



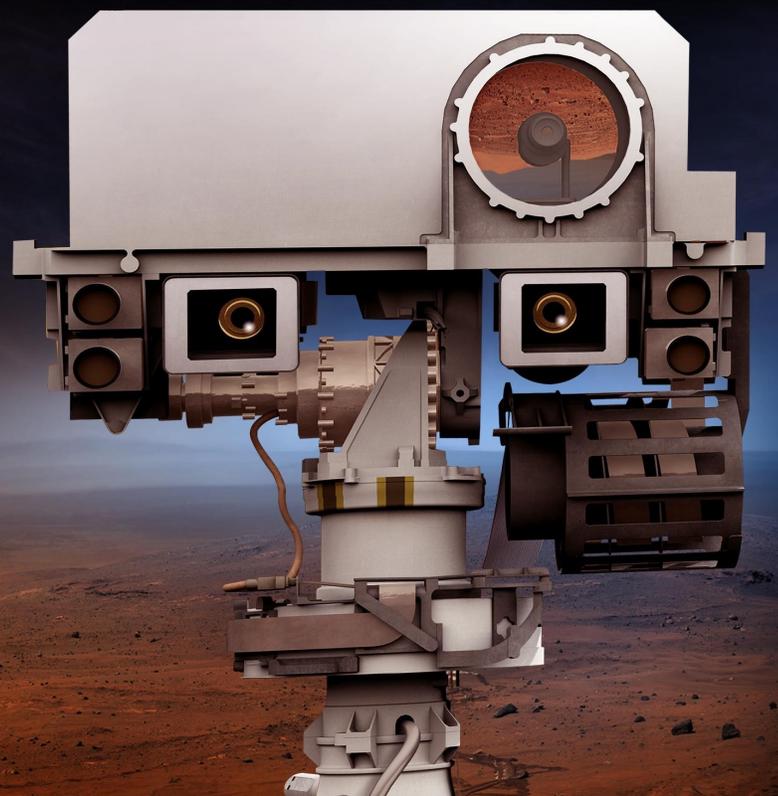
CP4SMPVC

Competitive Program for Science Museums,  
Planetariums, and NASA Visitor Centers

# 2017 Reverse Site Visit

Jet Propulsion Laboratory  
Pasadena, CA  
March 7-9, 2017

## PROGRAM GUIDE



# About CP4SMPVC

## Competitive Program for Science Museums, Planetariums, and NASA Visitor Centers Plus Other Opportunities (CP4SMPVC)

When NASA was created in 1958, the National Aeronautics and Space Act directed that the agency “provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof.” For over 55 years, NASA has met this directive through its communications and education efforts.

NASA’s education programs work in collaboration with other Federal agencies to improve the quality of science, technology, engineering, and math (STEM) education in the United States, which supports both NASA’s strategic plan and the Administration’s STEM policy. NASA’s contribution to STEM education brings immediate benefits to schools and other institutions, while helping to ensure that future generations of Americans will have the technical skills needed to continue NASA’s missions.

The Competitive Program for Science Museums and Planetariums began in Fiscal Year 2008 when Congress reallocated the NASA Office of Education budget to establish “a competitive program as authorized by section 616 of Public Law 109-155 for science museums and planetariums to enhance programs related to space exploration, aeronautics, space science, Earth science or microgravity.” Congress also urged NASA to use education funds to address the educational needs of women, minorities, and other historically underrepresented groups. Since Fiscal Year 2011, NASA Visitor Centers and other informal education institutions have been included in the competitive program. The program has sought STEM projects to infuse cutting edge NASA research and development activities into curriculum development and implementation, teacher preparation and professional development, effective teaching, out-of-school activities and educational technology.

From inception to date, 80 grants or cooperative agreements have been awarded in eight cohorts to 65 organizations in 34 states and the District of Columbia with periods of performance from one to five years. The partnerships developed through this program are maintained through the NASA Museum Alliance and have impacted communities across the nation. The projects and products developed via CP4SMPVC are summarized on the CP4SMPVC website (<https://informal.jpl.nasa.gov/museum/CP4SMP>). A partnership with the National Science Foundation-funded Center for the Advancement of Informal Science Education (CAISE) has been established to further share these projects and products with the broader informal science education community.

Starting in FY 2012 NASA’s STEM Education and Accountability Projects, or SEAP, became one mechanism used to reduce program fragmentation through the competitive consolidation of NASA’s Office of Education historic formal and informal education activities. All Office of Education competitions and activities align with strategic directions to improve STEM instruction, to increase and sustain youth and public engagement in STEM, and to better serve groups historically underrepresented in STEM fields.

Detailed information on CP4SMPVC, projects, products produced, and successes are at <https://informal.jpl.nasa.gov/museum/CP4SMP>

For more information please visit <https://www.nasa.gov/audience/foreducators/informal/museum-planetariums-index.html>.

To keep track of news related to CP4SMPVC, please subscribe to NASA's Education Express [https://www.nasa.gov/audience/foreducators/Express\\_Landing.html](https://www.nasa.gov/audience/foreducators/Express_Landing.html).



OFFICE OF THE DIRECTOR

## *Welcome to the Jet Propulsion Laboratory*

It is a great pleasure for us to host your meeting of CP4SMPVC at the Jet Propulsion Laboratory. Communicating the results of NASA's research and exploration programs to the public and particularly to young people has always been a critical component of our mission. In part, this is due to JPL's own roots as NASA's only federally funded research and development center, staffed and managed by the California Institute of Technology. As a part of one of the world's leading universities, we are always mindful of the critical role that education plays in our increasingly complex world.

Over the years JPL created America's first satellite, sent robotic spacecraft to all of the solar system's planets, developed the only rovers ever to operate on Mars, launched a fleet of satellites and instruments monitoring our home planet, and dispatched space telescopes to detect the signs of Earth-like planets orbiting other stars. Yet these all become most meaningful when we can see them change the lives of young people in positive ways. As you know, this does not occur only in the classroom; we all learn throughout our lives.

All of your teams participating in CP4SMPVC represent the best in creativity and innovation carried out on behalf of museums, science centers, planetariums, NASA Visitor Centers, and youth-serving organizations from across the country. We are very excited to help support the vital work you do facilitating learning for people of all ages and backgrounds.

I hope you will enjoy your visit to JPL and to Southern California, and wish you great success in your programs.

A handwritten signature in black ink, appearing to read "Michael Watkins", with a long horizontal line extending to the right.

Michael Watkins  
Director, Jet Propulsion Laboratory

JET PROPULSION LABORATORY  
CALIFORNIA INSTITUTE OF TECHNOLOGY

4800 Oak Grove Drive  
Pasadena, California 91109-8099  
(818) 354-7514



# Welcome to the 2017 CP4SMPVC Reverse Site Visit!

March 7-9  
Jet Propulsion Laboratory, Pasadena, CA

## Management Team & Support Staff

Beverly Girten  
*NASA Office of Education*  
*Institutional Engagement Line of Business Director*  
National Aeronautics and Space Administration  
Washington, D.C.

Stephanie Brown-Houston  
*Education Program Specialist*  
NASA Glenn Research Center  
Cleveland, OH

Leslie L. Lowes  
*CP4SMP NASA Informal Education Projects Specialist*  
*Acting Manager, NASA Museum Alliance*  
*Co-Manager, NASA Competitive Program for Science Museums, Planetariums, and NASA Visitor Centers, Plus Other Opportunities*  
NASA Jet Propulsion Laboratory, California Institute of Technology  
Pasadena, CA

### CP4SMP Support Staff

Amelia Chapman  
*Informal Education Specialist*  
NASA Jet Propulsion Laboratory, California Institute of Technology  
Pasadena, CA

Joyce Armijo  
*Staff Assistant, Logistics*  
NASA Jet Propulsion Laboratory, California Institute of Technology  
Pasadena, CA

Jessica Parker  
*Staff Assistant, Logistics*  
NASA Jet Propulsion Laboratory, California Institute of Technology  
Pasadena, CA

Maura Rountree-Brown  
NASA Jet Propulsion Laboratory, California Institute of Technology  
Pasadena, CA



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# NASA CP4SMPVC Awardees Reverse Site Visit 2017

Competitive Program for Science Museums, Planetariums, and NASA Visitor Centers

March 7-9  
NASA Jet Propulsion Laboratory  
Pasadena, CA

## Program Agenda

### OPTIONAL Day 1: Tuesday, March 7, 2017

---

8:15 am

**Bus departs from Courtyard Marriott Pasadena for JPL**

.....

8:30 am

**Check-In & Badging** (*JPL Visitor Reception*)

.....

9:00 am

**Welcome** (*von Karman Auditorium*)  
*Welcome to JPL: Blaine Baggett, Director for Communications and Education, JPL*  
*Overview of day's activities: Amelia Chapman, Education Specialist, JPL Informal Education Group*  
*Tour Safety Procedures: Jessica Parker, Support Staff, JPL Informal Education Group*  
*Tour Introduction: David Seidel, Deputy Manager, JPL Education Office*

.....

9:30 am – 12:00 pm

**Tour of JPL—Two Groups** (*Spacecraft Assembly Facility, Mars Yard, Starshade Lab, Gecko Grippers/ Robots Demo, OnSight Demo*)  
*Transportation: JPL Tour Bus*

.....

12:00 pm – 12:50 pm

**Lunch** (*167 Café*)

.....

**Meet-the-Experts Session** (*Main Conference Room, 321-B20*)

1:00 pm – 1:55 pm

**Mars 20/20: Robotic Exploration Panel**  
*Ann Devereaux, Mars 20/20 Flight System Systems Engineer, JPL*  
*Mallory Lefland, Entry Descent & Landing Systems Engineer, JPL*  
*Jessica Samuels, Mars 20/20 Deputy Flight System Systems Engineer, JPL*  
*Sarah Milkovich, Science Systems Engineer, JPL*

# OPTIONAL Day 1: Tuesday, March 7, 2017

---

2:00 pm– 3:00 pm

**Conversations with Scientists, Engineers (Main Conference Room, 321-B20)**

- *GRACE/GRACE-FO Missions– Felix Landerer, Deputy Project Scientist, JPL*
  - *ECOSTRESS Mission –Josh Fisher, Project Scientist and Sol Kim, Geoinformatics & Mission Applications, JPL*
  - *Europa Mission– Bob Pappalardo, Europa Science Office, Project Scientist, JPL*
  - *Exoplanets/ Kepler Mission– Gary Blackwood, Exoplanet Exploration Program, Manager, JPL*
  - *Juno Mission– Steven Levin, Juno Project Scientist, JPL*
  - *Cassini Mission– Jo Pitesky, Cassini Project Science System Engineer & Technical Group Supervisor for Science System Engineering, JPL*
  - *Mars Missions– Mars Panelists*
- 

3:00 pm – 4:00 pm

**Public Engagement Demonstrations (Main Conference Room, 321-B20)**

- **Earth Right Now**– *Susan Callery, Earth Public Engagement Manager; Kristen Walbolt, Earth Sciences Web Producer; Annie Richardson, Earth Public Engagement Public Outreach Specialist, JPL*
  - **Exoplanets– Juno, Europa**– *Courtney O’Conner, Juno and Europa Public Engagement Lead, JPL*
  - **Cassini**– *Rachel Zimmerman-Brachman, Solar System & Technology Public Engagement, Public Outreach Specialist, JPL*
  - **Journey to Mars**– *Sarah Marcotte, Mars Public Engagement, Education Program Specialist, JPL; Michael “Mic” Cox, Data Scientist, JPL*
  - **JPL Education**– *David Seidel, JPL Education Office, Deputy Manager/ K-12 Group Supervisor*
  - **“Eyes” Suite**– *Kevin Hussey, Visualization Technology Applications & Development, Manager & Jason Craig, Visualization Technology Applications & Development, Animation Producer*
- 

4:00 pm

**Wrap up/ Exit JPL**

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4:15 pm

**Bus Leaves JPL**

---

4:30 pm

**Bus Arrives at Courtyard Marriott Hotel**  
**DINNER ON YOUR OWN** (See page 24 for local Restaurant Info)

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6:30 pm – 9:00 pm

**Suggested Reverse Site Visit Check-In and Packet pick-up**  
(Courtyard Marriott Pasadena, hotel lobby, outside Colorado Room)  
Support Staff– *Joyce Armijo, JPL Informal Education Group*  
Lunch payments collected, Bus money collected for Civil Servants only

---

6:30 pm – 8:00 pm

**REQUIRED NASA Civil Servant Tag-Up** (Colorado Meeting Room, Marriott Hotel)  
Led by *Theresa Stanley, NSSC, Tammy Rowan, MSFC & Libby Romaguera, NSSC*

While at JPL, All Non-Civil Servants MUST be escorted at all times.

# Day 2: Wednesday, March 8, 2017

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7:30 am

**Bus departs Courtyard Marriott Pasadena for JPL**

---

7:45 am

**Check-in & Badging** (*JPL Visitor Reception*)

---

8:15 am

**Meeting Arrival & Poster-Set-Up** (*Main Conference Room, 321-B20*)  
**FINAL LUNCH PAYMENTS DUE** (*See Jessica Parker*)

---

8:30 am – 9:45 am

**Welcome & Overview** (*Main Conference Room, 321-B20*)  
*Leslie Lowes & Amelia Chapman Organizers, NASA/JPL CP4SMPVC Management Team*

**Welcome**

*Larry James, Deputy Director, JPL*  
*Beverly Girten, NASA Office of Education, Institutional Engagement Line of Business Director*

**Navigation & Safety for JPL Building 321**  
*Jessica Parker, JPL Informal Education Group*

**Outcomes and Introductions of Participants**  
*Leslie Lowes, Organizer, NASA/JPL CP4SMPVC Management Team*  
*Maura Rountree-Brown, consultant*

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9:45 am – 10:30 am

**Plenary: State of Federal and NASA STEM Education & NASA Organizational Overview**  
*Beverly Girten, NASA Office of Education, Institutional Engagement Line of Business Director*

---

10:30 am – 10:45 am

**Break** (*light refreshments available*)

---

10:45 am – 12:00 pm

**Panel: Managing a NASA Grant**, (*Main Conference Room, 321-B20*)

**Introduction:**  
*Leslie Lowes, Acting CP4SMPVC Co-Manager*

# Day 2: Wednesday, March 8, 2017

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## **Grant Management 101 Summary**

*Theresa Stanley, Lead Grant Officer and Libby Romaguera, Contract Specialist  
NASA Shared Services Center*

## **Grant Fraud Awareness**

*Chad Weston, Special Agent in Charge, NASA Office of the Inspector General  
Mark Gangloff, Special Agent in Charge, NASA Office of the Inspector General*

## **Grantee Perspective: Record Keeping Support of Financial Accounting**

*Anne Holland, Community Engagement Manager, Space Science Institute*

## **Civil Rights Compliance Overview**

*David Chambers, Senior Civil Rights Analyst, NASA Office of Diversity and Equal Opportunity (via phone)*

## **Grantee Perspective: Lessons Learned from Civil Rights Audit**

*Chance Grannan, STEaM Network Manager, Saint Louis Science Center (via phone)*

## **Safety and NASA Education**

*David Seidel, JPL Education Office Deputy Manager*

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12:00 pm – 1:00 pm

### **Lunch Break** (Main Conference Room, 321-B20)

*Pre-paid box lunches delivered*

*Last minute lunch payments can be made to Jessica Parker*

---

1:00 pm – 2:30 pm

### **Poster Session:**

#### **CP4SMPVC Grantee Poster & Resource Showcase** (Main Conference Room, 321-B20)

*Instructions– Maura Rountree-Brown, consultant*

*Rotation 1: NASA Content Clusters*

*Rotation 2: See assignments*

*Rotation 3: See assignments*

*Rotation 4: Free*

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2:30 pm – 4:00 pm

### **Panel & Breakouts: Project Evaluation and Measuring Impact** (Main Conference Room, 321-B20)

#### **Panel: The Importance of Reporting and Project Evaluation**

*Why Reporting Matters– Leslie Lowes, Organizer, NASA/JPL CP4SMPVC Management Team*

#### **Grantee Perspective: Data Collection and Reporting**

*Keni Sturgeon, Director, Science & Education, Pacific Science Center*

#### **Evidence-Based Practices and Generating Useful Findings**

*Kirsten Ellenbogen, President & CEO, Great Lakes Science Center*

#### **Project and Evaluation Introductions**

*Project representatives/ discussion group leaders*

### **Break and Change Rooms (15 min)**

While at JPL, All Non-Civil Servants MUST be escorted at all times.

