# Sharing the Adventure with the Student: Exploring the Intersections of NASA Space Science and Education - A Workshop

**December 2-3, 2014**  
National Academy of Sciences Building, Auditorium  
2101 Constitution Ave NW, Washington DC

## Tuesday, December 2, 2014

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<tr>
<th>Time</th>
<th>Event</th>
<th>Presenter</th>
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<tr>
<td>7:30 am</td>
<td>Registration Opens</td>
<td>Michael Moloney</td>
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<td>SSB Director</td>
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<td>Brett Moulding, Utah Partnership for Effective Science Teaching and Learning</td>
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<td>8:30 am</td>
<td>Welcome and Introduction Outlining the Goals of the Workshop</td>
<td>Michael Moloney</td>
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<td>8:40 am</td>
<td>Welcome from NASA</td>
<td>Kristen Erickson</td>
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<td>NASA SMD</td>
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<td>8:50 am</td>
<td>Introduction to the Keynote Speaker</td>
<td>John Mather</td>
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<td>NASA GSFC</td>
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| 8:55 am| Keynote Presentation:  
  How do Authentic Experiences Reach Students  
  Interaction with the audience                  | John Mather                                          |
|        |                                                                        | NASA GSFC                                            |
|        |                                                                        | (35 minutes)                                        |
|        |                                                                        | (20 minutes)                                        |
| 9:50 am| Setting the Stage  
  Discussion Panel: NASA Education Forum Leads  
  Laura Peticolas, University of California, Berkeley  
  Theresa Schwerin, Institute for Global Environmental Strategies  
  Stephanie Shipp, Lunar and Planetary Institute  
  Denise Smith, Space Science Telescope Institute | (40 minutes)                                        |
| 10:30 am| Coffee Break                                                          |                                                     |
SESSION 1: A New Vision for K-12 Science and Engineering Education and NASA SMD Education

Moderator: Brett Moulding, Utah Partnership for Effective Science Teaching and Learning

Guiding Questions and Focus:
- Present an overview of NGSS and the role of NASA in supporting science and engineering education.
- How can/does NASA interact effectively with the education system to support K-12 science and engineering education?
- What opportunities does NASA SMD have to better support the new vision described in the NRC’s A Framework for K-12 Science Education?
- How can/does NASA integrate the science and engineering talent of NASA SMD into the SMD education programs?

Keynote Presentation: (30 minutes)
Stephen Pruitt, Achieve

Panel Discussion: (20 minutes)
Maya Garcia, Office of the State Superintendent of Education D.C.
John Ristvey, University Corporation for Atmospheric Research
Holly Ryer, Space Telescope Science Institute
Sam Shaw, South Dakota Department of Education

Audience Joins the Discussion (20 minutes)

SESSION 2: Space Science Education Curriculum and Materials

Moderator: Richard McCray, NAS, University of California, Berkeley

Guiding Questions and Focus:
- How do the instructional strategies advocated for in the NASA education programs match the Vision for Science Education described in the NRC Framework for K-12 Science Education?
- How can NASA best encourage and support teachers to use NASA education resources in the classroom?
- What is the mechanism by which NASA education programs’ instructional content material will be aligned to the Framework and NGSS?
- How will NASA programs measure how well NASA EPO materials align to the NGSS?
- Information technology is changing the way science is done (data mining and simulations, for example) – what new possibilities does this development raise for the science classroom?

Keynote Presentation: (30 minutes)
Edna DeVore, SETI Institute
Bringing Space Down to Earth and into the Classroom
Panel Discussion:  
Beth Johnston, Principal at Endeavour Elementary School  
Mordecai Mac Low, American Museum of Natural History, Columbia  
Cassandra Soeffing, Institute for Global Environmental Strategies  
Belinda Wilkes, Chandra X-Ray Center  

Audience Joins the Discussion  

3:00 pm Coffee Break  
3:30 pm SESSION 3: Collaboration Among NASA SMD and K-12 Districts, Schools, and Teachers  
Moderator: Mitchell Nathan, University of Wisconsin-Madison  

Guiding Questions and Focus:  
- What are institutional arrangements that provide effective platforms for facilitating successful collaborations?  
- How are evidence-based models for successful collaborations or partnerships being communicated across NASA education programs?  
- How are proven models or strategies for scaling up and sustaining collaborations and partnerships being used in the NASA education programs?  
- What are the barriers to accomplishing common goals across collaborating organizations? How can these barriers be overcome?  

Keynote Presentation:  
Gordon Kingsley, Georgia Tech  
Building the STEM Partnership Toolkit: Choosing Your Spots Carefully, Measuring Twice, and Finding Your Spanner When You Need It  

Poster Session:  

Nancy Ali  
Space Sciences Lab  
Lindsay Bartolone  
Southwest Research Institute  
Lin Chambers  
NASA Langley Research Center  
Troy Cline  
NASA GSFC  
Anita Davis  
Sigma Space  
Bonnie Eisenhamer  
Space Telescope Science Institute  
Dorian Janney  
NASA GSFC  
Andrea Jones  
Planetary Science Institute  
Sheri Klug-Boonstra  
Arizona State University  
Keliann LaConte  
Lunar and Planetary Institute  
Kathleen Lestition  
Chandra X-Ray Center  
Nancy Maryboy  
David Begay  
Indigenous Education Institute  
Tony Murphy  
Globe  
Luisa Rebull  
Spitzer Science Center  
Daniella Scalice  
NASA Ames Research Center
Panel Discussion:  
Kathryn Flanagan, Space Telescope Science Institute  
James Lochner, Universities Space Research Association  
Michelle Thaller, NASA GSFC  

