



Engage Every Child in the 2017 Solar Eclipse:

Working Together with Diverse and Underserved Communities Across America

ASP 2016 Annual Meeting

Moonrise Hotel • St. Louis, Missouri

December 8–9, 2016

PROGRAM

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Get Social with the ASP!

Check the ASP Facebook page for news about the ASP: www.facebook.com/astrosociety

NASA Night Sky Network on Facebook: www.facebook.com/nightskynetwork

Twitter hashtag for the conference: #ASPeclipse

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Cover image: Rhys Jones

Welcome

Welcome to the ASP 2016 Annual Meeting: Engage Every Child in the 2017 Solar Eclipse. Thank you for participating in the ASP's long tradition of gathering the astronomy community together to promote science literacy through the awe and wonder of astronomy, improve the teaching of astronomy, and inspire everyone to look up and explore the cosmos.

A total solar eclipse was the catalyst that founded the ASP over 125 years ago. On January 1, 1889, a solar eclipse was visible in California and its path of totality passed just 85 miles north of San Francisco. Loaded up with telescopes and cameras, a group of 40 amateur astronomers traveled to Cloverdale, California, to capture the solar eclipse on film. Photography was a new technology and astronomers were eager to capture an image of an eclipse. The amateurs met a month later in San Francisco at the headquarters of the Pacific Coast Amateur Photographic Society where they shared their experiences and proudly displayed the photographs they had taken. The meeting was such a success that the group decided to form an astronomical society on the west coast, meet regularly, and dedicate themselves to sharing their knowledge and expertise — the Astronomical Society of the Pacific was born.

Now the 2017 North American Solar Eclipse brings us together for a singular and critically important purpose — to ensure that underserved communities across the nation experience the awe of a solar eclipse, especially the many millions of children who will experience a partial eclipse of great significance with at least 60% of the face of the Sun covered by the Moon.

I encourage you to use this meeting to meet new people, learn about the many exciting STEM programs across the country that support underserved communities, and discover astronomy education resources to help you plan exciting programs for children and their families. More importantly, use this gathering to forge lasting partnerships with people, institutions, and programs. Let's work together to make sure every child is engaged in astronomy long after the 2017 solar eclipse is over.

On behalf of the ASP Board of Directors, ASP staff, and our membership, I welcome you to the Moonrise Hotel in St. Louis, Missouri, and to the 128th meeting of the Astronomical Society of the Pacific. We thank our donors and meeting sponsors for their generous support of the meeting and we thank you for making the conference possible through your participation. I wish you a productive and inspirational meeting!

A handwritten signature in black ink, appearing to read 'Linda Shore', with a long horizontal line extending to the right.

Linda Shore
Executive Director
Astronomical Society of the Pacific

Acknowledgements

The ASP thanks the following individuals and institutions for their generous support. Our conference would not be possible without their time and dedication.

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Greg Schultz, *Astronomical Society of the Pacific (Chair)*

Linda Shore, *Astronomical Society of the Pacific*

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Mike Simmons, *Astronomers Without Borders*

Additional Support

American Astronomical Society (AAS) Solar Eclipse Task Force, for generous support with travel grants for select attendees.

Jeff Bennett (Big Kid Science), for generous contribution of his children's book, *I, Humanity*.

Michael Zeiler and Polly White (GreatAmericanEclipse.com), for generous contribution of 2017 solar eclipse maps.

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General Daily Schedule

Wednesday, December 7, 2016	
4:00 p.m.	Meeting Attendee Check-in — Hotel Lobby
7:00 p.m.	Reception — Twilight Room
Thursday, December 8, 2016	
8:00 a.m.	Meeting Attendee Check-in opens — 2nd Floor Reception Area
8:30 a.m.	Plenary Session 1: Selling the Eclipse — Gemini Room
9:30 a.m.	Poster and Resource Viewing/Refreshment Break — 2nd Floor Reception Area
10:00 a.m.	Concurrent Session 1: 1-Hour Workshops, 10-Minute Orals
11:00 a.m.	Transition Break
11:15 a.m.	Concurrent Session 2: 1-Hour Workshops
12:15 p.m.	Lunch (on your own)
1:45 p.m.	Plenary Session 2: Technology and the 2017 Solar Eclipse — Gemini Room
2:45 p.m.	Poster and Resource Viewing/Refreshment Break — 2nd Floor Reception Area
3:15 p.m.	Concurrent Session 3: 1-Hour Workshops, 10-Minute Orals
4:15 p.m.	Transition Break
4:30 p.m.	Concurrent Session 4: 1-Hour Workshops, 10-Minute Orals
5:30 p.m.	Poster and Resource Viewing — 2nd Floor Reception Area
7:30 p.m.	Annual Meeting Buffet Dinner — Gemini Room

General Daily Schedule

Friday, December 9, 2016	
8:00 a.m.	Meeting Attendee Check-in opens — 2nd Floor Reception Area
8:30 a.m.	Plenary Session 3: Per Aspera Ad Astra Civitatem — Stars for Every Neighborhood: An Unlikely Alliance — Gemini Room
9:30 a.m.	Poster and Resource Viewing/Refreshment Break — 2nd Floor Reception Area
10:00 a.m.	Concurrent Session 5: 1-Hour Workshops
11:00 a.m.	Check-in closes — 2nd Floor Reception Area
11:00 a.m.	Transition Break
11:15 a.m.	Concurrent Session 6: 1-Hour Workshops
12:15 p.m.	Lunch (on your own)
1:45 p.m.	Poster and Resource Viewing closed for the rest of Meeting — 2nd Floor Reception Area
1:45 p.m.	Concurrent Session 7: 1-Hour Workshops
2:45 p.m.	Transition Break
3:00 p.m.	Plenary Session 4: Closing Discussion: Next Steps — Twilight Room