# Day 2: Wednesday, March 8, 2017

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## **Evaluation Breakout Discussion Groups** (*Break-out Rooms*)

### **Evaluating Educator Professional Development** (*Room 321-530*)

*Led by Kay Taylor, Director of Education, U.S. Space and Rocket Center*

### **Evaluating Digital Tools (technology-based programs)** (*Main Conference Room, 321-B20*)

*Led by Kirsten Ellenbogen, President & CEO, Great Lakes Science Center*

### **Evaluating Exhibits** (*Main Conference Room, 321-B20*)

*Led by Becky Wolfe, Manager, Science Education and Resources, Children's Museum of Indianapolis*

### **Evaluating Outreach and Community Events/ Programs** (*Room 321-583*)

*Led by Anne Holland, Community Engagement Manager, Space Science Institute*

### **Evaluating Planetarium Shows and Other Multimedia** (*Main Conference Room, 321-B20*)

*Led by Dani LeBlanc, Planetarium Show Producer, Museum of Science, Boston*

### **Evaluating Student Programs** (*Room 321-517*)

*Led by Tamara Hudgins, Executive Director, Girlstart and Julie Sharpe, Sharpe Solutions*

.....  
4:00 pm – 4:10 pm

### **Return to Main Conference Room 321-B20**

.....

4:10pm – 4:15 pm

### **Wednesday Wrap-Up**, (*Main Conference Room, 321-B20*)

*Leslie Lowes, Acting CP4SMPVC Co-Manager*

.....  
4:15 pm – 4:40 pm

### **JPL Visitor Center Tour** (*Museum*)

.....

4:45 pm

### **Bus departs JPL for Courtyard Marriott Pasadena**

.....

6:45 pm

### **OPTIONAL Group Dinner** (*Pre-RSVP required, reservation under "Joyce Armijo"*)

**PAY YOUR OWN WAY**

*El Cholo Mexican Restaurant*

*Paseo Colorado*

*300 E Colorado Blvd,*

*Pasadena, CA 91101*

*(626) 795-5800*

# Day 3: Thursday, March 9, 2017

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7:30 am

**Bus departs Courtyard Marriott Pasadena for JPL**

---

7:45 am – 8:25 am

**Check-in & Badging** (*JPL Visitor Reception*)  
**Group Photo & Space Flight Operations Facilities Tour** (*Space Flight Operations Facility, Mission Support Area*)  
*Jim McClure, SFOF Maintenance and Operations Engineer, JPL*

---

8:25 am – 8:35am

**Walk to NASA Poster Room** (*321 Pickering Auditorium*)

---

8:40 am – 8:50 am

**Welcome and Overview of the Day** (*321 Pickering Auditorium*)

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8:50 am – 9:30 am

**Panel: Strategies of Accessing NASA Resources** (*321 Pickering Auditorium*)

**Introduction & Museum Alliance**  
*Amelia Chapman, NASA Museum Alliance*

**NASA Education Resources**  
*Flint Wild, NASA NETS Team, Marshall Space Flight Center (via phone)*

**NASA and JPL Artifacts**  
*Jay Sucher, JPL Property Accountability Supervisor*

**NASA Social Media Resources**  
*Stephanie Smith, JPL Social Media Lead*

**NASA “Solve” Citizen Science**  
*Amy Kaminski, Senior Policy Advisor, NASA HQ Office of the Chief Scientist*

**NASA Speakers Bureau**  
*Nora Normandy, NASA HQ*

**Working With Your Technical Officer**  
*Stephanie Brown-Houston, Education Program Specialist, Glenn Research Center*

**Grantee Perspective: Working with NASA to Get Access**  
*Becky Wolfe, Manager, Science Education and Resources, Children’s Museum of Indianapolis*

# Day 3: Thursday, March 9, 2017

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9:30 am – 10:40 am

**Poster Session: NASA Resources** (321 Pickering Auditorium)

*Instructions– Maura Rountree-Brown, Consultant*

*Mission Directorates: ARMD, HOEMD, SMD*

*NASA Centers: ARFC, ARC, GRC, GSFC/Wallops, JPL, JSC, KSC, MSFC, SSC, NSSC*

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10:40 am – 10:55 am

**NASA Poster tear-down, transition to Main Conference Room, 321-B20**

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10:55 am – 11:10 am

**Break** (light refreshments available, Main Conference Room, 321-B20)

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11:10 am – 11:45 am

**Technical Plenary Speaker: Mars Program Update** (Main Conference Room, 321-B20)

*Introduction– Sarah Marcotte, JPL Mars Public Engagement*

*Speaker: Hoppy Price, JPL Mars Program Chief Engineer*

---

11:45 am – 12:55 pm

**Lunch Break & Optional Group Visits to JPL Store** (Main Conference Room, 321-B20)

*Pre-paid box lunches delivered*

---

12:55 pm – 1:30 pm

**Technical Plenary Speaker: Exoplanet Exploration** (Main Conference Room, 321-B20)

*Introduction– Anya Biferno, Exoplanet Exploration Public Engagement*

*Speaker: Eric Mamajek, Deputy Program Chief Scientist, NASA Exoplanet Exploration Program*

---

1:30 pm – 2:30 pm

**Panel: Project Sustainability** (Main Conference Room, 321-B20)

*Discussion on effective practices for sustaining CP4SMPVC projects beyond the grant period.*

**Moderator**

*Leslie Lowes, Acting CP4SMPVC Co-Manager*

**Grantee Panelists**

*Lindsay Bartholomew, Director of Technology and Youth Development, Phillip and Patricia Frost Museum of Science*

*Kyrie Kellett, Senior Learning and Community Engagement Specialist, Oregon Museum of Science and Industry*

*Carl Lewis, Director, Fairchild Tropical Botanic Garden*

# Day 3: Thursday, March 9, 2017

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2:30 pm – 2:35 pm

**PI Teams/ NASA Technical Officer planning session Instructions** (*Main Conference Room 321-B20*)  
*Maura Rountree-Brown, consultant*

.....

2:35 pm – 2:50 pm

**Break** (*Light Refreshments Available, Move to Break-out Rooms*)

.....

2:50 pm – 4:00 pm

**PI Teams/ NASA Technical Officer Planning and Action Plan Development** (*Break-out Rooms*)  
*Planning session and Q&A for grantees and their Technical Officer*

- \* *Stephanie Brown-Houston—321-B20*
  - \* *Denise Coleman, Gloria Murphy (Rob Cannon, Theresa Martinez) —321-128*
  - \* *Brenda Collins—321-B20*
  - \* *Mary Sladek (for Kristen Erickson), & Beverly Girten—321-245*
  - \* *Tammy Rowan—321-215*
  - \* *Karen Rugg—321-650*
  - \* *Kayla Smith—321-B20*
  - \* *Nathan Sovik—321-B20*
  - \* *Darlene Walker—321-B20*
  - \* *Elsie Weigel—321-163*
- .....

4:00pm – 4:05 pm

**Return to Main Conference Room 321-B20**

.....

4:05 pm – 4:35 pm

**Wrap-up & Reverse Site Visit Evaluation** (*Main Conference Room, 321-B20*)  
*Leslie Lowes, Acting CP4SMPVC Co-Manager*

.....

4:35pm – 4:50 pm

**Grantee Poster Tear-down** (*Main Conference Room, 321-B20*)

.....

5:00 pm

**Bus departs JPL for Courtyard Marriott Pasadena**

# JPL 80th Anniversary



**OCTOBER 31, 1936**

## First Rocket Tests by Founders of What Would Become the Jet Propulsion Laboratory

Theodore von Kármán, the head of the Guggenheim Aeronautical Laboratory at Caltech, is overseeing pioneering work on rocket propulsion when a pair of young rocket enthusiasts, John W. Parsons and Edward S. Forman, come to him looking for help. Von Kármán connects them to some grad students, and on Halloween, a group goes out to the Arroyo Seco, a dry canyon wash at the foot of the San Gabriel Mountains on the northwest edge of Pasadena. The seven men -- Frank Malina, A.O. Smith, William Bollay, Carlos Wood, William Rockefeller, Parsons and Forman -- try four times to ignite a small rocket motor to gather thrust data, with only the last attempt succeeding (and setting fire to the outside of the motor, too).

Eighty years ago, when interplanetary travel was still a fiction and that fiction looked like *Flash Gordon*, seven young men drove out to a dry canyon wash in the foothills of the San Gabriel Mountains and helped jump-start the Space Age.

They were out there on Halloween 1936 to try what few people at the time had tried: lighting a liquid rocket engine. It took them four attempts to get a rocket to fire for a glorious three seconds -- though an oxygen

hose also broke loose and sent them scampering for safety as it thrashed around.

The result was encouraging enough for this group -- made up of five grad students studying at Caltech and two amateur rocket enthusiasts -- to keep going, to build more rockets that would lead to an institution where they could do this kind of work every day. JPL went on to plant the seeds for America's rocket program before transitioning into what sat on top of rockets in



**JANUARY 31, 1958**

## America's First Satellite

Explorer 1

With the launch of Sputnik, the first satellite to orbit Earth, on October 4, 1957, by the Soviet Union, Cold War America is eager to send its own satellite into orbit. JPL's work for the U.S. Army makes it possible to develop the flight, ground systems and hardware necessary to fly the first successful U.S. space mission, Explorer 1, a few months later. Even this first spacecraft makes an important scientific discovery: radiation belts around Earth held in place by the planet's magnetic field. These belts are named after James Van Allen, the scientist who designed the main instrument on Explorer 1. This project marks JPL's shift in emphasis from rockets to what sits on top of them.

1958, when it launched America's first satellite, Explorer 1. JPL has participated in more than 114 mis-

sions to space since its birth, becoming a leader in robotic exploration beyond the moon.



**DECEMBER 3, 1958**

## One of the First Centers in the Newly Created NASA

Two months after the National Aeronautics and Space Administration is created by Congress, JPL is transferred from U.S. Army jurisdiction to that of the new civilian space agency. It brings the new agency experience in building and flying spacecraft, an extensive background in solid and liquid rocket propulsion systems, guidance, control, systems integration, broad testing capability and expertise in telecommunications. JPL takes on the responsibility of planning and executing lunar and planetary missions, and developing the rocket and upper stages needed to launch spacecraft to the moon and the planets.

"The dreams and spirit of exploration that originally propelled JPL into the forefront of rocket research and ultimately deep-space exploration continue to this day. I think the pioneers of JPL would be very proud to know that today we have some two dozen spacecraft and instruments studying our

solar system, the universe and our home planet, Earth," said JPL Director Mike Watkins.

JPL grew up with the Space Age and helped bring it into being. It is a place where science, technology, and engineering intermix in unique ways: to produce iconic robotic space explorers sent to every corner of the solar system, to peer deep into the Milky Way galaxy and beyond, and to keep a watchful eye on our home planet. Analyzing the data pouring back from these machine emissaries, scientists around the world continue to discover how the universe, the solar system, and life formed and evolved.

## The Early Years

JPL's beginnings can be traced to the mid-1930s, when a few Caltech students and amateur rocket enthusiasts started tinkering with rockets. After an unintended explosion occurred on campus, the group and its experiments relocated to an isolated area next to the San Gabriel Mountains, the present-day site of JPL. In the following decade, as an anxious country sought to respond to the menacing challenge of German V-2 rockets, the fledgling Jet Propulsion Laboratory (officially named in 1944, some 14 years before NASA was formed) was sponsored by the U.S. Army to develop rocket technology and the Corporal and Sergeant missile systems.



DECEMBER 24, 1963

### First Network for Deep Space Communication

#### Deep Space Network

To receive signals from and plot the orbit of Explorer 1, JPL had, under contract with the U.S. Army, deployed portable tracking stations to Nigeria, Singapore and California. After JPL is transferred to NASA, the agency recognizes the need for a more extensive communications network rather than having each flight project acquire and operate its own equipment. JPL's Deep Space Information Facility is renamed the Deep Space Network on December 24, 1963, to reflect the expanded role, becoming the "phone company" for nearly every spacecraft that has gone to the moon or beyond.

### Becoming Part of the NASA Family

The early years of space exploration were fueled by the Cold War. The Soviet Union won the first round in October 1957 by placing Sputnik into Earth orbit. The "beep-beep" sound transmitted by the satellite was nervously heard around the free world, and

pressure mounted for the United States to respond. In less than three months, JPL had built Explorer 1, launched in January 1958 to become America's first satellite. Even this first spacecraft made an important scientific discovery: it detected what would become known as the Van Allen radiation belts encircling Earth, named after James Van Allen, the scientist who designed the main instrument on Explorer 1. The National Aeronautics and Space Administration was founded in October 1958, and JPL was transferred from the Army to the new agency. The transition from the Army to NASA also marked another change. The Laboratory began to turn its attention from the rockets themselves to the payloads they would carry. Developing these payloads - scientific spacecraft - would become the new focus and place JPL at the center of the Space Race with the Soviet Union.

Even though the Laboratory's charter had completely evolved away from rockets and jets, "Jet Propulsion Laboratory" had become the official name and was retained. Another defining moment for America in space came in 1962, when the JPL-built Mariner 2 flew past Venus to become the world's first spacecraft to successfully encounter another planet. Thus commenced a long series of "first ever" accomplishments by JPL that helped define history's first five decades of space exploration.

JPL has a unique position within the NASA family. Ever since its transfer to NASA, JPL has been structured as an FFRDC (Federally Funded Research and Development Center) dedicated to the robotic exploration of space. The Laboratory is NASA's only FFRDC and works alongside NASA's nine field centers. However, unlike those centers, which are staffed by government civil servants, JPL is managed for NASA by Caltech under a contractual arrangement begun in 1958 and renewed every five years. Thus, JPLers are Caltech employees.



JULY 28, 1964

### First U.S. Mission to the Moon

#### Ranger 7

The Ranger 7 lunar probe is the first unqualified success in the United States' early quest to explore the moon, and heralds a new era of exploration that sees dramatically more mission successes than failures. Designed chiefly to take high-resolution photographs of the moon as it descends to make an intentional crash-landing, Ranger 7 approaches the moon precisely on target and captures more than 4,300 images as it drops toward a region later named Mare Cognitum. Ranger 7 returns images of the moon from distances as close as 2,110 km – vastly closer than pictures from any previous Soviet or U.S. spacecraft.

# When Computers Were Human

By Ota Lutz

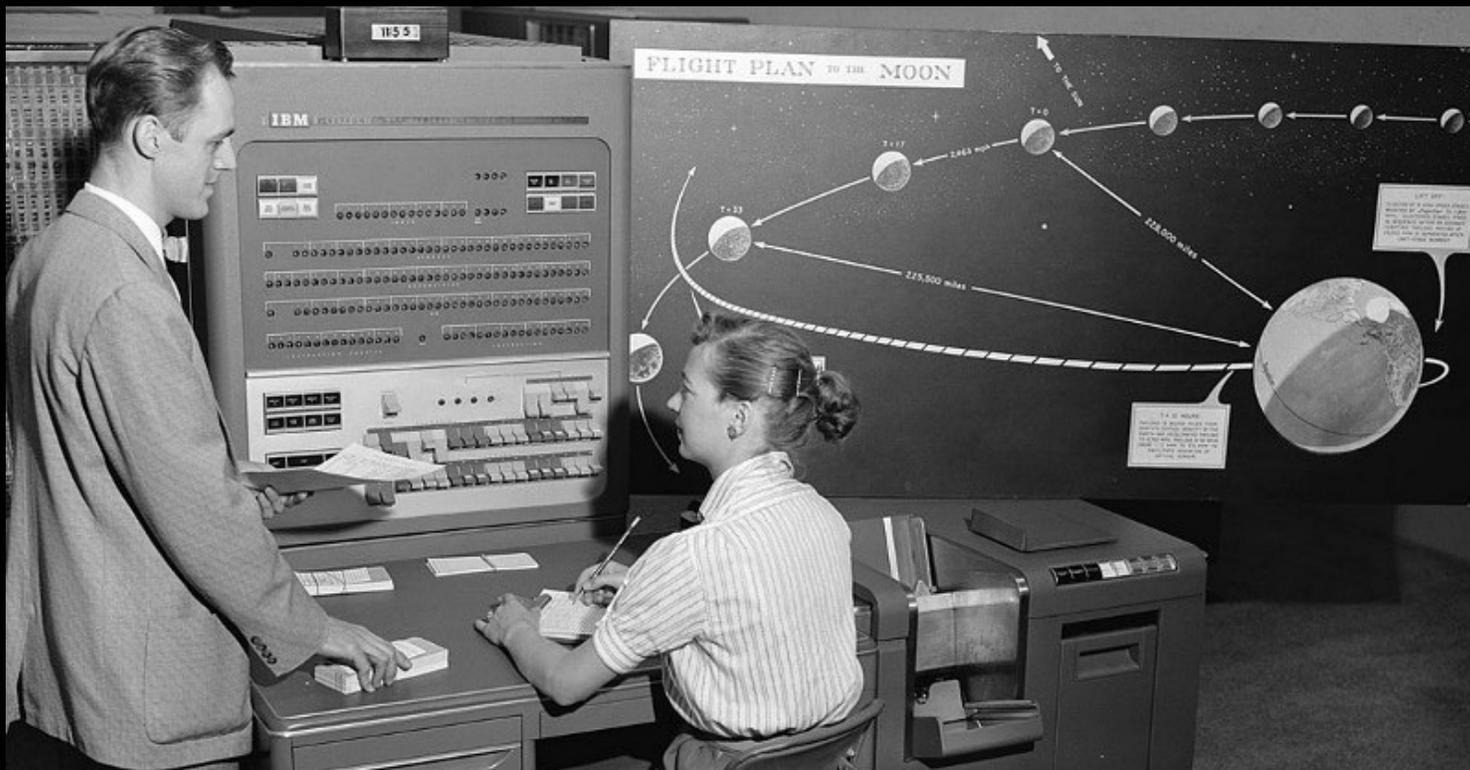
STEM Elementary and Secondary Education Specialist, NASA/JPL Edu

Adapted from *Teachable Moments: When Computers Were Human*, by Ota Lutz, Oct 31, 2016

Find out more at [www.jpl.nasa.gov/edu/](http://www.jpl.nasa.gov/edu/)

In the early days of space exploration, the best mechanical computers were large (the size of a room) and not particularly powerful. Human capabilities were much more powerful for many tasks, including the rapid calculations needed for trajectory analysis and verification, as well as the graphing of data points on trajectories, which made a spacecraft's path easy to see.

