

AAVSO 110th Anniversary

1911–2021

Thanks to each of you who have been involved with AAVSO!
You have contributed to our 110 years of
citizen and professional astronomy and collaborations!

A few messages of congratulations from AAVSO friends and collaborators:



AMERICAN
ASTRONOMICAL
SOCIETY

“Congratulations on 110 years of scientific discovery, community, and wonder! Happy anniversary to the AAVSO from everyone at the American Astronomical Society.”



“DC-3 Dreams wishes to congratulate AAVSO on its 110th Anniversary, and we are proud to support AAVSONet through the use of ACP Expert software to enable remote observing.”

“Congratulations to the AAVSO on 110 years! The stars may be variable, but the superior quality of your efforts, insights, and dedication has never varied in those 11 decades. From all your friends at S&T, keep up the fine work!”

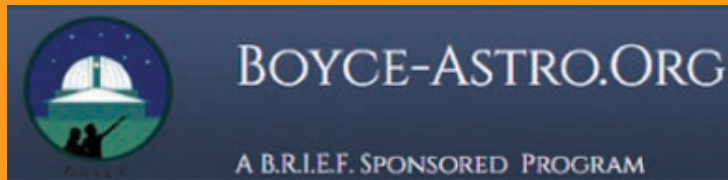
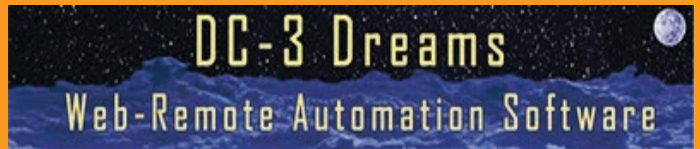
**SKY &
TELESCOPE**

ASTRONOMY
TECHNOLOGY TODAY
Your Complete Industry Guide to Astronomical Equipment

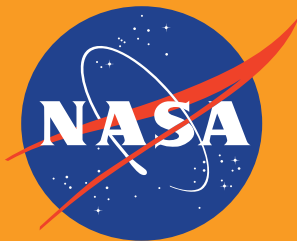
“Congratulations on being at the
forefront of Citizen Science for
110 years!”



Thank You to AAVSO's Stellar Sponsors!



UNISTELLAR



Who's Who of AAVSO, Fiscal Year 2021

Board Officers

President	Gordon Myers
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2nd Vice President	Richard Berry
Secretary	Kristine Larsen
Treasurer	Robert Stephens

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David Cowall
Joyce Guzik
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Bob Massey
Gregory Sivakoff
Brad Vietje

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Stella Kafka, PhD CEO and Executive Director

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Lindsay Ward Communications Manager, *Annual Report*
Production Editor

Science Team

Sara Beck Technical Assistant, Special Projects
Sebastián Otero External Consultant, VSX Team, Spanish Translations
Bert Pablo, PhD Staff Astronomer
Elizabeth Waagen Senior Technical Assistant, JAAVSO Associate Editor
Lauren Herrington Webinar Coordinator

Organization Information

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The American Association of Variable Star Observers (AAVSO) is an international scientific and educational 501(c)(3) nonprofit organization.

We provide citizen astronomers the tools, training, and other resources they need to observe and analyze variable stars—stars that change in brightness. Their accurate observations are stored in AAVSO’s open-source databases that professional astronomers use in their significant research.

Strategic Plan

This year, the AAVSO continued to implement the three key objectives of the strategic plan developed with Harvard Business Association’s Community Action Partners (CAP): increase the organization’s impact, fulfill high membership satisfaction, and achieve long-term financial stability.



Headquarters

The Board’s decision this year to sell the AAVSO Headquarters (HQ) building and move HQ operations into a smaller space (anticipated for 2022) led to an assessment of the Association’s holdings and a determination of its future.

The AAVSO Archives are being added as a collection to the Harvard University Archives, and the AAVSO’s sundials and scientific instruments will become part of the Harvard Collection of Historical Scientific Instruments.

Mission: to enable anyone, anywhere, to participate in scientific discovery through variable star astronomy

The majority of the AAVSO's two libraries—books and serial publications—have been purchased by AAVSO member and astronomy educator John Briggs, for his extensive astronomical library and museum. All of these holdings will thus be secured for the future, well stewarded, and available to researchers worldwide.

Another major transition for the AAVSO occurred after the end of the fiscal year, on January 3, 2022. Executive Director Dr. Stella Kafka left the AAVSO to become the Executive Director of the American Meteorological Society. AAVSO Operations Manager Kathleen Spierer is serving as Acting Executive Director while the Board seeks the next director.

With this report, we look forward to sharing with you how AAVSO evolved this past year, connected with other astronomers and educators, and what we all achieved with you.



Ambassadors and students during a break at AAVSO's 2021 Spectroscopy Workshop

The AAVSO community spans generations and multiple areas of focus. We learn from each other and become stronger as we move forward, united, with the work of the AAVSO.



Letter from AAVSO Director Stella Kafka

Friends,

In 2021, we celebrated 110 years of the AAVSO's foundation. Such an anniversary is an excellent place to pause; it is a moment for us to take stock, appreciate where we started and the challenges we faced, and celebrate our progress and accomplishments.



Last year, the AAVSO Board and I presented our new strategic plan, introducing the three focal points of our work, and we made key commitments to you, our community. **As part of our plan, we identified five main pillars (our science, society, technology, operations, and finances)**, determined focal points for our work, and defined priorities. And we promised to safe-keep our long history and core values, which reflect the principles guiding our work now and in the future. In this letter, I'll touch upon each of them, highlighting major achievements, some of which will be presented in more detail elsewhere in this report.

Science: We aspire to continue being an essential resource for researchers worldwide by providing the data necessary for their work; data that produce significant scientific results, increasing our observers' impact. Our observers are vital collaborators in long-term and short-term scientific projects; AAVSO is committed to supporting all relevant work and providing the resources and opportunities they need to maximize the impact of their involvement. To this

direction, we worked hard to curate and enhance our databases; we fostered strategic partnerships enabling our community to participate in new and exciting projects; we enhanced our observers' skills through appropriate educational material and courses, workshops, discussions on forums, and webinars; and we enriched our peer mentoring program. We continued offering our webinars, and we added "How-to Hours" to introduce astronomy concepts to our community. And we kept strengthening the *Journal of the AAVSO* with content from our community, which is disseminated widely for researchers to use in their work.

Community: The AAVSO's superpower is our international community. As the AAVSO's membership grew and more observers engaged, we focused on strengthening our observing sections, encouraging section activities, and building collaborations among our members to produce the best science they can. Our Observing Sections are led by enthusiastic and knowledgeable individuals—both professional and non-professional astronomers—and can be the center of learning communities for our members. Our Ambassador Program grew, with young individuals across the world working on scientific projects, giving talks, and representing the AAVSO in community events. Our collaboration with the International Planetarium Society and Ball State University resulted in videos disseminating variable star content to the general public.

