National Aeronautics and Space Administration

NASA

2023

SCIENCE ACTIVATION

Astrophysics Advisory Committee

March 30, 2023

Kristen Erickson, Director

Science Engagement & Partnerships

Science Activation Impact!

By the Numbers Through 2022

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!

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
  - Aurorasaurus 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

Who we are and What we do

Science Activation Leadership Team

Kristen Erickson
DIRECTOR

Dr. Lin Chambers
DEPUTY DIRECTOR

Dr. Rachel Connolly
SYSTEMS INTEGRATION AND ANALYSIS LEAD

Kim Holloway
PROJECT COORDINATOR

Newest addition:
Clarence Bostic
Learning & Integration

Science Division POCs

Astrophysics:
Dr. Hashima Hasan

Biological and Physical Sciences: Dr. Lisa Carnell

Earth Science

Applied Sciences	Dr. Nancy Searby		
Flight	Dr. Tahani Amer	R&A	Dr. Barry Lefer
GLOBE	Dr. Allison Leidner	Coordinator	Dr. Trena Ferrell

Fellows and Detailees

Einstein Fellow:
Luke Henke

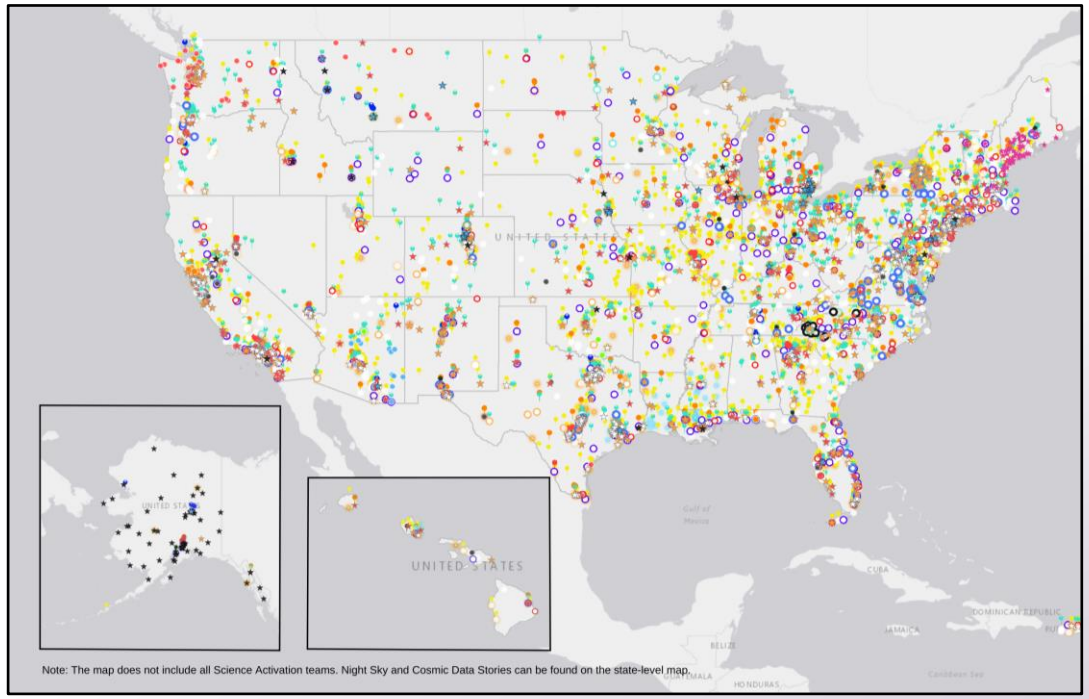
OSTEM Detailee:
Matt Pearce

Heliophysics:
Dr. Kelly Korreck

Planetary Sciences:
Dr. Michael Kelley

Investment by Division

Science Activation – Overachieved Broadening Participation Goal for Learners of All Ages in 2022!



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

($ in K's)	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Science Activation FY 2024 Request	$52,000	$55,600	$55,600	$55,600	$55,600	$55,600	$55,600

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

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

Arizona State University's SMD Community of Practice in Education (SCoPE) celebrated a record number of Subject Matter Experts (416) engaged in Science Activation efforts last year thanks in large part to the connections with each SMD science division. SCoPE is led by PI/Dr. Mini Wadhwa

Solar Eclipse Map 2023-2024

Citizen Science

Dr. Marc Kuchner
SMD Citizen Science Officer

Citizen Science Activated!

