

National Aeronautics and
Space Administration



Open Science:

Supporting a more equitable, impactful, and efficient scientific future

NASA Transform to Open Science Mission

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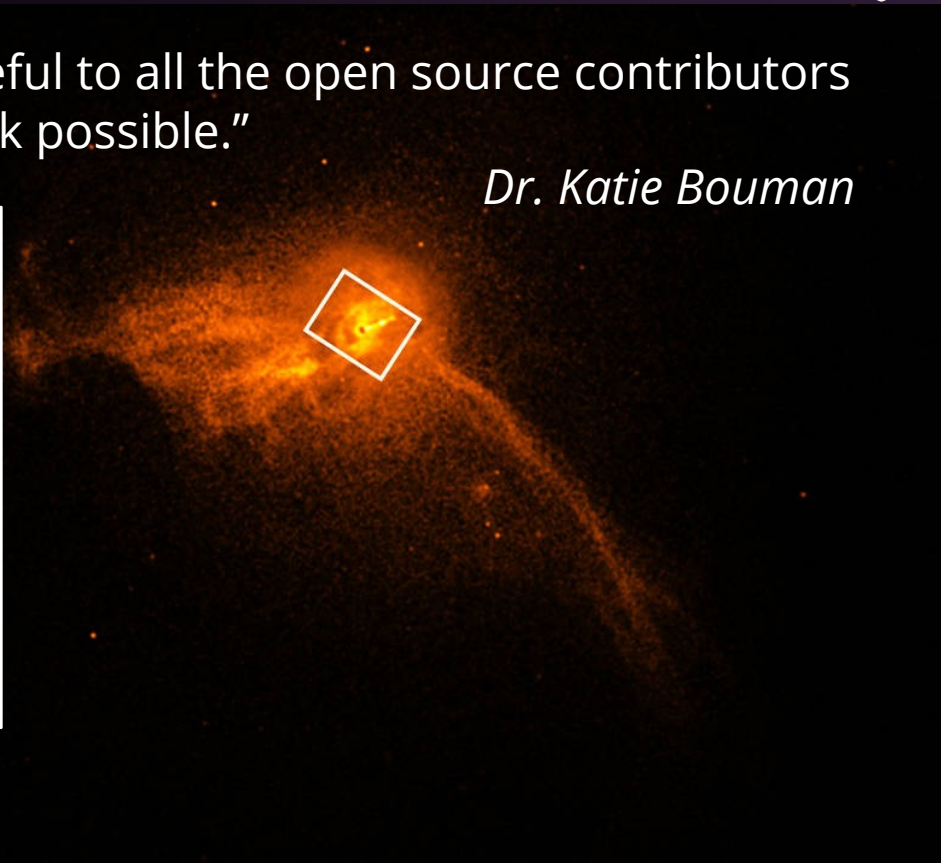




First image of a black hole

“We’re deeply grateful to all the open source contributors who made our work possible.”

