

Open Science

Stephanie van de Sandt, Lena Karvovskaya



Welcome!

We are happy that you could make it to our Open Science workshop.

Everything is meant to be as “open as possible”, so please don’t hesitate to ask questions and raise concerns!

Let’s break the ice!

- What is your superpower dish that you cook to impress your guests?

Who we are

Lena Karvovskaya

- PhD in theoretical Linguistics
- Research Data Management specialist
- Community Manager RDM at the VU



Stephanie van de Sandt

- PhD in Library and Information Science
- Special interest in measuring research data and software reuse
- Open Science and Research Data Management training coordinator at the VU

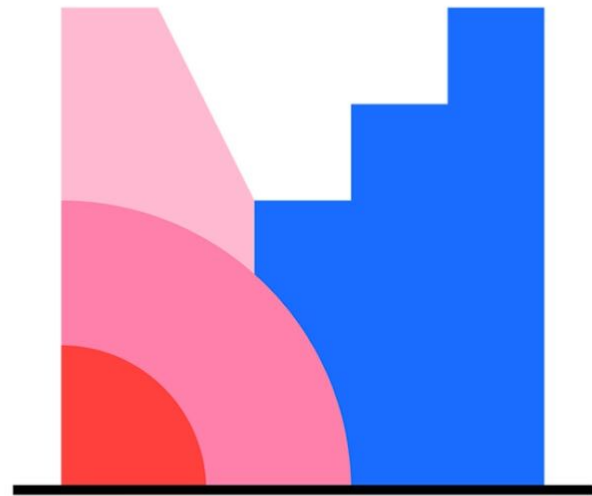


Who are you?

Please let us know who you are!