One of the human computers' main tasks was computing the planned trajectories, or paths, for a spacecraft based on the vehicle weight, lift capacity of the rocket, and the orbital dynamics of the planets.



Computers weren't always made of motherboards and CPUs. At one time, they were human! And at NASA's Jet Propulsion Laboratory, human computers were a talented team of women who went on to become some of the earliest computer programmers. In this photo from 1959, a human computer works with an early machine computer called the IBM 704. While machine computers were capable of some speedy calculations, they weren't nearly as reliable or efficient as humans.



A talented team of women, who were around since JPL's beginnings in 1936 and who were known as computers, were responsible for the number-crunching of launch windows, trajectories, fuel consumption and other details that helped make the U.S. space program a success. Image credit: NASA/JPL-Caltech



JPL's human computers didn't just help launch the U.S. space program; they also represented an important step forward for women and other underrepresented people at a time when much of the professional world and especially technical fields were dominated by white men. Janez Lawson (seen in this photo from 1953, front row, fifth from the left), was the first African American hired into a technical position at JPL. Having graduated from UCLA with a bachelor's degree in chemical engineering, she later went on to have a successful career as a chemical engineer. Image credit: NASA/JPL-Caltech



A computer in the control room at JPL tracks the position of Mariner 2. The spacecraft became the first to fly by another planet when it reached Venus in 1962. Image credit: NASA/JPL-Caltech

Today, JPL continues setting the pace for exploration of the solar system using robots to go where humans hope to venture one day, such as Mars. Though trajectory computations are now done using modern day computers, humans are still required to do trajectory analysis and mission planning. Every mission is different, and with new techniques comes new simulation equations that must be developed and computations that must be performed during actual mission events to ensure success. But even now, nothing is fail-proof. Lots of variables can and do influence spaceflight. Arriving safely on another planet millions of miles away isn't easy or taken for granted, but when things go right and we achieve a safe landing, it is definitely cause for celebration.

# For Further Study

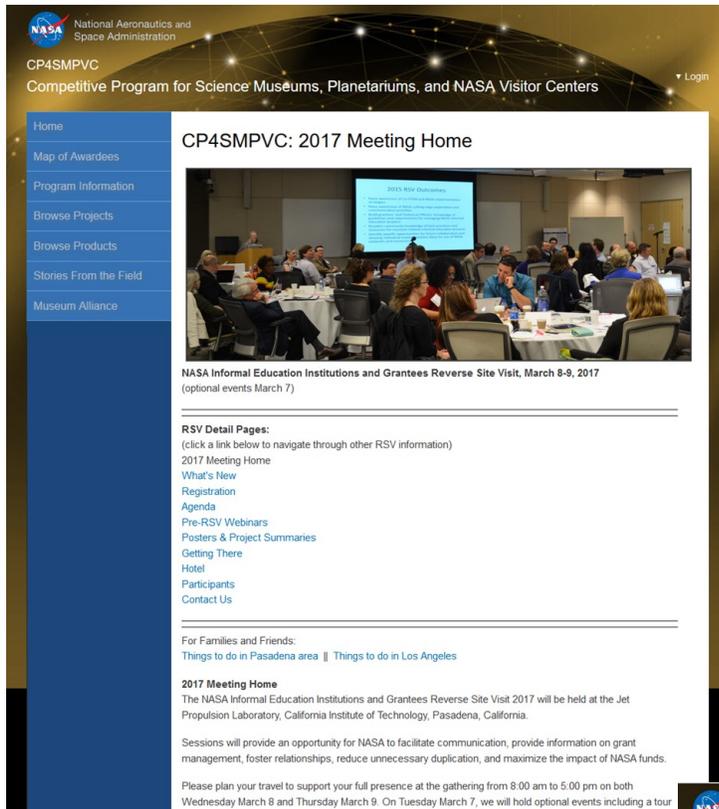
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We strongly suggest you view or review the available webinars, which cover topics in more detail than would be possible at the face-to-face meeting. Archived webinars are available at <https://informal.jpl.nasa.gov/museum/CP4SMP/PDWebEx> You will need to log-in with your Museum Alliance username and password.

- Content-based Webinars
  - ISS/HEOMD Projects
  - Mars/HEOMD Projects
  - SMD Earth Science/Heliophysics Projects
  - SMD Planetary Science/ Astrophysics Projects
  - ARMD Projects
- Grant Management Webinars
  - Grant Management 101
  - Activity Details Report Training
  - NASA Style and Logo Use
  - Civil Rights Compliance
- Common Guidelines for Education Research and Development A Report from the Institute of Education Sciences, U.S.Department of Education and the National Science Foundation, August 2013  
<http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf>
- The Framework for Evaluating Impacts of Informal Science Education Projects: Report from a National Science Foundation Workshop, National Science Foundation, March 2008  
[http://informalscience.org/documents/Eval\\_Framework.pdf](http://informalscience.org/documents/Eval_Framework.pdf)
- Principal Investigator's Guide: Managing Evaluation in Informal STEM Education Projects, Center for Advancement of Informal Science Education, Association of Science-Technology Centers, 2011  
[http://informalscience.org/documents/CAISEVSAPI\\_guide.pdf](http://informalscience.org/documents/CAISEVSAPI_guide.pdf)
- Designing Evaluations, Government Accountability Office, 2012  
<http://www.gao.gov/assets/590/588146.pdf>
- Learning Science in Informal Environments: People, Places, and Pursuits, National Research Council of the National Academies, 2009  
<http://www.nap.edu/catalog/12190/learning-science-in-informal-environments-people-places-and-pursuits>
- Surrounded by Science: Learning Science in Informal Environments, National Research Council of the National Academies, 2010  
<http://www.nap.edu/catalog/12614/surrounded-by-science-learning-science-in-informal-environments>

# Documenting the Meeting

The CP4SMPVC internal website contains the documentation from the 2017 Reverse Site Visit, including the pre-RSV administrative and content-based webinars. This will be your access point for participant and speaker lists, speaker presentations, posters from the NASA Centers and Mission Directorates, 1-page and PowerPoint descriptions of grantee projects, and more.



<https://informal.jpl.nasa.gov/museum/CP4SMP/2017MeetingHome>

<https://informal.jpl.nasa.gov/museum/CP4SMP/2017MeetingPreRSVWebinars>

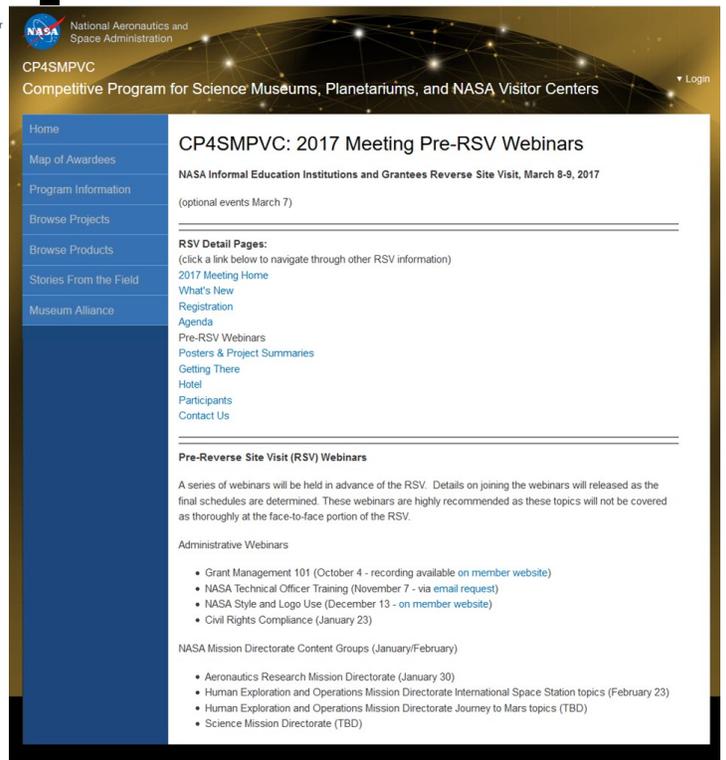
Please use your Museum Alliance login and password to gain access to the site.\*

You can also review the archives of past Reverse Site Visits from this location, along with other frequently-requested information from our internet community – see the left hand navigation bars.

\*If you have not yet done so, please join the Museum Alliance at this link:

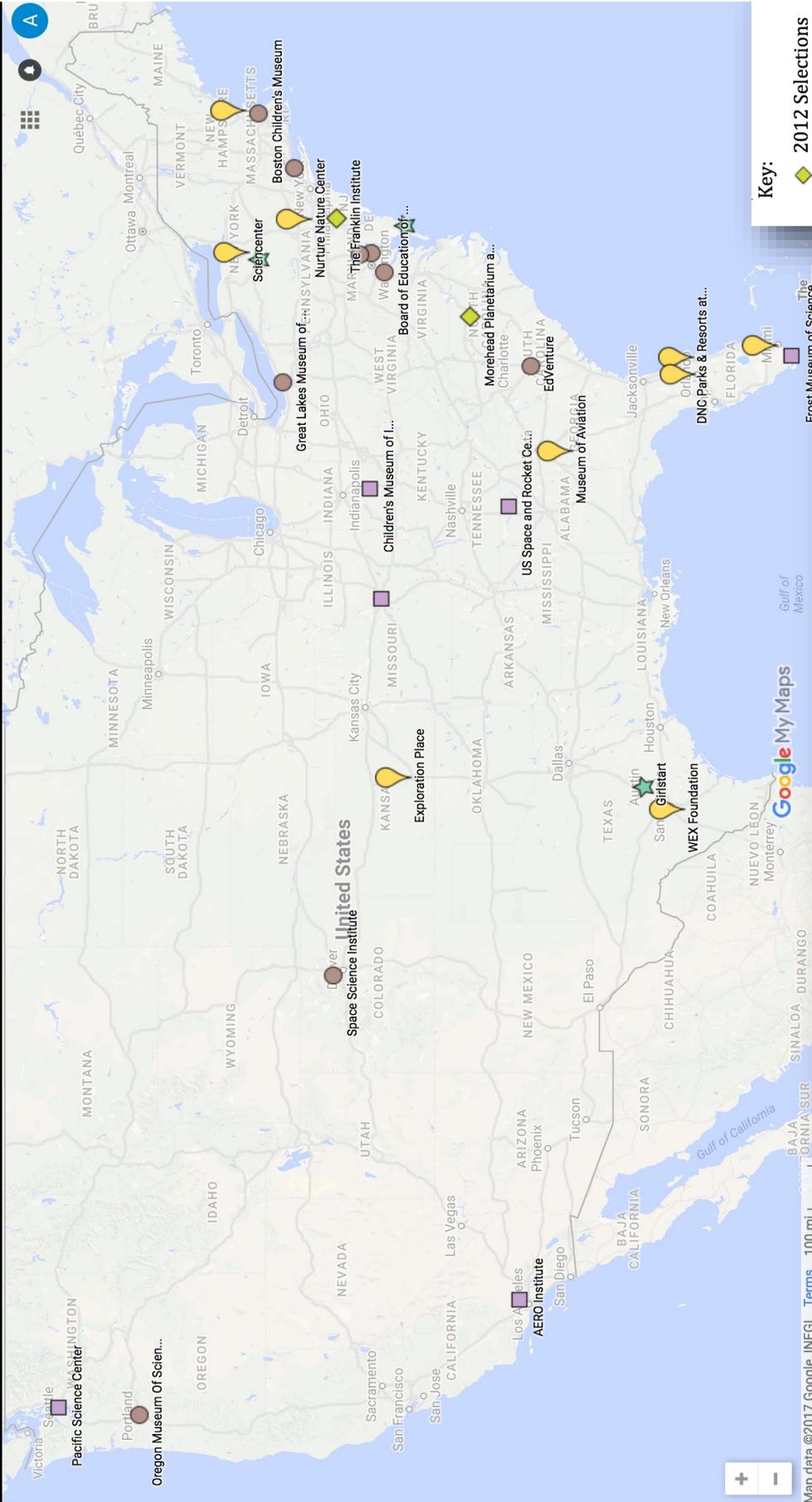
<https://informal.jpl.nasa.gov/museum/About/Application>

Your registration will take up to 2-3 days to process.



# Map of Awardees

## CP4SMPVC Competitive Program for Science Museums, Planetariums and NASA Visitor Centers



**Key:**

- 2012 Selections
- 2013 Selections
- 2014 Selections
- 2015 Selections
- 2016 Selections

# Technical Notes

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## JPL Informal Education Office POCs:

Leslie Lowes – Office: 818-373-7734, Cell: 818-389-9516

Amelia Chapman– Office: 818-354-6323, Cell: 626-437-0295

Joyce Armijo– Office: 818-354-2337, Cell: 626-524-8653

Jessica Parker – Office: 818-354-6986, Cell: 626-379-2345

## Advance reading:

We strongly suggest you view or review the available webinars, which cover topics in more detail than would be possible at the face-to-face meeting. Archived webinars are available at <https://informal.jpl.nasa.gov/museum/CP4SMP/PDWebEx>. You will need to log in with your Museum Alliance username and password.

## General:

Access to JPL: Bring your **government-issued photo ID** (e.g., driver's license, NASA badge, passport, green card) **every day**. You will only be able to get on-site if you have pre-registered for the RSV AND you bring your photo ID.

Dress will be business casual. The walk to the conference room is about 3 blocks and has a slight slope to it as well as some stairs.

On Tuesday, you'll want to grab coffee/breakfast at the hotel. On Wednesday and Thursday we will have coffee, tea, bottled water, and light snacks available in the conference room. On Thursday, you'll also want to grab breakfast at the hotel as the first meeting room of the day does not allow food inside.

On Tuesday, you will buy your own lunch in a JPL Cafeteria (cash or credit/debit card). On Wednesday and Thursday your previously-ordered (through the survey) box lunches will be delivered to the conference room; pay by cash or check (made out to Culinart) Tuesday evening or no later than Wednesday morning at check-in. (As a reminder, the cost for Wed/Thur were: sandwich \$9.75, salad \$10.75, vegetarian \$9.75, bottled water \$1.50, canned soda \$1.25, plus 10% tax.)

We suggest that you check-in with our support staff and pick-up your meeting packets and agendas at the Courtyard Marriott starting at 6:30pm—9:00pm. Lunch and bus money will also be collected, receipts available.

Civil servants need to bring exact cash to pay for the bus between the hotel and JPL. Cost: \$14/ day.

The restaurant for the group dinner on Wednesday evening will accept cash or credit/debit cards. Please pay them directly while we are at the restaurant. Cost: \$30 (includes starter, entrée, beverage, dessert, tax, and tip; alcohol is extra). See page 25 of the Program Guide for details.

## Weather:

Our weather can be unpredictable but looking ahead, we should see mostly sunny skies with temps near the high 60's, low 70's, so please plan accordingly. We will have buses for the tour of JPL, but you'll still want appropriate shoes and outerwear. Sometimes the meeting room can be a little chilly.

Here are a couple of reliable weather sites for this area:

NOAA: <http://forecast.weather.gov/MapClick.php?site=lox&smap=1&textField1=34.19917&textField2=-118.18694#.VOu33EunUa0>

Weather Channel: <http://www.weather.com/weather/tenday//La+Canada+Flintridge+CA+91011:4:US>

# Technical Notes

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## OPTIONAL DAY, TUESDAY, March 7, 2017

**Bus Departs Courtyard Marriott @ 8:15am**

### Morning Tour

8:30am Check-in @ Visitor Center

Bring government-issued photo ID (e.g., driver's license, passport, green card, NASA badge)

Reminder: Wear comfortable walking shoes (we will have buses available)

Cameras are allowed, no photo restrictions in scheduled tour/meeting areas.

