Open science – an introduction: Are we open?

Iryna Kuchma, Open Access Programme Manager

eifl **KNOWLEDGE WITHOUT BOUNDARIES**

Definition of Open Science

Open Science:

❖ makes scientific knowledge openly available, accessible and reusable for everyone,

❖ increases scientific collaborations and sharing of information for the benefits of science and society,

❖ opens the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community.
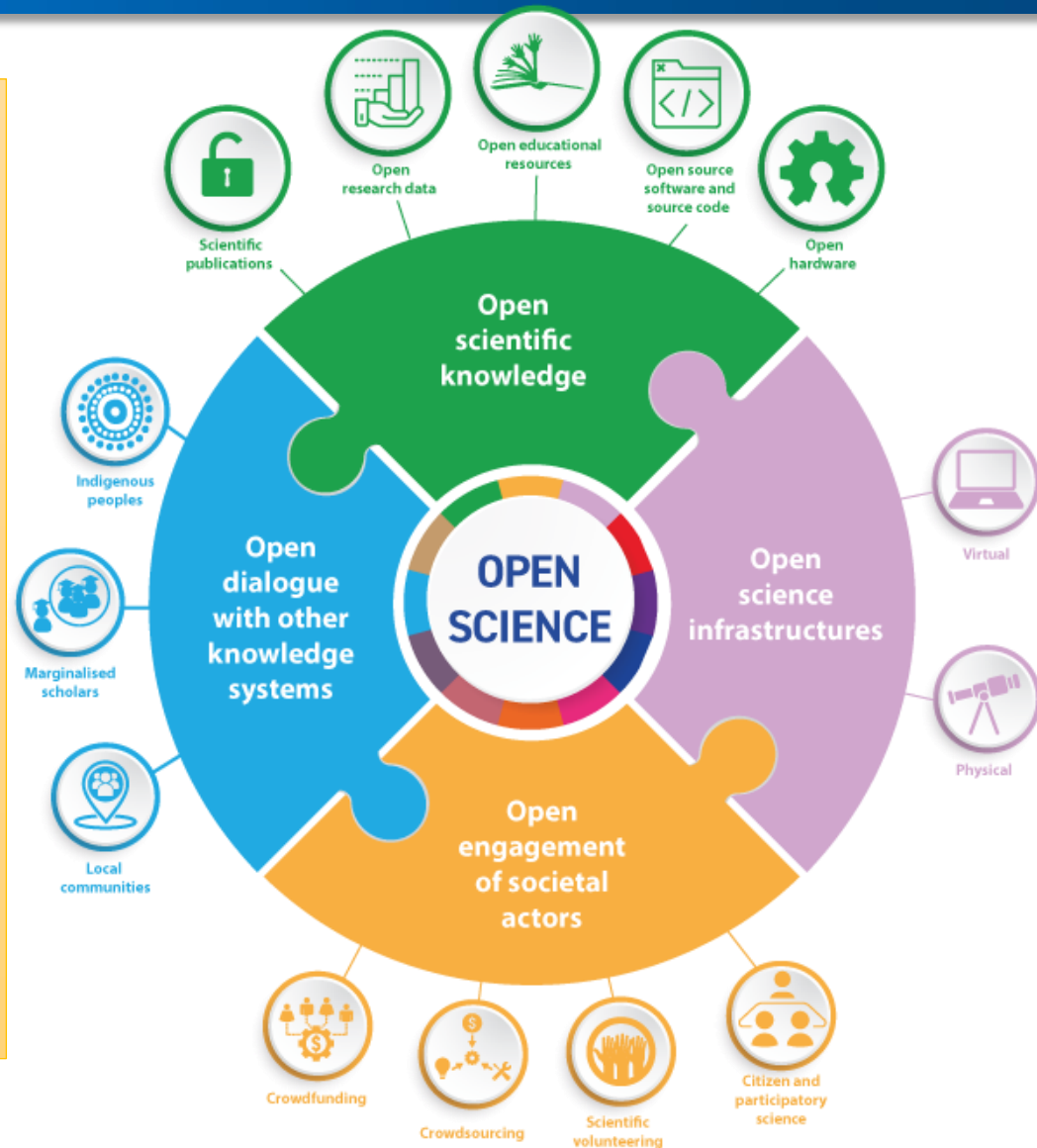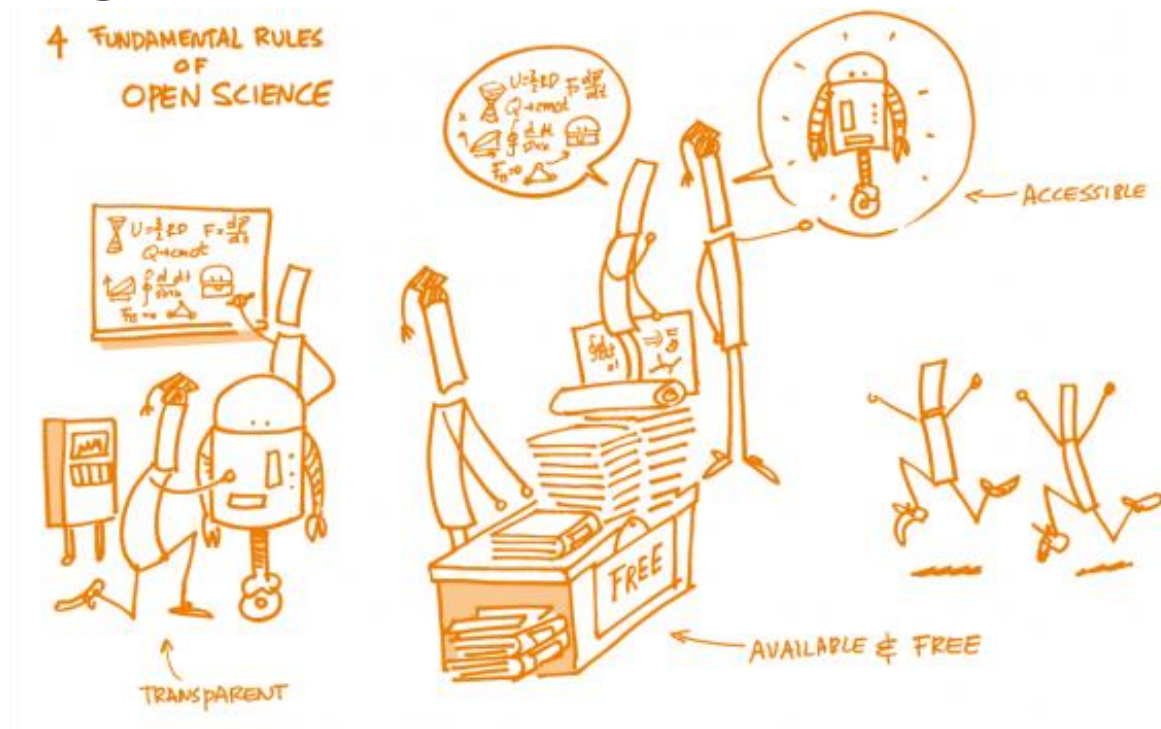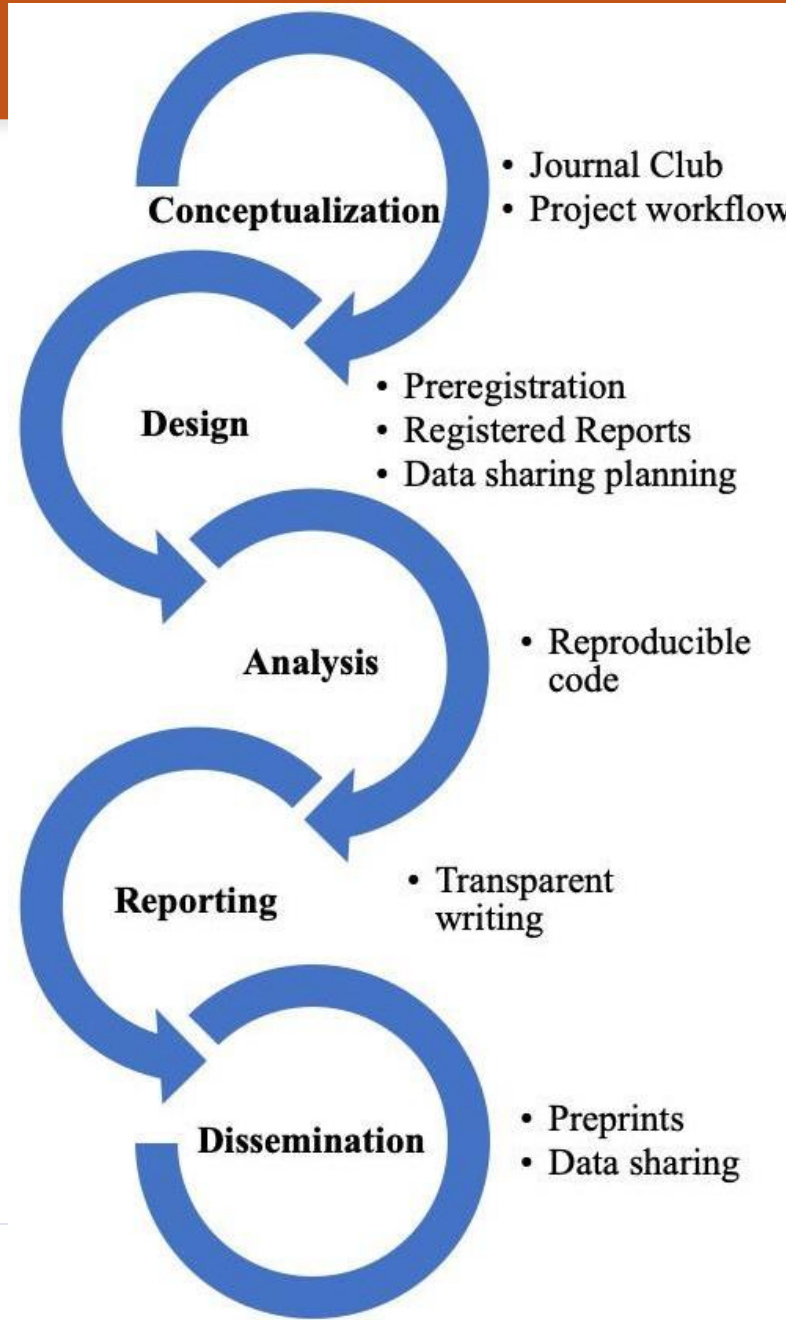
Worries about doing Open Science

"How do I sell this to my advisor?"

"Won't it make it harder to publish my research?"

