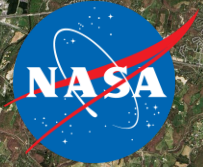


National Aeronautics and
Space Administration



EXPLORE EARTH

Earth Science Division Community Forum

Dr. Karen St. Germain, ESD Director

Oct. 21, 2021

Agenda:

- People
- Missions
- Open Science
- Special Topics
- Tribute



Questions Process

- During Q&A, please type your question directly into the Q&A panel
- Alternatively, you may email questions to Kate Becker at kate.s.becker@nasa.gov
- Answers to relevant questions will be posted on our website: <https://science.nasa.gov/earth-science/esd-community-forum>

The background of the slide is a cosmic scene. The top half features a dark blue and black space filled with numerous small, bright stars and a prominent, glowing blue nebula on the right side. The bottom half is dominated by a bright, golden-yellow and orange glow, with a greenish-yellow nebula on the right side. The word "PEOPLE" is centered in a white, sans-serif font across the dark blue band.

PEOPLE

New People in ESD

Frances
Adiele



Kate
Becker



Kathleen
Boggs



Amy
Chen



Toni
Eberhart



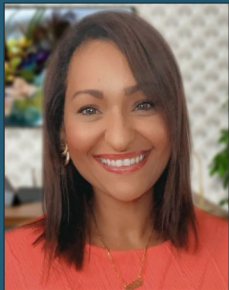
Sarah
Elkhatib



Tressa
Helvey-Kasulke



Yáitza
Luna-Cruz



Megan
McGroddy



Christine
McMahon-Bognar



Aaron
Piña



Christian
Reyes



Joel
Scott



Elena
Steponaitis



Sandra Cauffman: Moving to Astrophysics



- Will become Deputy Director, Astrophysics Division on Oct. 24
 - Expertise to help with division leadership transition
- Has been Deputy Director, Earth Science Division since 2016, and was Acting director from February 2019-early June 2020
- Prior to joining Headquarters, spent 28 years at Goddard Space Flight Center (3 as a contractor and 25 as a civil servant)
 - Leadership positions on missions including GOES I/M, GOES N/P, GOES-R series, MAVEN mission to Mars, and Assistant Director for Flight Projects
- Awarded the NASA Exceptional Achievement Medal, and twice the NASA Exceptional Leadership Medal
 - Four-time recipient of NASA Acquisition Improvement Award
- Costa Rica issued a postal stamp on her honor on International Women's Day in 2017 due to her extensive work in outreach and STEM in Costa Rica and Latin America
- Her profile has been highlighted by the United Nations Entity for Gender Equality and the Empowerment of Women for being a positive example for women, especially youth and children

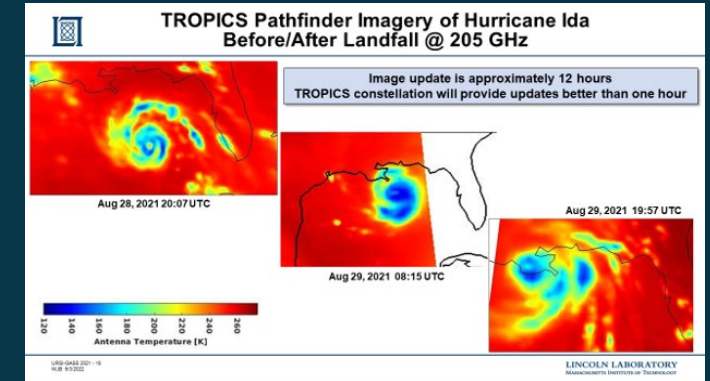
The background of the slide is a composite of two cosmic images. The top half features a dark blue and black space filled with numerous small, bright stars and a prominent, glowing blue nebula on the right side. The bottom half shows a similar starry field but with a warm, golden-orange glow on the left side, transitioning into a greenish-blue glow on the right. The central text is overlaid on a dark blue horizontal band.