THURSDAY, DECEMBER 8, 2016 DETAILED SCHEDULE BY DAY • SESSIONS LISTED BY LEAD PRESENTER

	GEMINI	APOLLO 8	APOLLO 11	TWILIGHT ROOM	2ND FLOOR RECEPTION
8:00					Meeting attendee check-in
8:30 – 9:30am Plenary Session 1	Speck: Selling the Eclipse				
9:30 – 10:00					Poster and Resource Viewing/Refreshment Break
10:00 – 11:00 Concurrent Session 1 1-Hour Workshops 10-minute orals	Session Chair: <i>Schultz</i> 1A.1 Simmons: Resources for underserved students in Africa — and the US 1A.2 Wagoner: Serving the Underserved Children through STEM 1A.3 Ouimet: STEM at Boys & Girls Clubs 1A.4 Harding: Hey Sun! Smile for the Camera! 1A.5 Sinha: The Eclipse that Changed the Picture of the Universe	1B White: Party Off the Path — how to hold a partial eclipse event	1C Balch: Learn about NASA's Eclipse Resources		
11:00 – 11:15					Transition break
11:15 – 12:15 Concurrent Session 2 1-Hour Workshops	2A Bennett: Story Time from Space — Literacy and Science from Earth Orbit	2B Kruse: The Eclipse in the Classroom, an NGSS Storyline Approach	2C DeVore: Destination Events and Eclipse Boxes for Girl Scouts		
12:15 – 1:45					Lunch (on your own)
1:45 – 2:45 Plenary Session 2	Shore (moderator), Peticolas, Higdon: Technology and the 2017 Solar Eclipse				
2:45 – 3:15					Poster and Resource Viewing/Refreshment Break
3:15 – 4:15 Concurrent Session 3 1-Hour Workshops 10-minute orals	Session Chair: <i>Kruse</i> 3A.1 Hepp: Southern Illinois Schools Eclipse Planning Group 3A.2 Dcruz: View the 2017 Solar Eclipse from Joliet Junior College, IL 3A.3 Sayle: Engaging diverse communities in a statewide eclipse party 3A.4 Petrie: Including astronomy in urban nature education 3A.5 Whitehouse: South Carolina's Unique K-12 Eclipse Engagement Challenges	3B Hurst: The Solar Eclipse for Early Learners	3C Front: Engaging Communities via Challenger Learning Centers		
4:15 – 4:30					Transition break
4:30 – 5:30 Concurrent Session 4 1-Hour Workshops 10-minute orals	Session Chair: <i>White</i> 4A.1 Mayo: The 2017 Total Solar Eclipse: Through the Eyes of NASA 4A.2 Edberg: Weather Observations During the Eclipse with GLOBE Protocols 4A.3 Raftery: The Sun 101 — NSO's monthly eclipse webinar 4A.4 Miesch: Creating a Total Solar Eclipse Experience with a Mobile Lab 4A.5 Metcalf: Practice, Practice for The Perfect Solar Eclipse Event	4B Ficken: Space Science Delivered Direct: Right to Your Public Library	4C Runyon: A Tactile View of the Eclipse		
5:30 – 6:00					Poster and Resource Viewing
7:30 – 9:30	Annual Meeting Buffett Dinner				

FRIDAY, DECEMBER 9, 2016 DETAILED SCHEDULE BY DAY • SESSIONS LISTED BY LEAD PRESENTER

	GEMINI	APOLLO 8	APOLLO 11	TWILIGHT ROOM	2ND FLOOR RECEPTION
8:00					Meeting attendee check-in
8:30 – 9:30am Plenary Session 3	Pitts: Per Aspera Ad Astra Civitatem — Stars for Every Neighborhood: An Unlikely Alliance				
9:30 – 10:00					Poster and Resource Viewing/Refreshment Break
10:00 – 11:00 Concurrent Session 5 1-Hour Workshops	5A Fiedler Lord: The New Jersey Solar Festival: Solar Eclipse of 2017	5B Summer: Making Astronomy Outreach More Effective for Girls	5C Nichols: Inexpensive Eclipse Activities		
11:00 – 11:15					Transition break
11:15 – 12:15 Concurrent Session 6 1-Hour Workshops		6A Henricks: Increasing Eclipse Engagement with STEAM	6B Walker: Measuring Sky Brightness During Solar Eclipse	6C Pener: Educational Equity and Diversity in Astronomy Education (ends at 12:45)	
12:15 – 1:45					Lunch (on your own)
1:45 – 2:45 Concurrent Session 7 1-Hour Workshops	7A Hadley: Informal & Formal Education Partnership Serving All Students	7B Gay: Creating a Community Building Moment	7C Triplett-Johnson: STAR: Connecting Classrooms to the Universe		
2:45– 3:00					Transition break
3:00 – 4:00am Plenary Session 4				Shore, Schutz (moderators): Closing Discussion: Next Steps	

Special Events

Wednesday December 7

Welcome Reception

Moonrise Hotel, 8th Floor, Twilight Room

7:00 – 9:00 p.m.

Join us in the Twilight Room for an ASP-hosted evening reception of light appetizers and a cash bar to kick off our two-day Annual Meeting. Enjoy a view of St. Louis as you meet new people and see old acquaintances.

Thursday December 8

ASP Annual Meeting Buffet Dinner

Moonrise Hotel, 2nd Floor, Gemini Room

7:30 – 9:30 p.m.

Join us at the end of the Meeting's first day for an ASP-hosted Buffet Dinner along with a complimentary glass of wine in the Gemini Room. Be sure to bring your Meeting badge.

ASP Table

ASP Table — Show Special on Eclipse products!

The ASP Table, located on the 2nd Floor near Check-in, will be displaying and taking orders for hand-selected products we offer online at the ASP AstroShop Solar Eclipse Shop. Our products were selected to support safe viewing of and education around the solar eclipse in August 2017. Look for new eclipse products in the coming months. We also have some ASP favorites to order during the Annual Meeting that might inspire your dedication to astronomy.

Be sure to take advantage of our Show Special: **10% off any order placed at the Annual Meeting.** All proceeds from our sales directly support the ASP's programs. Samples will be available to purchase and take home with you at the end of the Meeting.

Prepare for the North American Eclipse Classroom and Outreach Materials/Instruments

Endorsed by ASP Staff Educators



Lunt Mini SUNoculars (6x30)	\$29.95
Plastic Eclipse Glasses (with protective case)	\$19.95
ASP Solar Eclipse Glasses (set of 10)	\$24.95
ASP Solar Eclipse Glasses (set of 50)	\$119.95
ASP Solar Eclipse Glasses (set of 100)	\$199.95
See the Great American Eclipse of August 21, 2017	\$9.95
Solar Science: Exploring Sunspots, Seasons, Eclipses, and More	\$39.95
Sunspotter Solar Telescope (shipping included in price)	\$475.00
Yardstick Eclipse Activity (Kit of 5 Activities)	\$35.00
Yardstick Eclipse Activity (Kit of 100 Activities)	\$600.00

Plenary Sessions

Selling the Eclipse

Plenary Session 1

Thursday December 8

8:30 – 9:30 a.m.