"What if I get it wrong?"

Kathawalla, U.K., Silverstein, P. and Syed, M., 2021. Easing into open science: A guide for graduate students and their advisors. *Collabra: Psychology*, *7*(1). https://doi.org/10.1525/collabra.18684

Discuss with other students/staff issues surrounding reproducibility and open science

Project workflow

How you organize projects and move through the various stages of your research cycle: your **file folder structure**, **document naming conventions**, **version control**, **cloud storage**, and other details.

The choice of **who has access to the project** (e.g., collaborators, the public) and **when in the process they have access** (e.g., at all times, upon publication).
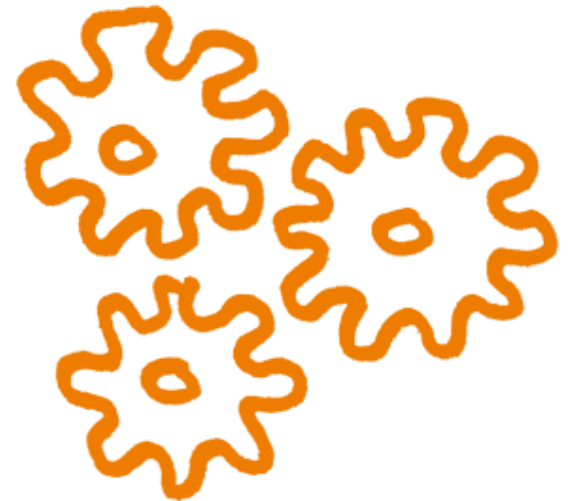
Research data lifecycle

RE-USING DATA: follow-up research, new research, undertake research reviews, scrutinising findings, teaching & learning

CREATING DATA: designing research, DMPs, planning consent, locate existing data, data collection and management, capturing and creating metadata

PROCESSING DATA: entering, transcribing, checking, validating and cleaning data, anonymising data, describing data, manage and store data

ANALYSING DATA: interpreting, & deriving data, producing outputs, authoring publications, preparing for sharing

ACCESS TO DATA: distributing data, sharing data, controlling access, establishing copyright, promoting data

PRESERVING DATA: data storage, back-up & archiving, migrating to best format & medium, creating metadata and documentation

CREATING DATA

PROCESSING DATA

RE-USING DATA

ANALYSING DATA

GIVING ACCESS TO DATA

PRESERVING DATA

Ref: UK Data Archive: http://www.data-archive.ac.uk/create-manage/life-cycle

Planning trick: think backwards

What data organisation would a re-user like?

Data organisation

Meaningful file names

Below are tips on meaningful and consistent file names. Read more in '*Choosing a file name*'. [2]

white_data_20140708.csv

blue_data_20140708.docx

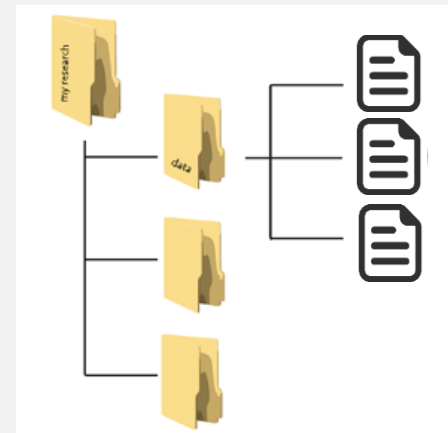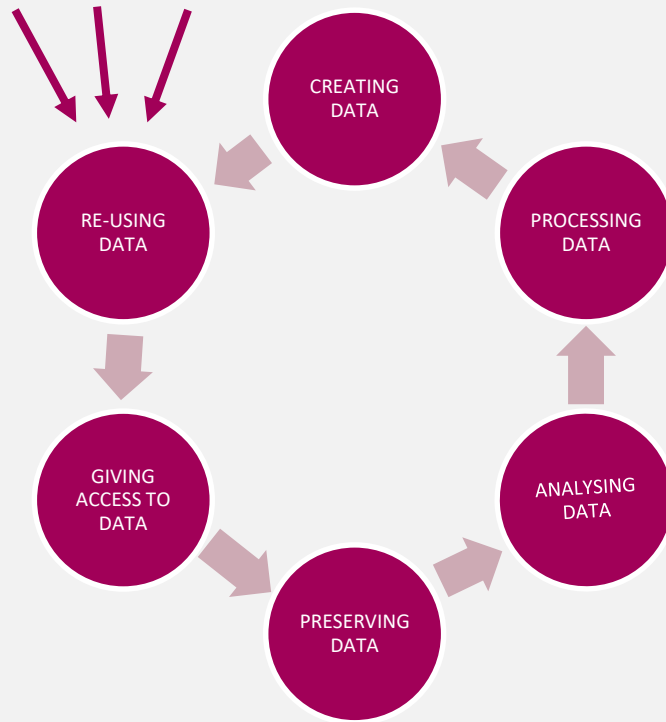- Make sure to use consistent file names. When you use a date in the file name, choose a notation (for instance, YYYYMMDD of yymmdd).
- Do not use strange characters like ?\!@*%{[<> in the file name.
- Use traceable file names, such as Project_Instrument_locatie_YYYYMMDD.ext.

red_data_20140708.R

red_data_20140708_v02.R

- Make sure to only use each file once in the folder structure. If you store a file in more than one place, several versions of the same file can unwillingly be created.
- See also version management.

It is good practice to note the file naming and its meaning in a readme.txt.

File naming and version management

Even if a researcher is well underway with his project consistent file naming is still an option by using a *bulk file rename utility*. [3] It is important, however, to check if this bulk renamer delivers on its promises.

Easing Into Open Science: A Guide for Graduate Students and Their Advisors

0.0B   Public   ⌥ 0   •••

Contributors: Ummul-Kiram Kathawalla, Priya Silverstein, Moin Syed

Date created: 2020-04-29 05:09 PM | Last Updated: 2021-06-28 10:50 PM

Category: 📦 Project

License: *CC-By Attribution 4.0 International* ❶

Has supplemental materials for Easing Into Open Science: A Guide for Graduate Students and Their Advisors on PsyArXiv
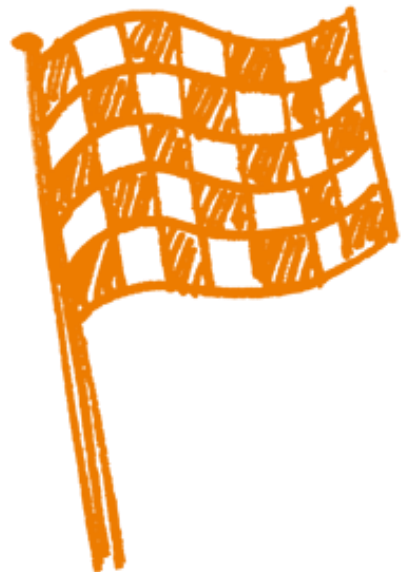
Wiki ⤢

Introduction

This wiki accompanies the paper "Easing Into Open Science: A Tutorial for Graduate Students" (accepted for publication). The purpose of this tutorial is

Citation ▾

Tags

Data sharing   Graduate Student   How To   Open Science   PhD   Preprints

https://osf.io/w5mbp

Preregistration

Future-proof your research. Preregister your next study.

What is Preregistration?

When you preregister your research, you're simply specifying your research plan in advance of your study and submitting it to a registry.

Preregistration separates *hypothesis-generating* (exploratory) from *hypothesis-testing* (confirmatory) research. Both are important. But the same data cannot be used to generate *and* test a hypothesis, which can happen unintentionally and reduce the credibility of your results. Addressing this problem through planning improves the quality and transparency of your research. This helps you clearly report your study and helps others who may wish to build on it.

For additional insight and context, you can read The Preregistration Revolution. (preprint)

PREREGISTERED

Get Started Now

https://osf.io/prereg

https://osf.io/prereg

Registered reports

https://www.cos.io/initiatives/registered-reports

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Registered Reports: Peer review before results are known to align scientific values and practices.

https://www.cos.io/initiatives/registered-reports

Registered Reports   Participating Journals   Details & Workflow   Resources for Editors   For Funders   FAQ   Allied Initiatives

Registered Reports is a publishing format that emphasizes the importance of the research question and the quality of methodology by conducting peer review prior to data collection. High quality protocols are then provisionally accepted for publication if the authors follow through with the registered methodology.

This format is designed to reward best practices in adhering to the hypothetico-deductive model of the scientific method. It eliminates a variety of questionable research practices, including low statistical power, selective reporting of results, and publication bias, while allowing complete flexibility to report serendipitous findings.

"Registered Reports eliminates the bias against negative results in publishing because the results are not known at the time of review."

"Because the study is accepted in advance, the incentives for authors change from producing the most beautiful story to the most accurate one."

https://www.cos.io/initiatives/registered-reports

Preprints

Why should I care?

Priority claim

By posting a preprint researchers can disclose their completed study immediately and without access barriers.[1]

Increase citations

Articles get 36% more citations if they have a prior associated preprint.[2]

Receive feedback

Improve your manuscript by getting valuable comments on your research prior to publication.[3]

Proof of productivity

A preprint provides funders and hiring committees with public evidence of your work.[4]

Creating a publishable unit is slower than ever
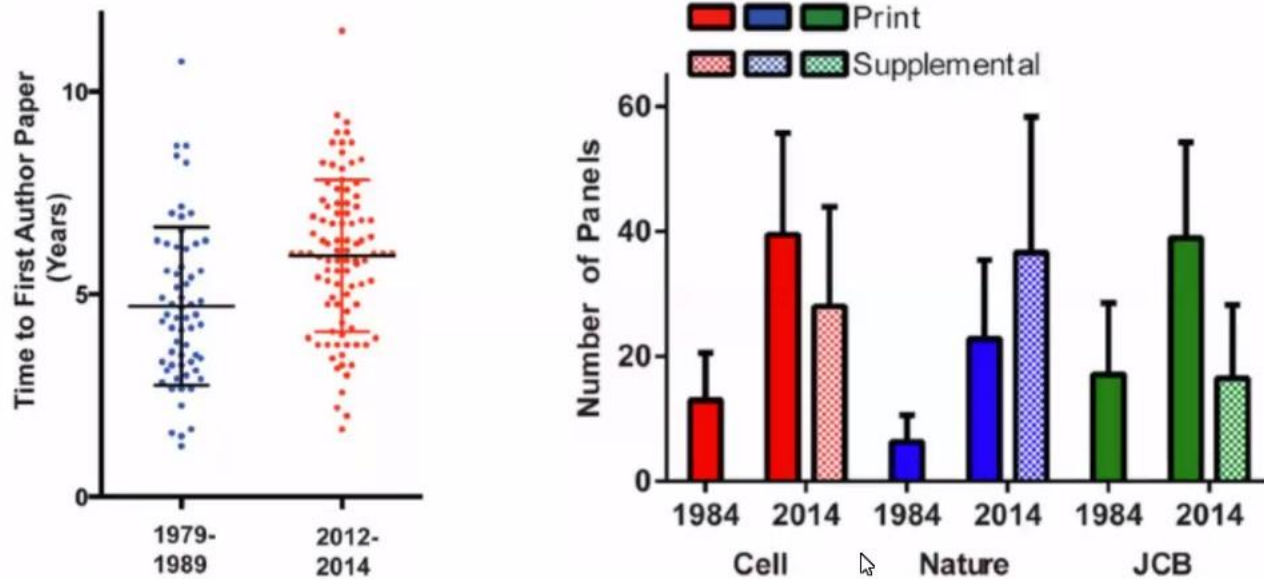
Iratxe Puebla @ASAPbio Community Call: Preprints in Progress

