this can be done visually, or by sketching or with photographs. Sunspot groups can be classified using the Zurich and/or McIntosh classification criteria. From these counts and classifications, solar activity such as rotation, sunspot group evolution, and flaring probability—all of which are components of space weather—can be studied.

The relative sunspot number is an important tool for the investigation of the solar cycle. The proper acquisition and compilation of data is the key to providing information that will be useful to researchers. As a case in point, I describe here how I have determined the sunspot Wolf Number for February 2014 based on the number of solar observations made, and also describe the sunspot activity for this period as determined from a statistical and comparative analysis of sets of data. Specifically, my study purports to answer the following questions:

- 1) Main problem: What will be the average number of groups, spots, and relative sunspot number for February 2014?
- 2) On what dates occur the highest and lowest number of sunspot groups, spots, and Wolf Number based on my own observation?
- 3) Are there any similarities or differences between my personal data and the AAVSO's data, especially concerning the relative sunspot number and trend?

My primary tools for data analysis and interpretation are tabulated datasheets, graphical presentations of sunspot counts, and calculation of the Wolf Number and its average for the period in question. I am only concerned with the counting; sunspot group classifications and other technical approaches are not included. I have compared my personal data for the Wolf Number to the international sunspot data provided by the AAVSO's Solar Section, consisting of average relative sunspot numbers from 41 other sets of solar observations conducted worldwide.

My personal datasheet of sunspot counts is limited to 17 days of solar observation due to circumstances of sky conditions, workday availability, and other academic work. I then compared my observations of recent sunspot activity with statistics from the AAVSO's data. The Wolf Number and dates served as the main variables for the study.

The instruments and techniques I used were: 1) SkyWatcher Dobsonian-mount reflector; 2) Samsung ST66 Digital Camera for raw imaging (D: 200mm, F: 1200mm) telescope with solar glass filter; 3) SkyWatcher Super 25mm and 10mm; 4) Bond paper, pencil, and eraser for astrosketching; 5) Wide Angle Long Eye Relief eyepiece; 6) visual counting.

I made my observations at Rizal Technological University (Boni Campus) Quadrangle, Mandaluyong City, Philippines, during the whole month of February 2014. The data was gathered through astrosketching and raw imaging. Rodney Howe, AAVSO Solar Section Leader, helped me with data analysis and interpretation, as well as datasheets and the latest AAVSO relative sunspot number. These were a great help for the progress of the research.

I spent almost an hour of solar observation for every possible date throughout the week. I found that the most difficult part of the data gathering process is the identification of individual spots for each group, as the spots tend to gather closer to each other whether they are a part of the penumbra or not—this seemed especially so on the raw images due to their low resolution, which greatly affects the sunspot counting. As noted in Table 1, the sunspot counts for the first four days (February 3–6) have random error, because of the low-resolution of the processed images.

My sunspot counts, tabulated on an Excel spreadsheet, are shown in the table. The list of counts includes the following important variables: date, universal time (UT), number of groups, number of spots, and the Wolf Number. The Wolf Number for each day of observation is determined using the formula:  $W = k(10g + f)$ , where:  $W$  = Wolf Number,  $g$  = number of groups,  $K$  = observer's correction factor,  $f$  (or  $s$ ) = number of spots (common value = 1). For the monthly average, I combined all sunspot groups, spots, and the Wolf Number, and then divided it by the number of solar observations made.

Table 1 shows my datasheet of the sunspot counts for the month of February 2014 based on 17 conducted solar observations. Sunspot counts for groups and spots are carefully noted, with the corresponding seeing condition and calculated Wolf Number noted for each day of observation. Remarks are also included in the table.

CONTINUED ON NEXT PAGE

## SUNSPOT ACTIVITY CONTINUED...

Day	See	UT	g	s	W	Remarks
01	—	—	—	—	—	weekend
02	—	—	—	—	—	weekend
03	E	4:20	4	62	102	*
04	E	3:20	4	57	97	*
05	G	3:52	6	58	118	*
06	F	4:04	6	59	119	*
07	E	3:30	6	50	110	!
08	—	—	—	—	—	weekend
09	—	—	—	—	—	weekend
10	F	3:22	5	45	95	!
11	—	—	—	—	—	#
12	G	7:45	6	78	138	!
13	F	6:24	6	83	143	!
14	G	3:30	6	70	130	!
15	E	1:06	6	85	145	!
16	—	—	—	—	—	weekend
17	F	5:05	5	51	101	!
18	E	2:55	6	56	116	!
19	G	6:02	5	48	98	!
20	—	—	—	—	—	Natl. Ast. Conv.
21	E	1:50	7	56	126	!
22	—	—	—	—	—	weekend
23	—	—	—	—	—	weekend
24	—	—	—	—	—	no faculty
25	—	—	—	—	—	national holiday
26	F	8:30	11	77	187	!
27	G	3:00	11	73	183	!
28	E	3:00	9	84	174	!
Total			109	1092	2182	
Mean			6.411764706	64.2352941	128.352941	

\* Input datum has (random) error, sunspot count based on low-resolution processed images.  
! Input datum from visual sunspot count and astrosketching (more precise).  
# No observation due to very poor sky condition.

Day	Personal	AAVSO
3-Feb	102	123.33
4-Feb	97	123.45
5-Feb	118	156
6-Feb	119	139.57
7-Feb	110	121.07
10-Feb	95	123.07
12-Feb	138	125.07
13-Feb	143	127.79
14-Feb	130	111.57
15-Feb	145	88.57
17-Feb	101	106.05
18-Feb	116	113.87
19-Feb	98	109.24
21-Feb	126	116.53
26-Feb	187	168.29
27-Feb	183	190.64
28-Feb	174	153.1
Total	2182	2197.21
Average	128.352941	129.2476471

Table 2 (above). Comparison of personal and AAVSO sunspot data

Table 1 (on left). Personal datasheet for February 2014 sunspot counts. Solar data by GABS; sunspot activity by Wolf Number; observer, Aldrin Gabuya; for the month of: February 2014; observation site, Rizal Technological University, Philippines; Instrument, Skywatcher Dobsonian reflector telescope (D: 200mm, F: 1200mm); methods, direct, visual counting, raw imaging; camera, Samsung ST66 Digital Camera.

