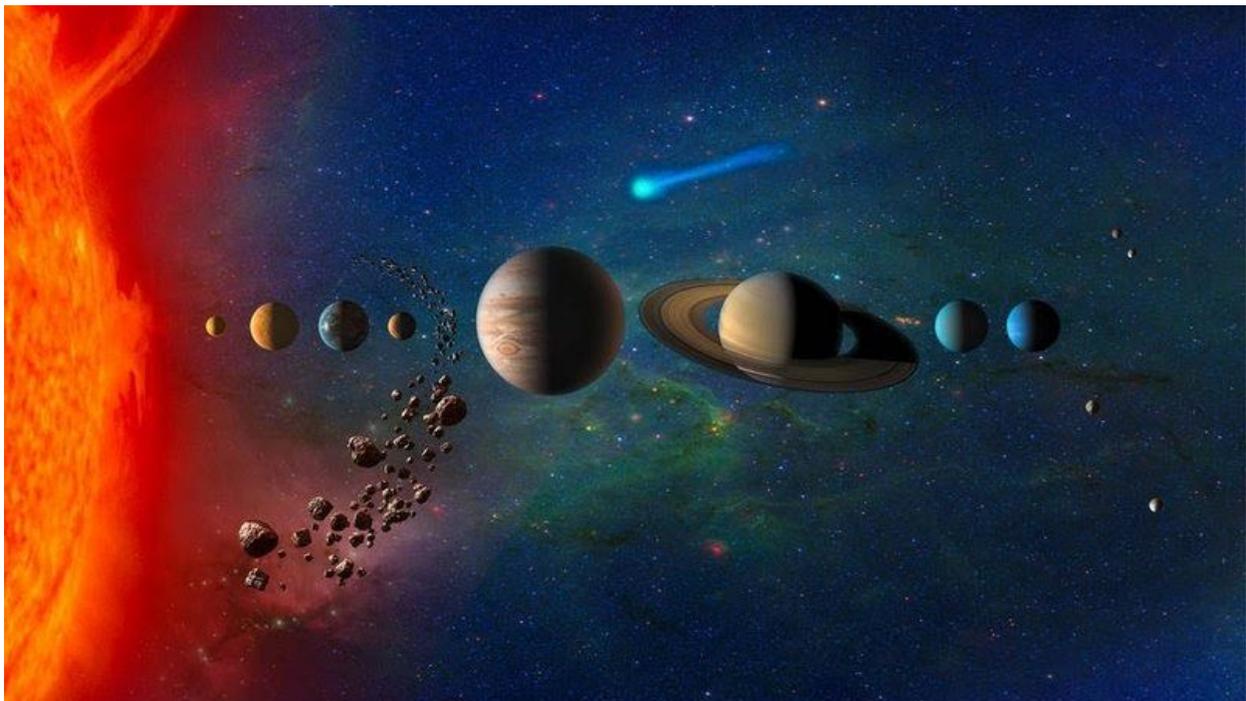


*Excerpts from a statement by Deputy Director Larry James:*

*JPL is closely monitoring the evolving COVID-19 (coronavirus) situation and following guidance from NASA and other federal agencies. As the number of confirmed cases grows, so does our concern for the health and welfare of JPLers, their families and colleagues. We have formed a coronavirus working group that meets daily to assess new developments and make recommendations as needed, and will continue to take precautions and provide guidance to help keep each other safe.*

## Featured Stories



## NASA Picks Two JPL-managed Discovery Proposals as Possible Missions

Out of four Discovery Program investigations selected today as possible missions by NASA, two are managed by JPL. Final selections will be made next year.

Each of the four nine-month studies will receive \$3 million to develop and mature concepts and will conclude with a Concept Study Report. After evaluating the concept studies, NASA will continue development of up to two missions towards flight.