What's Changed/What's the Same

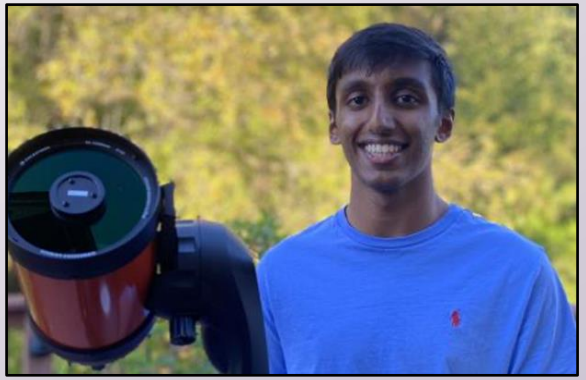
- Nine new citizen science projects released to the public in past year, for a total of 34 active projects
- New citizen science funding opportunity added: the Heliophysics Citizen Science Investigation (HCSI) Program
- New citizen science incentives in a Heliophysics Small Explorer (SMEX) Announcement 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

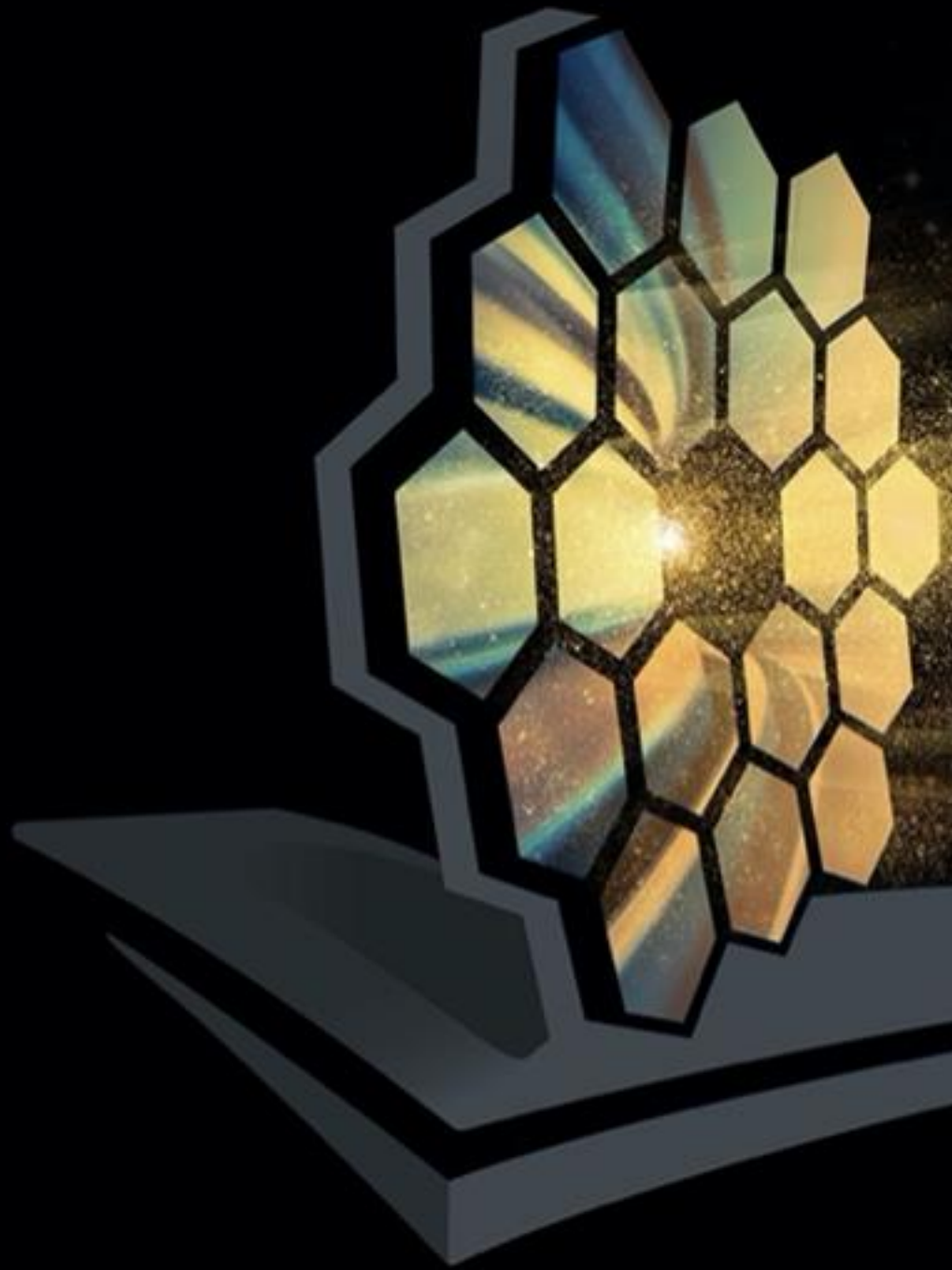
Accomplishments

- 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



WEBB
SPACE TELESCOPE
Community Events Best Practices

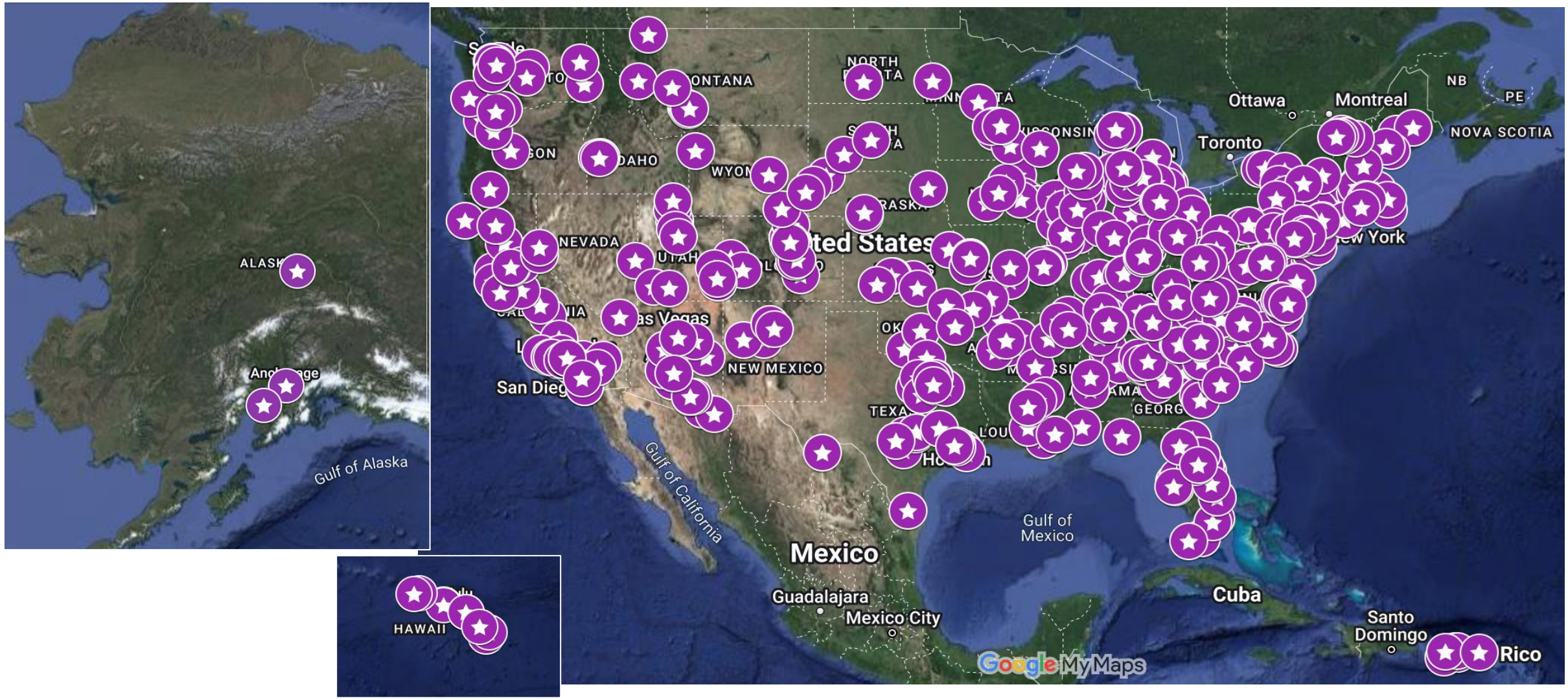
Anita Dey
Strategic Partnerships Manager
anita.dey@nasa.gov

