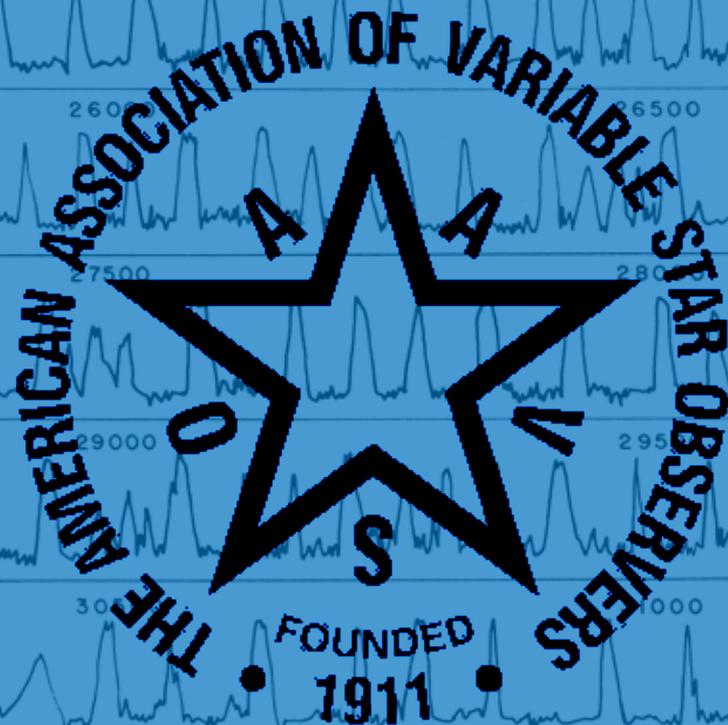


# AAVSO



## The American Association of Variable Star Observers



## Annual Report 2011-2012



# The American Association of Variable Star Observers

AAVSO

Annual Report  
2011–2012



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<http://www.aavso.org/aavso/annualreports.shtml>

### ***On the cover...***

*Scenes from the 101st Annual Meeting of the AAVSO include (from top left): Dr. Margarita Karovska of the Harvard-Smithsonian Center for Astrophysics, and a longtime AAVSO member; AAVSO President Mario Motta and Secretary Gary Walker; members Roger Kolman and Doug Welch; and members gathered for the group photo at the Annual Meeting.*

### ***Picture credits***

*In addition to images from the AAVSO and its archives, the editors gratefully acknowledge the following for their image contributions: Glenn Chaple, Shawn Dvorak, Mary Glennon, Bill Goff, Barbara Harris, Mario Motta, NASA, Gary Poyner, Msgr. Ronald Royer, the Mary Lea Shane Archives of the Lick Observatory, Chris Stephan, and Wheatley, et al. 2003, MNRAS, 345, 49.*

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# 1. About the AAVSO



*Participants in the AAVSO's 101st Annual Meeting, 2012*

## AAVSO Vision

Discovering the Universe through variable stars.

## The AAVSO's Mission

The AAVSO is an international non-profit organization of variable star observers whose mission is to enable anyone, anywhere, to participate in scientific discovery through variable star astronomy. We accomplish our mission by carrying out the following activities:

- observation and analysis of variable stars
- collecting and archiving observations for worldwide access
- forging strong collaborations between amateur and professional astronomers
- promoting scientific research, education, and public outreach using variable star data.

## About the AAVSO

The American Association of Variable Star Observers (AAVSO) is a non-profit worldwide scientific and educational organization of amateur and professional astronomers who are interested in stars that change in brightness—variable stars.

The AAVSO was founded in 1911 to coordinate variable star observations—made largely by amateur astronomers—for Harvard College Observatory. The AAVSO was incorporated in the Commonwealth of Massachusetts in 1918 as a non-profit scientific and educational organization. Today, as an independent, private research organization headquartered in Cambridge, Massachusetts, with active participants in 108 countries, and an archive of over 22 million variable star observations, it is the world's largest association of variable star observers.

Membership in the AAVSO is open to anyone—professionals, amateurs, and educators alike—interested in variable stars and in contributing to the support of valuable research.

## 1. About the AAVSO

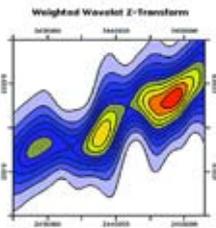
Professional astronomers have neither the time nor the telescopes needed to gather data on the brightness changes of thousands of variables, and amateurs make a real and useful contribution to science by observing variable stars and submitting their observations to the AAVSO International Database.

### What We Do

The AAVSO coordinates, evaluates, compiles, processes, publishes, and disseminates variable star observations to the astronomical community throughout the world.



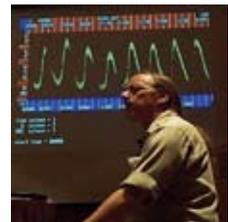
Observers send their data to Headquarters, where they are checked, processed, and added to the AAVSO International Database. The AAVSO and its observers frequently provide the professional community with archival data, intensive monitoring of interesting variable stars, and target-of-opportunity event notification for coordinated observing campaigns and satellite observations.



AAVSO publications provide the astronomical community with valuable information. The type of published information is diverse, and includes *The Journal of the AAVSO*, a peer-reviewed collection of scientific papers focused on variable stars, the *Manual for Visual Observing*, now available in eight languages, the *CCD Observing Manual*, the quarterly *AAVSO Newsletter*, the *Eclipsing Binary and RR Lyrae Ephemerides*, and the *AAVSO Annual Report*.

Additionally, the AAVSO is actively involved in education and outreach. We have several programs designed to assist with disseminating information to educators and the public.

The AAVSO has an active Mentor Program that is available to any observer requesting personal instruction in observing techniques and methods.



The Speakers Bureau is a service established for people and groups looking for enthusiastic, knowledgeable speakers.

Our Presentation Library offers free POWERPOINT™ presentations on variable stars, observing techniques, and other astronomical topics.

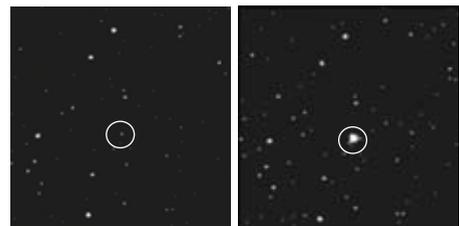
Our Writers Bureau offers variable star and topical astronomy content on a monthly basis to editors of astronomy club and society newsletters.

*Variable Star Astronomy (VSA)* is a flexible set of hands-on educational materials, activities, and investigations, based on the AAVSO's unique electronic database of variable star measurements.

Members and observers have a unique opportunity to present and exchange ideas at the AAVSO meetings. The AAVSO organizes two meetings a year, one in the fall and one in the spring. The fall meeting is the official AAVSO annual meeting that is always held at or near the AAVSO Headquarters in Cambridge, Massachusetts. The spring meeting is held outside of the state of Massachusetts with the intention of attracting more members and observers to attend. Everyone interested in the AAVSO and its activities is invited and encouraged to participate in these exciting events.

### What Are Variable Stars?

Variable stars are stars that change brightness. The brightness changes of these stars can range from a thousandth of a magnitude to as much as twenty magnitudes over periods of a fraction of a second to years, depending on the type of variable star. Over 150,000 variable stars are known and catalogued, and many thousands more are suspected to be variable.



*The variable star U Geminorum in its faint state (left) and its bright state (right)*

There are a number of reasons why variable stars change their brightness. Pulsating variables, for example, swell and shrink due to internal forces. An eclipsing binary will dim when it is eclipsed by a faint companion, and then brighten when the occulting star moves out of the way. Some variable stars are actually extremely close pairs of stars, exchanging mass as one star strips the atmosphere from the other.

The different causes of light variation in variable stars provide the impetus for classifying the stars into different categories. Variable stars are classified as either intrinsic, wherein variability is caused by physical changes such as pulsation or eruption in the star or stellar system, or extrinsic, wherein variability is caused by the eclipse of one star by another, the transit of an extrasolar planet, or by the effects of stellar rotation.

### Why Observe Variable Stars?

Variable stars need to be systematically observed over decades in order to determine their long-time behavior. Professional astronomers have neither the available time nor the

## 1. About the AAVSO

unlimited telescope access needed to gather data on the brightness changes of thousands of variable stars. Thus, it is amateur astronomers utilizing visual, photographic, photoelectric, and CCD techniques who are making a real and highly useful contribution to science by observing variable stars and submitting their observations to the AAVSO International Database. These important data are needed to analyze variable star behavior, to schedule satellite observations of certain stars, to correlate data from satellite and ground-based observations, and to make computerized theoretical models of variable stars possible.

Research on variable stars is important because it provides information about stellar properties, such as mass, radius, luminosity, temperature, internal and external structure, composition, and evolution. Some of this information would be difficult or impossible to obtain any other way. In many cases, it is the nature of the variability that provides the clues to the answers. This information can then be used to understand other stars.

Variable stars continue to play a crucial role in our understanding of the universe. Cepheid variables have played a major part in determining distances to far-away galaxies and determining the age of the Universe. Mira variables give us a glimpse into the future evolution of our own star, the Sun. Accretion disks in cataclysmic variables help us to understand larger scale disk behavior, like the activity inside active galaxies with super-massive black holes. Supernovae have led us to the surprising realization that the expansion of the Universe is accelerating. Even the search for extra-terrestrial life is illuminated by variable stars. Transiting extrasolar planets provide clues into the processes of planetary formation, and the very stuff of life as we know it is made of comes from the hearts of stars that explode in the final stages of their evolution.

### **The AAVSO International Database**

The AAVSO International Database has over 22 million variable star observations going back over one hundred years. It is the largest and most comprehensive digital variable star database in the world. Over 1,000,000 new variable star brightness measurements are added to the database every year by over 700 observers from all over the world.

#### *Quality*

The AAVSO International Database is not only the largest but also the highest quality database available to researchers. The AAVSO and its technical staff spend more time and resources on database maintenance and quality control than any other organization of its kind.

Quality control begins before the observation is even made. Extensive training materials are sent to new AAVSO observers and a large section of the AAVSO website is designed

specifically for observing techniques. We also have a thriving group of volunteers devoted to revising and developing new sequences for variable stars. The AAVSO holds two meetings per year where members come together to discuss their observing strategies, compare results, and much more. Workshops are routinely held at these meetings, bringing the best professionals in the field in contact with the observers. Since 2000, workshops have been held on CCD imaging, Eclipsing Binary star observing, GRB afterglow hunting, data mining, and data analysis. The AAVSO also has an active mentoring program for new observers.

We have data entry error checks at every stage in the process. Whether the observer is using WebObs, PCObs, or sending their data in via e-mail, we have error checking routines running to automatically identify the most common data entry errors. In addition, every month we comb through all the observations using both human scrutiny and automated programs to look for misidentifications, typos, and any other errors. The best check, however, is the observers themselves who check their own submitted data by using the many tools the AAVSO makes available: Light Curve Generator, QuickLook, and our Zapper application which lets volunteers highlight questionable observations and bring them to the attention of AAVSO staff. All revisions to the database are themselves tracked, and no observation is ever discarded without thorough checking.

### **Observers**

The AAVSO International Database would not exist without the dedication, tireless effort, and enthusiasm of thousands of variable star observers. Our observers come from all over the world. Over two-thirds of AAVSO observers contributing data come from outside of the United States.

Thanks to this broad network of observers we have coverage across most time zones and latitudes regardless of weather or other regional disruptions.

To make it easier for the widely-scattered AAVSO members and observers to gather together in person, the AAVSO meetings held every spring or summer take place in different parts of the United States or, as often as possible, in different countries.

The AAVSO receives observations from members of other variable star observing associations around the world for inclusion in the AAVSO International Database and dissemination to the astronomical



*Mary Glennon, AAVSO member-observer since 1999*

## 1. About the AAVSO

community worldwide. These observations are sent regularly by the group leader/representative or directly by the group members themselves. The AAVSO values these fruitful, mutually beneficial collaborations, and truly appreciates the ongoing efforts of everyone involved in working together for the benefit of the astronomical community.

### **Access**

Observations from the database are available to anyone at anytime, a free resource for the global scientific community. For raw observations, simply fill out our online request form. For access to light curves, use our Light Curve Generator which works in all browsers (you do not need JAVA or any special plug-ins), and for really quick access to recent data, use the QuickLook utility on our website. Our online systems are instantly updated every time data are submitted to the AAVSO.

### **Observing Variable Stars**

Astronomy is a unique science that cannot be studied in a typical laboratory setting here on earth. Instead, astronomers turn their attention and telescopes to the sky in order to study their subjects. Since professional astronomers often do not have the telescope time needed to follow a particular star or group of stars, the dedication of amateur astronomers is often an invaluable means of collecting information. Nowhere is this more true than in the field of variable star astronomy. Since 1911, thousands of amateur astronomers from all over the world and from all backgrounds have contributed observations, one at a time, to make up the over 22 million data points housed in the AAVSO International Database!

Anyone can be a variable star observer. All you really need to begin observing are:

- your unaided eyes, a pair of binoculars, or a telescope
- some variable star charts to help you navigate your way through the sky
- some basic instructions
- a little patience

For those interested in observing activity on our closest star, the Sun, or a particular type of variable, such as the Eclipsing Binary or RR Lyrae type stars, or if hunting for novae, supernovae, or optical counterparts to energetic Gamma-Ray Bursts strikes your fancy, we have observing programs designed to help satisfy your appetite.

The AAVSO Mentor Program is available to all observers to assist newcomers in the methods and techniques of visual variable star observation, as well as CCD, PEP, and DSLR observation.



*Msgr. Ron Royer, AAVSO member  
observer since 1953*

### Services to Astronomy

The AAVSO provides a wide range of services to the astronomical community. AAVSO International Database data are disseminated extensively to astronomers around the world, upon request, and are freely available from the AAVSO website. AAVSO data and services have been used, referenced, and acknowledged in hundreds of professional astronomical publications.



*Mario Motta, M.D., AAVSO President, and an AAVSO member-observer since 1985, at his 32-inch telescope in Gloucester, Mass.*

### Services to Astronomers

AAVSO services are sought by astronomers for the following purposes:

- real-time, up-to-date information on unusual stellar activity
- scheduling of variable star observing programs coordinating earth-based large telescopes and instruments aboard satellites
- simultaneous optical observations of program stars and immediate notification of their activity during earth-based or satellite observing programs
- correlation of AAVSO optical data with spectroscopic, photometric, and polarimetric multi-wavelength data
- collaborative statistical analysis of stellar behavior using long-term AAVSO data

Collaboration between the AAVSO and professional astronomers for real-time information or simultaneous optical observations has enabled the successful execution of hundreds of observing programs using satellites such as:

- Hubble Space Telescope
- Chandra X-Ray Observatory
- Spitzer Space Telescope
- XMM-Newton X-Ray Observatory
- Extreme Ultraviolet Explorer
- High Energy Astronomical Observatories 1 and 2
- International Ultraviolet Explorer
- Roentgen Satellite
- European X-Ray Observatory Satellite
- High Precision Parallax Collecting Satellite (HIPPARCOS)



*AAVSO services have been used by researchers affiliated with such satellites as Chandra, XMM, RXTE, FUSE, HST, Spitzer, and many more*

## 1. About the AAVSO

A significant number of rare events have been observed with these satellites as a result of timely notification by the AAVSO.

In recent years, the SWIFT satellite has been sending real-time notification to ground-based observers in the AAVSO High-Energy Network to alert them of Gamma-Ray Bursts (GRBs). Several GRB optical afterglows have been detected by AAVSO observers. In this way, AAVSO observers are contributing to cutting-edge, high-energy astrophysics.

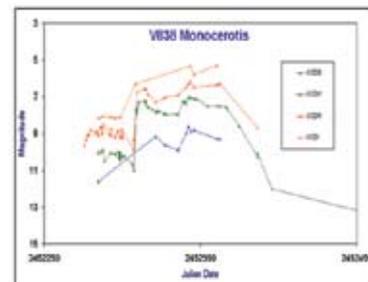
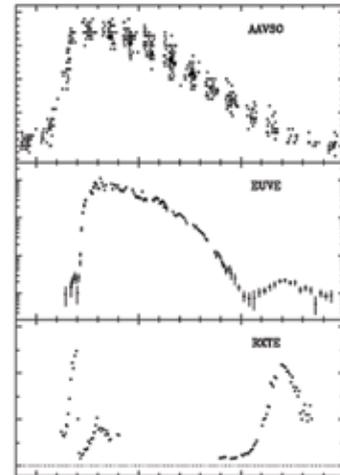
*With the outburst detected by AAVSO Observers, simultaneous AAVSO visual, EUVE, and RXTE observations of SS Cygni were triggered, providing astronomers with important information about the behavior of dwarf novae (from Wheatley et al. 2003, MNRAS, 345, 49)*

### Services to Observers and Members

The AAVSO enables variable star observers to contribute vitally to variable star astronomy by accepting their observations, incorporating them into the AAVSO International Database, publishing them, and making them available to the professional astronomer. Incorporating an observer's observations into the AAVSO archives means that future researchers will have access to those observations, so the observer is contributing to the science of the future as well as the present.

The AAVSO coordinates observing campaigns between professional and amateur astronomers, in which observations from amateur astronomers play an important role in correlating observations obtained with special instruments at earth-based observatories or aboard satellites.

On request, the AAVSO will help set up an appropriate observing program for an individual, an astronomy club, an elementary school, a high school, college, and so forth. In this way observers, students, and faculty are able to make the best use of their resources to do valuable science. The AAVSO can also assist in teaching observing techniques and in suggesting stars to be included in a program through the AAVSO Mentor Program.



## Education and Outreach

*The AAVSO believes that Education and Outreach are important to our mission:*

- to attract, train, and retain new variable star observers and members of all ages
- to increase awareness, understanding, and appreciation of variable star astronomy and variable star observing among amateur and professional astronomers, educators, students, and the general public
- to improve science education and literacy through the unique power of variable stars and variable star observing to motivate students young and old.

### *Projects, Programs, and Activities*

The AAVSO Writers Bureau offers variable star and topical astronomy content on a monthly basis to editors of astronomy club and society newsletters. This gives us the chance to inform the public about the fascinating objects we study, as well as the science and research being done, while providing reliable, accurate information to newsletter editors who may lack the time or expertise to write or vet articles for publication.



*The AAVSO has much experience in hosting successful educational lectures such as the series of High-Energy Astrophysics Workshops for Amateur Astronomers*

The AAVSO Mentor Program connects experienced observers with new observers to assist them in observing, recording, and reporting observations of variable stars to the AAVSO International Database.

The Speakers Bureau is a service established for people and groups looking for enthusiastic, knowledgeable speakers to provide informative presentations for astronomy clubs, star parties, banquets, Scout Troops, Astronomy Day activities, and other public and private astronomy functions.

Our Presentation Library contains POWERPOINT™ presentations on variable stars, observing techniques, and other astronomical topics. These are available free to the public to use in making your own presentations.



*Gary Poyner, AAVSO member-observer since 1991, with his 14-inch telescope*

## 1. About the AAVSO

*Variable Star Astronomy (VSA)* is an AAVSO educational project, originally developed as *Hands-On Astrophysics (HOA)* with funds from the National Science Foundation. It is a flexible set of hands-on educational materials, activities, and investigations based on the AAVSO's unique electronic database of variable star measurements. Students will be able to experience the excitement of doing real science with real data! By carrying out all aspects of the research process, they can develop and integrate skills in science, math, computing, and other areas. VSA has been converted to a web-based format and is available via the AAVSO website (<http://www.avso.org/education/vsa>).

VStar is the software that accompanies the activities for VSA. The original DOS-based programs have been ported to a Java platform and are being developed as part of the Citizen Sky project, with funding from the National Science Foundation.



*Glenn Chaple, AAVSO member-observer since 1980*

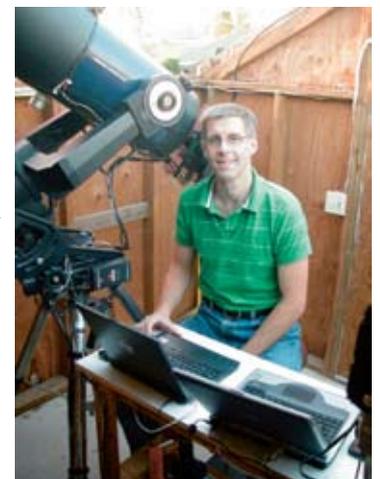


*Bill Goff, an AAVSO observer since 1981. His telescope is a Planewave 20" CDK with an Apogee U9 camera.*

*Chris Stephan, AAVSO member-observer since 1975*



*On January 28, 2010, AAVSO observers Barbara Harris (left) and Shawn Dvorak (right) detected a rare outburst of the recurrent nova U Scorpii, which set in motion satellite observations by the Hubble Space Telescope, Swift gamma-ray satellite, and the Spitzer Space Telescope.*





## 2. The Year in Review

### Introduction

The 101st AAVSO Spring meeting was held May 22–24, 2012, at The Northwoods Resort, Big Bear, California, in conjunction with the Society of Astronomical Sciences (SAS), and was followed by the Spring Council meeting on May 25. The 101st AAVSO Annual Meeting was held November 2–3, 2012, at the Woburn-Hilton Hotel in Woburn, Massachusetts, and was preceded by the Annual Council meeting on November 1 at AAVSO Headquarters.

### Minutes of the 101st Spring Meeting of the AAVSO, Held May 22–24, 2012, Big Bear, California

**Gary Walker, Secretary**

*Tuesday, May 22, 21012*

On the day before the joint SAS/AAVSO meeting began, two AAVSO workshops were presented. AAVSO Council Member John Martin gave a workshop during the morning on “Spectroscopy With Small Telescopes;” In the afternoon AAVSO Assistant Director Aaron Price gave a workshop on “Using the Photometry Analysis Package VPHOT.” Both workshops were well attended and received good reviews.



*John Martin's "Spectroscopy With Small Telescopes" workshop*

## 2. The Year in Review

*Wednesday, May 23, 2012*

The joint meeting officially began with an enthusiastic welcome from SAS President Lee Snyder and AAVSO Director Arne Henden. The rest of the morning featured paper sessions on Pro-Am Collaborations and on Solar System Research. After lunch, paper sessions on Variable Stars and on Campaign Champions were held.

Before dinner, Sponsors of the meeting presented “infomercials” on their products and/or services.

The AAVSO Membership meeting was called to order at 7 p.m. and a warm welcome was given by Mario Motta, AAVSO President. In addition to AAVSO members and observers, present at the meeting were numerous SAS members who were not AAVSO members. Gary Walker gave the Secretary’s Report and Gary Billings gave the Treasurer’s Report, which were approved. Director Arne Henden reported on deceased members and friends of the AAVSO: Hilmar W. Duerbeck, Yuri Sergeevich Efimov, John Sanford, Nathaniel Wesley Taylor, and Weidong Li. Attendees stood for a moment of silence in their memory.

Director Arne Henden gave his Semiannual Report. He reported that we were having another excellent year. As of this meeting, we had 21.5 million observations in the AAVSO International Database. Currently, about 75% are visual and 25% are CCD observations; less than 1% are photoelectric or photographic. Arne reported that we have over 900 paid members, not including those that are less than one year in arrears; we added 83 new members October 1, 2011–March 31, 2012. With the changes made this year to the method of tracking current members, we will be able to see much more clearly any future increases or decreases in membership. He also highlighted items described in detail in the Council Minutes below.

Those present at the meeting included AAVSO members (many also SAS members) William Goff, Steve Smith, Arne Henden, Richard Sabo, Robert Buchheim, Michael Cook, and Gary Walker. They were among AAVSO observers honored in May 2011 at the AAS/HST Heritage Press Conference for their observations of M31-V1, the first Cepheid discovered by Edwin Hubble in another galaxy. The impressive 19th-magnitude photometry obtained by these observers was used to characterize the behavior of M31-V1, after nearly 90 years since its discovery, in order to enable current Hubble Space Telescope observations. Those present were asked to stand for a moment of recognition.

Plans were announced for the AAVSO 101st Annual Meeting, to be held in Woburn, Massachusetts in November, as were tentative meeting locations for the AAVSO 102nd Spring Meeting.

The Membership meeting was adjourned shortly before 9 p.m.

*Thursday, May 24, 2012*

Paper sessions held during the morning were on Spectroscopy and Such and on Special Projects I.

An AAVSO/SAS group photo was taken at noon.

During the afternoon a final paper session—Special Projects II—was held, following which a brief summary of the meeting was given and attendees were thanked for coming and for their contributions.

The AAVSO/SAS closing banquet was held Thursday evening and was followed by the presentation of awards. AAVSO awards included the 2012 Director's Award, presented to Chris Watson in recognition of his work "as an AAVSO Council member and his contribution of countless hours of technical expertise to the creation and refinement of VSX, VSP, and VSD."

AAVSO Observer awards were announced for observers who had achieved milestone levels of variable star observations submitted to the AAVSO International Database. Awards were announced for 49 visual observers, including two observers achieving over 200,000 observations and two over 175,000 observations, 39 CCD observers, and two photographic observers; no awards were announced for PEP observers this year. Those recipients who were present received their awards and acclamation from banquet attendees.

Also announced was the first recipient of a new category of AAVSO award, the AAVSO Digitizer Award. Andrew Rupp was recognized posthumously for his digitization of over 2,500 variable star observations previously published in the astronomical literature but not included in the AAVSO International Database. Future recipients of Digitizer Awards will be recognized at the Annual meetings.

The Banquet Speaker was author Dava Sobel, Pulitzer Prize nominee and recipient of the Astronomical Society of the Pacific's Klumpke-Roberts Award for her outstanding contributions to the public understanding and appreciation of astronomy through her numerous writings and internationally popular books, including *Galileo's Daughter*, *A More Perfect Heaven*, *The Planets*, and *Longitude*. Ms. Sobel spoke on Nicolaus Copernicus and his story amid the complex medieval society in which he lived that she wrote about in *A More Perfect Heaven*. Ms. Sobel and her brother also read a substantial excerpt from the play that is embedded in that book and focuses on when and why Copernicus decided to make his theory public. The attendees greatly enjoyed this fascinating and very entertaining presentation.

