2023
SCIENCE ACTIVATION
Astrophysics Advisory Committee
March 30, 2023

Kristen Erickson, Director
Science Engagement & Partnerships
Science Activation Impact!
By the Numbers Through 2022

**Accomplishments**

- **Active in 50 states, DC and 4 territories**
- **Initiated National Academies Assessment that will inform the next phase of the program**
- **Leveraged internally and externally to maximize impact (113 internal cross-collaborations agreements and 525 external partners agreements). Some examples:**
  - Community College Network – now 49 colleges (23 Hispanic-serving) in 25 states
  - Earth Science High School intern program increased 5x number of interns participating in 2022 summer program
  - Indigenous audiences served through partner agreements with 10 Tribal Nations
  - Aurorascaurus citizen science leveraged with digital learning experience through Infiniscope at Arizona State University
- **Collaborated with Department of Energy, Albert Einstein Educator Fellows:**
  - Initiated Math Challenge to help offset historic national learning loss
  - Developed “3D Thursdays” a monthly webinar for information exchange of science with rural educators across 12 states
- **Supported Artemis I student launch experience**

**50+ million reached in 2022**
world-wide across 89 countries, 50 million in the U.S. directly

**110** peer-reviewed publications
690+ citations

**100%**
All competitively-awarded teams focus on or support underserved communities

**745** subject matter experts ensure accurate and timely science content

**48** teams including 1,100 volunteers hosting over 50,000 events

**525** leveraged partnerships Doubled since 2016!
Who we are and What we do

Science Activation Leadership Team

Science Division POCs

Astrophysics: Dr. Hashima Hasan

Biological and Physical Sciences: Dr. Lisa Carnell

Earth Science

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<tr>
<th>Applied Sciences</th>
<th>Dr. Nancy Searby</th>
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<tr>
<td>Flight</td>
<td>Dr. Tahani Amer</td>
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<td>GLOBE</td>
<td>Dr. Allison Leidner</td>
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R&A  Dr. Barry Lefer
Coordinator Dr. Trena Ferrell

Fellows and Detaileees

Einstein Fellow: Luke Henke
OSTEM Detailee: Matt Pearce
Heliophysics: Dr. Kelly Korreck
Planetary Sciences: Dr. Michael Kelley

Newest addition: Clarence Bostic Learning & Integration
Investment by Division
Science Activation – Overachieved Broadening Participation Goal for Learners of All Ages in 2022!

Strategic Objective - Enable NASA science experts and content to engage more effectively and efficiently with learners of all ages (K to Gray)

Major Activities
- Each award has an independent evaluator and entire program has portfolio-level independent evaluation team
- All 36 competed projects have broadening participation:
  - Native American nations in OK, AK, NM, NC, ME
  - Undergraduate students at MSIs, including Puerto Rico
  - Underserved HS students
  - Neurodiverse learners
  - People who are blind or have low vision
  - Learners with physical disabilities
  - Community College students
- 9 projects with Earth systems, and/or Earth data focus. GLOBE Observer App doubled GLOBE reach since 2016!
- 8 projects with a Space science focus
- 4 projects focused on Subject Matter Expert (SME) engagement

Over 50M Learners Reached in 2022!
Up from 21M in 2021

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<th>Science Activation FY 2024 Request</th>
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Science Activation Budget Features
(funded within Astrophysics Research)

What’s Changed
• +29M more learners reached than in 2021
• Universal design for learning expanded and new tools applied to enhance accessibility for all learners
• In 2023, working with Independent Evaluators to derive common measures of impact across multiple projects
• Projects supporting more Hispanic-serving institutions in Puerto Rico, and southwestern U.S.
• Expanding Biological and Physical Sciences content into 380 schools in 45 states

What’s the Same
• Connecting science assets with life-long learners efficiently and effectively through communities and their networks with this collaborative, innovative model
• Funding Annular Solar Eclipse – 10/14/2023: Known as a “ring of fire” eclipse. Path covers areas from the NW to the Gulf of Mexico. Also funding Total Solar Eclipse – 04/08/2024, from Mexico through eastern U.S
• All materials developed in both Spanish and English
Citizen Science

Dr. Marc Kuchner
SMD Citizen Science Officer
Citizen Science Activated!

What’s Changed/What’s the Same

• Nine new citizen science projects released to the public in past year, for a total of 34 active projects
• New citizen science funding opportunity added: the Heliophysics Citizen Science Investigation (HCSI) Program
• New citizen science incentives in a Heliophysics Small Explorer (SMEX) Announcement of Opportunity and an Astrophysics Probe AO.
• Science.nasa.gov now features summary pages providing more detail about how to participate in our citizen science projects.

Plans for 2023/2024

• Annual in-person meetings of the NASA citizen science community. The first will be May 22, 2023, in Tempe, AZ
• A series of eight Do NASA Science LIVE! online events for the public throughout 2023-2024
• The Heliophysics Big Year: A set of new citizen science projects based around the October 2023 and April 2024 solar eclipses

Accomplishments

• 410 citizen scientists are now named coauthors on refereed scientific publications
• 39 profiles of citizen scientists now posted at science.nasa.gov/citizenscience
• 29 new peer-review scientific publications in 2022
• 19 total grants awarded for citizen science in 2022
• 2 citizen scientists awarded time on the James Webb Space Telescope

Lead author Tarun Kota, a student at Eastview high school
The Global Learning and Observation to Benefit the Environment (GLOBE) Observer application provides outdoor learning opportunities in the midst of a pandemic
Community Events Best Practices

Anita Dey
Strategic Partnerships Manager
anita.dey@nasa.gov
What We Are Doing

- Created a network of communities around the country to share in Webb’s discoveries
- Supported them to have events for launch and first image
  - Training
  - Experts and expert panels
  - Resources
- Will nurture this network to become Webb Engagement sites
- Lessons learned from Independent Evaluator
- Preparing for First Anniversary events this Summer
Webb Space Telescope Community Event Sites - First Images and Beyond

621 as of Sept. 27, 2022
Types of Organizations

- Astronomy club/amateur astronomer
- Community college, college or university
- K-12 classroom, school, or club
- Nature park or center
- Non-science museum
- Other
- Other informal venue
- Public library
- Science museum, etc.
Lessons Learned

Define Your Vision, Goals and Objectives – Helps stay focused and to Measure Success

Outreach to Communities
- Use existing networks (ex. Libraries, MSIs), and non-STEM organizations
- Treat partners as equals
- “Why is this good for my community?”

Working with Community Hosts
- Early Information - Give hosts as much information as you can
- Training – Offer multiple opportunities
- Points of Contact - Hosts valued having an actual person to contact for assistance
- Foster Connections - Help hosts connect to each other
- Developing Resources & Storing Them - What will make life easier for hosts? E.g., Central location, automation, & organization

Zion National Park, Utah
Lessons Learned - Giving Community Hosts Access to Expertise

Scientist Involvement in Outreach Leads to Better Outcomes
   But matching 1:1 can be cumbersome

Subject Matter Expert (SME) Panels - Virtual, with Q&A. Record these

Volunteer Experts - Solar System Ambassadors and Night Sky Network

Resources for SMEs – Training, including Outreach slides and scripts
Lessons Learned - Preparing for Events

The Value of Clear Timelines
- Tell hosts what to expect
- Ambiguity leads to more emails and questions

Practice, Practice and More Practice
- For anything you do for hosts - training, SME panels, etc. – Do a dry run.

Next Up – Webb 1st Anniversary Events!
CONNECT
with us to Share your Science!

Thank you for your time today!

https://science.nasa.gov/learners
https://science.nasa.gov/citizenscience