The selected proposals managed by JPL are:

**TRIDENT:** Trident would explore Triton, a unique and highly active icy moon of Neptune, to understand pathways to habitable worlds at tremendous distances from the Sun. NASA's Voyager 2 mission showed that Triton has active resurfacing—generating the second youngest surface in the solar system—with the potential for erupting plumes and an atmosphere. Coupled with an ionosphere that can create organic

snow and the potential for an interior ocean, Triton is an exciting exploration target to understand how habitable worlds may develop in our solar system and others. Using a single fly-by, Trident would map Triton, characterize active processes, and determine whether the predicted subsurface ocean exists. Louise Prockter of the Lunar and Planetary Institute/Universities Space Research Association in Houston is the principal investigator.

**VERITAS:** VERITAS (Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy) would map Venus' surface to determine the planet's geologic history and understand why Venus developed so differently than the Earth. Orbiting Venus with a synthetic aperture radar, VERITAS charts surface elevations over nearly the entire planet to create three-dimensional reconstructions of topography and confirm whether processes, such as plate tectonics and volcanism, are still active on Venus. VERITAS would also map infrared emissions from the surface to map Venus' geology, which is largely unknown. Suzanne Smrekar of JPL is the principal investigator.

The concepts were chosen from proposals submitted in 2019 under a NASA Announcement of Opportunity. The proposals were chosen based on their potential science value and feasibility of development plans after a competitive peer-review process.

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## Mall Makeover

By Taylor Hill

Since 2015, the fountain at the center of JPL's Mall has sat dry — a sterile reminder of the state's years-long drought, and of a Lab water feature that once ran the length of Building 183.

Starting Feb. 27, demolition of the fountain will make way for a new seating area that will allow for additional lunch and meeting space on the Mall. The design, planned by JPL's The Studio group, includes a newly paved section for tables and umbrellas, and a wooden deck and steps that will extend into the lawn area east of the fountain.

“The Mall is truly the mixing area of the Lab, and there is a need for creating more space for people to be able to meet, and have lunch,” said The Studio Manager Dan Goods. “Removing the fountain allows us to take advantage of that space.”

The new deck will include built-in LED lights, and is designed to invite JPLers to step down from the concrete pavers onto the lawn.

“We’re surrounded by nature here, and we want to create an environment where people are able to be as creative as possible and step away from their everyday cubicle and be more relaxed in an outdoor environment,” said Graphic Designer Lois Kim, who worked on the project. “That’s what we’re trying to provide in this design.”

### **Construction Expected to Last Four Months**

The plans are phase one of the Mall renovation, which is estimated to take four months to complete; approximately a month-and-a-half for demolition, and two-and-a-half months for construction. Project Administrator Carl Cristiano said the team is aiming to have the project completed by June 29 in an effort to have the space available for the Mars 2020 launch in July.

Construction hours will be 7 a.m. to 5 p.m. Monday through Friday.

During construction, the area around the fountain will be closed, and a fenced roadway will run between the Mall and Oak Grove Drive to allow safe passage for trucks hauling construction materials. The fence will include sound dampening liners, but Cristiano says the area will still have construction noise associated with it.

“It’s a lot of concrete to break down and remove, and we’re making every attempt to mitigate the disturbances as much as possible,” Cristiano said.

Pedestrian walkways will ensure access to the Mall during the project, and some chairs and tables will remain available on the Mall.

The coffee cart will be relocated south of Building 167 along Mariner Road.

Most events on the Mall will be relocated to other areas around Lab, and the project team has reached out to event organizers to coordinate new locations. For some larger events, construction hours will be shifted around the event schedule.

“We have been working to coordinate the project with the tour groups, the Safety Office [OSPO], and Facilities to make sure we are all on the same page as this gets going,” Goods said.

Phase two of the project remains in the planning stage, with hopes to add a smaller, more environmentally sustainable water feature to the Mall, and additional wooden deck areas to extend behind the Mall coffee cart, and out into the wooded area just east of the Visitor’s Center.



## 5 Data Points: Dishing on the Big New Dish

By Celeste Hoang

A new antenna dish rising from the Mojave desert will give future spacecraft and interplanetary explorers a stronger signal for calling home.

The newest antenna in the Deep Space Network will receive laser as well as radio transmissions, potentially boosting the current bandwidth by a factor of 10. JPL Director Michael Watkins and Deputy Director Larry James, flanked by NASA officials, joined Suzanne Dodd, director for the Interplanetary Network Directorate, at the antenna's official groundbreaking Feb. 11 at Goldstone, California.

