News from the
Society for Astronomical Sciences
Vol. 23 No.2 (May 2025)

In-person attendees at SAS-2024. Photo by Bob Stephens.

Invitation to Attend SAS-2025

Everyone interested in the use of small telescopes for science and education is invited to participate in the Society for Astronomical Sciences' 44th Annual Symposium, in Ontario, California, on **June 19-20-21, 2025**. Mark your calendars, invite your science-oriented friends and club members to join us.

The SAS Symposium is the premier annual conference devoted to small-telescope astronomical research. SAS-2025 offers both in-person and interactive online participation.

The Symposium brings together amateur astronomers, students, instructors, and professional astronomers for in-depth discussions of topics related to small-telescope science and research. It is an excellent venue for presenting development of instruments, new observing techniques, discussing targets of observational campaigns, describing instrumentation and data reduction or analysis methods, developing collaborations, and sharing results, expertise and experience. Almost any topic related to astronomical research using modest telescopes is of interest to SAS. In the past these have included – but are not limited to – asteroids, planetary observations, variable stars, solar observing, extra galactic transients, and extrasolar planets.

You do not need to be an expert to benefit from participating in the Symposium. Our goal is to help you learn about small-telescope research opportunities and become a productive observer and researcher, by providing a collaborative environment where you will learn how to perform quality observations, generate useful data, and contribute to astronomical science.

Registration: The registration links are

In Person participation:
https://socastrosci.app.neoncrm.com/event.jsp?event=99&

Interactive On-Line participation:
https://socastrosci.app.neoncrm.com/event.jsp?event=94&

The Registration fee is $110 for SAS members or $135 for non-members.

Agenda: The tentative Agenda of talks and activities is given on page 11. This schedule is subject to adjustment.

Hotel: The Symposium will be held at the DoubleTree by Hilton hotel at 222 North Vineyard Avenue, Ontario, California, 91764 (ph 909-937-0900).

Workshops: On Thursday June 19th we are hosting two workshops: "Published Student Team Astronomical Research Seminars" in the morning, and "Scientific observations

with Smart Telescopes" in the afternoon. You can add these to your package when you register using the links above.

Morning Workshop: **Published Student Team Astronomical Research**

No charge, but registration is required.

The one-semester Astronomy Research Seminars results in published team papers that apply math and statistics to real data while investigating questions for which there is no textbook answer. In the past 18 years, over 200 team papers, co-authored by over 700 students, instructors, and supporting amateur astronomers have been published in the *Journal of Double Star Observations* or the *Proceedings of the Society for Astronomical Sciences*. As co-authors of peer-reviewed papers, the students form a self-image as scientists, often moving on to advanced education with a scholarship. The workshop explains how the Seminars work, the challenges faced by students, instructors, and administrators, and provides examples of successful Seminars. The workshop begins with a description of the role of small-telescope science in the age of large telescope surveys, looks back at the origins of the Seminars and describes how they expanded over time, first in the San Diego area, then online using remote robotic telescopes, and finally to a four-state community college consortium and to public and private high schools. The workshop presentations end by considering the future role of small-telescope science in the age of Big Data, AI, and ever larger and more numerous robotic survey ground and space telescopes. The presentations are followed by a panel discussion and Q&A session by the in-person presenters.

Workshop Agenda

8:30 *Bob Buchheim: Introduction to Small Telescope Science.* Bob will introduce the special role that small telescopes play in astronomical research (such as time-series measurements of bright targets that are not practical at large observatories), and will highlight some of the project areas where students and amateur astronomers are making scientific contributions.

8:50 *The Astronomy Research Seminar's Formative Years.* Team project success resulted from simply following four basic rules of scientific research: (1) conduct research within a community of practice; (2) publish the research (thereby placing the reputation of the students, instructors, and school on the line and motivating everyone to produce high quality papers); (3) present results at conferences; and (4) insist on unequal contributions, allowing each student to contribute as their time, talents, and experience dictate (author order providing justice). Three practical lessons were learned during these formative years: (1) reserve half of the semester to write and rewrite papers; (2) failure is not an option as this would impede student careers instead of advancing them; and (3) the most frequent cause of trouble was student teams taking on too much.