Gemini Room

Angela Speck, *University of Missouri*

The 2017 Eclipse is going to be a big nationwide event and yet many, if not most people still don't know it is going to happen.

In this talk Speck will discuss this eclipse and how we have engaged with multiple constituencies to raise awareness in an attempt to get everyone involved.

Named after political activist, scholar, and author Angela Davis, **Angela Speck** likes bright colors, is a nerd at heart, and has wanted to be an astronaut since she was five years old. Originally from Yorkshire she went to college in London where she was able to pursue her childhood dreams by majoring in astrophysics. After a brief stint as a r&d technician for a Lancashire, she returned to London and completed a PhD in astronomy. Now the Director of Astronomy at the University of Missouri, she continues to research and teach astrophysics and to share her passion for all things extra-terrestrial.



Laura Peticolas is Director of the Multiverse group and a Senior Fellow at the Space Sciences Laboratory (SSL) at the University of California, Berkeley. She received her B.A. in mathematics and physics at the University of Oregon Honors College and her Ph.D. in physics studying the aurora at the University of Alaska, Fairbanks. She spent 3 years as a post-doctoral fellow at SSL before transitioning to primarily the profession of education and outreach. She has had over a decade of experience in the education and outreach profession, co-leading and leading many NASA science mission education and public outreach programs and NSF informal science education programs. As part of these efforts, she has trained hundreds of teachers in space science concepts using researched-based educational best practices, and shared the excitement of NASA space science missions with students and the public.



Robyn Higdon has worked at the Exploratorium for over 20 years. She's currently the Director of Museum Experiences, which includes the Public Space, Tactile Dome, Biology Lab, Field Trip Program, High School Explainer Program, Public Programs, Cinema Arts, and Moving Images. Robyn has been a Co-Principal Investigator on NSF, NOAA, and NASA projects, including the Total Solar Eclipse: Stories from the Path of Totality, and NOAA's Scientific Residency program. She has received several Webby and MUSE awards for her work. On the weekends, she is working on an off-the-grid cabin in the Gold Country.



Technology and the 2017 Solar Eclipse

Plenary Session 2

Thursday December 8

1:45 – 2:45 p.m.

Gemini Room

Linda Shore, *Astronomical Society of the Pacific*, moderator

Laura Peticolas, *University of California, Berkeley*, panelist

Robyn Higdon, *Exploratorium*, panelist

Laura Peticolas will talk about the “eclipse megamovie” project, which will gather 1000+ quality images of the total eclipse from amateurs, photographers, and others across the path of totality, and assemble all that into a movie to gather dynamic data on the solar corona. Complementing this, Robyn Higdon will talk about the eclipse webcast she and her colleagues will be running, and share new approaches they will be taking after several prior eclipse webcasts from around the world.

Panel moderator **Linda Shore** is the Executive Director of the Astronomical Society of the Pacific. Previously, Shore served as Director of the Teacher Institute at San Francisco's renowned science museum, the Exploratorium. While there, she led a staff of scientists and educators, and created nationally recognized teaching programs. Shore has co-authored Exploratorium and ASP science and education books, and written articles about popular science and science education for the public. A native San Franciscan who has spent most of her life in the Bay Area, she holds a EdD in science education from Boston University, and a master's degree in physics and astronomy from San Francisco State University. Shore was also the recipient of a prestigious Smithsonian Pre-doctoral Fellowship to work at the Harvard-Smithsonian Center for Astrophysics where she developed curriculum and conducted research on astronomy learning for the National Science Foundation funded program, Project STAR (Science Teaching through its Astronomical Roots).



Plenary Sessions

Per Aspera Ad Astra Civitatem — Stars for Every Neighborhood: An Unlikely Alliance

Plenary Session 3

Friday December 9

8:30 – 9:30 a.m.

Gemini Room

Derrick Pitts, *Franklin Institute*

Recognizing the importance of making astronomy and space science concepts available to underserved audiences has turned out to be just as important, if not more important than actually delivering the content. Franklin Institute Chief Astronomer Derrick Pitts' most recent experiences engaging underserved audiences in Philadelphia not only opened urban skies to new viewers but fostered new independent science partnerships museum community outreach teams always wish for.

Derrick Pitts has created engaging and effective science content at Philadelphia's Franklin Institute since the Vikings landed on Mars. His in-house programs have made astronomy the most easily accessible entry point to science for our visitors while his community astronomy activities have produced some of the largest urban astronomy events in the nation. His appearances on *The Colbert Report* and *The Late, Late Show with Craig Ferguson* indicate that he plays well with others!



Panel moderator **Linda Shore** is the Executive Director of the Astronomical Society of the Pacific. Previously, Shore served as Director of the Teacher Institute at San Francisco's renowned science museum, the Exploratorium. While there, she led a staff of scientists and educators, and created nationally recognized teaching programs. Shore has co-authored Exploratorium and ASP science and education books, and written articles about popular science and science education for the public. A native San Franciscan who has spent most of her life in the Bay Area, she holds a EdD in science education from Boston University, and a master's degree in physics and astronomy from San Francisco State University. Shore was also the recipient of a prestigious Smithsonian Pre-doctoral Fellowship to work at the Harvard-Smithsonian Center for Astrophysics where she developed curriculum and conducted research on astronomy learning for the National Science Foundation funded program, Project STAR (Science Teaching through its Astronomical Roots).



Panel moderator **Greg Schultz** has been Director of Education and currently Senior Scientist and Educator at the Astronomical Society of the Pacific (ASP), 2009-present, following 10 years at UC Berkeley's Center for Science Education at the Space Sciences Lab. He has been involved in more than 20 NASA and NSF education and public outreach (EPO) grants and projects, and each year chairs the Program Committees for the ASP's Annual Meeting. Greg earned a PhD in 1999 from UCLA Astronomy & Astrophysics, and was an NSF Postdoctoral Fellow in Science, Mathematics, Engineering and Technology Education at UC Berkeley for 3 years. His primary professional interests have been teacher professional development, teacher education, undergraduate teaching, curriculum development, informal education, early childhood education, and developing and managing EPO projects and conferences — all in astronomy, space science, physics, earth science, and related fields. He served four years on the Board of Directors of the California Science Teachers Association, and for five years and running on the Board of Directors for Habitot Children's Museum in Berkeley.



