



2019 annual report

Celebrating Teaching and Learning



A Message from Board President **Kelsey Johnson**

Thirty years ago, we received a gift from the outer solar system: the image of our home planet, the “pale blue dot.”

As an astronomer, I am immersed in stunning images of the cosmos on a daily basis. Yet I find this grainy, almost featureless image—taken by the *Voyager 1* space probe before powering down its cameras in 1990—to be one of the most remarkable in human history. Never before had our existence been framed against such an overwhelmingly barren backdrop.

At the time, scientists at NASA knew that taking an image so close to the sun could damage *Voyager's* video system. In the cost-benefit risk analysis, there was controversy: The resulting image would have no real scientific value, so why take it?

To my mind, the point of science is to understand the world—and the universe—in which we live. Science sometimes provides entirely practical gifts, such as medicine or technology. But, at its best, science sometimes gives us the gift of pure awe—a peek at the true magnificence of the cosmos.

The ASP has long celebrated and advanced the power of astronomy to put human existence in context and give us a glimpse of the incomprehensible. I am proud to serve an organization at the forefront of bringing that power to people around the globe and from all walks of life. We are literally all in this together, on a tiny, pale blue dot.

Thank you to the many members, donors, and volunteers that make the work of the ASP possible.

Sincerely,



Kelsey Johnson
President, ASP Board of Directors



A Message from CEO **Linda Shore**

If you're like me, you rarely miss the chance to point out the constellations in the night sky when walking outside at night with friends or family. Give me a cold, clear November night, and I'll spend at least an hour showing you the shapes and locations of the magnificent and iconic constellations visible in fall, like Orion, Taurus, and Gemini.

At family gatherings, I'm the enthusiastic "go-to" person for questions about the latest NASA discoveries, and nothing thrills me more than seeing the awe and wonder in the eyes of a child taking their first look at Saturn through a telescope.

Sound familiar? I am hardly alone. Those of us passionate about astronomy look for any chance we can get to share our joy.

For 131 years, the ASP has been providing tools, resources, and training to astronomy enthusiasts eager to bring the wonder of the cosmos to people of all ages and backgrounds. The ASP's vision is a world where everyone has equal access to engaging in astronomy, whether as learners or teachers.

In this annual report, we present some of the many ways we supported astronomy teaching and learning in 2019. The "educators" we worked with included graduate students, elementary school teachers, amateur astronomers, Tibetan Buddhist monks and nuns, and scout leaders. Their "students" included pub patrons attending an "astronomy on tap" event, first-graders in an urban elementary school, families attending star parties and astronomy festivals, schoolgirls in India observing their first solar eclipse, and Girl Scouts working on new NASA-sponsored astronomy badges.

The ASP has literally helped many thousands engage many tens of thousands in astronomy. Thank you so much for your support and your share in our pride.

Sincerely,

A handwritten signature in white ink, appearing to be "Linda S. Shore".

Linda S. Shore, EdD
CEO, Astronomical Society of the Pacific

Project PLANET

Supported by a grant from the National Science Foundation, Project PLANET is working with 1st- and 3rd-grade teachers on investigating the astronomical phenomena of shadows and lunar phases. Storybooks, classroom activities, and live planetarium experiences are all designed to excite young children who are naturally curious about the sun, moon, planets, and stars.

ASP Teacher Learning Center

The ASP's annual four-day Summer Astronomy Institute focuses on teachers of grades 5–12 who come together in a professional setting to find inspiration and new ideas for conveying the wonders of the universe to their students. This year, presentations featured guest speakers, guidance in putting new teaching standards into place in the classroom, and workshops such as the popular "From Pinholes to Space Telescopes," which drew educators eager to learn how telescopes work.



“Big Astronomy” Toolkits

The ASP eagerly awaits the premiere of the Big Astronomy project’s new planetarium show, being released worldwide, and in multiple languages, in 2020. In preparation for the show—featuring the people who work in the world’s biggest observatories in Chile—the ASP has designed and tested a suite of informal activities created for educators in museums and astronomy clubs. The new toolkits are filled with materials and information on everything from light pollution to traditional sky knowledge.

Free Choice Learning Director Vivian White paints prototype glow-in-the-dark galaxy formations for the ASP’s “Big Astronomy” toolkits.





Night Sky Network

Over the past 15 years, more than 400 Night Sky Network clubs have inspired millions of visitors. NSN astronomy clubs are integral to a web of local informal science opportunities, and relationships are key. In 2019, connections forged with public libraries for the Universe of Stories summer reading program strengthened community partnerships across the country.

Space Science for Girl Scouts

New Girl Scout Space Science badges—which debuted in 2018 for K–5 graders and in 2019 for 6–12th graders—have created the perfect opportunity for attracting more girls and women to astronomy clubs. This year, the Girl Scout Stars project drew more than 200 amateur astronomers to workshops designed to make outreach more welcoming to everyone.