9:10 *Pat Boyce: Making an Astronomy Curriculum Available for Everyone Worldwide* Boyce-Astro has evolved from a San Diego community based double star course to a broad online suite of astronomy courses available for people of all ages anywhere in the world. Through a combination of asymmetric training, online Zoom classes, and remote robotic observatories, Boyce-Astro is fulfilling its mission to introduce students everywhere to science and technology via online astronomy research.

9:30 *Rachel Freed: Expanding the Seminars Nationally and Internationally.* Over the past several years the astronomy research seminars have been gaining traction, spreading nationally and internationally. Access to the Las Cumbres Observatory Global Telescope network has allowed all participants to collect their own data for analysis, giving students a sense of project ownership, and increased science identity. Working with teammates from different schools, states and countries gives students an introduction to global collaboration which is a hallmark of modern science. Learning to collect and analyze their own data, and then to communicate their findings through publication and conference presentations, teaches students about the processes of science as well as giving them an understanding of science as a human endeavor. For educators, these seminars allow them to provide authentic learning experiences for their students while becoming members of a larger Community-of-Practice.

9:50 Break

10:00 *Paul McCudden: Community College Consortium Seminar:* An NSF ITYC/IUSE Planning Grant was recently awarded to Colorado Mountain College to pilot a consortium of Southwest rural-community colleges in small-scale Astronomy research projects ideally suited to the skills, facilities and breadth of knowledge that the students have and can acquire. Guided by local faculty and mentors, and meeting weekly with their peers across the Four Corners area and program organizers via the internet, students acquire the tools and skills of scientific research, collect real data both locally and remotely, and publish their results in peer-reviewed journals, giving them the same access to and experience of doing real science that their four-year peers have enjoyed for years.

10:20 *Michael Ellis: Published Scientific Research in Rural Secondary Public Education* The second semester of an Earth and Space Science course engaged student teams (grades 9-12) in the observation and analysis of binary stars utilizing data from the United States Naval Observatory, and online observations using Las Cumbres Observatory robotic telescopes. Results were analyzed with AstroImageJ and Desmos. Students were tasked with composing a paper for publication in the *Journal of Double Star Observations*. The development and implementation of the course encountered numerous challenges, including constraints related to school technology, bureaucratic hurdles, administrative support, and varying levels of student interest. That said, nearly two-thirds of the students enrolled in the class completed the course with papers prepared for publication.

10:40 *Kalee Tock: Stanford Online High School Seminars* Learning along with your students and making a real contribution to science, is deeply gratifying. To do this takes deep engagement with the work of each student as well as willingness to be uncertain in front of them and alongside them. In the Stanford Online High School Astronomy Research Seminar, we start with semi-structured double star projects to learn how to study a star: navigating astronomical catalogs, inferring a star's spectral type from its color and parallax, making measurements on astronomical images, writing a paper, and

addressing comments from a journal reviewer. We then embark upon less structured variable star investigations that go in many different and often unexpected directions. The Universe is full of surprises!

11:00 *Brian Kloppenborg: The future of small telescope science.* Many of the observational areas where small ground telescopes predominated in the past—such as variable star astronomy, transient event discovery, and asteroid tracking—are now being shared with the firehose of fully automated observations spewing forth from the large survey telescopes. What, in this new era, will be the role of the numerous small ground telescopes? How can these smaller telescopes best contribute to science? How can these two observational resources, a few large survey telescopes and many small telescopes best complement each other?

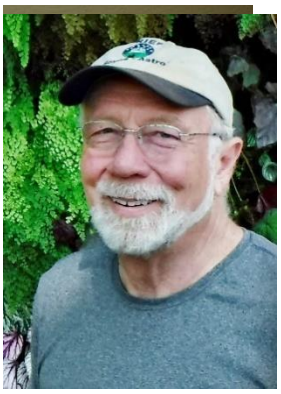
11:20 Panel Discussion, Q&A: The Future of the Astronomy Research Seminars and Small Telescope Science.