## 2. The Year in Review

### *Friday, May 25: Council Meeting*

The AAVSO Council held its day-long meeting at the Northwoods Resort the day after the AAVSO/SAS meeting concluded. In addition to business items such as the Secretary's Report and the Treasurer's Report, the agenda included a shortened version of the Director's Report, the full version of which had been given at the Membership Meeting.

Director Arne Henden updated the Council on grant proposals submitted to various agencies and reported that the AAVSO was successful in obtaining funding for the 2nd Generation Sky Survey (2GSS) proposal, Aaron Price's 2Eyes/3D proposal, and Donna Young's proposal to develop Chandra educational materials and present the materials as well as the mission science to workshops, conferences, and meetings.

The Director's Semiannual Report to Council included details regarding current membership, observation totals for the International Database, updates on AAVSONet assets and their deployment, BSM (Bright Star Monitor) projects, APASS (AAVSO Photometric All-Sky Survey) progress, outcomes from recent travel abroad, future travel plans, observing campaigns, the next Janet Mattei Fellow, and the AAVSO CCD School scheduled for July.

Treasurer Gary Billings presented the Treasurer's Report, which included the current totals for the endowment (\$12.5 million), as well as the year's operational expenses versus the 2012 budget. He also reported the current number of members in good standing (that is, current dues paid) to be in excess of 900.

Dr. Arne Henden presented an update on 2GSS. This survey, which is funded by The Robert Martin Ayers Sciences Fund, will provide nightly coverage of the entire sky to 17th magnitude in V and I bands. The first telescope to be used in the survey is showing spherical aberration due to the wrong adapters being supplied by the camera supplier, and the second telescope is late in delivery; both issues are expected to be resolved.

The Director also provided rationale for AAVSONet, including: training for our non-professional astronomer staff, research facility for professional staff, experimentation facility, demonstration to the outside community of the value of small telescopes, a means to introduce non-CCD owning members to CCD observing, and an opportunity for members to use research-grade facilities at no cost. Since AAVSONet is run at no cost to Headquarters, volunteers and donations are key. However, AAVSONet is also an activity that takes the Director away from other activities when his input is needed. As an indication of the success of APASS and AAVSONet, the Director cited that the next version of UCAC (U.S. Naval Observatory CCD Astrograph Catalog) is being held from publication until the next APASS Data Release is available for inclusion.

The Council meeting was adjourned at 6:30 p.m. by President Mario Motta.

***Papers and Posters Presented at the Joint Meeting of the Society for Astronomical Sciences and the American Association of Variable Star Observers, Held in Big Bear Lake, California, May 22–24, 2012***

"Photometry of Hubble's First Cepheid in the Andromeda Galaxy, M31"

Bill Goff, Matt Templeton, Richard Sabo, Tim Crawford, Michael Cook

"BK Lyncis: The Oldest Old Nova? Or: Archaeo-Astronomy 101"

Jonathan Kemp, Joe Patterson, Enrique De Miguel, George Roberts, Tut Campbell, Franz-J. Hamsch, Tom Krajci, Shawn Dvorak, Robert A. Koff, Etienne Morelle, Michael Potter, David Cejudo, Joe Ulowetz, David Boyd, Richard Sabo, John Rock, Arto Oksanen

"Photometric Monitoring by Amateurs in Support of a YY Gem Professional Observing Project"

Bruce L. Gary, Leslie H. Hebb, Jerrold L. Foote, Cindy N. Foote, Roberto Zambelli, Joao Gregorio, F. Joseph Garlitz, Gregor Srdoc, Takeshi Yada, Anthony I. Ayiomamitis

"The Lowell Amateur Research Initiative"

Deidre Ann Hunter, John Menke, Bruce Koehn, Michael Beckage, Klaus Brasch, Sue Durling, Stephen Leshin

"Lunar Meteor Impact Monitoring and the 2013 Ladee Mission"

Brian Cudnik

"First Attempts at Asteroid Shape Modeling"

Maurice Clark

"Diurnal Parallax Determinations of Asteroid Distances Using Only Backyard Observations From a Single Station"

Eduardo Manuel Alvarez, Robert K. Buchheim

"On the Maximum Amplitude of Harmonics of an Asteroid Lightcurve"

Alan Harris

"PV Cephei and Gyulbudaghian's Variable Nebula"

David Boyd

"Why Visual Observations Of Mu Cephei Are Important"

David G. Turner

"Road (Remote Observatory Atacama Desert): Intensive Observations of Variable Stars"

Franz-Josef Hamsch

## 2. The Year in Review

"ER Ursae Majoris: A Dwarf Nova With Surprises"

Enrique De Miguel, Joe Patterson, Jonathan Kemp, William Stein, George Roberts, T. Campbell, Franz-J. Hambsch, Tom Krajci, Shawn Dvorak, Robert A. Koff, Etienne Morelle, Michael Potter, David Cejudo, Steve Brady, Kenneth Menzies

"Small Telescope Spectroscopy of Epsilon Aurigae"

Jeffrey L. Hopkins

"Observations Using a Bespoke Medium Resolution Fast Spectrograph"

John Menke

"High Resolution Spectroscopy for the Amateur: Experiences With the Lhires Iii Spectrograph"

Stanley A. Gorodenski

"Extremelylow-Costpoint-Sourcespectrophotometry (EICPSS)"

John Beaver, Charles Conger

"Spectroscopic Analysis of Algol During Eclipse Cycle"

Jonathan Boyd, Kodiak Darling, Elise Sparks, Lajeana West, Douglas Walker

"A Fresh Look at the Algol-Like Eclipsing Binary, AO Ser"

Kevin B. Alton, Andrej Prša

"The Light At Night Mapping Project: LAN MAP 1, the Tucson Basin"

E. R. Craine, B. L. Craine, P. R. Craine, E. M. Craine

"Observing Double Stars"

Russell M. Genet, B. J. Fulton, Federica B. Bianco, John Martinez, John Baxter, Mark Brewer, Joseph Carro, Sarah Collins, Chris Estrada, Jolyon Johnson, Akash Salam, Vera Wallen, Naomi Warren, Thomas C. Smith, James D. Armstrong, Steve Mcgaughey, John Pye, Kakkala Mohanan, Rebecca Church

"Amateur Image Pipeline Processing Using Python Plus PyRAF"

Wayne Green

"High Time Resolution Astronomy or High Speed Photometry"

Gary A. Vander Haagen

"Photon Counting—One More Time"

Richard H. Stanton

"Tracking Bolides, 3D Visualization and Data"

Thomas G. Kaye, Robert Crawford, Mark Bowling, John Kalas

"Tools and Techniques for Measuring Asteroid Occultations With DSLR and CCS Cameras"

John E. Hoot

### ***Papers Without Presentation and Posters***

"A Virtual Astronomical Research Machine in No Time (VARMiNT)"

John Beaver

"The Confusing Case of 16666 Liroma"

Robert K. Buchheim, John Ruthroff

"Student Project and Curriculum Based on Light at Night Data Collection"

Erin M. Craine, Jennifer C. Debenedetti

"Enhancing the Educational Astronomical Experience of Non-Science Majors With the Use of an iPad and Telescope"

Robert M. Gill, Michael J. Burin

"The Rotational Period of the Sun Using the Doppler Shift of the Hydrogen Alpha Spectral Line"

Robert M. Gill

"Fast Spectrometer Construction and Testing"

John Menke

"ADILS: An Amateur Dual Imaging Littrow Spectrograph"

Wayne Green

"High Accuracy R.A./Dec. Encoders for a ca 1890 GEM"

Wayne Green

"A Single Beam Polarimeter"

Jerry D. Horne

## 2. The Year in Review

### *Deceased Members, Observers, and Colleagues*

Duerbeck, Hilmar W., Germany  
Efimov, Yuri Sergeevich, CA  
Sanford, John, CA

Taylor, Nathaniel Wesley, Australia  
Li, Weidong, CA

### *AAVSO Director's Award Recipient*

***Chris Watson of San Diego, California*** was awarded the AAVSO Director's Award In recognition of his work as an AAVSO Council member and his contribution of countless hours of technical expertise to the creation and refinement of VSX, VSP, and VSD.



*Chris Watson receives his Director's Award from Arne Henden*

**AAVSO Observer Awards** (presented or announced at the 101st Spring Meeting, Big Bear, California, May 22–24, 2012)

<i>Award/recipient</i>	<i>Affiliation**</i>	<i>Country</i>	<i>Interval</i>	<i>Total</i>
<i>Over 200,000 Visual Observations*</i>				
Rod Stubbings	14	Australia	1997–2011	200,709
John Bortle		USA	1963–2011	200,000
<i>Over 175,000 Visual Observations*</i>				
Gary Poyner		England	1991–2011	183,539
Paul Vedrenne	01	France	1978–2011	175,563
<i>Over 50,000 Visual Observations*</i>				
Alfredo Glez–Herrera		Spain	1990–2011	54,611
Pavol Dubovsky	09	Slovakia	1999–2011	53,793
Miroslav Komorous		Canada	1976–2011	51,300
Jerzy Speil		Poland	1976–2011	50,465
Attila Mizser	03	Hungary	1975–2011	50,146
<i>Over 25,000 Visual Observations*</i>				
Seiichi Sakuma		Japan	1984–2011	26,493
Robert Fidrich	03	Hungary	1984–2011	25,679
Wolfgang Kriebel	02	Germany	1989–2011	25,638
Erwin Van Ballegoij	04	Netherlands	1984–2011	25,452
<i>Over 10,000 Visual Observations*</i>				
Janos Piriti	03	Hungary	1978–2011	10,818
Francisco Pujol–Clapes	06	Spain	1989–2011	10,371
Chris Allen	20	Sweden	2004–2011	10,234
Hans Bengtsson		Sweden	2000–2011	10,047
<i>Over 5,000 Visual Observations (new level this year)</i>				
Janos Bakos	03	Hungary	2008–2011	7,051
Balazs Bago	03	Hungary	1986–2011	5,531
Sergey Kuznetsov		Russia	2004–2011	5,208
<i>Over 1,000 Visual Observations*</i>				
Kevin Paxson		USA	2001–2011	2,850

*continued on next page*

## 2. The Year in Review

*Observer Awards, cont.*

<i>Award/recipient</i>	<i>Affiliation**</i>	<i>Country</i>	<i>Interval</i>	<i>Total</i>
Sherrill Shaffer		USA	2009–2011	1,653
Sandor Hadhazi	03	Hungary	1983–2011	1,580
Veikko Makela	17	Finland	2000–2011	1,557
Bogdan Kubiak		Poland	2009–2011	1,442
Terje Bjerkgaard	08	Norway	2000–2011	1,203
Laszlo Kocsmaros		Serbia and Montenegro	2009–2011	1,143
Vladut Mihai		Romania	2009–2011	1,125
Glynis Van Uden	04	Netherlands	2003–2011	1,118
Gonzalo Beltran		Bolivia	2008–2011	1,094
Robert Schippers		Netherlands	2009–2011	1,080
Antal Fodor	03	Hungary	1981–2011	1,078
Manos Kardasis		Greece	2002–2011	1,052
Joao Almeida	13	Brazil	2004–2011	1,032
Artemy Kilin		Russia	2010–2011	1,001

*Over 100 Visual Observations\**

Ronald King		USA	2010–2011	485
David Watts		USA	2010–2011	176
Todd Jaarsma		USA	2010–2011	157
Stanley Spielbusch		USA	2010–2011	151
Malcolm Brown		USA	1978–2011	136
Laszlo Nemeth	03	Hungary	1984–2011	133
Poul Hansen		Denmark	2009–2011	132
Anders Nygaard		England	2008–2011	115
Thomas Wikander		Sweden	2011–2011	112
William Whitehead		USA	2011–2011	106
David Dowhos		Canada	2006–2011	105
David Conner		England	2009–2011	105
Dennis Cowles		USA	2002–2011	102
Gary Wood		USA	2006–2011	100

*Over 500,000 CCD Observations\**

Robert James		USA	1953–2011	525,582
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*Observer Awards, cont.*

<i>Award/recipient</i>	<i>Affiliation**</i>	<i>Country</i>	<i>Interval</i>	<i>Total</i>
<i>Over 400,000 CCD Observations*</i>				
Ray Tomlin		USA	2006–2011	487,313
<i>Over 100,000 CCD Observations*</i>				
Ian Miller	20	England	2007–2011	123,905
Keith Graham		USA	1981–2011	121,156
Teofilo Arranz		Spain	2005–2011	108,271
William Stein		USA	2008–2011	106,909
Arto Oksanen	17	Finland	2001–2011	100,123
Richard Sabo		USA	2006–2011	100,041
<i>Over 50,000 CCD Observations*</i>				
James Jones		USA	2003–2011	82,208
Kenneth Menzies		USA	1968–2011	76,053
<i>Over 10,000 CCD/PEP Observations*</i>				
Rudy Poklar		USA	2001–2011	38,607
Mark Blackford		Australia	2011–2011	18,386
Guan Tan Thiam		Australia	2010–2011	15,853
Laurent Corp		France	1997–2011	14,978
James Foster		USA	2003–2011	14,430
Arne Henden		USA	2000–2011	14,092
Neil Simmons		USA	1983–2011	13,111
Miguel Rodriguez Marco	06	Spain	1993–2011	12,731
Ron McDaniel		USA	2005–2011	11,484
Robert Henderson		England	2009–2011	11,286
Graham Darlington	20	England	2011–2011	10,883
David Hurdis		USA	1999–2011	10,584
Eddy Muyliaert	05	Belgium	1986–2011	10,434
Richard Campbell		USA	1989–2011	10,089
<i>Over 1,000 CCD Observations*</i>				
Margaret Streamer	29	Australia	2002–2011	6,128
David Moriarty		Australia	2011–2011	4,251
Katrin Fortak		Germany	2011–2011	1,850
Thomas Karlsson	19	Sweden	2010–2011	1,375

*continued on next page*

## 2. The Year in Review

*Observer Awards, cont.*

<i>Award/recipient</i>	<i>Affiliation**</i>	<i>Country</i>	<i>Interval</i>	<i>Total</i>
Patrick Wils	05	Belgium	1976–2011	1,318
Andreas Schumann	02	Germany	2005–2011	1,318
Marzio Rivera		Italy	2006–2011	1,299
Emmanuel Conseil		France	2011–2011	1,290
Peter Lake		Australia	2009–2011	1,238
Carlos Fernandez Rivero		Spain	2010–2011	1,193
David Trowbridge		USA	2001–2011	1,129
Janos Stickel	03	Hungary	2009–2011	1,107
Jerry Horne		USA	2003–2011	1,107
Charles Lemaire		Germany	2011–2011	1,091
Alan Bedard		USA	2002–2011	1,032

*Over 500 Ptg Observations\* (new level this year)*

Robert Kaufman		Australia	2008–2011	821
Ivan Sergey		Belarus	2003–2011	724

\* Years include total AAVSO observing interval (not only PEP/CCD/PTG observing).  
Total includes only visual or PEP/CCD/PTG observations, depending on award.

\*\* These symbols indicate observers are also affiliated with the groups below:

- 01 Association Française des Observateurs d'Etoiles Variables (AFOEV)
- 02 Bundesdeutsche Arbeitsgemeinschaft für Veränderliche Sterne e.V. (BAV) (Germany)
- 03 Magyar Csillagászati Egyesület, Valtócsillag Szakcsoport (Hungary)
- 04 Koninklijke Nederlandse Vereniging voor Weer–en Sterrenkunde, Werkgroep  
Veranderlijke Sterren (Netherlands)
- 05 Vereniging voor Sterrenkunde, Werkgroep Veranderlijke Sterren (Belgium)
- 06 Madrid Astronomical Association M1 (Spain)
- 08 Norwegian Astronomical Society, Variable Star Section
- 09 Ukraine Astronomical Group, Variable Star Section
- 13 Brazilian Observational Network REA
- 14 Royal Astronomical Society of New Zealand, Variable Star Section
- 17 URSA Astronomical Association, Variable Star Section (Finland)
- 19 Svensk Amator Astronomisk Forening, Variabelsektionen (Sweden)
- 20 British Astronomical Association, Variable Star Section
- 29 Variable Stars South (New Zealand)

***AAVSO Digitizer Awards*** (presented at the 101st Spring Meeting, Big Bear, California, May 22–24, 2012)

*2,500 observations digitized*

Andrew Rupp

## 2. The Year in Review

## **Minutes of the 101st Annual Meeting of the AAVSO, Held November 2–3, 2012, Woburn, Massachusetts**

**Gary Walker, Secretary**

### *Council meeting*

The Council met at Headquarters in Cambridge on Thursday, November 1, 2012, the day before the Annual Meeting officially began. Secretary Gary Walker presented his Minutes from the Spring Meeting.

Director Arne Henden reported that we were successful in obtaining multiple grants from the Robert Martin Ayers Sciences Fund for 2GSS for the pilot phase hardware. We expect another grant in 2012, providing the pilot phase is successful. Aaron spoke on his 2 Eyes/3 D grant, which contains a substantial percentage for the AAVSO. Arne reported that Donna Young's Chandra education grant was funded, and also that we have another installment from the Citizen Science grant for next year. He also reported on numerous grant proposals that are pending.

The Director's Annual Report to Council included details regarding current membership, observation totals for the International Database, updates on AAVSONet assets and their deployment, a Development Report, update on existing Grants and pending Proposals, status of Bright Star Monitor (BSM) projects, current APASS and 2nd Generation Synoptic Survey (2GSS) progress, outcomes from recent collaborations, future travel plans, observing campaigns, the next Janet Mattei Fellow, and the many other projects. More details are included in the Membership meeting section below and are not repeated here.

New Treasurer Tim Hager, who replaced Gary Billings who resigned because of time issues, presented a preliminary Treasurer's Report which included partial totals for the endowment, operational expenses, and income. Tim also laid out the projected annual expenses and income for the organization through 2013, showing the expected decline in spending and slow but steady rise on the income side over that time.

Arne Henden gave the Development Report for Development Director Mike Simonsen. Annual donation totals in 2008, 2009, 2010, and 2011 were significantly higher than the amounts usually raised before the hire of a Development and Membership Director. He also reported 110 new members joined April 1–September 30, 2012, with a total of 193 for the entire fiscal year.

## 2. The Year in Review

Arne reported that PayChex has started as our outsourced HR function provider. They cover paycheck and insurance administration. In addition, they are generating an employee handbook.

Mario gave the report of the Nominating Committee. Nominees for Council, with elections to be held on November 3, were Ed Guinan, Tom Krajci, John Martin, Ken Menzies, Ken Mogul, Kevin Paxon, Jim Roe, and Donn Starkey.

Elections of Officers were held. Results were Mario Motta as President, Jennifer Sokoloski as Vice President (there is only one Vice President this year), Tim Hager as Treasurer, and Gary Walker as Secretary.

After a full day and much constructive discussion, the Council meeting was adjourned.

On Thursday evening first-time meeting attendees were invited to have dinner with the staff to welcome them to their first AAVSO meeting and so they would recognize some of the friendly faces when they arrived for the official start of the meeting the next morning.

### *AAVSO Annual Meeting*

#### *Friday, November 2, 2012*

The Annual meeting started with Registration and a hot breakfast which was enjoyed by all.



*Dr. William Herbst*

After a welcome by President Mario Motta, Keynote Speaker Dr. William Herbst, John Monroe Van Vleck Professor of Astronomy, Wesleyan University, was introduced. Dr. Herbst spoke on “Variability of Young Stars: The Importance of Keeping an Eye on Children”, and his extremely interesting presentation was warmly received. This Keynote address was the first one to be given as the opening event on an AAVSO Annual meeting program.

The first paper session, on Young Stellar Objects (YSOs), followed Dr. Herbst’s talk, and three papers were given. The session then adjourned for lunch and informal discussions. After lunch, the second paper session, on Novae and Symbiotic Variables, was held, and included three papers. This session was followed by a coffee break and Poster viewing session. The third paper session, on Solar Astronomy, followed the break and four papers were presented.

*Saturday, November 3, 2012*

As on Friday, the day started with Registration and the hot breakfast buffet.

The Membership meeting was called to order at 9:30 a.m, and a warm welcome was given by President Mario Motta. Gary Walker gave the Secretary's Report and Tim Hager gave the Treasurer's Report, which were discussed and approved. A budget was presented which will withdraw money from the earnings of the Endowment, but as the amount was within the 5% limit recommended, there was no cause for alarm.



*AAVSO President Mario Motta and Secretary Gary Walker at the Annual Meeting*

Director Arne Henden reported on deceased members and friends of the AAVSO: J. Robert Buchler, Richard Crowe, former Solar Chair Carl Feehrer, Frank Kameny, Roy A. Mimna, Violet Royer (mother of Msgr. Ron Royer), and Romano Vivaldi. Attendees stood for a moment of silence in their memory.

Director Arne Henden reported that we have over 22 million observations in the AAVSO International Database as it continues its exponential rise. As in the past, the totals are approximately 75% visual and 25% CCD, with less than 1% photoelectric and photographic. Membership increased during the year and now stands at 1,082; about two-thirds of our members are from the U.S. and one-third from over 40 other countries. Dr. Ulisse Munari was named the third Janet Mattei Fellow, working at Headquarters during the summer of 2012. He worked on a RAdial Velocity Experiment (RAVE)-APASS paper, the comparison of Landolt and APASS magnitude measurements, RR Lyr variables in the Aquarius stream, the ANS Collaboration (an Italian network of small- and medium-size telescopes performing spectroscopy of astronomical objects, particularly novae and symbiotic stars), and the Schiaparelli Observatory in Varese, Italy. He is expected to return next summer.

That was followed by a summary of the status of currently funded grants: STARS (aka Citizen Sky) with a supplemental DSLR workshop, Sokoloski's Beyond Spherical Cows: Writing the Next Chapter on Novae (with funding for an AAVSO Campaign), Templeton's MOST Orion YSO and Mira no-cost grant extensions, Young's Chandra E/PO (extended through 2015), and the Las Cumbres Observatory Global Telescope Network funding of a red extension of the APASS project. Also, more than six project proposals are in progress.

## 2. The Year in Review

The impact of the 2GSS survey on AAVSO observers was reported in last year's report, but more details regarding survey parameters are now available. Data from the survey will be available for follow-up observations responding to *AAVSO Alert Notices* and *Special Notices*. The prototype is funded by The Robert Martin Ayers Sciences Fund, while additional systems will require future grants. Operation is expected to start in 2013. The Director issued a call to action for the next three years for visual observers to be very active in observing all the legacy stars, to provide a good transition period to match the photometry of 2GSS and the visual data.

Rebecca Turner, Project Manager and Sponsored Research Officer, gave a report on plans for future meetings and announced the following: the 102nd Spring Meeting will be held May 15–18, 2013, at Appalachian State University in Boone, North Carolina; the 102nd Annual Meeting will be held October 10–12, 2013, in the Cambridge/Woburn, Massachusetts, area.

President Mario Motta announced that Ed Guinan, John Martin, Kevin Paxon, and Donn Starkey were elected to council.

The Membership meeting adjourned shortly before lunch.

In the afternoon two paper sessions were held, with a coffee break and poster-viewing session in between.



*Some of the members present for the scientific paper presentations*



*Dr. Margarita Karovska of the Harvard-Smithsonian Center for Astrophysics, and a longtime AAVSO member, discusses the CH Cygni symbiotic system at the Annual Meeting*

The AAVSO Banquet was held Saturday evening at the Hilton-Woburn Hotel. In a change from previous years, awards were presented before dinner and there was no after-banquet speaker.

Pins recognizing 25 years of AAVSO membership (as of 2012) were announced for 186 current AAVSO members. The pin is a slightly larger version of the round AAVSO lapel pin (royal blue enamel with the AAVSO star and letters A-A-V-S-O between the star points in gold) and with a "25" in the center of the star. Those present had received their pins at registration and stood to be recognized by everyone.



*AAVSOers enjoy a relaxing moment before the evening's banquet*

Arne Henden presented the eleventh William Tyler Olcott Distinguished Service Award to Tim Crawford "for his many years of patiently mentoring observers, giving inspirational talks to astronomy clubs and societies, and his tireless creation of comparison star sequences for observers."

Gerald P. Dyck was given the 43rd AAVSO Merit Award "in recognition of his faithful membership and meticulous observing since 1978 resulting in over 158,000 variable star observations, his enthusiastic participation in countless observing campaigns, his mentoring of new observers, his unique contribution to the AAVSO's 75th Anniversary through his composition of the multi-media song cycle *Images and Variations*, and his ongoing and dedicated educational outreach to the community and particularly to children through volunteer classroom and hands-on astronomy teaching and through musical composition including *The Ancient Face of Night*."

AAVSO Digitizer Awards were given to Steve McKay, Ken Mogul, Robert Stine, Christian Froeschlin, Brian Skiff, Doug Welch, and Kevin Paxon for their invaluable contributions of digitizing historical variable star observations for inclusion in the AAVSO International Database.

Service awards were presented the following AAVSO staff members: Linda Henden and Richard (Doc) Kinne, 5 years, and Matthew Templeton, 10 years. Their invaluable service and loyalty were recognized with hearty and sustained applause.

President Mario Motta had to leave before the banquet to catch his flight to the upcoming eclipse, so after an excellent dinner and a greatly enjoyed evening, the meeting was closed by Director Arne Henden.