Plan to get your morning coffee/breakfast at the hotel

### Lunch

Self-purchased lunch onsite at JPL Cafeteria

Cash, debit/credit accepted; request receipts if needed

### Afternoon Meet the Experts Session

1:00pm – 4:00pm

**Bus Departs JPL for Hotel @ 4:15pm**

**Dinner on your own – see page 24 for a list of a few of the many restaurants within walking distance of hotel**

## WEDNESDAY, March 8, 2017

**Bus Departs Courtyard Marriott @ 7:30am**

**RSV Meeting will be in 321-B20.**

7:45 a.m. arrival for Visitor Center Check-in; group will be escorted to building location

Bring government-issued photo ID (e.g., driver's license, passport, green card, NASA badge)

Bring pre-printed posters, you will be given instructions as to where to set them up

321-B20 is in the basement of the Flight Projects Building.

You must take the elevator in the lobby down to the basement

Coffee, tea, and light snacks will be provided

There are 4 restrooms located in the center of the floor. Exit room, turn right.

### Lunch

Previously-purchased boxed lunches will be delivered to our conference room

Cash or check only, payable to Culinart, see Jessica Parker or Joyce Armijo

**Bus Departs for Hotel @ 4:45pm**

# Technical Notes

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## WEDNESDAY, March 8, 2017 Continued

Group Dinner @ 6:45pm

El Cholo Café, Paseo Colorado, 300 E. Colorado Blvd, Pasadena, CA 91101

Self-purchased at a flat rate of \$30, which includes starter, entrée, beverage, dessert, tax and tip. Alcohol extra.

Californian-influenced Mexican dining

Located in the Paseo Colorado shopping center

It is a 10-15 minute walk from the hotel to the restaurant. Exit hotel. Walk south on Fair Oaks Ave. Turn left onto Colorado Blvd. The shopping center is immediately after Marengo Avenue on the right side of the street. El Cholo Café is located upstairs on the 2<sup>nd</sup> floor.

Casual dress

## THURSDAY, March 9, 2017

**Bus Departs Courtyard Marriott @ 7:30am** (Plan to get your morning coffee/breakfast at the hotel)

7:45 a.m. arrival for Visitor Center Check-in, group will be escorted to building location

Bring government-issued photo ID (e.g., driver's license, passport, green card, NASA badge)

8:00am Group Photo

Welcome in 321 Pickering Auditorium (*No outside beverages or food allowed, water okay*)

Meeting continues in 321-B20, basement of the Flight Projects Building

You must take the elevator in the lobby down to the basement

Coffee, tea, and light snacks will be provided

There are 4 restrooms located in the center of the floor. Exit room turn right.

### Lunch

Previously-purchased boxed lunches will be delivered to our conference room

Cash or check only, payable to Culinart

### **Bus Departs for Hotel @ 5:00pm**

Other useful Information:

If you are driving yourself:

- It is a 10-minute drive from the Hotel to JPL. Refer to map/directions at [http://www.jpl.nasa.gov/about\\_JPL/maps.php](http://www.jpl.nasa.gov/about_JPL/maps.php)
- JPL is located at 4800 Oak Grove Drive, Pasadena, CA 91109. As you approach JPL you will come to a security checkpoint. Please tell the officer that you are attending the Reverse Site Visit with the Education Office. He or she will give you a pass for the visitor parking lot and direct you to the lot. Once you have parked, walk across the street towards the Visitor Reception Center. An Education Office representative will greet you, help you check in, and escort you to the meeting location.
- The distance between JPL/Hotel and LAX is approximately 30 miles. In rush hour traffic this could take 1.5 to 2 hours.
- Wi-Fi Guest Network login instructions
  - Select **JPLGuestInternet** then click ACCEPT when prompted, (If left idle, will disconnect)

# Pasadena Neighborhood Guide

## Coffee & Breakfast



**Marston's Restaurant:**

**Breakfast: 730am -11am**

Voted "Best Breakfast in California" by the Food Network Magazine!



**Intelligensia Café: 55 E. Colorado Blvd.**

**Open: 6am-Midnight**

Designed by MASS Architecture, the coffeebar plays host to the full menu of beautiful single origins, elegant teas, and refreshing iced drinks. Adjacent to the brewbar are two gleaming espresso machines built in to a beautiful bartop constructed of Douglas Fir.



**Copa Vida: 70 S. Raymond Avenue**

**Open: 7am-10pm Daily**

Cup of Coffee. Cup of Tea. Cup of Life. Copa Vida... an artisan coffee shop featuring espresso and coffee from roasters such as San Francisco-based Ritual Coffee. Sandwiches and Salads served as well.

## Dining



**Umami Burger: 49 E. Colorado Blvd.**

**Open: 11am-11pm Daily**

Conceived as "fine-dining fast food," Umami Burger creates unique combinations of ingredients naturally high in umami, the savory 'fifth taste.' The result is a sophisticated selection of burgers, sides and accompaniments.



**Mi Piacere Italian Kitchen: 25 E. Colorado Blvd.**

**Open: 730am-1130pm Daily**

Voted "Best Italian Restaurant" for a decade. Authentic Italian cuisine. Moderate prices.



**Sushi Roku: 33 Miller Alley (by iPic Theatre)**

**Open: 530pm-1030pm Daily**

A contemporary spin on classic Japanese cuisine, blending innovation with tradition to redefine the sushi experience.

## Drinks & Dessert



**Vertical Wine Bistro: 70 N. Raymond Ave. Upstairs**

**Open: Tues-Thurs: 5pm-Midnight**

Signature bistro dishes are paired with a dazzling selection of more than 650 wines from around the world.



**POP Champagne and Dessert Bar:**

**33 E. Union Street**

**Open: 5pm-close**

An extensive selection of Champagnes, sparkling wines, dessert wines and artisanal beers, to be enjoyed with our seasonal dinner menu, cheeses, charcuterie, and of course, desserts



**The Blind Donkey: 53 E. Union Street**

**Happy Hour: Mon-Fri 4-7pm**

Pasadena's premier Whiskey Bar (68+ in stock) and neighborhood Game Room featuring an extended bar food menu is packed with elevated pub fare and kicked-up master creations that use French Fries as their canvas (10 different kinds!)



**Bodega Wine Bar: (In Paseo Colorado by El Cholo Café)**

**Happy Hour: Mon-Fri 5-7pm**

Great Selection of Wine, Beer, and Soju plus snacks and pizzas with a fun candlelight ambiance.



**BJ's Restaurant & Brewhouse**

**Open: Mon.—Thurs 11:00am-Midnight**

Over 18 signature flavors of pizza, from tavern-cut to deep dish to made-to-order combinations. Offers 11 signature beers and cider,



## **2017 CP4SMPVC Optional Dinner**

**Wednesday, March 8, 2017 @  
6:45pm**

*El Cholo Mexican Restaurant*

Paseo Colorado  
300 E Colorado Blvd  
Pasadena, CA 91101  
(626) 795-5800

### ***MENU***

#### *Starters*

*Albondiga Soup or Mixed Green Salad with Cilantro, Lime Vinaigrette*

#### *Entrees*

##### **Burrito Dorado**

Chunky beef, beans, rice, covered with relleno sauce.

Guacamole & sour cream on the side

##### **Chicken Fajitas**

Delicate chunks of chicken with fresh vegetable medley

Served with beans and choice of tortillas

##### **Annie's Enchilada**

Filled with fresh vegetables, spinach mushrooms

and jack cheese

Smothered with a creamy corn - tomato salsa

##### **Blue Corn Chicken Enchiladas**

Marinated Breast of Chicken, wrapped in blue corn tortillas,

Topped with tomatillo sauce, garnished with sour cream & avocado relish

#### **Dessert**

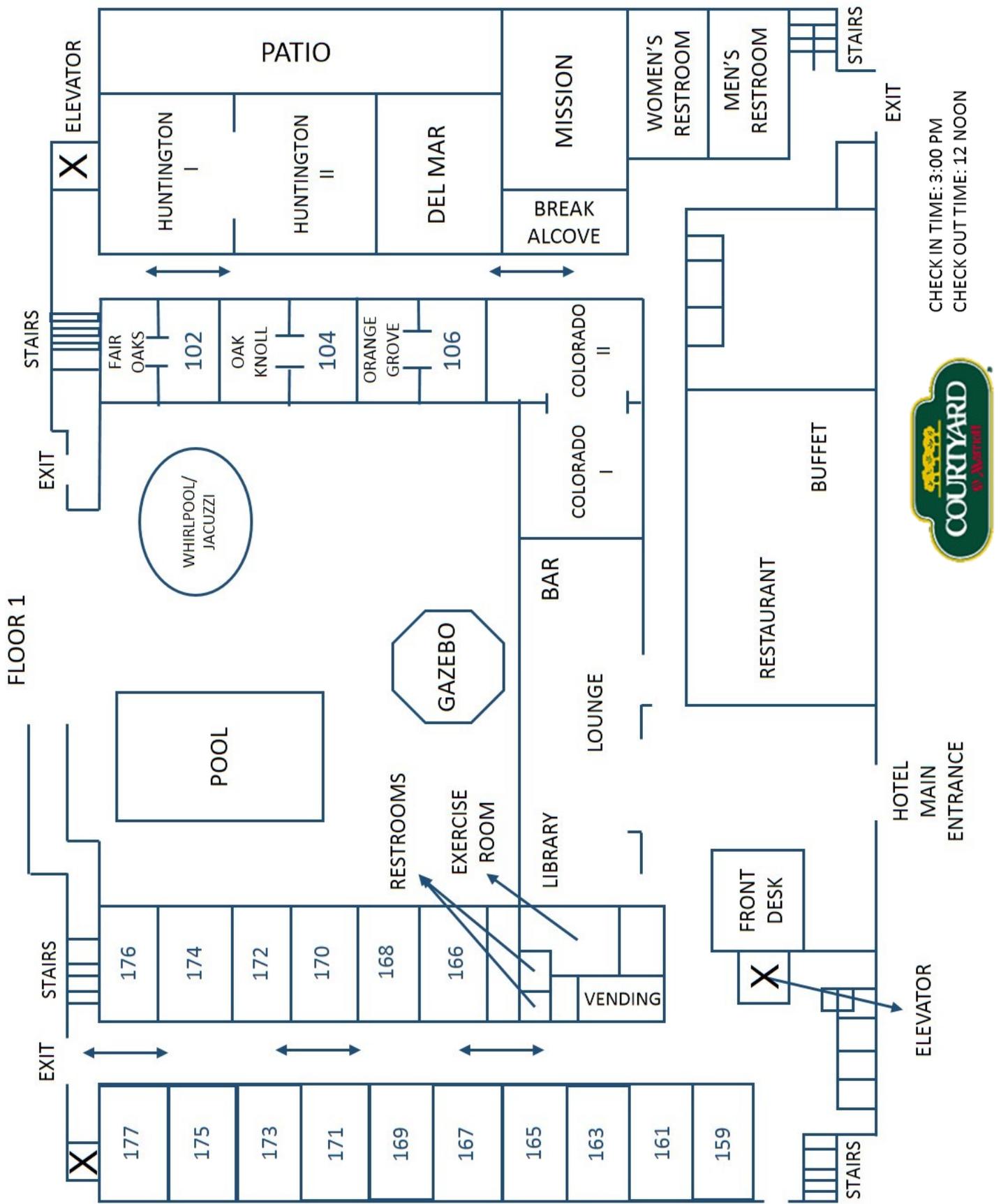
Choice of Traditional Flan or Churros

#### **Drinks**

Fountain Drinks, Coffee, Iced Tea

***Flat rate \$30 Per Person (Pay on your own)***

# Courtyard Marriott Hotel Map



CHECK IN TIME: 3:00 PM  
CHECK OUT TIME: 12 NOON



# TRANSPORTATION

Mt. Wilson  
25 miles  
40.23 kilometers

Griffith Park  
16 miles  
26 kilometers

Palm Springs  
104 miles  
167 kilometers

Rodeo Drive, Beverly Hills  
22 miles  
35.41 kilometers

San Diego  
129 miles  
227 kilometers

Santa Barbara  
99 miles  
160 kilometers

Santa Monica Beach  
25 miles  
40.23 kilometers

## TO AIRPORTS

Burbank/ Bob Hope Airport (BUR)  
16 miles  
25.75 kilometers  
818-840-8840  
bobhopeairport.com

Long Beach Airport (LGB)  
38 miles  
45 kilometers  
562-570-2600  
lgb.org

Los Angeles International Airport (LAX)  
29 miles  
46.67 kilometers  
310-646-5252  
lawa.org

Ontario International Airport (ONT)  
37 miles  
59.55 kilometers  
909-937-2700  
lawa.org/welcomeont.aspx

## AIRPORT TRANSPORTATION

Integrated Transportation Services, Inc.  
800-487-4255  
itslimo.com

Union Station Flyaway This nonstop bus service goes to and from LAX via Union Station in downtown

Los Angeles. From Union Station, passengers may ride the Gold Line light rail to Pasadena. Flyaway roundtrip fee: \$16.  
866-435-9529  
lawa.org

Prime Time Shuttle  
310-536-7922  
800-733-8267  
primetimeshuttle.com

SuperShuttle  
800-258-3826  
supershuttle.com

Xpress by Execucar  
800-427-7483  
execucarexpress.com

## CITY TRANSPORTATION

**Pasadena ARTS Bus** The ARTS buses travel between Old Pasadena, South Lake Avenue, and the Playhouse District. They are easily recognizable by their colorful depictions. Stops are designated throughout the city by a pink triangle marked "ARTS." Adult fare is \$0.75.  
626-398-8973  
cityofpasadena.net/transportation

**Foothill Transit Authority** These buses serve the San Gabriel and Pomona valleys. Base fare is \$1.25.  
800-743-3463  
foothilltransit.org

**Metro Rail/ Metro Bus** The Metro Gold Line services Azusa to Union Station in downtown L.A. with connections to other lines. Base fare is \$1.50. Metro bus service runs throughout Los Angeles County. Base fare is \$1.50.  
323-466-3876  
metro.net

**Taxis**  
City Cab  
626-584-1000  
888-248-9222

**United Taxi**  
626-768-4999  
800-822-8294



Details are subject to change. For the latest information, go to [VisitPasadena.com](http://VisitPasadena.com).

# EASY ACCESS

Get to and around Pasadena and neighboring Los Angeles areas trouble-free, thanks to close proximity and convenient transit options.

**P**asadena is an invitingly walkable community, but it also features a smart, streamlined transit system. Shuttles, buses, and light rail can take you anywhere in the city and to landmarks in the greater Los Angeles area. Go visit the Norton Simon Museum by day and catch an evening Lakers game at the STAPLES Center. And don't forget that four regional airports service visitors to Pasadena daily.

## { RAIL }

The Gold Line is a 13.7-mile light rail line within the Los Angeles-area Metro Rail network that transports passengers from Pasadena to Union Station in downtown Los Angeles. Take it to connect to other Los Angeles rail lines or Amtrak. Trains operate daily and include six stops in

Pasadena. Purchase tickets from self-service ticket vending machines at Metro Rail stations.

Cost is \$1.50 one way.  
323-466-3876  
[metro.net](http://metro.net)  
[cityofpasadena.net/transportation/gold\\_line](http://cityofpasadena.net/transportation/gold_line)

## { DRIVING DISTANCES }

**Anaheim, Disneyland**  
35 miles  
56.33 kilometers

**Downtown Los Angeles**  
10 miles  
16 kilometers

**Hollywood**  
16 miles  
25.75 kilometers

**FACT**

First opened for use in 1940, the Arroyo Seco Parkway, formerly known as the Pasadena Freeway, holds the distinction of being the first freeway in California and the western United States.

### Participant Bios

**Armijo, Joyce**

NASA Jet Propulsion Laboratory – Pasadena CA  
Staff Assistant  
joyce.e.armijo@jpl.nasa.gov  
818-354-2337

Joyce Armijo has more than 12 years of experience as an administrative assistant supporting directors and senior level executives in fields of manufacturing, R&D, and higher education. She joined Jet Propulsion Laboratory in October 2016 and serves as a Staff Assistant for the Informal Education Office. Joyce will be providing support for the department in travel logistics, event coordination, and other administrative support services.

**Ashdown, Christine**

Wings of Eagles Discovery Center – Freeville NY  
Project Education Coordinator  
waag65@gmail.com  
607-342-0942

Christine Ashdown, Project Education Coordinator for the CP4SMPVC+ Award at Wings of Eagles Discovery Center, in Horseheads, New York. Ashdown is an informal educator with experience with the “Ag in the Classroom” program and other Cooperative Extension education. Previously, she served as a Team Leader and Senior Grant & Contract Office at Cornell University for 13+ years. On the Award, she will be responsible for developing and carrying out the informal museum education programs, working closely with the museum Education Programs Director, Nicole Burt, local education experts, scientists and engineers to develop excellent educational tools to be utilized by the museum and Elmira City School District, in addition to linking the program to existing NASA Education tools. Ashdown continues to seek opportunities where her experience as a research administrator can be integrated with youth experiential learning programs that help youth develop the skills and the knowledge necessary to succeed in life.