12:00 Adjourn

Speakers

Robert Buchheim Bob is a retired aerospace executive. He has published papers on engineering management, asteroid light curves, double stars, and other astronomical topics. He wrote *The Sky Is Your Laboratory* as a way of helping other amateur astronomers get started with small-telescope research; and a compilation of historically important observing projects in *Astronomical Discoveries You Can Make Too*! (both books published by Springer). He has been the Secretary of the Orange County Astronomers, President of the Society for Astronomical Sciences, and a Board member of the American Association of Variable Star Observers. He was awarded the Western Amateur Astronomers' G. Bruce Blair award in 2010. He now spends most nights doing variable-star spectroscopy in his "Lost Gold Observatory".

Russell Genet Russ is the Director of STEM Education Development at Gila Community College where he teaches astronomy research courses. Russ has a BS in electrical engineering and a PhD in astronomy. He pioneered the development of robotic telescopes in the 1980s and initiated the Astronomy Research Seminars that produced over 200 published papers coauthored by some 700 students. Russ was President of the Astronomical Society of the Pacific (1993-1995) and is the author or coauthor of many books and papers. An instrument rated pilot, he lives in Payson, Arizona with his wife, Cheryl, who teaches philosophy and world religions.



Pat Boyce is the founder and Executive Director of Boyce-Astro, a nonprofit introducing students to science through observational astronomy. After a high-tech career, he built Boyce-Astro from a classroom environment into a global education program offering research in double stars, exoplanets, variable stars, spectroscopy, and introductory Python. The organization has two remote observatories, participates in LCO's Global Sky Partners, and hosts an annual program at Mount Wilson. With nearly one hundred student-published papers, Boyce-Astro emphasizes real scientific contribution. Pat's mission is to make research-based learning accessible to students around the world, enabling them to participate in STEM through astronomy research regardless of location or classroom access.

Rachel Freed Rachel is a postdoctoral researcher at the University of North Carolina, Chapel Hill studying the impacts of remote telescope use on students across the US. She is a co-founder and the President of the Institute for Student Astronomical Research through which she teaches introductory astronomy research seminars to high school and college students and instructors around the world.
She has been an amateur astronomer for 25 years and was a high school chemistry and astronomy teacher for 10 years. Seeing how students respond to authentic engagement in science, she is passionate about bringing astronomy research opportunities to all students. Rachel is also the editor of the *Journal of Double Star Observations*.

Paul McCudden Paul has taught Physics and Astronomy at Colorado Mountain College in Steamboat Springs, CO for eight years. Prior to that he taught at Los Angeles City College. At LACC he was PI for an NSF REU that took community college students (usually Hispanic and/or first-generation students) and gave them year-round internships at JPL. At CMC he has guided students on similar astronomy research projects, using the proven research seminar system worked out by Russ Genet, Rachel Freed and others, and has recently been awarded an NSF planning grant to explore the feasibility of expanding

these projects to a consortium of Southwest rural community colleges and their students.

Michael-James Lee Ellis holds an A.A.S. in General Technology and a C.P. In Photography from Mohave Community College and a B.S. in Physics and Secondary Education, with a Mathematics emphasis, from Northern Arizona University. A dedicated educator since 2010, he teaches Advanced Placement Physics and other STEM courses at Payson High School. He has authored and co-authored multiple papers in the Proceedings of the Society for Astronomical Sciences and The Journal of Double Star Observations. Recently, he launched a high school research initiative expected to result in the publication of nine student co-authors in The Journal of Double Star Observations

Kalée Tock earned her B.S. in Chemistry from Harvard University and an M.S. from the Stanford University Department of Chemistry. She then earned a second master's degree in Learning, Design, and Technology from the Stanford School of Education. She currently teaches Principles in Chemistry, Astrobiology, Astrophysics, and the Astronomy Research Seminar at Stanford Online High School, the latter three of which are her own creations. When not teaching, she enjoys camping, biking, sailing, launching high-altitude balloons, and reading fiction of all genres.

