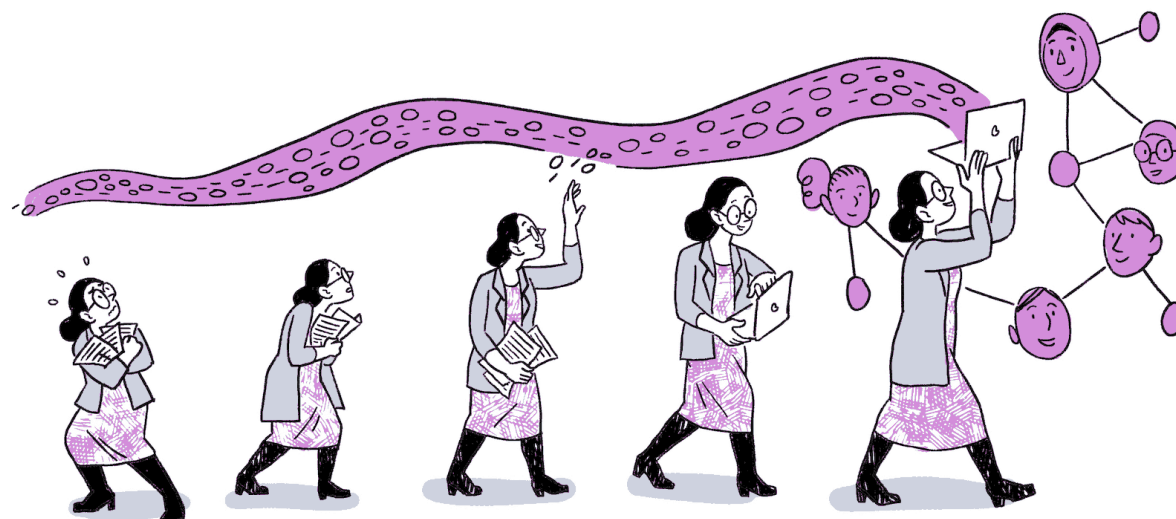


Good Practices for Open Science

- **Dr. Heather Andrews**
- **Data Steward**
- h.e.andrewsmancilla@tudelft.nl
- **Faculty of Aerospace Engineering**
- **Delft University of Technology**






EVOLVING TOWARDS AN
ERA OF
OPEN RESEARCH

What do you think of when you hear
the term **Open Science**?

ARTICLE

Decentralised Traffic Management for Constrained Urban Airspace: Dynamically Generating and Acting Upon Aggregate Flow Data

Andres Morfin Veytia ^{*}, Joost Ellerbroek , and Jacco Hoekstra 

Control and Simulation, Faculty of Aerospace Engineering, Delft University of Technology, Delft, Netherlands

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(Received: 1 July 2024; Revised: 28 August and 25 September 2024; Accepted: 25 September 2024; Published: 3 October 2024)

(Editor: Xavier Olive; Reviewers: Patrick Le Blaye, Yash Guleria, Mayara Condé Rocha Murça, Valentin Polishchuk)

EINSTEIN EXPLAINS HIS NEW DISCOVERIES

In a Simplified Discussion of "Field Theories, Old and New," the Eminent Scientist Shows the Meaning Of His Latest Contribution for Gravitation, Electro-Magnetism and Our Ideas of Time and Space

[illegible][illegible]

DR. ALBERT EINSTEIN

time. It is well known that this theory discarded the absolute character of the conception of the simultaneity of events. It appears as if a pure magnetic field, appears simultaneously in another coordinate system in relative motion with respect to the first. Then had received no satisfactory explanation the hypothesis regarding the incorporation of the equality of inertial mass and gravitational mass, or, in other time continues had to be abandoned.

[illegible]

ARTICLE

Decentralised T Airspace: Dynar Flow Data

Andres Morfin V

Control and Simulat

*Corresponding auth

(Received: 1 July 202

(Editor: Xavier Olive



<https://eu-citizen.science/project/579>



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Cosmic on air

O Active

from 04/02/2019

The Cosmic On Air project is a citizen science project which aims to collect measurements of dose rate carried out on board airplane by the public to organize and make them available to the scientific community, in particular those which could be carried out during solar flares. These phenomena can significantly increase dose rates at flight altitudes. Solar eruptions are sporadic phenomena and those with a significant effect in terms of dose rate are rare. For this reason, very few measurements on board aircraft have been made, which limits the understanding of these phenomena in the atmosphere.