Figure 1 shows the number of sunspot groups on a daily basis based on my solar observations. As shown, February 3 and 4 have the smallest number of sunspot groups (4) while the largest number of sunspot groups (11) was observed on February 26 and 27. The mode number of sunspot groups was 6 which was close to the mean of 6.411764706 as computed. The trend shows gradual movement: slow ascensions and depressions at the beginning, becoming stagnant at some times then peaking near the end of the graph. Interpretation based on the sunspot groups implies the Sun experienced dynamic sunspot activity near the end of the month, consistency during the central period, and less activity during the starting period.

Figure 2 shows the number of individual sunspots in the same manner as the previous figure. February 10 has the smallest number of individual spots (45) while the largest number of spots (85) was observed on February 15.

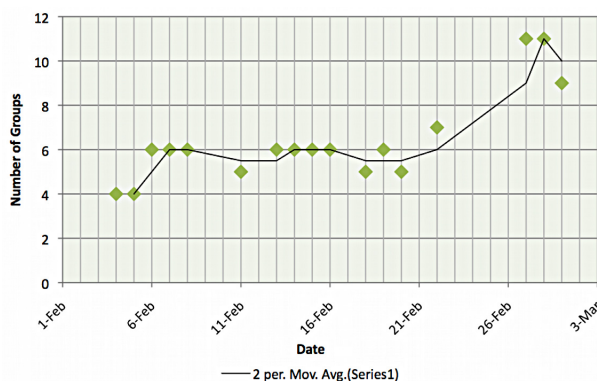


Figure 1. Graph of number of sunspot groups

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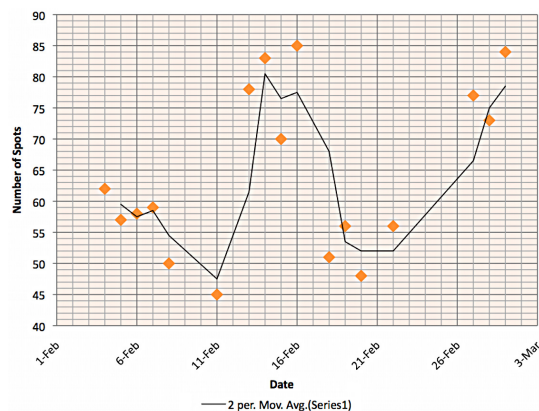
SUNSPOT ACTIVITY  
CONTINUED...

Figure 2. Graph of number of spots

Smaller spot counts were observed during the starting period and around the third week while the most spot counts were observed around the second and fourth week of the month. Compared to the previous figure, this shows much difference in the trend. It means that the Sun experienced several fluctuations in sunspot activity.

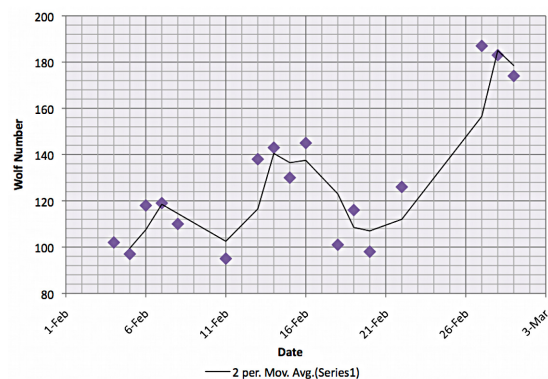


Figure 3: Graph of the Wolf Number

Figure 3 shows the relative sunspot number on a daily basis for the month based on my solar observations, as calculated. February 10 has the lowest Wolf Number (95) while the highest Wolf Number (187) was observed on February 26. The trend went through several rises and falls, forming an apparent pattern. The graph shows that the relative sunspot number gradually increases as time elapses, although fluctuations are present. Upon interpretation, there is an oscillating sunspot activity happening on the Sun during the month, as it in fact does in nature.

Table 2 (on previous page) shows the tabulated datasheet of matched dates' relative sunspot numbers between the researcher's and the AAVSO's for the month of February 2014. AAVSO data comprise the daily average Wolf Numbers from 41 experienced solar observers worldwide. As noticed, there are uneven gaps between the values. As already computed, my average Wolf Number is approximately 128 while the AAVSO's is 129. Despite the gaps present, the average values between the two are very close to each other. This may imply that the researcher got nearly as precise a relative sunspot number for the mentioned period as the AAVSO.

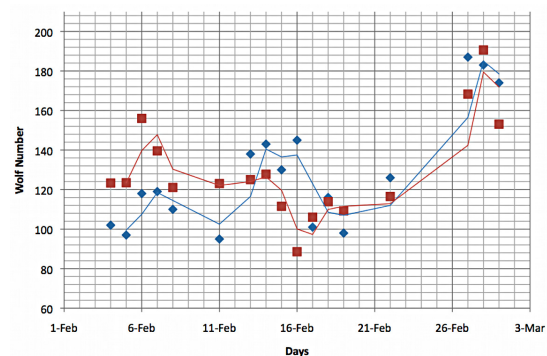


Figure 4. Graph comparing personal (squares) and AAVSO (diamonds) sunspot data

Figure 4 compares the trend between the two sets of data. As noticed, the two trends are closely correlated to each other, in a way that they almost follow the same trend orientation. Despite the scarcity of data, especially on the part of the researcher, the resultant graph was able to give us an idea about the recent behavior of the Sun through sunspots, though it may not meet its accuracy. The researcher's values are much lower than the AAVSO's values at the beginning but it almost matches towards the end of the month. Both trend lines peaked near the end of the month. This indicates that the Sun was very active February 26 to 28, where there are many sunspot groups and spots observed. One main difference is on the dates when the minimum and maximum values were recorded.