Brian Kloppenborg is an astrophysicist and Executive Director of the AAVSO. He holds a Ph.D. in Physics from the University of Denver and a B.A. in Physics from Hastings College. Previously, he was a Research Scientist at Georgia Tech, leading teams on government programs. Dr. Kloppenborg's work, published in journals like *Nature* and *The Astrophysical Journal*, focuses on fostering pro-am collaboration and advancing scientific discovery in astronomy.

Afternoon Workshop: **Scientific observations with Smart Telescopes**

Registration fee $50

This workshop will bring together users and investigators for a moderated discussion of how we can best take advantage of Smart Telescopes for scientific astronomical observations.

Smart Telescopes, pioneered by the 3-inch aperture UniStellar Odyssey and now spanning from the 1-inch aperture Dwarflab Dwarf II to the 6-inch aperture Celestron Origin, are a rapidly-evolving technology that combines telescope, mount, pointing and guiding, camera and image-acquisition in a self-contained low-cost package. There are not yet any "experts" in the use (or pitfalls) of these telescopes as scientific instruments, but it is time to have a focused discussion on the use of Smart Telescopes for scientific astronomical observations: their capabilities and limitations, your experiences (both successful and problematic), and scientific projects that match their capabilities.

If you would like to be scheduled to make a presentation at this Workshop, please send an e-mail to Program@SocAstroSci.org .

Proceedings and Videos from SAS-2024 are available online

The SAS-2024 Symposium saw 75 people registered in person and 25 people on-line, for 3 days of small-telescope science. Thank you to the presenters, Sponsors, and organizers for making this a great gathering!

The Proceedings book from SAS-2024 (as a PDF) is freely available on the SAS website, at: (https://socastrosci.org/wp-content/uploads/2024/06/2024-Proceedings_Ver1.3c.pdf).

Recordings of the presentations are also freely available:

Workshops (Global Meteor Network, and Tri-color Imaging for Science) are at:
https://www.youtube.com/playlist?list=PLmQ5Bvz4ACYJLYfswIeAipapoeGeI6QWy

Technical Presentations are at:
https://www.youtube.com/playlist?list=PLmQ5Bvz4ACYLNZQMZ0dZ7JhWsSYHWhrel

Sunday right after SAS-2025: On Sunday 6/22/25 from 9:00 am - 12:00 PM at the Doubletree hotel in Ontario, California, InStAR will host a workshop showcasing student research projects from various schools. This provides a wonderful opportunity for students to engage with the larger community around small telescope astronomical research, allowing students to learn from more advanced researchers, as well as bringing newer analysis methods to the community, as students are often engaged with the latest in coding and related technologies. There is no fee to attend, and the InStAR team encourages astronomers from SAS to attend.

SAS-2024 Symposium Sponsors

The Society for Astronomical Sciences is grateful to our Sponsors for their participation and financial support. Without them, our Symposium would not be possible. We encourage you to consider their fine products for your astronomical needs.

Sky & Telescope Magazine
The Essential Guide to Astronomy
http://www.skyandtelescope.com/

DC3 Dreams Software
Developers of ACP Observatory Control Software
http://www.dc3.com/

PlaneWave Instruments
Makers of the CDK line of telescopes
http://www.planewaveinstruments.com/

Sierra Remote Observatories
World Class Remote Imaging and Data Acquisition
http://www.sierra-remote.com

Software Bisque
Superior imaging solutions for discriminating astronomers
http://www.bisque.com

Woodland Hills Camera & Telescopes

https://telescopes.net

Optec Inc:
A creator of Astronomy Technology!
http://www.OptecInc.com

Small Telescope Science in the News

The best evidence for the ongoing value of small telescopes and amateur research efforts is the steady flow of published science results that used small-telescope data, or that are within the capabilities of our observers. Here are some noteworthy examples.

