Ethos of Open Science

Content from: https://github.com/opensciency

Code of Conduct

Expected Behavior
All participants are to…

- Be treated with respect and consideration, valuing a diversity of views and opinions
- Be considerate, respectful, and collaborative
- Communicate openly with respect for others, critiquing ideas rather than individuals
- Avoid personal attacks directed toward other participants
- Be mindful of your virtual surroundings and of your fellow participants
- Alert a host if you notice a dangerous situation or someone in distress
- Respect the rules and policies of the virtual meeting space

Unacceptable Behavior

- Harassment, intimidation, or discrimination of any form will not be tolerated
- Physical or verbal abuse of any participant
- Examples of unacceptable behavior include, but are not limited to; verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, national origin, inappropriate use of nudity and/or sexual images in the meeting space or in presentations or threatening or stalking of any participant.
- Disruption of proceedings, panels, discussions, and/or lightning talks.

Code of Conduct (continued)

Expected Behavior

- Anyone requested to stop unacceptable behavior is expected to comply immediately.
- Hosts may take any action deemed necessary and appropriate, including immediate removal from the meeting without warning.

Reporting Unacceptable Behavior

- If you are the subject of unacceptable behavior or have witnessed any such behavior, please immediately notify a meeting host.
- Notification should be done by contacting a host via direct chat or emailing your concern to Chelle Gentemann chelle.gentemann@nasa.gov
- Anyone experiencing or witnessing behavior that constitutes an immediate or serious threat to public safety is advised to contact 911 or your local emergency number.

Agenda

1:30	Welcome, Code of Conduct, Pre-survey
1:40	What is Open Science and what does it promote?
2:10	Why does it matter?
2:35	Who practices Open Science and for whom?
2:40	Where does open science happens?
2:50	How to Get Started
3:15	Q&A
3:25	Wrap-up

National Aeronautics and Space Administration

Please fill out our pre-course survey!

Your inputs are essential to the success of our mission. If you haven't yet filled out the pre-course survey, please do so now!

Welcome! We are…

Chelle Gentemann

TOPS Science Lead

@ChelleGentemann

Yvonne Ivey

TOPS Equity Lead

@Earth2Ivey

Thank you to the open science Subject Matter Experts (SMEs)!

Yo Yehudi

Natasha Batalha

Shilaan Alzahawi

Sara

Cameron

James Powell

Daniela Saderi

Siobhan M Hall

Jannatul Ferdush

Flavio Azevedo

Chris Erdmann

Yuhan (Douglas) Rao

Batool Almarzouq

Esther Plomp

Thank you to the open science SMEs!

TomoCoral	Melissa Black	 Malvika Sharan	 Saranjeet Kaur	Michel Lacerda	 Ismael-KG	 andreamedinasmith
 aosman12	 Elio Campitelli	Stephen Klusza	 Mariana Meireles	Pauline Karega	 Anne Fouilloux	Reina Camacho Toro

Thank you to the open science SMEs!

Sierra V. Kaufman

Shamsudddeen Hassan Muhammad

Johanna Bayer

Hugh Shanahan

MiguelSilan

Elli Papadopoulou

dunldj

Ana Vaz

Tyson L. Swetnam

Babatunde Valentine Onabajo

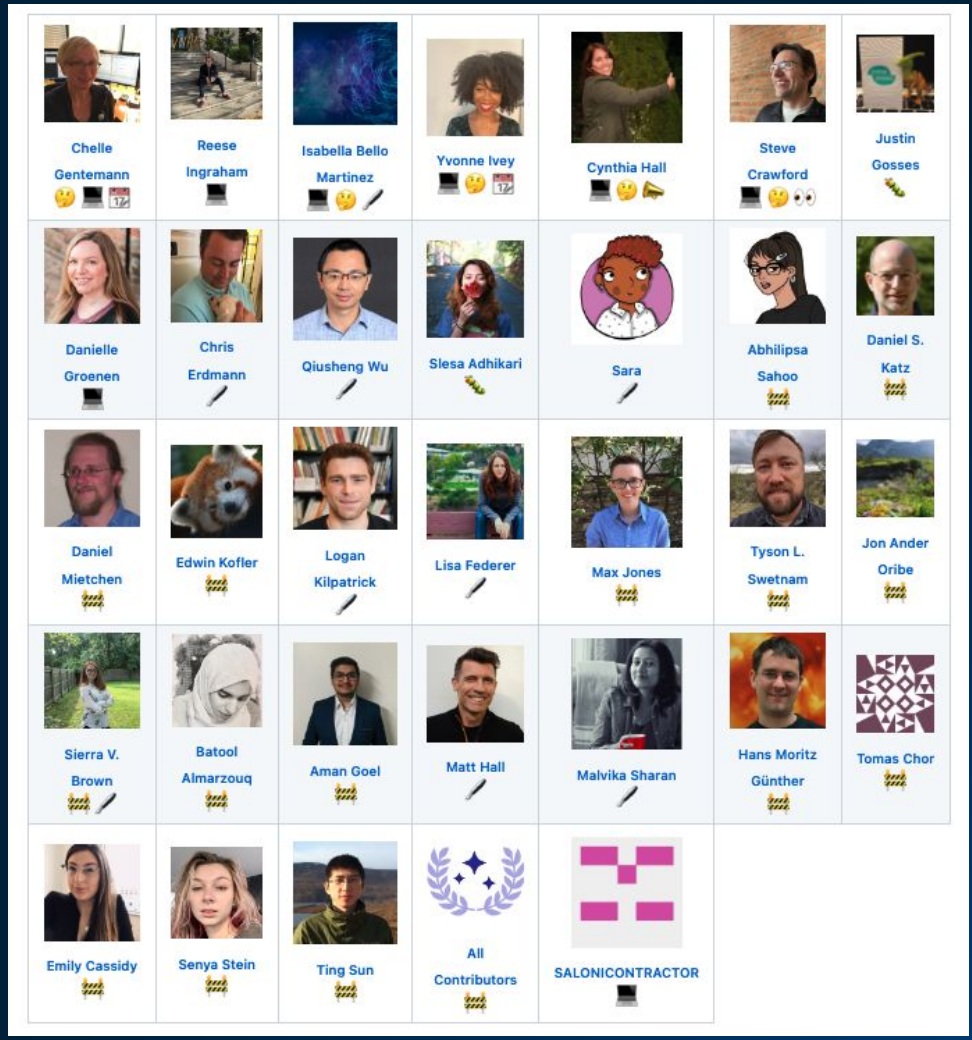
Taher Chegini

ee2110

rebeccaringuette

Mayya

And thank you to the rest of the TOPS community! It's a team effort.



OpenCore: NASA's Open Science Curriculum

What is open science, why does it benefit me, and why does it benefit the greater scientific community?

How to 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

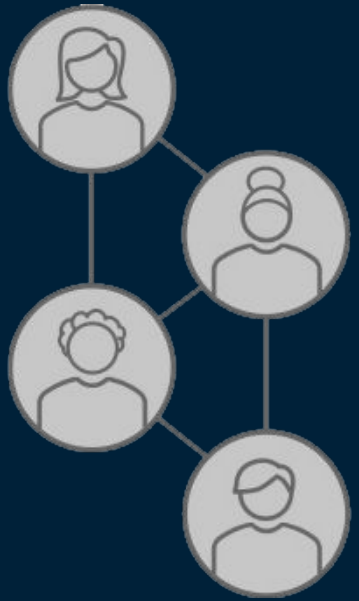
How to effectively use and share open data

Earn Badges at Each Level

Complete All 5 & earn TOPS Open Science Badge & Certification

OpenCore Curriculum

*A **community developed** introduction to open science*



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

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

Learning Objectives

By the end of the entire course we hope you will learn how to:

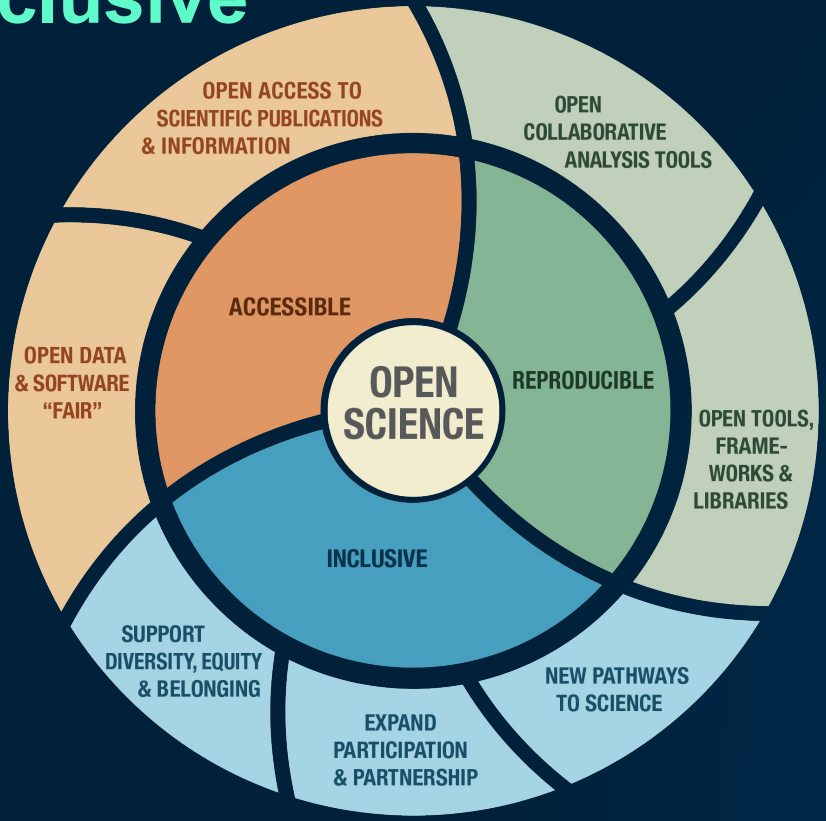
1. Find and identify community accepted data and software repositories
2. How to use, make, and share open data and software
3. Assign a unique digital object identifier (DOI)
4. Hold open meetings

What – What is Open Science and what does it promote?

How would you describe “open science”?

Reflect on your definition and write it on the index card provided.

Open Science is Accessible, Reproducible & Inclusive



Creates research that is:

- Cited more
- Creates a bigger impact
- Increases transparency
- Generates more scholarly collaborations

Inclusive science means more:

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

Open Science is Multifaceted!

https://www.scientificinfographics.com/21-towards-an-open-science

A working definition of Open Science for our workshop

“

There are *many* definitions of open science, reflecting the idea that “Open science is a process not a product.” - Fernando Perez, October 2022 TOPS Community Panel

”

A working definition of Open Science for our workshop

“

Open Science is the principle and practice to make scientific process and products available to all, while respecting diverse cultures, maintaining security and privacy, and fostering equity, collaborations, and reproducibility.