## 2. The Year in Review

### *Papers and Posters Presented at the 101st Annual Meeting of the AAVSO, Held in Woburn, Massachusetts, November 1–3, 2012*

William Herbst	"Variability of Young Stars: the Importance of Keeping an Eye on Children"
Matthew Templeton	"Variable Stars in the Trapezium Region: the View From Ground and Space"
Arne Henden	"YSOs as Photometric Targets"
Jeno Sokoloski	"Working Together to Understand Novae"
Margarita Karovska	"Campaign of AAVSO Monitoring of CH Cyg Symbiotic System in Support of Chandra and HST Observations"
Arne Henden	"2012: A Goldmine of Novae"
Gerald Dyck	"Introducing Solar Observation to Elementary Students"
Rodney Howe	"Statistical Evidence for a Mid-Period Change in Daily Sunspot Group Counts From August 2011 Through August 2012, and the Effect On Daily Relative Sunspot Numbers"
Kristine Larsen	"AAVSO Solar Observers World Wide"
Rodney Howe	"Monitoring Solar Activity Trends With a Simple Sunspotter"
Tim Crawford	"Mentoring, a Shared Responsibility"
John Martin	"66 Oph Decides to 'Be'"
David Turner	"V439 Cygni: Insights into the Nature of an Exotic Variable Star"
Marco Ciocca	"BVRI Observations of SZ Lyncis at the ECU Observatory"
Kristine Larsen	"Elizabeth Brown and Citizen Science in the Late 1800s"
Doug Welch	"APASS Data Product Developments"
Ed Guinan	"The Case of the Tail Wagging the Dog: HD 189733— Evidence of Hot Jupiter Exoplanets Spinning-up their Host Stars"
Frank Dempsey	"An overview of the Swinburne Online Astronomy courses"

### *Deceased Members, Observers, and Colleagues*

Buchler, J. Robert, FL  
Crowe, Richard, HI  
Feehrer, Carl E., MA

Mimna, Roy A., OH  
Royer, Violet, CA  
Vivaldi, Romano, Italy

### *AAVSO Merit Award Recipient (presented at the 101st Annual Meeting in Woburn, Massachusetts, November 3, 2012)*

*Gerald P. Dyck* was awarded the AAVSO Merit Award "... in recognition of his faithful membership and meticulous observing since 1978 resulting in over 158,000 variable star observations, his enthusiastic participation in countless observing campaigns, his mentoring of new observers, his unique contribution to the AAVSO's 75th Anniversary through his composition of the multi-media song cycle *Images and Variations*, and his ongoing and dedicated educational outreach to the community and particularly to children through volunteer classroom and hands-on astronomy teaching and through musical composition including *The Ancient Face of Night*."



*AAVSO Merit Award Recipient Gerald P. Dyck with Director Arne Henden*

## 2. The Year in Review

*AAVSO William Tyler Olcott Distinguished Service Award Recipient (presented at the 101st Annual Meeting in Woburn, Massachusetts, November 3, 2012)*



*Timothy R. Crawford* was awarded the AAVSO William Tyler Olcott Distinguished Service Award “...for his many years of patiently mentoring observers, giving inspirational talks to astronomy clubs and societies, and his tireless creation of comparison star sequences for observers.”

*Tim Crawford is presented the AAVSO William Tyler Olcott Distinguished Service Award by Director Arne Henden*



*AAVSO members Roger Kolman and Doug Welch at the Annual Meeting*

**AAVSO Solar Observer Awards (announced at the 101st Annual Meeting in Woburn, Massachusetts, November 3, 2012)**

**Sunspot Observers**

**3,000 observations**

Thomas Fleming, TX

**Sudden Ionospheric Disturbance Observers (40 or more months of reports)**

Jean-Pierre Godet, France

Lionel Loudet, France

**AAVSO Digitizer Awards (presented or announced at the 101st Annual Meeting of the AAVSO, Woburn, Massachusetts, November 3, 2012)**

*50,000 observations digitized*

Kevin B. Paxson

*20,000 observations digitized*

Doug Welch

*7,500 observations digitized*

Christian Froeschlin

Brian A. Skiff

*2,500 observations digitized*

Steve McKay

Ken Mogul

Robert J. Stine



*Receiving their Digitizer Awards from Director Arne Henden are (from top) Kevin Paxson, Doug Welch, and Bob Stine*

## 2. The Year in Review

### *AAVSO Staff Recognition Award Recipients (presented at the 101st Annual Meeting in Woburn, MA, November 3, 2012)*

Matthew Templeton—ten years  
Linda Henden—five years

Richard Kinne—five years



*Director Arne Henden presents an AAVSO Staff Recognition Award to Richard "Doc" Kinne for his five years of service*

## New Members 2011–2012

Ananyev, Dmitry, Russia	Evans, John, England
Anderson, David, England	Evelan, John, AZ
Anderson, Steven, CO	Fear, Randy, CA
Asto, Daniel, Singapore	Fienberg, Richard, MA
Bagyinszki, Peter, Hungary	Fortak, Katrin, Germany
Baker, Marvin, NC	S Foster, Mark, VA
Bennett, Christopher, FL	Fredrick, Richard, KS
Bernhard, Klaus, Austria	Fujiwara, Fabio, Brazil
Berns, David, IL	Furgoni, Riccardo, Italy
Betzina, Craig, CO	Gagen, Richard, England
Blackford, Mark, Australia	Garfield, T., Australia
Boulet, Dan, DE	Garlitz, Joe, OR
Briol, John, MN	Genet, Russell, CA
Buchwald, Randall, WI	S Geswein, Drew, AZ
Busato, Andrea, Italy	Gokhale, Vayujeet, MO
Camp, James, TX	Goodridge, Jim, Canada
Carr, Jason, TX	Goodwin, Mark, MA
Castillo, David, Nicaragua	Granville, Elizabeth, AK
Chouinavas, Ioannis, Greece	Greening, Jonathan, Canada
Conti, Luca, Italy	Grida, Joe, Australia
Craine, Eric, AZ	Hakes, Charles, CO
Crary, Lawrence, FL	Hall, James, UT
Crosby, Blake, SC	Harnden, Daniel, NC
Cudnik, Brian, TX	Harrold, Samuel, TX
Davis, Thomas, TX	Hatch, Robert, FL
Dean, Stephen, England	Haynes, John, NM
S de Carvalho Aguiar, Patricia, Brazil	Herrero, Juan, Canada
Dedrickson, Duane, OR	S Hixson, Christopher, DC
Dempsey, Frank, Canada	Hock, Leslie, TX
Dholakia, Hitesh, CA	Hodgson, Clive, Australia
Diamond, Michael, MI	Hoffert, Michael, CA
Dingle, Larry, CA	Holloway, Tyler, MA
Dutton, Fred, MI	Holmberg, Gustav, Sweden
Eidson, Robert, CA	Hooja, Gunjan, CT
Elvert, Jon, LA	Hopkins, Jeffrey, AZ
Embrey, Bryan, CA	Husar, Dieter, Germany

*continued on next page*

## 2. The Year in Review

*new members, cont.*

- Iverson, Ernest, TX
- S Jackson, Joseph, AL
- James, Stephen, Australia
- Jarkins, David, MO
- Jonske, Jim, IL
- Kalen, Joseph, MD
- Kantar, Michael, NV
- Kazmierski, Fredrick, WI
- Kell, Kevin, Canada
- Kendall, Jason, NY
- Kroes, Anthony, WI
- Krstanovic, Christopher, NH
- Kwadrat, Carl, VA
- Lamb, Steve, KY
- Lanham, Scott, TX
- Larson, Thomas, MN
- Littlefield, Colin, IN
- Lopatynski, Gary, CA
- S Luostarinen, Mika, Finland
- Lynch, Steven, TX
- Maca, Thomas, Austria
- MacPhail, Robert, Canada
- Madson, Christopher, SD
- Maloney, Chris, AR
- Mamajek, Eric, AZ
- Manske, Bob, WI
- S Mariani, Gael, England
- McArthur, Harvey, IL
- McCann, Conan, AR
- McFarland, John, England
- McLeod, Alexis, OH
- McMain, William, MA
- McMath, James, AR
- Medway, Kenneth, England
- Merrill, Lloyd, RI
- S Miller, Terry, AZ
- Mitchell, William, MI
- S Mittelman, David, MA
- Moat, Alice, PA
- Mock, Justin, IL
- Moe, David, WI
- Monks, Isabel, England
- Montes, Cristina, Spain
- Morford, Charles, NC
- S Morgan, Siobahn, IA
- Muro Serrano, Miguel, Spain
- Nelson, Robert, Canada
- Newsome, William, Canada
- Orlando, Steven, NY
- Ott, John, CO
- Parks, Julian, NY
- Pearce, Andrew, Australia
- Pepper, Joshua, TN
- S Perkins, William, MN
- S Peterson, Don, Canada
- Pieri, Roger, France
- Pinney, Kenneth, Canada
- Pollmann, Ernst, Germany
- Prosz, Aurel, Hungary
- Purves, Christopher, England
- Pye, John, HI
- Read, Ashley, Australia
- Robbins, Craig, MS
- Rock, John, England
- Rodriguez, Daniel, Spain
- Russell, Stuart, England
- Sandstrom, Jeffrey, AZ
- Schmidt, Edward, NE
- Schram, Brandt, OR
- Schwiegeraht, William, NC
- Scott, Mike, UT
- Seargeant, Jim, NM
- Sengupta, Amit, Luxembourg
- Sepulveda, Mark, TX

*continued on next page*

*new members, cont.*

	Shen, Katie, VA		Urbanik, Marian, Slovakia
	Singer, Burton, GA		Villi, Mirco, Italy
	Sinor, Timothy, TX		Vinton, William, VT
	Sippert, Brian, SD		Waddell, Jack, AR
	Sliski, Alan, MA		Walkington, Matt, New Zealand
	Smith, David, Canada		Wang, Luya, MA
	Smith, Douglas, AZ	S	Warner, Elizabeth, MD
	Smith, Richard, Australia	S	Watson, Stanley, MI
	Smith, Steve, CA		Weir, Robert, MA
	Souza, Steven, MA		Westlake, Wayne, AZ
	Springen, Clyde, TX		Whallon, Nikola, MI
	St. Laurent, Kathryn, MA		Wheelband, Ian, Canada
	Steer, Roger, England		Wierda, Folkert, Finland
	Stevenson, Arthur, WI		Wikander, Thomas, Sweden
	Strong, John, OH	S	Wilcoxon, Mark, OH
	Stubbings, Rod, Australia		Winrich, Ralph, WI
	Sullivan, Philip, CA		Yearley, Robert, NM
	Swanson, Phillip, IA		York, Paul, Australia
	Thompson, Michael, CA		Zaballa, Robert, GA
	Thrall, Russell, PA	S	Zaharevitz, Daniel, MD
	Togni, Robert, AR		Zaman, Mashiyat, NY
R	Tranaker, Thomas, Sweden	S	Zappe, Michael, CO
	Undreiu, Lucian, VA		Zeigler, Kenneth, AZ

**S** = *sustaining membership*

**R** = *sponsored membership*

## 2. The Year in Review

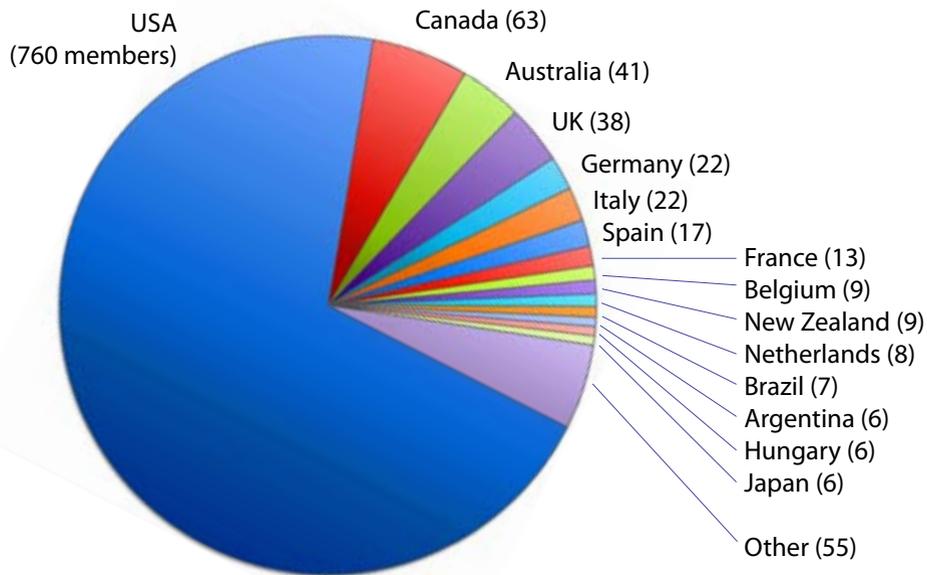
## Annual Report of the Director for Fiscal Year 2011–2012

**Arne A. Henden, Director**



If you are reading this, then we've made it past December 21, 2012. Fatalistic predictions are not anything new; we just have to provide a counterpoint for any argument that might be made. Personally, I think there are far more likely ways for the world to end! Some of them are even variable-star related: light-travel time makes it highly likely that a "killer" supernova has already gone off in our neighborhood, and we won't know about it for centuries. Have we discovered all of the nearby magnetars? SGR1900+14 ionized our atmosphere, and it is 45,000 light years away (the Spitzer image of this magnetar is really neat). However, since such destructive events are out of our control, let's concentrate on the fun things that happened in the past year!

Many large organizations are seeing their membership numbers shrink. The AAVSO has stood its ground, and in fact is seeing an increase in membership. In the past year, we offered a reduced rate in April in order to attract many of the Citizen Sky participants into becoming full AAVSO members. In addition, we've seen new members



AAVSO membership, 2011–2012, by country

## 2. The Year in Review

coming in from our Facebook presence along with the multiple star parties and meetings that staff members have attended and given presentations.

We find that the more AAVSO is publicized to a wider audience, the more interest is developed among researchers who had not known much about us. Several educators have used our software tools in their classes. The students from those classes will sometimes get “hooked” and continue their involvement with the AAVSO. We do see a large number of people not renewing their membership. These are often those that either joined for a year and then dropped out, or have retired from variable star observing. We continually try to find ways to keep these members.

### *AAVSO International Database*

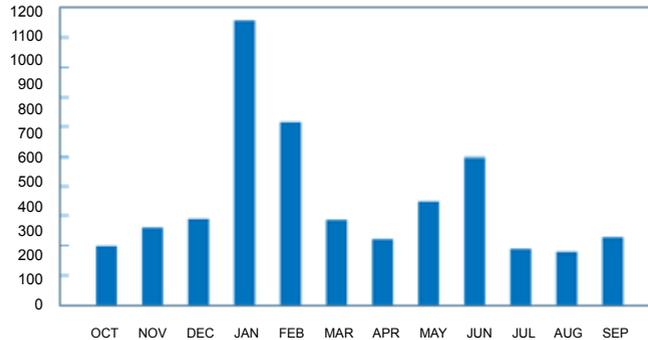
In FY2012, we collected 1.46 million observations: 197,837 of these were visual observations; 1,308 were PEP or photographic observations. The remainder (1,265,906) were CCD observations. The CCD totals remain high, as we get many thousands of observations for any time-series campaign (TT Ari is an example). The two charts on the following pages show the annual submission totals since 1911, and the total submitted observations (“Megasteps”; over 22 million observations) since 1911. You can see that the trend is exponential, so that by 2021, we will be collecting 15 million observations per year!

Work continues on importing the electronic database from the Royal Astronomical Society of New Zealand (RASNZ) into the AAVSO International Database. A large fraction of the observational data comes from just a few observers, such as Albert Jones and Danie Overbeek, and so was straightforward to import. The remaining observations require assigning observer codes to those observers who were not regular AAVSO submitters, as well as determining what charts and comparison stars were used. We hope to finish this project in the near future.

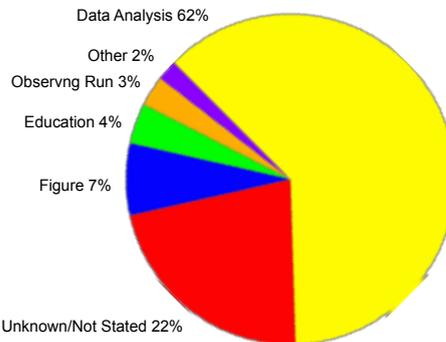
A couple of years ago, Grant Christie of the RASNZ shipped several boxes of file folders from Frank Bateson to AAVSO HQ. These file folders contained southern-star observations, some that made it into the RASNZ database and then into the AID when that database was transferred to us, and some observations that were never digitized. Mike Saladyga is starting to go through those boxes, sorting and cleaning up the filing, and discovering how many new observations were included in the shipment. We expect there to be quite a few estimates that need to be digitized so that they can be imported into the AID, and likely will ask for volunteers to help in the process.

We had 5,106 data requests from a multitude of researchers during the year. The data request rate is pretty constant throughout the year, but has definitely continued its

upward trend. The two big peaks are January and June, when the AAS meetings take place. About half of the requests are from educators and professional astronomers, primarily for doing research. About 130 requests were for people planning observing runs, so knowledge of the brightness and phase of a light curve are still important!



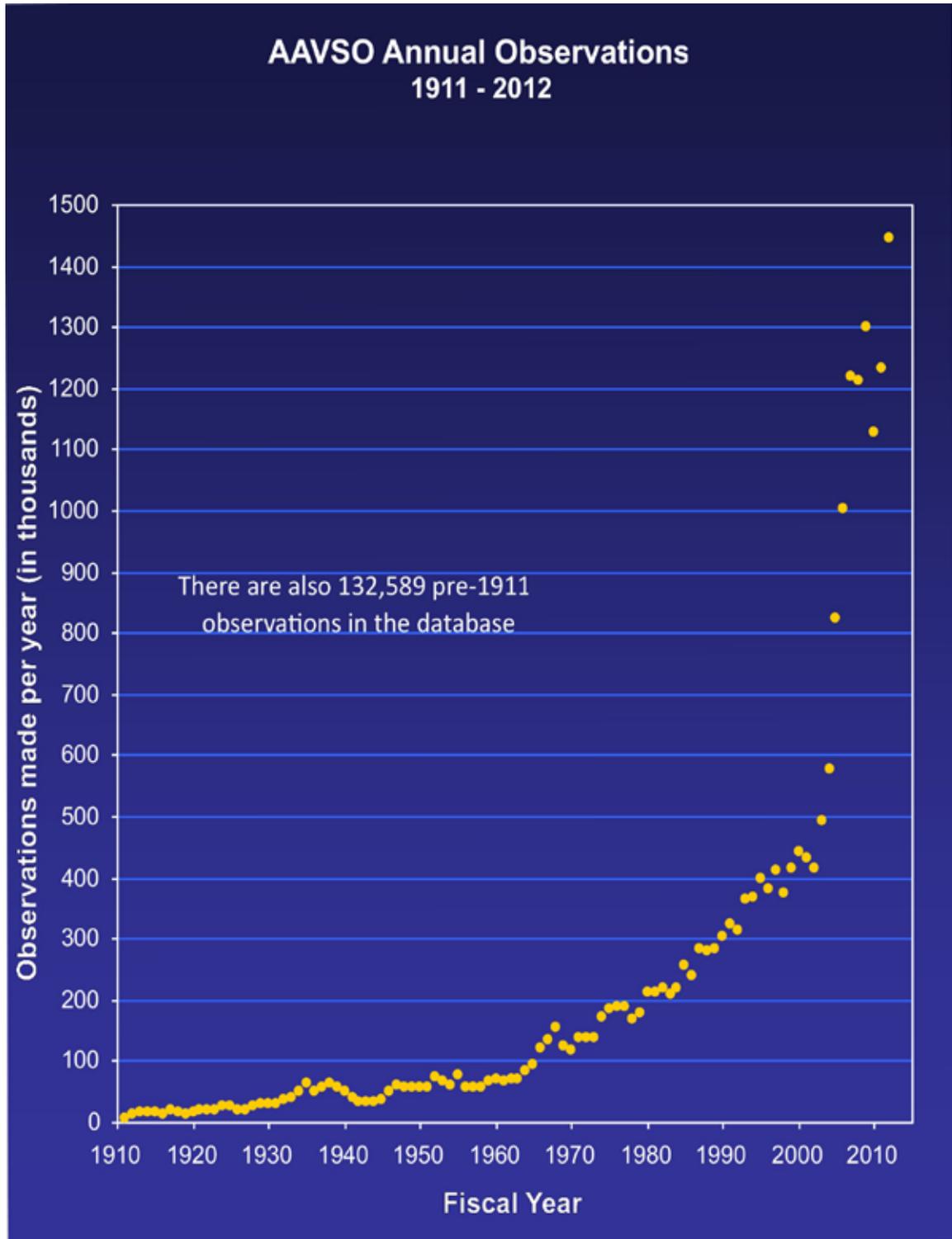
Number of data requests by month during FY 2011–2012

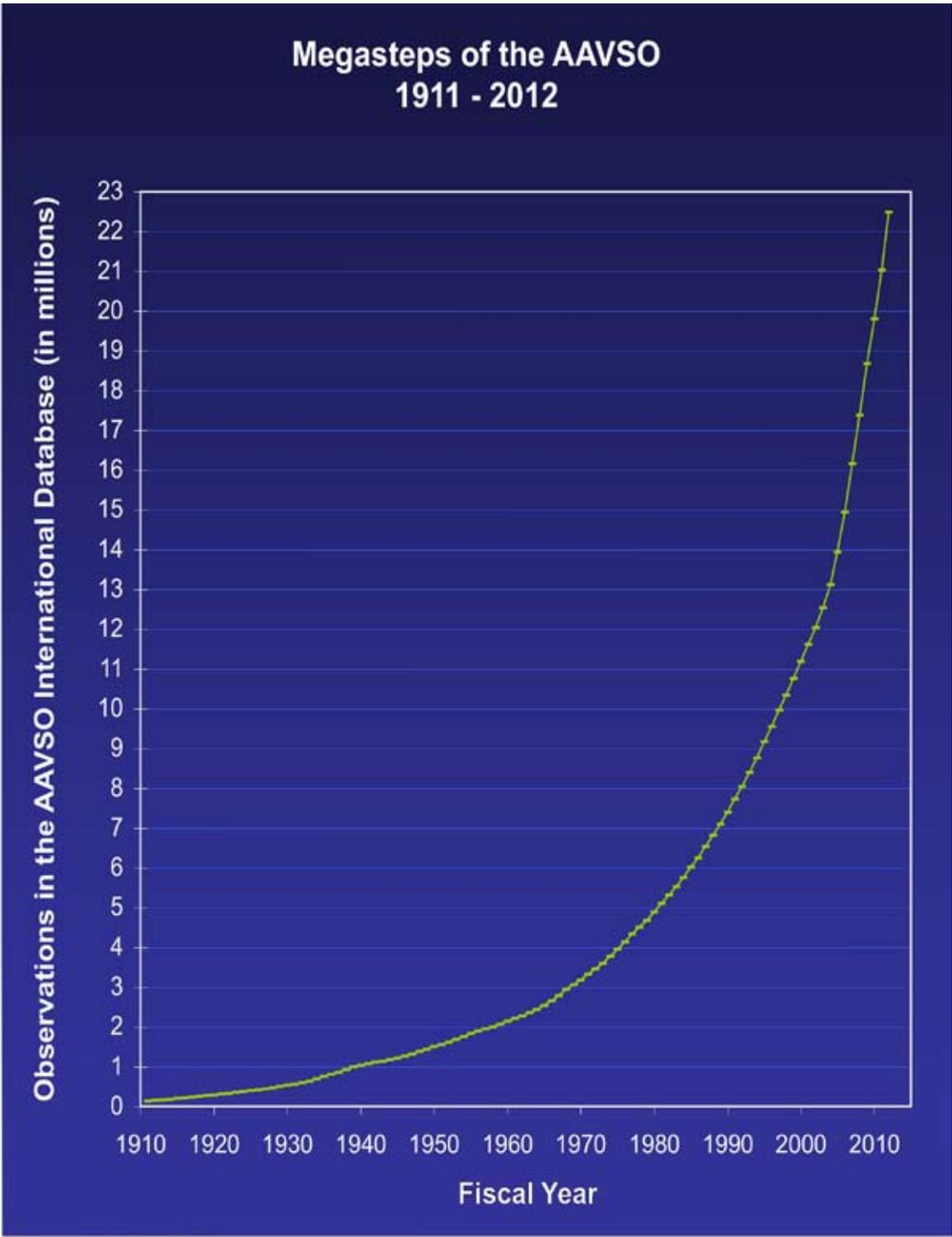


Areas in which AAVSO data or services were used during FY 2011–2012

Longtime member Tommy Cragg passed away in May 2011. Mary Cragg was kind enough to send us several boxes of his books and notebooks, including hundreds of solar drawings from the 1940s through the 2000s, his variable star observing charts, observing logs, and so on. Michael Saladyga is sorting through these boxes, retaining the historical documents and observational records. It is sad when one of the pioneers leaves us, but they live on through their observations and our memories of them.

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## 2. The Year in Review

### *International Cooperation*

We acknowledge with appreciation the observations sent to the AAVSO by members of the following variable star associations, either individually or as a group, for inclusion in the AAVSO International Database for dissemination to the astronomical community worldwide:

- a. Agrupacion Astronomica de Sabadell (Spain)
- b. Asociacion de Variabilistas de Espagne (Spain)
- c. Association of Variable Star Observers “Pleione” (Russia)
- d. Association Française des Observateurs d’Étoiles Variables (AFOEV) (France)
- e. Astronomical Society of Southern Africa, Variable Star Section
- f. Astronomisk Selskab (Scandinavia)
- g. Astronomischer Jugendclub (Austria)
- h. British Astronomical Association (BAA), Variable Star Section
- i. Bundesdeutsche Arbeitsgemeinschaft für Veränderliche Sterne e.V. (BAV) Germany)
- j. Center for Backyard Astronomy
- k. Koninklijke Nederlandse Vereniging Voor Weer-en Sterrenkunde, Werkgroep Veranderlijke Sterren (Netherlands)
- l. Liga Ibero-Americana de Astronomia (South America)
- m. Madrid Astronomical Association M1 (Spain)
- n. Magyar Csillagászati Egyesület, Valtózcillag Szakcsoport (Hungary)
- o. Norwegian Astronomical Society, Variable Star Section
- p. Nucleo de Estudo e Observacao Astronomica—Jose Bazilio de Souza (Florianopolis, Brazil)
- q. Red de Observadores (Montevideo, Uruguay)
- r. Rede de Astronomia Observacional (Brazil)
- s. Royal Astronomical Society of Canada
- t. Royal Astronomical Society of New Zealand, Variable Star Section
- u. Svensk Amator Astronomisk Förening, Variabelsektionen (Sweden)
- v. Ukraine Astronomical Group, Variable Star Section
- w. Unione Astrofili Italiani (Italy)
- x. URSA Astronomical Association, Variable Star Section (Finland)
- y. Variable Stars South (New Zealand)
- z. Vereniging Voor Sterrenkunde, Werkgroep Veranderlijke Sterren (Belgium)

Leonid Berdnikov (Moscow) stayed in the Guest Suite while he was working at the Harvard Plate Stacks in February 2012, investigating the long-term behavior of Cepheid variables.