Stellar evolution along the AGB as revealed by the shape of Miras' visual light curves

by D.T. Hoai, et al

pre-print at https://arxiv.org/pdf/2411.18044

Here is an interesting piece of work, based entirely on the long-term AAVSO photometry database of a set of Mira-type variable stars. The authors investigate taxonomic differences between stellar spectra class, and various correlations in the amplitude, shape, and periodicity of the lightcurves.

The authors confirm some previously-reported correlations, and identify some new ones. They also describe several distinct families of stars within this group, distinguished by photometric and spectroscopic features.

Stars in the Asymptotic Giant Branch of the HR diagram present a complex variety of observable effects. There is a lot going on in this stage of stellar evolution (cessation of Hydrogen burning, beginning of Helium burning, thermal pulses, possibly pulsation-induced shock waves, dense stellar winds and condensation of dust, etc.). More theoretical and observational work is needed to understand what the observables are telling us about the physics, the interior structure, and evolution of these stars.

The authors are enthusiastic about the AAVSO observers' attention to this family of variable stars, and the quite good accuracy and density of photometry observations.

I wonder whether a similar campaign of AAVSO spectroscopy, following some of these stars through several pulsation cycles might be fruitful?

The dramatic transition of the extreme Red Supergiant WOH G64 to a Yellow Hypergiant

By G. Munoz-Sanchez, et al

Pre-print at https://arxiv.org/pdf/2411.19329

This paper is only peripherally related to "small telescope science", since it reports on photometry and spectroscopy from large professional telescopes; but it is of interest for two reasons:

First: the object is a red supergiant (WOH G64) that has some things in common with the targets of the AAVSO "SNEWS" campaign; and

Second: the paper reports on a remarkable change in the star, over a surprisingly short interval of time.

Over the past 30 years, this star has changed its average magnitude, its pulsation amplitude, and its spectral type quite significantly. 30 years ago, it was a very cool red supergiant (spectral type M7.5). Today, it is a hot yellow hypergiant (spectral type B[e]).

Might other SNEWS targets do something similar in the coming decades? The only way to find out is to monitor them (and report the photometry to AAVSO). A particular value of small-telescope ground-based observations is likely to be their consistency in spectral bands (e.g. Johnson-Cousins BVRI and Sloan SG, SR, SI). Professional projects often have unique spectral/filter bands and limited lifespans, complicating the task of piecing together a long-term lightcurve. For example, the paper's Figure 1 knits together observations from MACHO (≈1993-2000), OGLE (≈2001-2014), GAIA (≈2014-2020) and ATLAS (≈2021-2025) to illustrate the photometric changes in WHO G64.

The AAVSO SNEWS targets are challenging objects for small-telescope spectroscopy (very red, and somewhat faint), and the AAVSO has not (yet) requested spectroscopic monitoring of the SNEWS target stars, but it appears that regular spectroscopic monitoring (including optical, red, and near-IR wavelength ranges) might turn out to be useful. If something surprising happens to one of these stars, people will start to wonder, "what about spectral changes?"

See the AAVSO website for details on the SNEWS campaign (https://apps.aavso.org/v2/campaigns/836).

Non-evolutionary effects on period change in Magellanic Cepheids. II. Empirical constraints on non-linear period changes

By R. S. Rathout, et al

Pre-print at https://arxiv.org/pdf/2503.00661

This paper barely misses our definition of "small-telescope science" because it is based on data from the Optical Gravitational Lensing Experiment (OGLE) 1-meter and 1.3-meter telescopes. I include it because it points to evolutionary and non-evolutionary effects that can probably be observed in Milky Way Cepheids by our observers: namely, period changes over a time-span of decades.

The paper itself is heavy-going, focused on the analysis and statistical tests that the authors made on their large sample of Cepheids in the Large and Small Magellanic Clouds. Skip the test and the math, and just look at the Figures! There, you'll see O-C diagrams of Cepheid variables with periods of a few days, and O-C changes amounting to a few hours over a couple of decades!

Presumably, such things are happening in some of the Cepheids that are regularly measured by the AAVSO short-period variable community. Hopefully, this research will motivate those observers to continue, and to continually strive to

"up their game" in terms of photometric data quality (standard filters, transforms, annual observing runs that are sufficient to create a well-sampled accurate phased-plot each year in two or three filter/bands).