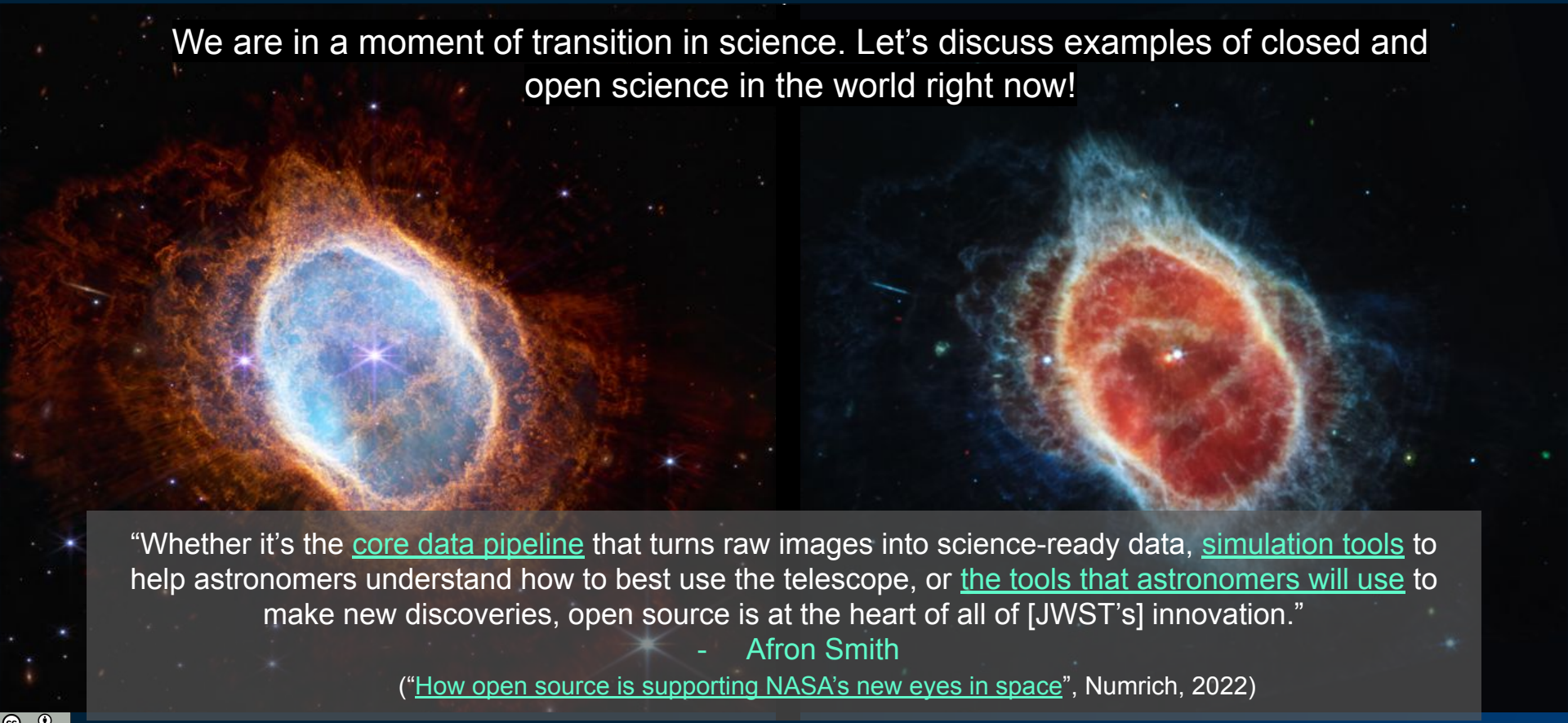
”

So, how did you describe open science?

Share your description of open science with your neighbors!

- How is it similar to the definitions provided today?
- How is it different?

What does science look like right now?



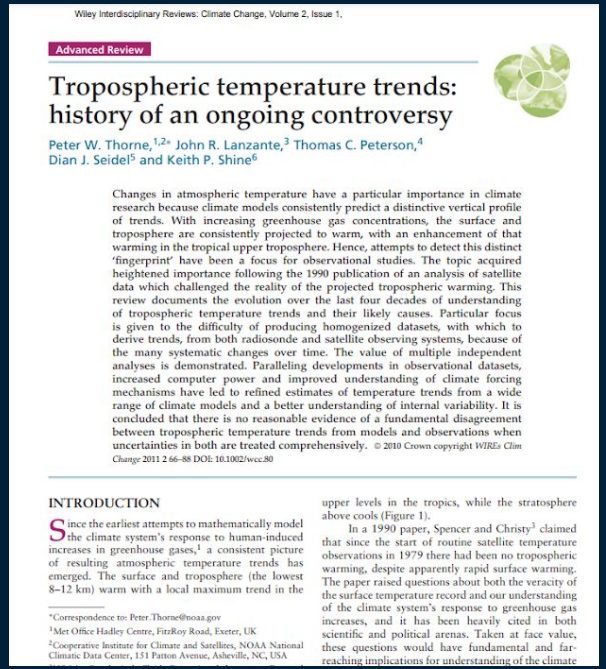
We are in a moment of transition in science. Let's discuss examples of closed and open science in the world right now!

"Whether it's the core data pipeline that turns raw images into science-ready data, simulation tools to help astronomers understand how to best use the telescope, or the tools that astronomers will use to make new discoveries, open source is at the heart of all of [JWST's] innovation."

- Afron Smith

("How open source is supporting NASA's new eyes in space", Numrich, 2022)

Can we rapidly iterate and resolve problems?



Wiley Interdisciplinary Reviews: Climate Change, Volume 2, Issue 1,

Advanced Review

Tropospheric temperature trends: history of an ongoing controversy

Peter W. Thorne,[1,2*] John R. Lanzante,[3] Thomas C. Peterson,[4] Dian J. Seidel[5] and Keith P. Shine[6]

Changes in atmospheric temperature have a particular importance in climate research because climate models consistently predict a distinctive vertical profile of trends. With increasing greenhouse gas concentrations, the surface and troposphere are consistently projected to warm, with an enhancement of that warming in the tropical upper troposphere. Hence, attempts to detect this distinct 'fingerprint' have been a focus for observational studies. The topic acquired heightened importance following the 1990 publication of an analysis of satellite data which challenged the reality of the projected tropospheric warming. This review documents the evolution over the last four decades of understanding of tropospheric temperature trends and their likely causes. Particular focus is given to the difficulty of producing homogenized datasets, with which to derive trends, from both radiosonde and satellite observing systems, because of the many systematic changes over time. The value of multiple independent analyses is demonstrated. Paralleling developments in observational datasets, increased computer power and improved understanding of climate forcing mechanisms have led to refined estimates of temperature trends from a wide range of climate models and a better understanding of internal variability. It is concluded that there is no reasonable evidence of a fundamental disagreement between tropospheric temperature trends from models and observations when uncertainties in both are treated comprehensively. 2011 2 66–88 DOI: 10.1002/wcc.80

INTRODUCTION

Since the earliest attempts to mathematically model the climate system's response to human-induced increases in greenhouse gases,[1] a consistent picture of resulting atmospheric temperature trends has emerged. The surface and troposphere (the lowest 8–12 km) warm with a local maximum trend in the upper levels in the tropics, while the stratosphere above cools (Figure 1).

In a 1990 paper, Spencer and Christy[3] claimed that since the start of routine satellite temperature observations in 1979 there had been no tropospheric warming, despite apparently rapid surface warming. The paper raised questions about both the veracity of the surface temperature record and our understanding of the climate system's response to greenhouse gas increases, and it has been heavily cited in both scientific and political arenas. Taken at face value, these questions would have fundamental and far-reaching implications for understanding of the climate

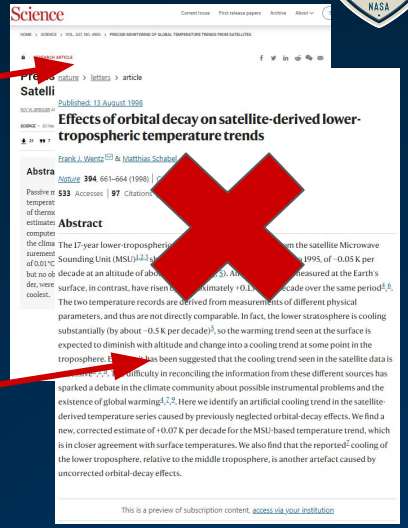
*Correspondence to: Peter.Thorne@noaa.gov
[1]Met Office Hadley Centre, FitzRoy Road, Exeter, UK
[2]Cooperative Institute for Climate and Satellites, NOAA National Climatic Data Center, 151 Patton Avenue, Asheville, NC, USA

1990 - Highly cited paper: no upper atmosphere warming. Therefore - we don't understand climate enough to change any policy

Data open but difficult to access

1998 - Authors didn't account for orbital decay + other effects and introduced artificial cooling trend

2003 - Close code so new analysis took 5 years & $$$



Science

nature › letters › article

Published: 13 August 1998

Effects of orbital decay on satellite-derived lower-tropospheric temperature trends

Frank J. Wentz & Matthias Schabel

Nature 394, 661–664 (1998)

533 Accesses | 97 Citations

Abstract

The 17-year lower-tropospheric … from the satellite Microwave Sounding Unit (MSU)[1,2,3] … 1995, of −0.05 K per decade at an altitude of … measured at the Earth's surface, in contrast, have risen … approximately +0.1 … decade over the same period[4,5,6]. The two temperature records are derived from measurements of different physical parameters, and thus are not directly comparable. In fact, the lower stratosphere is cooling substantially (by about −0.5 K per decade)[3], so the warming trend seen at the surface is expected to diminish with altitude and change into a cooling trend at some point in the troposphere. … has been suggested that the cooling trend seen in the satellite data is … difficulty in reconciling the information from these different sources has sparked a debate in the climate community about possible instrumental problems and the existence of global warming[3,7,8]. Here we identify an artificial cooling trend in the satellite-derived temperature series caused by previously neglected orbital-decay effects. We find a new, corrected estimate of +0.07 K per decade for the MSU-based temperature trend, which is in closer agreement with surface temperatures. We also find that the reported[2] cooling of the lower troposphere, relative to the middle troposphere, is another artefact caused by uncorrected orbital-decay effects.