Closing Discussion: Next Steps

Plenary Session 4

Friday December 9

3:00 – 4:00 p.m.

Twilight Room

Linda Shore, *Astronomical Society of the Pacific*, moderator
Greg Schultz, *Astronomical Society of the Pacific*, moderator

Linda Shore and Greg Schultz of the ASP will co-facilitate this final plenary session, in part reflecting on what we've heard and done these two days, but more importantly turning attention to what we can all do in the coming months in preparation for engaging children nationwide in the 2017 solar eclipse. This will be a lively, interactive discussion, with ideas invited for sharing with other conference attendees, and for expanding our reach and impact going forward.

Concurrent Session 1: 10-Minute Orals

Session Chair: Greg Schultz, Astronomical Society of the Pacific

Time: Thursday 10:00 a.m. – 11:00 a.m.

Session Type: 10-Minute Oral Presentation

Location: Gemini

1A.1 Resources for Underserved Students in Africa — and the US

Mike Simmons, Astronomers Without Borders, mikes@astronomerswithoutborders.org

Zoe Chee, Astronomers Without Borders, zchee@hotmail.com

A solar eclipse is a natural science lab that is often a first-time science experience and inspiration for students and teachers. Astronomers Without Borders has helped schools across Africa by crowdfunding safe viewing glasses to be distributed by vetted partners already working with schools. A similar but larger project is planned for schools in under-served or isolated communities across the US in 2017 including inner cities, Native American reservations, and children's cancer hospitals.

Session Type: 10-Minute Oral Presentation

Location: Gemini

1A.2 Serving the Underserved Children through STEM

John Wagoner, CLASS — City Lights Astronomical Society for Students, john@classusa.org

For 14 years, CLASS has served the Dallas inner city by bringing astronomy to the Dallas Library System's 29 branches, and helping DISD. We offer three major services to the DLS. Our services meet the science requirement for the Mayor's Program. CitySquare takes meals to needy kids. They asked me to teach the sun. I went into 15 of the worst apartments in Dallas, and handed out 596 pairs of solar glasses teaching these kids the sun. THESE KIDS PICKED UP SOLAR OBSERVING LIKE IT WAS A VIDEO GAME.

Session Type: 10-Minute Oral Presentation

Location: Gemini

1A.3 STEM at Boys & Girls Clubs

Elaina Ouimet, Boys & Girls Clubs of America, eouimet@bgca.org

Boys & Girls Clubs of America, headquartered in Atlanta, represents more than 4,000 Boys & Girls Clubs serving nearly four million youth annually. Research has shown that the out-of-school environment — after school and summer — advances STEM knowledge and increases youth interest in STEM-related careers. BGCA provides tools and high-quality programming to address the opportunity gap for youth in underserved communities, especially girls and minority youth, with access to quality STEM education.

Session Type: 10-Minute Oral Presentation

Location: Gemini

1A.4 Hey Sun! Smile for the Camera!

Christelle Harding, French STEM Academy – Decatur Public Schools, charding@dps61.org

Ashley Kennedy, French STEM Academy – Decatur Public Schools, AMKennedy@dps61.org

Katie Dilbeck, French STEM Academy – Decatur Public Schools, KDilbeck@dps61.org

Teachers and an instructional coach working in a K–6 STEM school with about a 90% poverty rate will share their work preparing and planning for the experience of a lifetime for their students. Innovative ideas for using individual learning devices to spark interest in and document the 2017 solar eclipse will be shared. Ideas on how to safely and economically use portable devices (iPads or similar) to photograph the eclipse will be emphasized.

Session Type: 10-Minute Oral Presentation

Location: Gemini

1A.5 The Eclipse that Changed the Picture of the Universe

Neeti Sinha, Independent; Past: Johns Hopkins University, nsinha@magnifieduniverse.com

The distinguished total solar eclipse of May 29, 1919, gave new

window to the universe. That eclipse truly stood as Einstein favoring cosmic phenomenon, authenticating his general theory of relativity; that the spacetime is conformed via gravity, upending the hitherto upheld Newtonian picture — gravity as force between masses. The bending of light due to mass that the eclipse captured reformed our understanding: from spacetime dynamics to black holes to the recently detected gravitational waves.

Concurrent Session 1: 1-Hour Workshops

Time: Thursday 10:00 a.m. – 11:00 a.m.

Session Type: 1-Hour Workshop

Location: Apollo 8

1B Party Off the Path — How to Hold a Partial Eclipse Event

Vivian White, Astronomical Society of the Pacific, vwhite@astrosociety.org

Mike Reynolds, Florida State College at Jacksonville, M.D.Reynolds@fscj.edu

Much of the excitement about August 21st relates to the main event on path of totality. However over 95% of the country will be left in the light. Join us to discover some of the innovative ways people are celebrating the partial eclipse all over the country. Come away with activities, ideas, and connections to make your eclipse events out of this world.

Session Type: 1-Hour Workshop

Location: Apollo 11

1C Learn about NASA's Eclipse Resources

Katrine Balch, NASA Marshall Space Flight Center, katrine.m.balch@nasa.gov

Erin McKinley, NASA Goddard Space Flight Center, erin.e.mckinley@nasa.gov

NASA has created a special website eclipse2017.nasa.gov to help spread the word about free educational resources, safe viewing instructions, where to watch, and other ways to participate in this event.

NASA Education would like to highlight many of the free education resources on the website. During the session inexpensive hands-on activities will be demonstrated.

By the date of the event, we hope to have ready lithographs and print resources for distribution.

Concurrent Session 2: 1-Hour Workshops

Time: Thursday 11:15 a.m. – 12:15 p.m.

Session Type: 1-Hour Workshop

Location: Gemini

2A Story Time from Space — Literacy and Science from Earth Orbit

Jeff Bennett, Big Kid Science, jeff@bigkidscience.com

IMAGINE astronauts on the International Space Station reading stories to the children of Earth, in an exciting new program that combines literacy and science education. IMAGINE videos of the readings, along with demos to illuminate their science concepts, all online for easy access. Now, imagine no more, because it is already happening. Come hear how you can tap this exciting and free resource both to support your activities around the 2017 eclipse and to continue to build upon those activities throughout the school year. Learn more about the program at www.storytimefromspace.com.