Dr. Katie Bouman



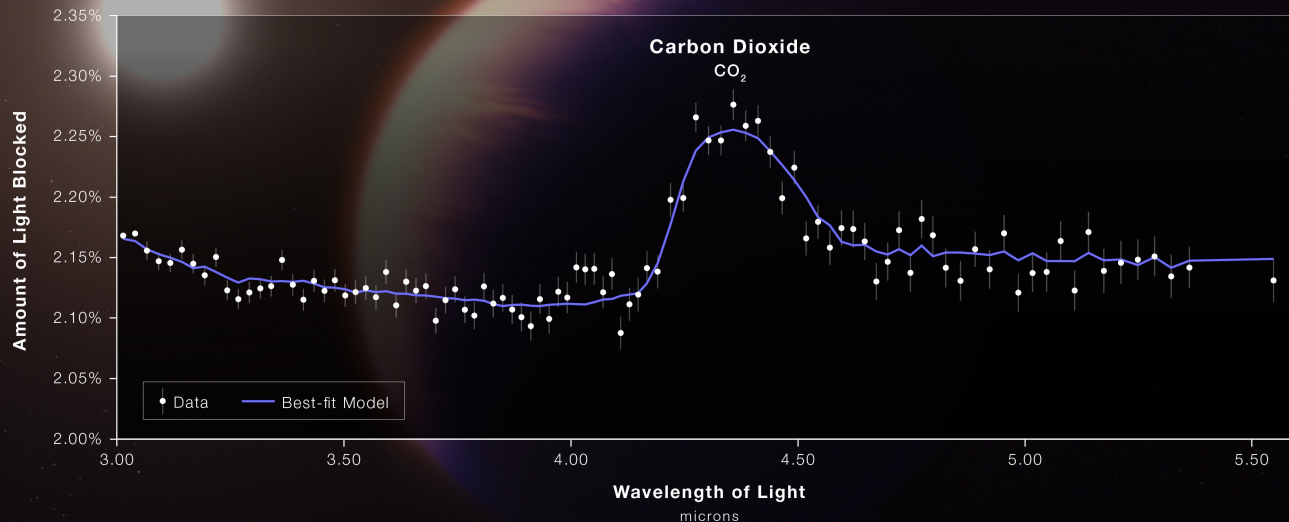


First discovery of CO₂ in exoplanet atmosphere

HOT GAS GIANT EXOPLANET WASP-39 b

ATMOSPHERE COMPOSITION

NIRSpec | Bright Object Time-Series Spectroscopy



"NASA's open science guiding principles are centered in our **Early Release Science** work, supporting an inclusive, transparent, and collaborative scientific process."