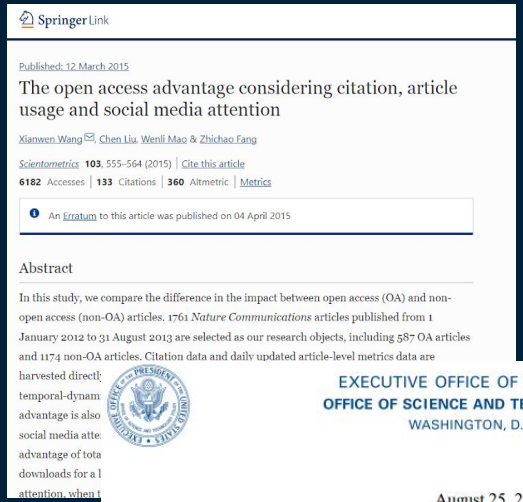
This is a preview of subscription content, access via your institution

Open science:

- More people looking at code improves quality
- Easier to revise/build, test hypotheses

https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1318&context=usdeptcommercepub

Can anyone participate?



SpringerLink

Published: 12 March 2015

The open access advantage considering citation, article usage and social media attention

Xianwen Wang, Chen Liu, Wenli Mao & Zhichao Fang

Scientometrics **103**, 555–564 (2015) | Cite this article

6182 Accesses | **133** Citations | **360** Altmetric | Metrics

An Erratum to this article was published on 04 April 2015

Abstract

In this study, we compare the difference in the impact between open access (OA) and non-open access (non-OA) articles. 1761 *Nature Communications* articles published from 1 January 2012 to 31 August 2013 are selected as our research objects, including 587 OA articles and 1174 non-OA articles. Citation data and daily updated article-level metrics data are harvested directly

temporal-dynam

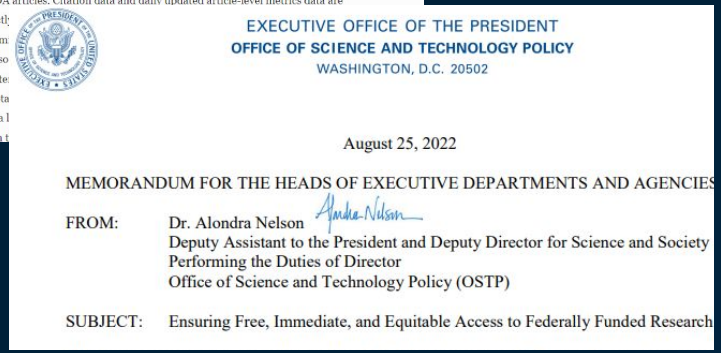
advantage is also

social media atte

advantage of tota

downloads for a l

attention, when t



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20502

August 25, 2022

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Dr. Alondra Nelson
Deputy Assistant to the President and Deputy Director for Science and Society
Performing the Duties of Director
Office of Science and Technology Policy (OSTP)

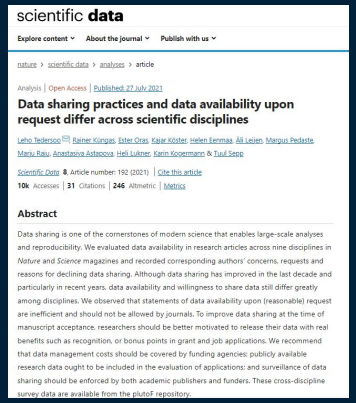
SUBJECT: Ensuring Free, Immediate, and Equitable Access to Federally Funded Research

Journal Paywalls:

- Restricts participation
- Inequalities in access to knowledge
- Current policy - 12 month embargo

“publications and their supporting data resulting from federally funded research publicly accessible without an embargo on their free and public release”

Scientists aren’t uniformly sharing data, even when they say they will:



scientific data

Explore content ~ About the journal ~ Publish with us ~

nature > scientific data > analyses > article

Analysis | Open Access | Published: 27 July 2021

Data sharing practices and data availability upon request differ across scientific disciplines

Lehti Tedersoo, Rainer Küngas, Ester Oras, Kajar Köster, Helen Eenmaa, Äli Leijen, Margus Pedaste, Marju Raju, Anastasiya Astapova, Heli Lukner, Kaido Kogermann & Tuul Sepp

Scientific Data 8, Article number: 192 (2021) | Cite this article

10k Accesses | 31 Citations | 246 Altmetric | Metrics

Abstract

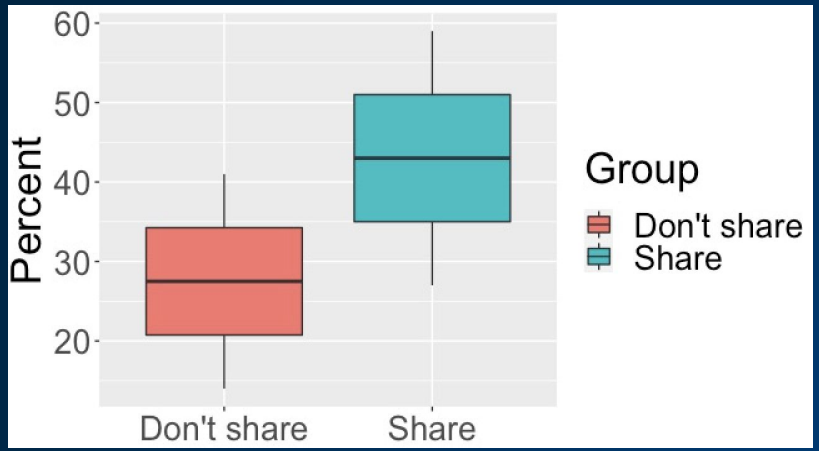
Data sharing is one of the cornerstones of modern science that enables large-scale analyses and reproducibility. We evaluated data availability in research articles across nine disciplines in *Nature* and *Science* magazines and recorded corresponding authors' concerns, requests and reasons for declining data sharing. Although data sharing has improved in the last decade and particularly in recent years, data availability and willingness to share data still differ greatly among disciplines. We observed that statements of data availability upon (reasonable) request are inefficient and should not be allowed by journals. To improve data sharing at the time of manuscript acceptance, researchers should be better motivated to release their data with real benefits such as recognition, or bonus points in grant and job applications. We recommend that data management costs should be covered by funding agencies; publicly available research data ought to be included in the evaluation of applications; and surveillance of data sharing should be enforced by both academic publishers and funders. These cross-discipline survey data are available from the plutoF repository.

https://www.nature.com/articles/s41597-021-00981-0

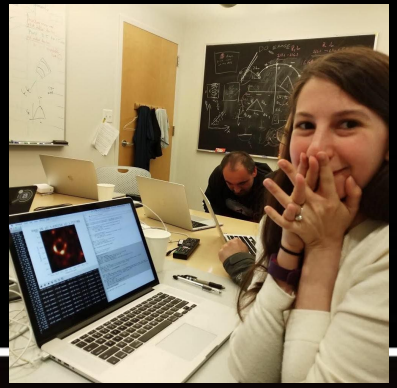
A 2021 study reviewed attempts to contact 875 authors who said data was “available on request.”

- 27–59% share**
- 14–41% don’t share**

**Variations indicated differing scientific fields



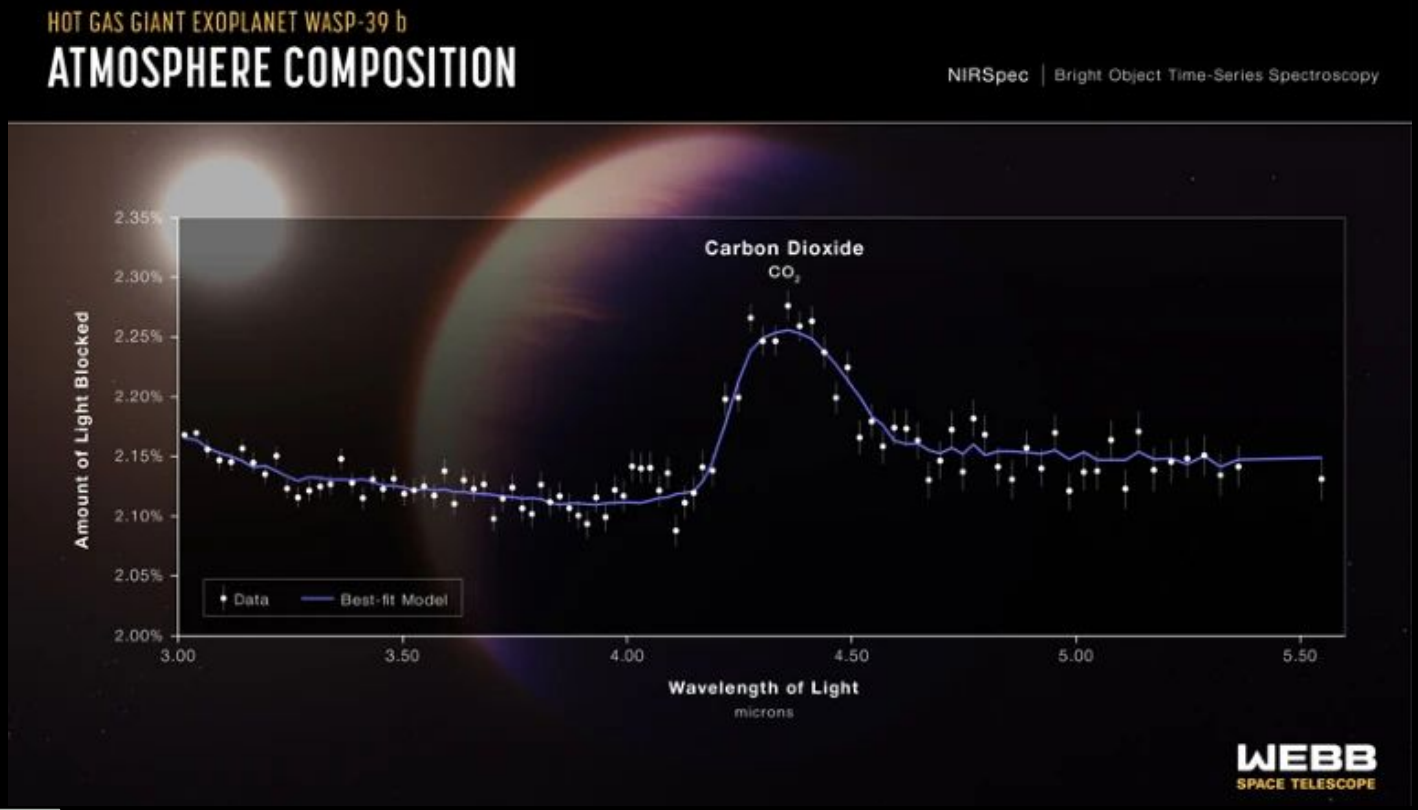
Open Science in Action: First Image of a Black Hole



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

Photo: EHT collaboration; NASA/CXC/Villanova University

Open Science in Action: Astronomers See CO2 on Exoplanet for the First Time



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

- Co-author Dr. Natasha Batalha

https://www.nature.com/articles/d41586-022-02350-2

Activity: Is it Open Science?