Session Type: 1-Hour Workshop

Location: Apollo 8

2B The Eclipse in the Classroom, an NGSS Storyline Approach

Brian Kruse, Astronomical Society of the Pacific, bkruse@astrosociety.org

The NGSS is shifting classroom instruction from learning topics to exploring and explaining phenomena. Using a storyline approach, this session demonstrates how educators can facilitate student learning about eclipses through active engagement in a series of investigations. Focusing on evidence-based reasoning, this session will prepare educators to work with teachers and/or students to develop accurate models of the Sun-Earth-Moon system, and the geometry leading to the pattern of eclipses.

Session Type: 1-Hour Workshop

Location: Apollo 11

2C Destination Events and Eclipse Boxes for Girl Scouts

Edna DeVore, SETI Institute, edevore@seti.org

Pamela Harman, SETI Institute, pharman@seti.org

Jennifer Allebach, Girl Scouts of the USA, jallebach@girlscouts.org

Joanne Berg, Girl Scouts of the USA, jberg@girlscouts.org

Wendy Chin, Girl Scouts USA

Cole Grissom, Girl Scouts USA

Amanda Hudson, Girl Scouts USA

Vivian White, Astronomical Society of the Pacific

Theresa Summer, Astronomical Society of the Pacific

Jean Fahy, Girl Scouts of Northern California

Jessica Henricks, Girl Scouts of Northern California

Larry Lebofsky, University of Arizona

Don McCarthy, University of Arizona

Lou Mayo, Aires Scientific, Inc.

The Girl Scouts across the nation are being equipped to learn about the Sun, and the 2017 solar eclipse through their local Girl Scout Councils and Summer Camps. They can choose to travel to the center line of the eclipse through the Girl Scouts of the USA's "Destinations" program for events in Missouri, Illinois and South Carolina. Special eclipse patches will be available from Girl Scouts USA. SETI Institute leads "Reaching for the Stars: NASA Science for Girl Scouts" Grant Number NNX16AB90A.

Concurrent Session 3: 10-Minute Orals

Session Chair: Brian Kruse, Astronomical Society of the Pacific

Time: Thursday 3:15 p.m. – 4:15 p.m.

Session Type: 10-Minute Oral Presentation

Location: Gemini

3A.1 Southern Illinois Schools Eclipse Planning Group

Cindy Hepp, Trico Elementary School & SIUC Noyce Project, chepp@trico176.org

Julie Wittenborn-Sikorski, Murphysboro Middle School & SIUC Noyce Project, jwittski@mhs.org

Meteicha Green, Murphysboro Carruthers Elementary School & SIUC Noyce Project, mgreen@mhs.org

Teachers from rural Southern Illinois school districts are working together to prepare students for the upcoming eclipses. Because we are in a privileged position to experience these rare events, we are incorporating lessons and activities into areas of our curriculum. We are also preparing our students to be able to educate others. We continue to collect and create resources that can be used by educators at all grade levels. We share these at <https://sischooleclipseplanning.wordpress.com/>

Session Type: 10-Minute Oral Presentation

Location: Gemini

3A.2 View the 2017 Solar Eclipse from Joliet Junior College, IL

Noella Dacruz, Joliet Junior College, Joliet, IL, ndacruz@jcc.edu

Joliet Junior College is a community college in Joliet, IL. From Joliet, the 2017 solar eclipse will be partial — the Sun will be 88.4% obscured, which will be impressive. The eclipse will occur on the first day of the Fall 2017 semester, and I plan to hold a public viewing event at the college, for the college community and the public to safely view the eclipse via a Sunspotter, a Coronado Solarmax with an H-alpha filter, etc. My presentation will describe detailed plans for this event.

Session Type: 10-Minute Oral Presentation

Location: Gemini

3A.3 Engaging Diverse Communities in a Statewide Eclipse Party

Amy Sayle, Morehead Planetarium and Science Center, UNC-Chapel Hill, sayle@email.unc.edu

Darlene Smalley, Ruth Patrick Science Education Center, University of South Carolina Aiken, DarleneS@usca.edu

How can we engage a network of partners to collaborate on a Statewide Eclipse Party that reaches diverse communities in all regions of a state? We'll discuss strategies learned from five years of coordinating the N.C. Science Festival's annual Statewide Star Party, which in 2016 offered 52 public skywatching events with 6,500 participants in 38 counties from the N.C. mountains to the coast. We'll demonstrate a hands-on activity from the kit that hosts are being trained on to engage their audiences.

Session Type: 10-Minute Oral Presentation

Location: Gemini

3A.4 Including Astronomy in Urban Nature Education

Kaylan Petrie, Discovery Place, aylanp@discoveryplace.org

The re-opening of the Nature Dome at Discovery Place Nature (DPN, formerly known as the Charlotte Nature Museum) coincides with the 70th anniversary of the museum as well as the 2017 solar eclipse visible from the museum in Charlotte NC. DPN serves one of the largest urban school districts in the country, and staff educators and naturalists are working to create an event focused not only on astronomy and observation of the eclipse, but also how astronomical events are related to nature.

Session Type: 10-Minute Oral Presentation

Location: Gemini

3A.5 South Carolina's Unique K–12 Eclipse Engagement Challenges

Matthew Whitehouse, South Carolina State Museum, matthew.whitehouse@scmuseum.org

In South Carolina, the eclipse occurs near dismissal time on the

first day of school for many districts: a unique challenge to student engagement. The South Carolina State Museum is working with educators, school STEM coordinators, and our State Department of Education to prepare teachers and students statewide. These preparations include school schedule changes, eclipse glasses purchasing initiatives, and teacher training. Our goal is to engage ALL students in South Carolina — both on and off the path of totality.

Concurrent Session 3: 1-Hour Workshops

Time: Thursday 3:15 p.m. – 4:15 p.m.

Session Type: 1-Hour Workshop

Location: Apollo 8

3B The Solar Eclipse for Early Learners

Anna Hurst, Astronomical Society of the Pacific, ahurst@astrosociety.org

Danielle Bardellini, Astronomical Society of the Pacific, dbardellini@astrosociety.org

Alice Enevoldsen, alicesastroinfo@gmail.com

A solar eclipse is an ideal astronomical event to observe with young children. We will discuss strategies for observing the eclipse with young children, and share activities for supporting the experience. We'll also share further resources for engaging young children in the excitement of astronomy, based on our work on My Sky Tonight, a collection of astronomy activities for pre-K children, designed to be engaging, developmentally appropriate, and embedded with science practices.