### *The International Variable Star Index (VSX)*

A report on VSX, prepared by Sebastián Otero, can be found on page 71.

### *Computers and Software*

The data analysis computer used for APASS and AAVSONet has been upgraded a couple of times, most recently to use dual hexcore CPUs and a 14TB RAID disk farm. However, we noticed that there was some interaction between disk reads and the CPU; we think we finally over-updated the system. So we've replaced the data analysis computer with a newer version, and updated the disk farm to use 3TB Enterprise drives, giving us 21TB of disk space. As usual, we expect that disk space to rapidly disappear, but to date, the computer is behaving marvelously.

Our Web Developer Will McMMain continues his upgrade of the website. He is replacing many of the standard tools, like WebObs, with improved versions that are faster, have more features, and are easier to maintain. This will eventually result in a website that has a consistent programming style. As part of that upgrade, the discussion group mail-list was morphed into several on-line forums. These forums, such as the General AAVSO Discussion, can be found under the "Community" tab on the home page. The forum concept is more modern than mail-lists, is far easier to police for spam, and has many improved features such as inclusion of attachments and ability to use the full ISO universal character set. We've added many new forum topics, such as spectroscopy, young stars, and R CrB stars. Compared with the old discussion and photometry mail-lists, there is far more activity on the new forums, so I think they have been accepted!

Speaking about WebObs, it now has many search and sort options to give you more flexibility when submitting observations. The membership/subscription module was redone. We've added new section pages, expanded the AAVSONet web pages, and AAVSO Science Director Matthew Templeton wrote a neat Bulletin Generator for the *AAVSO Bulletin on Long Period Variables* that gives you the ability to pick and choose a customized list of stars to follow. MyNewsFlash was ported to the new website.

Richard (Doc) Kinne and Will worked together this past summer and ported the website to the Amazon Cloud. Amazingly, this process only took about a week (at least as far as the users were concerned!), and resulted in a site that is much faster than when we hosted it locally. The Cloud has far higher bandwidth than our old T-1 Internet line, and when we need more CPU speed or disk space, we just ask for a larger virtual computer (at an increased cost, of course!).

## 2. The Year in Review

VPHOT, the premier photometry analysis program written by Geir Klingenberg, has been moved to the Amazon Cloud. This is our first experience with cloud computing, and has been very successful. Users upload their images to the cloud server and can then analyze them there. An AAVSO Extended Format report is generated and can be submitted to the AAVSO through WebObs.

Matt has released his observation planning tool on the website. This uses the AAVSO International Variable Star Index (VSX), as well as searching the AID, and produces a list of objects that meet certain criteria chosen by the observer for monitoring on the current night.

VSTAR, the Java program written by David Benn as part of Citizen Sky, has undergone several improvements this past year. The major new feature involves plugins; you can add analysis routines of your own to the system or increase the ability to read external datasets. For example, Doug Welch added a SuperWASP plugin that can read the FITS table format of the photometry from this survey.

Mike Simonsen and the Sequence Team have been busy, releasing hundreds of new sequences throughout the year. It is amazing how quickly the team can react to a request, using the Seqplot software written by Sara Beck and the APASS and AAVSONet calibration databases to create lists of quality comparison stars. Once created, they become immediately available to the community on any subsequently plotted finding chart from VSP.

Doc and Matt were awarded a grant from the Virtual Astronomical Observatory. A “virtual” check accompanied the grant, in the form of help from expert programmers at the Harvard-Smithsonian Center for Astrophysics. These programmers gave guidance on how to publish the APASS catalog through VAO. Doc will be giving a poster at the upcoming AAS meeting in January about the process and access to APASS, and will be expanding our offerings to our other catalogs next year.

### ***AAVSONet News***

AAVSONet has had some good successes this year, along with a couple of backward steps. No new telescopes have been added to the network, but there have been a number of improvements in the infrastructure.

We were able to obtain donations from the AAVSO's CCD School participants to purchase several all-sky cloud cameras. One of the major frustrations with CTIO, where APASS-south is located, is the limited availability of a night-time sky monitor.

We therefore have purchased an Orion all-sky camera for the PROMPT location, and expect it to be installed in November 2012 when the University of North Carolina maintenance crew goes down to refurbish their telescopes. We also purchased a very inexpensive cloud camera from Moonglow Technologies, and placed it into service at HQ. This urban environment has plenty of light pollution, and so few stars are visible, but clouds are easily seen in the images (available at <http://www.allskycam.com/u.php?u=467>). This will be useful in evaluating HQ for any permanent telescope. Finally, the remaining funds purchased another Orion all-sky camera that will be placed into service at an AAVSONet site.

Bareket Observatory Israel	Bright Star Monitor (BSM) Stations	Cerro Tololo International Observatory (CTIO) Chile
B35 - Barakot 35cm Offline	BSM AR (Argentina) Offline BSM AU (Australia) Fully Operational BSM CA (California) Commissioning Phase BSM Berry (Massachusetts) Commissioning Phase BSM NM (New Mexico) Offline	APASS South Fully Operational
Cohen/Menke Observatory (CMO) New Hampshire	Dark Ridge Observatory (DRO) New Mexico	Hawkins Pond Observatory (HPO) New Hampshire
C30 - Cohen 30cm Pending Construction	APASS North Fully Operational DR51 - Morgan 0.61m Telescope Under Construction	HPO - Motz 0.85m Telescope Offline
Lowell Observatory Arizona	Mount John Observatory (MJO) New Zealand	New Mexico State University (NMSU) New Mexico
W28 - Wright 28cm Telescope Offline	OC61 - Optical Craftsman 0.61m Telescope Commissioning Phase	TMB1 - Tortugas Mountain 0.61m Telescope Commissioning Phase
Sonita Research Observatory (SRO) Arizona	Sutter Creek Observatory California	
SRO50 - SRO 50cm Telescope Fully Operational	W30 - Wright 30cm Telescope Commissioning Phase	

BSM\_South had birthing pains, all related to the telescope mount. It went through a couple of control boards and motors before becoming reliable. Peter Nelson, Chris Stockdale, and Rod Stubbings are running this system, which collects southern-star data on about 1/3 of the available nights. This is our first taste of the bright southern sky, and Elizabeth Waagen, our BSM\_South telescope advocate, has been thoroughly enjoying her task of reviewing images, with such pretty objects as S Dor in the LMC passing by on her computer screen. One of the expectations of BSM\_South will be the BVRI calibration of a number of bright southern object fields; the calibration database will be released in 2013.

*Geographical and technical information about the AAVSONet telescopes (from <http://www.aavso.org/aavsonet>)*

The Tortugas Mountain Observatory 24-inch telescope (ne TMO61) refurbishment was completed this year. A temporary QSI-583wsg camera, donated by Quantum Scientific, was placed into service at the f/5 Newtonian focus. As expected, the image quality was excellent, with several sub-arc-sec nights during the first run. This is going to be a fun telescope to operate! Gary Walker, Jon Holtzman, and I handled the first couple of runs, and John Gross is helping with some of the software. The NMSU mechanical shop did most of the hardware refurbishment, using undergraduate student help (see the nice video at [http://enr.nmsu.edu/news\\_items/2011\\_news/news\\_5\\_tortugas.shtml](http://enr.nmsu.edu/news_items/2011_news/news_5_tortugas.shtml)). Jerry Foote (Scopecraft) did the design of the motor system, and the controller is from SciTech and is working well. We had to get some help from Bob Denny (DC3 Dreams) and Dan Gray (SciTech) in order to understand how to run a torque-tube mount in the

## 2. The Year in Review

software, since it does not require a meridian flip. We have a few more software tasks to perform before releasing this telescope into the network, but that should happen in early 2013.

Mike Simonsen was tasked to create a list of all of the AAVSONet targets, and took this one step further by working with Donn Starkey, Jim Bedient, and Tom Krajci to develop the policy and procedures document for the Telescope Allocation Committee. Our President, Mario Motta, then selected Dirk Terrell as the chair of the TAC. Dirk has now selected the remaining members of the TAC, and they are starting their review of recently-received proposals for AAVSONet observations.

We've made numerous improvements to the processing pipeline. Each AAVSONet telescope has its own pipeline, and starts processing at a fixed hour through the next day. As images are processed, they are stored locally, sent to the ftp site, and optionally sent to a user's VPHOT account. An email notification is sent when images for a specific project are available.

Related to AAVSONet is Ford Observatory. This was Clint Ford's private observatory in California, situated on Mt. Peltier near Table Mountain (JPL's observatory) on the east side of the San Gabriel Mountains. The telescope was installed in the 1960s, but is a much older 18-inch telescope that found a new home with Clint. After his passing, the observatory was maintained by Msgr. Ron Royer for decades, with many AAVSO visual observers making estimates with the  $f/5$  telescope. Greg Thomas took over from Msgr. Royer about a decade ago, and has been carefully maintaining the facility ever since. However, the observatory has outlasted its usefulness for the AAVSO. We have had to maintain building insurance from our Massachusetts provider, with ever increasing concern on their part about the remoteness of the facility and the opportunity for liabilities. The lights from Victorville, Wrightwood, and the general L.A. area have been making it difficult to discern faint variables, and the telescope is purely a manual movement system. It was also a 9-month facility, as the mountaintop receives heavy snow in the winter. We made the decision to donate the facility to the Los Angeles Astronomical Society, and completed that process this year. Tim Thompson of the LAAS accepted the donation on their behalf, with the understanding that all AAVSO members are welcome to use the facility for visual estimates.

### ***APASS News***

The AAVSO Photometric All-Sky Survey (APASS) continues to operate nominally. The southern station has far more photometric weather than the north, and we've expanded its coverage to +20 Declination to make use of that good weather. It is fun running a

telescope from 6,000 miles away, watching the web cams and the weather sensors to decide on what programs to execute! Tom Smith has been doing a marvelous job of both running the northern station as well as helping me with the southern system when things go wrong or I am on travel.

All of the starlists are uploaded to HQ on a nightly basis. About once every four months, we perform additional processing on the starlists to improve the astrometry and photometry, and merge the results to create a master catalog. As of May 2012, we had made six data releases, with the last release containing 42 million stars that had been observed at least twice.

This DR6 was incorporated into UCAC4 so that one catalog now contains the highest precision astrometry as well as the best photometry for most of its stars. UCAC4 is due for release during the next fiscal year. DR6 was also the topic of a press conference at the American Astronomical Society meeting held in Anchorage in early June. It gained a lot of attention from the press, as well as interest from those passing by our accompanying poster.

APASS is a volunteer effort, with many AAVSO members helping me out on the myriad of tasks required for each data release. I've mentioned Tom Smith above, and would be remiss if I didn't also include the three professional astronomers associated with the project: Stephen Levine, who is doing the precision astrometry; Dirk Terrell, who is keeping the computers running; and Doug Welch, who is archiving much of the data as both a backup to the HQ copy and an on-line research tool. All of the volunteers will be part of the first APASS paper that will be submitted next year.

### ***Education***

Mike Simonsen and Aaron Price started a new AAVSO educational initiative: the Carolyn Hurless Online Institute for Continuing Education (CHOICE, named after longtime AAVSO visual observer Carolyn Hurless). These are short, on-line courses about diverse citizen-science topics. Each topic has a peer-level course leader and a separate on-line forum. Those who complete a course get a certificate and a notation in the membership database of their certification. The first courses dealt with photometric uncertainty, building a visual observing program, CCD calibration, and light curve classification. We expect to expand the course offerings each year. The student cost is minimal, and once the course materials are written, each re-offering of a course is much easier. Currently, staff are providing the initial course material, and after the course is offered once, a graduate of a course volunteers to be the leader of the next class. A typical class has 10 to 30 students and lasts for about a month.

## 2. The Year in Review

Kevin Paxson has been working with Aaron Price on a number of membership surveys. Similar surveys were done over a decade ago, and it was time to learn how attitudes have changed. The first survey was the Demographic and Background Survey, with the intent to find out where our members and observers are located, their ages and gender, and their astronomical interests. It was released in December 2011, and the results were published in April 2012. Nearly 700 responses were received, so the results are statistically robust. A report is available on the website. The council also set up a subcommittee to review this survey and make suggestions as to how best to use its results. The second survey, the AAVSO Strategy and Operations Survey, was announced shortly thereafter. Nearly 400 member and observer responses were submitted. The council is still studying the results. These were mostly positive regarding the current status and future direction of the organization, and with strong support of the staff and Director. However, many useful suggestions were made that will be considered for improving our association. The final survey being designed by Kevin is for learning how the professional community feels about the AAVSO, with the intent of finding new methods to improve our visibility and usefulness to the professional community.

The AAVSO held its first CCD School July 30–August 3, 2012. The school was held at Tufts University, as they offered an inexpensive venue for both classroom and lodging. About 25 students were present from all across the globe. The Director gave lectures for the entire week, covering topics from an introduction to digital sensors to photometry, transformation, statistics, and a dabbling of astrophysics. We hope to make this an annual affair, improving both the classes and the meeting space based on comments from the initial set of students.



*Participants in the AAVSO's CCD school held July–August 2012*

### *The AAVSO Citizen Sky Project*

As part of the IYA 2009 celebration, the AAVSO was awarded a major NSF grant to involve a large number of Citizen Scientists in a real research project—following the 27-year eclipse of epsilon Aurigae and developing scientific projects related to the event. The first workshop occurred just before FY 2009/2010, but the second workshop was held in early September 2010. That one, at the California Academy of Sciences, was devoted to data analysis and paper writing. The eclipse occurred on schedule, with thousands of estimates reported to the AAVSO. We're still monitoring the star out of eclipse to more fully understand the pulsational behavior of the visible F-class star. This will also help in removing the pulsational signature seen during the eclipse, so that we can study just the eclipse phenomenon itself.

Several "teams" were formed that designed science projects. One team created the Southern Gems beginner's set of objects for southern hemisphere observers. Another experimented with DSLR cameras, finding that they are excellent photometric instruments, especially for bright stars. In fact, we are planning on holding a third and final workshop, on DSLR photometry and the creation of a manual for use of these cameras in variable star astronomy.

As the main grant ended this year, we held a special event called Astro-April, in which we had experts in several research areas give Webinars. Presenters included Grant Foster, Kris Larsen, John Martin, Steve Howell, Sebastian Otero, Bob Stencel, Bob Naeye, Kevin Marvel, Brian Kloppenborg, Alfon Smith, Paul Shankland, and Doug Welch.

The Citizen Sky project may have highlighted the eps Aur eclipse, but the infrastructure to develop the campaign, the website tools, the team concept, and the many volunteers are going to be used in the future to develop a new research area for the AAVSO devoted to bright stars. As a first step in this direction, Mike Simonsen and the sequence team have created new sequences for about 200 binocular variables—the first time that the AAVSO has had a binocular program. There will be more regarding Citizen Sky and the bright star project in the next Annual Report as this new direction is announced.

### *External Grants*

#### **MOST NASA grant**

Matthew Templeton was awarded a NASA grant last year, using the Canadian MOST spacecraft. MOST is a 12-cm telescope with a CCD camera, designed to observe a single field for weeks on end, obtaining precision photometric data of bright stars. Originally,

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MOST concentrated on stars fourth magnitude or brighter, obtaining micromagnitude precision. More recently, they've used their guiding chip to image fainter objects down to about twelfth magnitude with lower precision, but still far better than ground-based observations. Matt proposed using MOST to study stars in the Orion Trapezium region, concentrating on BM Ori but also imaging another couple of dozen stars. Those observations were taken during December 2010 and January 2011, for a total of about thirty consecutive days of data. We supported those observations with a ground-based campaign to acquire photometry before, during, and after the MOST window. Many nights of data were also obtained with the AAVSO Bright Star Monitor. Matt is now in the process of analyzing the observations, with several papers expected in collaboration with Bill Herbst (Weslyan University) and Joyce Guzik (LANL).

### Two Eyes, 3D NSF grant

Aaron submitted a new Education Research grant to the NSF Informal Science Education (ISE) branch, and was again successful. This grant, called *Two Eyes, 3-D*, studies the cognitive processes and learning outcomes involved in 2D and stereoscopic visualizations of highly spatial scientific objects, with a goal of building a more effective learning experience. Aaron will study school children using a series of images in both 2D and 3D and ask content and spatial questions about what they see. A pair of HD stereoscopic films about colliding galaxies and supernovae will be developed and presented by the Alder Planetarium as well, to study how adults learn spatial concepts. The tie-in for the AAVSO is in the variable star aspects of the movies and images, an understanding of how to better make finding charts, and the additional funding that will be available for our infrastructure.

### Second Generation Synoptic Survey (2GSS) grant

We've also received a major new grant from the Robert Martin Ayers Sciences Fund. Provisionally called the Second Generation Synoptic Survey (2GSS), this project aims to cover the entire sky, every night, from 10th to 17th magnitude, in two simultaneous bandpasses. This is much like ASAS (All-Sky Automated Survey) on steroids. It is a follow-on to APASS, highly leveraging its excellent calibrations to permit observations anywhere in the sky in even non-photometric weather. The grant pays for the first node of an anticipated five-node network. Once the initial node is operational, we will submit an NSF grant to pay for the remaining installations. We expect to be taking science data with the first node by mid- 2013, covering 8000 square degrees every clear night.

### **Nova grant**

Jeno Sokoloski, a Council member, was recently awarded an NSF grant, "Beyond Spherical Cows: Writing the Next Chapter on Novae." As part of that grant, Jeno has agreed to be the science advisor for the Nova Section of the AAVSO, and will work with the AAVSO to obtain optical light curves of the novae that will be studied. The AAVSO has a sub-contract with her for performing the campaign effort. This is a three-year award, so look forward to a dramatic increase in nova monitoring activity for the AAVSO!

### ***The Janet A. Mattei Research Fellowship***

Ulisse Munari (Asiago Observatory) was the JAM Fellow this year. Ulisse was at headquarters for about a month, working on various aspects of APASS. A paper on effective temperatures and interstellar extinction as calculated from APASS photometry was submitted to *Astronomy and Astrophysics*. Ulisse also brought an interesting project: the study of a new star stream of our Galaxy, thought to be caused by the breakup of a globular cluster. We programmed APASS-south to monitor the location of the southern branch of the Aquarius stream, finding dozens of new RR Lyr stars as well as over 1000 other new variables. Ulisse also fit the APASS  $g'/r'/i'$  magnitudes to produce Cousins Rc/lc magnitudes. This fit will be part of the upcoming APASS survey paper. Ulisse also gave a lunch-time talk to the AAVSO staff regarding the training of his team of amateur astronomers, and how they are able to produce exquisite photometry of novae and symbiotic stars.

Ulisse also inquired as to the availability of a large telescope mirror for an Italian observatory. Schiaparelli Observatory in Varese was largely completed before the untimely demise of its Director. The telescope mount and building were designed for up to one-meter aperture optics, and if completed, would be used for precision spectroscopy in support of Ulisse's novae and symbiotic star research. Mario Motta offered to donate his spare 80-cm mirror to the AAVSO in support of the Schiaparelli Observatory. We will have more details about this new system in next year's Annual Report, after the mirror is installed in the telescope. Mario will now have all three of his 80cm-class mirrors in active use. Thanks, Mario, for this marvelous donation!

### ***Headquarters News***

We purchased the HQ building from *Sky and Telescope* "as-is." In general, the building was in fine shape, but needed some basic repairs after many years of service. We refurbished the interior the first few years, repainting nearly every surface. We created the Dorrit Hoffleit Conference Center by raising the ceiling eighteen inches, improving

## 2. The Year in Review

the insulation, and moving the HVAC system to provide more space. Virginia Renehan and Mike Simonsen worked on the upstairs bathrooms, tiling the floors, adding new vanities and toilets, and painting everything.

This year we started work on the exterior landscaping. Linda Henden (who was a landscape designer in an earlier career) made a landscape design for the residential part of HQ, and we removed all of the grass, added cedar bark chips, and replaced the old chain-link fence with a new modern white vinyl fence. The architect for the new condominiums across the street offered to purchase and install at cost any plant material that we might need for the renovation, and so we now have two new trees and a number of new bushes. The yard looks great, dramatically improving the appearance of HQ. We still have a small amount of landscaping to do in front of the main building.

As mentioned above, the two yellow houses across the street that used to belong to *Sky & Telescope* were finally demolished. In their place are two new condo and apartment buildings, each containing five units. These were delivered as modular units in May. A series of flat-bed trucks drove up, and a crane lifted each section of the building over the power lines and into their final position. In just a few months, these buildings were finished and their units put on the market. It looks like they will be good neighbors, and the area surrounding HQ is becoming much more residential and attractive in character.

Surprisingly, a new neighbor showed up in August—a wild turkey! This bird was seen every day, walking down the street and visiting nearby yards in search of food. Cars would slow down and drivers would lean out the window with their cell-phones to get pictures of this guest.

### *Campaign News*

AAVSO data and assistance continue to be in high demand from the professional community around the world. This year AAVSO observers participated optically—and in some cases spectroscopically as well—in 23 observing campaigns on over 60 objects and followed the outburst and decline of 12 galactic novae and numerous extragalactic supernovae.

Observations were made using different methods: visual (eye plus telescope or binoculars), DSLR photometry, photoelectric photometry (primarily V band), near-infrared (J and H bands) photometry, CCD BVRI photometry, and spectroscopy. As spectroscopy becomes increasingly available as an amateur astronomer resource, more AAVSO observers are participating in this relatively new field.

Campaign targets ranged from young stellar objects to supernovae and everything in between—symbiotics, RCB stars, Miras, cataclysmic variables of every type, novae and recurrent novae, eclipsing binaries, exoplanets, blazars, and quasars—and even included an occultation of Pluto to study its atmosphere and extinctions of Jovian satellites to learn more about dust, atmospheres, and magnetic fields in this complex system. Some targets were monitored for weeks or months, some for only a few days, and cadence (frequency) ranged from once per night to every few minutes for as many hours as possible. A few of this year's campaigns are described below.

Dr. Boris Gaensicke (Warwick University) and fifteen professional colleagues organized a major campaign to use the HST Cosmic Origins Spectrograph to make far-ultraviolet observations of 45 cataclysmic variables over several months. HST observes a new target every ten to fourteen days; ongoing and overlapping close monitoring of current and upcoming targets is carried out by AAVSO observers to provide baseline light curves and to ensure HST instrumentation safety by knowing if the system is below a threshold magnitude twenty-four hours prior to the HST observations. This campaign continues this year.

Dr. James Miller-Jones (Curtin University, Australia) led a second multiwavelength campaign on the dwarf nova SS Cyg to follow up on their earlier successful campaign in which they discovered radio emission from SS Cyg. AAVSO observers monitored SS Cyg for outbursts; this monitoring was complicated by the need for detection of the outburst in the very earliest stages, confirmation of the event, and instant transmission of the event to the astronomers. This meticulous and painstaking work was accomplished by AAVSOers for three outbursts, and exciting results were obtained which will be announced in early 2013.

Dr. Margarita Karovska (Harvard-Smithsonian Center for Astrophysics) organized a campaign to study the central region of the symbiotic variable CH Cyg and its jet that was discovered recently. AAVSO observers provided visual observations, multicolor photometry, and spectra to monitor the state of the system and correlate HST and Chandra observations. Thanks to AAVSO data, atypical behavior of CH Cyg was detected and the campaign was extended so the study could be continued.

An example of how the AAVSO is on the cutting edge of research is the campaign led by Dr. Eric Mamajek (Cerro Tololo Interamerican Observatory and University of Rochester) on the young star 1SWASP J140747.93-394542. This star has a transiting ringed substellar companion, and AAVSO observers were asked to help determine the related eclipse in order to plan a major campaign.

## 2. The Year in Review

Solar system objects are not usually AAVSO observing campaign targets, but both cases this year (Pluto, Dr. Leslie Young of Southwest Research Institute, and Jupiter, Scotty Degenhardt, International Occultation Timing Association) required the precise observing skills learned by AAVSO photometrists in their searches for the very shallow eclipses indicating exoplanet transits.

Details of observing campaigns and related information may be found on the AAVSO website (<http://www.aavso.org/observing-campaigns>). The campaigns are exciting and impressive both in their scope and in the level of contributions the professional astronomers believe AAVSO observers can make to their research.

In support of the many campaigns, the Sequence Team, led by Mike Simonsen, created hundreds of new and revised sequences during the year. A typical transient sequence is created and uploaded within hours of notification, a far cry from the pre-VSP days, when a new sequence could take days or weeks to propagate through the community. This is particularly valuable for the many new cataclysmic variables being discovered by the surveys, and for the dozen new novae that went into outburst this past year.

### *Centenary Celebrations*

The majority of our centennial celebration took place last fiscal year; however, the actual meeting occurred in October 2011. This meeting lasted over several days, including a banquet dinner for prior Council members and special talks during the meeting. It was well attended by members and guests who had to travel great distances. Coverage of this meeting is given in last year's *Annual Report* and in the January 2012 *AAVSO Newsletter*.

### *Staffing*

Mike Simonsen was given the Charles Butterworth award from the British Astronomical Association-Variable Star Section (BAA-VSS). This is their main award, and it could not have gone to a better candidate. Mike has given much of his life towards mentoring new observers, producing variable star charts, and spearheading many public outreach activities, long before he joined the AAVSO staff. Mike also was given the Leslie C. Peltier Award by the Astronomical League at their convention in July.

We've added a staff blog on the home page of the website. This contains short articles primarily from the HQ staff, describing various events (like TURKEE), places that we've been, people that we've met.