On the next few slides, we will show an image associated with the scientific process or research outputs.

Raise your hand and take a guess: is this image showing “open science in action?”

Take Care: There is more than one right answer!

Is it open science?

Nature subscription

Nature

International weekly journal of science

ISSN:
0028-0836 (print)
1476-4687 (electronic)

Subscription length:
1 Year Subscription with 51 Issues (plus online access to all articles starting 1997)

Access options:
Print & Online

Description

Nature is the foremost international weekly scientific journal in the world and is the flagship journal for Nature Portfolio. It publishes the finest peer-reviewed research in all fields of science and technology on the basis of its originality, importance, interdisciplinary interest, timeliness, accessibility, elegance and

Journal subscription $199.00

Print & Online **$199.00**
only $3.90 per issue

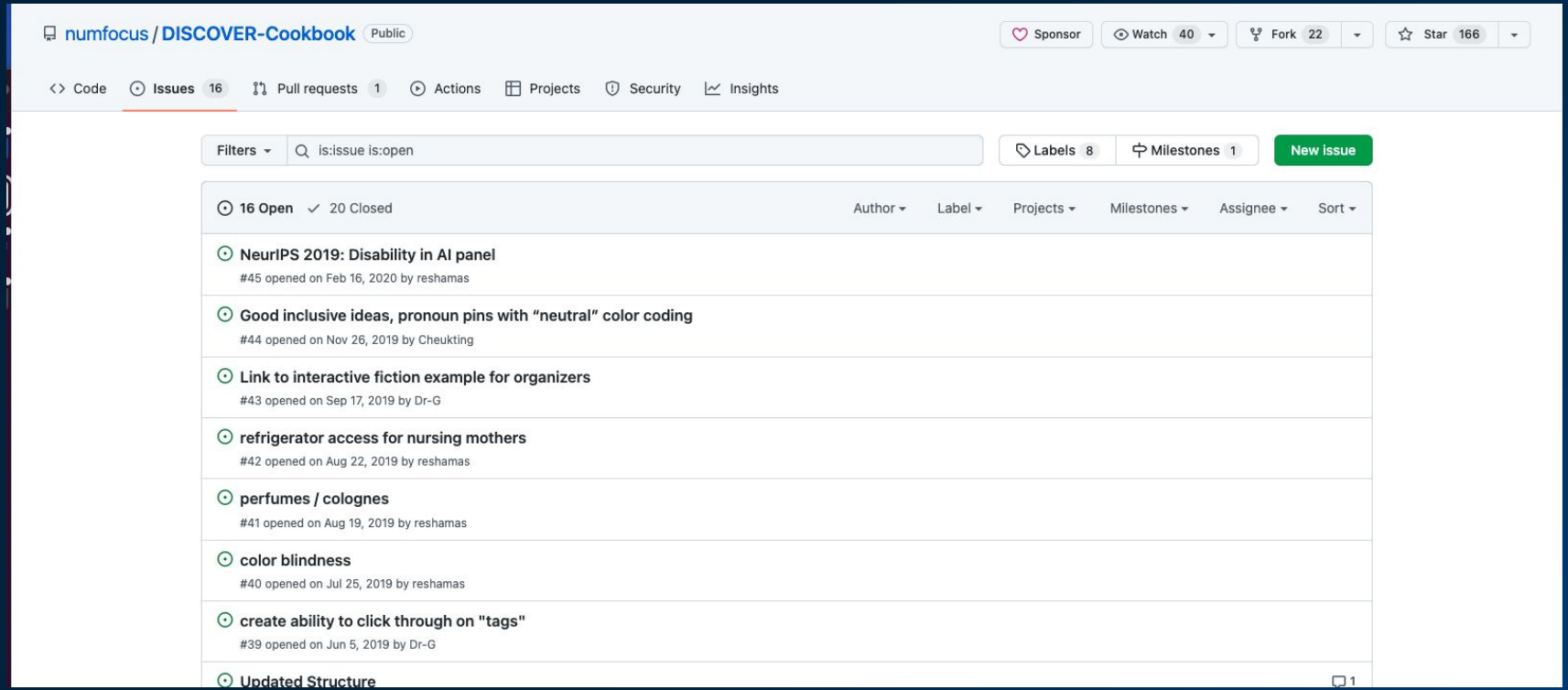
Subscribe

- The #1 Science Journal worldwide
- Provides cutting edge information on Science & Research topics
- Immediate Online Access
- Exclusive offer for individuals only
- 1 Year Subscription with 51 Issues (plus online access to all articles starting 1997)

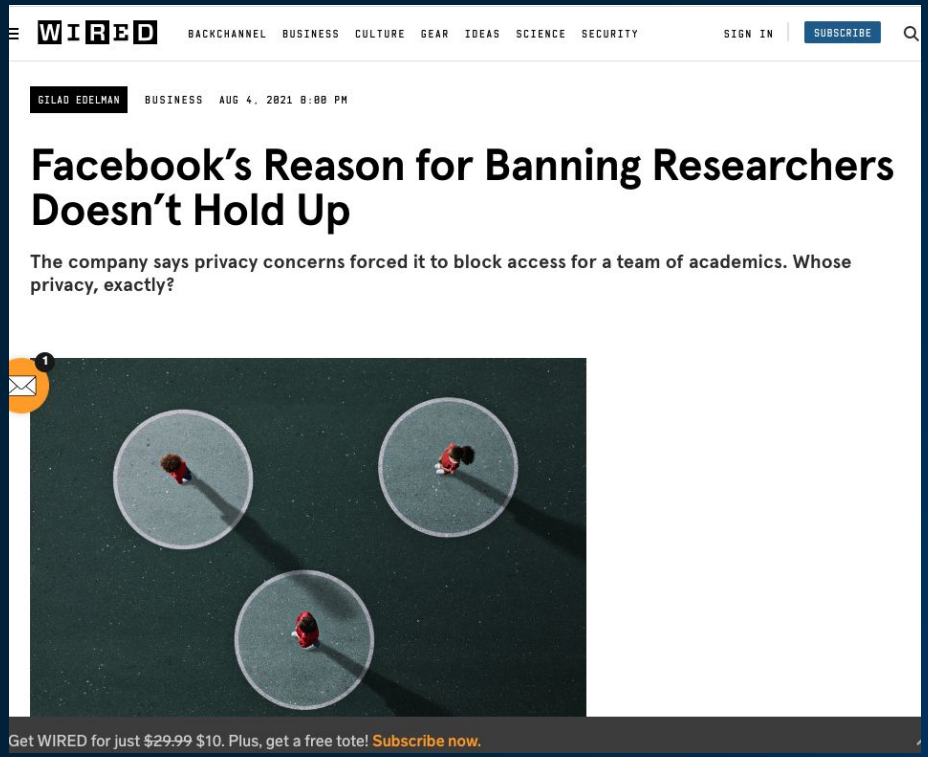
Nature+ subscription $29.99

Is it open science?

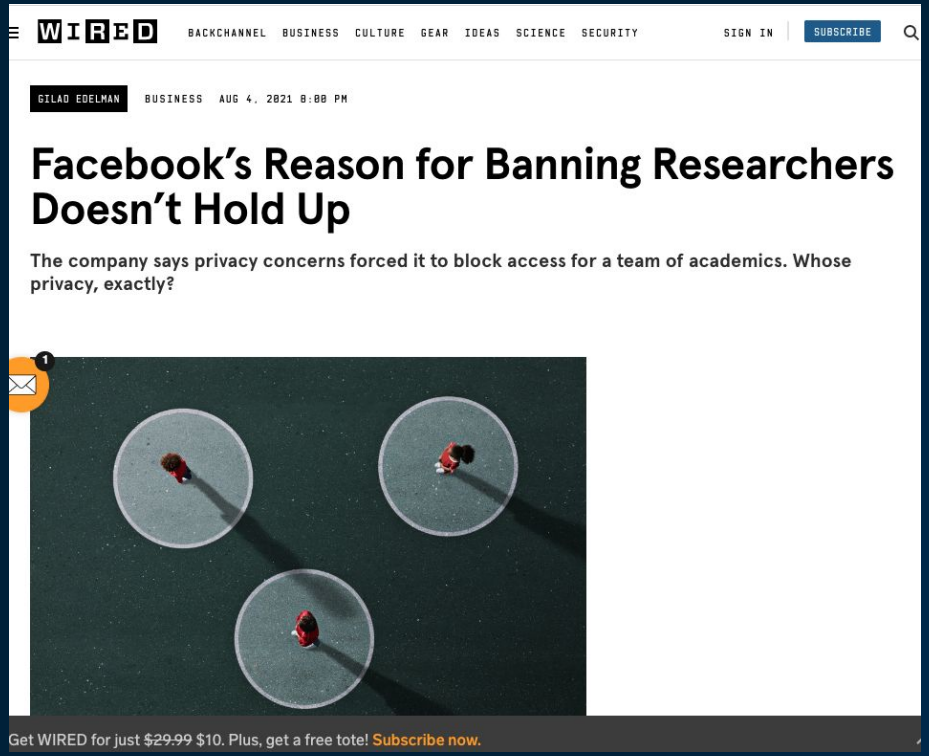
Is it open science?



Is it open science?



Hold on! This one is actually quite tricky…



WIRED BACKCHANNEL BUSINESS CULTURE GEAR IDEAS SCIENCE SECURITY SIGN IN SUBSCRIBE

GILAD EDELMAN BUSINESS AUG 4, 2021 8:00 PM

Facebook's Reason for Banning Researchers Doesn't Hold Up

The company says privacy concerns forced it to block access for a team of academics. Whose privacy, exactly?

Get WIRED for just ~~$29.99~~ $10. Plus, get a free tote! Subscribe now.

- Researchers aggregated data publicly available on Facebook and used it in a study.
- Facebook argued that this violates the privacy of the individuals.
- Researchers argue that all of this data was public anyway.
- People whose data was scraped did not know their data was scraped.
- What do you think?

There is no “one ethos” of open science.