MISSIONS AND OPPORTUNITIES

Earth Science Mission Highlights

TROPICS Pathfinder

- Launched June 30; global first light images Aug. 8
- Captured images inside Hurricane Ida before and after landfall
- Six-constellation TROPICS mission to launch in 2022



Landsat 9

- Launched Sept. 27 from Vandenberg Space Force Base
- On-orbit checkout continues with Oct. 2 power-up of its two instruments, OLI-2 and TIRS-2
- Continues nearly 50-year legacy of our most economically impactful mission with our USGS partners

Upcoming: STP-H8

- Will carry two NASA-developed payloads to the ISS: the Compact Ocean Wind Vector Radiometer (COWVR) and Temporal Experiment for Storms and Tropical Systems (TEMPEST)
- The mission will evaluate these small instruments' data quality for assimilation into DoD weather models



Earth Science Flight Opportunities

Open solicitation/In review

Completed solicitation

Mission	Mission Type	Release	Selection	Major Milestone
EVS-1 (EV-1) (AirMoss, ATTREX, CARVE, DISCOVER-AQ, HS3)	5 Suborbital Airborne Campaigns	2009	2010	Completed KDP-F
EVM-1 (CYGNSS)	Class D SmallSat Constellation	2011	2012	Launched Dec. 2016
EVI-1 (TEMPO)	Class C Geostationary Hosted Instrument	2012	2012	Delivered to storage Dec. 2018
EVI-2 (ECOSTRESS & GEDI)	Class C & Class D ISS-hosted Instruments	2013	2014	Launched June & Dec. 2018
EVS-2 (ACT-America, ATOM, NAAMES, ORACLES, OMG, CORAL)	6 Suborbital Airborne Campaigns	2013	2014	CORAL, NAAMES, ORACLES completed KDP-F
EVI-3 (MAIA & TROPICS)	Class C LEO Hosted Instrument & Class D CubeSat Constellation	2015	2016	MAIA Delivery 2022; TROPICS Launch 2022
EVM-2 (GeoCarb)	Class D Geostationary Hosted Instrument	2015	2016	Launch TBD
EVI-4 (EMIT & PREFIRE)	Class C ISS-hosted Instrument & Class D Twin CubeSats	2016	2018	Delivery NLT 2021
EVS-3 (ACTIVATE, DCOTTS, IMPACTS, Delta-X, SMODE)	5 Suborbital Airborne Campaigns	2017	2018	Passed Initial Confirmation Review, 2 began deployments
EVI-5 (GLIMR)	Class C Geostationary Hosted Instrument	2018	2019	Delivery NLT 2024
EVC-1 (Libera)	Class C JPSS-Hosted Radiation Budget Instrument	2018	2020	Delivery NLT 2025
EVM-3	Full Orbital	2020	2021	Launch ~2026
EVI-6	Instrument Only	2021	2022	Delivery NLT 2027
ESE	Explorer Mission	2022	2024	Launch ~2029 & ~2031
EVC-2	Continuity Measurements	2023	2024	Delivery NLT 2028
EVS-4	Suborbital Airborne Campaigns	2023	2024	N/A
ESE	Explorer Mission	2024	2026	Launch TBD
EVI-7	Instrument Only	2024	2025	Delivery NLT 2030
EVM-4	Full Orbital	2024	2025	Launch ~2030
EVC-3	Continuity Measurements	2026	2027	Delivery NLT 2031
EVS-5	Suborbital Airborne Campaigns	2027	2028	N/A

EVS

Sustained sub-orbital investigations (~4 years)

EVM

Complete, self-contained, small missions (~4 years)

EVI

Full function, facility-class instruments Missions of Opportunity (MoO) (~3 years)

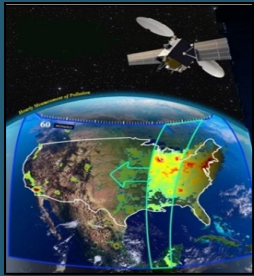
EVC

Complete missions or hosted instruments targeting "continuity" measurements (~3 years)

ESE (NEW)

Medium-size instruments and missions (~2 years)

Earth Science Flight Opportunities



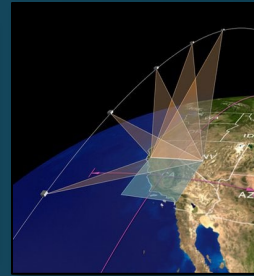
EVI-1
TEMPO



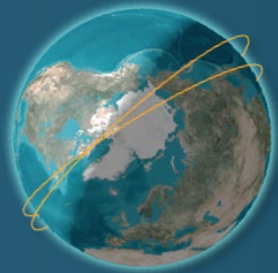
EVI-2
GEDI & ECOSTRESS



EVI-3
TROPICS



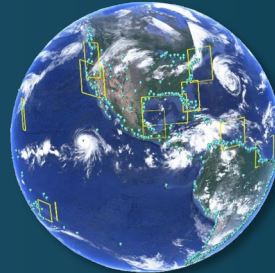
EVI-3
MAIA



EVI-4
PREFIRE



EVI-4
EMIT



EVI-5
GLIMR

EVI-6

- PI-Managed Mission Cost (PIMMC) cap of \$37M (FY24 \$)
- NASA will determine platform/launch vehicle
- Solicits only Class D Instrument and CubeSat proposals