Aim



What is Open Science?

Open science is the **movement** that stands for a more open and participatory research practice. Publications, data, software and other forms of scholarly information are shared at the earliest possible stage and made available for **reuse**.

<https://www.openscience.nl/en/about-open-science-nl>

What is Open Science?

**Open
Access**

**Open
Data**

**Open
Software**

What is Open Science?

**Open
Access**

**Open
Data**

**Open
Software**

Open → free & libre

What is Open Science?

**Open
Access**

**Open
Data**

**Open
Software**

**Open
Tools**

**Citizen
Science**

**Open
Evaluation**

**Open
Education**

What is Open Science?

**Open
Data**



**Open
Software**

Outline

- **Benefits** of Open Science
- **Challenges** of Open Science
- Where to **start**?

What are the **benefits** of Open Science?

What are the benefits of **Open Science**?

- Show **transparency**
 - increases **trust**

What are the benefits of Open Science?

- Show transparency
 - increases trust

Bengu Sezen Cited For Research Misconduct

Former Columbia chemistry graduate student falsified, fabricated, and plagiarized research data, government finds

by [William G. Schulz](#)
November 30, 2010

<https://cen.acs.org/articles/88/web/2010/11/Bengu-Sezen-Cited-Research-Misconduct.html>

NEWS FEATURE | 08 March 2024

<https://doi.org/10.1038%2Fd41586-024-00716-2>

Superconductivity scandal: the inside story of deception in a rising star's physics lab

Ranga Dias claimed to have discovered the first room-temperature superconductors, but the work was later retracted. An investigation by *Nature's* news team reveals new details about what happened – and how institutions missed red flags.

German university withdraws doctorate after fraud charge

Munich. In what could be the first case of its kind in Germany, a chemistry researcher at the University of Bonn has had his doctorate withdrawn following charges of scientific fraud. But the researcher, Guido Zadel, maintains his innocence, and is likely to challenge the decision in court.

of Organic Chemistry, because no other research group could reproduce the results.

Zadel was first accused of fraud in May 1994 by two other students of Breitmaier. Claiming now that he was “under pressure”, Zadel admitted to mixing some optically active substances with the initial chemicals.

<https://doi.org/10.1038/382104b0>

And there are many more examples...

What are the benefits of Open Science?

- Show **transparency**
 - increases **trust**
- By allowing others to **replicate, reproduce** and **build upon** your work:
 - get more **visibility**

What are the benefits of Open Science?

- Show transparency
 - increases trust
- By allowing others to **replicate, reproduce and build upon** your work:
 - get more **visibility**



<https://pathos-project.eu/>

Open Science Success Stories Database


Astronomers Accidentally Capture Planet Collision for the First Time

Without one social media user's sharp eye, their unexpected achievement might have gone unnoticed.

<https://www.extremetech.com/aerospac/astronomers-accidentally-capture-planet-collision-for-the-first-time>

Article | Published: 11 October 2023

A planetary collision afterglow and transit of the resultant debris cloud

[Matthew Kenworthy](#) , [Simon Lock](#), [Grant Kennedy](#), [Richelle van Capelleveen](#), [Eric Mamajek](#), [Ludmila Carone](#), [Franz-Josef Hambsch](#), [Joseph Masiero](#), [Amy Mainzer](#), [J. Davy Kirkpatrick](#), [Edward Gomez](#), [Zoë Leinhardt](#), [Jingyao Dou](#), [Pavan Tanna](#), [Arttu Sainio](#), [Hamish Barker](#), [Stéphane Charbonnel](#), [Olivier Garde](#), [Pascal Le Dû](#), [Lionel Mulato](#), [Thomas Petit](#) & [Michael Rizzo Smith](#)

Nature **622**, 251–254 (2023) | [Cite this article](#)

<https://doi.org/10.1038/s41586-023-06573-9>

What are the benefits of Open Science?

- Show **transparency**
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- By allowing others to **replicate, reproduce** and **build upon** your work:
 - get more **visibility**
 - increase **efficiency**

What are the benefits of Open Science?