Practicing *any* aspect of open science, when you can, is just as valuable as practicing all aspects.

https://www.scientificinfographics.com/21-towards-an-open-science

Why – Benefits and Challenges of Responsible Open Science: Why does it matter?

Open Science: Stop Checking The Box

There are many ways to practice open science and that's the beauty of it!

Maximize open science in action!

Minimize current challenges with research, data sharing, and access.

Open Science: Let's Talk About It

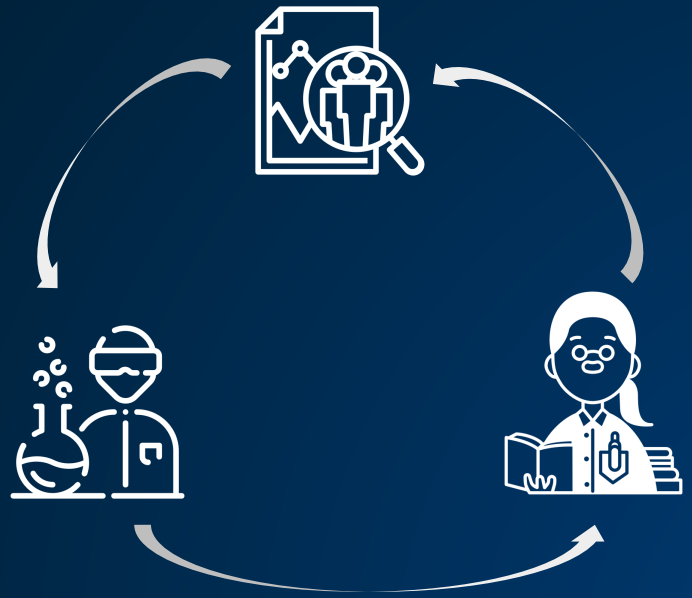
Maximize open science in action!

- Use best practices where possible
- Be practical and realistic about which resources available and the pressures felt by current researchers
- Do not share things that should not be shared (e.g., personally identifiable information)
- Be inclusive of all people

Open Science Strengthens Science

Open Science practices lead to greater…

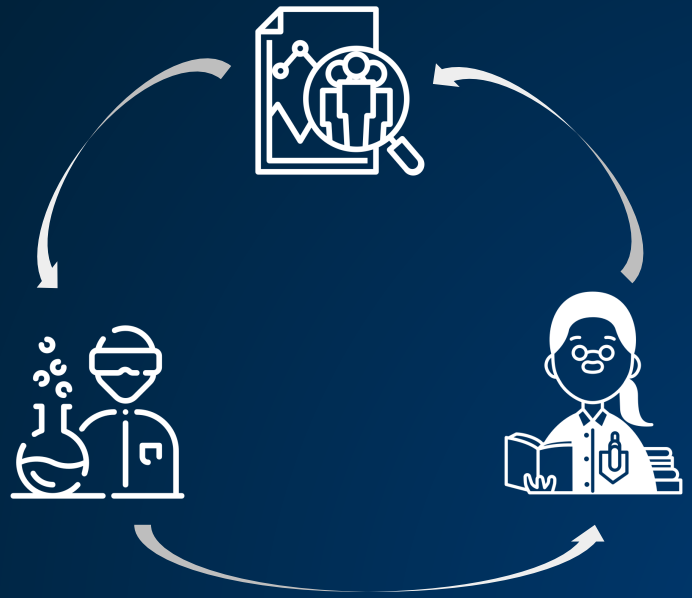
- Transparency
- Accuracy
- Sharing of ideas
- Greater visibility



Traditional (closed) Science is less reliable….

Open Science practices limit…

- Unreliable or misleading results
- Publication bias
- Amplification of “false positives” in research
- Unintentional or costly repetition of studies on the same population



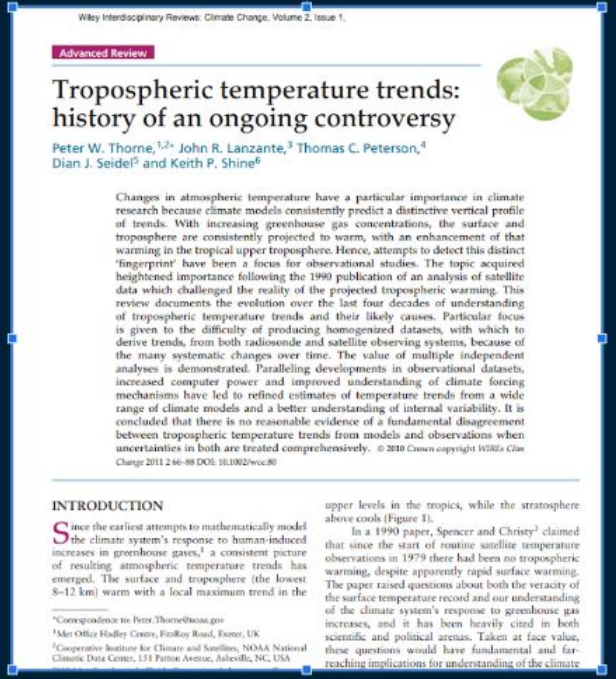
The Volkswagen Diesel Scandal: Code as Methods

When computers are used to produce scientific research, the code is considered a "method." When methods are not shared, no-one else can reproduce the work.

In 2025, it was revealed that Volkswagen intentionally programmed its diesel engines to cheat during laboratory emissions testing.

If the code had been part of the “scientific methods” that were shared with the public, this untrustworthy behavior would have been picked up on much earlier. (Gkotsopoulou et al., 2017)

Can we rapidly iterate and resolve problems?



Wiley Interdisciplinary Reviews: Climate Change, Volume 2, Issue 1.

Advanced Review

Tropospheric temperature trends: history of an ongoing controversy

Peter W. Thorne,[1,2]* John R. Lanzante,[3] Thomas C. Peterson,[4] Dian J. Seidel[5] and Keith P. Shine[6]

Changes in atmospheric temperature have a particular importance in climate research because climate models consistently predict a distinctive vertical profile of trends. With increasing greenhouse gas concentrations, the surface and troposphere are consistently projected to warm, with an enhancement of that warming in the tropical upper troposphere. Hence, attempts to detect this distinct 'fingerprint' have been a focus for observational studies. The topic acquired heightened importance following the 1990 publication of an analysis of satellite data which challenged the reality of the projected tropospheric warming. This review documents the evolution over the last four decades of understanding of tropospheric temperature trends and their likely causes. Particular focus is given to the difficulty of producing homogenized datasets, with which to derive trends, from both radiosonde and satellite observing systems, because of the many systematic changes over time. The value of multiple independent analyses is demonstrated. Paralleling developments in observational datasets, increased computer power and improved understanding of climate forcing mechanisms have led to refined estimates of temperature trends from a wide range of climate models and a better understanding of internal variability. It is concluded that there is no reasonable evidence of a fundamental disagreement between tropospheric temperature trends from models and observations when uncertainties in both are treated comprehensively.

INTRODUCTION

Since the earliest attempts to mathematically model the climate system's response to human-induced increases in greenhouse gases,[1] a consistent picture of resulting atmospheric temperature trends has emerged. The surface and troposphere (the lowest 8–12 km) warm with a local maximum trend in the upper levels in the tropics, while the stratosphere above cools (Figure 1).

In a 1990 paper, Spencer and Christy[2] claimed that since the start of routine satellite temperature observations in 1979 there had been no tropospheric warming, despite apparently rapid surface warming. The paper raised questions about both the veracity of the surface temperature record and our understanding of the climate system's response to greenhouse gas increases, and it has been heavily cited in both scientific and political arenas. Taken at face value, these questions would have fundamental and far-reaching implications for understanding of the climate

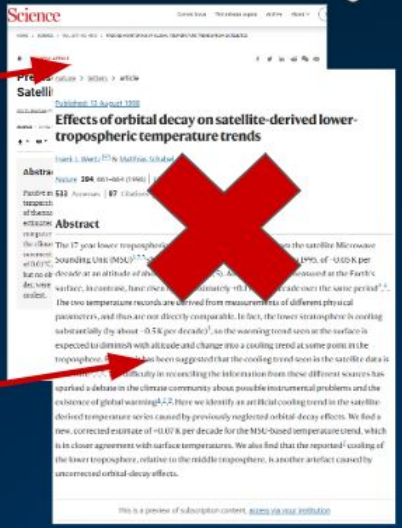
*Correspondence to: Peter.Thorne@noaa.gov
[1]Met Office Hadley Centre, FitzRoy Road, Exeter, UK
[2]Cooperative Institute for Climate and Satellites, NOAA National Climatic Data Center, 151 Patton Avenue, Asheville, NC, USA

1990 - Highly cited paper: no upper atmosphere warming. Therefore - we don't understand climate enough to change any policy

Data open but difficult to access

1998 - Authors didn't account for orbital decay + other effects and introduced artificial cooling trend

2003 - Close code so new analysis took 5 years & $$$



Science

Effects of orbital decay on satellite-derived lower-tropospheric temperature trends

Abstract

Open science:

- More people looking at code improves quality
- Easier to revise/build, test hypotheses

https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1318&context=usdeptcommercepub

Open science is all about helping more people do better science!

Document and share code and data

Attribute contributions to all who participated

Keep the conversation going (and help others join the discussion)

Discussion: Open Science Barriers

What barriers to conducting open science have you encountered in your education and career?

Share your experiences with one another.

How do you overcome this barrier? Or what questions do you have for one another and us about how to overcome it in the future?

Who – Stakeholders of Open Science: Who practices Responsible Open Science and for whom?

Stakeholders of Open Science

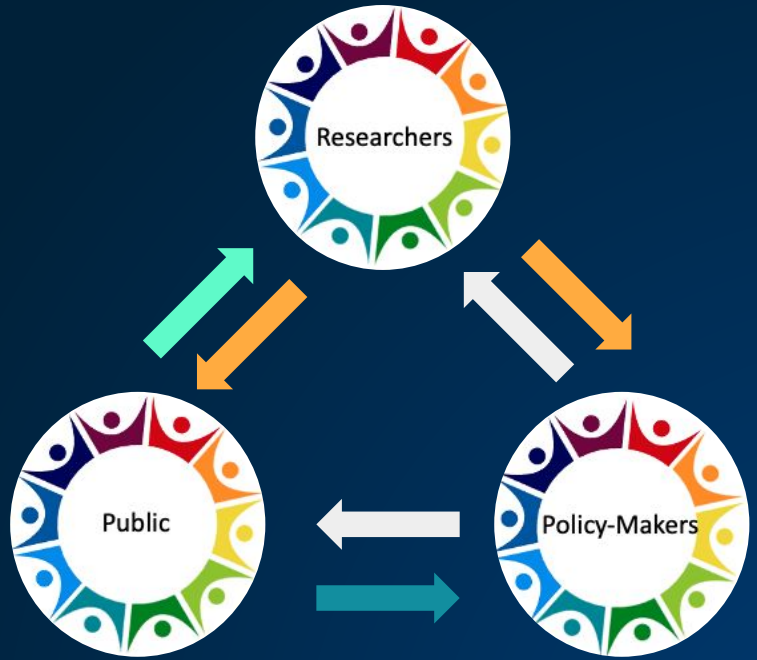
Stakeholders of open science can be categorized into three groups.