Linda decided to retire, and we hired a new accounting clerk to take her place. Kathy Vnek comes with great credentials, having performed similar work at other businesses and even having run a tax preparation service as a sideline. She came up to speed quickly and has made our bookkeeping more in-line with modern accounting practices. Gary Billings also decided to retire as AAVSO Treasurer, and was replaced by Tim Hager. Tim is an accountant in Connecticut and has taken to the task of monitoring the AAVSO finances with ease. He is close enough that he can come up to HQ if necessary.

We've had one sad note this year—Aaron Price left the AAVSO staff after he was offered the position of Manager of Research and Evaluation at the Chicago Museum of Science and Industry. The job advertisement looked like it was written specifically for Aaron, and he has found that it actually is as good as advertised. Aaron and his family moved to Chicago in July and love it there. Aaron stays in touch with the AAVSO, working as a consultant on the Two Eyes, 3D grant and volunteering time to help on software tasks. He also has provided several grant ideas and is working to form collaborations between the AAVSO and MSI. Aaron has not been replaced on staff. Rebecca has taken over his management duties and was promoted to Operations Director. Aaron's programming duties have been split between Will and Doc, with some activities handled by volunteers.

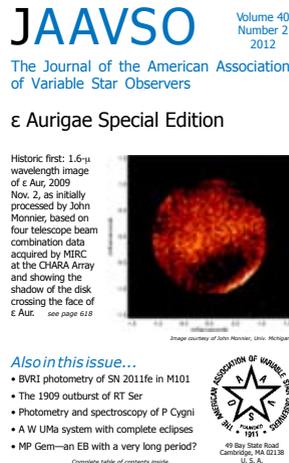
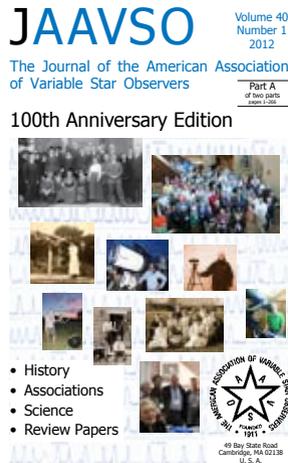
Ben Briggs returned to HQ for the June–August period (our Summer). He worked at HQ the prior summer, learning our website, and this year was able to be a valuable asset in taking over most of Will's duties during the period when Will needed to be programming for Two Eyes, 3D. Ben is a competent programmer and takes on projects willingly. Aaron Sliski was our Margaret Mayall Assistant this summer after graduating from high school, and helped the Director in getting hardware set up. He assembled BSM-Berry and did much of the software configuration, as well as working with several of the CCD cameras. His father (Alan) and brother (David) have been working on refurbishing historical telescopes for years, and have volunteered to help with the HQ robotic telescopes. David gave a great tour for the CCD School, showing the participants the Great Refractor at Harvard College Observatory. Aaron will be attending Suffolk University and hopes to be able to continue working at HQ part-time through the school year.

Other than these changes, headquarters staffing has remained constant. With the new additions, we have eleven full-time employees, along with two part-time staff members. All permanent employees are described on our website at <http://www.aavso.org/aavso/about/staff.shtml>. I encourage you to read about these folk that support the members and observers; it is a really nice and efficient staff at HQ!

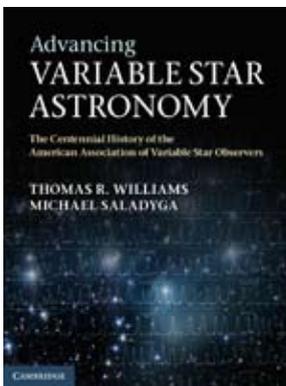
## 2. The Year in Review

### Publications

We published the largest *JAAVSO* issue in AAVSO history in August 2012; Volume 40, Number 1 was the issue commemorating the 100th anniversary of the AAVSO. Not only did it contain the usual contributed papers, but also a large set of invited review papers, totalling 608 pages in two parts. If you buy only one issue of *JAAVSO* for the next decade, you should buy this one. Mike Saladyga, Elizabeth Waagen, and Matt Templeton should be applauded for the enormous effort involved in bringing this issue to press. Volume 40, Number 2, due to be published in December, is dedicated to epsilon Aurigae and the Citizen Sky project, and promises to be another extremely large one, about 3/4 the size as the preceding issue.



*JAAVSO* Volume 40, Numbers 1 (Part A cover shown here) and 2, 2012



*The AAVSO Centennial History*

Don't forget *Advancing Variable Star Astronomy*, the Centenary history written by Tom Williams and Mike Saladyga! We still have several copies of this book for sale at HQ at a reduced price.

Our other publications were delivered on their regular schedule: 9 *Solar Bulletins*, 4 *Newsletters*, and translations of the *Visual Observing Manual* into Hungarian and Persian (Farsi). We posted 23 *Alert Notices* and 37 *Special Notices*. We contributed sections for the *RASC Observer's Handbook*. Elizabeth completed long period variable maxima/minima *AAVSO Bulletin 76*. The AAVSO released the annual eclipsing binary/RR Lyrae stars ephemerides.

There were 56 staff publications (Henden, Price, Templeton, Waagen; *PASP*, *AJ*, *JAAVSO*, etc.). We noted that 84 papers in journals such as *A&A*, *MNRAS*, *ApJ*, *AJ*, *PASP*, etc. were published using AAVSO data and assistance. The actual number is larger than this, as many posters and papers at AAS meetings use our light curves in their presentations.

### *Travel and Meetings*

I traveled extensively this year, including a few personal trips. Shane Larsen (Utah State University) met Rebecca Turner at the Table Mountain Star Party last year, and he then contacted me to ask if I was willing to come to Logan in November and give a colloquium. Shane is a gravitational wave expert and would like to make use of some of our wide-field optical imaging capability to look for optical counterparts to transient gravitational wave events. I was invited to attend in December 2011 an IAU workshop by the Office of Astronomy for Development (OAD) in Cape Town. The OAD is trying to find ways of promoting science in developing countries, and astronomy is the ideal subject to reach a broad audience. While traveling to Cape Town, I had a full day layover in London, and used the time to attend a British Astronomical Association meeting in Burlington House.

In March 2012, I went to Las Cruces to work on the NMSU 24-inch telescope (TMO61). This telescope will be part of our robotic telescope network. Gary Walker joined me, and along with Jon Holtzman (the chair of the astronomy department), we were able to make rapid progress on refurbishing the telescope.

We held a joint meeting with the Society for Astronomical Sciences (SAS) in May 2012. This was the second joint meeting with SAS, and there was a good crowd from the Center for Backyard Astrophysics (CBA) group there as well. Prior to the meeting, an annular eclipse of the sun took place. Linda and I went to Jerry Foote's house in Kenab to watch the event, with excellent weather.

I went to both of the American Astronomical Society (AAS) meetings this year. The winter meeting was held in January 2012 in Austin, TX. This is the big AAS meeting, as many students and postdocs attend to give research papers and look for employment. About half of the attendance is under thirty years old—a great meeting to see enthusiasm and unique ideas. Matt and Aaron also attended, with Aaron giving his dissertation talk. The summer meeting was held in Anchorage in June 2012. That gave Linda and me a chance to tour part of Alaska—an absolutely gorgeous place to visit. The meeting itself was better attended than I expected, perhaps due to the exotic location. As mentioned earlier, I gave a press conference on the DR6 APASS release.

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A conference on standardization of large surveys was given at FermiLabs near Chicago in April. I gave a paper on the use of APASS for photometric calibration. The Midwest Astronomical Imaging Conference was held in parallel with the Astronomical League convention near Chicago in July, and I was invited by Joe Ulowetz to give a talk on how the deep sky imagers can get involved in research.

The Large Synoptic Survey Telescope (LSST) team held an All-Hands meeting in Tucson during early August. Suzanne Jacoby paid for my participation at that meeting, as part of both the education/public outreach collaboration and the transient/variable star group. Tucson in August is a very hot place to be, but the LSST meeting was a large one and took over an entire resort (Dove Mountain) with plenty of air conditioning and swimming pools. I picked up a Paramount ME in Tucson and drove it up to Lowell Observatory (Flagstaff, Arizona) before the meeting. Stephen Levine is helping us install the first of the survey telescopes on Anderson Mesa; the mount is going to be used for that project.

Mike Simonsen hung out at the Winter Star Party (Florida) in February, telling everyone he could corner about variable stars and the AAVSO. He did the same thing at the Cherry Springs (Pennsylvania) Star Party in June. Doc Kinne gave an AAVSO talk at Stellafane (Vermont) in August with good attendance.

There were numerous smaller events. I participated in a few NSF/NASA review panels. Mike Simonsen gave local talks, as well as some web-based lectures. I talked about variable stars at Wheaton College in the Boston area. Most of the travel for the staff and me is partially or completely funded by the meeting coordinators.

### *Looking Towards the Future*

Coming up over the next fiscal year will be a number of improvements in support of our Observers, with more consistent interfaces to the web software. We will be adding more precision photometry to the comparison star database. APASS will complete its secondary 2-observation survey. More campaigns will be announced. The robotic telescope network will be expanded, with all of the 24-inch telescopes coming on-line. Hopefully some of our submitted grants will be awarded. All-in-all, I think it will be another great year for the AAVSO!

### *Acknowledgements*

This is not a one-person show, or even a dozen-person show. Everyone who has contributed data, made a monetary donation, volunteered their time and energy, has made this organization the success that it is. We “stand on the shoulders of giants” who

came before us and built the foundation of the organization. Clint Ford contributed enormously to the organization, which is why his name bears such prominence everywhere. Previous Directors organized the association and had the vision for its future. The Council guides the AAVSO, volunteering their efforts to make the organization financially solvent and relevant. Our section chairs handle specific areas of interest, working with enthusiastic observers and making reports to the membership and Council. Others work quietly behind the scene, acting as scientific advisors to programs, writing important software, or participating in important projects such as the Sequence Team. Finally, many institutions and government agencies see our research important enough to provide financial support. Without all of these people, the AAVSO would not exist.

### *Observer Totals*

Our special appreciation and thanks go to our enthusiastic and dedicated observers, who are the heart of the AAVSO and whose ongoing efforts make this association vital to variable star research. Listed on the following pages are the observation totals that we have received at Headquarters.

## 2. The Year in Review

Table 1. AAVSO Observer Totals 2011–2012 by Country.\*

Country	No. Observers	No. Obs.	Country	No. Observers	No. Obs.	Country	No. Observers	No. Obs.
Argentina	4	70	Greece	6	1399	Singapore	1	2
Australia	28	115317	Guatemala	1	1	Slovakia	2	4469
Austria	3	1264	Hungary	42	14946	Slovenia	5	344
Belgium	19	354610	India	1	400	South Africa	5	487
Bermuda	1	63	Indonesia	1	6	Spain	45	85478
Bolivia	2	118	Iran	3	7	Sweden	10	11610
Brazil	44	3438	Ireland	3	140	Switzerland	2	38
Bulgaria	4	15	Italy	43	15024	Turkey	2	12
Canada	37	21132	Japan	5	987	U.S.A.	254	559858
Chile	3	106	Mexico	2	511	Ukraine	2	6246
China	12	602	Netherlands	10	5346	Uruguay	1	1
Croatia	4	4166	New Zealand	4	2792			
Cyprus	1	3785	Norway	2	177	TOTAL	792	1465382
Czech Republic	2	43	Philippines	1	132			
Denmark	6	1284	Poland	24	11036			
England	38	90707	Portugal	3	408			
Finland	13	49208	Romania	8	4742			
France	36	67831	Russia	8	1052			
Germany	38	23282	Serbia and Montenegro	1	690			

Table 2. AAVSO Observer Totals 2011–2012 USA by State or Territory.\*

State	No. Observers	No. Obs.	State	No. Observers	No. Obs.	State	No. Observers	No. Obs.
APO/FPO (AE)	1	643	Maryland (MD)	4	1434	Pennsylvania (PA)	7	1743
Arizona (AZ)	10	6241	Massachusetts (MA)	17	33847	Rhode Island (RI)	1	281
Arkansas (AR)	4	398	Michigan (MI)	8	15628	South Carolina (SC)	3	179
California (CA)	23	40496	Minnesota (MN)	6	893	Tennessee (TN)	1	64
Colorado (CO)	7	202	Mississippi (MS)	2	1063	Texas (TX)	19	6155
Connecticut (CT)	3	1227	Missouri (MO)	3	11944	Utah (UT)	2	1379
Delaware (DE)	1	6	Montana (MT)	1	54978	Vermont (VT)	3	86
Florida (FL)	7	47516	Nebraska (NE)	2	99	Virginia (VA)	4	59
Georgia (GA)	4	566	Nevada (NV)	3	1390	Washington (WA)	5	18
Hawaii (HI)	2	1629	New Hampshire (NH)	3	2003	West Virginia (WV)	2	1134
Idaho (ID)	1	3	New Jersey (NJ)	6	122	Wisconsin (WI)	9	28753
Illinois (IL)	16	45875	New Mexico (NM)	9	145863	Wyoming (WY)	1	11
Indiana (IN)	9	47306	New York (NY)	13	7356			
Iowa (IA)	2	475	North Carolina (NC)	4	1146	TOTAL	254	559858
Kansas (KS)	8	991	Ohio (OH)	7	625			
Kentucky (KY)	2	217	Oklahoma (OK)	3	58			
Maine (ME)	3	1077	Oregon (OR)	3	46679			

\* Totals reflect observations made during fiscal 2011–2012 and do not include historical data (data preceding fiscal 2010–2011) submitted during fiscal 2011–2012.

Table 3. AAVSO Observers, 2011–2012, cont.\*

<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No. Obs.</i>	<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No. Obs.</i>
AAP		P. Abbott, Canada	2339	BJWB		J. Bispo, Brazil	2
AAN	02	A. Abe, Germany	180	BXN	01	M. Bisson, France	143
ADBA		D. Acker, PA	4	BXT	08	T. Bjerkgard, Norway	176
ACN	13	C. Adib, Brazil	608	BRAC		R. Black, OK	34
ASA		S. Aguirre, Mexico	503	BKL		J. Blackwell, NH	48
AFSA		F. Alfar, Spain	398	BVZ		J. Blanco Gonzalez, Spain	57
ACO	20	C. Allen, Sweden	1673	BLD	10	D. Blane, South Africa	368
AJC	13	J. Almeida, Brazil	135	BDSA		D. Blazko, Slovenia	181
AJV	15	J. Alonso, Spain	349	BWZ		E. Blown, New Zealand	1344
AKV		K. Alton, NJ	34	BJAA		J. Boardman, WI	3991
AAX	13	A. Amorim, Brazil	1845	BWJ		J. Bohdanowicz, Canada	5
AMG	13	M. Amorim, Brazil	56	BHQ	29	T. Bohlson, Australia	2649
ARLA		R. Andersson, Sweden	136	BBOA		B. Boitnott, TX	2
AADA		A. Anunziato, Argentina	19	BVS		S. Bolzoni, Italy	20
AAM		A. Arminski, Poland	504	BZU		M. Bonnardeau, France	107
AMBA		M. Arndt, MA	1	BRJ		J. Bortle, NY	5419
ARJ		J. Arnold, TX	65	BDLA		D. Boulet, DE	6
ARN	01	L. Arnold, France	119	BMU	04	R. Bouma, Netherlands	21
ATE		T. Arranz, Spain	46298	BDG	20	D. Boyd, England	16144
ATI	03	T. Asztalos, Hungary	960	BMK		M. Bradbury, IN	103
AAUA		M. Audejean, France	489	BXS		S. Brady, NH	326
ADI	02	D. Augart, Germany	343	BRAF		R. Braga, Italy	3
AANC		A. Ayiomamitis, Greece	196	BJFA		J. Brandie, China	133
AJBA	36	J. Azevedo, Brazil	15	BNW	02	W. Braune, Germany	39
BJAN	03	J. Bacsa, Hungary	41	BQC	01	J. Breard, France	19
BOZ	03	B. Bago, Hungary	1290	BTB		T. Bretl, MN	255
BPEA		P. Bagyinszki, Hungary	56	BMI		M. Brewster, TX	2
BIY		D. Bailey, IL	5	BQE		E. Briggs, Canada	41
BIE	05	A. Baillien, Belgium	50	BJFB		J. Briol, MN	100
BSEB		S. Bais, Argentina	11	BAVA		A. Broceno, Spain	1
BJEA		J. Baker, KS	43	BPEB		P. Brock, England	2355
BWW		W. Bakewell, CA	9	BJOB		J. Brooks, VA	5
BFO	03	J. Bakos, Hungary	1893	BXV	15	X. Bros Caton, Spain	6
BVN	18	M. Banfi, Italy	118	BBM		B. Brown, WA	8
BGZ		G. Banialis, IL	219	BPR	01	P. Brunet, France	3
BHAA		H. Barghamadi, Iran	3	BOA	01	A. Bruno, France	12488
BSR	18	S. Baroni, Italy	151	BANH		A. Busato, Italy	10
BPO		D. Barrett, France	1898	BIW		N. Butterworth, Australia	2583
BQ	03	L. Bartha, Hungary	1344	CCB		C. Calia, CT	434
BVT		T. Bartlett, TX	8	CMN		R. Cameron, Australia	30
BWAA		W. Basso, Canada	37	CMQ		P. Camilleri, Australia	224
BBA		B. Beaman, IL	2602	CPN	27	P. Campbell, Canada	50
BWX	27	A. Beaton, Canada	52	CMP		R. Campbell, FL	2213
BMAC		M. Bedard, Canada	177	CSHA		S. Campbell, Canada	95
BJS		J. Bedient, HI	3	CEM	15	E. Capella, Spain	27
BVEA		V. Bell, NJ	3	CDAC		D. Caporicci, Italy	2
BZX		A. Beltran, Bolivia	107	CALA		A. Caradossi, Italy	9
PNQ		R. Benavides Palencia, Spain	1244	CADA	36	A. Cardoso, Brazil	44
BHS		H. Bengtsson, Sweden	1128	CALB		A. Carreno, Spain	824
BDJB		D. Benn, Australia	6	CROA		R. Carstens, New Zealand	1172
BTY		T. Benner, PA	271	CNY		A. Cason, GA	14
BMRA		M. Bennett, NY	1	CLQ		L. Cason, SC	44
BEB		R. Berg, IN	363	CJE	01	J. Castellani, France	423
BGMB		G. Bertani, Italy	215	CWO		W. Castro, OH	30
BRIA		R. Biernikowicz, Poland	305	CDZ		D. Cejudo Fernandez, Spain	11967
BQM		M. Bignotti, Italy	149	COJ		J. Centala, IA	280
BBI	05	B. Billiaert, Belgium	1791	CMAB		M. Cervoni, Italy	5
BGW		G. Billings, Canada	1905	CNT		D. Chantiles, CA	380
BLOA		L. Bing, China	10	CGF		G. Chaple, MA	10

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Table 3. AAVSO Observers, 2011–2012, cont.\*

<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No.</i> <i>Obs.</i>	<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No.</i> <i>Obs.</i>
CGRA		G. Chapman, KS	278	DRD		R. Dietz, CO	9
CBEA		B. Chardi, Spain	2	DLA		A. Dill, KS	283
CTIB		T. Chen, China	43	DMVA		M. Do Prado, Brazil	16
CXIA		X. Chen, China	8	DRDB		R. Dos Santos, Brazil	1
CQS		S. Cheng, China	241	DRDA		R. Dos Santos, Brazil	12
CCY		C. Chiselbrook, GA	523	DRHA		R. Douglas, NM	1
CCX		C. Chrestani, Brazil	20	DXA		A. Douvris, Greece	65
CMAA		M. Ciocca, KY	213	DDJ		D. Dowhos, Canada	39
CWP		W. Clarke, AZ	379	DJIA		J. Du, China	40
CPE		P. Closas, Spain	357	DSE		S. Du, China	30
CDK		D. Collins, NC	827	DDP		D. Duarte Cavalcante Pinto, Brazil 1	
COL		P. Collins, AZ	10	DPV	09	P. Dubovsky, Slovakia	3372
CME	18	E. Colombo, Italy	141	DROB		R. Dudley, VT	2
CTIA		T. Colombo, Italy	656	DMO	01	M. Dumont, France	567
CMG	04	G. Comello, Netherlands	28	DMPA		M. Durkin, NY	151
CDSA		D. Conner, England	13	DFEA		F. Dutton, MI	32
CEMB		E. Conseil, France	935	DKS		S. Dvorak, FL	42155
CMJA		M. Cook, Canada	13	DGP		G. Dyck, MA	1262
CGI		G. Corfini, Italy	217	EHEA		H. Eggenstein, Germany	16
CLZ		L. Corp, France	5826	EMA		M. Eichenberger, Switzerland	12
CAI		A. Correia, Portugal	196	ELE		L. Elenin, Russia	399
CMM		M. Costello, CA	18104	EY		E. Erdelyi, CA	420
CKLA		K. Cotar, Slovenia	95	EJC		J. Escudero, Spain	19
CDN		D. Cowles, TX	3	ERW	14	R. Evans, New Zealand	6
CXO		J. Cox, England	2	EJDA		J. Evelan, AZ	11
CTX		T. Crawford, OR	5846	FJDA		J. Fadem, NC	310
CBLA		B. Crosby, SC	2	FWJA		W. Fahey, NE	23
CMD	20	M. Crow, England	52	FJAA		J. Falcon, Spain	18
CMJC		M. Crowe, England	28	FREA		R. Fallah, Iran	3
CBZ	03	B. Csak, Hungary	25	FSU		S. Fanutti, Canada	2
CTI	03	T. Csorgei, Hungary	51	FRJB		R. Farber, CA	3
CSM	03	M. Csukas, Romania	756	FTGA		T. Farias, Brazil	2
CKB		B. Cudnik, TX	2706	FAJ	03	A. Fejes, Hungary	3
CUU		J. Curto Amigo, Spain	5	FOM	15	M. Fernandez Ocana, Spain	51
DJRA		J. Da Silva, Brazil	11	FRF	03	R. Fidrich, Hungary	818
DLGA		L. Da Silva, Brazil	4	FRIA		R. Filiatreault, Canada	4
DWPA		W. Da Silva, Brazil	2	FSJ	01	J. Fis, France	79
DANB		A. Dantas, Brazil	12	FEV		E. Fischler, WA	1
DGSA	20	G. Darlington, England	10397	FJRD		J. Fitzgerald, MA	9
DAM	06	A. Darriba Martinez, Spain	357	FDKA		D. Flippo, AR	1
DAJ		J. Davis, MD	342	FLE		L. Florin, Romania	17
DJK		J. Davis, NV	3	FDA	03	A. Fodor, Hungary	85
DMA		M. Davis, SC	133	FSE	18	S. Foglia, Italy	2
DFAA		F. Daviè, Italy	2	FMR		M. Fonovich, Croatia	4148
DJX	27	M. De Jong, Canada	241	SNH01		K. Fortak, Germany	807
DENA		E. De Miguel, Spain	168	FJQ		J. Foster, CA	3196
DPP		P. De Ponthiere, Belgium	3591	FDU		D. Fowler, OH	173
SWQ	13	W. De Souza, Brazil	33	FXJ		J. Fox, NM	302
DSJA		S. Dean, England	10	FBN	10	B. Fraser, South Africa	8
DSWA		S. Delchamps, IL	10	FRID		R. Fredrick, KS	1
DLM	01	M. Deldem, France	4	FML	04	M. Fridlund, Netherlands	1
DFR	27	F. Dempsey, Canada	38	FCHA		C. Froeschlin, Germany	3
DDE		D. Denisenko, Russia	94	FGIA		G. Frustaci, Italy	178
DAT		A. Derdzikowski, Poland	3760	FMG		G. Fugman, NE	76
DNO		O. Deren, Poland	939	FFAB		F. Fujiwara, Brazil	67
DBRA		B. Desoete, Belgium	1	FRTA		R. Fuller, TX	63
DSI		G. Di Scala, Australia	4824	FRIC		R. Furgoni, Italy	4487
JNDB		N. Dias Cavalcante, Brazil	16	GGL	18	G. Galli, Italy	5
DBJA		B. Dieter, Germany	7	GTN		T. Gandet, AZ	183