NASA talks to more than 30 deep space missions on any given day using the DSN's massive antenna dishes at Goldstone; in Madrid, Spain; and in Canberra, Australia. Managed by JPL, the DSN is the largest and busiest network in the world that reaches deep space, and supports many U.S. and international missions.

Here are five ways the new antenna will stand out:

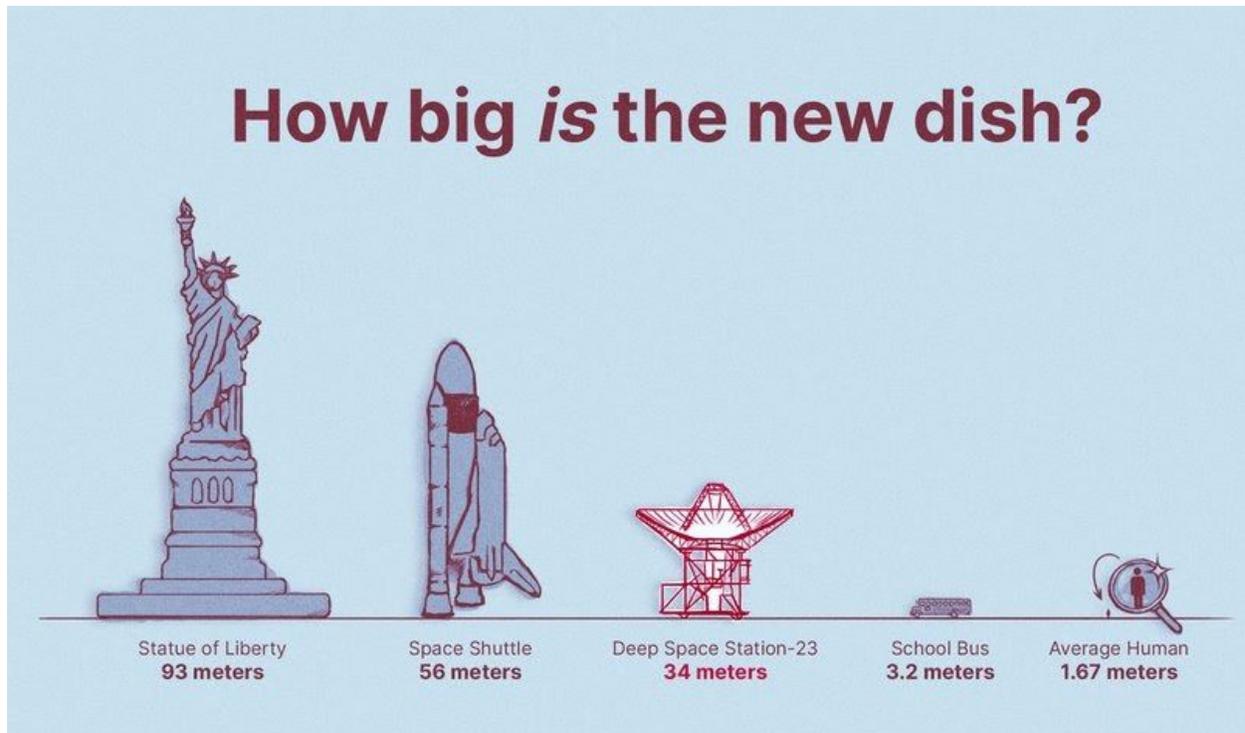
### 1. The Future of More Missions.

The new dish, which measures 34 meters in diameter and 33.34 meters in height, represents a future in which more missions—including ones involving astronauts on the Moon and Mars—will require advanced technology, such as lasers capable of transmitting vastly increased amounts of data and videos from the Martian surface. NASA plans to send the first woman and next man to the Moon by 2024 as part of its Artemis program.