**Bartholomew, Lindsay**

Patricia & John Phillip Frost Museum of Science –  
Miami FL  
Director of Technology and Youth Development  
lbartholomew@frostsscience.org  
305-434-9600

Lindsay Bartholomew is Director of Technology and Youth Development at Miami’s Patricia and Phillip Frost Museum of Science. Ms. Bartholomew holds Bachelor’s and Master’s degrees in physics and astronomy, and has 15 years of experience in formal and informal science education. She taught physics and astronomy at Kent State University, and physical science and mathematics at a high school in Namibia. She developed programs at the Royal Observatory Edinburgh in Scotland, and Birr Castle Demesne Science Centre in Ireland. Subsequently, Ms. Bartholomew has worked in science museums for the last 10 years. At Chicago’s Museum of Science and Industry, she served as Concept Development Coordinator, bridging exhibition and program development for the Science Storms exhibition. Since joining the Patricia and Phillip Frost Museum of Science in 2011, she has worked on exhibition development for the new Frost Science opening in 2017, and cultivated or expanded new initiatives, such as science communication efforts on a National Science Foundation climate research expedition to the Arctic, and integrating technology experiences into youth programs. Ms. Bartholomew has worked on multiple grant projects funded by NASA, NOAA, NSF, and the Department of State. She is Co-PI for NASA’s CP4SMPVC grant project, vMAX: Virtual Missions and Exoplanets.

**Beall, Lydia**

Museum of Science – Boston MA  
Manager, Informal Engineering and Computer  
Science Learning  
lbeall@mos.org  
617-589-0328

Lydia Beall comes to the Museum of Science with a background in both engineering and museum education. She received her BS in Chemical Engineering from the University of Rochester and worked in the Environmental Technologies Division of Corning Incorporated with ceramic substrates for catalytic converters before changing careers to informal science and engineering education. She received her MA from Tufts University in Museum Education and worked at the Rochester Museum and Science Center as well as the Corning Museum of Glass. As Manager of Informal Engineering and Computer Science Learning, Lydia creates and presents informal computer science and engineering activities that encourage students and visitors to think like engineers to design and test prototype solutions. Now in its thirteenth year, the Design Challenges program has served over 800,000 visitors at the museum. Lydia is particularly interested in the intersection of “maker” programming and engineering education as well as emerging research on engaging girls in engineering design.

**Briere, Dean**

The Sciencenter – Ithaca NY  
 Executive Director  
 dbriere@sciencenter.org  
 607-272-0600

Dean Briere is executive director of the Sciencenter, where he oversees administration, programs, and operations, in addition to leading special projects. Briere has previously served at the Arizona Science Center, where he served as Chief Finance and Administration Officer and served as Executive Vice President and COO at Discovery Place in Charlotte, NC. Briere has decades of experience in non-profit and science museum work, combining his business background with his love of science and background in chemistry. Briere's passion for science museums began in 1977 when he began volunteering at the Springfield Museum of Science in Massachusetts. As a result, Briere earned a bachelor's degree from Worcester Polytechnic Institute in Massachusetts and an MBA /Master of Science in Organizational Change and Leadership from Pfeiffer University in North Carolina.

**Brown-Houston, Stephanie**

NASA Glenn Research Center – Cleveland OH  
 Education Program Specialist  
 sdbrown-houston@nasa.gov  
 216-433-8006

Stephanie Brown-Houston is an award-winning employee at NASA's Glenn Research Center in Cleveland, Ohio, where she has been employed for the past 32 years in various positions. Stephanie currently serves as an Education Program Specialist in the Office of Education, and as a NASA Research Announcement (NRA) Technical Officer for the CP4SMP. In this position, Stephanie ensures that initiatives align with the goal of attracting and retaining students in STEM disciplines by focusing on engaging and encouraging their pursuit of educational disciplines critical to NASA's future engineering, scientific and technical missions. Stephanie also manages the informal STEM engagement programs for Glenn at the local, regional and national levels. Over the years, she has planned, developed and implemented more than 30 STEM education experiences that have engaged over 80,000 students, teachers and members of the public in NASA education content. The majority of her work has served students and teachers from areas traditionally underrepresented and underserved in STEM information and careers. Last year, Stephanie was selected to receive the Women of Color Educational Leadership -- Corporate Promotion of Education award by the Career Communications Group Inc. She has been mentor, friend and leader to countless students and co-workers.

**Carlson, Christina**

Saint Louis Science Center – Saint Louis MO  
 Manager, Science Beyond the Boundaries Network  
 christina.carlson@slsc.org  
 314-289-1477

Christina Carlson manages Science Beyond the Boundaries – a worldwide network of over 260 museums – at the Saint Louis Science Center. In this role, she facilitates network initiatives focused on providing tools and resources for science museum educators. Her background consists of experience working in various museum roles, as well as project management.

**Chapman, Amelia**

NASA Jet Propulsion Laboratory – Pasadena CA  
 Education Program Specialist  
 amelia.j.chapman@jpl.nasa.gov  
 818-354-6323

Amelia Chapman has more than 20 years of experience as an informal educator. Working in a range of science, history, art and cultural museums, she has helped audiences of all ages learn from real objects and direct, hands-on experiences. Now at NASA's Jet Propulsion Laboratory, she helps run the Museum Alliance community of practice, providing professional development and NASA resources to informal educators who want to use the excitement of space exploration and scientific discovery to inspire new generations.

**Coleman, Denise**

John F. Kennedy Space Center – Kennedy Space Center FL  
 Education Program Specialist  
 denise.y.coleman@nasa.gov  
 321-867-4484

Denise Coleman is a NASA Education Project Specialist in the Education Projects and Youth Engagement Office at the Kennedy Space Center. She moved to Florida from Syracuse, NY, due to her dad's job, during the big start-up of the US space program in the 1960's. She was privileged to watch the Saturn V rockets of the Apollo program fly over her school playground, and then grew up and got her own job at the Kennedy Space Center. She was given a second opportunity to be part of such greatness by supporting the entire Space Shuttle program, from the first to last launches. She worked in several different organizations throughout her career, from Launch Processing Systems, Safety and Mission Assurance, Public Affairs, External Relations, and most recently the Education Projects Office.

She is now looking forward to supporting the new programs and direction NASA is going in, our exciting Journey to Mars, as well as interacting with the educators and students who are going to be part of that future.

**Collins, Brenda**

NASA Ames – Moffett Field CA  
 NASA Ames Research Center  
 Education Director  
 brenda.j.collins@nasa.gov  
 650-603-3540

Brenda Collins began her career with NASA Ames (ARC) by heading up the visitor center operations. From there she created multiple Agency-wide higher education programs that would eventually evolve into what is now the NASA Scholarships and Fellowships programs. Ms. Collins serves as the Education Director for NASA Ames as well as serving as the Branch Chief of Education and Public Outreach. Ms. Collins is particularly passionate about ensuring that all of ARC's education portfolio is targeting and reaching the underserved and underrepresented in STEM.

**Corona, Lynn**

Exploration Place – Wichita KS  
 Director of Exhibits  
 lynn.corona@exploration.org  
 316-660-0655

Lynn Corona, Director of Exhibits, will serve as the primary liaison with the exhibit firm, Roto Group, LLC, and will oversee all aspects of the exhibit development, fabrication and installation. She has 34 years of experience developing permanent and traveling exhibitions for museums. In her role at Exploration Place, Lynn oversees the planning, development, production, implementation and maintenance of permanent exhibitions, as well as administers traveling exhibit contracts, negotiation and scheduling. Prior to Exploration Place, she worked at the Science Museum of Virginia and the Oregon Museum of Science and Industry.

**Drews, Marc**

EdVenture – Columbia SC  
 Director of Education Programs and Partnerships  
 mdrews@edventure.org  
 803-400-1150

Marc Drews is the Director of Education Programs and Partnerships at EdVenture Children's Museum. He taught middle and high school algebra and geometry, served as a district-level math consultant, and for twenty-two years, he held various positions at the South Carolina Department of Education, including serving as the director of the SC Statewide Systemic Initiative, overseeing an infrastructure of support for the state's mathematics and science teachers. He retired from the agency in 2008. His has been recognized by several state organizations for his support for educators across South Carolina, including receiving the Outstanding Contributions to Mathematics Education Award by the SC Council of Teachers of Mathematics, the Saylor Award for Advancing International Education by the SC IB Schools, and recently he was honored with the 2015 Catalyst Award for Education Excellence by the South Carolina Science Council. For two years prior to joining the team at EdVenture, he coordinated the 2010 and 2011 state conferences for the SC Arts Education Association. Marc and his wife Patty, a retired high school science teacher and instructional coach, are most proud of their family that includes three children, their spouses, three grandchildren, and their canine child, Lilly.

**Dusenbery, Paul**

Space Science Institute – Boulder CO  
Director, National Center for Interactive Learning  
dusenbery@spacescience.org  
720-974-5888

Paul Dusenbery. I received my Ph.D. in Physics in 1978 from the University of New Hampshire specializing in space plasma physics. In September of 1989, I became the Program Director of the Magnetospheric Physics Program at the National Science Foundation. I was appointed the Director of the Space Science Institute's National Center for Interactive Learning in 2010. From 1995-2004, I helped develop a successful workshop series for scientists and engineers to learn how to implement effective formal and informal STEM education programs. I led the development of major national traveling exhibitions: Electric Space, Space Weather Center, MarsQuest, Destination Mars, Alien Earths, Giant Worlds, and recently Great Balls of Fire: Comets, Asteroids, and Meteors. Currently, I direct the national library education program called the STAR Library Education Network (STAR\_Net), in partnership with the American Library Association and many STEM education organizations. It has developed a robust community of practice for librarians and STEM professionals along with an online and in-person training program. STAR\_Net also includes the Discover NASA: From Our Town To Outer Space project. I was the project director for the first Public Libraries & STEM conference, in August 2015, that brought together leaders from both the public library and STEM education communities.

**Ellenbogen, Kirsten**

Great Lakes Science Center – Cleveland OH  
President and CEO  
Kirsten.ellenbogen@glsc.org  
216-518-1514

As third President and CEO of Great Lakes Science Center, Kirsten Ellenbogen has launched Cleveland Creates, a strategic initiative developed in collaboration with corporate leaders to change the community's narrative around advanced manufacturing and technology for diverse middle-school youth and families. Her energetic leadership on national initiatives has included serving as co-principal investigator of the Center for Advancement of Informal Science Education, in collaboration with the National Science Foundation and being appointed to the National Academy of Sciences' committee that produced the volume, Learning Science in Informal Environments. Dr. Ellenbogen's research focuses on measuring the community impact of science centers, designing learning experiences to facilitate science talk, and using scientific visualization technologies to engage the public in exploring complex phenomena. Her Noyce Fellowship focused on using museum resources to help policy makers use scientific evidence to inform decision-making. She has been elected President of the Visitor Studies Association and received the 2015 Community Inspiration Award at STEMCON. Dr. serves on the board of the Cleveland Water Alliance, the Association of Science-Technology Centers, and the Rock and Roll Hall of Fame and Museum. She received her Ph.D. in Science Education from Vanderbilt University and her B.A. from the University of Chicago.

**Fondal, Wesley**

STARBASE ROBINS at the Museum of Aviation –  
Warner Robins GA  
Executive Director  
wesley@starbaserobins.org  
478-926-1769

Wesley Fondal, Jr. is the Executive Director of DoD STARBASE ROBINS. DoD STARBASE is a premiere science, technology, engineering and math (STEM) educational program. He has helped to expose youth to the technological environments and positive role models found on military bases and installations and helped in making sure that students get exemplary instruction using a common core curriculum that meets or exceeds the National Standards. He has also helped in nurturing a winning network of collaborators and building mutual loyalty. In his eighteen years as Director, he has increased funding to the program as well as increased the number of students from area school districts attending the program. STARBASE ROBINS has programming that increases the knowledge and interest in STEM careers and fields of study to students in grades 5th – 8th grade. It is the only program in the Middle Georgia Area that offers computer aided design and three dimensional modeling with 4th and 5th graders. He was instrumental in having STARBASE ROBINS and the Museum of Aviation become the host site for the Middle Georgia FIRST Lego League Super Regional Competition and Peachtree Regional Mid-season FIRST Robotics Competition. He has been PI / co-PI on three major NASA grants.

**Geddes, Sondra**

AERO Institute – Palmdale CA  
 LIFTS Education Specialist  
 sondra.l.geddes@nasa.gov  
 661-276-2359

Ms. Sondra Geddes is an Education Specialist with the Aerospace Education, Research and Operations (AERO) Institute at NASA's Armstrong Flight Research Center. Sondra is a Project Lead on the EXCITE: Expanding Children's Interest Through Experiential Learning grant the AERO Institute received from NASA CP4SMP in 2014. She serves as the primary contact on the Library Initiative for Teachers and Students (LIFTS) project, aiding in the development of new library partnerships, supporting existing collaborations with libraries, providing outreach opportunities and materials to libraries, and acts as the liaison between the agency and the project. In addition to her duties on the LIFTS Project, Sondra manages the NASA Armstrong Educator Resource Center, and is responsible for providing monthly educator professional development workshops, responding to requests for NASA's educational resources and assisting educators in finding curriculum supplements for their classrooms. She is the caretaker of the center's Lunar and Meteorite Sample Disks. Sondra has been a member of the Office of Education at NASA Armstrong since 1999, hired initially by Oklahoma State University to support the Aerospace Education Services Project (AESP) as an Administrative Assistant, then as a Project Assistant for the NASA Explorer Schools Project (NES) that ended in 2012.

**Girten, Beverly**

NASA HQ OE – Washington DC  
 Institutional Engagement  
 beverly.e.girten@nasa.gov  
 202-358-0212

Currently serving as Director for Institutional Engagement in the Office of Education at NASA HQ. Prior to that was Council Executive for the Agency Strategic Management Council, chaired by Charlie Bolden, and Council Executive for the Partnership Council at NASA HQ. Served as Assistant Director for Strategic Planning and Integration at Ames Research Center and was Division Chief of Space Life Science, Branch Chief of Science Payloads and Program Manager and Program Science for several Shuttle and Station experiments in Life Sciences at Ames. Was Director of Strategic Research and Director of Pharmacology at Trega Biosciences (formally Houghten Pharmaceuticals). Inventor on 15 U.S. patents and have published more than 50 peer reviewed abstracts, papers and book chapters. Prior to working in the pharmaceutical industry, I was on the faculty of the Wright State University School of Medicine and did a postdoctoral fellowship at Wright Patterson AFB. My Ph.D. is from Ohio State, M.S. from University of Akron and B.S. from Miami University.

**Greer, Christian**

Saint Louis Science Center – Saint Louis MO  
 Chief Officer/Science + Education + Experience  
 christian.greer@slsc.org  
 312-550-6289

Christian Greer is the Chief Education and Programs Officer at the Saint Louis Science Center (SLSC) and former Vice President of Learning Initiatives at the Chicago Architecture Foundation (CAF). At SLSC, he is responsible for igniting and sustaining an innovative portfolio of programs, processes, and partnerships for STEM learning. He also oversees the advancement and scaling of Science Beyond the Boundaries--a network of over 250 science centers and museums from around the world. Christian has over 20 years of experience in informal education and is a certified project management (PMP, CSM). He was formally the Program Director for the Hive Chicago Learning Network, funded by the MacArthur Foundation, and the Senior Director of Education at Shedd Aquarium where he launched the first NOAA/MATE Midwest Regional Underwater Robotics Competition. He was the Director of Teaching and Learning for Project Exploration, an afterschool program for minority youth and girls in STEM, where he created the Men's Aeronautics Challenge (MACH-10) aerospace program for teens. At Adler Planetarium in Chicago, Christian served as an "airborne space educator" aboard the Kuiper Airborne Observatory (C-141), on its last science flight into the stratosphere.

**Heinz, Jay**

Morehead Planetarium and Science Center –  
 Chapel Hill NC  
 Director of Creative and Experiential Design  
 jayheinz@unc.edu  
 919-843-5906

Jay Heinz leads fulldome-planetarium show production, digital media, exhibits and the on-site experience at Morehead Planetarium and Science Center on the campus of the University of North Carolina – Chapel Hill. While at Morehead, he has also taught video and multimedia courses and helped lead overseas documentary projects with the UNC School of Media and Journalism. Prior to joining Morehead in 2007, Heinz worked at the Computer Museum, Lucasfilm and the Washington Post. He has a bachelor's degree in computer science and film from Boston College and a master's degree from UNC-CH's School of Media and Journalism.

**Holland, Anne**

Space Science Institute – Boulder CO  
Community Engagement Manager  
aholland@spacescience.org  
720-974-5876

Anne Holland is the Community Engagement Manager at the Space Science Institute's National Center for Interactive Learning. Anne provides project management support on all federally funded programs, and also contributes her expertise to exhibit and interactive design. She also leads exhibit management and outreach efforts at the Institute. For this program, Anne assisted PI Dusenbery in developing the exhibit text and design, and manages the 7 site tour. She also is the lead on required agency reporting, including reporting in Museum Alliance.