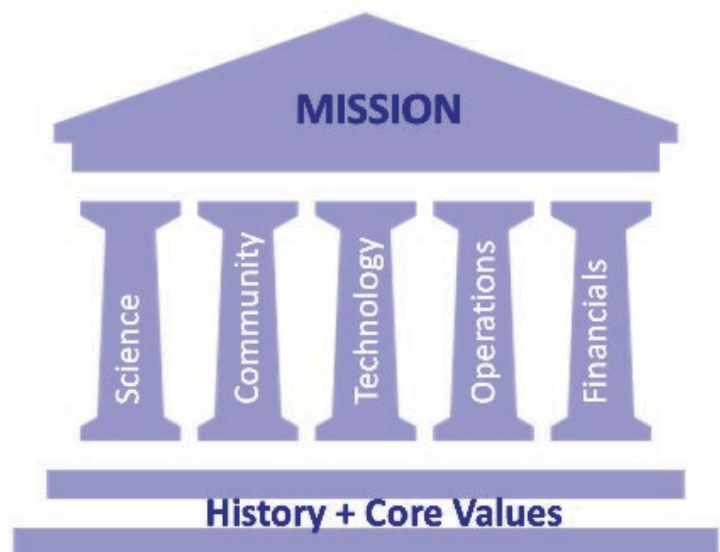


Technology: A whirlpool of activities behind the scenes ensured a stable infrastructure and reliable tools and resources for our community. We started the

year by completing a significant migration and launching a new website that is easy to navigate, with considerable resources up front and center, and tools and databases connected for all. We strategically enhanced our existing software to facilitate our observers' work and improve the functionality of critical tools. Significant work was focused on cybersecurity, backups, and generating necessary documentation of the structure in place and our accomplishments.

Operations: We increased the efficiency of our operations by introducing new Operations Committees (IT, Marketing, Programs, Membership, and Observing Section Leaders), which work alongside staff to satisfy major needs of our work and understand our community. As a result, we have a solid plan for improving our infrastructure. We assessed and evaluated the progress of our essential programs; we increased our presence in popular media, celebrating our successes and impacts; and we strengthened and supported the work of our Observing Sections. We strived to understand our members to ensure that we serve our community the best way we can.

Financial stability: For our long-term success, we need the AAVSO to become a financially sound and sustainable organization with the financial capacity to support our mission. As we promised, we have decreased our endowment withdrawal to ~4%, and successfully engaged with federal and private funding agencies to fund key projects at the AAVSO. Thanks to your generosity towards the Annual Campaign and throughout the year, we are well positioned to support our staff and volunteers with appropriate resources, enhance our infrastructure with the help of expert consultants, and provide the quality of services and tools you are accustomed to.



So, what do we have to look forward to as the year closes? We will focus on training and helping our observers, securing and enhancing our databases and software tools, increasing our efficiency at HQ, and providing engagement opportunities in more key projects while continuing our legacy work. We are looking for new avenues for reaching out to "anyone, anywhere" virtually through our online events; as such, this coming year will bring you a webinar series in Spanish, *Las Estrellas a tu Alcance*, to engage individuals for whom English is not a native language. We will also be hosting our webinar series *Superstar Astronomers*. We will continue to foster key partnerships to widely disseminate the AAVSO's value, and engage more interested individuals in the excitement of scientific discovery. Please read more about our strategic plan (<https://www.aavso.org/StrategicPlan2020>)—we hope you'll be inspired to continue embracing and supporting the AAVSO's work toward these goals. YOU are the AAVSO!

I am closing with a personal note: as you already know, I am starting a new position at the American Meteorological Society, working on urgent issues that threaten our well-being and safety (climate change, erratic weather patterns, clean water). Looking back in my seven-year tenure at the AAVSO, I see an association solid and sustainable, serving a dedicated community, continuously evolving, and building new knowledge on some of our favorite objects in the sky. I am proud of all the hard work and passion that AAVSO staff, leadership, and volunteers have put in over the years to "enable anyone, anywhere to participate in scientific discovery through variable star astronomy." Those of us who work in the non-profit world know that we serve our community and a mission that is bigger than any one of us, a mission that has a profound impact on our society and leaves a legacy. The AAVSO is all of us. I will always be a member of the AAVSO, and I am looking forward to seeing many of you at a future meeting.

Until then, best wishes, clear skies, and stay safe!

A handwritten signature in blue ink that reads "Stella". Below the name is a long, horizontal, wavy flourish.

Astronomers' Corner

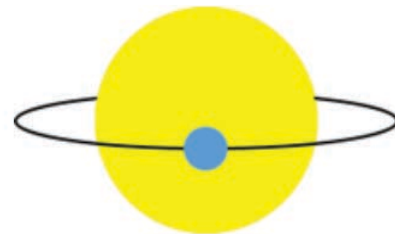


This has definitely come with its own challenges, but we have come out the other side the stronger for them.

Beyond this, we have also been hard at work opening up more opportunities for our observers. The Observing Section Webinars spun off an entire webinar series, which has become a regular part of our programming.



We launched our long-awaited project with NASA's Jet Propulsion Laboratory, and opportunities to do exoplanet observations have become even easier.



We have continuously driven spectroscopy to be more and more approachable with How-to Hours and workshops.

This year has been an eventful one at the AAVSO. We launched our new infrastructure, complete with changes to the look and feel of the website. We also added a new store feature and now all payments go through one centralized location. Outside of the visible changes to the website, so much has gone on below the surface: enhancing our backup policies, strengthening our security measures, and updating and future-proofing our infrastructure. AAVSO's focus is, and always has been, to be a safe, reliable repository of variable star observations, and we have worked hard over the past year to make this truer than ever.

A I D





We have also worked with our section leaders to add new CHOICE courses this upcoming year, including one on spectroscopy, and another on advanced exoplanet observing.

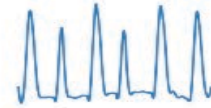


The focus over the last few years has been to add new methods of learning about and submitting new data types, and now we are working to make these new additions as accessible as possible.

We hope that you will take the time to broaden your horizons with the myriad of new possibilities at the AAVSO, and perhaps try something new, whether it be a new class of star or an entirely different type of observing.



(VSX) Variable Star Index



Submit and Access Data



Education
CHOICE Courses, Manuals, Videos

Pick a Star

Star name here

- ▶ Plot a light curve
- ▶ Check recent observations
- ▶ Create a finder chart



Tools and Observer Resources

JAAVSO

The Journal of the AAVSO



Observing Sections

Welcome to AAVSO's 2021 Webinars and How-to Hours!

Image credit: Carles Zerbst, AAVSO observer

In the span of the 23 AAVSO webinars open to the public, 35 professional scientists in the field of variable stars and astronomical observing were our admired guests as they shared their latest discoveries and how vital AAVSO observations have been to their research.