Trend

Officialize

Participate

Share

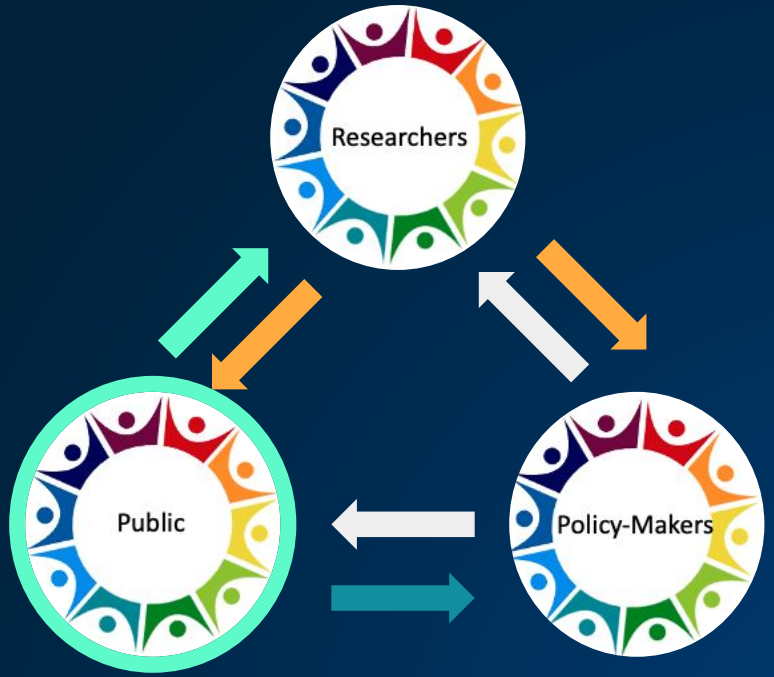


Stakeholders of Open Science

Researchers are engaged in creating new knowledge, and responsible for creating an environment as well as open outputs and processes.

Stakeholders of Open Science

The Public are non-researchers who can drive, improve, and conduct science (e.g., citizen science).



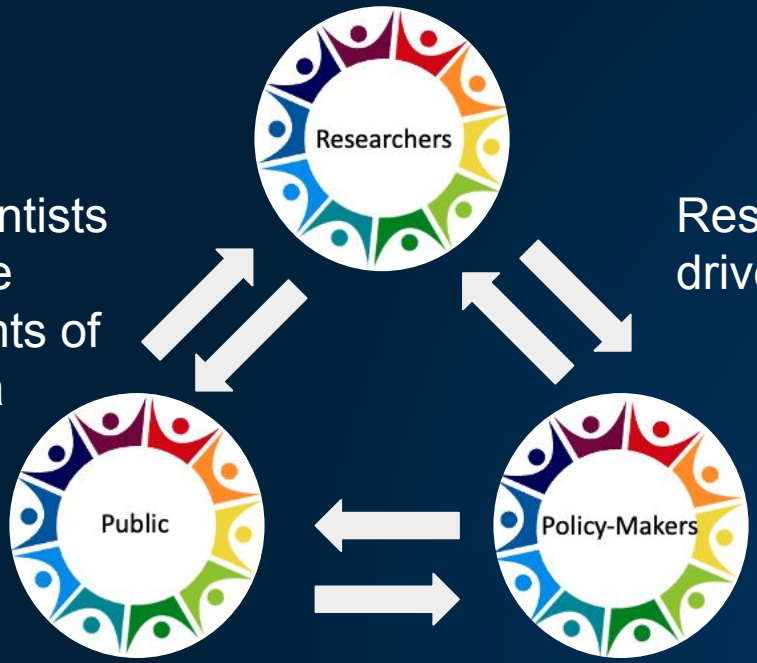
Stakeholders of Open Science

Policy-Makers have the decision-making power, and include government and regulatory bodies. This includes those who make regulations for a particular academic institution or organizational group.

Where – Impact of Open Science on Academia, Communities and All Society: Where does open science happens?

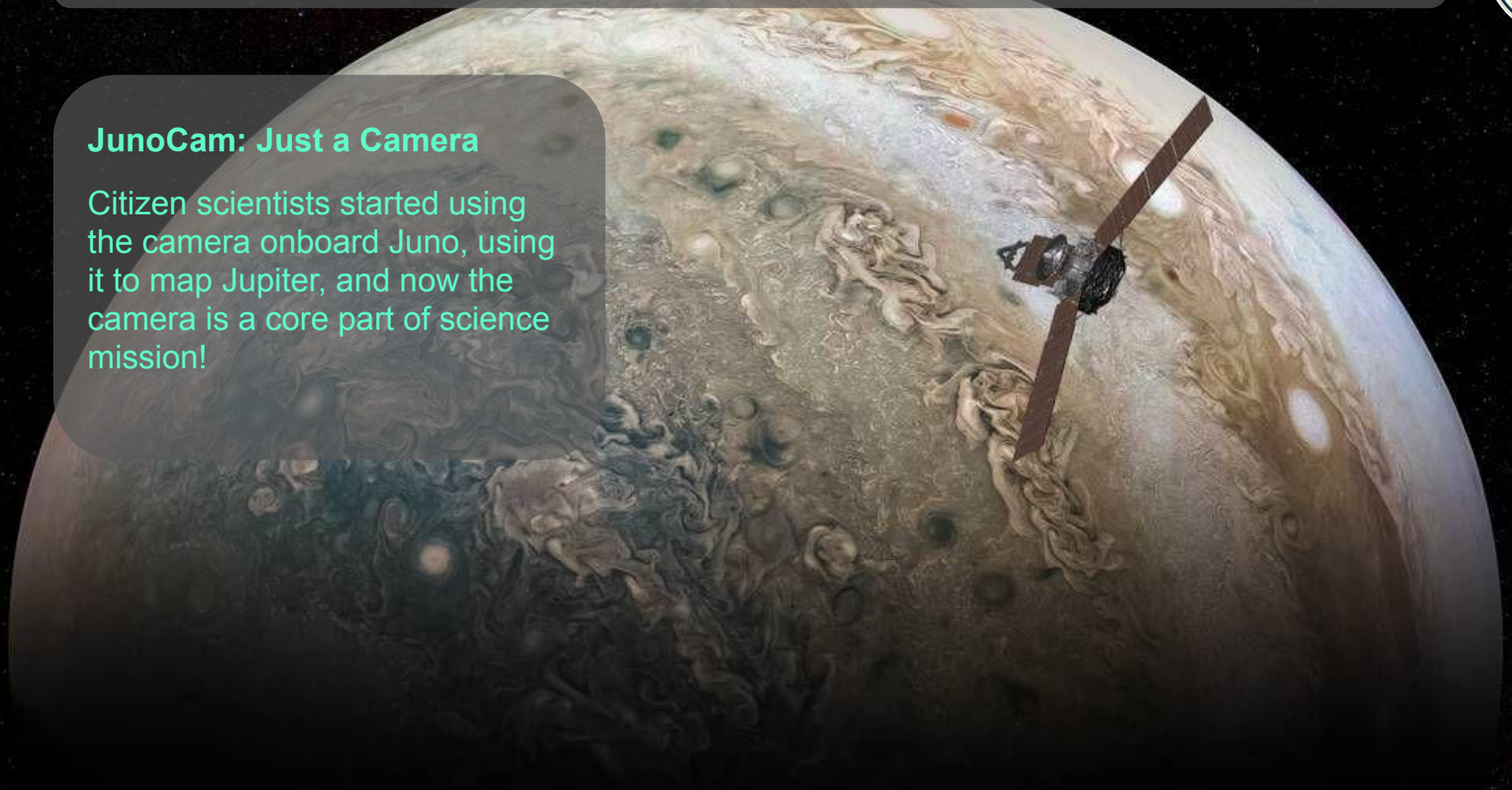
All Stakeholders Contribute to Advancing Open Science

Citizen Scientists help analyze large amounts of diverse data



Research is used to drive policy decisions

Case Study: Public Drives New Research Methods



JunoCam: Just a Camera

Citizen scientists started using the camera onboard Juno, using it to map Jupiter, and now the camera is a core part of science mission!

Image: NASA/JPL-Caltech/SwRI/MSSS/Kevin M. Gill

Community Science: When researchers and the community co-create

Community science refers to projects that are led by a community and honor community priorities.

- Can be initiated by a science practitioner or a community member
- Are a collaborative endeavor (ASTC, 2021)
- Prioritize community needs

Case Study: Community Science

Remote Islands in Canada facing Sea Level Rise

Local Issues:

- Salt water intrusion
- Loss of archaeological sites

Community-driven Solutions:

- Climate-related mapping and visualization techniques for vulnerability assessments
- Preservation Initiatives

Charles, et al (2020)

Open Science is Accessible Science

To make science truly open, we must ensure that **open science is accessible** to everyone.

The best way to include a diverse group of stakeholders is to r**emove existing barriers**, and **design for inclusion**.

https://www.nature.com/articles/s41557-020-0529-x

Activity: What would you do?