**Hudgins, Tamara**

Girlstart – Austin TX  
Executive Director  
tamara@girlstart.org  
512-536-0196

Tamara Hudgins, Ph.D., is the Executive Director of Girlstart. Since 2009, Girlstart's impact has grown from reaching 1,500 girls, teachers, and family members each year to over 20,000. The world's greatest challenges need new STEM ideas and insights. Yet half of the world's potential ideamakers—women and girls—are discouraged from developing vital STEM ideas. Girlstart believes that more girls with more ideas will create more solutions to benefit us all. To address this, Girlstart increases girls' interest and engagement in STEM through innovative, nationally-recognized informal STEM education programs. Girlstart cultivates a culture where risk is rewarded, curiosity is encouraged, and creativity is expected. Since 2009, Girlstart After School has grown from 4 to 65 programs, has been recognized as the most robust program of its kind in the nation, and is now replicating across Texas. Girlstart Summer Camp, the second core program, has expanded from 8 to 28 week-long programs each summer, with replication outside Austin as well as in six states nationwide. Hudgins has served in the nonprofit, philanthropic, and higher education communities in Austin, Chicago, and in Central Europe for 20 years, and earned her Ph.D. from Charles University in Prague.

**Kallhoff, Traci**

Exploration Place – Wichita KS  
Director of Education  
traci.kallhoff@exploration.org  
316-660-0665

Traci Kallhoff is the Director of Education at Exploration Place. Traci holds a Bachelor of Arts: Secondary Education: Earth & Space Science, a minor in geology and significant course work in biology from Wichita State University. She has worked in informal science education for 12 years. She serves on the Kansas State Science and Engineering Fair board, Women in Aviation - Air Capital City Chapter board, Kansas Association of Teachers of Science board, and state committee to integrate informal learning with formal curriculum. She also served two years on the program committee for the Association of Children's Museums and is an NGSS trainer for the State of Kansas. In 2010, she launched the museum's successful summer aviation camp, a community collaborative endeavor. Under Kallhoff's leadership, Exploration Place has fulfilled extensive education grants and contract and expanded education programming by more than 400% in students served and program revenue.

**Kellett, Kyrie**

Oregon Museum of Science and Industry (OMSI) –  
Portland OR  
Senior Learning and Community Engagement  
Specialist  
kkellett@omsi.edu  
503-797-4366

Kyrie Thompson Kellett is a Senior Learning and Community Engagement Specialist at the Oregon Museum of Science and Industry. She completed her BA in environmental studies and physics from Whitman College and her MA in applied anthropology at Northern Arizona University. Her Master's thesis focused on the relationship between education, the environment, and culture. During her career, she has worked in a variety of informal science education contexts including the National Park Service, non-profit educational organizations, and camps programs. During her 10 years at OMSI, she has focused on collaborative projects that engage diverse community partners in the exhibition and program development process. She is currently acting as the Conceptual Lead and Co-Investigator on the NASA-funded Lenses on the Sky project.

**Kornmann, Mark**

Smithsonian National Air and Space Museum –  
Washington DC  
Assistant Director, Education and Public  
Engagement  
kornmannm@si.edu  
202-633-2355

Mark Kornmann is currently the Assistant Director for Public Engagement and Education at the Smithsonian National Air and Space Museum. He is responsible for the offices of Education, Interactive Media and Outreach, Digital Experiences, and Lectures and Programs. Kornmann co-founded VMG Strategies in February 2011 following 24 years in secondary and higher education and four years in a national nonprofit organization. Mark is one of the founding directors of a residential academy for high ability students leading the state and national outreach efforts for the state of Indiana. In 1994, he developed the nationally and internationally recognized Electronic Field Trip Program at Ball State University that connected classrooms across the globe with some of our national treasures in an interactive and engaging format. The electronic field trips were known for their innovative use of new media and integrating interdisciplinary curriculum strategies into the classroom. Mark built these award-winning programs with some of the nation's leading institutions like the Smithsonian Natural History Museum, The Air and Space Museum, The American Indian Museum, The National Baseball Hall of Fame and Museum, the Chicago Field Museum, and the United States Congress. Mark has developed both state and national programs for students and teachers focusing on the integration of technology and sound teaching practices. During his tenure with the National Park Foundation, Mark served as the Senior Vice President for Grants and Strategic Engagement. In this role, Mark led the effort to connect the American public with their over 390 national parks. In 2007, Mark led the program efforts in launching First Bloom, a program aimed at connecting kids from across the country with their national parks around native landscapes. First Bloom was launched by First Lady Laura Bush in Austin, Texas. Other programs focused on scholarly work addressing critical needs in the national parks, educational programs for students and teachers, developing healthy communities around active trails, and in 2009, around the release of the Ken Burns documentary, Mark developed the National Park Foundation's America's Best Idea Grants Program. Mark has experience in developing national programs and strategies and working to secure funding through corporate, foundation, private, and government donors.

**Lanman, Brandon**

Orlando Science Center – Orlando FL  
VP of Visitor Experience  
blanman@osc.org  
407-514-2043

Brandon Lanman, Vice President of Visitor Experience. Mr. Lanman holds a B.S. in Physics and Astronomy from Butler University. Mr. Lanman has more than ten years' experience in informal learning institutions. His background in informal learning began when he served as Manager of the James Irving Holcomb Observatory and Planetarium where he worked under the direction and tutelage of Dr. Brian Murphy of Butler University. Mr. Lanman was directly involved in developing, implementing, and evaluating space science programming for general audiences and K-12 school children from the central Indiana region. Mr. Lanman began working for the Orlando Science Center (OSC) in 2007 as the Manager of Space Science Programming. In 2008, Mr. Lanman was promoted to Director of Public Programming where he oversaw all daily operation of programmatic activities throughout the entire Science Center. As of 2015, Mr. Lanman is Vice President of Visitor Experience. His teams oversee the public programming, exhibits, nature and conservation, early childhood, and facilities departments. The visitor experience team members are responsible for all aspects of the guest's interaction with the staff, exhibits, and building. Recently, Mr. Lanman's teams have contributed to the museum's highest satisfaction ratings and highest annual attendance, on record. As of October 2016, the museum opened its largest permanent exhibit experience in twenty years, KidsTown, which has 11,500 sq. ft. of interactive, hands-on experiences for learners zero through seven. Mr. Lanman was responsible for guiding the experience design and implementation of KidsTown.

**LeBlanc, Danielle**

Museum of Science – Boston MA  
 Planetarium Show Producer  
 dleblanc@mos.org  
 617-589-0272

Danielle LeBlanc is an educator and producer at the Charles Hayden Planetarium at the Museum of Science, Boston. As an educator, she brings over 16 years of experience developing and presenting live, interactive astronomy shows for Museum visitors, including school groups, families, general public, and adult audiences, and in a variety of settings from the Museum's 209-seat theater to its traveling Starlab. As producer, she manages the full-dome show production process, writing scripts, providing concept direction, and overseeing the creation of a show's visual elements and soundtrack. Since 2010 she has led the Planetarium's production team in developing award-winning shows that have been distributed to nearly one hundred planetariums on five continents and translated into a variety of languages. One of these shows, "From Dream to Discovery", was supported by an earlier NASA CP4SMP+ award to the Museum of Science, Boston, and was honored with the "Best Immersion" award at the 2015 Immersive Film Festival in Espinho, Portugal.

**Lewis, Carl**

Fairchild Tropical Botanic Garden – Coral Gables FL  
 Director  
 clewis@fairchildgarden.org  
 305-776-6495

Carl Lewis is a botanist, explorer, and educator. He joined the science staff of Fairchild Tropical Botanic Garden in 2001, and has served as the Garden's Director for the past eight years. He is developing Fairchild as the center of botanical education within the South Florida metropolitan area. In recent years, he launched the Million Orchid Project and Growing Beyond Earth citizen science initiatives that bring botany into middle and high schools throughout South Florida. He worked with the local school district to open BioTECH, the world's first high school that allows students to specialize in botany. Dr. Lewis received a bachelor's degree in Botany from Connecticut College and a Ph.D. in Plant Biology from Cornell University. He serves on the Graduate Faculty at Florida International University and holds an adjunct appointment at the University of Miami. He has conducted field expeditions worldwide, and has ongoing research in Indonesia.

**Litzinger, Marion**

Fairchild Tropical Botanic Garden – Coral Gables FL  
 Education Research Project Manager  
 mlitzinger@fairchildgarden.org  
 305-321-0027

Marion Litzinger is the Education Research Project Manager at Fairchild Tropical Botanic Garden. She has over 20 years of management and team leading experience. She has a degree in Forestry Engineering from the Georg August Universitaet, Goettingen, Germany. Working within Fairchild's education department since 2007, she leads Fairchild's citizen science initiatives throughout South Florida. Since 2011, she has managed the Fairchild Challenge K-12 outreach program, which reaches more than 250 schools and more than 100,000 students each year.

**Lowes, Leslie**

NASA Jet Propulsion Laboratory – Pasadena CA  
 CP4SMPVC Management Team  
 leslie.l.lowes@jpl.nasa.gov  
 818-393-7734

Leslie Lowes has almost 20 years of leadership and service for NASA education projects at the Jet Propulsion Laboratory. She exercises her specialty in informal education in her role as the Acting CP4SMPVC Co-Manager. Since 2009 has coordinated a community of practice of over 80 NASA-funded museum and planetarium projects around the country. Previously, Leslie served on the NASA Management Operations Working Group for NASA SMD Education and Public Outreach (E/PO) in 2008, and co-chaired NASA Science Mission Directorate's (SMD) Out-of-School Time Working Group from its inception in 2002. She currently works with regional, state, and national afterschool organizations to infuse fun and real-world STEM activities into afterschool, through professional development workshops. She received the NASA Exceptional Service Award in 2006 for leadership of NASA SMD's Solar System Exploration E/PO Forum in establishing a vital community of SSE E/PO practitioners. In her initial work for SMD E/PO, she served as the Lead Outreach Coordinator for NASA's Galileo Mission to Jupiter. She created the Galileo Ambassador to Jupiter Program, which later became the Solar System Ambassador Program.

**Martin, Miranda**

NASA AFRC – Palmdale CA  
Education Specialist  
miranda.martin@nasa.gov  
661-276-2527

As an Education Program Specialist, manages K-12th grade and informal education projects and activities that includes managing resources and/or resource allocations, requirements definition, integration and review of projects and activities. Advises and consults with next higher levels of management, Headquarters personnel, and other federal agencies. Maintains awareness and understanding of Agency and Center research efforts. Responsible for the development and management of programs to incorporate those research topics into education projects and activities. Responsible for the development of methods that bridge the technology gap and level of understanding between research environments and classrooms. Works with subordinate, secondary, and matrixed resources on implementation of education programs. Enables the inclusion of research efforts into classroom activities for all education levels. Develops strategies, plans, programs, and methods to bring NASA technology to the classroom. Identifies specific engineering and research topics that can be used in Education programs through contracts, grants, co-operative agreements, outreach programs, and classroom instruction for the purpose of improving education in the science, technology, engineering and mathematics (STEM) fields.

**Mayo, Jennifer**

Einstein Fellowship/NASA Office of Education –  
Arlington VA  
Einstein Fellow  
jennifer.s.mayo@nasa.gov  
503-467-1127

Jennifer Mayo, Ed. D., is the Albert Einstein Distinguished Educator Fellow with NASA's Office of Education—serving at Headquarters and Goddard Space Flight Center. From Portland, Oregon, Jennifer is the Science Teacher on Special Assignment (TOSA) for Portland Public Schools. As Science TOSA she is the coordinator for middle school science for the district and works extensively with science teacher leaders from around the state, with an emphasis on the Next Generation Science Standards. Jennifer's doctorate is in Educational Leadership, with extensive coursework in neuroeducation. Her research interests include development of teacher leadership and teacher identity, from both individual and organizational perspectives.

**Mestre, David**

Discovery Museum and Planetarium – Bridgeport CT  
Manager of STEM Learning Programs  
mestre@discoverymuseum.org  
203-372-3521

David Mestre is the Director of the Henry B. duPont III Planetarium and Manager of STEM Learning Programs at the Discovery Museum and Planetarium in Bridgeport, CT. He holds an undergraduate degree in Astronomy and Astrophysics from Harvard University and a graduate degree in Physics and Astronomy from the University of Pennsylvania. David has worked in the field of informal education for over 13 years specializing in space science education. He oversees programming and content in the Henry B. duPont III Planetarium, and manages the Discovery Museum Challenger Learning Center, and served as adjunct faculty in the Farrington College of Education at Sacred Heart University in Fairfield, CT. He launched high altitude balloons to teach science and engineering practices in extreme environments as analogues to space exploration with students from the School of Engineering at University of Bridgeport, Bridgeport, CT.

**Miller, Susan**

AERO Institute – Palmdale CA  
Executive Director  
smiller@aeroi.org  
661-755-3321

Susan Burgess Miller is the Executive Director of the NASA Aerospace Education, Research and Operations (AERO) Institute. She retired from the National Aeronautics and Space Administration where she was the recipient of the Outstanding Leadership Medal and the Exceptional Achievement Medal. While at NASA she was most recently the Director, Academic Investments at NASA Dryden Flight Research Center, Edwards, CA. There she was responsible for all academic and education programs, K-20, and development of the Aerospace Education Research and Operations (AERO) Institute. The AERO Institute is a revolutionary, new business model to produce the next generation aerospace technical workforce within the aerospace community. Earlier in her career she worked at three NASA field Centers and at NASA HQ in a variety of management positions spanning personnel, facilities and workforce strategies. Dr. Miller is a graduate of the College of William and Mary, (BA) and George Washington University, (MS and EdD). Dr. Miller teaches Management, Leadership and Research Methods for the University of Maryland University College's Graduate School of Management and Technology and Capella University, School of Business and Technology. Her areas of research interest and publication include organizational culture, complexity science and high reliability organizations.

**Murphy, Gloria**

NASA KSC Education – Titusville FL  
Lead, Education Projects  
gloria.a.murphy@nasa.gov  
321-867-8934

Gloria Murphy is currently the Lead for Education Projects at NASA's Kennedy Space Center. Ms. Murphy began her career in 1990 with NASA at KSC as a cooperative student in the Payload Processing Directorate. Her first engineering position was an experiment test engineer for the Spacelab Program. In 1998, Ms. Murphy began working on the International Space Station (ISS) Program as a systems engineer for the Multi Element Integrated Test (MEIT). She continued to develop her engineering skills working with many engineering disciplines for testing various hardware and software interfaces between the U.S. and international elements for the Space Station. Ms. Murphy joined the Launch Services Program in 2003 as an integration engineer for Pegasus and Taurus missions. In this position, she concentrated on the interfaces between the launch vehicle and the spacecraft. Ms. Murphy joined the Education Office in 2007 where she leads a team that works on multiple education Lines of Business, including Educator Professional Development, STEM Engagement and Institutional Engagement.

**Myers, Ted**

Patricia and Phillip Frost Museum of Science –  
Miami FL  
Consultant  
fred.owen.myers@gmail.com  
954-600-9394

Ted Myers has over 20 years of experience in informal science education, specifically in applying innovative technologies to support STEM curricula. Ted has served as Co-Investigator for two projects funded by CP4SMPVC: Youth EXPO: Youth Exploring the Potential of Virtual Worlds and vMAX: Virtual Missions and Exoplanets. Both projects explored the use of virtual worlds and data visualizations to engage broader audiences in STEM, with Youth EXPO focused on climate science, and vMAX centered around on exoplanet discovery. Through vMAX, currently in its third year, the Museum is taking lessons learned from using virtual worlds with students and applying them toward the creation of an interactive kiosk to be installed in the new museum facility. Ted is an ITEST PI Emeritus for his work on Digital WAVE: Warming Winds and Water, an NSF project to create and test a new model for engaging youth in science and related IT-intensive careers. Through WAVE, participants acquired 3D design and animation skills, and collaborate with experienced virtual world exhibit fabricators to create science-rich simulations on the impacts of climate change on Florida. He also developed the Miami Teen Tech Center, a member the Intel Computer Clubhouse Network.

**Nery Gomez, Guillermo**

University of Puerto Rico at Arecibo –  
 Bayamon PR  
 Director  
 guillermo.nery1@upr.edu  
 787-795-1637

Guillermo Nery was born in South America, in the Republic of Bolivia. He spent his first few years there, but then his family migrated to the US and his first four school years were in Florida and Georgia. After moving again, he's mostly been in Puerto Rico. He got a BS in physics from the University of Puerto Rico (UPR) at Mayaguez, and a PhD in Physical Chemistry at UPR-Río Piedras. Since then he's been teaching at UPR-Arecibo, and participating in the ISMuL outreach program, which strives to improve pre-university STEM teaching and get high school students exposed to and interested in STEM fields. He is the PI of the LASED program, which was designed to expose high school and university students, pre service teachers and in service teachers to NASA related topics during workshops, and a summer academy (students), and by developing museum-like exhibits that will be incorporated in the ISMuL facilities and activities.