Preprints of different forms in the response to COVID-19

F

COVID preprints were short (early on, <50% of length of other preprints) and were revised more often

Fraser N, Brierley L, Dey G, Polka JK, Pálfy M, Nanni F, et al. (2021) The evolving role of preprints in the dissemination of COVID-19 research and their impact on the science communication landscape. PLoS Biol 19(4): e3000959. https://doi.org/10.1371/journal.pbio.3000959

Iratxe Puebla @ASAPbio Community Call: Preprints in Progress
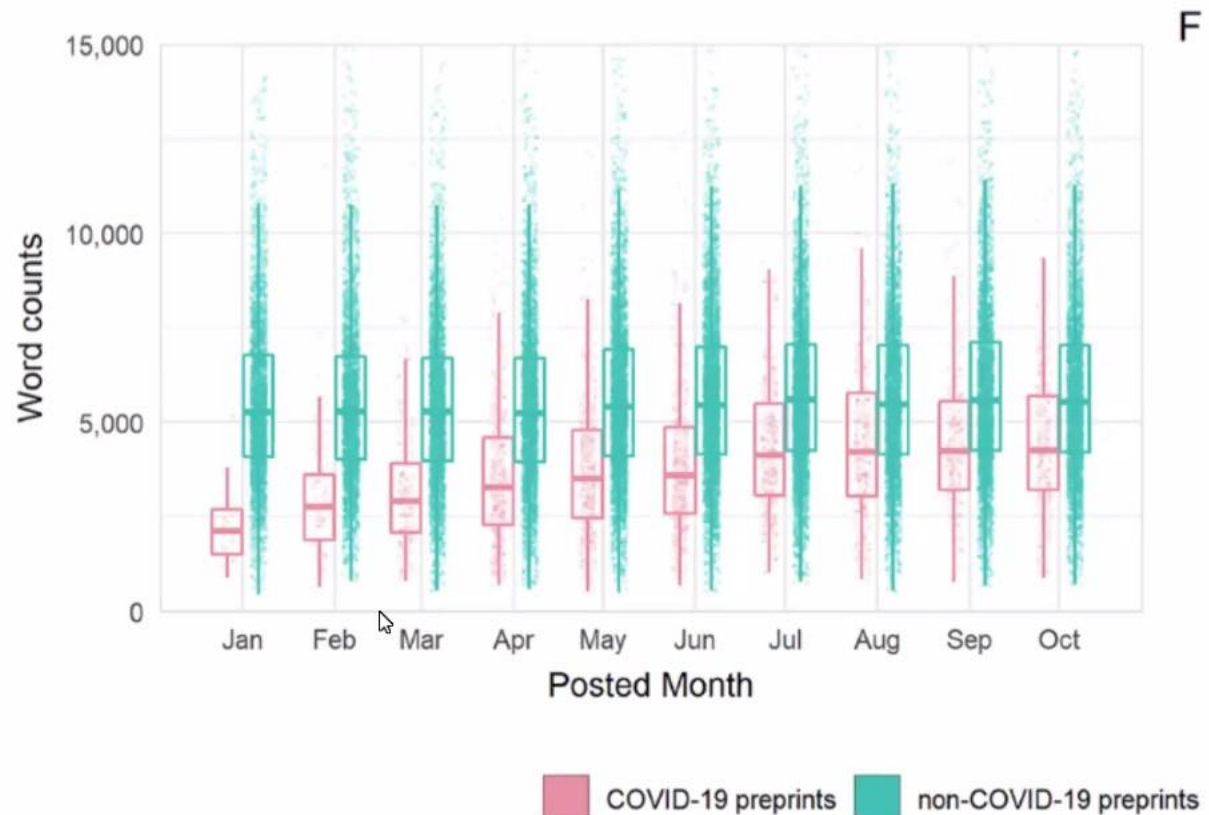
Preprint fact checking

FACTS ✓
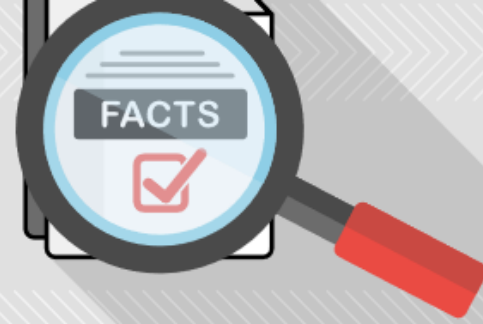
Scoop protection

Preprints allow you to establish priority for your discoveries. 99.3% of preprint authors reported no scoop problems.[1]

PREPRINTS 99.3%

Preprints are journal compatible

Over 1,200 journals operate policies compatible with preprints.[2]

Preprints are good quality

Two thirds of bioRxiv preprints appear in a journal within two years.[3] Quality of reporting is within a similar range as that of peer-reviewed articles.[4]
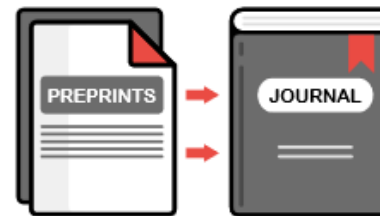
Smoother path to publication

Many journals allow preprint transfers directly from servers.[1] Some editors scout preprints and invite submissions to their journal.

PREPRINTS → JOURNAL

ASAPbio

Guiding principles for researchers to aid the responsible media reporting of research posted as preprints

When communicating about their work in social media, blogs or with journalists, researchers should be mindful of the potential for misinterpretation of their findings and:

1. Label the research as a preprint (where that is the case).

2. Prominently state whether or not it has undergone peer review.

3. Prominently highlight the limitations of the work.

4. Provide narrow interpretations that are unlikely to be exaggerated or misconstrued when communicating research findings to a lay audience.

5. Make every effort to ensure that the research is presented so that non-experts can understand it with minimal room for misinterpretation.

6. Make every effort to anticipate the potential for their research to be propagated in ways that are far from the original intent.

7. Avoid overhyping the significance of the research findings.

8. Consider using a structured format, similar to that recommended by the UK Academy of Medical Sciences for press releases. For example, in biomedical fields, structured information to be included in social media post(s) might include the following.

   a) Brief lay summary

   b) Type of research: [Observational/interventional etc]

   c) Model system: [Humans/mice/in vitro biochemistry]

   d) Sample size: [Number of patients, etc]

   e) Peer review status [Preprint/(open) peer review etc]

   f) Other caveats/limitations

9. Be familiar with any guidelines provided by their institution on the responsible use of social media. Guiding principles for institutions to aid the responsible media reporting of research can be found at asapbio.org/public.

10. Work in collaboration with their institutional press office if approached by the media to comment on research they have carried out at the institution, regardless of whether or not the research is actively promoted by the institution.

https://asapbio.org/wp-content/uploads/2021/03/Preprints-in-the-Public-Eye-Researchers-infographic.pdf

'Mathematics is an unknown land': meet Fields Medal winner Maryna Viazovska

https://www.nature.com/articles/d41586-022-01920-8

https://arxiv.org/abs/1603.04246

arXiv > math > arXiv:1603.04246

Search... | All fields ▾ | Search

Help | Advanced Search

Mathematics > Number Theory

The sphere packing problem in dimension 8

Maryna Viazovska

In this paper we prove that no packing of unit balls in Euclidean space $\mathbb{R}^8$ has density greater than that of the E_8-lattice packing.

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Current browse context:
math.NT

< prev | next >

new | recent | 1603

Change to browse by:

math
   math.MG

References & Citations

- NASA ADS
- Google Scholar
- Semantic Scholar

13 blog links (what is this?)

Export Bibtex Citation

Bookmark

Submission history

https://arxiv.org/abs/1603.04246

https://asapbio.org/preprint-info#action

"Preprinting saved me from scooping myself."

"While I was working to resubmit a manuscript, collaborators of mine decided it was time to submit a second paper related to the work. We had no way to reference my manuscript which laid the foundations for the second paper. Being able to submit a preprint saved me because within 48 hours I could submit my primary manuscript to bioRxiv and get a DOI for the second paper to reference."

Steph Hays
PhD student, Harvard Medical School

Photo by Alina Chan

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https://asapbio.org/preprint-info#action

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https://asapbio.org/preprint-info#action

"Preprints facilitate reproducible research."

"The day my preprint was posted, I tweeted links to the data, code, and a short 'how-to-reproduce-this' YouTube video. During the time the paper has been undergoing review and revision, I've already received two questions from scientists who are testing and using the code I made available."

Rayna Harris
PhD candidate, The University of Texas at Austin

ASAPbio.org

https://asapbio.org/preprint-info#action

"It's motivating to see interest in my work."

"I uploaded my master's thesis to thesiscommons.org, a preprint server for student dissertations. I did not do a perfect job on the thesis and was not 100% proud, but I decided to upload it and include the marker comments anyway. I just checked it the other day and it has been downloaded over a hundred times. As an ECR, it is motivating to see that someone cares about the work I produce. "

Peder M Isager
PhD student, Eidhoven University of Technology

ASAPbio.org

https://asapbio.org/preprint-info#action

https://asapbio.org/preprint-info#action

https://asapbio.org/preprint-servers

ASAPbio

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Preprints & COVID-19   Search

List of preprint servers: policies and practices across platforms

Home / List of preprint servers: policies…

How to use this directory

Press the "+" icon next to a server's name to expand the record. Use the search bar to find terms anywhere in the record. Click on the eye icon to select the columns you want to display.