Session Type: 1-Hour Workshop

Location: Apollo 11

3C Engaging Communities via Challenger Learning Centers

Tasmyn Front, Challenger Learning Center-St. Louis, tasmyn@clcstlouis.org

Robert Fredell, Colorado Consortium for Earth & Space Science Education, rfredell@challengercolorado.org

Rebecca Manis, Challenger Learning Center of Northwest Indiana, manis@clcnwi.com

The international network of CLC sites are found in more than 40 cities in the US. Many of these centers will coordinate available resources from NASA and local astronomical societies to provide area educators with activities to teach K–12 students about the once-in-a-lifetime August 2017 event. In addition, participants will learn about Challenger programs and how best to work together to achieve common goals of inspiring the future generation of innovators.

Concurrent Session 4: 10-Minute Orals

Session Chair: Vivian White, Astronomical Society of the Pacific

Time: Thursday 4:30 p.m. – 5:30 p.m.

Session Type: 10-Minute Oral Presentation

Location: Gemini

4A.1 The 2017 Total Solar Eclipse: Through the Eyes of NASA

Lou Mayo, NASA/GSFC, astronomer2go@verizon.net

C.A. Young, NASA/GSFC

T. Cline, NASA/GSFC

A. Debebe, NASA/GSFC

E. Lewis

C. Ng

S. Odenwald

S. Reed

B. Stephenson

Over 500 million in North America alone will be able to see the August 21, 2017 total solar eclipse in either partial or total phase. NASA will take full advantage of this unique event as an E/PO opportunity by leveraging its extensive networks of partners, unique space assets, and people to bring the eclipse to America and the world as only NASA can.

This talk will outline NASA's E/PO plans for the eclipse leveraging our extensive experience with Big Events including the 2012 Transit of Venus.

Session Type: 10-Minute Oral Presentation

Location: Gemini

4A.2 Weather Observations During the Eclipse with GLOBE Protocols

Stephen Edberg, NASA Jet Propulsion Laboratory, Stephen.J.Edberg@jpl.nasa.gov

After the UK's 2015 National Eclipse Weather Experiment, the 2017 eclipse offers greater numbers and spread of observers and across more local times.

GLOBE invites students and the public to collect weather data (<http://www.globe.gov/do-globe>). Measurement protocols for the eclipse will be described, including a mobile phone app.

This publication was prepared by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Session Type: 10-Minute Oral Presentation

Location: Gemini

4A.3 The Sun 101 — NSO's Monthly Eclipse Webinar

Claire Raftery, National Solar Observatory, claire@nso.edu

In preparation for the eclipse, the National Solar Observatory will be hosting a monthly public webinar for outreach professionals who are not well versed in the science of the Sun. Each month we will cover: an introduction to solar science, a demonstration of an outreach activity, and a short presentation by a guest scientist. We anticipate that this series will help those facilitating eclipse events feel better prepared to play a role in the sustained impact of the solar eclipse.

Session Type: 10-Minute Oral Presentation

Location: Gemini

4A.4 Creating a Total Solar Eclipse Experience with a Mobile Lab

Mark Miesch, National Center for Atmospheric Research, miesch@ucar.edu

Dimitri Klebe, Denver Museum of Nature and Science, dimitri.klebe@dmns.org

Robert Sallee, National Space Science and Technology Institute, robert.sallee@gmail.com

The Mobile Earth and Space Observatory (MESO) is a "Science Center on Wheels": a vehicle equipped with scientific equipment and learning resources and staffed by a team of scientist/educators. We intend to deploy MESO to under-served communities close to the eclipse path before, during, and after the event in order to engage and educate a diverse group of students and citizens in the science of the Sun and how it influences our climate, our space environment, and our technological society.

Session Type: 10-Minute Oral Presentation

Location: Gemini

4A.5 Practice, Practice for The Perfect Solar Eclipse Event

Larry Metcalf, Sunspot Solar, larryemetcalf@yahoo.com

By their very nature, many people try to do too much during a solar eclipse and literally "miss" the eclipse experience. I will present a timeline and a series of practice exercises for viewing and photography to be performed prior to the eclipse to insure the perfect event. I will focus more on planning and practicing for the event and not go into detail on the techniques.

Concurrent Session 4: 1-Hour Workshops

Time: Thursday 4:30 p.m. – 5:30 p.m.

Session Type: 1-Hour Workshop

Location: Apollo 8

4B Space Science Delivered Direct: Right to Your Public Library

Donald Ficken, Saint Louis Astronomical Society, donaldficken@sbcglobal.net

Kathy Condon-Boettcher, Festus Public Library, kcondon@cityoffestus.org

Sarah Post, Cornerstones of Science, sarah.post@cornerstonesofscience.org

The project NASA@My Library brought together the partnership between the St. Louis Astronomical Society, Festus Public Library, and Cornerstones of Science. Public libraries are conduits to all parts of the community including the underserved, young and old, schools, and others. They are also uniquely positioned to provide

ongoing access to space science resources with connections to the scientific community. This panel will share their perspectives on the value of such collaborations.

Session Type: 1-Hour Workshop

Location: Apollo 11

4C A Tactile View of the Eclipse

Cassandra Runyon, College of Charleston, runyonc@cofc.edu

David Hurd, Edinboro University of PA, dhurd@edinboro.edu

Cynthia Hall, College of Charleston, hallcr@cofc.edu

Joe Minafra, NASA SSERVI, joseph.minafra@nasa.gov

Working closely with the NASA Solar System Exploration Research Virtual Institute (SSERVI), we developed a tactile guide to eclipses. Getting a Feel for Eclipses includes both a tactile model of eclipses in general and a map of the path of totality for the upcoming "Great American Solar Eclipse". Kinesthetic activities help to further illustrate the content. A Spanish version is also available and the book will be adapted for subsequent significant eclipses in South America and North America.

Concurrent Session 5: 1-Hour Workshops

Time: Friday 10:00 a.m. – 11:00 a.m.