From this study, I found that the sunspot activity for February 2014 was very dynamic, especially during the end of the month, and quite less so at the beginning. There was constancy in the occurrence of sunspots, though several variations were observed. The recorded relative sunspot numbers range from 90s to near 200s—which are of high value. This clearly signifies that our parent star was active this February, experiencing much concentrated magnetic activity resulting in numerous solar phenomena.

My Wolf Numbers show a larger increase in the trend (slope) line for those days in February where sunspots were counted and matched to the AAVSO average Wolf Numbers. This is likely due to being new to sunspot counting methods, and also perhaps due to the large size of the Dobsonian telescope being used.

Seeing conditions may also help explain the difference in slope lines for those early days in February where the sunspot numbers are lower (Poor, Fair seeing) than the high sunspot counts (Good, Excellent seeing), toward the end of February. It would take over 100 days of observations before the researcher's sunspot counts would begin to match more closely those of the AAVSO visual observations of 41 experienced observers.

The researcher suggests further investigation regarding the solar activity for the mentioned month using other means of available scientific data such as solar magnetic flux, solar wind velocity, and so on.

*Ed. note: for more information on this topic read Carl Feeher's piece "Dances with Wolves: A Short History of Sunspot Indices" on the AAVSO website at: <http://www.aavso.org/dances-wolfs-short-history-sunspot-indices> ★*

## LOOKING AT LEGACY STARS

### STARS OBSERVED RECENTLY AND RECOMMENDATIONS FOR THE NEXT FEW MONTHS

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

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

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

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

Top seventeen best-covered stars of the LPV Legacy program, as measured by number of nights observed, 2013 December 16 through 2014 March 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	$N_{(vo)}$	$N_{(von)}$	$N_{(co)}$	$N_{(con)}$
W Cas	Cas	00:54:53.85	+58:33:49.2	27	54	6	14
U Per	Per	01:59:35.1	+54:49:19.9	11	33	3	14
R Tri	Tri	02:37:02.33	+34:15:51.4	41	70	2	9
X Cam	Cam	04:45:42.18	+75:06:03.4	15	37	2	17
R Aur	Aur	05:17:17.69	+53:35:10.1	19	46	6	21
alf Ori	Ori	05:55:10.3	+07:24:25.4	61	81	3	17
U Ori	Ori	05:55:49.16	+20:10:30.6	55	68	5	18
X Aur	Aur	06:12:13.38	+50:13:40.4	17	48	6	22
eta Gem	Gem	06:14:52.66	+22:30:24.5	45	79	2	5
R Gem	Gem	07:07:21.27	+22:42:12.7	37	67	7	17
R Leo	Leo	09:47:33.48	+11:25:43.7	78	82	1	1
Z UMa	UMa	11:56:30.22	+57:52:17.6	59	84	2	2
S UMa	UMa	12:43:56.67	+61:05:35.4	45	72	1	2
CH Cyg	Cyg	19:24:33.06	+50:14:29	41	67	3	14
T Cep	Cep	21:09:31.78	+68:29:27.1	53	79	1	7
V Cas	Cas	23:11:40.72	+59:41:58.9	31	50	3	18
rho Cas	Cas	23:54:23.03	+57:29:57.8	35	61	3	28

$N_{(vo)}$  = 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

Eleven least-observed stars of the LPV Legacy program during the quarter 2013 December 16 through 2014 March 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	$N_{(vo)}$	$N_{(von)}$	$N_{(co)}$	$N_{(con)}$
W Per	Per	02:50:37.89	+56:59:00.3	7	11	1	1
SS Vir	Vir	12:25:14.4	+00:46:10.9	8	14	2	2
V CrB	CrB	15:49:31.31	+39:34:17.9	6	14	2	5
R Ser	Ser	15:50:41.73	+15:08:01.1	3	6	2	5
RU Her	Her	16:10:14.52	+25:04:14.3	6	14	2	3
W Her	Her	16:35:12.31	+37:20:43	4	7	2	5
alf Her	Her	17:14:38.85	+14:23:25.1	3	7	0	0
X Oph	Oph	18:38:21.12	+08:50:02.7	9	20	0	0
S Aql	Aql	20:11:37.47	+15:37:14.5	5	12	0	0
S Del	Del	20:43:04.87	+17:05:17.3	7	14	0	0
R Vul	Vul	21:04:22.5	+23:49:18	5	20	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.

Top seventeen best-covered stars of the CV Legacy program, as measured by number of observers and nights observed, 2013 December 16 through 2014 March 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	$N_{(vo)}$	$N_{(von)}$	$N_{(co)}$	$N_{(con)}$
RX And	And	01:04:35.52	+41:17:57.8	41	78	10	66
KT Per	Per	01:37:08.51	+50:57:20.4	14	61	6	25
TZ Per	Per	02:13:50.94	+58:22:52.7	19	67	11	73
GK Per	Per	03:31:12	+43:54:15.4	31	76	9	51
CN Ori	Ori	05:52:07.79	-05:25:00.5	17	64	5	20
SS Aur	Aur	06:13:22.47	+47:44:25.6	38	77	6	16
BX Pup	Pup	07:54:15.55	-24:19:36.3	3	5	4	81
U Gem	Gem	07:55:05.21	+22:00:04.7	36	72	15	51
YZ Cnc	Cnc	08:10:56.63	+28:08:33.2	13	54	5	39
Z Cam	Cam	08:25:13.18	+73:06:39	41	86	6	31
AT Cnc	Cnc	08:28:36.89	+25:20:02.9	10	48	9	64
SY Cnc	Cnc	09:01:03.31	+17:53:56	19	49	6	47
AL Com	Com	12:32:25.9	+14:20:43.5	4	17	6	40
TX CVn	CVn	12:44:42.05	+36:45:50.6	6	17	5	61
T CrB	CrB	15:59:30.16	+25:55:12.6	23	62	4	14
CH Cyg	Cyg	19:24:33.06	+50:14:29.1	41	67	3	14
SS Cyg	Cyg	21:42:42.78	+43:35:09.8	67	77	7	26

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LEGACY STARS  
CONTINUED...