Dr. Burçin Mutlu-Pakdil,
Webinar guest
astronomer, May 22, '21



Dr. Gibor Basri,
Webinar guest
astronomer, Aug. 28, '21



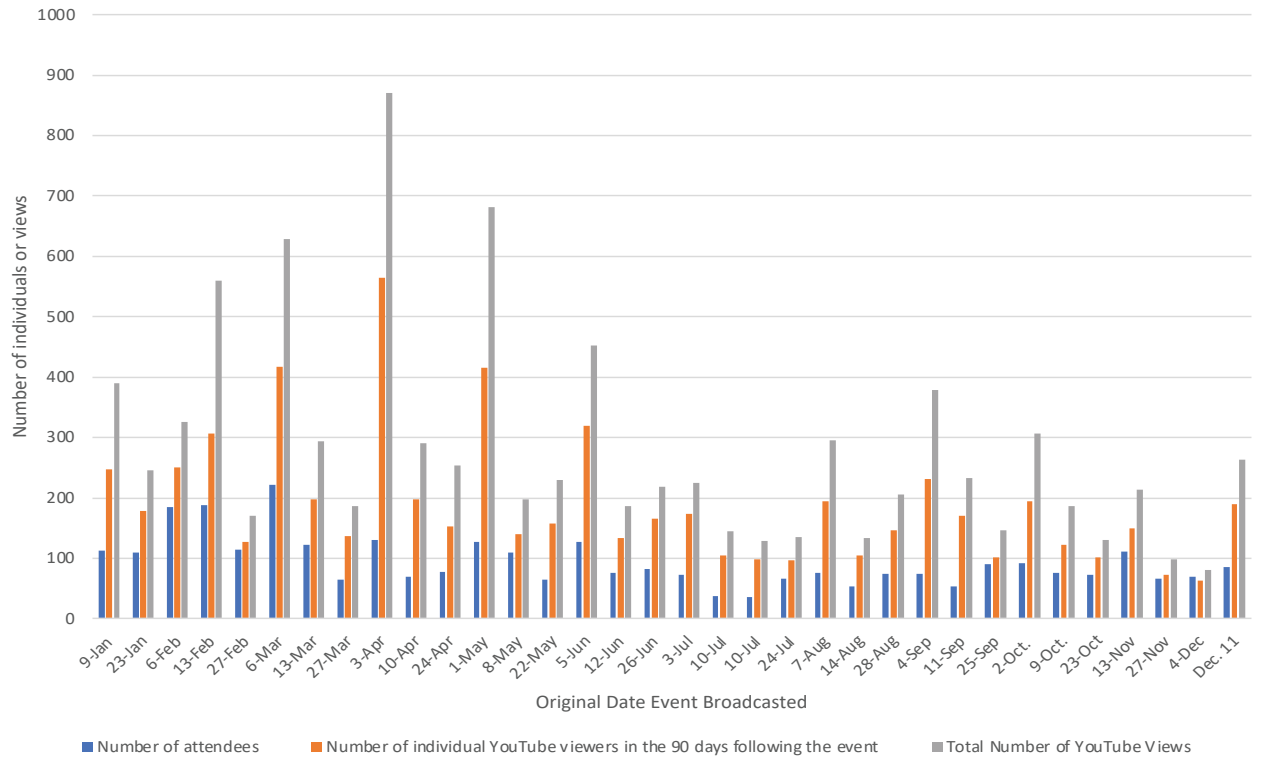
Dr. Kathy Vivas
Webinar guest
astronomer, July 10, '21

Image credit: Carles Zerbst, AAVSO observer

The AAVSO also provided 10 How-To Hours, each providing a time for the AAVSO's own community to really shine. Presentations focused on practical skills given by expert variable star observers, and were followed by Q&A sessions.

These webinars and How-to Hours are now a playlist on AAVSO's YouTube channel (www.youtube.com/c/AAVSOHQ) that anyone can enjoy.

2021 Webinar and How-to Hour Attendees and YouTube Views



If you are wondering who we impacted, an average of 84 individuals participated in each webinar, and an average of 117 individuals participated in each How-to Hour.

Attendees were from at least 36 countries located across all six populated continents, with a range in experience level from just beginning to explore astronomy, to citizen scientists, to professional astronomers.

Our 2021 webinar recordings have had over 6,421 unique views cumulatively, and many viewed a single session more than once.

The AAVSO used feedback from optional post-session surveys to produce its educational trio of webinar series in 2022.



The AAVSO's *International Variable Star Index (VSX)* is a continuously evolving database containing most available variable star catalogues and stars published in star listings/journals, plus new discoveries submitted by researchers.

The team accomplished many significant activities this past year.

Team members added:

a new search feature: "New objects since last login"

a set of ASAS-SN objects (246) that had ambiguous identifications

882 objects from the *VVV DR4 RR Lyraes* list

the new SPBe and WDP variability types

935 false positives from KELT (eclipsing binaries formerly thought to be exoplanets)

In addition, team members:

deleted 11 comparison stars in the *Comparison Star Database (VSD)* that were variable

provided feedback to contributing observers

revised stars in VSX that had missing or incorrect parameters

corrected 32 GCVS star identifications, and deleted 142 duplicates

launched a data-mining project, "Finding the Offending Eclipsing Binary," to identify and characterize those stars

The team put emphasis on revising existing VSX entries. Revisions are often improvements to entries based on new and more accurate information. Only an estimated 1% of revisions are corrections to entries. Revisions take longer than additions because accurate data need to be maintained.

The 2020 publication of the *ZTF DR2 Catalogue of Periodic Variable Stars* created an opportunity to increase the accuracy of VSX because ZTF's resolution is better than that of other catalogues, leading to more reliable

cross-identifications.

Meanwhile, the number of duplicates have been decreasing because cross-identification is performed before adding new stars.

Observers:

reported 505 variable stars to VSX
tripled their corrections to VSX data

The increase in corrections may be due to surveys encouraging observers to spend more time revising survey-found objects instead of submitting new ones.

Thank you to those who contribute to VSX for your excellent work!

If you want to participate in data-mining projects, please visit aavso.org/vsx-data-mining.

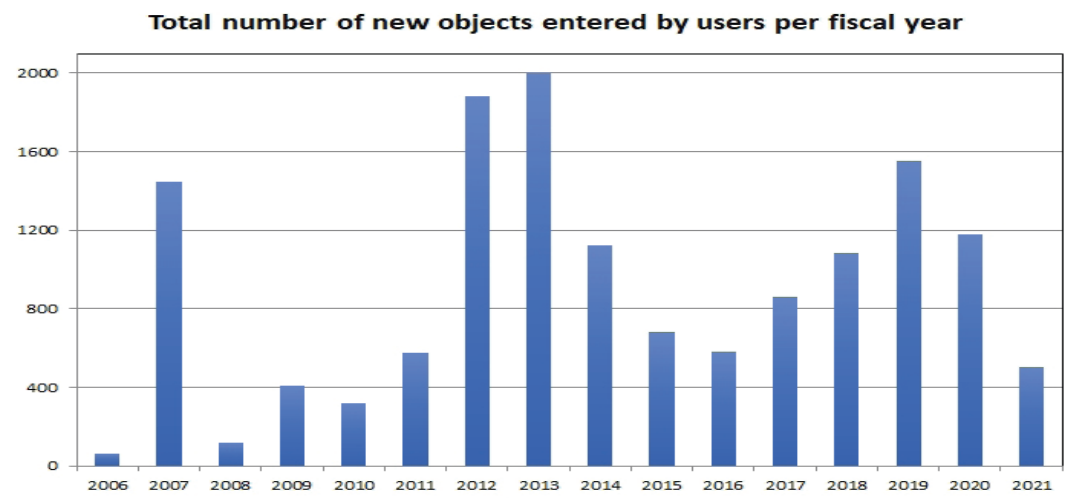


Figure 1. Total number of new objects entered into VSX by users per fiscal year.

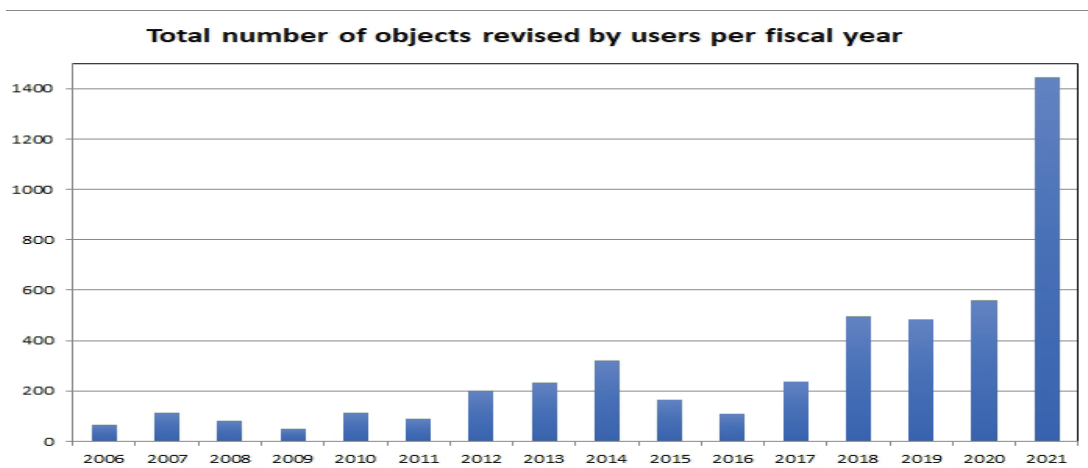


Figure 2. Total number of objects in VSX revised by users per fiscal year.