Group 1: Accessibility

- Open-source code hackathon
- Some attendees are deaf or have visual difficulties

Group 2: Cultural Norms

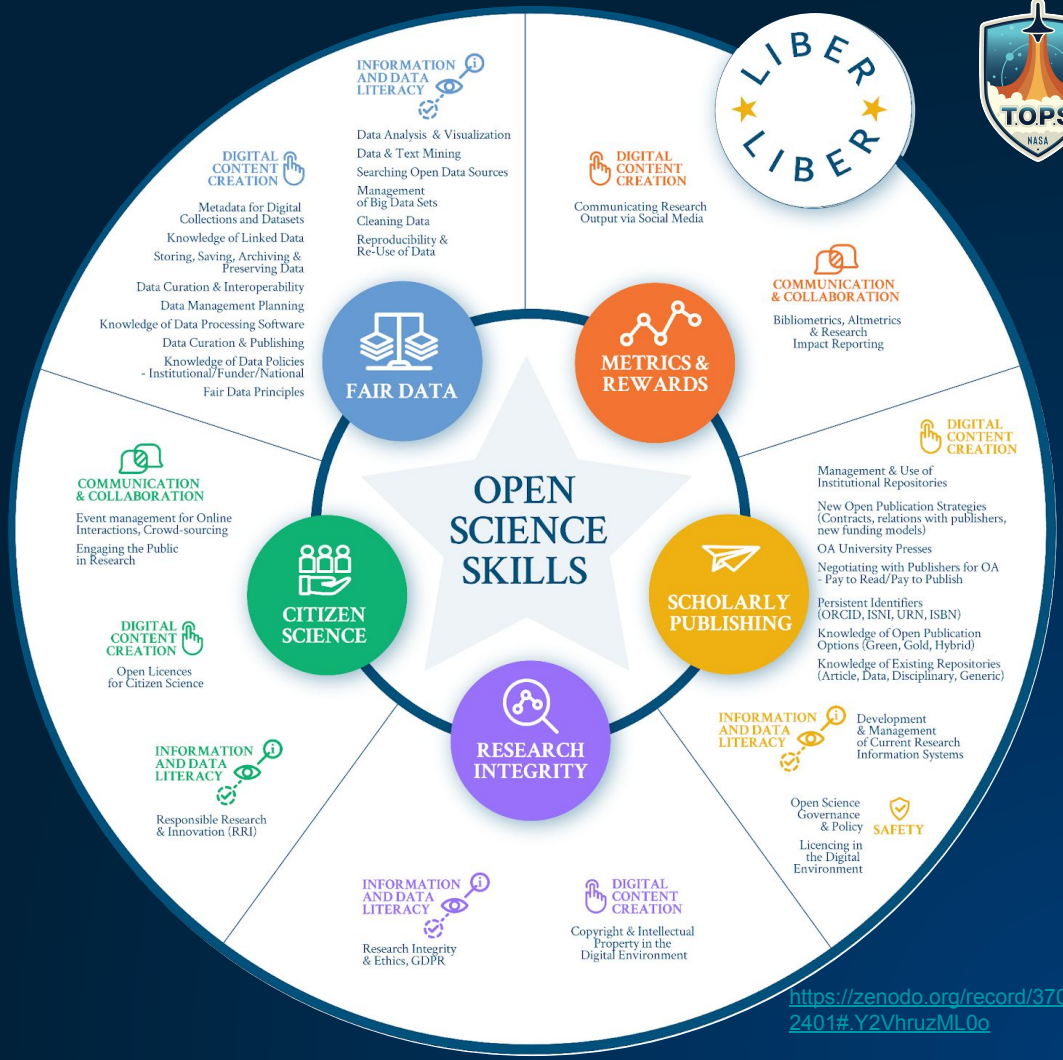
- Open science meeting
- Attendees have differing cultural backgrounds

Group 3: Conflict Resolution

- Open meeting
- Disruptive Behavior

How – How to Get Started With Responsible Open Science

The rest of our conversation today will be focused on core, open science skills!



https://zenodo.org/record/3702401#.Y2VhruzML0o

Responsible Open Science is Both a Mindset and Culture

Preparing for open science in advance is critical!

- Decide on meeting rules, code of conduct, and other inclusive work practices
- Create data management and archiving plans
- Organize tasks equitably among your research team
- Decide which tools to use
- Think about authorship and credit
- Engage with relevant stakeholders and research partners
- Identify repositories for software and data
- Highlighting these approaches in your grant

and much more!

The Internet Facilitates Sharing of Information

The internet creates many outlets for public and free hosting of research and data. It is now possible to connect all participants, stakeholders, and outputs of open science so that they are easy to discover.

We’re going to show you the tools that will make this easier!

Digital Persistent IDentifiers (PID)

To take full advantage of **digital interoperability** - assign each artifact a “persistent identifier” and “metadata.”

- Secure path
- Machine-readable

Created digitally, Persistent IDentifiers are called “PID.”

- Digital Object Identifier (DOI)
- Open Researcher and Contributor ID (ORCID)

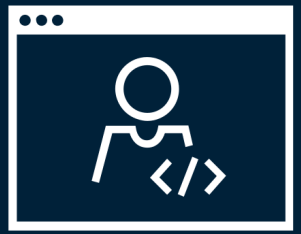
DOIs and PIDs can be used for researchers as well as their research.

Examples of PIDs in Action

A researcher writes a script in R.

They can upload their R code to a repository, and get a DOI for their script.

Others can peer-review or use the code!



A consortium member collaboratively authors a paper summarizing the results of a workshop.

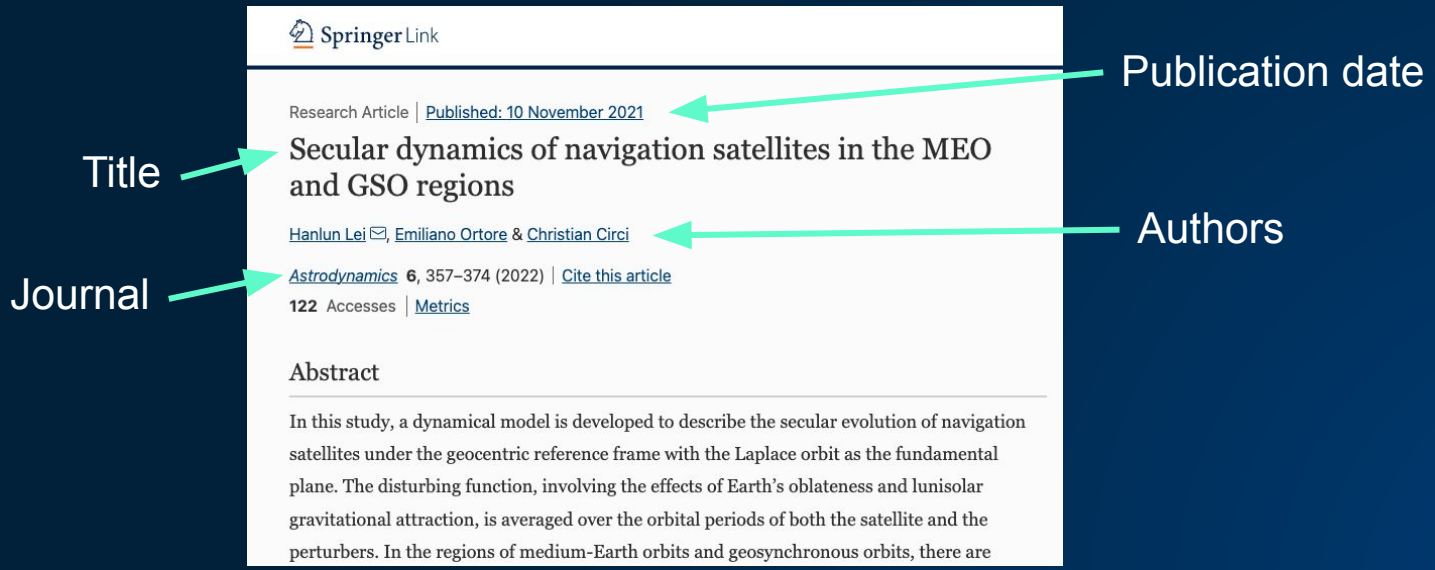
The journal they publish is automatically assigned a DOI.

A citizen scientist attends an online conference and gives a short talk.

They deposit their slides on Zenodo, and then share that DOI URL to receive credit.

Metadata is About Discoverability

Metadata is documentation about your data, and each object with a persistent identifier helps overall research discoverability.

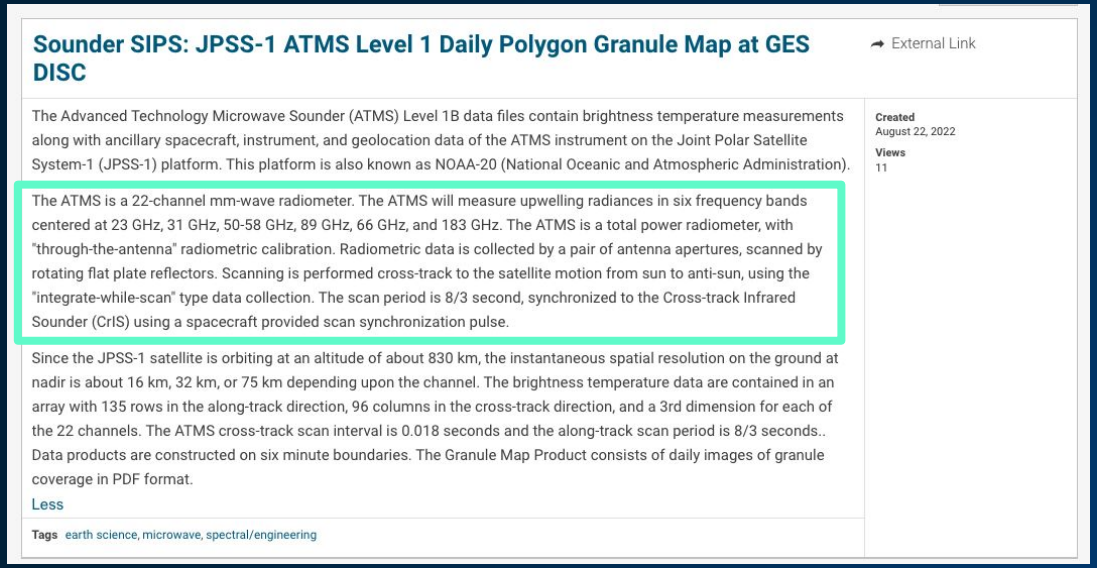


Metadata is About Discoverability

Metadata is documentation about your data, and each object with a persistent identifier helps overall research discoverability.

Data sets include information on

- Standards
- Uncertainty
- Calibration



Sounder SIPS: JPSS-1 ATMS Level 1 Daily Polygon Granule Map at GES DISC

External Link

The Advanced Technology Microwave Sounder (ATMS) Level 1B data files contain brightness temperature measurements along with ancillary spacecraft, instrument, and geolocation data of the ATMS instrument on the Joint Polar Satellite System-1 (JPSS-1) platform. This platform is also known as NOAA-20 (National Oceanic and Atmospheric Administration).