Astronomy Ambassadors

In 2019, the ASP continued its role delivering the American Astronomical Society's (AAS's) Astronomy Ambassadors Program. In partnership with AAS, National Radio Astronomy Observatory, Portal to the Public project at the Institute for Learning Innovation, and Oregon State University, the ASP has been at the forefront of helping early-career scientists connect with the public. This year, the program welcomed its seventh cohort of Ambassadors as part of ASP's new NSF-funded On-the-Spot Assessment feedback project. This four-year initiative is focused on creating and testing novel strategies scientists can use to spark curiosity and engage public audiences in the wonder of astronomy.

"I received hundreds of messages from women in Muslim countries, saying that my work gave hope to Muslim girls to pursue a science-related career."
—Astronomy Ambassador Program graduate Burçin Mutlu-Pakdil



ASP2019: Earth to Space

The ASP's Annual Meeting for 2019, held at San Francisco State University on October 18th, celebrated the ASP's 130th anniversary. Focusing on the theme "Earth to Space: Astronomy for All," presentations included plenary sessions, day- and night-sky observations, outdoor solar viewing, and more. Talks focused on everything from new research on planets outside our solar system to visions of a future when people can travel across the universe, and the incredible sights our descendants might someday see.



Conference Series

This year, we're pleased to announce a new addition to our distinguished *Conference Series*: a dedicated volume showcasing the creative scholarly work of undergraduate students. Research is one of the most effective ways to improve student success, particularly among first-generation college students and underrepresented minorities. We are proud to provide students with a professional publication in which to highlight their high-quality, faculty-mentored research papers.

Publications of the ASP (PASP)

In 2019, the Society's technical journal covered research conducted by professional and citizen scientists for the Continental-America Telescope Eclipse Experiment (CATE), which captured precise measurements of the solar corona during the eclipse of August 21, 2017. The CATE observers—which included students from Grant Union High School in Oregon—provided new insights into the ways coronal mass ejection plasma accelerates in the solar corona.

Mercury Online

This online companion to our popular quarterly member magazine brings space and astronomy news to the public throughout the year. In 2019, blogs covered everything from the mysteries of dark matter to the controversy surrounding building a new telescope in Hawaii.



Mercury

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astrosociety.org

Science for Monks and Nuns

On December 26, 2019, an annular solar eclipse crossed southern India and was visible at several Tibetan Buddhist monasteries at the forefront of learning science. The eclipse offered a once-in-a-lifetime opportunity for monks and nuns trained as science leaders to apply their expertise in leading an astronomy festival for the exiled Tibetan community there. To prepare, ASP staff led training workshops for the monks and nuns using activities designed by the ASP for the 2017 North American solar eclipse. Thousands of local people, monastics, and school children learned some astronomy, viewed the eclipse safely, and had an awe-inspiring day.

The Science for Monks and Nuns project launched almost 20 years ago in response to the Dalai Lama's desire for Buddhist monastics and Western scientists to share knowledge. The ASP has been a partner organization since 2014.



2019 ASP Awards

Each year, the ASP recognizes achievements in astronomy research, technology, education, and public outreach. We're excited to share the accomplishments of this year's winners.

Maria and Eric Muhlmann Award

DR. MARK J. REID, Senior Radio Astronomer at the Smithsonian Astrophysical Observatory, for his pioneering work in radio astronomy

Robert J. Trumpler Award

DR. KATHERYN DECKER FRENCH for her thesis on radio surveys of gas clouds within galaxies that have ended the star-forming phase of their evolution

Arthur B.C. Walker II Award

DR. WILLIAM M. JACKSON, JR., distinguished research and emeritus Professor of Chemistry at the University of California, Davis, for outstanding achievement in astronomy and education by an African-American scientist

Klumpke-Roberts Award

PROFESSOR JAY PASACHOFF of Williams College for his contributions to the public understanding and appreciation of astronomy

Las Cumbres Amateur Outreach Award

LYNN POWERS, President of the Southwest Montana Astronomical Society, for her dedication in sharing her knowledge and passion for astronomy

Richard H. Emmons Award

PROFESSOR NICK SCHNEIDER for his innovative methods teaching Astrophysical and Planetary Sciences at the University of Colorado, Boulder

Catherine Wolfe Bruce Gold Medal

DR. MARTHA P. HAYNES,
Goldwin Smith Professor of
Astronomy at Cornell University,
in recognition of her leadership
in radio studies of galaxies



Thank You

Our sincere thanks to the following organizations and individuals for their generous support during the 2019 calendar year. Funds raised support our ongoing mission to foster curiosity, advance scientific literacy, share the joy of exploration and discovery, and encourage the development of tomorrow's science, technology, and academic leaders. Thank you for believing in the ASP.

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Honoring the “Mother of the Hubble”

Nancy Grace Roman, an icon in the history of astronomy research and space exploration, vocal advocate for encouraging girls to participate in STEM, and generous supporter of the ASP, passed away on December 26, 2018, at the age of 93.

Nancy Grace Roman was the first woman to hold an executive position at NASA in 1961. While she went on to plan many successful NASA programs and experiments—including SpaceLab, Gemini, Apollo, and Skylab—Dr. Roman will be long remembered as the “Mother of the Hubble.”

In 1979, NASA asked Dr. Roman to pitch the idea of launching a space telescope in orbit around the Earth to skeptical government agencies. Her passionate advocacy led to the successful 1990 launch of the Hubble Space Telescope, an instrument that produced images that captivated the public and fundamentally transformed our understanding of the universe.