### 2. Lucky Number 13.

As more missions have launched, NASA has had to add antennas to the three DSN sites, which are positioned approximately 120 degrees apart around the globe to enable continual contact with spacecraft as Earth rotates. (This live tool lets viewers see which DSN dishes are sending up commands or receiving data). When completed in two-and-a-half years, the new dish will be christened DSS-23 (Deep Space

Station-23) and will bring the number of operational DSN antennas to 13. At Goldstone, the new dish will have the same dimensions as the four other operating 34-meter dishes (all the DSN sites, including Goldstone, also each have a powerful 70-meter dish).



### 3. The Latest in 17 Years.

The first addition to Goldstone since 2003, the new dish will be built at the complex's Apollo site, so named because its DSS-16 antenna supported NASA's human missions to the Moon. Similar 34-meter antennas have been built in recent years in Canberra, while two are under construction in Madrid. "The DSN is Earth's one phone line to our two Voyager spacecraft, both in interstellar space, all our Mars missions and the New Horizons spacecraft that is now far past Pluto," said JPL Deputy Director Larry James. "The more we explore, the more antennas we need to talk to all our missions."

### 4. Laser Prowess.

DSS-23 will be equipped with mirrors and a special receiver for lasers beamed from distant spacecraft. This technology is critical for sending astronauts to places like Mars. Humans would need to communicate with Earth more than NASA's robotic explorers do, and a Mars base, with its life support systems and equipment, would buzz with data that needs to be monitored.

"Lasers can increase your data rate from Mars by about 10 times what you get from radio," said Suzanne Dodd, who heads the Interplanetary Network Directorate, the organization that manages the DSN. "Our hope is that providing a platform for optical communications will encourage other space explorers to experiment with lasers on future missions."

### 5. A Golden Location.

Clouds can disrupt lasers, but Goldstone's clear desert skies make it an ideal location to serve as a laser receiver about 60 percent of the time. A demonstration of DSS-23's capabilities is around the corner: when NASA launches the orbiter Psyche to a metallic asteroid in a few years, it will carry an experimental laser communications terminal developed by JPL. This terminal, called the Deep Space Optical Communications project, will send data and images to an observatory at Palomar Mountain near San

Diego. But Psyche will also be able to communicate with the new Goldstone antenna, paving the way for higher data rates in deep space.

For more information on the Deep Space Network, visit: <https://deepspace.jpl.nasa.gov/>

For more information on NASA SCA, visit <https://www.nasa.gov/directorates/heo/scan/index.html>



## A Seismic Shift in JPL's Testing Capabilities on the Mesa

By Taylor Hill

JPL's two newest buildings may be the Lab's smallest—and hardest to find. Just below the Mesa, tucked into the hillside like high-tech hobbit holes, reside buildings 358 and 359; home to JPL's new seismic testing vault.

The tiny underground rooms are designed to test and study future seismometers developed at JPL that could one day fly on upcoming missions.

So, why here? JPL Research Scientist Sharon Kedar said the location on the hill allows for the vaults to be carved into hard ground close to Lab but isolated from the swaying motions that propagate through normal soil.

"When you build seismometers for missions, you need a top-of-the-line test facility, because your biggest challenge is testing the performance of the instruments, and measuring how sensitive they are," Kedar said. To test interplanetary seismometers comparable to InSight Lander's Seismic Experiment for Interior Structure (SEIS), the sensitivity levels need to be on the order of nanometers of motion. The instruments require a quiet environment and the company of other state-of-the-art seismometers — ideally next to it — for comparing and validating results.

As a bonus to seismology on Earth, JPL's new vault has been set up as a designated seismic station in the Caltech Seismological Laboratory/USGS-managed Southern California network—where data is gathered from locations around the state to record seismic events. With Caltech's reference station and accompanying ultra-sensitive seismometer now on site, the Lab can compare and test its instruments in a fraction of the time.

"Before we had this facility, there was no easy way for us to do this level of seismometer testing," Kedar said. "There's a really nice station at Goldstone that's also run by Caltech, but it's not very convenient. Now, if we test something here on Lab now, we can simply drive up to the Mesa."

The two side-by-side vaults are essentially hurricane shelters buried into the hill. One of the vaults contains a two-foot-thick concrete platform—isolated from the building and coupled to the ground—to serve as a platform for the seismometers. That keeps even minimal movement from the building, whether from wind or other factors, from affecting the seismometers.