For further details about how the data were gathered, refer to the paper and source data. Provisional results were presented in January at the #bioPreprints2020 meeting.

If you represent a preprint server and would like to add or update a record in this directory, please contact

ASAPbio

Blog   Preprints   Preprint review   Journal review   About us

Preprints & COVID-19   Search

Preprint server directory

Columns   Print   Excel   CSV   Copy

Show All entries   Search:

Preprint server	Disciplinary scope	Ownership type	Screening processes	External content indexing	Permanence of content	Preservation of content	Commenting
+ AAS Open Research	Multiple scientific fields, including health and wellbeing*	Funding organisation (funder)	Data is available (if applicable), Code is available (if applicable), All authors notified, One author affiliated with AAS, Legal compliance,	Google Scholar, Prepubmed, Europe PMC, SciLit	Permanent with some removal options in exceptional circumstances	Preprints permanently archived in Portico	Commenting (including annotation plug-ins)

https://asapbio.org/preprint-servers

https://asapbio.org/preprint-info

Research Data Management

FOSTER

Data Management Planning

Deciding which data should be open, closed or shared requires advanced planning. In this section, you'll learn what a data management plan is and how they can help you to make important decisions before your research begins.

What are data management plans (DMPs)?

A data management plan (DMP) is a document that describes the scale and the format(s) of those data you will generate, collect or reuse during the life of your project and outlines how they will be handled and shared during your project and in the longer-term. Many funding bodies require a DMP to be submitted as part of new grant applications but even if your research isn't supported by external funds, developing a DMP is a useful exercise whenever you're working with data.

https://www.fosteropenscience.eu/learning/managing-and-sharing-research-data

https://www.fosteropenscience.eu/learning/managing-and-sharing-research-data/#/id/5b2ccc7d7ce0b17553f690

FOSTER

What should be covered in your DMP?

Most funding bodies' DMP templates cover five core themes. Click through each of these below to see what topics should be addressed in your data management plan. This advice is taken from the DCC's How to Develop a Data Management Plan guide which is worth a read if you want to delve a bit deeper.

Click the plus sign to expand the text box

+ Data Types, Formats, Standards and Capture Methods

+ Ethics and Intellectual Property

+ Access, Data Sharing and Reuse

+ Short-Term Storage and Data Management

+ Deposit and Long-Term Preservation

https://www.fosteropenscience.eu/learning/managing-and-sharing-research-data

Assistance: tools

- Wizards
    - Usually free for individual researchers
    - Inbuilt templates
    - Customizable (for institutions)
    - Machine readable DMPs
    - Integration with repositories
- Checklists
    - Swedish National Data Service DMP checklist
    - Customized versions are often found on the websites of academic libraries

Why manage data?

Make research easier

Get credit for it

Save data for later

Avoid accusations of fraud or bad science

Share data for re-use

Meet funder or institution requirements

It's part of good data practice

"It was *never* acceptable to publish papers without making data available."

- Ewan Birney

#OpenData
#OpenScience

Sidebar navigation:
- Why manage data?
- Responsibilities in Research Data Management
- Which data should be preserved and shared?
- Why share data?
- Explore the indicators related to open research data
- What is a data management plan (DMP)?
- Key messages
- View our webinars recordings
- Useful links

https://www.openaire.eu/rdm-handbook

OpenAIRE

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Cut down on academic fraud

www.nature.com/news/2011/111101/full/479015a.html

nature — International weekly journal of science

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comments on this story

Published online 1 November 2011 | Nature 479, 15 (2011) |
doi:10.1038/479015a
Updated online: 1 November 2011
Updated online: 8 December 2011
News

Stories by subject
- Brain and behaviour
- Lab life

Report finds massive fraud at Dutch universities

Investigation claims dozens of social-psychology papers contain faked data.

Ewen Callaway

Stories by keywords
- Diederik Stapel
- Tilburg University
- Academic fraud
- Retractions
- Social psychology

This article elsewhere

Blogs linking to this article

When colleagues called the work of Dutch psychologist Diederik Stapel too good to be true, they meant it as a compliment. But a preliminary investigative report (go.nature.com/tqmp5c) released on 31 October gives literal meaning to the phrase, detailing years of data manipulation and blatant fabrication by

Related stories
- Seven days: 9–15 September 2011
  14 September 2011
- Chaos promotes stereotyping
  07 April 2011

Naturejobs

Tenure-Track Faculty Positions (Assistant / Associate / Full Professor)Yale University, Department of Genetics
Yale University School of Medicine

Assistant Professor
Harvard Medical School

- More science jobs
- Post a job for free

Resources

PDF Format

https://www.openaire.eu/rdm-handbook

SIGN IN

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Validate results

"It was a mistake in a spreadsheet that could have been easily overlooked: a few rows left out of an equation to average the values in a column. The spreadsheet was used to draw the conclusion of an influential 2010 economics paper: that public debt of more than 90% of GDP slows down growth. This conclusion was later cited by the International Monetary Fund and the UK Treasury to justify programmes of austerity that have arguably led to riots, poverty and lost jobs."

www.guardian.co.uk/politics/2013/apr/18/uncovered-error-george-osborne-austerity

The error that could subvert George Osborne's austerity programme

The theories on which the chancellor based his cuts policies have been shown to be based on an embarrassing mistake

Charles Arthur and Phillip Inman
The Guardian, Thursday 18 April 2013 21.10 BST

https://www.openaire.eu/rdm-handbook

NEWS

Open data linked to higher citations for journal articles

BY REBECCA TRAGER | 11 JULY 2019

SOURCE: © GETTY IMAGES

Studies that provide access to underlying data are cited 25% more often than those that don't

Research papers that make their underlying data openly available are significantly more likely to be cited in future work, according to an analysis led by researchers at the Alan Turing Institute in London that has been published as a preprint. The study, which is currently under peer review, examined nearly 532,000 articles in over 350 open access journals published by Public Library of Science (PLoS) and BioMed Central (BMC) between 1997 and 2018, and found those that linked directly to source data sets received 25% more citations on average.
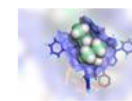
Increased use and economic benefit

The case of NASA Landsat satellite imagery of the Earth's surface:

Up to 2008	Since 2009
Sold through the US Geological Survey for US$600 per scene	Freely available over the internet
Sales of 19,000 scenes per year	Google Earth now uses the images
Annual revenue of $11.4 million	Transmission of 2,100,000 scenes per year.
	Estimated to have created value for the environmental management industry of $935 million, with direct benefit of more than $100 million per year to the US economy

http://earthobservatory.nasa.gov/IOTD/view.php?id=83394&src=ve

BE PART OF THE NEW ERA OF OPEN SCIENCE

here's one example of **the gains arising from open research data**

Bioinformatics Institute

€1.3 billion per year

Benefits identified by the European Bioinformatics Institute to users and their funders just by making scientific information freely available to the global life science community...

equivalent to **more than 20 times** the direct operational cost of the Institute

Source: Charles Beagrie Ltd. for EMBL-EBI

Research and Innovation

European Commission

BE PART OF THE NEW ERA OF OPEN SCIENCE
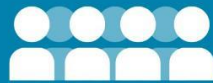
reach more people, have greater impact

avoid duplication of efforts

preserve data for future researchers

simplify final Horizon 2020 reporting thanks to an up-to-date DMP

European Commission

Levels of openness

Open data - the Open Data Institute (ODI) defines Open Data as those that anyone can access, use and share. According to the ODI, open data must be licensed to make clear that anyone can use the data in any way they want, including transforming, combining, and sharing it with others, even for commercial purposes. The ODI provides a great introduction to all aspects of Open Data in their <u>Open Data Essentials course</u>. We highly recommend reviewing these modules.

Shared data - similar to Open data, shared data may be made widely accessible but could have some conditions such as non-commercial reuse or reuse with attribution. It is important to note that not all shared data has to be available to anyone. Sometimes shared data is only made available to specific groups such as peers from another university.

Closed data - if researchers are dealing with highly sensitive data - such as sensitive personal data or commercially sensitive data - it may not be possible to share the data at all. However, even in such cases a metadata description of the research data should be shared. Sharing of sensitive data can also be supported by making use of safe havens where only authorised users are given controlled access.

https://www.fosteropenscience.eu/learning/managing-and-sharing-research-data

Tip – use 5 Star Open Data Model to explain FAIR

★ make your stuff available on the Web (whatever format) under an open license

★ ★ make it available as structured data (e.g., Excel instead of image scan of a table)

★ ★ ★ make it available in a non-proprietary open format (e.g., CSV instead of Excel)

★ ★ ★ ★ use URIs to denote things, so that people can point at your stuff

★ ★ ★ ★ ★ link your data to other data to provide context

Tim Berners-Lee's proposal for five star open data - http://5stardata.info
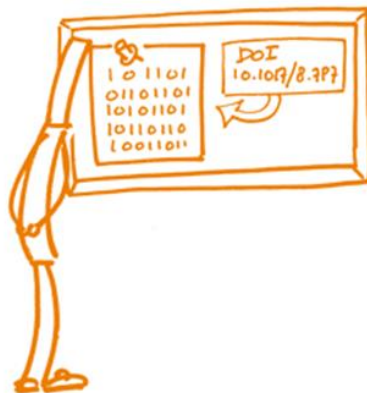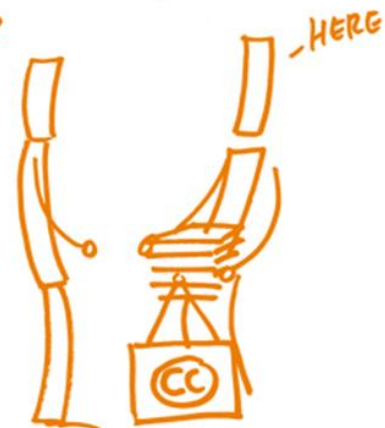
What should be preserved and shared?

- The **data** needed to validate results in scientific publications (minimally!).
- The associated **metadata**: the dataset's creator, title, year of publication, repository, identifier etc.
  - Follow a metadata standard in your line of work, or a generic standard, e.g. Dublin Core or DataCite, and be FAIR.
  - The repository will assign a persistent ID to the dataset: important for discovering and citing the data.

What should be preserved and shared? (2)

- **Documentation**: code books, lab journals, informed consent forms – domain-dependent, and important for understanding the data and combining them with other data sources.

- **Software**, hardware, tools, syntax queries, machine configurations – domain-dependent, and important for using the data. (Alternative: information about the software etc.)

Basically, everything that is needed to replicate a study should be available. Plus everything that is potentially useful for others.