Volume 48, No. 2 & Volume 49, No. 1

Editor: Nancy Morrison

Associate Editor: Elizabeth Waagen

Production Editor: Michael Saladyga

The *Journal of the AAVSO (JAAVSO)* advances the mission of the AAVSO by enabling variable star researchers to publish their results after peer review, showcasing amateur-professional collaborations, enabling authors to deposit their data in an open repository, and providing beginner astronomers with an accessible introduction to research.

Authors include student, professional, and amateur astronomers. In the latest two volumes, amateur authors were published as often as professionals (including students).

JAAVSO production progressed toward achieving AAVSO's strategic goals

One goal of the *JAAVSO* is to increase the size and usage of our openly available data archive—we encourage authors to archive the data supporting

their research results. Being in a machine-readable format, the archived tables are more accessible to researchers than they are on the formatted journal page. To find these tables, readers perform a text search on the character string 'ftp' in the PDF version of a published journal.

To support additional content and increase professional familiarity with the *JAAVSO*, we continued to enlarge the pool of scientific referees. Most are professional astronomers or advanced graduate students, and a few are experienced amateurs.

32 new referees contributed to the most recent volume

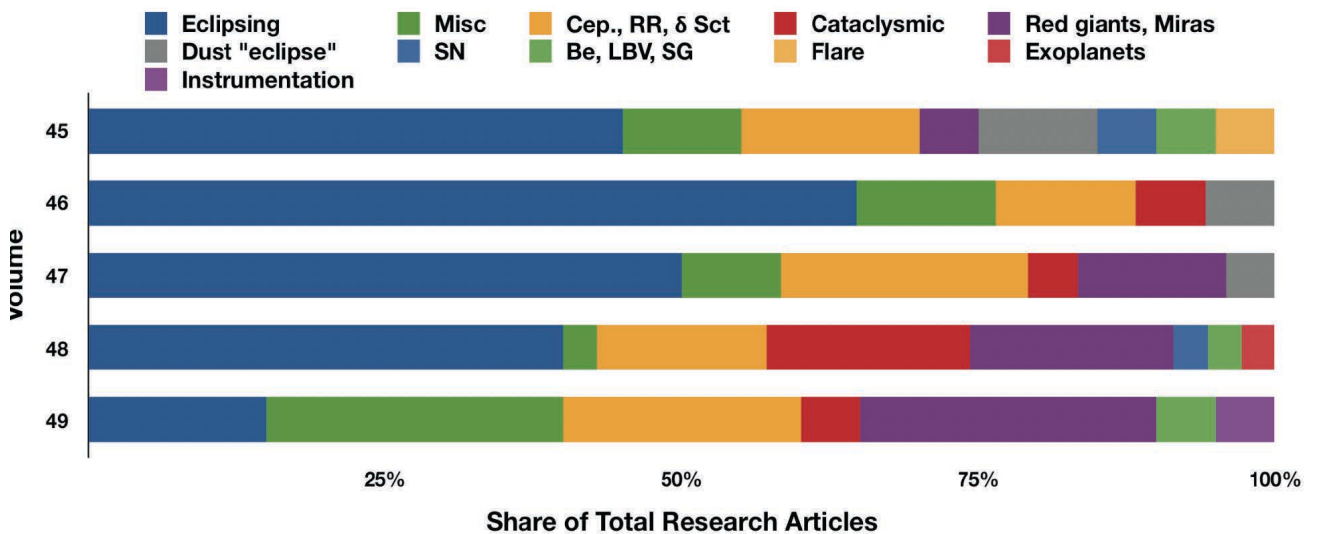
15 of the new referees are at institutions outside the U.S.

125 referees are active

We could not function without the effective work of our volunteer referees, which we warmly appreciate.

The distribution of subject matter in recent volumes was tracked, as shown below (“Variable Star Data” excluded).

Short-term changes in these counts may or may not develop into trends.



Abbreviations: Misc. = unspecified or unknown type; Cep. = Cepheids of any type; RR = RR Lyrae stars; Dust “eclipse” = R CrB and similar stars; SN = supernovae; LBV = luminous blue variables; SG = supergiants.

Figure: The share of research-article content in each of the five most recent volumes, coded by color for each of twelve research topics according to the legend at the top. The colors repeat in a cycle of six, left to right, so each color may appear twice.





AAVSO 2nd Spectroscopy Workshop

On November 3–4, 2021, the AAVSO presented its second Spectroscopy Workshop (ASW2021), as part of the 110th Annual Meeting. The workshop, led by Ken Hudson, was an online/in-person hybrid event, with 18 exceptional speakers providing valuable knowledge to beginning and experienced amateur spectroscopists.

The in-person audience followed strict COVID protocols (vaccinations and masks), and more than 35 people representing 14 U.S. states physically came to the venue in Somerville, Massachusetts, USA. The online audience included people from 18 U.S. states and five other countries.

In the survey on the workshop, the most complimented aspect of the workshop was the variety of talks, and the most commonly and highly enjoyed activities were the pro-am collaborations and opportunities presented, the Fundamentals of Spectroscopy for Astrophysics talk, and Sol'Ex instruction. Survey participants also provided valuable feedback on improvements AAVSO can make to any future workshops.

ASW2021 was made possible, in part, by a generous grant from the U.S. National Science Foundation (NSF).



Thirteen high school science teachers from across the nation were awarded grants to attend the workshop. The majority of them teach astronomy as part of their school's science curriculum.

The teachers enthusiastically participated in all the workshop sessions alongside AAVSO members. Ken also provided a special teacher session on incorporating spec-

troscopy into an astronomy curriculum and developing teacher-amateur collaborations. AAVSO Ambassador Lauren Herrington provided teachers with many cost-effective alternatives to expensive equipment purchases, and treated everyone to a star party on the hotel patio in the evening.

As part of the grant, teachers will be submitting curriculum projects they develop using the skills and tools they acquired at the workshop. To aid them in their spectroscopy education, each received a license to RSpec software and a Star Analyser 100 Grating (special thanks to AAVSO member Tom Field, President of Field Tested Systems, LLC, who donated these items), a one-year complimentary AAVSO membership, and a complimentary registration for the 2021 AAVSO Annual Meeting.

As a result of the workshop, some teachers are planning to work together on future projects. The AAVSO's long-term plan is to set up a volunteer group of members



High school teachers who were recipients of the NSF AAVSO 2021 Spectroscopy Workshop Grant, together at the workshop in Somerville, MA in November.

and staff to review the teachers' projects and select several to post on the AAVSO website to be shared with our community. Grant recipients also are given an opportunity to present their spectroscopy curriculum at a future AAVSO Meeting.