Session Type: 1-Hour Workshop

Location: Gemini

5A The New Jersey Solar Festival: Solar Eclipse of 2017

Pia Fiedler Lord, The Pia Lord Company, thepialordcompany@gmail.com

Marialicia Ryan-Cirillo, United States Air Force NJ Joint Base Library McGuire-Lakehurst-Fort Dixon, marialicia.ryan-cirillo@us.af.mil

The New Jersey Solar Festival 2017 will take place at the United States Air Force (USAF) Joint Base Library McGuire-Lakehurst-Fort Dix on August 21st, 2017. The USAF Library and The Pia Lord Company will bring the solar eclipse to over 2000 joint base children and NJ children's groups. The children will explore the sun in S.T.E.A.M. areas, make Native American sun catchers, design sundials, do safe solar eclipse viewing, make thermometers and

solar satellites, and explore renewable energy.

Session Type: 1-Hour Workshop

Location: Apollo 8

5B Making Astronomy Outreach More Effective for Girls

Theresa Sumner, Astronomical Society of the Pacific, tsummer@astrosociety.org

Vivian White, Astronomical Society of the Pacific, vwhite@astrosociety.org

Jessica Henricks, Girl Scouts of Northern California, JHenricks@girlscoutsnorcal.org

Research shows that specific techniques are effective when working with girls/being more inclusive. (Key Components are SciGirls 7, Exploratorium EDGE research, Techbridge papers.)

Workshop Goal: To share the latest research on working with girls in STEM and to brainstorm and practice ways to incorporate it into astronomy and observing outreach.

Session Type: 1-Hour Workshop

Location: Apollo 11

5C Inexpensive Eclipse Activities

Michelle Nichols, Adler Planetarium, mnichols@adlerplanetarium.org

Looking for quick, inexpensive eclipse activities? This workshop will highlight Sun, Moon, light, and color activities that are easy to do, utilize materials that you probably already have around your house, classroom, or museum, and can be done before, during, and after the eclipse. Participants will also receive a link to download the workshop presentation materials and resource suggestions.

Concurrent Session 6: 1-Hour Workshops

Time: Friday 11:15 a.m. – 12:15 p.m.

Session Type: 1-Hour Workshop

Location: Apollo 8

6A Increasing Eclipse Engagement with STEAM

Jessica Henricks, Girl Scouts of Northern California, jhenricks@girlscoutsnorcal.org

Jean Fahy, jfahy@girlscoutsnorcal.org

Edna DeVore, SETI Institute, edevore@seti.org

Pamela Harman, SETI Institute, pharman@seti.org

Theresa Sumner, ASP

Vivian White, ASP

Lou Mayo, ARIES

How might we use art to attract new audiences to science and increase engagement with the 2017 eclipse? Participate in arts-integrated making activities the Girl Scouts of Northern California will deliver to complement activities in the Eclipse Boxes compiled by Lou Mayo in collaboration with the Reaching for the Stars: NASA Science for Girl Scouts team. These eclipse activities will spark interest in girls in summer camps, under-resourced community afterschool series, and Girl Scout programs.

Session Type: 1-Hour Workshop

Location: Apollo 11

6B Measuring Sky Brightness During Solar Eclipse

Constance Walker, National Optical Astronomy Observatories, cwalker@noao.edu

Get the public more involved with the upcoming total solar eclipse by teaching them ways to measure it. Participating in the Globe at Night citizen-science campaign or using the *Loss of the Night & Dark Sky Meter* apps or a Sky Quality Meter are great ways. No special tools are required for the first three & observations can easily be reported. Attendees will experience these firsthand. All reported observations will go into the Globe at Night database and show up as a map downloaded worldwide.

Session Type: 1-Hour Workshop

Location: Twilight

6C Educational Equity and Diversity in Astronomy Education

Barbara Peneer, Washington University Institute for School Partnership, stempactvbpeneer@gmail.com

Windows & Mirrors to the Universe: Participants will be introduced to the concept of windows (books, posters, movies, art, etc that offer a view into someone else's experience) and mirrors (stories that reflect your culture and reality to help you understand yourself) and how they can be integrated into the astronomy curriculum. Gain tools to cross the cultural divide which can sometimes seem light years away. Build on the strengths and diversity within your education communities.

Concurrent Session 7: 1-Hour Workshops

Time: Friday 1:45 p.m. – 2:45 p.m.

Session Type: 1-Hour Workshop

Location: Gemini

7A Informal & Formal Education Partnership Serving All Students

Eric Hadley, Ferguson-Florissant School District, ehadley@fergflor.org

Tasmyn Front, Challenger Learning Center-St. Louis, tasmyn@clcstlouis.org

The Challenger Learning Center-St. Louis is organized locally through a partnership that includes the Ferguson-Florissant School District. Many of the Center's programs are grant-funded, which provides both opportunities and challenges for success. Representatives from both organizations will discuss how they work together to develop, plan, and implement programs that specifically serves the needs of the students and teachers, including the upcoming eclipse.

Session Type: 1-Hour Workshop

Location: Apollo 8

7B Creating a Community Building Moment

Pamela Gay, Astronomy Cast, tarstryder@gmail.com

Susan Murph, Astronomy Cast, susanmurph@gmail.com

This workshop will help you leverage the upcoming eclipse to build a lasting community for your participants. Lessons learned are drawn from the December 2012, “Astronomy Cast End of the World” event and CosmoQuest online events, including the Hangout-a-thons. This workshop will discuss both building a new community, and connecting into existing communities. Strategies will cover both online & in real-world audiences. Attendees will walk away with a general plan for implementing what they learn.

Session Type: 1-Hour Workshop

Location: Apollo 11

7C STAR: Connecting Classrooms to the Universe

Rebecca Triplett-Johnson, Science Technology Advanced Resource, Inc. [STAR], rebecca@star-classroom.org

Matt Whitman, matt@star-classroom.org

Science Technology Advanced Resource, Inc., STAR, a FREE national education program, integrates k-early college students with STEM/STEAM experts via real-time, interactive events. STAR reaches remote underserved schools, and is partnered with AWB-ASP to educate/excite about the 2017 Eclipse and disperse eclipse glasses to STAR students across the US. With lead partner, Lockheed Martin Skunk Works, along with ASP, AWB, NASA and others, STAR brings the universe to the classroom.