Tip – link data to other outputs for context (reuse)

Open Data

To support validation and facilitate reuse

Open Code

Software created to analyse and/or visualise the data

Open Workflows
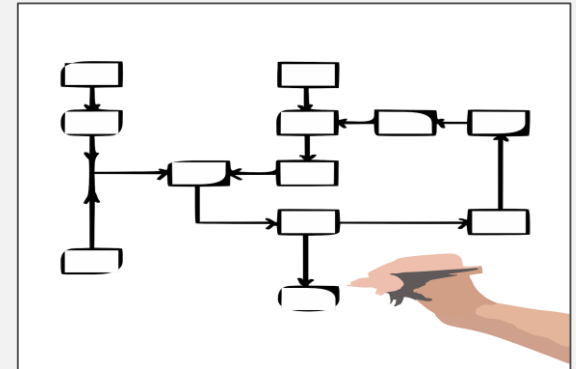
What steps were taken and in what order?

PLAN FOR SHARING

- **Desirebly at data creation**

- Identify which bits of personal data will be collected

- Do you really need to collect personal data?
    - (eg. irrelevant questions in questionnaires)

- Consider how will anonymization costs be covered
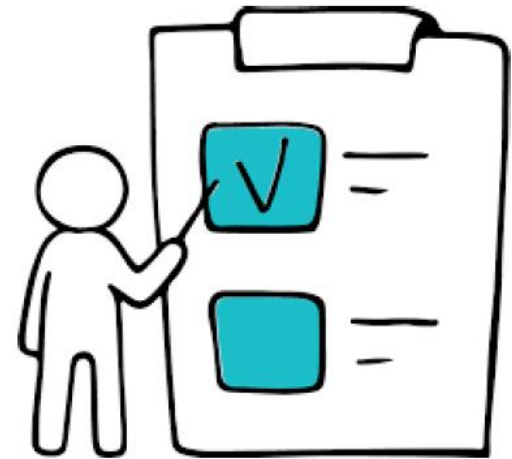
"As Open as possible, as closed as necessary"
SHARING AND PUBLISHING IS ALSO RELATED WITH...

ETHICS AND RESEARCH

- Any recorded **interviews** (either video or audio)
- Surveys or **questionnaires** that collect personal information (date/place of birth or anything else that could identify the participant).
- Research where the participant is asked to **reveal or reflect on instances from their past** (e.g. oral histories...)
- Anything that involves the participation of minors
- Anything in which the participant is asked to **reveal something** that might cause them or others physical or mental harm or embarrassment if made public.
- Any research in which the participant is asked to **complete tests**, or test-like scenarios.

INFORMED CONSENT

- **Informed consent is the process by which a researcher discloses appropriate information** about the research so that a participant may make a voluntary, informed choice to accept or refuse to cooperate." (CESSDA Expert Tour Guide RDM)
- **When creating consent forms, researchers should make sure to:**
  - inform participants about their rights
  - introduce relevant aspects of the research in an understandable, transparent, and precise way
  - explain data protection measures that will be taken
  - be clear about plans for data sharing in the consent form

Consider who else has a say about sharing data

Collaborators

Research participants

Commercial partners

Data repository

Publishers

Institutions, funders

PUBLISH DATA – Clarify concepts and diferences

AN IMPORTANT DIFFERENCE

- **Deposit**: upload a digital object (data, articles, …) on a platform that allows to correctly describe the object through medatada and that implements long-term preservation.

- **Give access**: once the object has been deposited, the authors can choose the type of access that can be granted (open, restricted, closed, embargoed,…) and assigns a licence to reuse the contents (Creative Commons)

WHAT IS THE DIFFERENCE BETWEEN SHARING, PUBLISHING & ARCHIVING?

SHARED: any way of sharing information, could mean I emailed it to you.

PUBLISH: citable artifact, discoverable.

ARCHIVE: long-term preservation.

Reference:
https://datacarpentry.org/rr-publication/01-publication/

Where to find a repository?

1 Use an external data archive or repository already established for your research domain to preserve the data according to recognised standards in your discipline. More information for **selecting a data repository.**

2 If available, use an institutional research data repository, or your research group's established data management facilities.

3 Use a cost-free data repository such as Zenodo.

zenodo
Research. Shared.

4 Search for other research data repositories in http://re3data.org/

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES

Zenodo: http://www.zenodo.org
Re3data.org: http://www.re3data.org

Data availability policy - publishers

Scenarios:

- **send the dataset to the publisher** and the publisher publishes the dataset online.

- the publisher asks the author to **deposit the dataset in a trusted repository** and to notify the publisher.

- the publisher asks the author to **give contact information** for those who wish to have access to the data.

The requirements are generally found on the journal's website.

A number of journals have a specific Data Availability or Data Archiving Policy

OpenAIRE

19

← → C 🛡 🔒 https://open-research-europe.ec.**europa.eu**/for-authors/data-guidelines/#addstatement

Submit your Research

My Submissions

Article Guidelines

Article Guidelines (New Versions)

Data Guidelines

Article Processing Charges

Finding Article Reviewers

1.1 Open Data Policy

Open Research Europe requires open access to research data supporting articles under the principle 'as open as possible, as closed as necessary', according to the policy of Horizon Europe. Data should be deposited in trusted data repositories.

All articles should include citations to repositories that host the data underlying the results, together with any information needed to replicate, validate, and/or reuse the results/ your study and analysis of the data – as part of the Data Availability Statement. This includes details of any software, instrument or other tool used to process results and, where relevant, the raw data. Importantly, publishing your data will allow you to track its provenance and ensure that those responsible for its generation are adequately credited for their work. Others who then reuse your data for their own studies can cite your data (which can be cited separately from your article if appropriate). Failure to openly provide data for publication without good justification will result in your article being rejected.

Exceptions: We recognize that openly sharing data may not always be feasible. Exceptions to open access to research data underlying publications in the Open Research Europe are permitted according to the relevant policy of Horizon Europe. These consider the obligation to protect results, confidentiality obligations, security obligations, the obligation to protect personal data and other legitimate constraints. For Horizon Europe grants, these exceptions should be noted in the associated Data Management Plan. Where open access is not provided to the data needed to validate the conclusions of a publication that reports original results, authors should provide the relevant access needed to validate the conclusions to the extent their legitimate interests or constraints are safeguarded (see Add a Data Availability Statement to Your Article).

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https://open-research-europe.ec.europa.eu/for-authors/data-guidelines/#addstatement

Submit your Research

My Submissions

Article Guidelines

Article Guidelines (New Versions)

Data Guidelines

Article Processing Charges

Finding Article Reviewers

2.3 Add a Data Availability Statement to Your Article

All articles must include a Data Availability statement, even where there is no data associated with the article. **This statement should be added to the end of the article** *prior to submission*. The Data Availability statement should not refer readers or reviewers to contact an author to obtain the data, but should instead include the applicable details listed below.

No associated or additional data

For articles which have no associated data, the statement should read:

"No data are associated with this article."

For articles where all associated data are presented in the article itself, please include the statement:

"All data underlying the results are available as part of the article and no additional source data are required."

Repository-hosted data

Where underlying and/or extended data are hosted in a repository, please include the name of the repository used and the license along with details indicated in the 'What to include in the data availability section of your article' column in the tables above. This should be done in the style of, for example:

Repository: Manually annotated miRNA-disease and miRNA-gene interaction corpora. https://doi.org/10.5256/repository.4591.d34639.

This project contains the following underlying data:

- Data file 1. (Description of data.)
- Data file 2. (Description of data.)

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Data that cannot be shared

Exceptions

In these instances, an extensive metadata record describing the research, where it is stored, and how to access it should be deposited openly in a repository and cited in the Data Availability statement (please see Repository-hosted data above). Metadata records must adhere to any legal or ethical requirements. Metadata records must not contain data that is protected, confidential, secure, or personal.

An obligation to protect results because of legitimate interests or other constraints

Where data cannot be open because of legitimate interest, such as for example because of industrial exploitation, or constraints such as confidentiality, trade secrets, security rules, Union competitive interests or Intellectual property Rights including patents and trade secrets, authors may be asked to provide evidence of this. The article must include a description of the restrictions on the data and all necessary information required for a reader or reviewer to apply for access to the data and the conditions under which access will be granted – or the PID of an open and FAIR metadata record containing this information.

For more information on this exception, please see Horizon Europe Model Grant Agreement – Articles 13 (confidentiality and security), 16 (intellectual property rights) and 17 (open science).

An obligation to protect personal data

Personal data must be processed in compliance with applicable EU and national law on data protection. Where human data cannot be sufficiently de-identified, please include: an explanation of the data protection concern; what, if anything, the relevant Institutional Review Board (IRB) or equivalent said about data sharing; and, where applicable, all necessary information required for a reader or reviewer to apply for access to the data and the conditions under which access will be granted – or the PID of an open and FAIR metadata record containing this information.

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Data paper Journals

- Scientific Data (Nature)
  - https://www.nature.com/sdata
- Data in brief (Elsevier)
  - https://www.journals.elsevier.com/data-in-brief/
- Data (MDPI)
  - https://www.mdpi.com/journal/data
- Patterns (bio data intensive science)
  - https://www.cell.com/patterns

Data reuse

stories & use cases

https://www.openaire.eu/data-reuse-use-cases

In OpenAIRE we are collecting a series of stories, use cases and other relevant resources that report the process of data reuse, trying to demonstrate and describe experiences (successful or not) of reuse of a variety of research data, as well as associated assumptions and implications. This work is being developed by the RDM Task Force - Data Reuse Working Group. The number of use cases will expand over time.

FAIR4Health

Sensitive data: FAIR4Health

Data resuse use case

DataShare — Edinburgh

Enabling data reuse:
Edinburgh DataShare

Data reuse use case

IZTECH University's view on Research Data

Data reuse use case

binder / zenodo

Evidence of data reuse:
Binder + Zenodo

Data Reuse Stories

Data Reuse Stories involving several institutions and consortia in Europe

Stay tuned!

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Dr Marc Metzger from the School of GeoSciences, speaks of the value of transparency and impact in sharing data publicly. Moreover he saves himself time by making his climate mapping research data openly available so that others can download it for themselves, rather than him having to send out copies in response to requests. This approach represents best practice – making the data openly available is also more convenient for users, removing a potential barrier to the reuse of the data. https://youtu.be/7GVNay4NL8U

WHAT DOES 'RESEARCH DATA MANAGEMENT' MEAN TO YOU?

https://www.openaire.eu/blogs/enabling-data-reuse-case-study-of-an-institutional-repository-edinburgh-datashare

Case study: Dr Bert Remijsen (Linguistics)
https://www.youtube.com/watch?v=pQFWZV8g3jU

A recent example of how our data
has been useful to other people

LINGU

0:19 / 6:11

Scroll for details

Dr Bert Remijsen has gathered a significant body of audio data – songs and stories - from individuals living in South Sudan as part of his linguistics research into the languages of Shilluk and Dinka. He finds it very rewarding that not only other language researchers can access the data freely, but also the members of the Sudanese community have discovered parts of their lost heritage through the collections. He was pleasantly surprised when a news organisation used the music as a backdrop to a piece of televised journalism as well.