**Newman, JoAnn**

Orlando Science Center – Orlando FL  
 President and CEO  
 jnewman@osc.cor  
 407-514-2024

Originally from Pennsylvania, JoAnn has a Bachelor's Degree in Industrial Engineering from Penn State University and a Master's Degree in Industrial Engineering from Purdue University. She began her career as a development engineer with AT&T Microelectronics in Allentown, PA and relocated to Orlando, Florida in 1989 to work for AT&T Microelectronics as senior engineer. When she left the corporation in 2003, she had risen to the position of Vice President of Manufacturing with responsibility for a staff of 650. JoAnn then joined the Orlando Science Center in 2003. Prior to being named president and CEO in 2009, she served as Director of Exhibits, then Vice President of Operations and Chief Operating Officer. During her time as president, the Orlando Science Center has seen tremendous growth with total attendance doubling as the organization reached over 570,000 people in 2016. JoAnn is dedicated to guiding the Orlando Science Center as a strong community partner for informal science education, family engagement and workforce development.

**O'Leary, Jim**

Maryland Science Center – Baltimore MD  
 Senior Scientist  
 oleary@mdsci.org  
 410-545-5975

Jim O'Leary serves as the lead space science and astronomy specialist for the Maryland Science Center (MSC). He has produced dozens of programs for the MSC's Davis Planetarium, some of which have played in more than 650 planetariums worldwide. He has co-produced several IMAX films – Star Spangled Banner, Dinosaurs Alive and The Human Body. He oversaw the introduction of a full-dome digital projection system in the Davis Planetarium, the conversion of the IMAX Theater to IMAX 3D technology, and the renovation of MSC's rooftop Observatory and its 1927-era telescope. He was part of a nine-member team of astronomy educators that took part in the inaugural year of a National Science Foundation-sponsored expedition to Chile, visiting astronomical observatories and meeting with astronomers and other astronomy educators. Jim is a recipient of a number of NASA, NSF and NOAA informal education grants and was awarded the Excellence in Outreach Award from NASA Goddard Space Flight Center. He often serves as astronomy and space science expert for radio and TV, including The Weather Channel, and for 12 years was co-host of an astronomy radio program on the local NPR affiliate.

**Parker, Jessica**

NASA Jet Propulsion Laboratory – Pasadena CA  
 Staff Assistant  
 jessica.a.parker@jpl.nasa.gov  
 818-354-6986

Jessica Parker graduated from California State University, Long Beach, in 2009 with a Bachelor of Fine Arts degree in drawing and painting. This year she received her Masters of Arts in Management from Azusa Pacific University. She began her career at the Jet Propulsion Laboratory in August of 2012 and now serves as the Administrative Staff Assistant for the Education Office, Higher Education Group. With her previous experience working with Leslie Lowes and the CP4SMPVC community and Reverse Site Visits, Jessica is assisting with the travel logistics and event coordination of the 2016 CP4SMP Reverse Site Visit.

**Patel, Srujal**

Aerospace Engineering, Georgia Tech – Atlanta GA  
 Research Engineer II  
 srujal.patel@aerospace.gatech.edu  
 404-512-9294

Mr. Srujal Patel serves as the research faculty at Guggenheim School of Aerospace Engineering (AE) at Georgia Institute of Technology. Mr. Patel earned his dual M.S. degrees in Aerospace Engineering and Applied Mathematics at Georgia Tech with specialization in Applied Numerical Analysis and Computational Fluid Dynamics/Aerodynamics. After joining as the research faculty, Mr. Patel worked as project manager for the Manufacturing Experimentation and Outreach (MENTOR) program - an initiative aimed at introducing new design tools and collaborative practices of making to high school students across the United States - sponsored by Defense Advanced Research Projects Agency (DARPA). Mr. Patel has also served as Project Manager for DARPA's MENTOR2 program which involved developing project kits and curricula to train the U.S. armed forces in understand, troubleshoot, repair and adapt electromechanical systems. Mr. Patel also teaches courses in Systems Engineering, Aerodynamics and Digital Design & Manufacturing at School of AE at Georgia Tech. Currently, Mr. Patel serves as Project Manager for Innovative Mars Exploration Education and Technology (IMEET) program - funded under NASA's CP4SMPVC+ grant – in which Georgia Tech will develop curriculum and project kits that will be used during the summer camps to be run at partnering Informal Education Institutes.

**Porter, Tim**

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 Project Director  
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Tim Porter is Project Director at Boston Children's Museum with 24 years as an exhibit and program developer, grant writer, and author. His work includes: "MySky", a NASA-supported exhibit that engages families in astronomy; "Beyond the Chalkboard", the world's first online activity resource for afterschools, used by programs across the world; "Our Sky", an afterschool ESS project, bringing NASA resources to "Beyond the Chalkboard"; "Peep's World", an NSF-funded exhibit and research project; "Small World", an exhibition showcasing macrophotographs taken by children alongside Tim at the Museum; and "Learning Together", an IMLS-funded training curriculum addressing staff engagement of families in informal museums. Tim is also Director of the Boston Mini Maker Faire. "Beyond the Chalkboard" was awarded the 2009 ACM Promising Practice Award, and 2012 Best of the Web, Education Website by Museums and the Web. In 2012 Tim was also named a Noyce Leadership Institute Fellow. Tim lives in Boston with his wife and children. He is an avid musician and cook, who spends much of his time trying to convince his youngest child not to lick everything in sight, and then reminding himself that sensory experiences are a critical, if at times unfortunate, part of children exploring their world.

**Romaguera, Libby**

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Libby Romaguera is from New Orleans, Louisiana. She is a graduate of Loyola Law School and has been with the NASA Shared Services Center (NSSC) in Stennis Space Center, Mississippi since February 2006. She currently works in the Research Activities Branch of Procurement as both a Grants and Contracts Officer. Libby is certified in Grants Management from Management Concepts and serves as the NSSC Grant Officer point of contact for NASA Ames Research Center, NASA Headquarters Education and NASA Headquarters Planetary Science group and Astrophysics. Other administrative responsibilities she holds include; Lead Backup for Grants; award and administer Grants and Cooperative Agreements, complex Cooperative Agreements; Administrative Contracting Officer for the NASA Ames Research Center for SBIR/STTRs; and point of contact to monitor fully funded grant compliance, indirect rate compliance, drawdown, FSRS, FPDS-NG, and high-risk recipients.

**Rountree-Brown, Maura**

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Maura Rountree-Brown has worked for NASA for 25 years in the area of Education and Public Outreach and in professional development. She has managed projects and partnerships for both space missions and for programs across NASA centers. She has designed and developed educational products, web sites, videos, articles and professional development workshops in support of missions like Deep Impact and QuikScat. Her work has been integrated with both formal and informal institutions and her outreach and education efforts have supported pre-school through adult audiences.

**Rowan, Tammy**

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Tammy Rowan has been a member of the NASA Team since 1990, beginning her career in the then NASA Marshall Space Flight Center (MSFC) Propulsion Laboratory as administrative assistant. Since 1990 she has held positions of increasing responsibility and complexity, including serving on the Center's Executive Staff. She is currently the MSFC Academic Affairs Office Manager in the Office of Human Capital. She was competitively selected as Assistant Manager in October 2006, but was elevated to her current position upon retirement of the Manager in January 2007. Before accepting the job as Assistant Manager, Ms. Rowan was the Educational Technology Program Manager at NASA Headquarters within the Technology & Products Office, in the Office of Education. Ms. Rowan has also served as MSFC's Educational Alliances (Informal Education) Lead Education Specialist in the Customer & Employee Relations Directorate, Education Programs Department. She is currently Acting in a transition support role as the STEM Education and Accountability Program (SEAP) Director at NASA HQ in Office of Education. Ms. Rowan holds an Associate of Applied Science in Marketing. She earned a BS in Organizational Management from Oakwood University in Alabama and is a graduate of the Florida Institute of Technology, where she graduated with her Masters in Information Systems, an MIS degree, in 2004.

**Rugg, Karen**

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As the lead for communications and education at NASA's Aeronautics Research Mission Directorate (ARMD), Karen Rugg is responsible for ensuring that directorate and agency communications activities and products are accessible, accurate, impactful, and indicative of ARMD's goals and benefits to the flying public. She integrates communications efforts across web, social media, public engagement, media and collateral distribution platforms for ARMD, and co-leads the agency's Aeronautics Research Campaign Team. Previously she was a writer and then a strategic communications team lead with ARMD since 2005. Prior to working for NASA, as owner of Karlyne Creative she completed projects for clients ranging from the Afterschool Alliance to the Challenger Center for Space Science Education. She was also communications and congressional relations director for the National Space Society. Rugg has several group and individual commendations from NASA including a NASA Headquarters Special Service Award. She has a bachelor's degree in speech communications from the State University of New York at Geneseo, and she is a musician for Washington National Cathedral labyrinth walks.

**Rutzke, Corinne**

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Corinne Johnson Rutzke, Ph.D., earned a BS-Plant Pathology (The Ohio State University) MS-Seed Technology and PhD-Controlled Environment Agriculture (Cornell University). Rutzke worked as a plant scientist and teacher at NASA Kennedy Space Center's Plant Space Biology Laboratory. Rutzke also served as Science Coordinator and Astronaut/Cosmonaut Crew Trainer for several Space Shuttle mission life sciences experiments. Currently Rutzke serves as Director of Bioenergy and Bioproducts Education Programs at Cornell University and Director of Sponsored Programs at Wings of Eagles Discovery Center. In 2012 she was named one of the "100 Buckeyes you should know" by The Ohio State University for contributions to bioenergy education. Rutzke lives in Ithaca, NY and runs a small organic vegetable farm with her husband Mike, children Mikey and Ella.

**Sanborn, Brenden**

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Brenden Sanborn serves as the lead for STEM Engagement at NASA Ames Research Center (ARC). Mr. Sanborn joined NASA as a "Pathways Student" to redesign and on-site informal education field trip experience for elementary students. From there he transitioned to a civil servant and led informal education, eventually transitioning to his current role. Mr. Sanborn has served as a PI for two previous CP4SMPVC grants. In addition, he also specializes in partnerships, contract management, and project management. Before joining NASA, Mr. Sanborn worked directed camps, designed corporate camp models, and consulted in informal education in both non-profit and private sectors.

**Santiago, Glorymill**

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Graduated from the University of Puerto Rico with an MS in Pure Mathematics has been the Integrated Science Multi use Laboratory (ISMuL) Director for the last ten years. This project, belonging to the University of Puerto Rico, emphasizes and encourages middle and high school students to study STEM careers. Also improves and enhances the teaching of science and mathematics through workshops and seminars to teachers at all levels.

**Schrage, Daniel**

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Dr. Daniel P. Schrage is a professor in the School of Aerospace Engineering at Georgia Tech since 1984. He also is the Director of the Integrated Product Lifecycle Engineering (IPLE) Laboratory and the Vertical Lift Research Center of Excellence (VLRCE). Prior to coming to Georgia Tech Dr. Schrage was an engineer, manager and senior executive with the Army Aviation Research and Development Command (AVRADCOM) and the Army Aviation Systems Command (AVSCOM). As a senior executive he served as the Associate Technical Director for Science & Technology of the Army Aviation Laboratories, including those co-located with the NASA Centers. Dr. Schrage was also a combat aviator, commander, and operations officer in South Vietnam and a nuclear weapons commander in Europe. Dr. Schrage has a BS in Engineering from USMA, West Point NY; a in Aerospace Engineering from Georgia Tech, a MBA from Webster University and a DSc in Mechanical Engineering from Washington U. (St. Louis). He has over 200 publications and is a Fellow of both the AIAA and AHS.

**Semmens, Kathryn**

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Kathryn Semmens, is the Science Director of the Nurture Nature Center. She holds a Ph.D. in environmental and earth sciences from Lehigh University, along with a master's degree in marine policy from the University of Delaware and a bachelor of science in environmental studies from Ursinus College. Kathryn was employed previously as a postdoctoral associate at the Agricultural Research Service of the United States Department of Agriculture and has also worked for the Pew Environment Group in Washington, D.C. Her awards include a NASA Earth and Space Science Fellowship for doctoral research, a Udall Environmental Scholarship and a EPA Greater Research Opportunity Fellowship for her undergraduate studies. Kathryn's interests focus on the nexus of science, policy, and community. Her responsibilities at NNC are to help advance the organization's outreach efforts on scientific and environmental issues generally, with a special emphasis on floods, climate change, and social science research.

**Sharpe, Julie**

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Julie Sharpe is President of Sharpe Solutions, LLC, a small company providing evaluation, grant writing, community assessment, board development, resource development, and strategic planning for school systems, technical colleges, non-profit organizations, museums, state agencies and foundations. Sharpe has a M.S. in geography from Arizona State University and a B.S. in geography from the University of Georgia. She is a 1995 graduate of Leadership Georgia, was recognized for her contributions to the children of Georgia by the House of Representatives in 2000, and has won numerous state and local awards for community service. For nearly three decades, Sharpe Solutions has implemented and evaluated programs in family support, community health, early learning, afterschool, juvenile justice, child abuse/neglect prevention, substance abuse prevention, STEM, adult literacy, job training and agriculture. Sharpe, a member of the American Evaluation Association, is data manager of Georgia KIDS COUNT and has developed an array of user-friendly data tools that aid in the use and visualization of local, state, and national data. Sharpe Solutions is the external evaluator for the Museum of Aviation NASA-funded STEM education program, a NSF STEM initiative for technical colleges and high schools, and four Governor's Office of Student Achievement Education in Innovation grants.

**Sladek, Mary**

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Mary Sladek has more than 25 years of experience in competitive grants management, program evaluation and STEM education accountability from assignments at NASA and the National Science Foundation. In 2007 after 18 years at NSF, Mary joined NASA Headquarters Office of Education where she launched the "Competitive Program for Science Museums, Planetariums and NASA Visitor Centers" as required by Congress. At NASA she has engaged with for- and non-profit groups such as Sally Ride Science and the Center for the Advancement of Informal Science Education and federal entities, including NOAA's Environmental Literacy Grants and the National Institute for Food and Agriculture (4-H). Ms. Sladek holds the Master of Government Administration degree from the Fels Institute of Government, University of Pennsylvania. She is a Phi Beta Kappa graduate of the University of Connecticut, Storrs. Ms. Sladek began in the US government as a Presidential Management Intern in 1989.

**Smith, Kayla**

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Kayla Smith works in the Office of Education at Johnson Space Center (JSC). She has served as the Informal Education Lead in the office for the last year and a half. Kayla started with NASA in 2011 as an intern and followed the NASA pipeline into a graduate Pathways Internship and ultimately to a full time position. In addition to her informal education role, she has been a member of the JSC Internships team, managed a high school robotics activity and co-managed NASA Community College Aerospace Scholars. She received her undergraduate degree in Astronomy from Columbia University and her masters in Space Education through Embry Riddle Aeronautical University.

**Smith, Shaun**

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Shaun Smith graduated from California Polytechnic, San Luis Obispo, with a Bachelor of Science in Biochemistry. While there, he completed a senior capstone project to study self-replicating prion proteins. After graduation, he worked as an environmental chemist, and later as a wine chemist. He moved from the Central Coast to Palmdale to teach high school chemistry and other subjects, and in parallel, coached high school volleyball and soccer. He transitioned from teaching to managing education projects for the AERO Institute, a NASA Armstrong Flight Research Center (AFRC) partner. During his tenure at AERO, he supported the Stratospheric Observatory for Infrared Astronomy, or SOFIA, program by writing test plans and developing automation test software. In 2015, he accepted a position as an AST Technical Manager and the Pre College Lead within AFRC's Office of Education. Some of his personal interests include playing volleyball, hiking, video games, politics and the stock market.

**Sovik, Nathan**

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Dr. Sovik is currently the University Affairs Officer for the Stennis Space Center Education Office. Previously he was a senior scientist within the Applications Research Division. Prior to that, he managed the NASA Commercial Remote Sensing Program's R&D division. His expertise is in environmental policy modeling and analysis, GIS and remote sensing, experimental design and statistical analysis, software design, and systems integration. Major past projects have included the development of applications programs in precision agriculture, natural resource management, and management information systems. He has carried out independent research in public lands policy, air pollution modeling, forest biometrics, and water quality monitoring. Sovik has worked for NASA for seventeen years. Prior to joining NASA, he worked for Lockheed Martin Space Operations, the Columbia (University) International Earth Science Information Network, Ford Motor Company, as well as being a teacher at the high school, undergraduate, and post-graduate levels. He earned both of his graduate degrees at the University of Michigan.