Earth System Explorers (ESE) *NEW*

- PI-Managed Mission Cost (PIMMC) cap of \$310M (FY24 \$)
- NASA will provide launch vehicle services
- Two-step selection process currently planned

Step 1 Selection

- 4 Proposals
- 9-month Phase A concept studies



Step 2 Selection

- 2 Missions
- Staggered phasing and funding

Earth Science Technology Opportunities

ESTO Opportunities in ROSES

CURRENT

- **IIP-21** (Instrument Incubator Program) closed; awards expected to be announced mid-Nov. 2021
 - Parminder Ghuman, Program Manager
- **DSI-21** (Decadal Survey Incubation) proposals received Oct. 14; awards expected to be announced in Spring 2022
 - Bob Bauer, Program Manager
- **AIST-21** (Advanced Information Systems Technologies) Step-2 proposals due Nov. 30, 2021
 - Jacqueline Le Moigne, Program Manager

UPCOMING

- **ACT-22** (Advanced Component Technologies) Next solicitation targeted for ROSES-22 release
 - Amber Emory, Program Manager

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OPEN SOURCE SCIENCE

Open Science

We define open science as a collaborative culture enabled by technology that empowers the **open sharing of data, information, and knowledge** within the scientific community and the wider public to accelerate scientific research and understanding.

Open *Source* Science

Builds on concepts from Open Source Software, expanding participation in developing code, applying to the scientific process to accelerate discovery by openly conducting science from project initiation through implementation.

Open Science Recognition



2021 AGU Falkenberg Award: Ryan Abernathey

- The **NASA-funded Pangeo open science community**, led by Abernathey, recognized the potential of the CMIP6 data to advance climate change research
- Pangeo collaborators created a cloud-optimized version of a ~900 TB dataset and open source tools to help with analyses



Ryan Abernathey
@rabernat

So while I gladly accept the award and the good feelings that come with getting a 🏆, I also want to ask the scientific community to think hard about how to recognize scientific communities and teams, rather than just individuals. /10

9:01 AM · Sep 16, 2021 · Twitter Web App

- Today, model data are freely available on the cloud, adjacent to massive computing power, and anyone can examine them in a few minutes



Recent Activities

- SMD Policy Directive-41 Released
- Developed Open-Source Science requirements for ESO mission
- Conducted 7 meetings with potential ESO partners
- Open Source Science Initiative Workshop (October 14, 2021)
- ESO Processing Study Workshop #1 (October 19-20, 2021)
- Environmental Justice Workshop (October 20, 2021)
- TOPS Github: <https://github.com/nasa/Transform-to-Open-Science>

Upcoming Activities

- RFI for SMD Policy Directive-41 amendments
- ESO Open Source Science Workshops #2 (February 2022) and #3 (August 2022)

Open Source Science Policy for Earth System Observatory

- A. All mission data, metadata, software, databases, publications, and documentation shall be available on a full, free, open, and unrestricted basis starting in Phase B with no period of exclusive access.
- B. Science workshops and meetings shall be open to broad participation and documented in public repositories.

1 Software shall be developed openly in a publicly accessible, version-controlled platform using a permissive software license allowing for community use and contributions.	4 Scientific data, metadata, software, publications and documentation shall be archived and made available by NASA and/or [Partner] starting in Phase B.
2 Manuscripts shall be published with open access licenses; versions of as-accepted manuscripts shall be made available as open preprints and deposited in a NASA or [Partner] repository upon publication.	5 NASA and [Partner] software, documentation and data shall be properly marked, cited, and/or attributed. Metrics to measure and acknowledge open-source science contributions will be developed.
3 All mission data, calibration information, and simulated products supporting development and validation of algorithms shall be made available without any conditions to use.	6 NASA and [Partner] will mutually develop an Open-Source Science Plan that specifies details of collaboration.