FishBase
Raw data released with a cc by-nc licence *(consortium 1)*
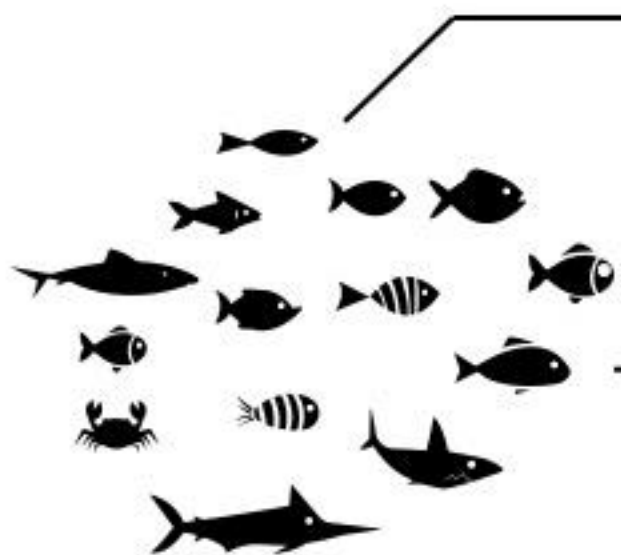
Institution two processes the data

A third consortium produces AquaMaps

2275 bibliographical citation

Report on fishing stocks discussed at the European Parliament

https://www.openaire.eu/blogs/data-reuse-stories-some-concrete-cases-involving-several-institutions-and-consortia-in-europe

FishBase

References Citing FishBase

n=2578

Sort by ○ Author ● Year ○ Title ○ Ref. no.

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10	126036	Purwanto, P., E.C. Franklin, S. Mardiani and A. White,2022.Stock assessment and overexploitation risk of small pelagic fish in fisheries management area 715 of Indonesia..Asian Fish. Sci. 35:76-89.
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http://www.fishbase.us/references/FBRefList.php

BACK

CLIMATE CHANGE

OTHER VISUALISATIONS ⌄
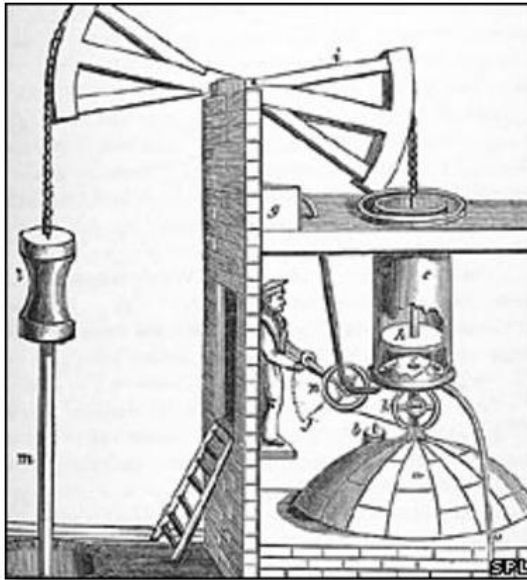
A Brief History of Climate Change image ⌄

1700 — 2100

Climate Change

This timeline presents the result of a data preparation and processing of Climate Change forecasts by AquaMaps and NASA through the CNR DataMiner Cloud Computing platform.

Forecasting environmental parameters in the far future requires complex modelling, large computational resources, fluid-dynamics processing applied to air and ocean currents information, correlating physical parameters (e.g. temperature, pressure, and wind), and involving human-related factors, e.g. greenhouse gases emission, energy resources exploitation etc. Thus, long-term forecasts data are rare and published by few organisations.

The history of Climate Change due to human activity can be dated back to the beginning of 1700 when the British ironmonger Thomas Newcomen invents the first widely

IPCC SRES A1B
Forecast

❯

1520   1540   1560   1580   1600   1610   1630   1650   1670   1690   1700   1720   1740   1760   1780   1800   1810   1830   1850   1870   1890   19

◆Timeline JS

https://dlnarratives.eu/timeline/climate.html

Data from Marine floats (Argo)

Original raw data produced by Argo floats. Data are released with an open license (CC-0) on the institutional repository without any kind of processing.

Stanzardization process

A standardization process was necessary and then a new dataset was produced.

Database: data released in CC-BY

The dataset is released with an open license (CC-BY) on the institutional repository and it is suggested to mention Institution 1 and Institution 2 in case of reuse.

Reuse of other research products

Finally, it is worth mentioning that not only research data can be reused, but also associated outputs such as **software, lab notes or models**. For example, time series forecasting techniques have been reused to study the fishing pressure in the Indian Ocean in the paper "Analysing and forecasting fisheries time series: purse seine in Indian Ocean as a case study". In another case, in the paper "Distinguishing Violinists and Pianists Based on Their Brain Signals", an artificial neural network (ANN) model was reused to study the relation between music and the brain. ANNs are general models applicable in several domains.

A Web service, designed to apply ANNs to a marine environment, has been used in the brain computer interface. This was possible because the Web service was WPS standardised and used standardised data, as it is reported in the study: "The ANN implementation used for this paper, is open-source and part of the DataMiner framework and is published as a free to use Web service under the Web Processing Service standard (WPS). WPS standardises the representation of the input and output and makes the service usable by a number of clients and by external software. DataMiner saves the history of all trained and tested models using a standard and exportable format. Every executed process can be re-executed and parametrised multiple times by other users, thanks to collaborative experimentation spaces. In this view, this platform allowed making the presented experiment compliant with Open Science directives of repeatability, reproducibility and reusability of data and processes".

Final considerations
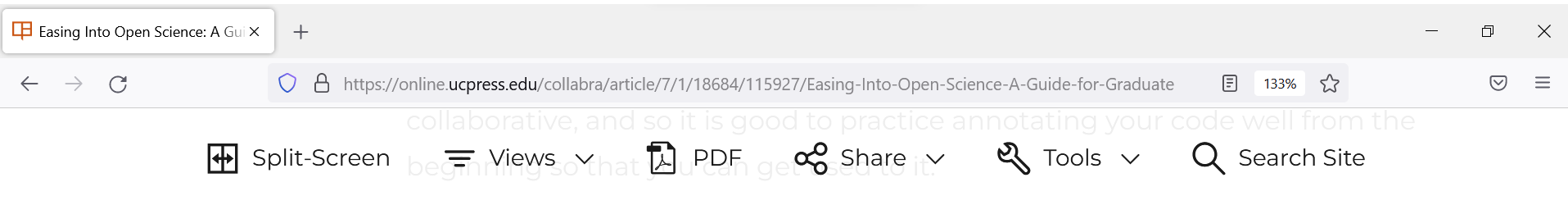
Ensuring **data reuse** requires investment and effort. Fostering reuse through the **FAIR principles** needs to be illustrated by showing the impacts it has and should be properly rewarded in the evaluation process. Moreover, the ownership of data - still considered a power, even in the scientific field - and the sale of data, even by public institutions, are aspects to be taken into account.

Reproducible code and open research software

Reproducible code

2021

collaborative, and so it is good to practice annotating your code well from the beginning so that you can get used to it.

How? Contrary to what seems to be popular belief, you do not need to learn to code yourself in order to create reproducible code of your analyses! Windows-based programs where the user points and clicks options for analysis (e.g. SPSS Statistics; https://www.ibm.com/products/spss-statistics; JASP; **https://jasp-stats.org/**) can also be used in a reproducible way. For example, in SPSS Statistics, a good starting point for beginners is to select the analysis options in the windows, then press the "paste" button rather than "OK." Doing so will paste the analysis script into a new "syntax" file that can be modified, executed, annotated, and saved for future use. Similarly, options selected via point-and-click in JASP can be exported to a reproducible script. Using R/RStudio (**https://www.r-project.org/**, **https://rstudio.com/**) is a popular choice for writing your own reproducible code, but there are also many other programming languages such as Python and Matlab. There are many helpful resources available online to help you learn to code, and although it is hard work at the beginning, it does
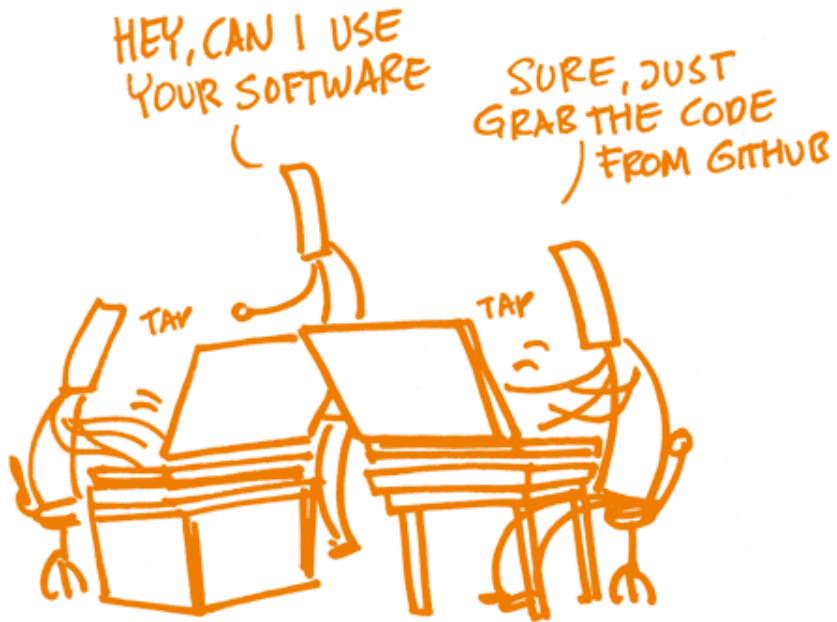
The Turing Way Community, & Scriberia. (2020, November). Illustrations from the Turing Way book dashes. Zenodo. http://doi.org/10.5281/zenodo.4323154

Open access publishing

PAY-TO-PUBLISH OPEN ACCESS IS PRACTICED BY FEE-BASED OR APC*-LED JOURNALS . BUT THIS IS JUST ONE OF THE POSSIBLE MODELS THAT THE GOLD OPEN ACCESS ROUTE ENTAILS. SOME OF THE PRICES PRACTICED BY APC-LED JOURNALS SUCH AS THE ONES SHOWN BELOW** CAN ABSOLUTELY EXCLUDE SOME SCHOLARS FROM PUBLISHING IN PARTICULAR VENUES. THERE'S NO DENYING THAT!