Stars in CV Legacy list with no visual or CCD observations during the quarter 2013 December 16 through 2014 March 15:

Name	Con	R.A.(J2000)	Dec.(J2000)	N(vo)	N(von)	N(co)	N(con)
EK TrA	TrA	15:14:00.43	-65:05:35.5	0	0	0	0
FQ Sco	Sco	17:08:04.45	-32:42:02	0	0	0	0
V2051 Oph	Oph	17:08:19.11	-25:48:30.3	0	0	0	0
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
V0618 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
V0533 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
V0443 Her	Her	18:22:07.85	+23:27:20	0	0	0	0
V0441 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
V0446 Her	Her	18:57:21.59	+13:14:29	0	0	0	0
FO Aql	Aql	19:16:38.11	+00:07:37.4	0	0	0	0
PW Vul	Vul	19:26:05.04	+27:21:57.7	0	0	0	0
DH Aql	Aql	19:26:10.81	-10:15:28.9	0	0	0	0
NQ Vul	Vul	19:29:14.75	+20:27:59.7	0	0	0	0
LV Vul	Vul	19:48:00.7	+27:10:19.5	0	0	0	0
V0725 Aql	Aql	19:56:45.03	+10:49:32.6	0	0	0	0
UU Aql	Aql	19:57:18.6	-09:19:19.8	0	0	0	0
V0476 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
VZ Aqr	Aqr	21:30:24.59	-02:59:17	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. ★

PHOTOELECTRIC PHOTOMETRY PROGRAM UPDATE  
MATTHEW TEMPLETON (TMT), AAVSO SCIENCE DIRECTOR

The first quarter of 2014 starting January 1 showed a decline in the number of PEP observations submitted over previous quarters. Given the difficult winter that we've had in much of the United States, this isn't too surprising. Although the overall number of observations is lower—only 112 observations of 33 stars—AAVSO PEP observers collected data on several interesting stars.

Gerald Persha (PGD) once again gets the nod for the quarter as the most prolific observer, with 42 observations in infrared J- and H-band filters. He made a number of observations of Betelgeuse (alpha Ori), and delta and epsilon Orionis. Our PEP Section leader Jim Fox (FXJ) was a close second with 41 observations (35 in V, 6 in B) of a number of different stars. They were followed by Patrick Rochford (RPT) with 17 V-band measures; Jim Kay (KJMB) with 2 measures in each of the V, J, and H bands; Tom Calderwood (CTOA) with three V-band measures; John Martin (UIS01) with one measure in B- and V-bands; and Charles Calia (CCB) with one V-band observation.

The three variables in Orion were the most observed this quarter, with Betelgeuse getting 35 observations, delta Ori 12, and epsilon Ori 7. Other variables observed more than twice were: RR Eri (6 observations), IS Gem (4), EG And (4), V442 And (4), RZ Ari (3), X Per (3), and BC CMi (3). Stars observed twice were: XZ Psc, eta Gem, BQ Gem, V1142 Tau, NZ Gem, R Leo, CH Cyg, TX Psc, psi Per, and Z Eri. Now that Betelgeuse is heading into evening twilight, I'll recommend CH Cygni as a new suggested target, especially if you can observe in B and V filters. Dr. Margarita Karovska of the Harvard-Smithsonian Center for Astrophysics is still very interested in obtaining multi-filter data for this interesting symbiotic star. PEP observers' data have been very useful for providing a calibration standard for all other data since PEP data have been transformed to the Johnson-Cousins standard system. Please consider adding CH Cyg to your observing schedule once it comes around again toward the end of this quarter (or right now if you're a very, very early riser).

A note about AAVSO PEP Program stars: the original list of targets was established so that observers could make single-filter (V-band) measures of a short, focused list of stars, enabling both easy reduction by the PEP chair and easier analysis by researchers trying to combine data from multiple users. This list still exists, and observers can still use the AAVSO's PEPObs web tool to submit single filter data. If you're a novice with PEP and looking to start contributing, this is the place to look for targets:

<http://www.aavso.org/suggested-stars-pep-observers>

That said, we very strongly encourage observers with multiple filters to give them a try, and to explore new targets of interest to them. Our only request is that if you make PEP observations, you (a) transform them to a standard system of your filter set, and (b) use reliable comparison star magnitudes where available. For the latter, we have used data from the *General Catalogue of Photometric Data* (Mermilliod and Mermilliod) in the past, and some bright star comparison data may be available from the AAVSO's own Bright Star Monitor as well. If you have multiple filters available but need pointers on doing data reductions or finding good comparison star magnitudes, you're welcome to contact PEP chair Jim Fox (makalii45@gmail.com) or AAVSO headquarters.