There are still mysteries in this family of standard candles. We are used to sorting the Cepheids into "fundamental mode" and "first overtone" mode pulsators. But there is also a time dimension: as the stars age and evolve, they pass into, through, and out of the Instability Strip three times (1st, 2nd and 3rd crossings). The pulsation period should change in a predictable way during each crossing. Quite a few of the Cepheids in these author's sample show some sort of period change; especially the first overtone pulsators (about 70% of them). Some of those changes might be due to evolution, but most of the period changes are too rapid for that explanation. Some are in binary systems (leading to a cyclic O-C curve). And quite a few have up-and-down O-C curves with large excursions.

As always, more – and better – data will lead to better characterization of these stars and their life-cycles.

Symbiotic stars in the era of modern ground- and space-based surveys
By Jaroslav Merc
Pre-print at https://arxiv.org/pdf/2504.16825

Here's something that you don't see every day: a professional review article that doubles as a motivational lesson that encourages amateurs to persist in measuring symbiotic stars. Two of the prominent figures in the paper come from amateur observations (AAVSO photometry, and ARAS spectroscopy).

Small-telescope photometry and spectroscopy are essential for characterization of known (or suspected) symbiotic stars, and for identifying the yet-undiscovered members of the symbiotic family. "*Characterization"* requires time-series observations because both the brightness and the spectral features of these systems vary on a wide range of time scales, in ways that are not fully understood; and such time-consuming long-duration projects rarely fit into the time-allocations of professional observatories. Searches for symbiotics – and putative "*discoveries*" of symbiotics – need to be confirmed by targeted multi-band photometry and especially by spectroscopy (usually time-series or time-sequences of both) because the selection algorithms used by surveys all have serious limitations; and are subject to significant risk of false-alarms. Only dedicated individual follow-up of each target will really settle the question of it being a genuine symbiotic system.

Caught in the Act: Observations of the Double-mode RR Lyrae V338 Boo during the Disappearance of a Pulsation Mode
by K. Carrell, et al
The Astrophysical Journal, 973:157 (8pp), 2024 October 1
Open Access at:
https://iopscience.iop.org/article/10.3847/1538-4357/ad7094/pdf

Here is a wonderful example of the power of pro-am collaboration – in this case professional analysis of TESS photometry (outstanding long-duration, rapid-cadence, high-precision photometry ... but over a limited time-span) and ground-based photometry carried out by AAVSO members (roughly 1-day cadence, excellent precision, and continued long after the TESS satellite had moved on to a different pointing.

V338 Boo is a double-mode RR Lyrae-type star (RRd). Its pulsations display two periods (fundamental mode and first-overtone mode); and in a normal RRD, the first-overtone is somewhat stronger than the fundamental mode. Previous observations of V338 Boo had shown that in this star, the relative strengths of the two modes change over time.

In this study, the TESS Sector 51 photometry clearly showed the fundamental mode fading almost to zero amplitude over the course of the TESS sector, and barely starting to increase at the end of the TESS sector. AAVSO observers were asked to continue time-series photometry for an additional month (Alert Notice 786). Their data showed that the star had returned to "normal" (first-overtone mode being dominant), but also showed ongoing changes in the ratio of the strengths of the two modes.

Well done!

Stellar tidal streams around nearby spiral galaxies with deep imaging from amateur telescopes

by David Martínez-Delgado, et al

pre-print at https://arxiv.org/pdf/2504.02071

Way back at the 2011 SAS Symposium, R. Jay Gabany and David Martinez-Delgado described their successful efforts to image the faint tidal-tail structures around spiral galaxies – remnants of the process by which these galaxies are constructed. You can read their paper at
https://articles.adsabs.harvard.edu/pdf/2011SASS...30....1G

The demonstrated capability of amateur telescopes – fairly large aperture, wide field of view, modern CCD imaging chips – led to a pro-am collaboration described in this paper. The imaging goal is to collect a large sample of stellar stream images, so that statistical study can be done. These targets are faint: surface brightness of 26 mag/sq-arcsec, or fainter, so they do represent a serious challenge for imaging! Nevertheless, scientific-grade images have been obtained by expert astro-imagers using telescopes ranging from 0.13m (5 inch) to 0.8m (31 inch), from pristine dark-sky sites. Accumulated exposure durations range from 3 hours to 10 hours.