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All prices excluding taxes. Prices as of date: 23-Apr-2021

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		Open access	8.900	7.600
2666-3899	Patterns	Open access	5.200	4.500
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* APC = "ARTICLE PROCESSING CHARGE" OR "ARTICLE PUBLISHING CHARGE".

** PRICE LIST IS AVAILABLE AT: HTTPS://WWW.ELSEVIER.COM/ABOUT/POLICIES/PRICING

Christophe Dony. (2021, May 16). The Scholcomm Chronicles #1. Rambling about Misconceptions of Open Access. Zenodo. http://doi.org/10.5281/zenodo.4765798

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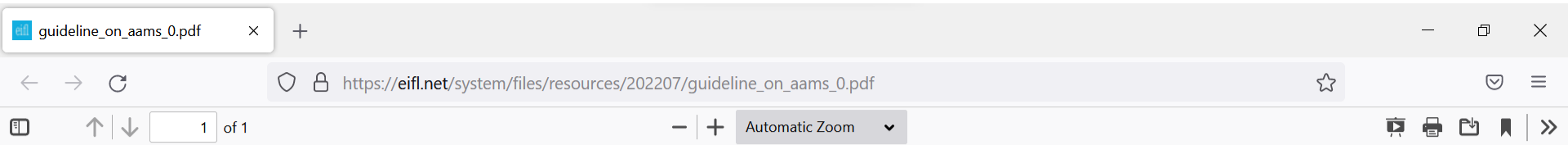
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Find at: openaire.eu

IMMEDIATE OPEN ACCESS

IMMEDIATE OR DELAYED OPEN ACCESS

GUIDELINE FOR AUTHORS

HOW TO GET THE RIGHT VERSION OF YOUR ARTICLE FOR DEPOSIT IN THE REPOSITORY

The majority of publishers allow the author's final version, also called the author's accepted manuscript (AAM), to be deposited into an institutional or disciplinary repository where it will be available open access, maximising its visibility and impact.

What is an author's accepted manuscript (AAM)?

This is the version of your article after peer-review but prior to publisher typesetting.

How can I get a copy of my accepted manuscript?

It is advisable to retain the final version of the article you uploaded into the journal's submission system. Or you may be able to download it from the journal's submission system as soon as you receive notification of acceptance for publication. Publishers vary in how long they keep AAMs in their systems. If you log in to the submission system and cannot find your AAM, you can contact the journal and request it.

https://eifl.net/resources/authors-how-get-right-version-your-article-deposit-repository
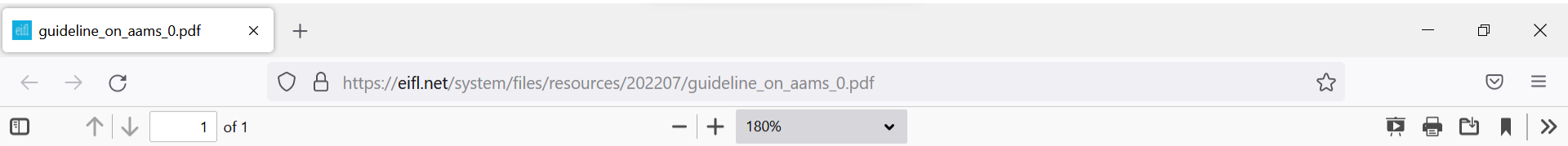
STEP 1: You write an article and plan to submit it to a journal. This first version is called a **preprint** and many publishers allow this to be uploaded in a preprint repository

STEP 2: You submit your article to a journal

STEP 3: The editor and referees peer review your article

STEP 4: You amend your article according to the reviewer's comments and resubmit it to the journal

STEP 5: **Your article is accepted for publication. This is your AAM and can be retained for depositing in a repository for open access**

STEP 6: The publisher copy edits and formats your article for publication in the journal

STEP 7: Your article is published in the journal. This version is called the **version of record (VoR)**

https://eifl.net/resources/authors-how-get-right-version-your-article-deposit-repository
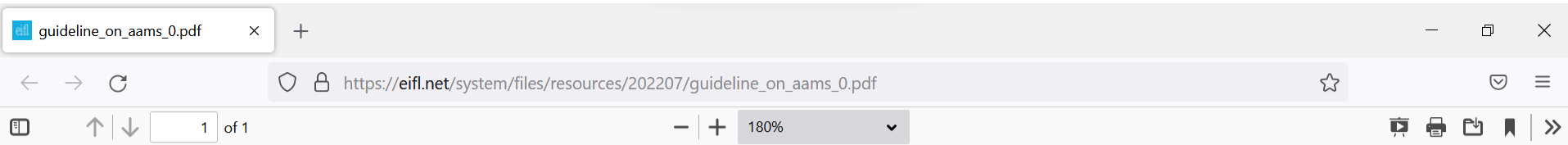
How do I put my AAM in the institutional repository?

Pass your AAM immediately to the repository manager at your library to deposit your article in the institutional repository. Or if you can, deposit it in the repository yourself. Some publishers allow the AAM to be made available in the repository immediately, but some publishers only allow this after an embargo period. Your repository manager will know about the publishers' copyright policies and when your AAM can be made available in open to the public. Or you can check using the SherpaRomeo service at https://v2.sherpa.ac.uk/romeo.

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OPEN ACCE

https://eifl.net/resources/authors-how-get-right-version-your-article-deposit-repository

February 19, 2018

Open Access Initiatives and Networking in the Global South

Kuchma, Iryna

Editor(s)

Herb, Ulrich; Schöpfel, Joachim

This short study highlights the impact of open access in the Global South. Featuring collaborative open access initiatives in Algeria, Kenya, Myanmar, Nigeria, Nepal, Palestine, Tanzania, Uganda and Latin American countries, it showcases success and describes the challenges that we still face. It also questions a notion of a journal article – perhaps already becoming obsolete – and discusses the growing preprints initiatives to speed up the availability of research results. The value of regional journal and repository networks enhancing open access content in Europe and Latin America is also discussed as well as the impact human networks make in the Global South.

Preview

Page: 1 of 5 — Automatic Zoom

Open Access Initiatives and Networking in the Global South

Iryna Kuchma

This short study highlights the impact of open access in the Global South. Featuring collaborative open access initiatives in Algeria, Kenya, Myanmar, Nigeria, Nepal, Palestine, Tanzania, Uganda and Latin American countries, it showcases success and describes the challenges that we still face. It also questions

Open Peer Review

European Commission
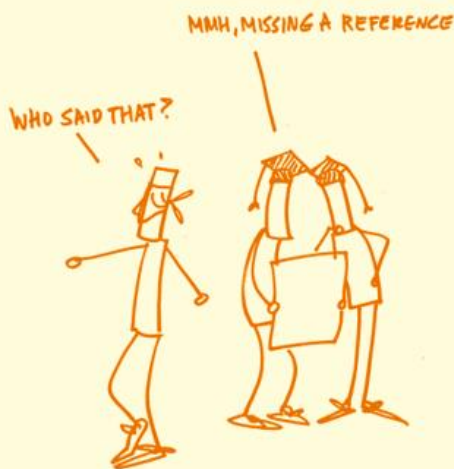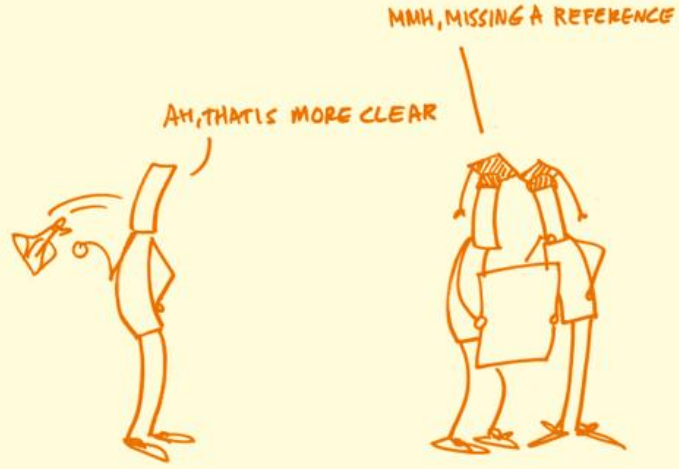
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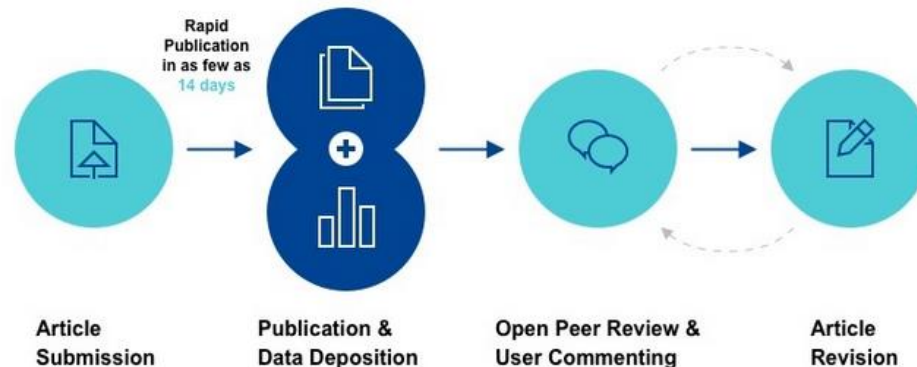
How the open peer review process works

The fundamentals of post-publication peer review at Open Research Europe

At Open Research Europe, our peer review process is **formal**, **invited**, and **open** - so reports are published alongside the article, with reviewer names and affiliations.

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REVIEW 🔓

Transition from monolithic to microservice-based applications. Challenges from the developer perspective [version 1; peer review: awaiting peer review]

Antonios Makris ✉ 🆔, Konstantinos Tserpes, Theodora Varvarigou

Article   Authors   Metrics

Abstract

Microservices have taken the world of software development by storm. Application developers are struggling to understand the new concepts and make the transition by the so-called monolithic" application approach to microservices. This paper touches upon this delicate issue, providing a more concrete view of the developers' concerns together with recent responses to these concerns. The objective is to place the concept of microservices in the most up-to-date context and shed some light in the challenges that puzzle the developers the most while they attempt to make use of this development and design style.