- Show **transparency**
 - increases **trust**
- Allow others to **replicate, reproduce** and **build upon** your work
 - more **visibility**
 - increases **efficiency**
- Save resources by **reusing** material

What are the **challenges** of Open Science?

What are the challenges of Open Science?

- **Intellectual Property**

What are the challenges of Open Science?

- **Intellectual Property**

Keep in mind author is **not (necessarily) the same** as being the owner

Follow institutional **IP guidelines**

Consider **commercial or licensing restrictions** (incl. confidentiality)

What are the challenges of Open Science?

- Intellectual Property
- **Special regulations (incl. ethics)**

What are the challenges of Open Science?

- Intellectual Property
- **Special regulations (incl. ethics)**

General Data Protection Regulation (GDPR, EU) – *protect privacy*

Health Insurance Portability and Accountability Act (HIPPA, US) – *protect privacy of medical records*

EU Dual-Use Regulation (EC No 428/2009, EU) – *control the distribution of dual-use items*

International Traffic in Arms Regulations (ITAR, US) – *control the distribution of defense related items, technologies and services*

What are the challenges of Open Science?

- Intellectual Property
- Special regulations (incl. ethics)
- **Resources**

What are the challenges of Open Science?

- Intellectual Property
- Special regulations (incl. ethics)
- **Resources**

Plan for Data/Software Management

What are the challenges of Open Science?

- Intellectual Property
- Special regulations (incl. ethics)
- Resources
- **Quality control**

What are the challenges of Open Science?

- Intellectual Property
- Special regulations (incl. ethics)
- Resources
- **Quality control**

Ask for **feedback**

Participate in data/code **review sessions**

Provide **contribution guidelines**

Where to **start**?

Where to start?

- Start **small**

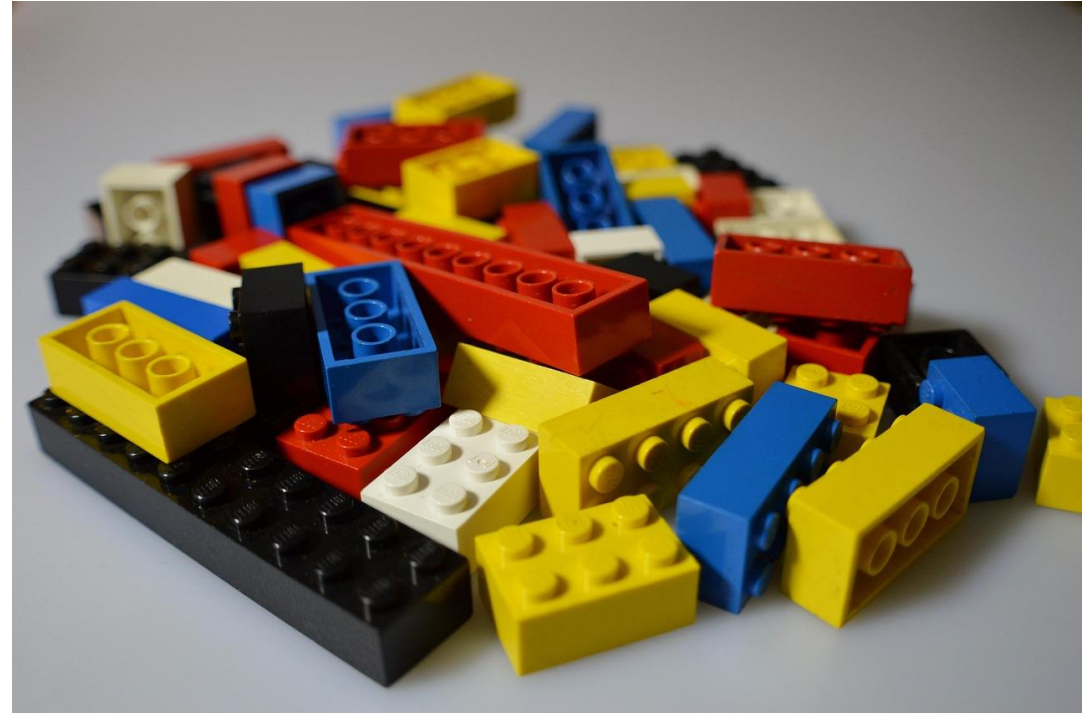


Image by [Alexa](#) via [Pixabay](#)

Where to start?