The other vault holds the electronic data loggers, designed to digitally record the seismometer's mechanical readings, and to run ultra-quietly so as to not affect any readings.

Mark Panning, research scientist with the Planetary Interiors and Geophysics group, says the creation of the seismic vault comes thanks to a resurgence in seismological experiments—due in part to the success of InSight.

"In previous missions, there was an impression that seismometers were difficult, and so they often weren't included in many missions," Panning said. "But now that InSight has happened, and we're doing a really good job of recording very sensitive readings of marsquakes, the interest in bringing that to other planets is back."

Proposals include a network of seismometers on the moon, a seismometer planned to ride aboard the Marshall Space Flight Center-managed Dragonfly mission to Saturn's moon, Titan and others.

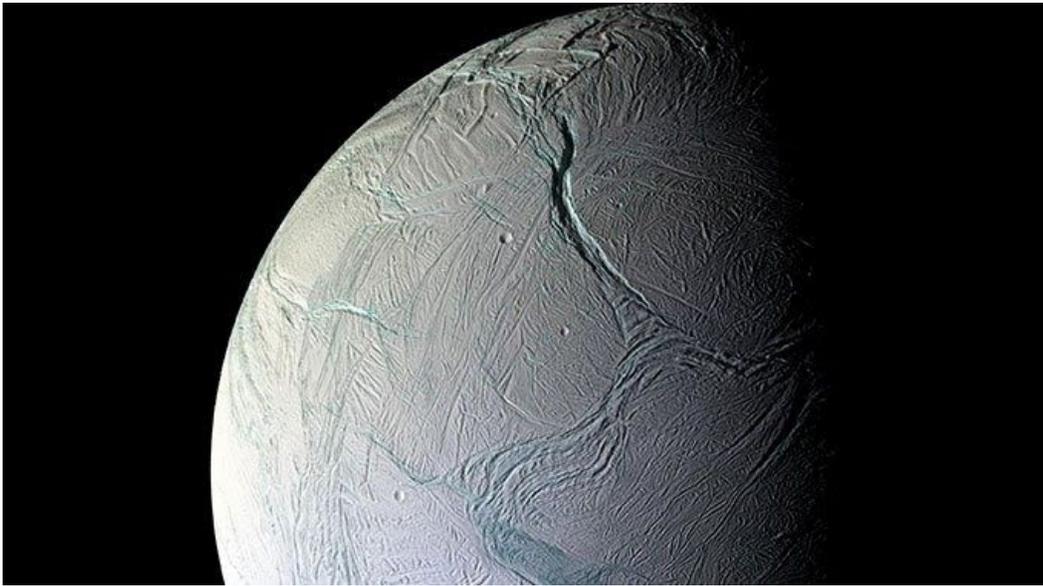
"With all of this thought as to where we can put seismometers, it's really important for JPL to be at the forefront of seismometer development," Panning said. "This new vault is going to give us that opportunity."

The project was led by Division 33, with support from Divisions 38 and 32 and the Solar Systems Explorations Directorate (4X), and with funding from the Technical Equipment and Facilities Infrastructure Management (TEFIM) Program. The vault installations were overseen by JPL Facilities, and seismic equipment was procured from Pasadena based Kinemetrics Inc. Caltech Seismological Laboratory staff installed the seismometers in the new vault, which was designated the seismic station code name "JPLS."

A ribbon cutting ceremony was held Feb. 24, with Lab representatives including Leon Alkalai from the Office of Strategic Partnerships, Cinzia Zuffada, JPL manager from the Associate Chief Scientist's Office, Egill Hauksson, manager of the Caltech Southern California Seismic Network, Rob Clayton from the Caltech Seismological Laboratory, Ogie Kuraica, President and CEO of Kinemetrics Inc., Ian Standley, Kinemetrics VP for Engineering and Division 33 Manager Thomas Jedrey.

"This state-of-the-art test facility should help us perform measurements of important instruments for space," Jedrey said during the ceremony. "Such a facility requires a first-class installation, and that was only possible because of the collaboration and efforts of the groups here."

## Events



### **Von Karman Lecture Series – The Search for Life: Exploring Ocean Worlds**

Friday, March 6

7 to 9 p.m.