In 2019, the ASP received a very generous bequest from the Nancy Grace Roman Estate that will support our education programs for decades to come. Dr. Roman was already one of our most generous donors, having helped kickstart our initiatives focused on engaging young girls in astronomy. We mourn Nancy Grace Roman's passing, and are honored to carry forward her commitment to STEM teaching, learning, and inclusion.



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CREDITS & ACKNOWLEDGMENTS

Chief Executive Officer

Linda Shore

Project Manager

Joycelin Craig

Editor

Ruth Tepper Brown

Graphic Designer

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IMAGES

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Astronomical Society of the Pacific

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San Francisco Headquarters

390 Ashton Ave., San Francisco, CA 94112

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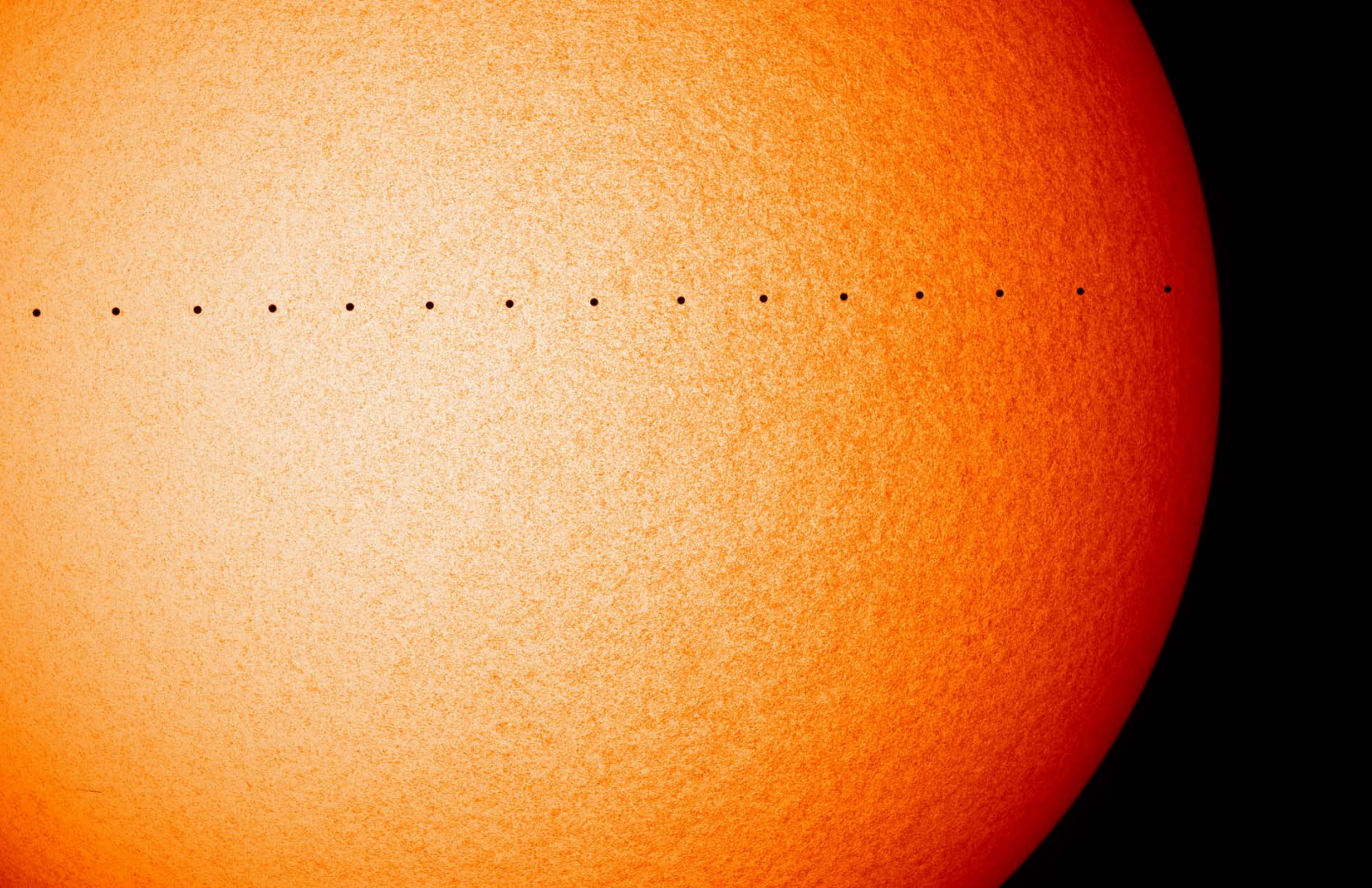
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In Memoriam

In memory of NASA mathematician Katherine Johnson (1918–2020), whose calculations helped send the first American astronauts safely into space.

In 2016, Johnson was the inaugural recipient of the ASP's Arthur B.C. Walker II Award, presented to an African American (or member of the African Diaspora) for outstanding achievement in astronomy research and leadership in efforts to diversify the scientific community.





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