(25 minutes)

Audience Joins the Discussion  
(30 minutes)

5:30 pm Adjourn for the day

5:30 - 7:30 pm Reception in the Great Hall  
All workshop participants are welcome
Wednesday, December 3, 2014

8:00 am  Registration Opens

9:00 am  Welcome
  
  Summary of Day 1
  
  Committee Co-Chairs
  Phil Christensen
  Brett Moulding

9:15 am  SESSION 4: Supporting Science and Engineering Teachers through Professional Development

  Moderator: Albert Byers, National Science Teachers Association

  Guiding Questions and Focus:
  - How are standards for professional development used in NASA professional development programs?
  - How do the mechanisms and programs by which NASA programs meet the needs of in-service teachers, and how does this differ from the ways NASA programs meet the needs of pre-service teachers?
  - What are the most effective and widely used delivery models (online, train the trainers, professional learning communities, summer seminars, internships) for NASA professional development programs?
  - What are example strategies for partnering scientists and educators?

  Keynote Presentation:
  Bill Penuel, University of Colorado, Boulder

  (30 minutes)

  Panel Discussion:
  Annette DeCharon, University of Maine
  Sheri Klug-Boonstra, Arizona State University
  Mariel Milano, Orange County Public Schools, Florida

  (25 minutes)

  Audience Joins the Discussion

  (35 minutes)

10:45 am  Coffee Break

11:15 am  SESSION 5: Part 1 – Evaluation of Education

  Moderator: Theresa Schwerin, Institute for Global Environmental Strategies

  Guiding Questions and Focus:
  - What are current leading theories of STEM education evaluation (e.g., evidence-based, logic models)?
  - Selecting the most appropriate assessment(s) for a given situation is a common challenge across education evaluation. What are leading factors or best practices that you recommend in selecting the most appropriate assessment(s) for a given situation?
The goal of many STEM-related professional development efforts is to facilitate a change or increase in teacher effectiveness that in turn increases student learning. Additionally, many efforts aspire to increase students’ awareness/interest in STEM careers or students’ desire to pursue more STEM-related coursework during high school and college. These impacts are sometimes challenging to capture as part of an evaluation. What are some methods or data that might shed light on these often elusive goals?

- What can we realistically measure? What can’t we?
- What are the attributes of the evaluation tools that are consistent with effective evaluation of education programs?

Keynote Presentation:  
Steve Schneider, WestEd  
Making the Right Choices: How to Get the Most Value out of eVALUation!

12:00 pm  
Lunch provided in the Great Hall

1:15 pm  
SESSION 5: Part 2 – Evaluation in Practice within NASA SMD

Moderator: Theresa Schwerin, Institute for Global Environmental Strategies

Guiding Questions and Focus:
- Why and how does NASA evaluate the programs it executes?
- What are examples of evidence that the evaluation of NASA’s programs is providing useful information to improve the programs?
- How does NASA make a difference in STEM education, and how is this known?
- What are the greatest challenges or barriers that people have encountered related to SMD education evaluation? What strategies have been used or recommended for addressing these barriers?
- How does the evaluation of NASA programs compare to the model presented for education by the speaker in Part 1 of this session?
- What is the mechanism by which the results of evaluation change NASA education programs?

Keynote Presentation:  
Hilarie Davis, TLC Inc.  
Using Evaluation to Increase and Measure the Impact of Education

Panel Discussion:  
Bonnie Eisenhamer, Space Telescope Science Institute  
Jenny Gutbezahl, Brandeis University  
Frances Lawrenz, University of Minnesota

Audience Joins the Discussion
SESSION 6: Enabling Actions

Moderator: James Manning, Education Consultant

Engage the audience in breakout groups related to each of the previous sessions.

Instructions (5 minutes)
Discussion/Breakout Groups Meet (40 minutes)

Breakout 1: Aligning to Standards
- What actions can NASA take to build upon, leverage, and/or expand its current efforts to align to and support the new vision described in the NRC’s A Framework for K-12 Science Education, NGSS, and other standards initiatives?
- What new opportunities can be explored, and what challenges need to be overcome?

Breakout 2: Curriculum Support Resources
- What actions can NASA take to build upon, leverage, and/or expand its current efforts to translate its science into curriculum support materials and resources for formal and informal education and encourage educator use?
- What new opportunities can be explored, and what challenges need to be overcome?

Breakout 3: Collaborations
- What actions can NASA take to build upon, leverage, and/or expand its current collaborations among scientists, teachers, and formal and informal education institutions?
- What new opportunities can be explored, and what challenges need to be overcome?

Breakout 4: Professional Development
- What actions can NASA take to build upon, leverage, and/or expand its current efforts to provide professional development support to pre-service and in-service teachers and informal educators?
- What new opportunities can be explored, and what challenges need to be overcome?

Breakout 5: Evaluation
- What actions can NASA take to build upon, leverage, and/or expand its current efforts in measuring and assessing its impact in science and engineering education?
- What new opportunities can be explored, and what challenges need to be overcome?

3:15 pm Coffee Break
3:30 pm  SESSION 6: Enabling Actions Continued

Moderator: James Manning, Education Consultant

Reporting of Group Discussions (10 minutes per group, 5 minutes for questions)

4:45 pm  Summary and Wrap Up

Committee Co-Chairs
Phil Christensen
Brett Moulding

5:00 pm  Adjourn