Check out this paper to see some remarkable images, and clever low-signal photometry.

Characterization of the Dust and Sodium Tails of Comet C/2020 F3 (NEOWISE) from Parker Solar Probe and Amateur Observations
by Qasim Afghan, et al
The Planetary Science Journal, 5:264 (12pp), 2024 December
Open access at
https://iopscience.iop.org/article/10.3847/PSJ/ad856b/pdf

If you take a beautiful astro-image, you may ask yourself, “is this of any scientific value?” Other papers highlighted in this article answer “yes” for images of galaxies (and their tidal streams) and stars (via time-series photometry). It turns out that the answer is also “yes” for comet images.

This paper describes how amateur images of the comet were used to fit a standard model of comet dust grains and trajectories. The combination of a spectacular comet and professional facilities being closed for COVID made the rich data set of amateur images the dominant record of the comet’s activity. The authors note that amateur images present challenges “such as small image distortions caused by postprocessing techniques and nonlinear brightnesses resulting from image enhancement techniques, … background noise … each observers’ atmospheric conditions, equipment, [and] spatial resolution”.

Happily, having recognized these issues, the authors were able to use the amateur images for detailed study of the comet's activity, dust ejection times, and grain parameters.

Upcoming Meeting

BINARY ASTEROIDS VI: The 6th Binary Asteroids Meeting will be hosted at Observatoire de la Côte d’Azur, Nice, France on September 15-17, 2025. The workshop will be focused on binary and multiple systems among the NEO, Hungaria, main-belt, Trojan, Centaur, and TNO populations. Hear from experts on all topics related to binaries, including their detection, characterization, formation, and dynamical evolution.

For updates and registration information go to:
https://forms.gle/dCVgFa2t6WXVLMuM8

SAS Leadership

Corporate Officers:
Bob Buchheim – President
Robert Stephens – Treasurer
Robert Gill – Secretary

Board Members:
Wayne Green
John Menke
John Martin
Tony Rodda
Jerry Foote (Emeritus)

Newsletter Editor:
Robert Buchheim

Sponsor & Vendor contact:
SASLiaisons@gmail.com
Wayne Green
Tony Rodda

Registration:
Lorraine Moon

All SAS Leaders are volunteers, serving without compensation.

Advisors:
Dr. Arne Henden
Dr. Alan W. Harris
Dr. Dirk Terrell

Membership Information

The Society for Astronomical Sciences welcomes everyone interested in small telescope astronomical research. Our mission is to foster amateurs' participation in research projects as an aspect of their astronomical hobby, facilitate professional-amateur collaborations, and disseminate new results and methods. The Membership fee is $25.00 per year.

As a member, you receive:
• Discounted registration fee for the annual Symposium.
• A copy of the published proceedings on request each year, even if you do not attend the Symposium.

Membership application is available at the MEMBERSHIP page of the SAS web site: http://www.SocAstroSci.org.

The SAS is a 501(c)(3) non-profit educational organization.