Table 3. AAVSO Observers, 2011–2012, cont.\*

<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No. Obs.</i>	<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No. Obs.</i>
GNIB		N. Gannon, NY	7	HKEB		K. Hills, England	638
GAA		P. Garey, IL	72	HJX	13	J. Hodar Munoz, Brazil	2
GXX	14	T. Garfield, Australia	2	HEK	11	E. Hoeg, Denmark	15
GALB		A. Garofide, Romania	33	HAGA		A. Hoeven, Netherlands	2930
GKI		K. Geary, Ireland	83	HANA		A. Hoffman, FL	20
GGK	03	G. Gerofi, Hungary	3	HBDA		B. Hoffman, CA	17
GAO		A. Giambersio, Italy	5	HDF		D. Hohman, NY	77
GERB		E. Gibert, Singapore	2	HTYA		T. Holloway, MA	10
GGU	04	G. Gilein, Netherlands	549	HGUA		G. Holmberg, Sweden	3794
GSEB		S. Girard, OK	19	HKAA		K. Honkova, Czech Republic	3
GMY		M. Glennon, Ireland	4	HJG		J. Horne, CA	119
GZN		A. Glez-Herrera, Spain	2829	HJZ		J. Horne, CA	243
GKAA		K. Glick, MA	1	HSP	14	S. Hovell, New Zealand	270
GANB		A. Gnidovec, Slovenia	8	HOA		A. Howell, FL	1308
GFB	31	W. Goff, CA	12695	HSW		S. Howerton, KS	64
GOT	06	T. Gomez, Spain	284	HUR	20	G. Hurst, England	2096
GED		E. Goncalves, Brazil	7	HUZ		R. Huziak, Canada	105
GGQ	07	G. Gonzalez Anton, Spain	9	ILE	03	E. Illes, Hungary	153
GCDA		C. Gonzalez Avila, Chile	41	IMA		M. Iozzi, Italy	29
GCJ	07	J. Gonzalez Carballo, Spain	1579	JTAA		T. Jaarsma, MA	1
GKPA		K. Gowney, England	1	JPM	10	P. Jacobs, South Africa	26
GENB		E. Gozzoli, Italy	13	JMA		M. Jacquesson, France	13
GHN		J. Graham, OH	54	JTP	01	P. Jacquet, France	132
GKA		K. Graham, IL	10824	JAT	03	T. Jakabfi, Hungary	103
GDAC		D. Gravina Dalla Paula, Brazil	1	JNDA		N. James, England	1
GDT		D. Gray, Canada	7	JM		R. James, NM	85333
GNJ		J. Green, Canada	3	JSP		S. James, Australia	29
GJOA		J. Greening, Canada	6	JZO	03	Z. Jankovics, Hungary	329
GMKA		M. Griffiths, England	11	JMAA		M. Jansson, Sweden	139
GJSB		J. Griggs, MI	204	JDAB		D. Jarkins, MO	457
GVD	16	V. Grigorenko, Russia	20	JMIB		M. Jian, China	1
GTZ		T. Grzybowski, NM	976	JGE	06	G. Jimenez Lopez, Spain	52
GCO		C. Gualdoni, Italy	3117	JPTA		P. Jochym, Poland	5
GPIA		P. Guzik, Poland	2	JSHA		S. Johns, AE	643
GGX	01	G. Guzman, France	165	JOG		G. Johnson, MD	48
HCS	03	C. Hadhazi, Hungary	1501	JRA		R. Johnson, MN	1
HDH	03	S. Hadhazi, Hungary	307	JON	05	K. Jonckheere, Belgium	3
HTY		T. Hager, CT	778	JJI		J. Jones, OR	40777
HKB		B. Hakes, IL	169	JKL		K. Jones, Australia	2
HPIA		P. Hallsten, Sweden	103	JPG		P. Jordanov, Bulgaria	4
HTDA		T. Halstead, OR	56	JPGA		P. Jordanov, Bulgaria	9
HMB	05	F. Hamsch, Belgium	326607	JLZ	03	L. Juhasz, Hungary	362
HDX		D. Hands, NC	5	JWM		W. Julian, NM	1855
HPL		P. Hansen, Denmark	4	KPK		P. Kalajian, ME	987
HBB		B. Harris, FL	343	KCI	03	C. Kalup, Hungary	2
HMQ		M. Harris, GA	3	KAM	02	A. Kammerer, Germany	17
HKM		K. Hartmann, MA	302	KTU		T. Kantola, Finland	7154
HHU	05	H. Hautecler, Belgium	1058	KMO		M. Kardasis, Greece	12
HJKA		J. Haynes, NM	2	KSF		S. Karge, Germany	24
HAB		R. Hays, IL	783	KTHA	19	T. Karlsson, Sweden	2919
HKDA		K. Hearst, CA	3	KEI		E. Kato, Australia	33
HMC		M. Hencheck, WI	3	KBJ		R. Kaufman, Australia	275
HQA		A. Henden, MA	3338	KFAB		F. Kazmierski, WI	105
HND		R. Henderson, England	1671	KMQ	06	M. Kearns, Spain	8
HPMA		P. Henrichs, TX	16	KJSA		J. Kendall, NY	515
HCW		C. Hergenrother, AZ	447	KSZ	03	S. Keszthelyi, Hungary	257
HMV		M. Hessom, CA	88	KJMA		J. Ketchum, MO	238
HNDA		N. Hewitt, England	10	KANB		A. Khruslov, Russia	3
HEY	05	B. Heyndrickx, Belgium	64	KIY		A. Kilin, Russia	22

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Table 3. AAVSO Observers, 2011–2012, cont.\*

<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No. Obs.</i>	<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No. Obs.</i>
KRB		R. King, MN	529	LWEA		W. Lopes, Brazil	5
KRAA		R. King, VA	17	LRD		D. Loring, UT	1376
KQR		R. Kinne, MA	2	LBG		G. Lubcke, WI	2
KBR		B. Kirshner, CA	19	LIRB		I. Lubiszewski, Poland	120
KCO	03	S. Kiss, Hungary	1	LFZ		F. Lucidi, Italy	693
KPC		P. Klages, England	5	LMJ	17	M. Luostarinen, Finland	2226
KKAA		K. Klindt-Jensen, Denmark	436	MDW	27	W. MacDonald, Canada	2812
KGE	08	G. Klingenberg, Norway	1	MSAB		S. Machado, Brazil	3
KGT		G. Knight, ME	24	MRGA		R. MacPhail, Canada	136
KSP		S. Knight, ME	66	MALB		A. Maidik, Ukraine	1521
KJAE		J. Kobryn, Poland	24	MLI		L. Maisler, NY	27
KLO		L. Kocsmaros, Serbia and Montenegro	690	MDAV		D. Majors, CA	32
KRV		R. Koff, CO	38	MVO	17	V. Makela, Finland	498
KRS		R. Kolman, IL	2179	MJHN	20	J. Mallett, England	23
KERA		E. Kolodziejski, NJ	9	MCPA		C. Maloney, AR	314
KMA		M. Komorous, Canada	2626	MALC		A. Malsbury, NJ	2
KKU		K. Kookaram, Iran	1	MBJA		B. Mansdahl, Sweden	1
KSO		S. Korotkiy, Russia	8	MKE		B. Manske, WI	291
KJAC		J. Kos, Slovenia	5	MFRA		F. Marcoux, Canada	2
KOS	03	A. Kosa-Kiss, Romania	3545	MFB	01	F. Mariuzza, Italy	485
KLX		L. Koscianski, MD	25	MOLB		O. Mark, Germany	6
KNIA		N. Kourounis, Greece	2	MTON	20	T. Markham, England	2452
KVTA		V. Kousa, Spain	996	MMN	18	M. Martignoni, Italy	940
KAF	03	A. Kovacs, Hungary	387	MCHR		C. Martin, CO	5
KTC		T. Krajci, NM	6125	UIS01		J. Martin, IL	227
KJOA		J. Kribbel, Austria	1	MVIA		V. Marttila, Finland	3
KWO	02	W. Kriebel, Germany	1576	MTH		H. Matsuyama, Australia	9628
KIS	02	G. Krisch, Germany	616	MTM		M. Mattei, MA	1
KGEA		G. Kristiansen, England	1	MPR		P. Maurer, Germany	735
KTZ		T. Krzyt, Poland	776	MRRA		R. Mazzei, VA	27
KBA		B. Kubiak, Poland	827	MMPA		M. McBride, Canada	6
KUC	01	S. Kuchto, France	579	MJHA		J. McCammon, CO	88
KSQ		S. Kuznetsov, Russia	499	MCOA		C. McCann, AR	43
LCR	15	C. Labordena, Spain	718	MUE		R. McDaniel, TX	1018
LHS		H. Lacombe, Canada	40	MDP	27	P. McDonald, Canada	1077
LBEA		B. Lafonte, CO	12	MMAE		M. McNeely, IN	8
LSA	17	S. Lahtinen, Finland	263	MEP		D. Medicis, NY	12
LPB		P. Lake, Australia	275	MED	20	K. Medway, England	888
LPEA		P. Lancaster, Australia	13	MFR		F. Melillo, NY	5
LDJ	27	D. Lane, Canada	620	MZK		K. Menzies, MA	20719
LTO	02	T. Lange, Germany	27	MZAA		Z. Merakov, Bulgaria	1
LMF	13	M. Lara, Brazil	107	MDEN		D. Merrill, CA	102
LTM		T. Laskowski, IN	5	MWOA		W. Merten, Germany	17
LZT		T. Lazuka, IL	297	MVH		V. Mihai, Romania	265
LMT		M. Legutko, Poland	42	MIW	20	I. Miiller, England	11959
LJY	17	J. Lehtinen, Finland	24	MMGA		M. Miller, TX	18
LCLA		C. Lemaire, Germany	5650	MADA		A. Mills, Canada	361
LPD	01	P. Lemarchand, France	145	MZS	03	A. Mizser, Hungary	493
LMMA		M. Leobino, Brazil	2	MCE		E. Mochizuki, Japan	3
LCHB		C. Leonard, Chile	63	MRV		R. Modic, OH	105
LSI	18	S. Leonini, Italy	1	MHH		J. Moehlmann, PA	1160
LVY		D. Levy, AZ	110	MOD		D. Mohrbacher, OH	2
LDRA		D. Leys, Australia	49	MMMA		M. Moinho, Brazil	1
LMI		M. Lierl, KY	4	MISA		I. Monks, England	13
LMK		M. Linnolt, HI	1626	MDPA		D. Monteiro, Portugal	16
LCO		C. Littlefield, IN	43998	MMOI		M. Montero Reyes Ortiz, Bolivia	11
LJX	01	J. Llapassat, France	90	MJOH	20	J. Moore, England	2317
LTE	20	T. Lloyd Evans, England	1785	MEV	01	E. Morelle, France	38054
LGV		G. Lopatynski, CA	56	MDJA		D. Moriarty, Australia	10654

Table 3. AAVSO Observers, 2011–2012, cont.\*

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MHSA		H. Moring, MA	2	PLFA		L. Perez, Spain	1
MOW		W. Morrison, Canada	4277	PAAA		J. Perez Trevino, Mexico	8
MMX		M. Motta, MA	1	PZSA		Z. Perko, Hungary	4
MCAB		C. Moura, Brazil	2	PVA	27	V. Petriew, Canada	39
MRDA		R. Moura, Brazil	1	PDMA		D. Phillips Sr, NJ	4
MPS	27	P. Mozel, Canada	48	PXR	20	R. Pickard, England	11986
MMH		M. Muciek, Poland	65	PDKA		D. Piekowski, Poland	15
MALG		A. Mueller, Germany	13	PROC		R. Pieri, France	27
MROB		R. Mueller, Germany	7	PLQ	01	L. Pinatelle, France	2
MDU		D. Mulinski, Poland	3	PGU	18	G. Pinazzi, Italy	12
MBQ		B. Mullin, MN	5	PIJ	03	J. Piriti, Hungary	1162
MGAB		G. Murawski, Poland	120	PMAA		M. Pirtac, Romania	20
MMIC		M. Muro Serrano, Spain	3356	PPL		P. Plante, OH	249
MUY	05	E. Muyllaert, Belgium	2934	PHN	04	H. Pleijsier, Netherlands	2
MGW		G. Myers, CA	4790	PAW	29	A. Plummer, Australia	7349
NDQ	01	D. Naillon, France	117	AST	12	R. Podesta, Argentina	38
NHDB		H. Nascimento, Brazil	4	PRX		R. Poklar, AZ	4931
NLX		P. Nelson, Australia	4136	PALB		A. Ponzoni, Brazil	4
NJO	02	J. Neumann, Germany	1356	PDM		A. Popowicz, Poland	9
NOT		O. Nickel, Germany	81	PRV		R. Potter, MI	57
NJL	01	J. Nicolas, France	18	PWR		R. Powaski, OH	12
NHS	11	H. Nielsen, Denmark	3	POX		M. Poxon, England	348
NCH		C. Norris, TX	261	PYG		G. Poyner, England	9914
NAO		A. Novichonok, Russia	7	PAH		A. Price, IL	421
NKL		K. Nuber, Germany	2	PSIA		S. Prieto Saavedra, Spain	1
OCX		L. O'Connor, MA	107	PMB		M. Prokosch, TX	1
OCN		S. O'Connor, Bermuda	63	PAGA		A. Prosz, Hungary	25
ONJ		J. O'Neill, Ireland	53	PUJ	06	F. Pujol-Clapes, Spain	607
OAS		A. Odasso, Italy	1	PHEA		H. Purkaer, Denmark	15
OALA	02	A. Oertlin, Germany	544	PHG		H. Purucker, Germany	42
OYE		Y. Ogmen, Cyprus	3785	QYIA		Y. Qiu, China	17
OJMA		J. Ojanpera, Finland	68	QW	02	W. Quester, Germany	44
OAR	17	A. Oksanen, Finland	34873	RKE	02	K. Raetz, Germany	601
OAD		A. Ormsby, MI	83	RMN		M. Ratcliffe, KS	98
OSE		S. Otero, Argentina	2	RCJB		C. Reed, CA	5
OSJ		J. Otero Saiz, Spain	3	REP	24	P. Reinhard, Austria	447
OJJ		J. Ott, CO	49	RFP	13	P. Reis Fernandes, Brazil	24
OCR	05	C. Otten, Belgium	154	RLUA		L. Ribe, Spain	21
OEH		E. Ozturk, Turkey	3	RJG		J. Ribeiro, Portugal	196
PLA	13	A. Padilla Filho, Brazil	47	RIX	29	T. Richards, Australia	206
PSD		S. Padovan, Spain	4986	RHM		M. Richmond, NY	468
PLN	02	L. Pagel, Germany	2415	RROA		R. Riordan, NV	1117
PLP		L. Palazzi, Italy	804	RCCA		C. Riou, France	49
PPAB		P. Palma, Italy	21	OJR		J. Ripero Osorio, Spain	3076
PTFA		T. Papadimitriou, Greece	57	RVAA		V. Rivas, Chile	2
PCC	18	R. Papini, Italy	762	RIV		M. Rivera, Italy	20
PPS	03	S. Papp, Hungary	1435	REE		E. Robinson, England	5
PGC		G. Pappa, Italy	2	RJWB		J. Rock, England	10724
PREA		R. Paret, France	1	RDAA		D. Rodriguez, Spain	37
PCN		C. Parrinello, IL	10	RMU	06	M. Rodriguez Marco, Spain	3872
PTQ		T. Parson, MN	3	RZD	06	D. Rodriguez Perez, Spain	28
PJJ	15	J. Pastor, Spain	11	ROE		J. Roe, MO	11249
PKV		K. Paxson, TX	1539	RMAB		M. Rosicarelli, Italy	1
PTX		T. Peairs, VT	63	ROG		G. Ross, MI	252
PEX	14	A. Pearce, Australia	2277	RJJA		J. Ross, NC	4
PEI	11	E. Pedersen, Denmark	811	RGN		G. Rossi, Italy	1
PEG	01	C. Peguet, France	155	RR		R. Royer, CA	8
PWD		W. Pellerin, TX	109	RGY		G. Rubright, PA	3
PCX	15	C. Perello, Spain	6	RSWA		S. Rumistrzewicz, Spain	37

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Table 3. AAVSO Observers, 2011–2012, cont.\*

<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No. Obs.</i>	<i>Code</i>	<i>Org.</i>	<i>Name</i>	<i>No. Obs.</i>
RMAD		M. Russiani, Italy	1	SX		L. Snyder, NV	270
RTH		T. Rutherford, TN	64	STAK		T. Soejima, Japan	20
RZM		M. Rzepka, Poland	771	SYOA		Y. Soilen, Canada	1
SRIC		R. Sabo, MT	54978	SJRA		J. Solano, Guatemala	1
SJQ		A. Sajtz, Romania	63	SBX		A. Sonka, Romania	43
STAA		T. Sakamoto, Japan	207	SGYO	03	G. Soponyai, Hungary	72
SSU		S. Sakuma, Japan	708	SOW	17	J. Sorvari, Finland	12
SDAA		D. Sala Tapias, Spain	3	SJFA	01	J. Soulier, France	32
SQL	26	R. Salvo, Uruguay	1	SJZ		J. Speil, Poland	2131
SAH		G. Samolyk, WI	20958	SC	27	C. Spratt, Canada	59
SRMB		R. Sampson, IL	235	SMWA		M. Sprouse, AZ	2
DSS	06	A. San Segundo Delgado, Spain	12	SXR	03	M. Sragner, Hungary	10
SLAA		L. Santos, Brazil	1	SBL	05	B. Staels, Belgium	16668
STFA		T. Santos, Brazil	1	SVAE		V. Stanimirov, Bulgaria	1
SPQ	03	C. Sapi, Hungary	7	STR		R. Stanton, CA	10
SVA		A. Saw, Australia	174	SDB		D. Starkey, IN	1497
SDAV		D. Scanlan, England	89	SPET		P. Starr, Australia	31786
SFI	18	T. Scarmato, Italy	1	SJAT		J. Starzomski, Poland	407
SDY	02	D. Scharnhorst, Germany	26	SYO		T. Steck, IN	1226
SFS		S. Schiff, VA	10	SABB		A. Steenkamp, England	4
SRBR		R. Schippers, Netherlands	550	STI		P. Steffey, FL	738
SFRA		F. Schorr, GA	26	SGP		P. Stegmann, PA	8
SGLE		G. Schrader, Australia	31	SWIL		W. Stein, NM	50416
SYU	02	M. Schubert, Germany	874	SVR		R. Stencil, CO	1
SJEA	01	J. Sciolla, France	402	SET		C. Stephan, FL	739
SMIK		M. Scott, UT	3	STHB		T. Stephane, France	8
SDMA		D. Selmo, Brazil	6	SBAF		B. Stepinski, Poland	2
SSSA	36	S. Sepetiba, Brazil	3	SRB		R. Stine, CA	126
STVA	36	T. Sepetiba, Brazil	4	SOX		C. Stockdale, Australia	1914
SMAG		M. Sepulveda, TX	6	SDI	20	D. Storey, England	23
SMRC	01	M. Serreau, France	1003	SFU	29	M. Streamer, Australia	19077
SFJA		F. Sevilla, Spain	779	SAJA		A. Strehlow, WI	1
SSTA	27	S. Shadick, Canada	276	SNJ		N. Stritof, Slovenia	55
SSHA		S. Shaffer, WY	11	SHZ	02	H. Struever, Germany	98
SHS		S. Sharpe, Canada	3491	SRX	14	R. Stubbings, Australia	5840
SDP		D. Sharples, NY	10	SAC	02	A. Sturm, Germany	10
SFY	20	J. Shears, England	3476	SUC		A. Sucker, Germany	9
SLH		L. Shotter, PA	255	SUS	02	D. Suessmann, Germany	352
SGQ		C. Sigismondi, Italy	82	SJAE		J. Suherli, Indonesia	6
SPAO	18	P. Siliprandi, Italy	688	SJAR		J. Suomela, Finland	2857
SMAK		M. Silva, Italy	877	SWW		D. Swann, TX	327
STHA		T. Silva, Brazil	9	SSW		S. Swierczynski, Poland	169
SBN	13	A. Silva Barros, Brazil	279	SPTR	03	P. Szalai, Hungary	37
SERM		E. Silva De Souza, Brazil	8	SAO	03	A. Szauer, Hungary	67
SNE		N. Simmons, WI	3400	SLY	03	L. Szegedi, Hungary	38
SXN		M. Simonsen, MI	14793	SJAF		J. Szydowski, Poland	5
SANG		A. Sing, Philippines	132	TUO		U. Tagliaferri, Italy	90
SPAB		P. Singh, India	400	TMAA		M. Talero, Spain	10
STOC		T. Sitek, Czech Republic	40	TTG		T. Tan, Australia	8205
SGOR		G. Sjoberg, MA	8076	TJOB		J. Tapioles, Spain	9
SDN		D. Slauson, IA	195	TVAA		V. Tarantini, Italy	7
SMI		A. Smith, England	13	TDB	27	D. Taylor, Canada	2
SBAD		B. Smith, England	16	TSZ	03	S. Teichner, Hungary	266
SDCA		D. Smith, NY	8	TPV		P. Temple, NM	853
SDZ		D. Smith, AZ	110	TCI	03	C. Tepliczky, Hungary	14
SHA		H. Smith, MI	206	TPS	03	I. Tepliczky, Hungary	756
SJE		J. Smith, CA	62	TTU		T. Tezel, Turkey	9
SSTB		S. Smith, CA	9	TSN	03	S. Thompson, Hungary	3
SLEE		L. Smojver, WA	2	TJD		J. Thrush, MI	1

Table 3. AAVSO Observers, 2011–2012, cont.\*

Code	Org.	Name	No. Obs.	Code	Org.	Name	No. Obs.
TIA	03	A. Timar, Hungary	309	WLY		L. Wade, MS	1046
TLEB		L. Tkachook, Ukraine	4725	WROA		R. Wahlstrom, Sweden	1057
TBRA		B. Tobias, TX	5	WNBA		N. Wakefield, England	4
TRL		R. Togni, AR	40	WGR		G. Walker, NH	1629
TRE		R. Tomlin, IL	834	WBY		B. Walter, TX	3
TRT	03	T. Tordai, Hungary	152	WLUA		L. Wang, MA	5
TSC		S. Tracy, CT	15	WYUC		Y. Wang, China	3
TRF		C. Trefzger, Switzerland	26	WGE		G. Ward, WV	1
TDW		D. Trowbridge, WA	4	WAU		A. Wargin, Poland	10
TSJ		S. Tsuji, Japan	49	WDC		D. Watts, MS	17
TJDA		J. Tubbs, ID	3	WCB		C. Webster, PA	42
TUC	10	C. Turk, South Africa	12	WPT	10	P. Wedepohl, South Africa	73
TCLA		C. Tydtgat, Belgium	17	WKL	15	K. Wenzel, Germany	766
TYS		R. Tyson, NY	656	WDO		D. Whelan, RI	281
UAN	03	A. Uhrin, Hungary	4	WJAA		J. Whinfrey, England	385
UJHA		J. Ulowetz, IL	26988	WWIA		W. Whitehead, NJ	70
UMAA		M. Urbanik, Slovakia	1097	WAH		A. Whiting, WA	3
VLN	01	L. Vadrot, France	61	WBN		B. Widla, Poland	25
BVE	04	E. Van Ballegoij, Netherlands	792	WFOA		F. Wierda, Finland	6
VBR		H. Van Bommel, Canada	100	WTHB		T. Wikander, Sweden	660
VDF		F. Van Den Abbeel, Belgium	248	WEY		E. Wiley, KS	221
VHJA		H. Van Den Broeck, Belgium	1	WI		D. Williams, IN	20
VDE	04	E. Van Dijk, Germany	15	WPX	29	P. Williams, Australia	3046
VNL	05	F. Van Loo, Belgium	2	WLP	05	P. Wils, Belgium	429
VUG	04	G. Van Uden, Netherlands	163	WWJ		B. Wilson, England	848
VWS	05	J. Van Wassenhove, Belgium	986	WBH		R. Wilson, AZ	58
VBH	05	H. Vandenbruaene, Belgium	3	WSN		T. Wilson, WV	1133
VSD	05	D. Vansteelant, Belgium	3	WAS	02	A. Winkler, Germany	56
VKN		K. Vardijan, Croatia	9	WEN		E. Woerner, KS	3
VED	01	P. Vedrenne, France	3648	WGI	02	G. Wollenhaupt, Germany	12
VCLA		C. Veliz, VT	21	WVR		R. Wood, TX	3
VFA	18	F. Verza, Italy	1	WUB	04	E. Wubbena, Netherlands	310
VIA	01	J. Vialle, France	6	WUN	02	E. Wunder, Germany	1
VMDA		M. Vieira, Brazil	10	XWE		W. Xu, China	4
VBI	03	B. Vigh, Hungary	1	YBA		B. Young, OK	5
VJA	17	J. Virtanen, Finland	1222	ZDAB		D. Zaharevitz, MD	1019
VGK		G. Vithoukas, Greece	1067	ZFRA		F. Zecchin, France	24
VPZ	03	P. Vizi, Hungary	120	ZPA		P. Zeller, IN	86
VFK	02	F. Vohla, Germany	5895	ZGEA		G. Zhao, China	72
VOL		W. Vollmann, Austria	816	ZXIA		X. Zhu, WI	2
VVE		V. Vrhovac, Croatia	4	ZGRA		G. Zinn, Brazil	5
VSA		S. Vuorinen, Finland	2	ZDAC		D. Zubovic, Croatia	5

\*Totals reflect observations made during fiscal 2011–2012 and do not include historical data (data preceding fiscal 2011–2012) submitted during fiscal 2011–2012.

## 2. The Year in Review

These codes, which appear in the Table (AAVSO Observers 2011–2012), indicate observers are also affiliated with the groups below:

- 01 Association Française des Observateurs d'Étoiles Variables (AFOEV)
- 02 Bundesdeutsche Arbeitsgemeinschaft für Veränderliche Sterne e.V. (BAV) (Germany)
- 03 Magyar Csillagászati Egyesület, Valtózcillag Szakcsoport (Hungary)
- 04 Koninklijke Nederlandse Vereniging voor Weer-en Sterrenkunde, Werkgroep Veranderlijke Sterren (Netherlands)
- 05 Vereniging voor Sterrenkunde, Werkgroep Veranderlijke Sterren (Belgium)
- 06 Madrid Astronomical Association M1 (Spain)
- 07 Asociacion de Variabilistas de Espagne (Spain)
- 08 Norwegian Astronomical Society, Variable Star Section
- 09 Ukraine Astronomical Group, Variable Star Section
- 10 Astronomical Society of Southern Africa, Variable Star Section
- 11 Astronomisk Selskab (Scandinavia)
- 12 Liga Ibero-Americana de Astronomia (South America)
- 13 Rede de Astronomia Observacional (Brazil)
- 14 Royal Astronomical Society of New Zealand, Variable Star Section
- 15 Agrupacion Astronomica de Sabadell (Spain)
- 16 Association of Variable Star Observers "Pleione" (Russia)
- 17 URSA Astronomical Association, Variable Star Section (Finland)
- 18 Unione Astrofili Italiani (Italy)
- 19 Svensk Amator Astronomisk Förening, Variabelsektionen (Sweden)
- 20 British Astronomical Association, Variable Star Section
- 24 Astronomischer Jugendclub (Austria)
- 26 Red de Observadores (Montevideo, Uruguay)
- 27 Royal Astronomical Society of Canada
- 29 Variable Stars South (New Zealand)
- 31 Center for Backyard Astronomy
- 36 Nucleo de Estudo e Observacao Astronomica—Jose Bazilio de Souza (Florianopolis, Brazil)

Table 4. Observation statistics for fiscal year 2011–2012.\*

<i>Observations (increments of 1000)</i>	<i>No. Observations per increment</i>	<i>% of All Observations</i>	<i>No. Observers per increment</i>
0 – 999	89762	6	657
1000 – 1999	61419	4	44
2000 – 2999	55447	4	22
3000 – 3999	62854	4	18
4000 – 4999	41304	3	9
5000 – 5999	34476	2	6
6000 – 6999	6125	0	1
7000 – 7999	14503	1	2
8000 – 8999	16281	1	2
9000 – 9999	19542	1	2
10000+	1063669	73	29

\*Totals reflect observations made during fiscal 2011–2012 and do not include historical data (data preceding fiscal 2011–2012) submitted during fiscal 2011–2012.