Educators are key to forming the next generation of AAVSO members. Incorporating astronomy into the basic high school science curriculum builds interest and curiosity at a young age, and is surely a wonderful and unique experience for the students.

We received many great reviews from the teacher participants, but a review by Debbie Morgan, a teacher of physics, earth science, space science, and chemistry at Sevier High School in Monroe, Utah, really sums up the outcome we were hoping for:

“This was an incredible opportunity. I found the overall experience to be incredibly enlightening, and am excited to get things going on my own personal journey with spectroscopy observations this year and then implementing it into my classroom more fully next year. I’ve already written and submitted a grant to my local aerospace education foundation to secure funding for the lenses needed to build a Sol’Ex for my school, and am excited to see what the coming months bring. Thank you.”



A banner for the AAVSO 110th Annual Meeting. The text "AAVSO 110th Annual Meeting" is written in a blue serif font against a background of a city skyline at sunset, with green leaves in the foreground.

AAVSO 110th Annual Meeting

November 5–7, 2021 saw AAVSO community members out on a rooftop observing the wondrous stars through Unistellar’s eVscope2, sipping coffee face to face while catching up and having discussions on variable stars, toasting to 110 years of AAVSO, learning from each other, and engaging with the esteemed keynote speakers.

Vaccinated and masked astronomers traveled to The Row Hotel in Somerville, Massachusetts for these three days of activities, while other astronomers from the U.S. and various countries attended remotely.

The event began with Cambridge city councilors issuing a proclamation in recognition of the AAVSO’s 110 years of service to the city and the scientific community. James Lowenthal continued the evening by presenting on Satellite Constellations (SatCon) and leading a resulting discussion. The evening wrapped up with a delicious celebratory cake from a local bakery and rooftop observing with Unistellar Ambassador Greg Redfern (shown below) dazzling attendees with stellar images collected by the equipment despite the bright urban lights.



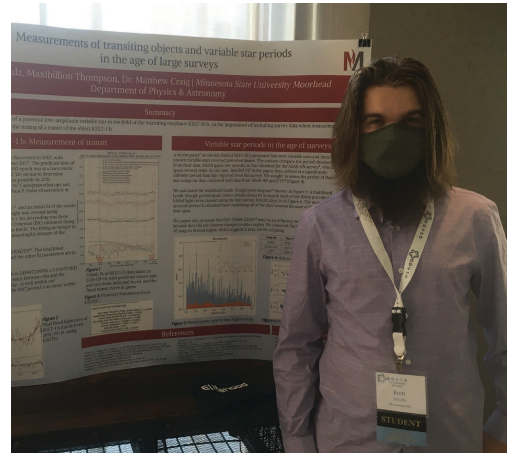
The next two days were filled with enlightening presentations by AAVSO observers, keynote speakers (Andrea Dupree, David Latham, Sara Seager, and Barry Pointon), invited students, and AAVSO Ambassadors. In between, in-person attendees visited with our sponsors, including Chroma Technology; and in-person and remote attendees participated in Observing Section discussions, and visited our on-site and on-

line Poster Halls. The event raffle included software licenses from event sponsor DC-3 Dreams, along with an array of items donated by Celestron, Sky & Telescope, Big Bang Prints, and individuals. The event wrapped up with a banquet, the presentation of awards, and the passing of the proverbial baton from one AAVSO President (Gordon Myers) to the next (Dave Cowall).

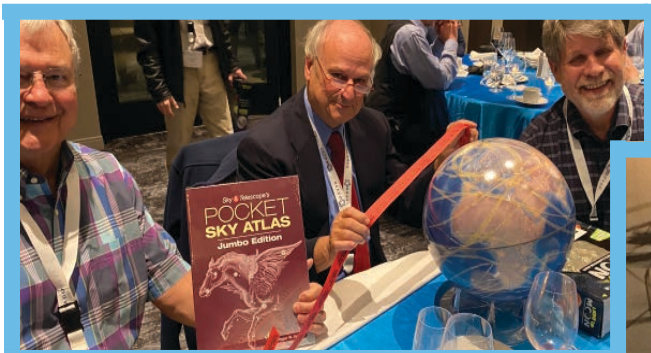
We hope to see you November 4–8, 2022 at our 111th Annual Meeting in Tucson, Arizona!



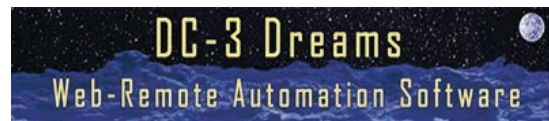
Team members of Chroma Technology, a sponsor of AAVSO's 110th Annual Meeting, with Stella Kafka, AAVSO's (now former) Executive Director, and an event attendee



Brett Schultz standing next to his research poster at AAVSO's 110th Annual Meeting in Somerville, MA in November



AAVSO 110th Annual Meeting attendees with Sky & Telescope raffle items



Gordon Myers and Dave Cowall finalizing the AAVSO presidency transfer with a handshake





A Year in the Life of an Ambassador

AAVSO Ambassadors created a united vision for themselves: to be involved, love what you do, and showcase AAVSO.

The Ambassador Program **goal**: to get diverse people interested and capable in beginning variable star astronomy with the AAVSO, which helps the organization achieve its mission to enable anyone, anywhere, to participate in scientific discovery through variable star astronomy.

Ambassadors create their own education and outreach activities. Over the year, 13 ambassadors conducted or participated in 30 events, including hosting educational sessions; guest speaking in AAVSO's webinar series; heading online astronomy tutorials; creating a logo for AAVSO's Solar Section; scripting, recording, and producing a video on YouTube that provides solutions to some perceived barriers to observing; being guest speakers at external astro events; designing ads; participating in AAVSO's diversity committee; and more. Three ambassadors presented their research at the Annual Meeting.

Some ambassador-created content and more is available at aavso.org/ambassador-program

A special feature was added to the Annual Meeting this year: the **Ambassador and Student Symposium**, where five ambassadors, as well as other students, discussed their journeys on becoming involved in astronomy.

The point of the Symposium was to provide insights to how students and teachers are, and can be, engaging in astronomy, and to communicate to students that programs and support are in place to help anyone with an interest get started.



Above: AAVSO Ambassador and MIT student Skylar Larsen presenting her research at AAVSO's 110th Annual Meeting

Below: AAVSO Ambassador Ana Parra speaking as a guest astronomer in our 2021 webinar series



Above: AAVSO Ambassador and high school student Teja Begari presenting remotely from India in the Ambassador & Student Symposium at AAVSO's 110th Annual Meeting



Above: Ambassador Lauren Herrington showcasing her telescope set up for an ambassador-created video that addresses perceived barriers to stellar observing

I became an AAVSO Ambassador in 2019, during my freshman year of college—just before the brunt of the COVID-19 pandemic forced my colleagues and me into a life of remote study. Though the world is still far from back to normal, this past year marked a gradual return to in-person (or at least hybrid) activities for AAVSO Ambassadors. Easily the highlight of my year was my first in-person attendance of an AAVSO Annual Meeting, during which I presented my research on the surface compositions of near-Earth asteroids to conference-goers. To my delight, the AAVSO community remained as welcoming as ever. It warms my heart that so many young scientists and astronomers like myself have access to the AAVSO’s guidance, community, and support.