* Projects should release all information with open licenses unless exceptions are granted based on laws or regulations, including classified, ITAR, EAR and CUI restrictions. CSDO evaluates and approves or declines deviation requests by projects for NASA.

Transform to OPen Science (TOPS)



A 5-year effort focused on capacity building, partner engagement, and incentives to help accelerate scientific discovery through open science

Public Engagement

- **Designate 2023 as Year of Open Science**
- Partnering with professional orgs., publishing TOPS articles in high-impact journals
- Engage early with historically excluded communities
- TOPS GitHub

Capacity Building

- Create FAIR - Analysis-Ready Cloud-Optimized (ARCO) data
- Develop learning resources
- TOPS JupyterHub
- Host and sponsor events (summer schools, multi-day trainings, massive open online courses)

Incentives

- Develop NASA Open Source Science Awards program
- Leverage prizes and challenges and cross-division science use cases
- Increased citizen science activities

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ACTIVITY HIGHLIGHTS

NASA Releases Policy Statement on IDEA (Sept 30th) with definitions:

Diversity and Inclusion

- We define diversity broadly as “the entire universe of differences and similarities” and inclusion as “the full participation, belonging, and contribution of organizations and individuals”

Equity

- We define equity as “the consistent and systematic provision of fair, just, and impartial treatment to all individuals, including individuals who belong to underserved communities that have been denied such treatment”

Accessibility

- We define accessibility as “the capability for full and independent use by all people, including people with disabilities, of technology, programs, and services through inclusive design, construction, development, and maintenance of facilities”

Read the entire [Policy Statement on Diversity, Equity, Inclusion, and Accessibility for NASA's Workforce and Workplaces](#)

IDEA Working Group Accomplishments and In-Progress Actions

Completed IDEAs (just a few!)

- Collected ROSES available demographic data
- SMD-wide Job Shadowing Pilot Program
- Created the IDEA In-Flight Action Board for working group members, advocates across divisions/branches/centers

In progress

- Overarching IDEA Strategy – incorporating into the updated Science Plan coming Nov. 10th
- Climate survey looking at SMD culture
- Anonymous Comment box and dialogue sessions inside SMD
- Developing an HBCU/MSI engagement model and resources
- Monthly conversation series – internal learning development for SMD staff
- Code of conduct and standard inclusive language for ROSES (Initial language being used for ESD AOs)

Additional ESD Highlights

Space Apps Challenge, Oct. 2-3

- Largest global hackathon
- Smashed 2020 records in all categories
- 28,200+ participants; 323 local virtual events; 162 countries/territories; 4,534 teams; 2,814 projects; 28 challenges; 472 volunteers; 10 space agency partners worldwide



Commercial SmallSat Data Acquisition Program

- NASA has uplifted licenses for Planet and Spire data
- The USG license allows federal agencies and affiliates (contractors, grantees, etc.) to access data for scientific use
- Contact CSDA (<https://earthdata.nasa.gov/esds/csdap>) with any questions

Upcoming Events

- International Astronautical Congress
- CEOS Plenary
- UN Climate Conference (COP26)
- AGU Fall Meeting
- AMS Annual Meeting



A TRIBUTE TO
DR. GAIL SKOFRONICK-JACKSON

In Memoriam

Gail Skofronick-Jackson

Weather and Atmospheric Dynamics Program Scientist

- Gail was deployed with a joint NASA-ESA airborne campaign team in St. Croix, U.S. Virgin Islands. On a day off from the experiments, she perished in a tragic accident while hiking with colleagues
- Gail was a brilliant scientist and a deeply passionate and principled person who carried her enthusiasm for life over into her career at NASA
 - She was a dedicated researcher whose interests included passive remote sensing, radiative transfer theory, and detection and estimation of falling snow using active and passive spaceborne sensors
- Gail received her B.S. degree in electrical engineering (EE) from Florida State University and her M.S. and Ph.D. degrees in EE from Georgia Institute of Technology
- Gail's family established a scholarship for women in Electrical Engineering and Science at FSU: <https://spark.fsu.edu/GailSkofronickJackson>.
- A celebration of life is planned for Nov. 14, 2021, 2 p.m. at Foundry UMC, 1500 16th St., NW, Washington, D.C.





QUESTIONS?

Questions Process

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