What We Are Doing

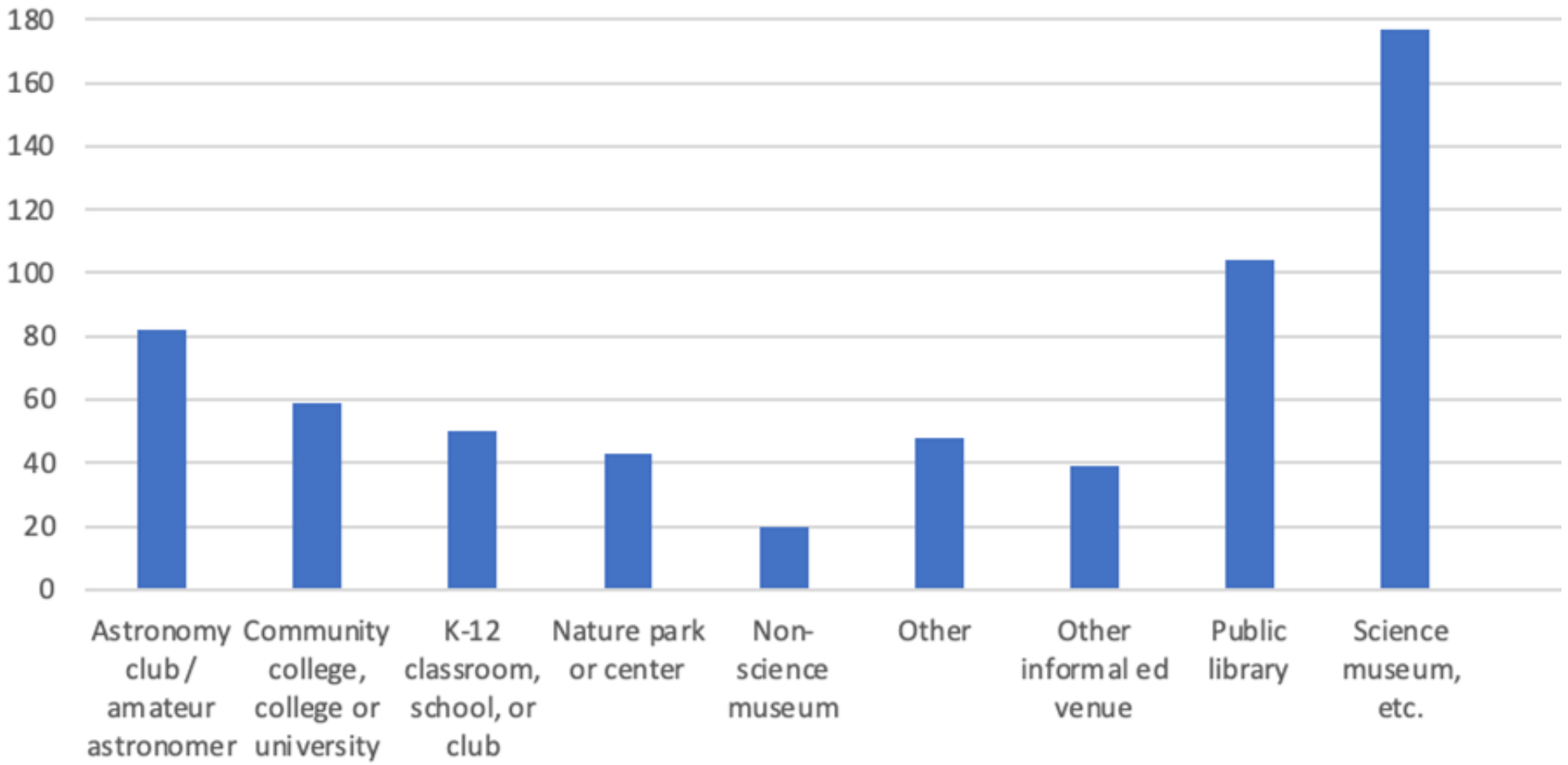
- Created a network of communities around the country to share in Webb's discoveries
- Supported them to have events for launch and first image
  - Training
  - Experts and expert panels
  - Resources
- Will nurture this network to become Webb Engagement sites
- Lessons learned from Independent Evaluator
- 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