—Skylar Larsen
MIT, USA

I joined AAVSO as an ambassador this past year. I can say that from the very beginning, AAVSO has been so amazing! You find people with the same interest, a very dedicated team of volunteers, and daily observers! And the best parts of being an ambassador are that you are a part of an international organization, get connected to people of different parts of the planet, and more importantly, you gain a lot of knowledge! I met Dr. Stella Kafka through social media, and she was the one who gave me this wonderful opportunity to be a part of this jubilant organization. What an amazing team we have! A team full of helpful people! I am sure there will be a wide array of opportunities for newly joining ambassadors to learn, get connected, and more importantly, work with amazing people! I am out of words to describe my happiness being as an ambassador and observer at AAVSO!

—Teja Begari
High school student, India



Thank You,

Observing Section Leaders



<p>Kris Larsen David Cowall Arne Henden George Silvis Cliff Kotnik Kenneth Menzies Gary Walker Richard Post Shawn Dvorak Patrick Schmeer Gerry Samolyk Dennis Conti Dave Hinzl Richard Berry Richard Roberts</p>	<p>John Percy Lee Anne Willson Tom Calderwood Eric Hintz Melanie Crowson Horace Smith Rodney Howe Kim Hay David Whelan Ryan Maderak Ulisse Munari Michael Poxon William Herbst Heinz-Bernd Eggenstein Bob Massey</p>
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EP AND Chart
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Period: 0.4041075
Type: 0.0000000
Size: 12.6469HS

Michael Poxon
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Brad Walter
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- Research with Data
- Present Research: Finding for Satellites, Centaurs and Near Objects

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Manual for Visual Observing
of Variable Stars
ریغتم ناگرات س یرص ب دصر ری امر نهار
Šta su promenljive zvezde?
Citizen Science with variable stars
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HDH	HMQ	HWAC	JJP	KSLA	KSLA	LMAK	MJZ	NADA	OEH	PJGA	PWMA
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HDZA	HOA	IMA	KADB	KSQ	LMN	MDOA	MILL	NAO	OJEA	PJJO	PXR
HEY	HOQ	JADB	KAF	KKAA	KSQ	LMN	MOP	NCH	OJR	PJOC	RACA
HFF	HOT	JAT	KAM	KKE	KSQ	LMT	MDRA	ONJ	PJOF	PKT	RBCA
HGAB		JBEA	KB	KKX	KSZ	LNAA	MDW	ONOA	PJOC	PLA	RBK
HGAC		JDOA	KBE	KLN	KTHA		MED	OSE	PLA	PLA	RBCA
HGAF		JENI	KBJ	KLO			MFAA	MMGA	OVLA	PLMA	RBK
HGUA		JGAA		KMA	KTHC		MFB	MMH	OYE	PLMA	RBCA
HHAD	HPAB	JGE		KMAJ	KTJA	LOLA	MFR	MMU	NDQ	PAFA	RCCA
HHU	HQA	JJB		KMIC	KTU	LPAC	MGDA	MNIC	NGCA	PALA	RDAE
HIA	HRBA	JJNA		KMM	KTZ	LPEB	MGBE	MNIE	NJO	PALE	REE
HJAD		JLZ		KMO	KUC	LRAB	MGIA	MNN		PALH	REP
HJAE		JMAB		KMCQ	KWO	LROC	MGRA	MOD		PANF	RFDA
HJG		JPG		KCHB	KYUB	LSA	MGW	MOW		PARA	RFP
HJRA		JRAB		KCY	KZAD	LSI	MHH	MPPA	NKEA	PARC	RGN
HJW		JRBA		KDAD	KZAE	LSTC	MISA	MPIA	NLX	PBRA	RHM
HKB	HSRA	JSGA		KEVA	KMWA	LALB	LTO	MISB	MPIB	NMMA	RISA
HKEB	HSW	JSJA		KEVB	KOC	LAMA	LVT	MIVB	MPPA	NMT	RPLA
HKY	HTN				KNAA	LBCB	LZT	MIV	MPPA	NOT	RJA
HMA	HTY				KOC	LBG	MAEA	MQA	NREA	PCHD	RJG
HMB					KOS	LCR	MAND	MRA	NRNA	PCHE	RJOC
					KPEA	LDA	MAU	MRY	NRNB	PDM	RJOG
					KPL	LDB	MAV	MJAK	NROA	PDQ	RJWB
					KST	KRAA	LDRB	MJAL	MSL	PEG	RKE
					KHAD	KRB	LFEA	MJAN	MTA	PEI	RMAF
					KHL	KRB	LFK	MCAL	MJAO	MUY	PSD
					KIAB	KRIA	LFLB	MCHB	MJB	MVH	NXAA
					KIS	KROB	LGB	MCJC	MIA	MVO	OAAA
						KROE	LGV	MCOA	MJMA	MXAA	OAR
						KSEC	LHS	MCPA	MJOD	MXI	OAS
						KSF	LKR	MDAG	MJOE	MZK	OCN
						KSGB	LLAA	MDOA	MJPA	MZO	OCR



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AAVSO's International Database:

4,070,224

AAVSO's Solar Database:

14,486

AAVSO's Spectroscopy Database:

3,612

AAVSO's Exoplanet Database:

429

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35

AADA	AMAK	ASZA	BDVA	BJS	BRIC	CCHC	CRAB	DFR	DPP	FDA	GFDB
AAM	AMID	ATDA	BEJB	BRJ	BRJ	CCHD	CRAB	DFS	DPV	FDAD	GGC
AAN	AMLA	ATE	BENS	BROJ	CCY	CCT	CKB	DGSA	DQR	FDU	
AANE	ANAB	ATOB	BETB	BRYB	CDAD	CDAD	CRI	DGRA	DROD	FERA	
AANF	APAA	AJMA	BFAD	BRYB	BSBB	CDAI	CKYA	DHEB	DROG	FESA	GGLA
AAP	APGA	AVKB	BFO	BKAE	BSEB	CDAI	CLAC	DSI	DSI	FFAD	GGU
AAX	BADB	BFX	BKL	BSEB	CDK	CLQ	CTIA	DSJ	DSJ	FJQ	GIGA
ABRA	BALB	BGEF	BLD	BSM		CLUB	CTIC	DSIA	DSN	FMAC	GJJ
ACEA	BANP	BGZ	BLEW	BSTB		CLZ	CTOA	DJAD	DSN	FMDC	GJLA
ACH	BBA		BLP	BSTB		CMAE	CTX	DJED	DTAA	FMG	GKA
ACD	APIA	BBRE	BLUA	BTB	CDMB	CMAL	CUU	DJEF	DUBF	FME	GKEA
ACDB	ARJ	BCAD	BLUC	BTY	CDSA	CME	CVIC	DJEG	DVIA	FML	GKI
ADI	ARJA	BCMB	BHA	BLUE	BVDA	CMEA	CVIF	DJUA	DVLA	FMMA	GMAG
ADIA		BCOB	BHOB	BMAI	BVE	CDZ	CMF	DWRA	DWRA	FPAA	GMID
AESA		BDAD	BHQ	BMF	BVQ	CEM	CMJA	CWD	DXA	FRF	GMV
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AJV	AST			BMU	BXT	CFRA	DAMU	DANH	DMAH	EY	GRL
AKV				BNBA	BXU	CGED	DANH	DARB	DMIB	EJF	FSU
ALRB				BNK	BYF	CGF	DARB	DMIB	EJF	FWH	GSED
				BNRA	BYQ	CGRD	COLC	DCJB	DMID	EJIA	FXJ
				BNW	BZX	CGRE	COM	DCMA	DMO	EMA	GAA
				BOH	CABB	CGZ	COO	DDE	DMPA	EMAB	GALB
				BOS	CADA	CHAG	COV	DDIC	DNO	ERW	GANG
				BOZ	CAGC	CIOA	CPE	DDJ	DNRA	ESEA	GATH
				BPEC	CAGC	CIOA	CPE	DDJ	DNRA	ESEA	GATH
				BQC	CAGC	CIOA	CPE	DDJ	DNRA	ESEA	GATH
				BQE	CAGC	CIOA	CPE	DDJ	DNRA	ESEA	GATH
					CALH	CJEC	CPD	DERA	DPK	FBA	GCO
					CANG	CJPB	CPU	DEY	DPOA	FCAD	GEA
					CBRR	CJUC					HDAE