The ATMS is a 22-channel mm-wave radiometer. The ATMS will measure upwelling radiances in six frequency bands centered at 23 GHz, 31 GHz, 50-58 GHz, 89 GHz, 66 GHz, and 183 GHz. The ATMS is a total power radiometer, with "through-the-antenna" radiometric calibration. Radiometric data is collected by a pair of antenna apertures, scanned by rotating flat plate reflectors. Scanning is performed cross-track to the satellite motion from sun to anti-sun, using the "integrate-while-scan" type data collection. The scan period is 8/3 second, synchronized to the Cross-track Infrared Sounder (CrIS) using a spacecraft provided scan synchronization pulse.

Since the JPSS-1 satellite is orbiting at an altitude of about 830 km, the instantaneous spatial resolution on the ground at nadir is about 16 km, 32 km, or 75 km depending upon the channel. The brightness temperature data are contained in an array with 135 rows in the along-track direction, 96 columns in the cross-track direction, and a 3rd dimension for each of the 22 channels. The ATMS cross-track scan interval is 0.018 seconds and the along-track scan period is 8/3 seconds.. Data products are constructed on six minute boundaries. The Granule Map Product consists of daily images of granule coverage in PDF format.

Less

Tags earth science, microwave, spectral/engineering

Created
August 22, 2022

Views
11

Get the Credit that You Deserve

Sharing data, code, and software is a key for ensuring reproducibility of findings, improvement of code and software, and to enable other researchers to easily re-use, extend, and cite that work!

DATA.NASA.GOV

zenodo

- Collaborative Coding
- Domain Archives
- Citations & Version Control

binder

The FAIR Principles Help Facilitate Data-Sharing

PIDs, DOIs, open-source software, metadata and other identifiers help research data to be FAIR.

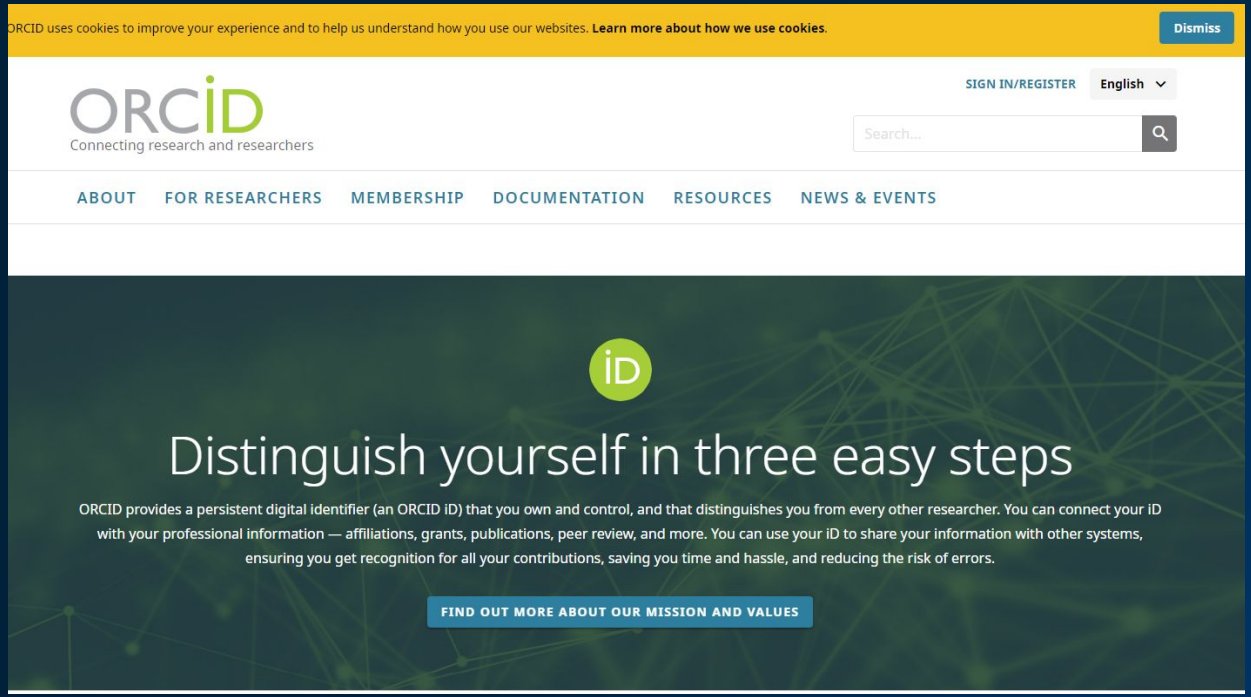
- **F**indable
- **A**ccessible
- **I**nteroperable
- **R**eusable

As an open scientist, you can use a license to grant others permission to re-use your work, and the conditions for that re-use.

Basics of intellectual property, copyright, and licensing

- Written content – *Creative Commons licenses* allow re-use
- Data – Creative Commons Public Domain (CC0) licenses
- Computer code – The Open Source Initiative has a set of licenses designed specifically for code projects

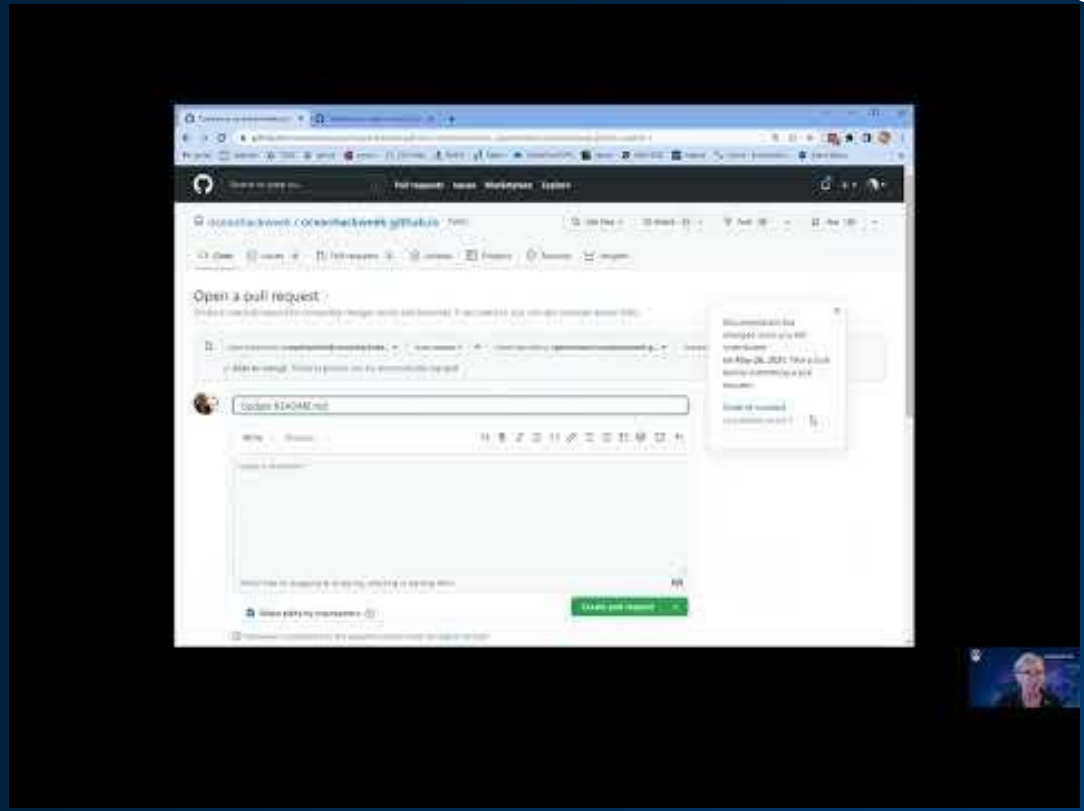
Activity: Let's get an ORCID!



Activity: Making a Pull Request!

Practice by Adding Your Comments to

https://github.com/nasa/Transform-to-Open-Science/blob/main/Open_Science_Cookbook/reading_list.md



https://www.youtube.com/watch?v=PHoScPeMWHI&t=1s

Making Your Work Useful to Others

In addition to enabling you to get the proper credit for your work, open science practices makes it easier for others to use your work.

Preprints and public, manuscript repositories

Publish open access

Proper authorship that recognizes all contributors

Discipline-specific practices

https://www.scientificinfographics.com/21-towards-an-open-science

6 Guidelines to Start Practicing Open Science

1. Plan for responsible Open Science from the beginning.
2. Plan for making data and code open and available in leading repositories, and citing it in your publications. If you use the data and software of others, cite it!
3. Adopt open science tools specific to your discipline.
4. Develop and foster inclusive practices for meetings and collaborations.
5. Learn the routes to make your publications open, including what your institution supports and funders require.
6. Support and inform your colleagues.

Select List of Resources

- Digital Persistent identifiers - for objects and researchers (such as doi and ORCID)
- Open Journal System: open source software for managing & publishing scholarly journals
- Electronic notebooks such as Jupyter and R Markdown
- Data repositories: genetic sequence database Genbank, protein data bank (PDB), Dataverse, figshare, Zenodo and for wide search use Re3data and/or DataCite
- Softwares/Codes: Zenodo used with Github / mybinder
- Materials: Addgene (for molecular biology)
- Reference management tools: Zotero, Mendeley
- Academic Social networks: Academia.edu, ResearchGate
- Peer Review: Publons, PreView
- Project management: Open Science framework
- Github as a platform for collaborative work on training materials etc

Find more (and contribute your own) at
https://github.com/nasa/Transform-to-Open-Science/blob/main/Open_Science_Cookbook/reading_list.md

National Aeronautics and Space Administration

Submit Feedback or Suggestions

Please fill out our post-course survey to help us improve!

Learn more and collaborate with us!

TOPS Email List

TOPS Website


T.O.P.S
NASA
NASA
Q&A

Upcoming Opportunities

- F.14 Transform to Open Science-Training (TOPST) ROSES solicitation due December 8, 2022
- TOPS Monthly Community Forum (2nd Thursday of every month)
  - Thursday, November 10, 2022 at 1pm ET; Register here.
- TOPST Notice of Intent (NOI) is also due on November 10, 2022 (optional); TOPST: FAQ here
- Visit the NASA booth at the 2022 AGU Fall Meeting and keep an eye out for the TOPS workshops and Hyperwall presentations.
- Find a friend! Want to find some collaborators? Join the discussion!
- We encourage sharing knowledge! Please make a pull request on the TOPS GitHub here!

New Funding Opportunity!

NASA has allocated **$3 million/year** to fund projects related to Open Science Training via the “TOPST” ROSES 22 element.

F.14 Transform to Open Science Training (TOPST) solicits proposals to advance Open Science literacy through:

1) Development of *ScienceCore*,
2) *OpenCore* summer schools, and
3) *OpenCore* virtual cohorts

Deadline: December 8, 2022