- Start small
- **Plan and discuss**



Image by [Adithya Rajeev](#) via [Pixabay](#)

Where to start?

- Start small
- **Plan and discuss**

Challenges
Research Data/Code Management Practices

Ask for support!

Talk to peers!

Open Science Community Delft

<https://www.tudelft.nl/en/open-science/community>



International Network of Open Science & Scholarship Communities

<https://osc-international.com/>



my community
is open!

OSCD
Open Science Community Delft



my community
is open!

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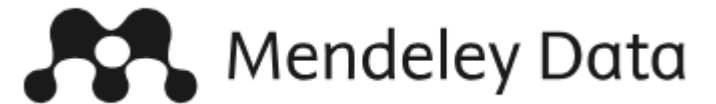
Make it open!

- Choose a proper platform

Persistent identifier and archiving services



And many more!



Make it open!

- Choose a proper platform
- Provide all info for the dataset to be self-explanatory

Supporting data for ultrasonic guided wave and electro-mechanical reactance tests on a full scale composite torsion box panel

doi: [10.4121/uuid:8c743b60-69f3-4f59-b738-8f58b784bb9f](https://doi.org/10.4121/uuid:8c743b60-69f3-4f59-b738-8f58b784bb9f)

Cite

DATASET

by [Pedro Carvalho](#) 

The data refers to ultrasonic guided wave (GW) measurements on a full-scale composite torsion box stiffened panel. The panel was subjected to realistic low-energy impacts in different critical locations in order to obtain barely-visible impact damage (BVID) of different severities. The purpose of the study was to assess the diagnostic capabilities of the GW based structural health monitoring (SHM) system, which was designed according to a newly developed systematic multi-parameter methodology. Hence, the diagnostic capability assessment served also the purpose of validating the SHM system design methodology. The data in this dataset was collected in the Netherlands Aerospace Centre – NLR, located in Marknesse, the Netherlands, and was integrated in the Thermoplastic Affordable Primary Aircraft Structure 2 (TAPAS 2) project, financed by the Netherlands Enterprise Agency of the Ministry of Economic Affairs

HISTORY

2019-01-28 first online, published, posted

PUBLISHER

4TU.Centre for Research Data

FORMAT

media types: application/pdf, application/x-matlab-data, application/zip, text/csv

REFERENCES

<https://doi.org/10.1002/stc.2340>

DOI (persistent identifier) of the related article


FUNDING


- The Netherlands Enterprise Agency of the Ministry of Economic Affairs

ORGANIZATIONS

TU Delft, Faculty of Aerospace Engineering, Department of Aerospace Structures and Materials

CONTRIBUTORS

Benedictus, R. (Rinze) 

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<https://doi.org/10.4121/uuid:8c743b60-69f3-4f59-b738-8f58b784bb9f>



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CATEGORIES

[Aerospace Engineering](#)

[Construction Materials Performance and Processes](#)

KEYWORDS

Barely-visible impact damage (BVID), Composite primary structure, Structural health monitoring (SHM), System design, Ultrasonic guided wave (GW)

LICENCE



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[RefWorks](#), [BibTeX](#), [Reference Manager](#), [Endnote](#), [DataCite](#), [NLM](#), [DC](#), [CFF](#)

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- Choose a proper platform
- Provide all info for the dataset to be self-explanatory
- Tell others how to use the data/code

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- Tell others how to use the data/code
- Provide contribution guidelines

Image by [M W](#) via [Pixabay](#)



Take home messages

Open Science **goes beyond** opening the articles

Plan ahead to face the challenges and enjoy the benefits of Open Science

Start small



Other interesting links

- Open Science training book: <https://open-science-training-handbook.gitbook.io/book>
- Podcast Open Science Bites: <https://www.rug.nl/research/openscience/podcast/?lang=en>
- Citizen Science projects: <https://eu-citizen.science/project/579>
- Open Science NL: <https://www.openscience.nl/en>
- Open Science EU: <https://openscience.eu/home>
- The Turing Way: <https://book.the-turing-way.org/>