To learn more about PEP observing and the AAVSO PEP program visit:

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

Clear skies! ★

## AAVSO OBSERVING CAMPAIGNS UPDATE

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

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

### *Campaigns concluded since January 1, 2014*

The large campaign on cataclysmic variables organized by Drs. Boris Gaensicke (Warwick University), Joseph Patterson (Columbia University, Center for Backyard Astrophysics), and Arne Henden (AAVSO), and the 13 other consortium members astronomers, including Drs. Ed Guinan, Knox Long, and Paula Szkody, was finally completed (*AAVSO Alert Notice 471* and *52 AAVSO Special Notices*). The 40th and final target on the campaign list, SDSS J100658.40+233724.4, was successfully observed by the HST Cosmic Origins Spectrograph on 20 March 2014. Dr. Gaensicke had said that there are two Ph.D. students working full-time on the data obtained throughout 2013, and on March 22 he wrote: “The observations of SDSS1006+2337 went well.

“This was the last star in this HST program, and I would like to sincerely thank all of you for the outstanding support you have provided!

“I met last week some of the people from STScI involved in the technical implementation of the HST observations, and they said it has been one of the most challenging programs they have done!

“Without your help, these HST observations would not have been possible. It has worked beautifully, with just one out of the 41 targets being kicked off the schedule for bad behaviour! But there were a few close calls, and a number of sleepless nights throughout the past 1 1/2 years...as such, I am not too sad we have reached the end of it.

“We have begun working on this fantastic data set, and will get back in touch with you later on some of the results we find.

“All the best, Boris”

More than 105 observers worldwide contributed over 30,000 visual and multicolor observations to this campaign. THANK YOU, EVERYONE!

### *Campaigns initiated since January 1, 2014*

The recurrent nova **V745 Sco = Nova Sco 1937** was discovered in outburst by Rod Stubbings (Tetoora Road, VIC, Australia) at visual magnitude 9.0 on 2014 February 6.694 UT. Previous outbursts were reported in 1937 and 1989. Please see p. 24 for information on current behavior and p. 15 for a light curve. AAVSO Nova Section advisor Dr. Jenő Sokolowski (Columbia University) has requested as much photometry and spectroscopy as possible for correlation with planned multiwavelength observations for V745 Sco. Dr. Sokolowski writes: “Outbursts of recurrent novae are relatively rare events. Each outburst is an opportunity to add to the study of the relationship between recurrent novae and the progenitors of Type-Ia supernovae, so the most complete coverage possible is important.”

Dr. Bradley Schaefer (Louisiana State University) suggests that fast time-series of this nova may be useful to detect possible flaring activity as was observed during the outburst of U Sco in 2010. He suggests that coincident time-series by multiple observers would be most useful for such a study, with a V-filter being preferred. (*AAVSO Alert Notice 496*)

The bright supernova **SN 2014J = PSN J09554214+6940260** in the galaxy NGC 3034 = M82 was discovered at R magnitude 10.5 R and 11.7 V on 2014 Jan. 21 UT by Stephen J. Fossey (University of London Observatory, University College, London), assisted by students B. Cooke, G. Pollack, M. Wilde, and T. Wright. Spectra showed SN 2014J to be a reddened young Type-Ia supernova discovered before maximum. Please see p. 24 for information on current behavior and a light curve. In addition to photometric follow-up of this supernova by our visual and instrumental observers, Dr. Bradley Schaefer (Louisiana State University) requested rapid V-band time-series for an exploratory search for possible flares or other short-term photometric variations during the outburst. (*AAVSO Alert Notice 495*)

### *Campaigns in progress*

With March behind us, Taurus’ and Orion’s days are winding down for a while and Centaurus and Cygnus are coming into view again. There are several campaigns on stars in Taurus and Orion that need to be covered until those constellations are gone from evening twilight. Similarly, there are campaigns that need to be picked up as soon as their constellations become observable in morning twilight.

The campaign that was started (*AAVSO Alert Notice 493*) to observe the classical T Tauri star **BP Tau** at the request of Dr. Hans Moritz Guenther (Harvard-Smithsonian Center for Astrophysics) continues. Dr. Guenther is studying the accretion processes underway in this star and is observing with Chandra. The satellite observations will be carried out in several segments, and coverage of this ~11–13 magnitude star is requested at least until the end of the observing season. To date, 47 observers have contributed 7,653 visual and multicolor observations. He writes: “...BP Tau is a classical T Tauri star...surrounded by a thick accretion disk. Material is falling from the accretion disk onto that star and we want to study this accretion shock and its interaction with the other layers of the star... We need optical light curves...so that we can see the rotational modulation and the average fluctuation in the light curve. For this we ask for the help of the AAVSO....”

Dr. Guenther’s other campaign—on the classical T Tauri star **AA Tau**—officially ran 2013 August 1 through September 20 in order to determine the behavior of AA Tau for scheduling XMM-Newton observations (*AAVSO Alert Notice 488*). However, continuation of monitoring was requested to help track the star’s behavior, which has changed completely from its decades-long pattern. To date, 14 observers have contributed 602 visual and multicolor observations. Please continue your snapshot CCD and visual observations of AA Tau through the remainder of the observing season.

Darryl Sergison’s (University of Exeter) campaign to study the environments of T Tauri stars (*AAVSO Alert Notices 494*, preliminary campaign announced in *AAVSO Alert Notice 473*) continues. The revised targets for now through the end of the observing season (for good follow-up coverage) are **BP Tau**, **DN Tau**, **FK2**, **V1068 Tau (LkCa4)**, and **V1264 Tau**.

## CAMPAIGNS UPDATE CONTINUED...

Dr. William Herbst (Wesleyan University) and Rachel Pederson's (Bates College) request for optical monitoring (nightly snapshot CCD and visual observations) of the Orion variable **T Ori** (*AAVSO Alert Notice 490*) continues through the observing season. Dr. Herbst is grateful for observers' coverage of T Ori in this study of the star's variability of several magnitudes, the cause of which is still not fully understood. To date, 45 observers have contributed 1,930 visual and multicolor observations.