Caltech's Beckman Auditorium

The search for life is "civilization level science." What happens if or when we find it? Using the upcoming block of "Ocean Access" missions, JPL Research Scientist Morgan Cable shows us why ocean worlds are important and what the discovery of life could mean to us as a civilization.

Host: Brian White

Speaker: Morgan Cable, Astrobiology and Ocean Worlds

Website: [https://www.jpl.nasa.gov/events/lectures\\_archive.php?year=2020&month=3](https://www.jpl.nasa.gov/events/lectures_archive.php?year=2020&month=3)

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## Women's History Month Luncheon Featuring NASA Astronaut Stephanie Wilson

Wednesday, March 25

11 a.m. to 1 p.m.

The Athenaeum at Caltech

Join the Advisory Council for Women (ACW) and the Black Excellence Strategic Team (B.E.S.T.) at the annual Women's History Month Luncheon at Caltech's Athenaeum, featuring NASA Astronaut Stephanie Wilson.

### RSVP and Payment deadline: March 16

Buffet lunch: \$30/person. Seating is limited.

To RSVP, register for the event via Google: [2020 ACW Women's Luncheon Registration](#)

Payment methods: [VENMO](#) or [PayPal](#)

### Speaker Bio:

Stephanie D. Wilson is the second African-American woman to go into space. She is a veteran of three spaceflights—STS-120, STS-121, and STS-131—and has logged more than 42 days in space. As a member of the Astronaut Office, she is currently the Mission Support Crew Branch Chief. On Oct. 18, 2019, Wilson was ground controller at Houston for the first all-woman spacewalk by Christina Koch and Jessica Meir. Wilson has served as the Space Station Integration Branch Chief from 2010 to 2012, and in 2013 Wilson completed a nine-month detail to NASA's Glenn Research Center as the Acting Chief of Program and Project Integration in the Spaceflight Systems Directorate. She has also served as a member of the 2009, 2013 and 2017 Astronaut Selection Boards.

# JPL Family News

## Retirees

### 30+ Years:

**Daniel R. Coulter**, Section 7000, 39 years

**Joy A. Crisp**, Section 3223, 31 years

**Robert D. Steele**, Section 347R, 31 years

### 10+ Years:

**Martha N. Criss**, Section 2501, 18 years

**Stephen F. Tier**, Section 2506, 15 years

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## Awards

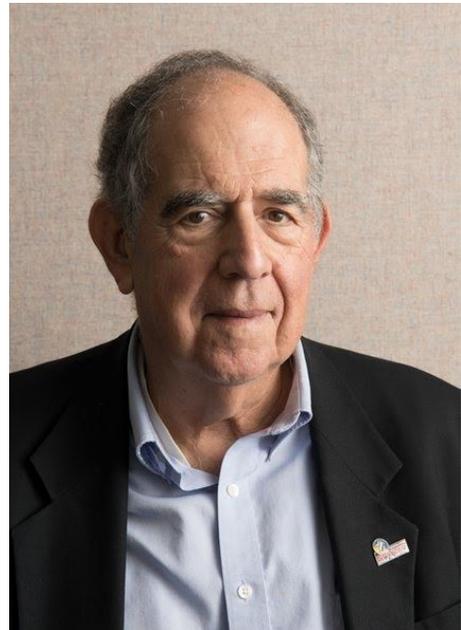
### **Prestigious AAS Carl Sagan Memorial Award Goes to Michael Werner**

After a poignant finale to the historic Spitzer Space Telescope mission, its longtime project scientist is receiving a prestigious award from the American Astronautical Society.

The Society is presenting Michael Werner with its 2019 Carl Sagan Memorial Award "for scientific leadership of the Spitzer Space Telescope, which has fundamentally changed our understanding of the Universe through infrared observations of the Universe from the Solar System to the most distant galaxies."

The AAS says the Carl Sagan Memorial Award is given to "an individual who has demonstrated leadership in research or policies advancing exploration of the Cosmos."