Posters

Time: 8:00 a.m. Thursday – 4:30 p.m. Friday

Poster Location: 2nd Floor Reception Area

Special Poster Viewing Times
with presenters at posters

Thursday 9:30 a.m. – 10:00 a.m.

Thursday 2:45 p.m. – 3:15 p.m.

Thursday 5:30 p.m. – 6:00 p.m.

Friday 9:30 a.m. – 10:00 a.m.

01 STEAM POWERED: Inspiring Youth to Create, Dream and Learn

Elaine Cuyler, Orbit Oregon, orbitoregon@gmail.com

Nancy Coffelt, coffeltart@cs.com

The 2017 total solar eclipse presents an extraordinary chance to jumpstart children's learning about science. One way to bring eclipse messages to children in all communities is through the arts. Educators can offer opportunities for STEAM-based eclipse education tailored to specific communities. Participating in creative eclipse arts projects in their own communities will encourage students to learn about eclipses and related science concepts, and prepare for this possibly life-changing event.

02 Eclipse '17 at Indiana University Bloomington

Karna Desai, Indiana University Bloomington,

kardesai@indiana.edu

Catherine Pilachowski, Indiana University Bloomington,

cpilacho@indiana.edu

August 21, 2017, is the first day of classes at Indiana University Bloomington. We will host viewing stations to assist students, faculty, and community members to watch the eclipse safely. The Kirkwood Observatory solar telescope will provide an online view of the event. To increase the scientific literacy of rural Indiana, we will work with K12 educators and other organizations involved in science outreach to help Indiana classrooms prepare class activities and educational material.

03 Connecting Curricula and Community: Local Eclipse History

Donovan Domingue, Georgia College & State University,
donovan.domingue@gcsu.edu

Project ASTRO at Georgia College has included central Georgia eclipse history as a way of connecting teachers to the significance of the August 2017 eclipse and the associated eclipse timescales. As an extension in the classroom, teachers may incorporate library skills with local news sources to answer historic and scientific questions. The local scientific history uncovered in this interdisciplinary approach may strengthen the retention of science lessons and benefit local outreach efforts.

04 Southern Illinois Schools Eclipse Student Activities

Meteicha Green, Carruthers Elementary School & SIUC
Noyce, mgreen@mhs.org

Julie Wittenborn-Sikorski, Murphysboro Middle School &
SIUC Noyce Project, jwittski@mhs.org

Cindy Hepp, Trico Elementary School, chepp@trico176.org

Students from rural Southern Illinois school districts are participating in activities designed to prepare them to experience the upcoming total solar eclipse. They will also be prepared to educate others in their communities. Teachers from these rural Southern Illinois schools are working together to research, share and create activities that are incorporated into many areas of the curriculum. Examples may be found at <https://sischoolseclipseplanning.wordpress.com/>

05 STEM Outreach Activities Using a Home Built Spectroscope

Margaret Hill, Southeast Missouri State University,
phill@semo.edu

Michael Rodgers, Southeast Missouri State University,
mrodgers@semo.edu

Anticipating the eclipse of 2017 we have developed outreach activities that we hope foster long-term communication and collaboration between the university and local community. In rural communities and at the K-12 level there is a need for inexpensive, accurate experimental equipment that can be used to foster active inquiry in science. We present workshop activities involving the construction of an inexpensive homebuilt spectroscope which can be used to investigate the nature of visible light.

06 Girl Scout Solar Eclipse Observing Supported by CosmoQuest

Larry Lebofsky, Planetary Science Institute, lebofsky@psi.edu

Thea Canizo, Planetary Science Institute, tcanizo@psi.edu

Bill Schmitt, The Science Center of Inquiry, bill@
thesciencecenter.org

Sanlyn Buxner, Planetary Science Institute, buxner@psi.edu

Pamela Gay and the CosmoQuest Team

Girl Scouts nationwide will observe the 2017 solar eclipse and with support of CosmoQuest, coordinate and compare their observations. We have an active network of over 250 Girl Scout Adult Leaders in 80 Councils in 45 states who have attended our Astronomy Camps. We will use activities developed by NASA's HEC as well as other Sun-related activities that the Leaders will be able to use. We will use HEC's eclipse Events Map for the posting of the Girl Scout's observations, sketches, photo, etc.

07 Photographing Solar Eclipses With DSLRs and Cell Phones

Robert T. Sparks, NOAO, rsparks@noao.edu

The 2017 total solar eclipse will be one of the most observed in history. Most of North America, the Caribbean and parts of South America will experience at least a partial solar eclipse. Many people will want to photograph the eclipse. This poster will describe techniques used with off the shelf DSLRs, cell phone cameras and simple point and shoot cameras to photograph the annual solar eclipse in 2012 and partial solar eclipses in 2014 and 2016.

08 Experiencing Totality: Engaging Students in the Eclipse

Theo Wellington, Western Kentucky University,
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Dr. Richard Gelderman, Western Kentucky University,
Richard.Gelderman@wku.edu

Western Kentucky University aims to maximize the science impact of the eclipse for students in 31 school districts. Districts in totality will be encouraged to bring students to their high school(s) for guided activities before observing totality. Districts in partial eclipse will be invited to WKU's football stadium for activities and the experience of totality. We discuss development of hands-on activities students will do in their seats and training to be provided to all site facilitators.

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About the ASP

Astronomy sows the seeds of curiosity and discovery, critical thinking, quantitative fluency, comfort with data, and problem solving. These skills lay the foundation of science, technology, engineering and math (STEM), thus positioning astronomy as the gateway to STEM literacy.

For over 125 years, the ASP has served at the forefront of science/STEM education and professional development:

- Our diverse programs empower formal and informal educators across the learning spectrum:
 - More than 2,000 **Project ASTRO** teacher/astronomer partners around the country have provided science inspiration and education to more than 175,000 classroom students
 - The **Astronomy from the Ground Up/Sky Rangers** network of museum, nature center and national park educators now numbers more than 1,000 from nearly 500 facilities and sites, incorporating ASP tools and training to introduce thousands to the universe
- Our publications serve professional astronomers and the wider scientific community:
 - **PASP** has published nearly 1,000 issues
 - **ASP Conference Series** has published over 500 volumes
- Our outreach to the active amateur community through the **Night Sky Network** has engaged over 3 million people to date

Thank you for your support of the ASP by attending our 2016 Annual Meeting!

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