SMD Science Activation Desired Outcome:
To further enable NASA science experts and content into the learning environment more effectively and efficiently with learners of all ages.
Perspectives

Baselined in November 2016, this collaborative model enables over 200 partnerships through a network of science and community-based institutions using a “multiplier effect” across the U.S. to achieve Objectives. Includes a number of digital learning approaches maximizing SMD’s unique capabilities (e.g. ViewSpace). Each agreement uses independent evaluators to validate performance.
Partnering Opportunities

Heliophysics
Astrophysics
Planetary
Earth
Cross-divisional

SMD Assets (Content, SME’s, etc) *

Science Activation Provider(s)

Examples:
- Translate Datasets to useful information for users
- Alignment to education Standards and Decadal Questions
- Enable SMEs to share science with target audiences
- Effective Dissemination
- Open/transparent reporting
- Timely evaluation/relevant assessment
- Development of materials, per Needs Assessments

Enable STEM Education
Improve U.S. Science Literacy
Advance National Education Goals
Leverage Through Partnerships

Outcomes to Meet these SMD Science SciAct Objectives

Improve U.S. Science Literacy
Advance National Education Goals
Leverage Through Partnerships

Evaluation

* Divisions responsible for science content datasets, SME selection, and enabling flight opportunities.
2018 SMD Collective Relationships

SMD

NASA Hq

SMD Earth

SMD Space

Leads/PI’s

Content

Heliophysics
Astrophysics
Mars
Astrobiology
Earth
Planetary

Dissemination

Universe of Learning
PBS Learning Media
NASA eClips
Cosmoquest
Infiniscope
Surveys
NESSP
LabVentures

Audiences

Planetariums
Science Centers/Museums
Public and State Libraries
Challenger Centers
Girl Scouts
Educators

Infrastructure

APOD, Eyes,Treks, SVS, IDP, Wavelength, Solar System Ambassadors, Night Sky Network, American Camp AssociationAlice, National Parks, 3D Resources, JSC Astromaterials, Museum Alliance, LPI/smdepo.org

Independent Evaluation
2016 “Reach”

2017 Reach: Eclipse Libraries
NASA’s Universe of Learning
An Integrated Astrophysics STEM Learning and Literacy Program

Contact PI/Dr. Denise Smith for Free Resources and how to get involved: dsmith@stsci.edu
NASA’s Universe of Learning
An Integrated Astrophysics STEM Learning and Literacy Program

Direct Connection to NASA Content

New Science Results
Subject Matter Experts

Our Program Elements

Data Tools & Participatory Experiences

Multimedia & Immersive Experiences

Exhibits & Community Programs

Professional Learning Experiences

Our program is designed to advance SMD Objectives:
• Enable STEM learning
• Improve scientific literacy
• Advance National Education Goals
• Leverage through Partnerships

External Evaluation
Direct Connection to the Science Enables Rapid Response

October 16 & 20, 2017: Neutron Star-Neutron Star Merger results published

Multimedia

November 1, 2017

November 2, 2017

Informal Educator Professional Learning

Science Briefing with NASA SMEs

ViewSpace show disseminated to over 200 venues
SCIENCE RESOURCES

https://science.nasa.gov/toolkits/nasa-science-resources
Upcoming Opportunities

• Announcement 100th AGU in DC – Over 20 sessions including many led by SciAct team members. [https://agu.confex.com/agu/fm18/prelim.cgi/Program/1694](https://agu.confex.com/agu/fm18/prelim.cgi/Program/1694) Abstracts are due by August 1, 2018. Astro welcome!