The campaign organized by Huan Meng and Dr. George Rieke (University of Arizona) and begun in April to study dust production in developing planetary systems continues until the end of the observing season on the 7th and 9th magnitude V stars **BD+20 307**, **HD 15407A**, and **HD 23514** (*AAVSO Alert Notice 482*). The comparison star for HD 15407A has been changed from the 96 in the field of HD 15407A to a 95 (AUID 000-BKY-169) and a 102 (AUID 000-BKY-171) in the field. Please use these stars as comparisons for HD 15407A. **Do not use the 96.** Please see *AAVSO Special Notice #373* for details.

Dr. Noel Richardson's multiwavelength campaign on the Luminous Blue Variable prototype **S Dor** continues at least through the 2013–2014 observing season (*AAVSO Alert Notice 453*, *AAVSO Special Notices #280* and *#293*, and S Doradus Telegram on organizer's website). Please continue your coverage of this interesting variable, which is best observed instrumentally.

Dr. Eric Mamajek's campaign on **J1407 (ISWASP J140747.93-394542.6)** (*AAVSO Alert Notice 462*) has been extended through 2014. He writes: "We are awaiting the next eclipse.... Thus far there is no sign of eclipse in the 2012 or 2013 data.... This introduces the interesting possibility that the 2001 dip was from another body in the J1407 system." Since that was written in June, AAVSO observers have continued to provide excellent coverage and no eclipse has been observed, so please continue your observations—they are extremely important in helping to solve the puzzle of this interesting and possibly complex system (*AAVSO Alert Notice 462*). Three observers have contributed 1,240 multicolor observations to date.

Dr. Margarita Karovska's HST and Chandra campaign on **CH Cyg** (*AAVSO Alert Notice 454* and *AAVSO Special Notices #267*, *294*, and *320*) continues and has been extended through the 2014 observing season at least. Dr. Karovska, who is extremely grateful for the wonderful coverage, pleads for observers to continue, especially in V and B. The V and B data are crucial for detecting certain significant system changes key to her research. Since this campaign began in March 2012, 179 observers have contributed 18,316 visual and multicolor observations!

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

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

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

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

### *Novae and a Supernova*

2014 is off to a hectic start event-wise, with four new novae, one recurrent nova, and a bright Type-Ia supernova in three months! If that weren't enough, the two bright novae from the previous months, V339 Del and V1369 Cen, continue to be bright even as they fade.

**Nova Sagittarii 2014 = PNV J18250860-2236024** was discovered by Sigeru Furuyama (Tone-machi, Ibaraki-ken, Japan) at unfiltered CCD magnitude 8.7 on 2014 Jan. 26.857 UT. Low-resolution spectra obtained by A. Arai (Nishi-Harima Astronomical Observatory, University of Hyogo, Japan) indicate that Nova Sgr 2014 is a Fe II-type classical nova past maximum. (*AAVSO Alert Notice 497*) The light curve of this nova is very interesting, with oscillations of about a magnitude continuing (Figure 1). As of April 2.4130 UT, Nova Sco 2014 is 10.527V (HMB, J. Hamsch, Mol, Belgium).

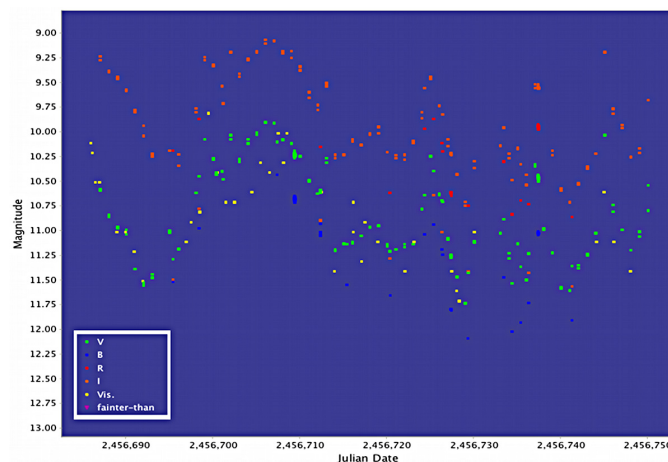


Figure 1. AAVSO light curve of Nova Sgr 2014 JD 2456685.8264–2456749.91324 (28 January–2 April 2014). 11 AAVSO observers worldwide have contributed 549 observations to this light curve.

**Nova Cephei 2014 = TCP J20542386+6017077** was discovered by Koichi Nishiyama (Kurume, Japan) and Fujio Kabashima (Miyaki, Japan) at unfiltered CCD magnitude 11.7 on 2014 Mar. 8.792 UT. Spectra obtained by U. Munari (INAF Astronomical Observatory of Padova) et al. indicate Nova Cep 2014 is a highly reddened Fe II-type classical nova near maximum. (*AAVSO Alert Notice 498*) Although Nova Cep 2014 and Nova Sgr 2014 are both classical novae, their light curves are interestingly different (Figure 2, on next page). Visual and V magnitudes have been tracking each other closely, and as of March 31.4222 UT Nova Cep 2014 is visual magnitude 12.7 (SLH, L. Shotter, Uniontown, Pennsylvania).

**Nova Scorpii 2014 = TCP J17154683-3128303** was discovered by Koichi Nishiyama (Kurume, Japan) and Fujio Kabashima (Miyaki, Japan) at unfiltered CCD magnitude 10.1 on 2014 Mar. 26.849 UT (*AAVSO Special Notice #383*, *AAVSO Alert Notice 500*). Optical, infrared, and X-ray spectra show Nova Sco 2014 to be a symbiotic nova and very interesting. Nova Sco has been declining quite fast, and as of April 1.4154 UT it is 13.052 V (HMB, J. Hamsch, Mol, Belgium).

CAMPAIGNS UPDATE  
CONTINUED...