Observers

RNL	SCRB	SDWA	SHRA	SNE	SSUD	TMAA	VJEC	WGI	YBA
RRA	SDAB	SEDB	SHS	STAC	STAK	TMAA	VKAC	WGR	YGAA
RRO	SDAL	SEF	SHAK	STAC	STAK	TPV	VLUA	WGU	YIGA
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RSWA	SDB	SFOA	SIQ	SOI	STFB	TRF	VPAC	WIG	WJAA
RUI		SFRG	SIVA	SOLC	STHE	SUQ	VPAD	WJAA	WJOB
RWSA		SFRG	SIVA	SOLC	STHE	SUQ	VPAD	WJAA	WJOB
RZM		SFV	SJEA	SPAO	SUQ		VPIA	WJOB	YSD
SAB	SDCC	SGCA	SPGA	SVID	TRT	VTRC	VRG	WKL	ZFYA
SAC	SDEA	SGE	SPIB	SVID	TSAA	VSD	WCLA	ZHAB	
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SBIB	SDN	SHEC	SMAI	SQN	TANE	TWP	WBH	WMX	
SBL	SDOA			SBRB	TCGA	TGGA	WBOA		
SBN	SDP			SREB	TFUA	TGGA	WBOA		
SBOC				SREB	TGAA	TSCB	WBOA		
SCHD				SMDB	SRGA	THAA	UISO1		
				SMIE	SRIC	TIA	UIHA		
				SMIF	SROI	TICA	UMIA		
				SMIH	SRX	TJAC	VADA		
				SMU	SSAB	TJD	VARA		
				SMRC	SSEC	TJGA	VBPA		
				SMYA	SSEC	TJOB	VCLA		
					SSER	TJV	VDE		
					SSHA	TLMA	VFK		
					SSU	TLUC	VGK		
						TMAA	VII		



Observers



Congratulations to AAVSO's Award Recipients!

52nd AAVSO Merit Award recipient **Rod Stubbings**

in recognition of the phenomenal visual observing program he has conducted, providing researchers with many time-critical observations and alerts, and contributing 316,292 visual observations to the AAVSO International Database from 1997 through October 4, 2021. His work has also been recognized with the AAVSO Director's Award in 2002 for his "very significant contributions to variable star astronomy, particularly to special observing programs" and the Astronomical Society of the Pacific's Amateur Achievement Award in 2014.

William Tyler Olcott Distinguished Service Award recipient **Arlo Landolt**

for his promotion of variable stars and astronomy; his AAVSO membership since 1997 and over ten years of service on the AAVSO Council/Board; his pioneering work in photoelectric photometry; the creation of the Landolt Standard star fields, which established a firm photometric foundation used by both professional and amateur astronomers; his leadership in the IAU Photometry community since 1979; and his mentoring of many AAVSO members, including being always willing to listen and to offer advice.

Special Award recipient **Dayna Thompson**

in recognition of her valuable contributions to a collaboration between Ball State University's Charles W. Brown Planetarium, the International Planetarium Society, and the AAVSO. Dayna devoted an extraordinary amount of time, expertise, and creativity into designing and producing 360-degree interactive videos for public education. Dayna's extensive knowledge and passion show through the entire program, and it would not have been possible without her.

Special Award recipient **Jim Fox**

in recognition of his valuable contributions to the monthly featured variable star program, a collaboration between Ball State University's Charles W. Brown Planetarium, the International Planetarium Society, and the AAVSO. Jim's fondness for variable stars and education, coupled with his expertise, contributed greatly to the success of this program.

Special Award recipient **Larry Krozel**

to recognize that Larry embraced and exemplified the joy of life-long learning, not only as a planetarium performer but a dedicated solar observer for the AAVSO. Larry not only brought the universe to children, but viewed it with a childlike wonder himself.

Special Award recipient **Tom Bretl**

for his service and tremendous contribution as a chair of the AAVSO Sequence Team.

Special Award recipient **Tim Crawford**

for his service training new sequence team members, creating spreadsheets for utilizing additional photometry sources, serving as the point person for new sequence requests, and working with Tom to put together extensive guidelines for creating and updating sequences. It will certainly take more than one or two people to fill his shoes. His support has been greatly appreciated over the years.

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.

Picture : Friedrich Wilhelm August Argelander (1799–1875)
Photograph courtesy of the Mary Lea Shane Archives of the Lick Observatory, University of California-Santa Cruz

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Michael Soukup
Kathy Spirer

Mark Sproul
Dr. Sumner Starrfield
Ken D. Steiner
Cristian Suciu
Achim Sucker
James Donald Sykes
David Syndergaard
Margaret G. Thacher
Ian C. Thompson
Dr. John Thorstensen
Dr. John G. Timothy
Jim Tomaka
Ray E. Tomlin
Bob Tracy
Dr. Charles F. Trefzger
Robert W. Trudel
Dr. Gerard T. van Belle
Gary Vander Haagen
Peter Volkmer
Elizabeth O. Waagen
Glenn M. Wahlgren
Brian D. Warner
Daniel Washburn
William C. Weiss
Dr. Edward O. Wiley
Jeffrey A. Wilkerson
Matthew Will
Roger G. Williams
Ralph Winrich
Samuel N. Winstead
Michael Witten
Gary L. Wood
Dr. Tae S. Yoon
William D. Zeilstra



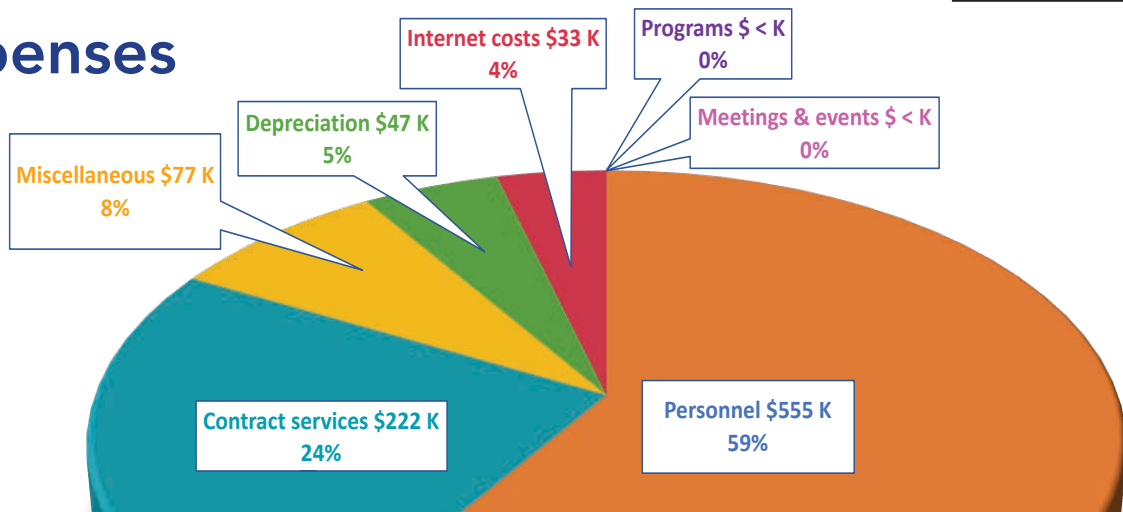
Treasurer's Report: Oct. 1, 2020 to Sept. 30, 2021