SAS Contact Information

9302 Pittsburgh Avenue, Suite 200, Rancho Cucamonga, CA 91730

On the web:
www.SocAstroSci.org

Program Committee:
program@SocAstroSci.org

Membership:
Robert Stephens:
rstephens@socastrosci.com

Send Newsletter Submissions to:
Bob@RKBuchheim.org

	SAS-2025 Symposium - tentative Agenda	
start	Thursday, June 19: Morning Workshop: Student Team Astronomical Research	
8:00	Registration & Welcome	Bob Buchheim
8:30	Student Team Astronomical Research	Dr. Russ Genet, et al
12:00	*Lunch Break*	
13:00	Thursday, June 19: Afternoon Workshop: Smart Telescopes for Science	
13:00	Smart Telescopes for Science	Robert Buchheim, et al
16:30	*Welcome Reception in Breakout Room*	
	Dinner break (on your own)	
19:00	Evening Presentation: Modern Science at Mount Wilson Observatory	Dr. Russ Genet, Tom Meneghini, Dr. Gail Schaefer
	Friday June 20: Technical Papers	
8:30	Welcome	Bob Buchheim
8:45	In investigation of the B – V and V – R color indexes of the Semi-regular variable RZ-	Dr. Richard Schmude
9:10	Spectroscopic Variation of the Hα Line of the Be Shell Star Omicron Andromedae Over Two Seasons of Observations	Rick Diz
9:35	Observing in the Satellite Era: Tools to Minimize Interference	Michelle Dadighat
10:00	Study of the determination of the topocentric lunar librations by a best fit estimate of the plate constants from digital images with a small telescope	Dr. Fabrizio Pinto
10:25	*Poster "Sparkler Talks"*	
10:35	*Poster Session* * Steven Conard * Alexander Brotherton, Max Watrous-Schumaker, Ethan Hammond, Sara Weng * Maria Palma Bejarano Rey, Rex Dan, Saryu Bapatla, Rohan Raghu * Xinyue Wang, Xichen Tang and Kairun Zhang * Raghav Ramji, Arnav Bansal, Natalie Wang, Kevin Li * Thomas Guo, Dane Hansen, Saarth Desai, and Silvia Ellis	
10:55	Astrometric Measurements of Five Visual Double Stars	Rishi Janakiraman, Alice Li, Marlin Humphreys*, Mateus Aruda, Xinyue Wang
11:20	Towards tracking of Apophis with Meade telescope in 2029: Citizen science tracking ISS followed by on-line public site	Aron Wolf (Willy) Siegel
11:45	Autonomous asteroid imaging, identification, and orbit determination with commercial camera systems	Melisa Gündoğdu
12:10	*Lunch break*	
13:10	*Sponsor Introduction*	
13:20	Invited Talk (remote presentation)	Dr. Richard Gray
13:45	A Custom Speckle Interferometry Camera System for the Hooker Telescope	Lou Jackson
14:10	Speckle Interferometry Camera Checkout on the 100-Inch Telescope at Mount Wilson Observatory	Dale Ghent
14:35	*Sponsor introduction*	
14:45	*afternoon break*	
15:10	Speckle Interferometry and Spectroscopy of Gaia Two-Parameter Binaries	Dr. Paul McCudden
15:35	The Case For Terrestrial Gaia Band Photometry	John Hoot
16:00	Intensity Interferometry with 10" Backyard Telescopes in an Urban Setting	Thomas J. Mozdzen
16:25	Invitation to SAS Stakeholder's Meeting	Bob Buchheim
16:35	*Evening Break*	
19:00	SAS Stakeholders Meeting	Bob Stephens, Bob Buchheim
20:00	*close conference room*	
	Saturday June 21: Technical Papers	
8:45	Welcome	Bob Buchheim
9:00	Workshop results: Astronomical Research Seminars	Russ Genet
9:25	A Study of Random Telegraph Noise in CMOS sensors	Dr. Arne Henden
9:50	*Sponsor Introduction*	
10:00	*Morning Break*	
10:20	How To Photograph Astronomers	Richard Berry
10:45	Optical SETI	Bruce Howard
11:10	Telescope arrays to solve a Double Optical Pulse mystery	Richard H. Stanton
11:35	*Sponsor introduction*	
11:45	*Lunch break & Group photo*	
13:00	Comparative Analysis of Two Astrometric Measuring Tools on 5 Known Binaries	John Major
13:25	Thirty-Plus years of Mars Photometry	Dr. Richard Schmude
13:50	Photometry of RR Lyrae Stars In Two Globular Clusters	Tom Polakis
14:15	Good Afternoon, and Good Luck	Bob Buchheim
14:45	*Closing Reception in Breakout Room*	