**Nova Cygni 2014 = PNV J20214234+3103296** was also discovered by Koichi Nishiyama (Kurume, Japan) and Fujio Kabashima (Miyaki, Japan). They found it at unfiltered CCD magnitude 10.9 on 2014 Mar. 31.970 UT (*AAVSO Alert Notice 500*). Spectra from several sources all indicate a highly reddened classical Fe II-type nova discovered around maximum. As of April 2.4 UT, it is visual magnitude 10.9 (KMA, M. Komorous, London, ONT, Canada).

The recurrent nova **V745 Sco = Nova Sco 1937** was discovered in outburst by Rod Stubbings (Tetoora Road, VIC, Australia) at visual magnitude 9.0 on 2014 February 6.694 UT. Previous outbursts were reported in 1937 and 1989. V745 Sco has been fading quickly and the most recent positive V observation is  $17.10 V \pm 0.15$  on March 20.740 2014 (OCN, S. O'Connor, St. George's, Bermuda). His observations show a large infrared excess (he estimates  $V-I_c = 3.5$ ), as do extensive VRI photometry by J. Hamsch. Please see p. 22 for information on an observing campaign on V745 Sco.

The bright supernova **SN 2014J = PSN J09554214+6940260** in the galaxy NGC 3034 = M82 was discovered by Stephen J. Fossey (University of London Observatory, University College, London), assisted by students B. Cooke, G. Pollack, M. Wilde, and T. Wright, at R magnitude 10.5 on 2014 Jan. 21.805 UT; he also reported it at V magnitude 11.7 on Jan. 21.818. Spectra by Y. Cao (Caltech) et al. showed SN 2014J to be a reddened young Type-Ia supernova discovered before maximum. SN 2014J is  $12.822 V$  as of April 2.076 UT (CABB, A. Clevenson, Hymble, TX). Please see p. 22 under Campaigns Initiated for information on an observing campaign on SN 2014J (Figure 3). (*AAVSO Alert Notice 495*)

**V1369 Cen = Nova Centauri 2013 = PNV J13544700-5909080**, discovered by John Seach on 2013 December 2 at unfiltered magnitude 5.5, continues to decline slowly and also continues to be very interesting (Figure 4). As of April 2.85 UT it is visual magnitude 7.5 (BLD, D. Blane, Henly-on-Klip, South Africa).

**V339 Del = Nova Delphini 2013 = PNV J20233073+2046041**, discovered by Koichi Itagaki on 2013 August 14 (*AAVSO Alert Notice 489*) and reported in the October 2013 *AAVSO Newsletter*, continues to be of great interest. This very fast classical nova (class NA) peaked at visual magnitude 4.3 and is continuing to fade, most recently at  $11.694 V \pm 0.01$  on 2014 April 1.4192 UT (HMB, J. Hamsch, Mol, Belgium). 522 observers worldwide have contributed 67,196 multicolor observations to date!

2014 looks to be another active year with many opportunities for you to contribute—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! ★

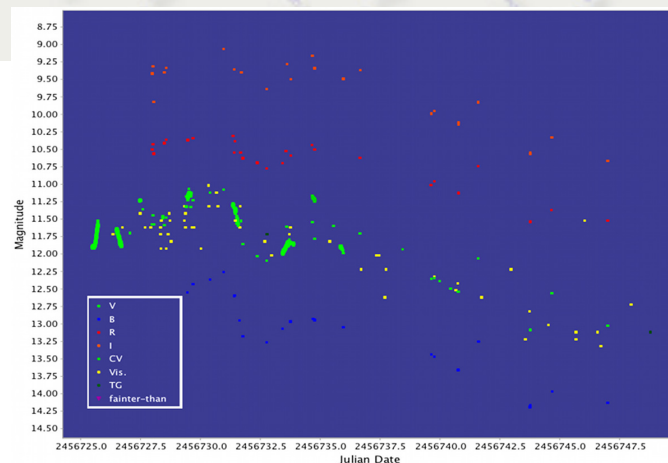


Figure 2. AAVSO light curve of Nova Cep 2014 JD 2456725.42169–2456747.92222 (8–31 March 2014). 11 AAVSO observers worldwide have contributed 1,293 observations to this light curve.

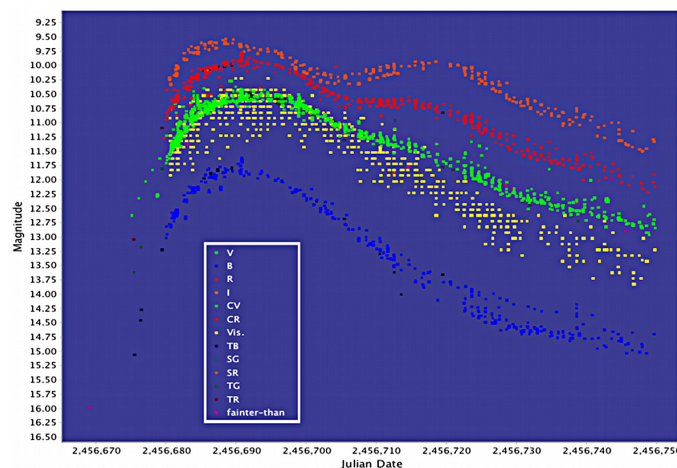


Figure 3. AAVSO light curve of SN 2014J JD 2456669.169979–2456749.576238 (11 January–2 April 2014). 233 AAVSO observers worldwide have contributed 18,179 observations to this light curve.