Werner served as Spitzer Project Scientist since 1983, when the mission was still a concept, and continued through development, launch, and its 16-plus years of science operations. He was responsible for the scientific integrity of the mission, oversaw the transition of science requirements into measurement capability, and helped set up the mission's interactions with the broader scientific community.



"I am privileged to have served as Spitzer Project Scientist," Werner says. "In addition to its great scientific legacy, Spitzer stands as an example of the very best people can do—a monument to the human spirit."

He will accept the award at a ceremony on Wednesday, March 18 in Washington. That same evening, he will be giving a lecture about Spitzer at the National Air and Space Museum.

During its lengthy journey in space, Spitzer's powerful infrared detectors were able to pierce the thick dust in the cosmos to study fascinating objects near and far, from distant galaxies, stars that were in various stages—from newborn to grownup, and comets and asteroids within our own solar system. Spitzer demonstrated an unexpected capability to study exoplanets. Its discoveries included the detection of seven possibly habitable Earth-sized planets in the TRAPPIST-1 system and determining their radii, masses and densities.

More information about the Sagan Award is at <https://astronautical.org/awards/sagan/>.

Werner joins a distinguished short list of previous recipients, including three former JPL directors: Charles Elachi, Ed Stone and Bruce Murray.

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## **JPLer Stephen Unwin Elected VP of American Astronomical Society**

The American Astronomical Society (AAS) has a new vice president: Stephen Unwin of JPL. His three-year term will begin at the Members' Meeting in June in Madison, Wisconsin.

The prestigious organization has nearly 9,000 members and is the major organization for professional astronomers in North America.

Unwin is a principal scientist in JPL's Project Systems Engineering and Formulation Section. He works in early mission concept development and mission proposals, primarily in astrophysics. He was proposal manager for the SPHEREx Astrophysics Medium Explorer mission recently selected for implementation by NASA, and he currently serves on the SPHEREx Science Team and the Project Systems Engineering Team.

As vice president of the AAS, he will serve two roles: as interface between the broad AAS membership, the board of directors, and the organization's various committees and working groups, and as a leader in helping to shape the AAS policies and strategic vision. Collectively, the three VPs are responsible for the overall scientific content of the Society's major meetings, selecting invited speakers, reviewing proposals for special sessions, and advising the AAS staff on meeting planning.

"The AAS has been my professional home for almost my entire career. I've published in AAS journals, and presented at numerous AAS conferences, so I identify strongly with the Society," said Unwin. I'm excited to have the opportunity to serve this venerable organization, and to help chart its future in a rapidly-changing scientific and technical world."

Read the full AAS news release [here](#).



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## Andrey Matsko Named Fellow by SPIE

SPIE, the International Society for Optics and Photonics, has elected Andrey Matsko to become a Fellow of the organization. Matsko accepted the honor formally at the Photonics West conference earlier this month in San Francisco.

According to the SPIE, Fellows are "Members of distinction who have made significant scientific and technical contributions in the multidisciplinary fields of optics, photonics, and imaging."

The SPIE honor was granted to him this year for achievements in theory, design, engineering and device applications of ultra-high Q whispering gallery mode resonators.

Matsko was senior and then principal member of the technical staff in the Quantum Science and Technology Group in 2001-2008, and became Technical Supervisor of the Frequency and Timing Advanced instrument Development Group (335E) in July 2019.

During his early JPL career, Matsko was developing various devices involving very high-quality factor monolithic microcavities. His work led to the invention and demonstration of low-noise lasers and radiofrequency photonic oscillators based on the whispering gallery mode microcavities. This development resulted in a 2005 JPL Lew Allen Award "for seminal and unique theoretical contributions in quantum optics, in particular, the nonlinear interactions of optical crystalline whispering gallery mode resonators, leading to the establishment of this new area of research at JPL."

Matsko moved to industry to commercialize the developments incepted at JPL. The company that he joined commercialized the devices and earned the SPIE Prism Awards for Micro-Opto-Electronic Oscillator (2013) and Ultra Narrow Linewidth Laser (2012). The 1,064-nanometer laser based on the technology was selected for further development as a candidate master oscillator for the first space-based gravitational wave observatory, known as the Laser Interferometer Space Antenna (LISA) mission. The LISA mission is led by ESA in cooperation with NASA.