• NASA Headquarters Office of Education invites organizations to apply to attend the Space STEM Forum to be held September 19, 2018 in Washington, D.C. at NASA Headquarters. The purpose of the Forum is to identify collaborative opportunities and leverage our individual STEM engagement efforts to maximize impact on students across the U.S. regarding space exploration as part of the upcoming 50th anniversary of the first Apollo moon landing. Abstracts are due by August 11, 2018. [https://www.fbo.gov/notices/3074c52c312b6de4e621a889bae576ab](https://www.fbo.gov/notices/3074c52c312b6de4e621a889bae576ab)


• WGBH PBS Learning Media release of Universe Learning Modules on August 15, 2018, to its 1.9M educator subscribers

• Earth and Space 2019 Toolkits - Includes activities designed for use in children’s museums, science centers and museums, public planetariums and observatories, and NASA visitor centers in the U.S. Activities are designed for family audiences with a range of experiences appropriate for visitors ages 4 through adult. Applications are due November 1, 2019. Learn more about 2019 toolkit and how to apply
HIGHLIGHTS
AstroViz 2018
Held at Caltech/IPAC June 13-15

Bring together visualization experts (providers and consumers) to re-energize a community of practice

GOALS

Explore the current and future state of astrovisualizations

Initial Outcomes

Broader engagement than in previous astrovisualization workshops
- **Who:** 67 attendees and 64 web-based participants from around the world including scientists, visualization experts, educators, and software developers.
- **Roles in Viz Community:**
  - content providers,
  - educators who use/adapt content for their audiences,
  - developers who enable new tools for content creation and dissemination, and
  - disseminators who provide wider distribution.

Facilitated opportunities for new collaborations
- Brought together multiple communities to build new partnerships.
- Discussions held:
  - tools,
  - asset sharing,
  - immersive technologies,
  - audience-driven needs,
  - best practices, and
  - visual storytelling.

Inform the NASA Sci-Act Visualization Working Group
- Input from the workshop will inform the NASA Sci-Act Visualization Working Group white paper.

Attendee Evaluation Results
- 93% of respondents agreed: the workshop “helped re-establish a community of practice”
- Majority of respondents are highly likely to:
  - further a research topic discussed at the workshop (75%),
  - adopt a new strategy or practice presented at the workshop (65%),
  - share resources with a colleague who did not attend (63%)

Credit: Astroviz 2018 / NASA’s Universe of Learning
• On April 14, 2018, Dr. Kimberly Arcand (Chandra/Smithsonian Astrophysical Observatory-SAO) organized with the Black Girls Code (BGC) New York Chapter, an all day workshop in Brooklyn, NY on “Coding the Universe with NASA”
• 40 students ages 9-13 worked with astronomers to use computers to create images of our Universe in 2D and 3D formats with hands-on activities
• Working with data from Chandra, Spitzer, Hubble and other telescopes, students experienced real world applications of science, technology and art, ending the day delivering presentations on their accomplishments to their families
• Speakers included Andrea Razzaghi Deputy Director of Astrophysics Division at NASA Headquarters, Jessica Harris STEAM Education Program Development Officer at National Radio Astronomy Observatory (NRAO), Scientist Emma Marcucci from the Space Telescope Science Institute, and volunteers from Chandra/SAO Kristin DiVona, Kayren Phillips and Aldo Solares
• Black Girls Code is a not-for-profit organization founded in 2011 by Kimberly Bryant that focuses on providing technology education for African-American girls
Project PANOPTES

Project PANOPTES is a beta project – our question:
Can members of the public participate in the discovery of transiting exoplanets using robotic telescopes they build themselves from store-bought components?

Yes they can! So far units have been used to observe transiting exoplanets, take astrophotography images, and observe solar system objects.

SME Partnership: NASA’s Universe of Learning made a strategic decision to partner with MacArthur genius grant winning SME Dr. Olivier Guyon on his existing project (PANOPTES) to achieve SMD level goals
Girls STEAM Ahead With NASA

- Initial results of participant surveys show those who recalled meeting a scientist or engineer were more likely to report learning a lot and becoming a lot more interested in astronomy and space science.

Impact is greatest for those who meet a scientist/engineer.

<table>
<thead>
<tr>
<th>Met scientist</th>
<th>Didn't meet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learned &quot;a lot&quot; about astronomy and space science</td>
<td>87%</td>
</tr>
<tr>
<td>Became &quot;a lot&quot; more interested in astronomy and space science</td>
<td>75%</td>
</tr>
</tbody>
</table>
QUESTIONS?
“Education is not the filling of a pail, but the lighting of a fire...and NASA is the spark”