**Stanley, Theresa**

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Theresa Stanley is from Gulfport, Mississippi. She has been a Grants Officer with the NASA Shared Services Center (NSSC) in Stennis Space Center, Mississippi for eight years. Theresa recently was promoted to the Grant Lead position as of August 2016. She was the NSSC Grant Officer point of contact for NASA Ames Research Center, NASA Headquarters Education and a part of NASA Headquarters SMD group. Theresa has been with the NSSC since opening in March 2006. She has received her Bachelor of Arts in Organizational Management in 2007. She was a recipient of the NASA Space Flight Awareness Honoree Award in January of 2016, she was awarded the Silver Achievement Medal in April 2014 and was selected as the NSSC Contract Specialist of the Year for 2013 and 2014. She is a Certified Grants Management Specialist and has completed the Grants Management Certificate Program from Management Concepts. She is also a graduate of the NASA FIRST (Foundations of Influence, Relationships, Success & Teamwork) program.

**Sturgeon, Keni**

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Keni Sturgeon is currently the Director of Science and Education at Pacific Science Center in Seattle, where she oversees the education and programming work of the institution. She is a museum professional with both experience in private not for profit and public institutions of varied types and sizes. In addition, she has been an instructor for numerous museum studies and anthropology courses for graduate and undergraduate students. Keni is a Peer Reviewer for the American Alliance of Museums (AAM) and is on the Board of Directors for the Western Museums Association (WMA). She has been a grant reviewer for the State of Oregon's Heritage Department, the National Endowment for the Humanities (NEH), the National Oceanic and Atmospheric Administration and the Institute of Museums and Library Services (IMLS). Prior to coming to the Science Center, Keni served as curator and museum director at the Willamette Heritage Center since its formation on January 1, 2010. Before that she was Mission Mill Museum's curator and assistant director; curator of education and programs for Brown University's Haffenreffer Museum of Anthropology; curator and director of Western Oregon University's Jensen Arctic Museum; and assistant director of education at the Chesapeake Bay Maritime Museum.

**Swinford, Clare**

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Ms. Swinford is the Director for Georgia's NASA Regional Educator Resource Center (RERC). She received a dual degree in Theatre and Arts Management from Mary Baldwin College in 1982. Ms. Swinford served as the Assistant Managing Director of the Grand Opera House in Macon, Georgia from 1983-1993. In 1995 she completed a Teacher Certification program at Mercer University and began teaching at The Westfield Schools in 1996 until 2002. Ms. Swinford joined the Museum of Aviation in July 2007 to organize and manage the newly relocated NASA Regional Educator Resource Center. In collaboration with local and state school systems and educational organizations, she initiated the NASA STEM Educator Workshop Series, which provides monthly professional development workshops for Georgia teachers. The workshops are led by education specialists from NASA's Educator Professional Development Collaborative and other NASA programs including the Georgia Space Grant Consortium, Network of Educator Astronaut Teachers, and Solar System Ambassadors. A part of this Workshop Series includes Georgia's NASA STEM Conference, an annual event established to showcase NASA Education opportunities. Ms. Swinford collaborates with the Middle Georgia Regional Education Service Agency and serves on the committee to provide a STEM Endorsement for Georgia educators. She also serves as a Space Foundation Teacher Liaison Officer since 2014.

**Taylor, Kay**

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Dr. Kay Taylor is the Director of Education at the U.S. Space & Rocket Center. Her background is in media messaging and higher education. In almost 15 years of collegiate teaching, Taylor developed and taught an array of communication courses ranging from introductory, skills-based writing and design courses to capstone research-based courses and cross-disciplinary honors seminars. She created an assessment and development plan for curriculum review in her home department of journalism that became the university-wide blueprint for curriculum development, implementation and assessment at Appalachian State University. She has published and presented peer-reviewed original scholarship on media effects and political media and has co-authored a textbook on communication ethics. She established a digital storytelling platform for her students and worked with high school newspapers, coordinating research symposia and competitions for aspiring journalists. Early in her career, she worked at a 200,000-circulation daily metropolitan in Alabama and managed a weekly newspaper in Georgia. Throughout her career, she has crafted all manner of marketing and public relations campaigns in addition to reporting. She also served as a technical editor for a Georgia environmental firm associated with a DoE/DoD Superfund site in South Carolina. She is the co-Investigator on NASA grants NNJ13ZBG001N Space Camp Earth Observation Lab and NNH15ZDA004C Space Racers: Educating the Next Generation of Explorers about NASA's Missions. She holds a bachelor's degree in journalism from Auburn University, a master's degree from the Grady College of Journalism, University of Georgia, and a doctorate in communication from the University of Alabama.

**Trautmann, Charlie**

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Charlie Trautmann is executive director of the Sciencenter, a hands-on museum in Ithaca, NY. Beginning as the first employee in 1990, he coordinated funding and construction of the museum, a facility built largely by 4,000 volunteers, working in three phases over 10 years, the organization now serving 100,000 visitors onsite and 1 million offsite through its traveling exhibitions. Charlie has overall responsibility for organizational vision, planning, external relations, and fundraising. Trautmann serves on the faculty of Cornell University as adjunct professor of engineering and is a member of the board of directors of the Association of Children's Museums in Washington, DC, an international organization serving 300 museums worldwide. He has also served on the board of ASTC. He was the founding president of the Discovery Trail, a regional museum-library collaboration in Ithaca and is past-president of the board of the Ithaca Montessori School. He currently chairs the board of directors of Tompkins County Area contributes regularly to conferences and has published over 100 articles on museum management and other subjects. He has received three Alexander von Humboldt Fellowships from Germany and has spent two years pursuing research interests in Europe related to museums, sustainability, and engineering. He is a registered professional engineer, certified professional geologist, licensed radio amateur, and experienced sailor, having once worked as first mate on a 90-foot schooner. When not at work, Charlie enjoys trail running, biking, tennis, and squash.

**Walker, Darlene**

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Darlene S. Walker serves as Deputy Division Chief of the Office of Education at the NASA John H. Glenn Research Center (GRC) at Lewis Field in Cleveland, Ohio. In this capacity, she assist in the development and implementation of a portfolio of innovative partnerships and programs that leverage NASA's unique mission content, facilities and workforce to improve the quality of science and math education nationally. The Office of Education collaborates with Universities, Museums, K-12 School Districts and host of non-profit organizations to achieve its mission. In her current role, she assists in managing both Agency and Center supported K-12, Informal Education, and University Affairs Programs. Prior to this assignment, Ms. Walker, was responsible for managing the NASA Science, Education, Mathematics and Aerospace Academy (SEMAA), which was an innovative, national project designed to increase participation and retention of historically underserved and underrepresented K-12 youth in the areas of science, technology, engineering and mathematics. Ms. Walker is a native of Philadelphia. She holds a Bachelor of Science Degree in Business Administration from Drexel University. She has more than thirty-five years of federal service, and has served in various leadership positions throughout her career working in Logistics, Procurement, Human Capital and Education.

**Webb, Joules**

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Joules Webb has a passion and expertise for promoting STEM education through K-12 community outreach. She received a Bachelor of Science in Chemistry from Sam Houston State University, a Master of Education in Secondary Mathematics and Science from Our Lady of the Lake University, and is a PhD Candidate in Integrative STEM Education at Virginia Tech. She is a Texas-certified science teacher and Master Technology Teacher. With a career spanning 20+ years, Joules has worked in education, non-profit, and industry roles. Currently, Joules serves as the Associate Director of The University of Texas at San Antonio's Prefreshman Engineering Program. As the Associate Director of PREP, Joules is responsible for the curriculum taught across the State and Nation. Joules is an advocate in the community for STEM education with a talent for connecting P-20 education needs with available opportunities and resources. Joules serves the community through volunteer activities such as participation on school advisory boards, the Texas Girls Collaborative Project Regional Leadership Team, and the Alamo FIRST robotics executive advisory board. Joules brings a depth and breadth of STEM education knowledge to the community, acting as a synthesizer fostering collaborative partnerships among academia, industry, and the military/government.

**Weigel, Elsie**

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Elsie Weigel has had an extensive career in communication and public outreach with NASA, the Department of Energy, and national nonprofit associations. She works with various NASA institutional partners and with informal education organizations to create exhibits, planetarium programs and literature to keep the US informed about NASA's changing programs and activities. She is currently directing various outreach activities from NASA Headquarters and is the NASA Museum Alliance Technical Officer for the NASA's Human Exploration and Operations Directorate.

**Winterton, Joyce**

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Joyce Winterton, Ph.D., is the Senior Advisor for Education and Leadership Development at the NASA Goddard Space Flight Center's Wallops Flight Facility. Wallops specializes within NASA in the area of scientific, technology and educational projects involving suborbital and small orbital payloads including sounding rockets, high altitude balloons and aircraft. Joyce also served as NASA's Assistant Administrator for Education, directing the development and implementation of the agency's education programs. Before coming to NASA, she served as the Director of Education Programs for USA TODAY. Dr. Winterton founded Winterton Associates, a consulting firm that specialized in working on projects with business and industry, education, and government. Winterton was the executive director of the National Council on Vocational Technical Education, a Presidential Advisory Council providing recommendations to the President, Congress and the Secretary of Education. She also served as the Deputy Assistant Secretary for vocational and adult education in the U.S. Department of Education and was the first director of the Presidential Academic Awards program. She was a professional staff member for the U.S. Senate Committee on Labor and Human Resources.

**Wolfe, Becky**

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Becky Wolfe is the Manager, Science Education and Resources at The Children's Museum of Indianapolis. In this role, she oversees the museum's science labs, coordinates science programs for students, teachers and families and serves on science exhibit development teams. Ms. Wolfe is responsible for developing and presenting teacher professional development in science at the museum and at conferences around the country. In addition, Ms. Wolfe serves as project manager several STEM education grants for the museum and serves as the museum's liaison on several state and local STEM Education organizations. At the museum, Ms. Wolfe has also served as the museum's Science Programmer, focusing solely on science programs for schools and teachers. Prior to joining the museum in 2007, Ms. Wolfe taught 5th grade math and science at St. Michael Catholic School in Louisville, KY. Ms. Wolfe received a BA degree in education from the University of Northern Iowa and a M.Ed., specializing in science education from the University of Louisville.

**Ximenes, Samuel**

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Samuel Ximenes is an aerospace professional and Space Architect. He is the Founder and Managing Partner of XArc Exploration Architecture Corporation, and Founder and Board Chair for the WEX Foundation, a non-profit dedicated to advancing careers in space exploration. Mr. Ximenes has over 25 years of extensive experience in the aerospace industry providing products and services to NASA, DoD, and international aerospace programs. He is a subject matter expert published in the field of space architecture and systems engineering for aerospace habitability systems. Throughout his career he has supported NASA and the commercial space industry on various space architecture projects including commercial spaceport development, design concepts for lunar bases, Mars habitation and space station habitability studies, developing concept design, analysis and trades for lunar outposts, and site planning for planetary surface systems, as well as mission planning, operations & utilization. He has worked for Grumman Aerospace Corporation leading design integration efforts of the Japanese and European laboratory modules for NASA's Space Station program. He held executive management positions at Lockheed Martin, L-3 Communications, and Futron Corporation where he was responsible for growth and development of business strategies for their respective business units in advanced programs and technology insertion for space systems.

# Tuesday: Invited Speaker List

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Gary Blackwood, Exoplanet Exploration Project Manager; [Gary.H.Blackwood@jpl.nasa.gov](mailto:Gary.H.Blackwood@jpl.nasa.gov)

Susan Callery, Manager, Earth Public Engagement; [Susan.H.Callery@jpl.nasa.gov](mailto:Susan.H.Callery@jpl.nasa.gov)

Michael "Mic" Cox, Data Scientist; [Michael.Cox@jpl.nasa.gov](mailto:Michael.Cox@jpl.nasa.gov)

Jason Craig, Visualization Technology Applications and Development, Technical Producer;  
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Ann Devereaux, Mars 20/20 Flight System Systems Engineer; [Ann.S.Devereaux@jpl.nasa.gov](mailto:Ann.S.Devereaux@jpl.nasa.gov)

Josh Fisher – ECOSTRESS Project Scientist; [Joshua.B.Fisher@jpl.nasa.gov](mailto:Joshua.B.Fisher@jpl.nasa.gov)

Kevin Hussey, Visualization Technology Applications and Development Manager; [Kevin.J.Hussey@jpl.nasa.gov](mailto:Kevin.J.Hussey@jpl.nasa.gov)

Randy Jackson, Internet Manager; [Randal.K.Jackson@jpl.nasa.gov](mailto:Randal.K.Jackson@jpl.nasa.gov)

Sol Kim, Geoinformatics & Mission Applications, [Sol.Kim@jpl.nasa.gov](mailto:Sol.Kim@jpl.nasa.gov)

Felix Landerer, GRACE/GRACE-FO Deputy Project Scientist; [Felix.W.Landerer@jpl.nasa.gov](mailto:Felix.W.Landerer@jpl.nasa.gov)

Mallory Lefland, Entry Descent & Landing Systems Engineer; [Mallory.Lefland@jpl.nasa.gov](mailto:Mallory.Lefland@jpl.nasa.gov)

Steven Levin, Juno Project Scientist; [Steven.M.Levin@jpl.nasa.gov](mailto:Steven.M.Levin@jpl.nasa.gov)

Sarah Milkovich, Science Systems Engineer; [Sarah.M.Milkovich@jpl.nasa.gov](mailto:Sarah.M.Milkovich@jpl.nasa.gov)

Courtney O' Connor, Juno and Europa Public Engagement Lead; [Courtney.M.OConnor@jpl.nasa.gov](mailto:Courtney.M.OConnor@jpl.nasa.gov)

Bob Pappalardo, Europa Mission Project Scientist; [Robert.Pappalardo@jpl.nasa.gov](mailto:Robert.Pappalardo@jpl.nasa.gov)

Jo Pitesky, Cassini Project Science System Engineer and Technical Group Supervisor for Science System Engineering; [Joeliza.Pitesky@jpl.nasa.gov](mailto:Joeliza.Pitesky@jpl.nasa.gov)

Annie Richardson Public Outreach Specialist, Earth Public Engagement; [Annie.H.Richardson@jpl.nasa.gov](mailto:Annie.H.Richardson@jpl.nasa.gov)

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Kristen Walbolt, Web Producer, Earth Sciences; [Kristen.L.Walbolt@jpl.nasa.gov](mailto:Kristen.L.Walbolt@jpl.nasa.gov)

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# Wednesday & Thursday: Invited Speaker List

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Blaine Baggett, Director for Communications and Education, JPL; [Blaine.Baggett@jpl.nasa.gov](mailto:Blaine.Baggett@jpl.nasa.gov)

Lindsay Bartholomew, Director of Technology and Youth Development, Phillip and Patricia Frost Museum of Science; [lbartholomew@frostsience.org](mailto:lbartholomew@frostsience.org)

Anya Biferno, Public Engagement Specialist, Exoplanet Exploration Program, JPL; [Anya.A.Biferno@jpl.nasa.gov](mailto:Anya.A.Biferno@jpl.nasa.gov)

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David Chambers, Director, Program Planning and Evaluation Division, NASA Office of Diversity and Equal Opportunity; [David.R.Chambers@nasa.gov](mailto:David.R.Chambers@nasa.gov)

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Marc Drews, Director of Education Programs and Partnerships, Edventure Children's Museum; [mdrews@edventure.org](mailto:mdrews@edventure.org)

Kirsten Ellenbogen, President & CEO, Great Lakes Science Center/NASA Glenn Visitor Center; [kirsten.ellenbogen@glsc.org](mailto:kirsten.ellenbogen@glsc.org)

Mark Gangloff, Special Agent in Charge, NASA Office of the Inspector General; [Mark.Gangloff@nasa.gov](mailto:Mark.Gangloff@nasa.gov)

Bev Girten, Director, Institutional Engagement, NASA Office of Education; [Beverly.E.Girten@nasa.gov](mailto:Beverly.E.Girten@nasa.gov)

Chance Grannan, STEaM Network Manager, Saint Louis Science Center; [Braton.C.Grannan@slsc.org](mailto:Braton.C.Grannan@slsc.org)

Anne Holland, Community Engagement Manager, Space Science Institute; [aholland@spacescience.org](mailto:aholland@spacescience.org)

Tamara Hudgins, Executive Director, [Girlstart](http://Girlstart.org); [tamara@girlstart.org](mailto:tamara@girlstart.org)

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Kyrie Kellett, Senior Learning and Community Engagement Specialist, Oregon Museum of Science and Industry

Dani LeBlanc, Planetarium Show Producer, Museum of Science, Boston; [dleblanc@mos.org](mailto:dleblanc@mos.org)

Carl Lewis, Director, Fairchild Tropical Botanic Garden; [clewis@fairchildgarden.org](mailto:clewis@fairchildgarden.org)

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Jim McClure, SFOF Maintenance and Operations Engineer, JPL; [James.R.McClure.Jr@jpl.nasa.gov](mailto:James.R.McClure.Jr@jpl.nasa.gov)

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# NOTES

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