Matsko rejoined JPL half a year ago to take advantage of his broad experience in photonics and physics of oscillators and clocks to support and maintain the Deep Space Network Time and Frequency Subsystem, as well as to develop novel time and frequency devices advancing NASA and JPL missions.

For more information and the full list of 2020 SPIE Fellows, visit:

<https://spie.org/membership/explore-membership/fellows?SSO=1>





## **Principal Microdevices Engineer Michael Hoenk Named SPIE Fellow**

SPIE, the International Society for Optics and Photonics, has elected Michael Hoenk to become a fellow of the organization. Hoenk plans to attend a ceremony in Yokohama, Japan to formally accept the honor.

According to the SPIE, Fellows are "Members of distinction who have made significant scientific and technical contributions in the multidisciplinary fields of optics, photonics, and imaging."

Hoenk is a principal microdevices engineer in JPL's Flight Instrument Detectors & Systems Group. For 30 years, he has led research projects in nanostructured materials and devices, in-situ sensors for planetary surfaces and atmospheres, and instruments for suborbital experiments and spaceflight. After earning a Ph.D. in physics at Caltech in 1990, Hoenk joined JPL to work on silicon imaging detectors in the Microdevices Laboratory. His work led to the invention, development and demonstration of the first delta-doped CCD, which addressed a critical problem in efficiency and stability that had been identified during integration and test of the Hubble Space Telescope's Wide Field and Planetary Camera.

Hoenk invented and led a team to fly an in-situ humidity sensor in Atlantic hurricanes during a joint NASA-NOAA convection and moisture experiment, for which he received the Lew Allen Award for Excellence and the NASA Exceptional Achievement Medal. His ongoing work on the physics of surface passivation in silicon imaging detectors led to his invention of superlattice-doped CCDs and CMOS imaging sensors (CIS), which led to a breakthrough for deep and far ultraviolet detectors with dual use in NASA and commercial cameras.

Hoenk recently led the development and delivery of the CIS context cameras for NASA's Orbiting Carbon Observatory 3 (OCO-3), which launched in 2019 and is currently flying on the International Space Station. He is working on photon-counting imaging detectors and cameras for the WFIRST coronagraph instrument, an advanced technology demonstrator for future missions aiming to directly image Earth-like exoplanets.



## **JPL Education Manager David Seidel Earns AAS Sally Ride Award**

David Seidel, the head of JPL's Education Office, will receive the American Astronautical Society 2019 Sally Ride Excellence in Education Award on March 18 at a ceremony during the Goddard Symposium in Silver Springs, Maryland.

The award recognizes an outstanding educator in either a) the delivery of space education or b) the use of space in STEM education.

The award is named for the late Sally Ride, the first American woman in space. She started Sally Ride Science in 2001 to inspire students—especially girls—to follow their interest in science and consider pursuing science and engineering careers. Ride died of cancer in 2012. The next year, she was posthumously awarded the Presidential Medal of Freedom, the nation's highest honor.

Seidel is receiving the AAS Sally Ride award "for exceptional service in creating and implementing transformative K-12 STEM education programs and experiences for the benefit of NASA, the Jet Propulsion Laboratory, educators, students, and the public."

In addition to his role as manager of JPL's Education Office, Seidel serves as JPL's STEM Engagement Director for NASA.

Seidel is honored to receive an award named for someone he admired greatly. "I had the very good fortune to work with Sally on a few occasions. Of course I knew of her as a pioneering astronaut, but I worked with her in the role she assumed as an educational pioneer, leveraging her fame and NASA connections to develop some really impactful programs for children," he said.

Seidel hopes to continue his efforts to live up to Ride's goals of inspiring future scientists and engineers, saying, "I have received some other recognitions and I always feel like they are a beginning, not a culmination. I hope to live up to the award as I continue as a NASA educator."

And he would like to emphasize that it really does take a village to create the strong educational programs for JPL and NASA.

He said, "Of course it is a great honor to receive a personal recognition from AAS but, in this case, I really feel that the talent and quality of others I have worked with has reflected on me, not the other way around. I think of this as a group award."

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