## The International Variable Star Index (VSX)

**Sebastián Otero, Christopher Watson, and Patrick Wils**

Data on variable stars are constantly changing. New and ongoing surveys are locating new variable stars every day. Corrections to errors in the data are always coming in. But all of this work to refine what we know about these stars is happening at different times and in different places. The mission of VSX is to bring all of that new information together in a single data repository, make it accessible to the public via a simple web interface, and provide the tools necessary for the controlled and secure revising of the data.

VSX was conceived and created by amateur astronomer Christopher Watson in response to the specific desires of the members of the AAVSO's Chart Team and the Comparison Star Database Working Group, and the broader perceived need for a globally-accessible central "clearing-house" for all up-to-the-minute information on variable stars, both established and suspected. The VSX web site was designed to be the on-line medium by which variable star data are made available to the general public, and through which the data are maintained, revised, and commented upon. This database literally comes alive with the input from the world of registered contributors.

In order to keep VSX up to date and populated with the latest corrected findings, registered and approved individuals constantly review and revise the metadata, always citing sources for any new details, and fully documenting the rationales behind any additions or changes. By maintaining a strict version control on all records, the history of the gathered knowledge on each variable star can be traced, validated, and followed up on by those who rely on this information to be accurate and true.

This VSX report covers activity from January 1, 2012, to December 31, 2012.

### ***Number of Submissions***

The number of new submissions grew exponentially in 2012. In 2012 we had 2273 new stars submitted by users (and approved) against 766 submitted over the previous year. That's almost a 300% increase!

We are currently receiving about 200 new submissions a month against about 50 in 2011. This means a lot of time was invested to support submitters and revise new submissions.

## 2. The Year in Review

### *Revisions*

The number of revisions made by users has also grown. It was 10 per month in 2011 and it was 21 per month in the last 12 months. Sebastián Otero's personal count per month was 294 per month in 2011 and 205 in 2012. More submissions by users mean less time invested on his own revisions.

The number of batch revisions made by Patrick Wils was 910 a month in 2011 and 454 in 2012. This number, however, depends on what was published in the journals and which new lists became available. One list of 5,000 variables can change such a number in a blink of an eye. But the more stars in a list the harder the work involved in importing it because there is a lot of effort put in avoiding duplications. And most of the lists contain duplicates, missed cross-identifications with known variables, and duplicate entries among their own new stars.

The number of duplicates being added through updates has been reduced now. Patrick Wils takes good care of that. Also, new variables being announced through the Catalina Sky Survey pages and published in the different astronomy journals are imported almost in real time, as are announcements through alert lists like VSNET or those in the IAU CBAT Circulars and Electronic Telegrams. VSX is being cleaned and populated with more and more stars every day.

You can all check what's new yourselves by trying one of the special searches (like "Changes since last login") in the VSX search page.

### *Users*

We've had 62 different users submitting new stars in 2011 and 71 in 2012, more than we had in any of the previous years. People from Belarus, Spain, Russia, Italy, USA, Czech Republic, Germany, France, Uruguay, Belgium, Austria, Poland, The Netherlands, Hungary, Croatia, China, Slovakia, UK, Ukraine, Australia, New Zealand, Canada, and Argentina have been submitting new stars to VSX.

### *Duplicate Records*

The total number of duplicate records hidden by Sebastián Otero during his revisions in 2012 is 1,401 with a monthly average of 117, compared to 2,602 in 2011 with a monthly average of 217 records. Each duplicate record that has been hidden means a primary record that has been revised with the most recent available data (each day we have more and more public surveys providing up-to-date information).

There are a lot of submissions to moderate so more time is devoted to that, as is true with other miscellaneous revisions. Altogether, 20,995 duplicates have been hidden since VSX was created.

Other duplicate records that are being hidden, even though they are never visible to the public, are the Unclassified stars with duplicate AUIDs. With these stars, we had two records for the same star and each of them had data submitted to the AID. 98 such duplicate AUIDs were identified and deleted, and the affected data were moved by Sara Beck to the new primary record. This project is another that is taking and will continue to take a lot of time but it is quite comforting to see the observations being placed where they really belong.

Sebastián Otero also started digging into VSD (the Comparison Star Database) to check the duplicate AUID problem between VSX and VSD that exists because we use several stars that are or once were suspected variables or even small amplitude variables as comparison stars. These are 5,364 of these duplicates and all kinds of different problems are being addressed (some VSD magnitude labels are wrong, some are too variable to be used as comparison stars, and so on). He plans to continue with this other kind of duplicate deletion in 2013.

### ***Incorrect Identifications Corrected***

This became an interesting aspect of the revisions and checking of duplicates. A lot of incorrect identifications were found in the process, some from the surveys, and a very large number from the *General Catalogue of Variable Stars* (GCVS).

123 incorrect cross-identifications in VSX have been deleted since Sebastián Otero started this work in 2011.

87 GCVS/NSV identifications have been corrected and reported to the GCVS team, 36 in 2011 and 51 in 2012.

Typical examples of incorrect identifications include survey objects identified with the wrong GCVS star in the original survey (and thus in VSX), and survey objects classified as the wrong type of variable star.

## 2. The Year in Review

### *Cross-Identifications (Between Objects) Added*

In this context, adding a cross-identification is the same as finding a new duplicate and then deleting it. 1,532 cross-identifications were added during work since 2010, 957 in 2011 and 575 in 2012.

Although Sebastián Otero spends many hours a week working alone in his home office in Buenos Aires, this important work is assisted by a team of Headquarters staff and volunteers worldwide. We wish to express our thanks to them and the people who are submitting new variables to VSX for making it the excellent resource it has become.

## Section Reports

### *Cataclysmic Variable (CV)*

**Section Leaders:** *Mike Simonsen, 2615 S. Summers Road, Imlay City, MI 48444*  
*Gary Poyner, 67 Ellerton Road, Kingstanding, Birmingham, B44 0QE,*  
*England*

#### **CV Section Website**

The CV Section website is hosted by Google at:

<https://sites.google.com/site/aavsocvsection/Home>

The main features on the home page are a left-hand news column and navigation box, a center column feature story and recent preprints for arXiv on CVs, and a right-hand column with Activity at a Glance, (outbursts from the past 72 hours), CV outbursts from CRTS, and boxes for the Z CamPaig, Hamburg Survey CVs, and the Long-Term Polar Monitoring Program.

The home page is maintained and updated daily, often several times per day, by section co-leaders Simonsen and Poyner. All the remaining content, including the blog, feature articles, and interviews, is written, edited and maintained by Simonsen.

This year we added a forum on Cataclysmic Variables to the AAVSO website. We discuss cataclysmic variables, potential targets, observing techniques, recent activity, campaigns, resources for information, and more.

Simonsen and Poyner also moderate the CVnet Yahoo mail lists. The three CVnet lists are:

#### **CVnet Discussion**

The discussion list has 263 subscribers. The past year's activity is best described as an announcement list. Actual discussion seldom takes place. Notes from *AAVSO Alert Notices*, *IAU Circulars*, and *Astronomers Telegrams* get forwarded here also.

#### **CVnet Outburst**

Outburst list has 239 subscribers. This list has daily activity and is used by observers to

## 2. The Year in Review

announce outburst detections and unusual behavior of CVs, as well as Z Cam standstills and time series results.

### *CVnet Circular*

The Circular has 169 subscribers and is edited and maintained by Chris Watson and Mike Simonsen. Daily average magnitudes of all the CVs in the AAVSO International Database are calculated and tabulated for a 30-day period and distributed automatically via email each Monday morning at 00:00UT.

### *Charts and Sequences*

**Section Leader:** *Mike Simonsen, 2615 S. Summers Road, Imlay City, MI 48444*

#### *The Team*

The charts and sequences team is made up of volunteers who work countless hours each month revising old sequences and creating new sequences. Our most active team members account for about 90% of the work, notably Tom Bretl, Tim Crawford, Robert Fidrich, and Jim Jones. Bob Stine serves as our team visual sequence evaluator and Sebastian Otero provides invaluable insight into bright star catalogs and photometry as well as southern hemisphere sequences.

#### *The Tools*

The primary tool, SeqPlot, displays stars with reliable photometry in three colors, green, red, and blue. This makes it easy for team members to select non-red and non-blue stars based on B–V color. Selecting a star for a sequence is done by clicking on that star, which in turn sends it to a text file, formatted for uploading into the variable star/comp star database, VSD.

Files and notes on sequences are shared through the sequence team mail list. Simonsen collects and archives the files, evaluates the submissions, uploads data to VSD, checks the resulting charts, and notifies the observers of updates every other month via the AAVSO website.

The other important tool in the chain is the VSD Admin tool, which allows team members to access, edit, add, and delete information from the comp star database.

Changes are all tracked online in a Google spreadsheet accessible to the public at:

<https://spreadsheets.google.com/ccc?key=0Ar0ujdSb5ufQdEhkTE5jREhWRm95dDRialMOR1ZGREE&hl=en&pli=1#gid=0>

We have been actively addressing reported errors and requests for sequence revision and additions via CHET, the chart error tracking tool, which allows observers to report and track the progress of chart issues. CHET can be accessed on the website at:

<http://www.aavso.org/chet>

## 2. The Year in Review

### *The Website*

The sequence team has its own website, created and maintained by Simonsen, where team members and especially new team members can find instructions on how to use SeqPlot, guidelines for sequence creation and revisions, photometric resources outside SeqPlot, a tutorial on how to use ASAS data, and a list of current projects and priorities. The team site can be viewed online at:

<https://sites.google.com/site/aavsosequenceteam/Home>

### *Photometry*

Photometry available in SeqPlot includes the Tycho database, Bright Star Monitor data, Henden 1M USNO calibrations, new releases of APASS data as they become available, and several sources from AAVSONet, including SRO and the Wright telescopes.

Almost all the new photometry used in 2012 came from APASS, which now covers the entire sky down to approximately 16th magnitude in V.

### *Results*

The results speak for themselves in the improved quality of the sequences available to observers and the speed and efficiency with which revisions and new sequences can be implemented with the system now in place. The team has revised or created 841 sequences used on AAVSO charts in the 2012 calendar year.

2012 saw the launch of the new AAVSO Binocular Program, consisting of 153 stars in the northern and southern hemispheres. They are mostly semiregulars and Miras, with a few other types sprinkled in. Most of the stars range between 3.0 and 9.5V and can be observed best using simple hand-held binoculars. The team has selected special sequences for these stars. Additionally, special "Binocular Charts" can now be plotted that will display only those comparison stars selected for the sequence for that star.

## Eclipsing Binary

**Section Leaders:** *Gerard Samolyk, P.O. Box 20677, Greenfield, WI 53220*

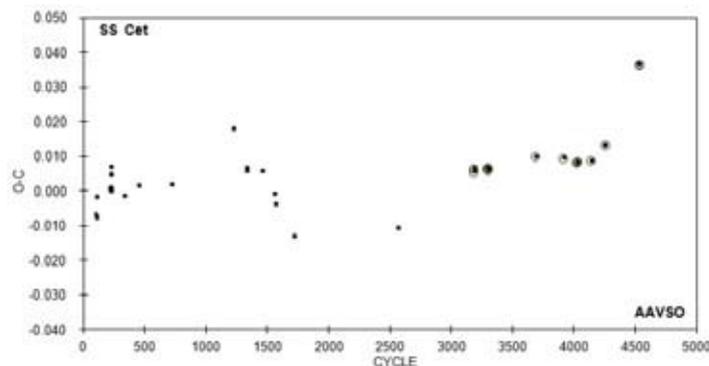
*Gary Billings, P.O. Box 263, Rockyford, Alberta T0J 2R0, Canada*

A paper containing a total of 241 times of minima of 150 stars has been submitted to the JAAVSO for publication. While much of these data were received in the 2012 calendar year, an effort to reduce and publish some of the CCD data received by the old EB committee continues. A total of fourteen observers contributed to this paper including L. Corp, S. Dvorak, K. Menzies, R. Poklar, R. Sabo, G. Samolyk, and N. Simmons, who each contributed 20 or more times of minima. Observers who would like to contribute data to these papers in the future should upload their observations to the AAVSO International Database and send a copy to [gsamolyk@wi.rr.com](mailto:gsamolyk@wi.rr.com).

Times of minima published by the AAVSO continue to be added to the Lichtenknecker Database maintained by the Bundesdeutsche Arbeitsgemeinschaft für Veränderliche Sterne e.V. (BAV), Germany. This is the most comprehensive database of EB times of minima. An English language interface to this database can be found at: <http://www.bav-astro.de/LkDB/index.php?lang=en>.

The 2013 ephemeris of the times of minima for the 200 stars on the AAVSO legacy program is available on the AAVSO website is available at <http://www.aavso.org/eclipsing-binary-ephemerides>. This ephemeris is intended for use by observers in North America. Starting in 2013, TZ CMa will be added to the AAVSO legacy program. This star has been observed for several decades but has recently been found to have an elliptical orbit with apsidal motion. It is important to observe both primary and secondary eclipses of this star.

One of the stars on the legacy program, SS Cet, has recently undergone a significant change in period. The O–C plot below includes times of minima of SS Cet observed since 1975. The points are visual and the circles are CCD.



## 2. The Year in Review

It only requires one or two quality times of minima per season to maintain a long term record of the periods of the stars on this program. When selecting a target for observation, observers are encouraged to make stars with rare eclipses their first choice.

Below is a list of stars on the legacy program that have not been observed for three or more years:

RY Aqr	KV Cyg	U Oph	AC Tau	AX Vul
IV Cas	UZ Dra	SX Oph	VV Vir	AY Vul
MM Cas	SS Lib	V505 Sgr	AG Vir	BO Vul
SW Cyg	EW Lyr			

### ***Long Period Variable (LPV)***

***Interim Section Leader:*** Mike Simonsen, 2615 S. Summers Road, Imlay City, MI 48444

The primary goals of the section are to continue the long-term observation, both visually and electronically, of the Legacy LPVs in the program as well as to determine other scientifically significant LPV targets for observers to follow. We are particularly interested in encouraging and guiding visual observers to include LPVs in their target selection and in building their own observing programs.

This year's highlight was the establishment of a new Binocular Program and the capability for our chart plotter to produce a specific format of charts for binocular use.

This year we launched an LPV Forum on the AAVSO website as a venue for discussing LPV stars, strategies for observing them, and ideas on how the AAVSO and its observer community can contribute to LPV research.

Mike Simonsen is stepping down as section leader January 1, 2013. The future of the LPV Section will be decided in early 2013.

### ***Nova Search***

The Nova Search Section is being redesigned. Information will be available on the AAVSO website as work in this section develops.

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### *Photoelectric Photometry*

**Section Leader:** *James H. Fox, P.O. Box 135, Mayhill, NM 88339*

The AAVSO Photoelectric Photometry (PEP) program has had another bountiful year. We have welcomed four new or returning observers into the corps during 2012: Lou Cox (CLX), Steve Linscott (LSM), Tom Pears (PTX), and Pat Rochford (RPT).

Observations have concentrated on the campaigns of CH Cyg for Margarita Karovska and P Cyg for Ernst Pollman. PEP observers continue to provide quality observations of brighter variables.

During FY 2011–2012 we received a total of 1,089 observations of 104 different stars by 14 observers (see table on next page). All of these observations were submitted to the AAVSO during the fiscal year, but some observations date to 2008. The majority of PEP data submitted were Johnson V-band observations, with a much smaller amount of Johnson B-band data also obtained. However, it is noteworthy that nearly 100 observations in each of the infrared J- and H- bands were made by two observers: Giorgio DiScala (DSI, 68 J and H observations), and Thomas Rutherford (RTH, 32). Importantly, observer DSI is located in Australia, and his data are some of the first J,H photometry of southern sources in the AID.

The eleven most-observed PEP stars were the following: eps Aur (178 observations), P Cyg (108), CH Cyg (33), W Boo (29), AC Her (28), V441 Her (27), zeta Aur (25), RS Cnc (25), EU Del (19), U Del (17), and V2048 Oph (17).

We also received 24,475 archival UBV observations of northern and southern Cepheids by Richard Mitchell (MUP) and others through the 1960s. These observations were digitized by Dr. Doug Welch and students from published literature and were added to the AAVSO International Database in 2012.

Heartfelt thanks to each observer for their contribution! Sincere thanks also go to Dr. Matthew Templeton for his assistance in coordinating the PEP work at AAVSO Headquarters.

### AAVSO International Database PEP data contributors 2011–2012

<i>Name</i>	<i>Location</i>	<i>Observer Initials</i>	<i>Total</i>
Charles Calia	CT	CCB	131
Giorgio Di Scala	Australia	DSI	126
James Fox	NM	FXJ	304
Brian Fraser	South Africa	FBN	14
Gianni Galli	Italy	GGL	5
Erik Hoeg	Denmark	HEK	1
Frank Melillo	NY	MFR	99
Hans Nielsen	Denmark	NHS	3
Adrian Ormsby	MI	OAD	83
Thomas Peairs	VT	PTX	63
Thomas Rutherford	TN	RTH	72
John Martin	IL	UIS01	19
Henri Van Bommel	Canada	VBR	151
David B. Williams	IN	WI	18
TOTAL			1,089

## 2. The Year in Review

### Short Period Pulsator

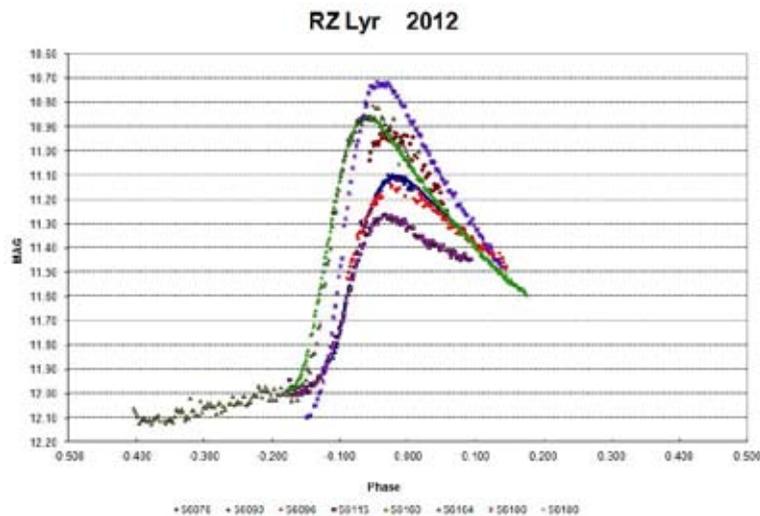
**Section Leader:** Gerard Samolyk, P.O. Box 20677, Greenfield, WI 53220

**Section Webmaster:** Shawn Dvorak, 1643 Nightfall Drive, Clermont, FL 34711

A paper containing a total of 182 times of maxima of 55 stars has been submitted to the JAAVSO for publication. This paper contained data from eight observers. The most active observers last year were K. Menzies, R. Sabo, and your section chair. Times of maximum published by the AAVSO are included in the database of the Groupe Européen d'Observations Stellaires (GEOS), France, that can be found at: <http://dbrr.ast.obs-mip.fr/>. Observers who would like to contribute data to these papers in the future should upload their observations to the AAVSO International Database and send a copy to [gsamolyk@wi.rr.com](mailto:gsamolyk@wi.rr.com).

The 2013 ephemeris for the 40 stars on the AAVSO legacy program has been posted. The light elements used have been updated based on recent observations sent to the section chair. This ephemeris is best used by observers in North America. This ephemeris along with information about the AAVSO SPP section can be found at: <https://sites.google.com/site/aavsosppsection/>

This year, multiple nights of observations were made on several legacy stars on our program. This was done to monitor the Blazhko period of these stars. Below are the 2012 observations of RZ Lyr plotted to phase. It should also be noted that the brightness at minimum also varies. Other Blazhko stars that were observed multiple times in 2012 include RW Cnc, DM Cyg, RW Dra, RR Gem, and RV UMa.



**Solar**

**Section Leader and SID Group Leader: Rodney Howe, 3343 Rivaridge Drive,  
Fort Collins, CO 80526**

**Sunspot Group Leader: Kim Hay, 76 Colebrook Road, Yarker, ON K0K 3N0, Canada**

For the last 12 months overall SID (Sudden Ionospheric Disturbance) Activity has been up and down. Our observer ranks have remained consistent and we still have a good number of observers remaining vigilant in their watch for the next solar flare events. We also added three new observers this year. There were a total of twenty-four observers submitting reports and a total of 325 reports were sent in. Thanks to all observers for their efforts in monitoring and report generation.

Two observers are eligible for an award this year: Lionel Loudet and Jean-Pierre Godet. SID Observer awards are given to observers after having submitted at least 40 reports to the group.

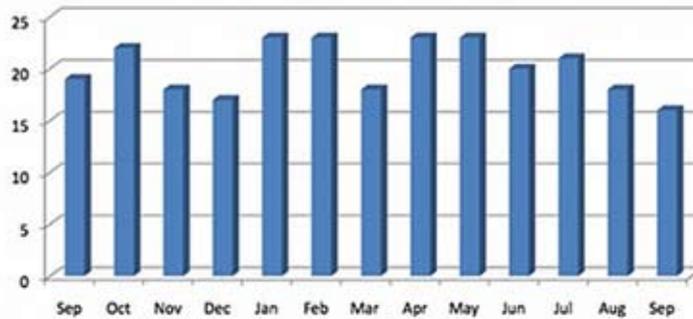


Figure 1. Monthly reports (total of 325) for VLF data submissions this last year.

## 2. The Year in Review

Here we have a yearly summary of optical sunspot and group counts from September 2011 through September 2012.

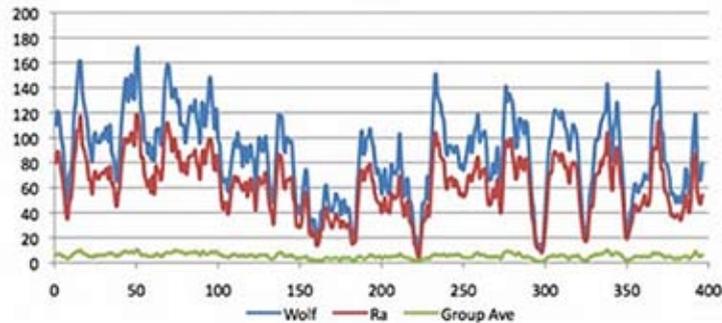


Figure 2. Daily numbers for group, sunspot, and Wolf number for the last year.

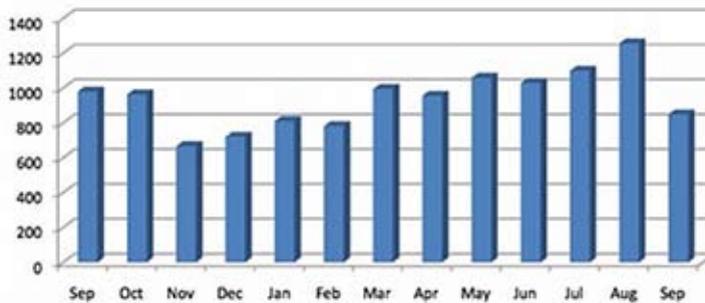


Figure 3. Number of observations per month 2011–2012. There were 12,173 daily observations reported this last year in the SunEntry database.

With the new SunEntry database it is easy to extract data in many different formats. Extracting data by day it is easy to compare the AAVSO Ra number to other observatories and their daily observations. For example: the month of March 2012 may be compared to the NOAA sunspot counts, the SIDC sunspot counts, and the SDO Satellite's STAR detector. (The SDO/HMI images come from a space-based instrument HMI, <http://hmi.stanford.edu/>).

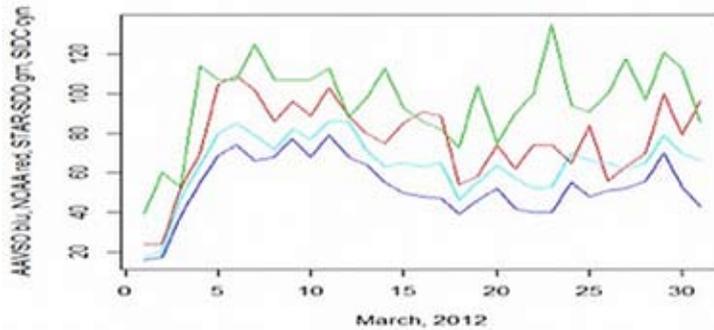


Figure 4. Sunspot averages during March 2012.

Figure 4 is a comparison between a SDO/HMI-based sunspot number (derived by Jan Alvestad <http://www.solen.info/solar/>), the NOAA SSN (<http://www.ngdc.noaa.gov/stp/solar/ssndata.html>) and the SIDC Ri data (<http://sidc.oma.be/sunspot-data/>), which is essentially the Locarno Wolf number. It had been noticed that in March 2012, Ri/Locarno was significantly above the other SSNs (by up to 25%!), taking as a base a 12-month average  $k$  scaling coefficient between the series. Then SIDC found that their March numbers were on the high end of the statistical distribution (at about + 10%), but not enough to call it an anomaly. On the other hand, it seems that both other series (NOAA and SDO counts) suffer from inverse biases, which were not present in AAVSO Ra and were artificially inflating the difference with the SIDC Ri in March. The SDO data set is of short duration (only since the launch of SDO), which is a common limitation of space-based data sets, making them less appropriate for long-term solar cycle studies.