Robert Stephens, Treasurer

Statement of Financial Position, September 30, 2021

Assets		
Current Assets		
Cash	\$	411,242
Accounts receivable		200,000
Prepaid expenses		9,518
Investments		14,368,646
Total Current Assets		14,989,406
Property & Equipment, Net of Accumulated Depreciation		1,127,750
Total Assets	\$	16,117,156
Liabilities and Net Assets		
Current Liabilities		
Accounts payable & accrued expenses	\$	49,679
Prepaid membership dues & meetings		63,201
Total Current Liabilities		112,880
Net Assets		
Without donor restrictions		12,416,372
With donor restrictions		3,587,904
Total Net Assets		16,004,276
Total Liabilities & Net Assets	\$	16,117,156

Expenses



Statement of Activities and Changes in Net Assets for the Year Ended September 30, 2021

Changes in Net Assets Without Donor Restrictions		
Unrestricted Revenues, Gains, & Other Support		
Contributions & grants	\$	428,613
Membership dues & fees		117,742
Sales of publications & related material		15,143
Meeting fees		16,175
Annex rent		50,384
Investment income		243,746
Unrealized gain (loss) on investments		2,320,030
Gain (loss) on sale of investments		133,058
Total Unrestricted Revenues, Gains, & Other Support		3,324,891
Expenses		
Program Services: research, data collection, publication, & meetings		636,889
General & administrative		270,158
Fundraising		44,684
Total Expenses		951,731
Increase in Unrestricted Net Assets		2,373,160
Changes in Net Assets <u>With</u> Donor Restrictions		
Contributions & grants		12,540
Investment income		4,320
Unrealized gain (loss) on investments		41,114
Gain (loss) on sale of investments		2,358
Expenses		(17,699)
Increase in Temporarily Restricted Net Assets		42,633
Increase (Decrease) in Net Assets		2,415,793
Net Assets: Beginning of Year		13,588,483
Net Assets: End of Year	\$	16,004,276

Message from AAVSO President Dave Cowall

The year 2022 promises to be challenging. However, with challenges come new and potentially exciting possibilities! Our Executive Director (ED), Stella Kafka, PhD, has resigned effective January 3rd. Our existing Headquarters (HQ) building is being sold. New members are starting their terms of office on the Board of Directors (BOD). A Development Plan is underway. Here are some details:

Kathleen Spirer, MBA, has been appointed to serve as Acting ED until a permanent ED is on board. She has been our Operations Manager, and she has the full confidence of the BOD. Since she does not have a science background, our resident astronomer, Bert Pablo, PhD, will assist her in all science-related issues. A search for a new ED is now underway with both internal and external candidates already expressing interest. Our Search Committee is chaired by Richard Berry, MSc, with Gordon Myers, MSEE, and Kathleen Spirer as the other members.

Our current HQ building is in poor structural condition, but sits on a valuable property in Cambridge, MA. It has appreciated dramatically in value since it was purchased and has far more physical space than we need, particularly since the pandemic has taught us how effective we can be teleworking. By late spring, and with the sale closed, we will be moving to a smaller rental space in the Cambridge area. However, there are multiple possibilities for the future of HQ downstream.

We welcome four new members to the BOD: Sarah Austrin-Willis, MA, MBA; John Blackwell, MS; Dennis Conti, PhD; and Thomas Maccarone, PhD. They bring diverse skill sets to the BOD, which should significantly enhance our effectiveness.

The proceeds from the sale of our existing HQ building will be added to our endowment, bringing us back into long-term fiscal stability. However, to keep up with the growing demands of our mission, our operating budget will need to increase. To meet these needs, the Fundraising and Marketing Committees are working on a Development Plan seeking new endowments, grants, and donations.

The future of the AAVSO is bright!



Kathleen Spier,
AAVSO Acting
Executive Director



Bert Pablo,
AAVSO Staff
Astronomer

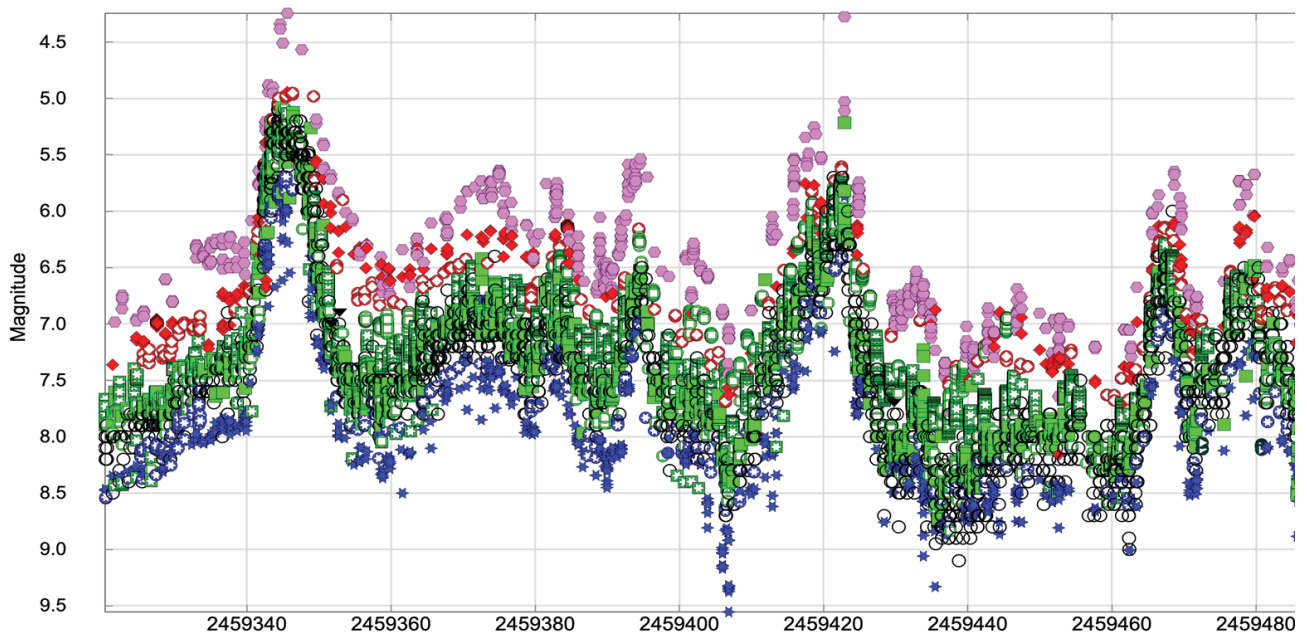


AAVSO Headquarters building at 49 Bay
State Road, Cambridge, MA, USA



New AAVSO Board Members, from left: Sarah Austrin-Willis, John Blackwell, Thomas Maccarone, and Dennis Conti

“Thank you!”
to all of our incredible donors, observers,
members, and program participants for
your valuable support and contributions
throughout the year! You each make
AAVSO’s work and astronomical
discoveries possible, and you have a
lasting positive impact on the scientific
community!



Observations of magnitude of V1405 Cas (Nova Cas 2021) in various bands
by AAVSO observers, as generated by AAVSO’s Light Curve Generator