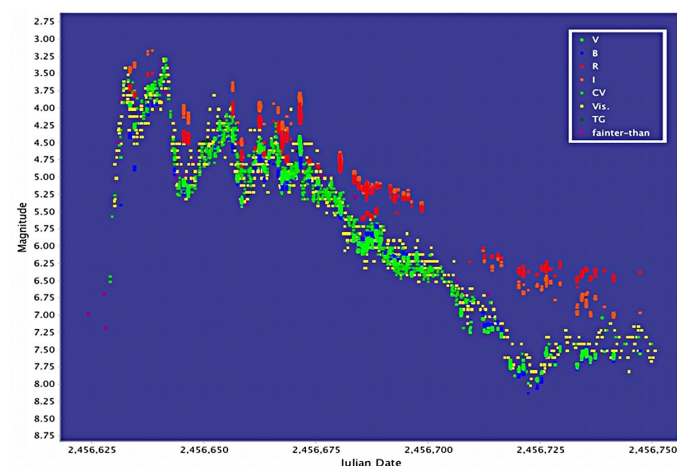


Figure 4. AAVSO light curve of V1369 Cen JD 2456624.30278–2456750.35069 (2 November 2013–2 April 2014). 69 AAVSO observers worldwide have contributed 8,423 observations to this light curve.



## JULIAN DATE / MOON PHASE CALENDARS

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

### APRIL 2014

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1 	2 	3 	4 	5 
6 	7 	8 	9 	10 	11 	12 
13 	14 	15 	16 	17 	18 	19 
20 	21 	22 	23 	24 	25 	26 
27 	28 	29 	30 			

### MAY 2014

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 	2 	3 
4 	5 	6 	7 	8 	9 	10 
11 	12 	13 	14 	15 	16 	17 
18 	19 	20 	21 	22 	23 	24 
25 	26 	27 	28 	29 	30 	31 

### JUNE 2014

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 	2 	3 	4 	5 	6 	7 
8 	9 	10 	11 	12 	13 	14 
15 	16 	17 	18 	19 	20 	21 
22 	23 	24 	25 	26 	27 	28 
29 	30 					

Moon calendars courtesy StarDate online

<http://stardate.org/nightsky/moon/>

## THE AAVSO MENTOR PROGRAM

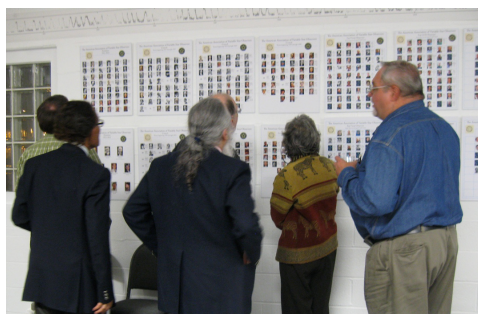
Since the earliest days of the AAVSO, experienced observers have helped new observers by corresponding, answering questions, and even providing personal guidance at the telescope.

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

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

Visit the AAVSO mentor program webpage:

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



## BY POPULAR DEMAND!

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

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

or use this link:

<http://tinyurl.com/cge9t9s>

## THE AAVSO WALTER A. FEIBELMAN SUITE

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

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



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

# JOIN THE AAVSO!

## AAVSO 2014 New Member Form

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

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

Date: \_\_\_\_\_  
 Full Name: \_\_\_\_\_  
 Full Address: \_\_\_\_\_  
 \_\_\_\_\_  
 Telephone 1: \_\_\_\_\_ Telephone 2: \_\_\_\_\_  
 E-Mail: \_\_\_\_\_  
 Birth Date: \_\_\_\_\_ Vocation: \_\_\_\_\_  
 Telescopic Equipment: \_\_\_\_\_  
 \_\_\_\_\_  
 Astronomical Experience (if any): \_\_\_\_\_  
 \_\_\_\_\_  
 How did you learn about the AAVSO? \_\_\_\_\_

### Types of Membership Offered and Dues

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

Membership is prorated through the end of the year, starting with the current month.

**All applicants also add a one-time, \$10.00 application fee.**

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

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

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

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

**Dues (see chart):** US \$ \_\_\_\_\_ **Application fee:** US \$ 10 \_\_\_\_\_

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

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

<b>Contributions (see last page for descriptions):</b>	
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: \_\_\_\_\_

# 2014 MEMBERSHIP RENEWAL

On this page is a copy of the AAVSO membership renewal form for 2014. You may also renew your membership online. Safe and secure online payments are possible by visiting <http://www.aavso.org/membership-renew>. If your postal or email address has changed, please also take a minute to update your personal profile online. Simply click "User login" at the upper right of the home page, then go to "My account." In addition to your dues, your contributions to the AAVSO further support the organization's activities and are very much appreciated. Also, on the next page you will find descriptions of the various funds to which you may contribute. *Developing countries EXCLUDE Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, the Korean Republic, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, the United States.*



**AAVSO**  
**Membership and Subscriptions**  
**49 Bay State Rd**

*Address service requested*

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: \_\_\_\_\_

### 2014 Membership Dues Renewal Form

#### Membership Type *(please check one)*

Annual \$75     Sustaining \$150

Associate (under 21) \$37.50

Pension/Limited Income \$37.50

Developing Country \$25

#### Contributions *(see next page for descriptions)*

AAVSO Building Fund \$ \_\_\_\_\_

Janet A. Mattei Research Fellowship \$ \_\_\_\_\_

Margaret Mayall Assistantship \$ \_\_\_\_\_

Solar Fund \$ \_\_\_\_\_

AAVSONet Fund \$ \_\_\_\_\_

Member Sponsorship Fund \$ \_\_\_\_\_

AAVSO General Fund \$ \_\_\_\_\_

The Endowment Fund \$ \_\_\_\_\_

Contributor-Specified Restricted Funds \$ \_\_\_\_\_

**TOTAL ENCLOSED** \$ \_\_\_\_\_

# SUPPORT THE AAVSO

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

## AAVSO Funds

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

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

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

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

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

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

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

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

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

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

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

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

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

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