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

Barrington Public Library, Rhode Island

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

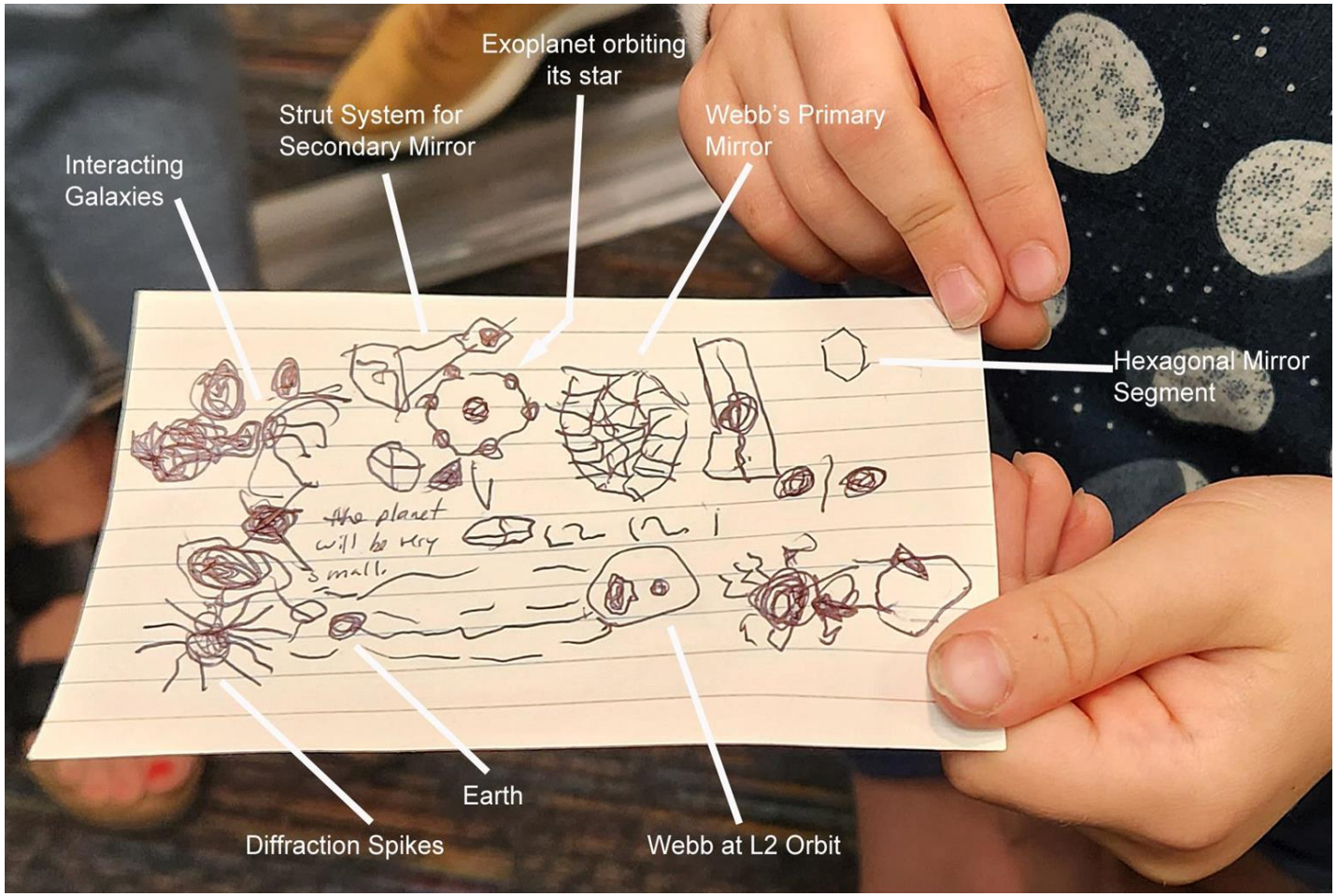
The Value of Clear Timelines

- 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!



Eastern Iowa Observatory

CONNECT

with us to Share your Science!

Thank you for your time today!

https://science.nasa.gov/learners
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