<https://www.menti.com/>

use code **6385 9484**



Mentimeter



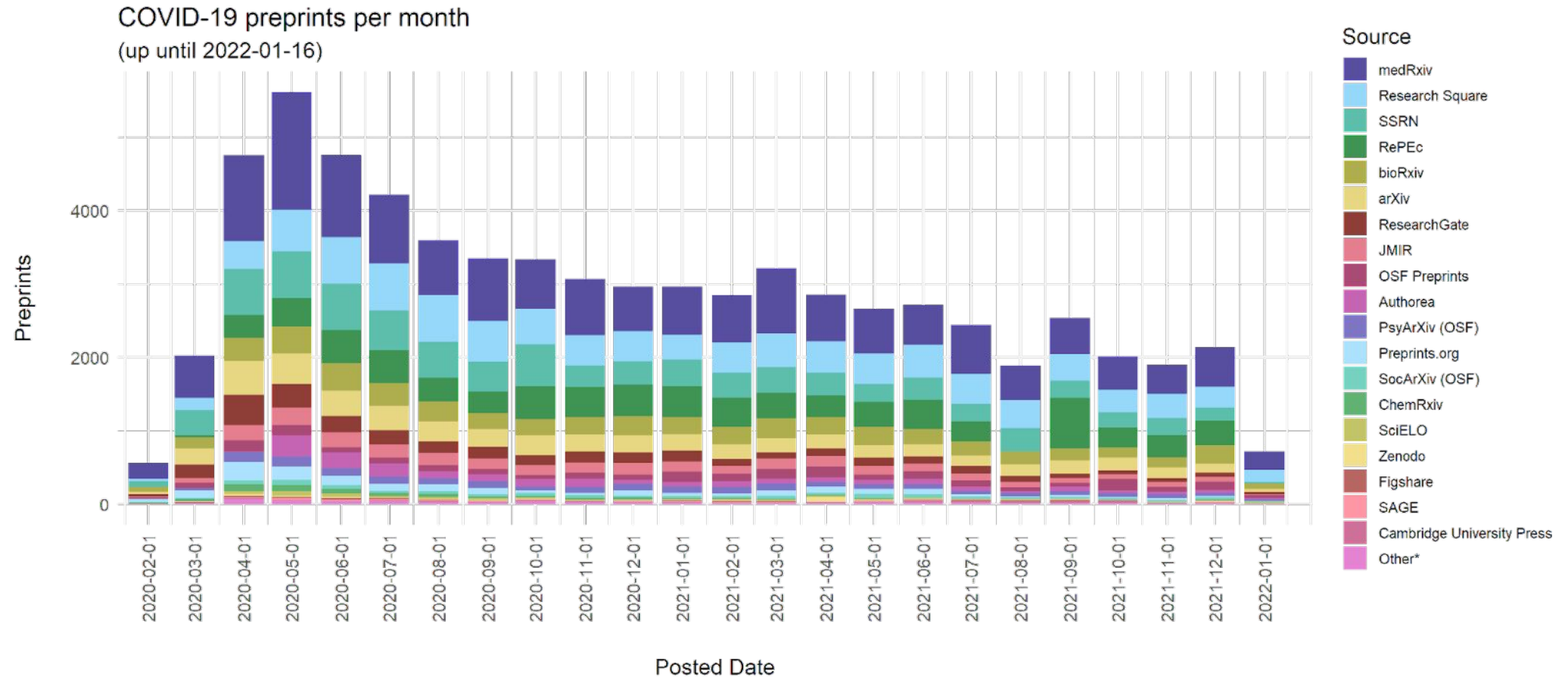
Or use QR code

Why do we talk about Open Science now?

Have you heard about Open Science lately in the press?



OS Practices During the Pandemic



* 'Other' refers to preprint repositories containing <125 total relevant preprints. These include: AfricArXiv (OSF), AgriXiv (OSF), BioHackrXiv (OSF), Copernicus GmbH, EcoEvoRxiv (OSF), EdArXiv (OSF), engrXiv (OSF), ESSOAR, Frenxiv (OSF), INA-Rxiv (OSF), IndiaRxiv (OSF), LawArXiv (OSF), MediArXiv (OSF), MetaArXiv (OSF), NutriXiv (OSF), ScienceOpen, SportRxiv (OSF), Techrxiv (IEEE), WHO.

Source: https://github.com/nicholasmfraser/covid19_preprints

“There can be no doubt that **Covid-19 gave a boost to open science.**

[..] But as things begin to return to a ‘new normal’, and some of the barriers begin to reappear, it is important to consider what open science has actually gained from the pandemic, and **some of the challenges that remain to be overcome** in the face of other global challenges.”

taken from “[Open Science and the new normal](#)” (2021)

“ In response to the COVID-19 pandemic many publishers and researchers have **sped up their adoption of Open Science practices**, sometimes embracing them fully and sometimes partially or in a sub-optimal manner. [...] many news outlets have recently amplified public exposure to **low-quality research**, sowing confusion among the public. In this paper we argue that many of the **sub-optimal and non-transparent scientific practices** witnessed during the pandemic, in conjunction with **poor coordination** across the global research community, have contributed to a **dysfunctional scientific process** for COVID-19 research.”

taken from Besançon, L., Peiffer-Smadja, N., Segalas, C. et al. Open science saves lives: lessons from the COVID-19 pandemic. BMC Med Res Methodol 21, 117 (2021). <https://doi.org/10.1186/s12874-021-01304-y>


with more challenges ahead

WIRED LONG READS BUSINESS CULTURE GEAR SCIENCE SECURITY VIDEO

GRACE SPONGE SCIENCE 22.04.2022 12:00 PM

Making Science More Open Is Good for Research—but Bad for Security

The open science movement pushes for making scientific knowledge quickly accessible to all. But a new paper warns that speed can come at a cost.