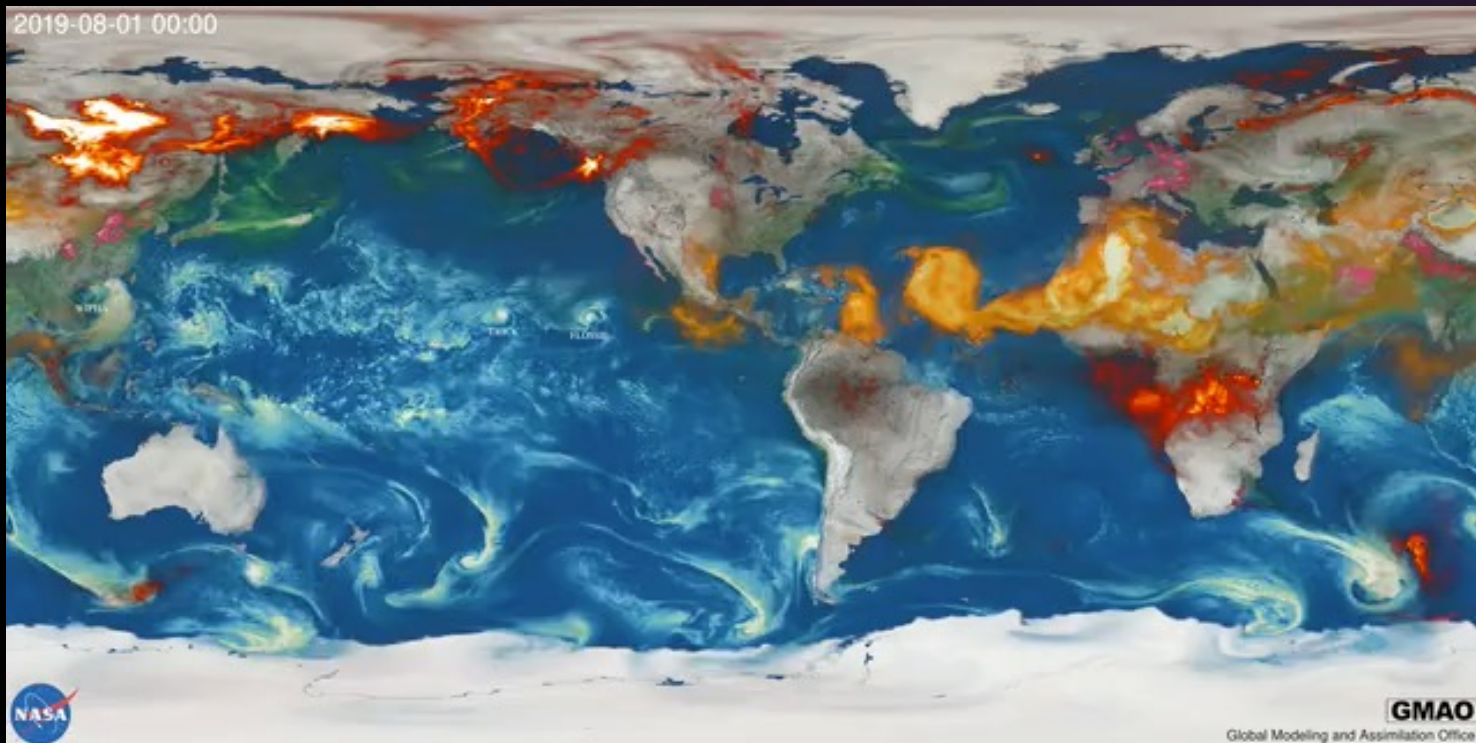
Dr. Natasha Batalha





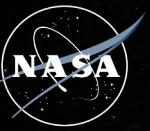
Near Real-Time Products:

Rapidly informing stakeholders via integration of data and modeling products



Empowering communities through data

Making data more usable and meaningful for all as a public service





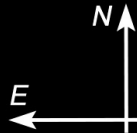
NASA is looking ahead at really big challenges



Dimorphos
HST WFC3/UVIS
F350LP

“We need **more** WE science rather than ME science¹” – openly sharing data, software, & results

We need **more** people - more hands, more eyes, more brains - with diverse experiences to participate so that we ask the best questions and find the best solutions



¹: quote from Harlan Krumholz, Yale School of Medicine at 2022 CZI meeting



**What can we
do about this?**





Open Science

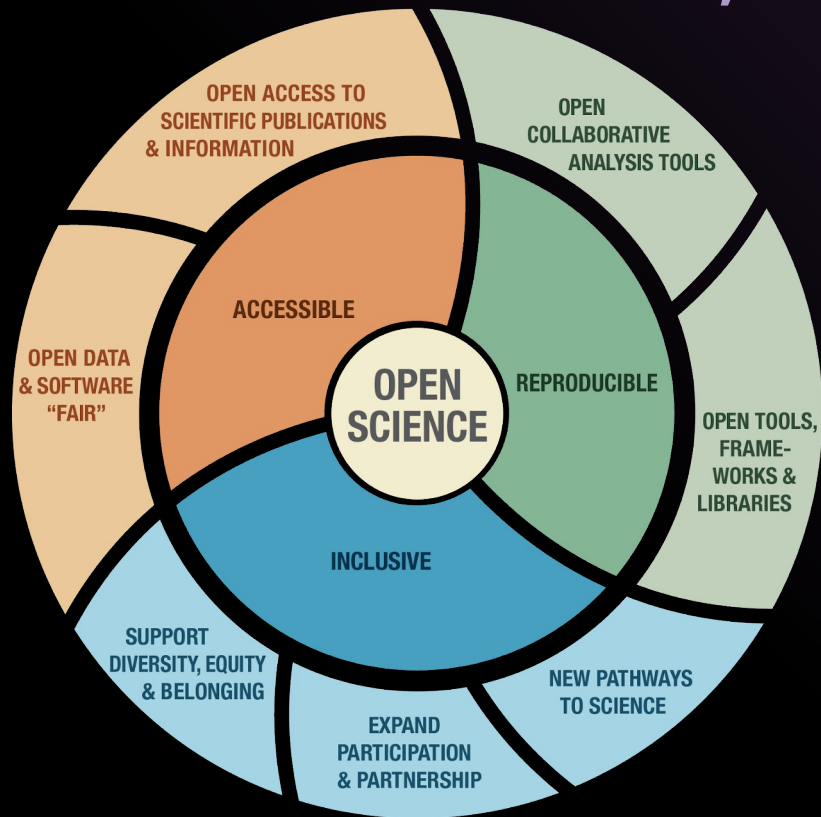
NASA defines Open Science as:

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 Science is Accessible, Reproducible & Inclusive



Creates research that is:

- - Cited more
- - Has a bigger impact
- - Increases transparency
- - More inclusive

Inclusive science means more:

- - Collaborative projects
- - Access to 'hidden knowledge'
- - Equitable Systems
- - Increased Participation



Policy



Infrastructure

**NASA
Open-Source
Science
\$20M/year**



Funding



Outreach

Community Engagement

Community participation is the foundation of an open scientific process.