Open Peer Review

Reviewer Status

AWAITING PEER REVIEW

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All Comments (0)

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REVISED **Hydrogen and deuterium charging of lifted-out specimens for atom probe tomography [version 2; peer review: 1 approved, 1 approved with reservations]**

Heena Khanchandani, Se-Ho Kim, Rama Srinivas Varanasi, TS Prithiv, Leigh T. Stephenson, Baptiste Gault

This article is included in Excellent Science gateway

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Abstract

Hydrogen embrittlement can cause a dramatic deterioration of the mechanical properties of high-strength metallic materials. Despite decades of experimental and modelling studies, the exact underlying mechanisms behind hydrogen embrittlement remain elusive. To unlock understanding of the mechanism and thereby help mitigate the influence of hydrogen and the associated embrittlement, it is essential to examine the interactions of hydrogen with structural defects such as grain boundaries, dislocations and stacking faults. Atom probe tomography (APT) can, in principle, analyse hydrogen located specifically at such microstructural features but faces strong challenges when it comes to charging specimens with hydrogen or deuterium. Here, we describe three different workflows enabling hydrogen/deuterium charging of site-specific APT specimens: namely cathodic, plasma and gas charging. All the experiments in the current study have been performed on a model twinning induced plasticity steel alloy. We discuss in detail the caveats of the different approaches in order to help future research efforts and facilitate further studies of hydrogen in metals. Our study demonstrates successful cathodic and gas charging, with the latter being more promising for the analysis of the high-strength steels at the core of our work.

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1. **Maria Auger**, University of Oxford, Oxford, UK
2. **Gregory Thompson**, University of Alabama, Tuscaloosa, AL, USA

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Amendments from Version 1

The reviewers' comments have been very helpful in improving the manuscript. In response to them, the title of the manuscript is changed to emphasize that the work is focused on the lifted-out specimens. The study was conducted on a model twinning induced plasticity steel alloy. This fact has now been included in the abstract and conclusions. Figure 1 has been moved to Figure 4 as an introduction to the workflows. The first paragraph of introduction has been modified to improve its clarity.

See the detailed response from the author(s) to the review by Maria Auger
See the detailed response from the author(s) to the review by Gregory Thompson

Introduction

The ingress of hydrogen inside structural metallic materials in engineering parts in service leads to a degradation of their mechanical properties and their premature catastrophic failures[1–4]. Hydrogen that freely diffuses through the material under ambient conditions[5] can interact with crystalline defects and contributes to the deterioration of the mechanical properties[3,5–7]. A strategy to mitigate the deleterious influence of hydrogen is to design alloys with a high number density of trapping sites to limit the deleterious influence of H on moving dislocations[5,6,8]. Traps can even be irreversible traps, i.e. H is unable to re-enter the lattice under service conditions, owing to the high binding energy with H[9,10]. Trapped hydrogen has even been reported to potentially increase the resistance to hydrogen embrittlement of some materials[1,2,5]. In order to guide the design of hydrogen-resistant materials, it is necessary to study the details of the structure and composition of sites that can trap diffusible hydrogen, which are mostly defects such as stacking faults, dislocations and phase and grain boundaries[1,5]. Very few techniques have the combination of high spatial resolution and compositional sensitivity.

Atom probe tomography (APT) is a time-of-flight mass spectroscopy technique, which maps the spatial distribution of specific chemical species within a three-dimensional (3D) volume with sub-nanometre resolution[11,12]. In principle, APT is capable of detecting and quantifying hydrogen in three dimensions at near-atomic scale[13]. Yet despite some successes[14–17], and decades of work from numerous research groups, hydrogen microanalysis remains very challenging[1,2,13,14,17–20]. There are issues associated with the influence of residual gases from the analysis chamber of atom probe, specimen preparation and transport[20,21], and a strong dependence of the analytical performance on the analysis conditions[22–25]. Let us discuss these aspects in more details.

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METHOD ARTICLE 🔓

Optimization and parallelization of the discrete ordinate method for radiation transport simulation in OpenFOAM: Hierarchical combination of shared and distributed memory approaches [version 1; peer review: 2 approved]

Jose Moreno-SanSegundo, Cintia Casado 🆔, David Concha 🆔, Antonio S. Montemayor 🆔, Javier Marugán ✉ 🆔

This article is included in Societal Challenges gateway 🌐

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Abstract

This paper describes the reduction in memory and computational time for the simulation of complex radiation transport problems with the discrete ordinate method (DOM) model in the open-source computational fluid dynamics platform OpenFOAM. Finite volume models require storage of vector variables in each spatial cell; DOM introduces two additional discretizations, in direction and wavelength, making memory a limiting factor. Using specific classes for radiation sources data, changing the store of fluxes and other minor changes allowed a reduction of 75% in memory requirements. Besides, a hierarchical parallelization was developed, where each node of the standard parallelization uses several computing threads, allowing higher speed and scalability of the problem. This architecture, combined with optimization of some parts of the code, allowed a global speedup of x15. This relevant reduction in time and memory of radiation transport opens a new horizon of applications previously unaffordable.

✉ Corresponding Author: Javier Marugán

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1. **João Miguel Nóbrega** 🆔, University of Minho, Guimarães, Portugal

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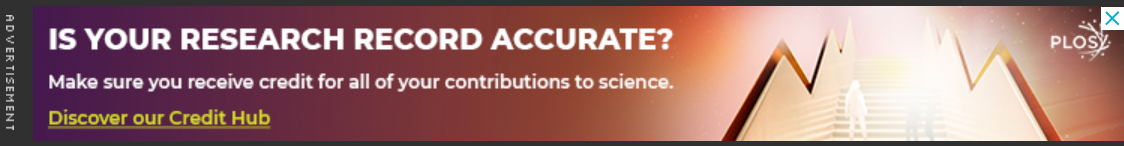
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RESEARCH ARTICLE

National differences in dissemination and use of open access literature

Marc-André Simard ✉, Gita Ghiasi, Philippe Mongeon, Vincent Larivière

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Acknowledgments

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2. Bromley A. Policy Statements on Data Management for Global Change Research. 1991. http://www.gcrio.org/USGCRP/DataPolicy.html

Misconception: Open Science is mainly pain with little gain

There's no denying that getting acquainted with new ways of working costs time. But at the end of the day, it will also save you time. For instance, preregistration forces you to consider issues that could otherwise have bitten you in the ass afterwards (e.g., a lack of statistical power). Moreover, a detailed plan allows for a swift analysis once the data comes in. There is an increasing number of open-source tools available that will help you make your workflow more reproducible and efficient at the same time. And there's another gain for those interested in an academic career: more and more universities and funders are seeking candidates who implement Open Science practices in their work.

https://openscience-groningen.nl/10-open-science-myths

Open Science in Horizon Europe proposals

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Jonathan England

OpenAIRE

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Jonathan England

Mandatory open science practices

- Some open science practices are **mandatory for all beneficiaries per the grant agreement.** They concern:

    o open access to scientific publications under the conditions required by the grant agreement;

    o responsible management of research data in line with the FAIR principles of 'Findability', 'Accessibility', 'Interoperability' and 'Reusability', notably through the generalised use of data management plans, and open access to research data under the principle 'as open as possible, as closed as necessary', under the conditions required by the grant agreement;

    o information about the research outputs/tools/instruments needed to validate the conclusions of scientific publications or to validate/re-use research data;

    o digital or physical access to the results needed to validate the conclusions of scientific publications, unless exceptions apply;

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

Recommended open science practices

- **Involving all relevant knowledge actors**, including citizens, civil society and end users in the co-creation of R&I agendas and contents (such as citizen science)

- **Early and open sharing of research**, for example, through preregistration, registered reports, pre-prints, or crowd-sourcing)

- **Research output management** beyond publications and research data

- **Measures to ensure reproducibility of research outputs**

- **Providing open access to research outputs beyond publications and research data** (for example software, models, algorithms, and workflows)

- **Participation in open peer review**
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Open Science

Published: 09.08.2022.

The Latvian Open Science Strategy aims to provide society, researchers, businesses, policymakers and other stakeholders with freely accessible scientific information (including scientific publications and research data), as well as to promote meaningful societal engagement in the scientific research process.

The Open Science Strategy is structured in 3 pillars:

I. "Open Access to Scientific Publications" addresses open-access publishing practices and defines a national open-access policy – all scientific publications produced for new state-funded research projects must be openly accessible in "green" or "gold" open access, without an embargo period.

II. "FAIR research data" foresees that research data should be open by default, and that data, metadata and e-infrastructures intended for long-term preservation and reuse must meet the FAIR (*findable, accessible, interoperable, reusable*) principles to the greatest extent possible.

III. "Citizen Science" foresees encouraging co-creation in the context of citizen science activities, supporting citizen science initiatives by e.g. providing access to scientific e-infrastructures (i.e. research data repositories) and integrating citizen science in Latvian science communication activities. Latvian stakeholders will be encouraged to participate in international initiatives and networks related to citizen science.

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INOSC is an international network of local Open Science & Open Scholarship communities (OSC). OSCs are hubs where academics learn from their peers how to make their workflows more open. Over 1000 academics have joined OSCs, ready to put Open Science to practice!

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Open Science Community Video

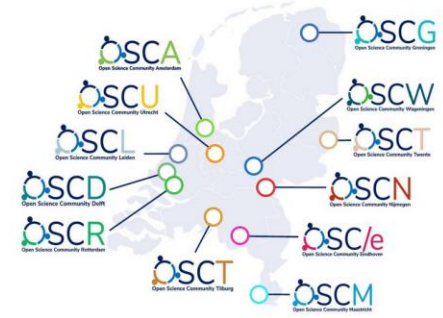THE FOUR STAGES OF DEVELOPING
AN OPEN SCIENCE COMMUNITY

Loek Brinkman

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03:45

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Kristijan Armeni, Loek Brinkman, Rickard Carlsson, Anita Eerland, Rianne Fijten, Robin Fondberg, Vera E Heininga, Stephan Heunis, Wei Qi Koh, Maurits Masselink, Niall Moran, Andrew Ó Baoill, Alexandra Sarafoglou, Antonio Schettino, Hardy Schwamm, Zsuzsika Sjoerds, Marta Teperek, Olmo R van den Akker, Anna van't Veer, Raul Zurita-Milla, Towards wide-scale adoption of open science practices: The role of open science communities, *Science and Public Policy*, Volume 48, Issue 5, October 2021, Pages 605–611, https://doi.org/10.1093/scipol/scab039

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Thank you! Questions? Your thoughts?

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