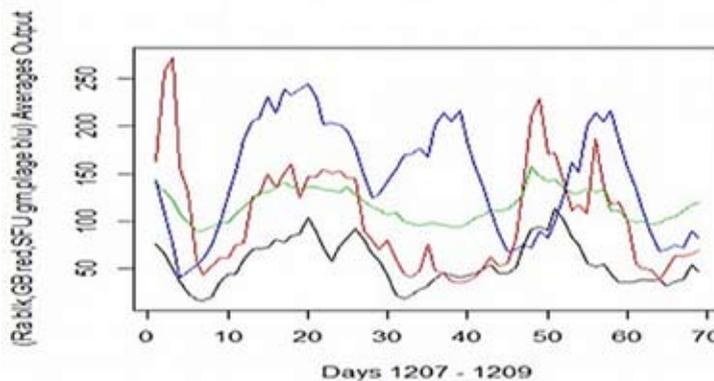


Figure 5. Daily Ra, GB, SFU, plage during days 1207–1209.

Another example of using the AAVSO Ra sunspot numbers shows a comparison of the GOES satellite X-ray data (hourly values supplied by Al McWilliams from the NOAA Space-weather web site <http://www.swpc.noaa.gov/today.html>) with the Mount Wilson

## 2. The Year in Review

Observatory's ([http://obs.astro.ucla.edu/150\\_data.html#spotplots](http://obs.astro.ucla.edu/150_data.html#spotplots)) plage data (from CII and H-alpha spectra) and the daily NRC 10.7 cm SFU data (<http://www.spaceweather.gc.ca/sx-eng.php>) for a 3-month period.

Here we begin to see how these different solar indices show different phenomena on the sun. The plage data fluctuate over a wider range than either the 10.7 cm SFU or the AAVSO Ra sunspot counts, and the GOES X-ray flare data are completely different from the other three indices.

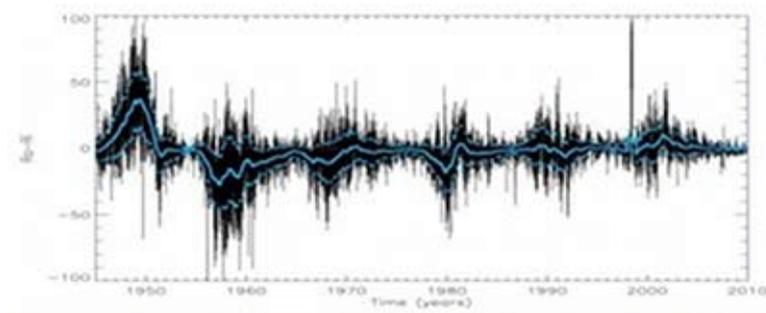


Figure 6. Locarno vs.  $R_A$  SSN (AAVSO), 1945–2010.

It is not surprising that the AAVSO American Relative (Ra) number compares best with the Solar Influences Data Center (SIDC) Sunspot Index (Ri) over the long term (Figure 6 courtesy of Frederic Clette, SIDC), as both organizations have between 70 and 80 visual observers worldwide submitting daily sunspot numbers. This long term correspondence is a tribute to the dedication of the volunteer visual observers all over the world who consistently have submitted data for over 65 years.

*continued on next page*

**Solar Section Observer Awards for 2011–2012**

**Sunspots**

<i>Category</i>	<i>Name</i>	<i>Observer Initials</i>	<i>Category</i>	<i>Name</i>	<i>Observer Initials</i>
<b>1500 Observations</b>			<b>3500 Observations</b>		
	Jose Berdjo	BERJ		Gema Araujo	ARAG
	Susan Oatney	OATS		Brian Cudnik	CKB
				David Teske	TESD
<b>2000 Observations</b>			<b>4000 Observations</b>		
	IPS Observatory	OBSO		Brenda Branchett	BRAB
<b>2500 Observations</b>				German Chavas Morales	CHAG
	Javier Ruiz Fernandez	FERJ			
<b>3000 Observations</b>					
	Tom Fleming	FLET			
	Kenichi Fujimori	FUJK			
	John Kaplan	KAPJ			
	Michael Moeller	MMI			
	E. C. Richardson	RICE			
	William M. Wilson	WILW			

**SID**

Lionel Loudet	A-118
Jean-Pierre Godet	A-119

### *Young Stellar Objects*

**Section Leader:** *Michael Poxon, 9 Rosebery Road, Great Plumstead,  
Norfolk NR13 5EA, England*

The section has definitely hit the ground running, and indeed it may be thought of as a highly active young stellar object itself! But before I get to the astronomy, I must give a huge lump of thanks to Mike Simonsen, who supported me throughout the inception of the idea, liaised with Director Arne Henden, and generally made it all happen—literally within days.

We have as our scientific consultant Professor Bill Herbst, one of the world's leading figures in Young Stellar Objects (YSO) studies, and already we are engaged in a Professional-Amateur campaign with Darryl Sergison of Exeter University in the U.K. to study selected stars in the Taurus-Auriga starforming region. As I write these words I am proposing another campaign for the group—one for you AAVSO members who like to do astronomy from a PC (or those like your humble servant who lives in the U.K. where clear nights seem to have become even rarer than they used to be!). Several stars formerly classified as Algol types have turned out to be UX Orionis stars, a type of YSO whose occasional fading episodes led initial researchers to describe them as EA-type variables. The AAVSO YSO site (<http://www.starman.co.uk/ysosection>) will carry news of this campaign, as will the YSO forum page.

At the inception of the YSO section, I drew up a database of confirmed and possible YSOs, made charts for them where none existed, and produced the web pages to interrogate the AAVSO International Database. Initially the charts available through the site, which is located on my own server at <http://www.starman.co.uk/ysosection>, bore sequences derived, using the appropriate transformation equations, from such catalogues as UCAC. Later sterling work by the sequence team (thanks again Mr. Simonsen!) resulted in official AAVSO sequences which were of greater accuracy than the 0.1m derived from UCAC.

Looking at the MyNewsFlash reports, it has become clear that more observers are taking an interest in these fascinating and important stars, with several objects, for example YZ Cephei, being caught in flagrante delicto. My hope now is that the number of members observing these stars—which are of a wide range of magnitudes (AB Aur is a wholly binocular object)—will increase. There tends to be, at least from the Northern Hemisphere, a “Spring gap” where starforming regions are low in the sky, so that is when our much-needed southern colleagues can step up to the plate, and the AAVSO's wide spread of observers proves its worth. So dust off those charts today!

### **Treasurer's Report** **October 1, 2011–September 30, 2012**

**Tim Hager, Treasurer, AAVSO, 49 Bay State Road, Cambridge, MA 02138**

The financial figures provided herein are prepared in the same way as the past three years to provide a statement of income and expenses. AAVSO also has its finances audited yearly by an external auditor and that report is available on request.

Income for the year totaled \$1,403,996. This amount included \$678,048 (48%) from withdrawals from the endowment fund and \$725,948 (52%) from other non-endowment sources. The primary sources of non-endowment funding included grants (38%), bequests and donations (6%), and membership dues (4%).

A significant portion of the non-endowment income was from various grants including \$182,260 for NASA's Chandra mission education and public outreach, \$126,855 from the National Science Foundation (NSF) for Citizen Sky, and \$165,849 from NSF for the Two Eyes, 3D education initiative. These three grants will continue to be a major source of income for the organization in fiscal year 2013. However, next year is expected to be the final year for Citizen Sky and Two Eyes, 3D funding.

We received numerous donations from many benefactors and we are very grateful to all who support the AAVSO through their contributions and planned giving. Notable among the contributions and bequests was a final payment of \$24,000 from the Hoffleit estate.

Expenses for the year totaled \$1,375,610 with salaries and benefits being the major contributor (79%). Meeting expenses were again high this year as expenses for the centennial meeting extended into the beginning of this fiscal year and also included the cost of this year's CCD school conducted at Tufts University. It is also worth noting that almost all of the AAVSONet direct expenses were covered by donations.

Not included in the year's expenses were purchases of capital assets which remain of value and useful to the association over multiple years. These capital items amounted to \$65,819 and are listed in the disposition of net income later in this report.

Finally, the endowment fund saw an increase in value this fiscal year ending the year at \$12,536,842 after withdrawals, compared to \$11,623,124 at the end of last year. Council continues to monitor the performance of the fund and is continuing to exercise discipline in its withdrawals and continues to seek ways of increasing returns on our investments.

## 2. The Year in Review

### 2012 Income

Dues	\$55,683
Sales	2,834
Meetings, CCD School, Choice	33,222
Grants	537,984
Bequests and Donations	90,784
Miscellaneous Other	5,152
Transfers from endowments	678,048
Bank interest and royalties	289
	<hr/>
<b>Total Income</b>	<b>\$1,403,996</b>

### 2012 Expenses

Staff salary costs	\$804,329
Contract/temp salaries	101,894
Payroll tax, benefits, and other costs	178,608
Building maintenance	5,295
Utilities, cleaning, insurance	17,831
General office expenses	33,275
Postage	12,288
Legal and accounting	13,140
Publications	1,286
Technical operations (including AAVSONet)	31,337
Internet	8,828
Meetings	61,462
Travel	58,264
Miscellaneous	47,773
	<hr/>
<b>Total Expenses</b>	<b>\$1,375,610</b>

**2012 Disposition of Net Income**

Total Income	\$ 1,403,996
Total Expenses	(1,375,610)
Capital Expenditures:	
AAVSONet	(25,760)
2 Eyes, 3D Equipment	(15,716)
Computer Equipment	(10,779)
Building & Property Improvements	(12,500)
Prepaid insurance	(1,064)
Change in payables/liabilities	(1,067)
Change in cash (current account withdrawals)	38,500
	<hr/>
<b>Balance</b>	<b>\$ 0</b>

**2012 Year End Endowment Balance**

Margaret Mayall Assistantship	\$ 72,297
Janet Mattei Fellowship	70,584
Other Endowment Investments	12,393,961
	<hr/>
<b>Total Endowment Balance</b>	<b>\$ 12,536,842</b>

## 2. The Year in Review



# 3. Officers, Staff, and Volunteers

## **AAVSO Officers, Council Members, and Section Leaders for Fiscal Year 2012–2013**

*You may contact these persons through AAVSO Headquarters.*

### ***Officers***

Director	Arne A. Henden	(term of office: 2005–2016)
President	Mario E. Motta	(2011–2013)
1st Vice President	Jennifer Sokoloski	(2011–2013)
Secretary	Gary Walker	(2009–2013)
Treasurer	Tim Hager	(2012–2013)
Clerk	Arne A. Henden	(2009–2013)

### ***Council Members***

Edward F. Guinan	(2008–2014)
Roger S. Kolman	(2011–2013)
Chryssa Kouveliotou	(2011–2013)
John Martin	(2011–2014)
Kevin Paxson	(2012–2014)
Robert J. Stine	(2010–2013)
Donn R. Starkey	(2010–2014)
David G. Turner	(2009–2013)

### 3. Officers, Staff, and Volunteers

#### *Section Leaders*

Cataclysmic Variable	Mike Simonsen, Gary Poyner
Charts and Sequences	Mike Simonsen
Eclipsing Binary	Gerard Samolyk, Gary W. Billings
Long Period Variable	Mike Simonsen
Photoelectric Photometry	James H. Fox
Short Period Pulsator	Shawn Dvorak, Gerard Samolyk
Solar	
Section Chair	Rodney H. Howe
Sunspot Group Leader	Kim Hay
Solar Flare/SID Observing Group	Rodney H. Howe
Solar Bulletin Editor	Rodney H. Howe
Young Stellar Objects	Michael Poxon
<i>Journal of the AAVSO</i> Editor	John R. Percy

#### **AAVSO Headquarters Staff**

Sara Beck	Technical Assistant, Special Projects
Gloria Ortiz Cruz	Data Entry Technician
Arne Henden, Ph.D.	Director
Richard Kinne	Astronomical Technologist, Information Technology
Will McMain	Web Developer
Sebastián Otero	External Consultant, VSX Team, Spanish Translations
Lauren Rosenbaum	Administrative Assistant
Michael Saladyga, Ph.D.	Technical Assistant, <i>JAAVSO</i> , <i>Newsletter</i> , and <i>Annual Report</i> Production Editor, Archives, Library
Mike Simonsen	Membership Director and Development Officer
Matthew Templeton, Ph.D.	Science Director, <i>JAAVSO</i> Assistant Editor
Rebecca Turner	Operations Director
Elizabeth O. Waagen	Senior Technical Assistant, <i>JAAVSO</i> Associate Editor, <i>AAVSO Newsletter</i> and <i>Annual Report</i> Editor
Donna Young	Lead Educator, Chandra Education/Public Outreach Office, SAO/NASA

#### AAVSO Volunteers

AAVSO members are very generous with their time and talents. Many of the programs and services we offer would not be possible without the participation of member volunteers. They are regularly involved in teaching new observers, writing articles for our publications, vetting submissions to the *Variable Star Index*, and the creation of charts and comparison star sequences.

We take this opportunity to recognize these special people, and to say *thank you* for another year of valuable contributions of time and expertise.

#### *Mentor Program*

Patrick Abbott	Jim Fox	Peter Nelson
John A. Blackwell	Geoff Gaherty	Chuck Pullen
Thom Bretl	Bill Goff	Guido E. Santacana
Glenn Chaple Jr.	Keith Graham	Donn Starkey
Tim Crawford	Roger S. Kolman	Ray Tomlin
Bill Dillon	Michael Linnolt	
Robert Fidrich	Mike Mattei	

#### *Variable Star Index (VSX) Moderators*

Wolfgang Renz	Christopher Watson	Patrick Wils
---------------	--------------------	--------------

#### *Charts and Sequences*

Thom Bretl	Keith Graham
Tim Crawford	Jim Jones
Robert Fidrich	Mati Morel

#### *Speakers Bureau*

Raymond Bengé	Roger S. Kolman	Michael Rupen
Tom Bretl	Doug Lombardi	Arif Solmaz
Tim Crawford	Alex McConahay	Chris Stephan
Pamela Gay	Mario Motta	Bob Stine
Keith Graham	Gordon Myers	Paul Temple
Albert Holm	Chuck Pullen	
Kate Hutton	Michael Richmond	

### 3. Officers, Staff, and Volunteers

#### *AAVSO Headquarters*

David Benn

Anna Hillier

Chris Watson

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Kevin Ivarsen

Tom Smith

Ben Davies

Stephen Levine

Donn Starkey

Bob Denny

Ed Los

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Gary Myers

Patrick Wills

John Gross

Tim Puckett

Alson Wong

Walter Hildebrand

Dan Reichart

#### *AAVSONet*

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Muazzez Lohmiller

Chris Stockdale

John Gross

Peter Nelson

Tom Krajci

Tom Smith

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Ken Mogul

Kevin B. Paxson

Steve McKay

Wayne Osborn

Doug Welch

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Terrill Bartlett

Michael Cook

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Tim Crawford

Hans Moritz Gunther

Bob Stine

Gerry Dyck

Rodney Howe

Andrew Wilson

Jim Fox

Roger S. Kolman

A. Gonzalo Vargas B.

Kevin B. Paxson



# 4. Word From the Astronomical Community

*Nirav Shah, an active member of the Amateur Astronomers Inc (AAI) astronomy club located in Cranford, NJ, has asked the AAVSO Mentoring Program for assistance in variable star CCD Photometry. The AAI has a membership of 215. The club had asked Nirav to lead a project on variable stars, so Nirav and three other club members have taken responsibility for moving the club into the realm of variable star observing using CCD photometry.*

*Nirav and his colleagues first wrote us having absolutely no experience in photometry, although they did have CCD imaging experience. The first step was to provide them with a paper I wrote especially for those just starting out in CCD photometry. After perusing this paper, Nirav started asking the right questions to get the group on its way. Those questions pertained to equipment, charts, comp stars, imaging, calibration, & software. With two observatories, four telescopes ranging from 8" to 24", and an SBIG ST8MXe camera, the club already had excellent equipment for making CCD variable star observations. To round out the equipment list, the club recently purchased a V filter, MaximDL, and AIP4WIN.*

*With the necessary equipment at hand, Nirav asked for some guidance with making flat and dark frames. He also asked for assistance in creating charts and selecting appropriate comp stars. Next came image acquisition with the V filter and image calibration. Nirav plans to use AIP4Win for magnitude determination. Should he need assistance in the use of this program and with submitting observations to AAVSO, we remain ready and eager to help.*

*Nirav tells me that he hopes to inspire others in their club to take an interest in variable star observing. He has also asked me to convey his deep gratitude to the mentoring program for the guidance and assistance in their endeavor. With the enthusiasm, quest for knowledge, ability for quick understanding, and desire for accurate observations displayed by Nirav, AAVSO can look forward to some quality data from Nirav and the AAI.*

—Keith Graham  
Manhattan, Illinois

*This is a short note to tell you that I have been working with Bill Goff in Sutter Creek California, since meeting him last week at the Amador Amateur Radio Club meeting. My name is James G Cottle and I am a long-time VS enthusiast and astronomer since I was 14 years old. I am*

## 4. Word From the Astronomical Community

*interested in gearing up for some serious work in addition to astro imagery at my new Fiddletown, California observatory. I am presently mid-way thru construction on this 9' x 14' roll off roof structure with an isolated telescope/warm room at 2,500 feet on one of the foothill ridges of Gold Country in the Sierras. Bill has been very helpful in suggesting more expenditures (such as a V-filter to contribute data, several books on cataclysmic and variable stars in general, and so forth). I appreciate the comradeship of Bill and his long expertise in the observational CV area as well as VS's in general. I have been a member of the Florida group at Hickory Hill, Chiefland and am reminded of the encouragement and warmth that I received from several members down there before I moved (1994) to the San Francisco Bay area. Now, constructing this new permanent observing site in Fiddletown is a long term dream of mine but, as you probably know, the work is difficult and a good friend can help drive things forward. Now, with my permanent site, I am looking toward organizations such as the AAVSO and CBAstro for some more structure to my work. Bill has been very tolerant of my novice inquiries. I hope to join AAVSO in the next few days. In the meantime, please consider my renewed interest due to Bill's encouragement and help. Thank you for your time and THANKS BILL!*

—James G Cottle, Ph. D.  
San Francisco

*If you make a report to the Variable Star Index (VSX) all this information is vital, as to have your discovery reported and confirmed it needs to be verifiable by others, and available for peer review. Thus the onus is on the discoverer to present the data that needs to be reviewed.*

*As this was the first time I had been through the process, and being very much in the AMATEUR Astronomy camp, I was very nervous about the process. Its always important to follow the process and accept the feedback that comes from those with much more experience than one's self.*

*I received back a very helpful email that rejected my submission (for now) due to the fact that I didn't have enough data to produce a full phase diagram and I had suggested that it may be a Cepheid Variable due to the short period and hadn't considered that it was a bit too blue to be a Cepheid and that it was more likely a RRab. The VSX person made some very helpful suggestions about what I should do next—get some more data and produce a full phase diagram and re-submit.*

—Peter Lake  
AAVSO member  
Australia

## 4. Word From the Astronomical Community

*My master thesis was about to fail because our telescope broke down. I had only three months to finish it and the telescope was not going to be ready by that date. So I REALLY needed data for doing my eclipse mapping.*

*Thanks to your help and the excellent AAVSO data, I won a scholarship to do my PhD in England. I'm so happy!! Thanks again for all your help with my thesis.*

—Penelope Longa  
Graduate student  
Chile

*The AAVSO provides invaluable services to astronomy, first in collecting and maintaining very long-term light curves for a huge number of stars, and second in motivating a global network of amateurs to track and report observations of individual objects in support of multi-wavelength observations. Further, the AAVSO has set the standard for the immediate public availability of data which is essential to time-variable astronomy. In my own case, the AAVSO has been critical to several X-ray/radio/infrared campaigns, including the first clear demonstration that cataclysmic variable (CV) outbursts lead to strong radio emission. More generally, the professional community is finally beginning to realize the importance of the time domain, with major instruments like Swift, LSST, and SKA making the exploration of this last astronomical frontier one of their major objectives. The AAVSO will play an ever more critical role, providing consistent, reliable, and global optical coverage for the sources these instruments discover and study.*

—Michael Rupen  
Scientist, National Radio  
Astronomy Observatory,  
Socorro, NM

*I have downloaded AAVSO data for a few [Cataclysmic Variable Stars], most of the times for use in public talks, or in teaching.... I would like to express my sincere acknowledgement of the resources that the AAVSO provides. The online database is extremely good, there is not much that could be improved.*

—Boris Gaensicke  
Dept. Physics, Univ. Warwick,  
Coventry, England

*I am pleased to say that my experience with the AAVSO [International Database] was a*

## 4. Word From the Astronomical Community

*good one. The web-based system was straightforward to use and the download was fast. I used the AAVSO observations of Betelgeuse in my research concerning the nature of the star's variability. Although these data were a relatively small part of my investigation, being combined with my own spectroscopic data from the Elginfield Observatory here at the University of Western Ontario, it was still very valuable and helped fill out the scientific picture. The long time base was particularly useful.*

—David F. Gray

*I am a young astronomer from Sri Lanka.... Although [our institute] has the facility to do photometry, our site is very bad for such observation. In such a case, it is very important to have a data archive for variable star observations. As a less-privileged astronomer, I very much appreciate your service in the development of astronomy in my country.*

—Janaka Adassuriya

*During this past year we have published two papers in which we used AAVSO data: Gromadzki, M.; Mikolajewska, J.; Whitelock, P. A.; Marang, F., 2007, "On the nature of the cool component of MWC 560", *Astronomy and Astrophysics*, 463, 703; and Gromadzki, M., Mikolajewska, J., Lachowicz, P., 2008, "Post-outburst variations in the optical light curve of RS Oph", in "RS Oph 2006 and the Recurrent Nova Phenomenon", eds. N. Evans, M. Bode, T. O'Brien, *Astron. Soc. of the Pacific Conf. Ser.*, in press. This data helped us very much. Thank you very much for your efforts.*

—Mariusz Gromadzki  
N. Copernicus Astronomical  
Center, Warsaw, Poland

*...I was aiming to look at some data from SS Cyg to see if it would be appropriate for a laboratory exercise. I didn't have any trouble getting the data. I appreciate the service.*

—Tom Maccarone

*[AAVSO support] was especially critical, as many of the Southwestern U.S. observatories were clouded-out, and it was the AAVSO measurements that saved the day. For cataclysmic variable work on the Hubble Space Telescope, the AAVSO observations are fundamental to the project as HST needs confirmation that the objects are not in an outburst state within twenty-four hours of the start, and if this is not received, the observation is cancelled and it cannot be done later. With the vagaries of weather, multiple sites are a must, and this is where the AAVSO shines. I have been awed by the continued response of AAVSO observers*

## 4. Word From the Astronomical Community

*to my requests.... [on AAVSO support for her Hubble Space telescope observing campaign on the cataclysmic variable SDSS133948 ( <http://www.aavso.org/news/sdss133948.shtml> )]*

*—Dr. Paula Szkody  
University of Washington,  
Seattle*

*For my dissertation research I studied water masers around evolved stars, like Miras. Masers are the microwave equivalent of lasers, and amplify ambient background microwave emission through stimulated emission of radiation and very long path lengths (~1AU) through velocity coherent water vapor that is in an inverted energy state. By studying the motions of these point-like bright spots of microwave light, I measured the distance to the stars more accurately than was possible before. In order to gain insight into the physical environment around the stars at the time of my observation I used AAVSO observations. The light curves of these stars are important for understanding how much of the gas might be in an excited state and picking the best time to observe the stars (the more light from the star, the more molecules are typically in an inverted state and the brighter the masers are). The work of the AAVSO community in providing these observations added significantly to my ability to understand my target objects and ensure that my observations with the VLBA would be successful.*

*—Kevin Marvel  
Executive Officer, American  
Astronomical Society*

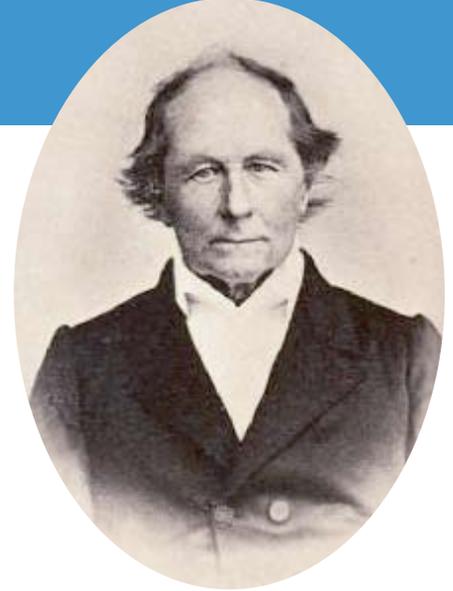
## 4. Word From the Astronomical Community



# 5. Support for the AAVSO

## The Argelander Society

Named for Friedrich Argelander, who is considered to be "the father of variable star astronomy," **The Argelander Society** offers membership benefits to those individuals who have given substantial financial support to the AAVSO over many years. Once a benefactor has donated a cumulative total of \$35,000.00 to the AAVSO, they are eligible for a lifetime membership in the organization, free registration to annual meetings, invitations to special events, special awards, and tokens of the association's appreciation.



Friedrich Wilhelm August Argelander  
(1799–1875)

*Photograph courtesy of the Mary Lea Shane Archives  
of the Lick Observatory, University of California-Santa Cruz*

The AAVSO gratefully acknowledges the benefactor members of

## THE ARGELANDER SOCIETY

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## 5. Support for the AAVSO

### 2012 Benefactors (January 1, 2012–December 31, 2012)

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Margaret Doleman (*in honor of Dorrit Hoffleit*)

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*AAVSO Annual Meeting at Harvard College Observatory, 1917*

*continued on next page*

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*The AAVSO's 50th Anniversary Meeting at  
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*The AAVSO's 75th Anniversary Meeting at Harvard University, 1986*

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If you would like more information about becoming a Corporate Affiliate of the AAVSO, please contact the Development Director at [aavso@aavso.org](mailto:aavso@aavso.org)

*The AAVSO's 100th Anniversary Meeting at  
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*details on next page*

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# The American Association of Variable Star Observers



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