Transparency

Collaboration

Participation

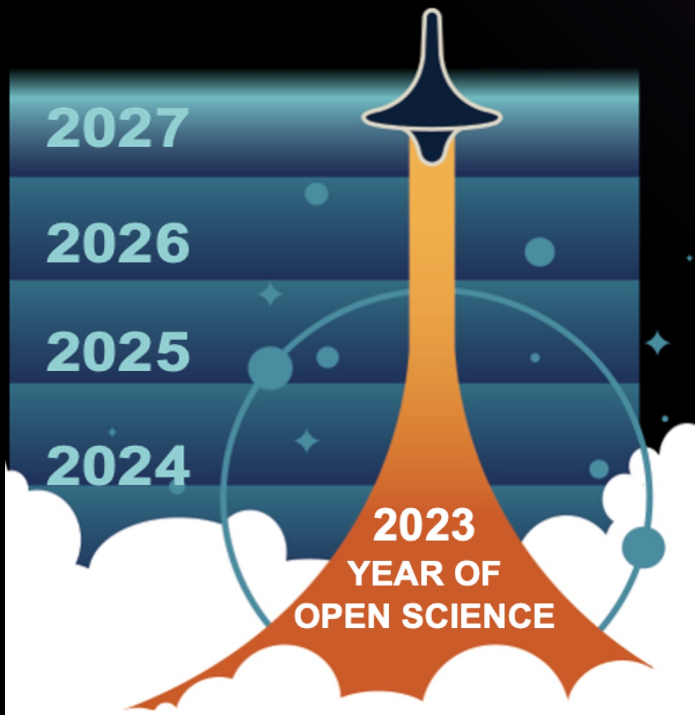


2023 is the Year of Open Science!





NASA's Transform to Open Science is a \$40 million 5-year mission to accelerate adoption of open science



TOPS' Strategic Goals:

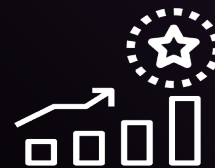
- Support 20K researchers to earn NASA's open science badge
- Double the participation of historically excluded groups across NASA science
- Enable five major scientific discoveries through open science principles



Engagement



Capacity
Sharing



Incentives



Coordination



NASA Open Science Curriculum





What am I going to learn in OpenCore?

What is open science? Why should I do it?



How to use, make, & share software



Best practices for sharing all results and analysis, as well as peer reviewing

ETHOS OF OPEN SCIENCE

OPEN TOOLS & RESOURCES

OPEN SOFTWARE

OPEN DATA

OPEN RESULTS



How to use popular open science tools



How to use, make, & share open data



Earn Badges at Each Level

Complete All 5 & earn TOPS Open Science Badge & Certification



Why get a NASA Open Science certification?



Designed to provide researchers with **core open science skills:**

- Create the digital tools to perform open science (e.g., ORCID, Zenodo, Github accounts)
- Familiar with data management and software management plan best practices and resources
- Grow connections across a community of open science practitioners

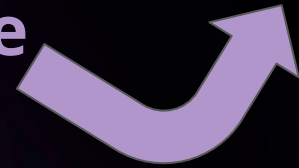
*A **community developed** introduction to open science with inclusivity, accessibility, and diversity at the forefront.*



Get your NASA Open Science certification!



Enroll here





TOPS Email List:

- Get the latest information about TOPS activities
- Get a chance to apply to participate on a Summer School with NASA scientists
- Be part of the Open Science Community!



We need YOU!

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