Macron praises Europe of 'open and free science' as he renews plea for strategic autonomy

10 May 2022 | News

In a speech at the closing ceremony of the Conference on the Future of Europe, the French president praised the EU's scientific prowess, and called for treaty changes

By Florin Zubaşcu



OPINION article

Front. Environ. Sci., 11 October 2018 | <https://doi.org/10.3389/fenvs.2018.00115>



Enhancing Climate Change Research With Open Science

 Travis C. Tai^{1*} and  James P. W. Robinson²

¹Institute for the Oceans and Fisheries, University of British Columbia, Vancouver, BC, Canada

²Lancaster Environment Centre, Lancaster University, Lancaster, United Kingdom

Agenda Overview

16:00 - 16:10	Introduction
16:10 - 16:30	What is Open Science (for us)?
16:30 - 16:50	How to integrate Open Science in your research workflow?
16:50 - 16:55	Short Quiz
16:55 - 17:00	Coffee Break
17:00 - 17:40	Sharing and publishing
17:40 - 17:50	Open Science benefits and barriers / Open Science escape room
17:50 - 18:00	Where to continue?

What is Open Science?

You may be overwhelmed

open access?

DMP?

ORCID?

OSF?

YODA?

citizen science?

open hardware?

repository?

RDM?

CC-BY?

GitHub?

open data?

metadata?

preprints?

FAIR?

preregistration?

altmetrics?

reproducibility?

open peer review?

What is Open Science for you?

What does Open Science mean for you? What concepts do you connect with Open Science?

Let's create our definition of Open Science together:

Please create your own **Open Science Cloud** in **Breakout Rooms**.

<https://www.menti.com/>

use code **6385 9484**



Or use QR code

Our definition of Open Science

Open Science is ...

Open Science is

...a global movement that aims to “make scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society, and to open the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community.”

Source: [UNESCO Recommendation on Open Science \(2021\)](#)

Why Open Science?

“Forcing” factors:

- Funder requirements
- Publisher requirements
- Community / stakeholder requirements



Why Open Science?

Reproducibility crisis

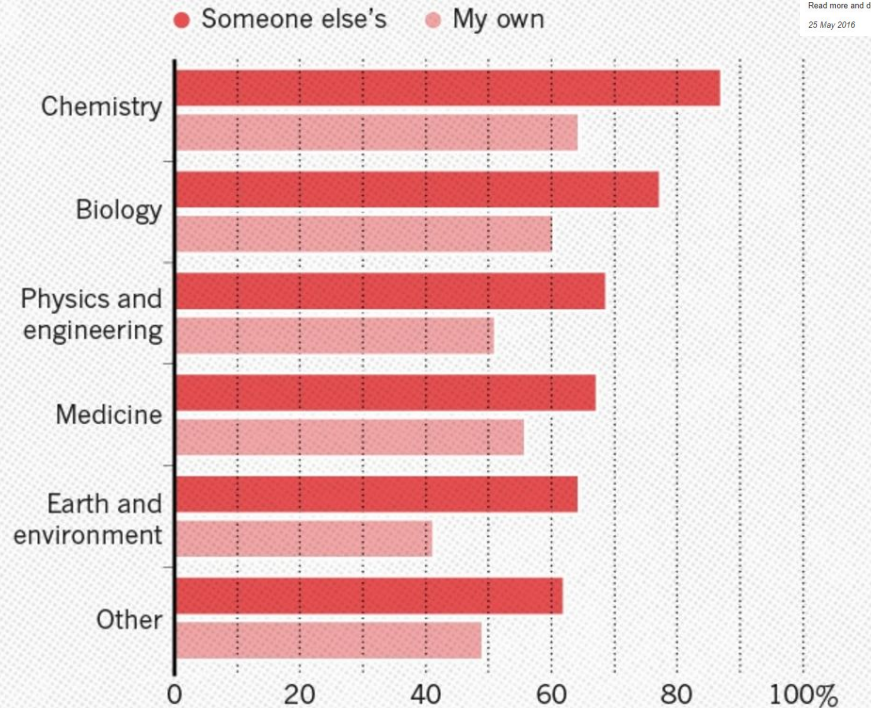


Is there a reproducibility crisis in science?

Nature asked 1,576 scientists this question as part of an online survey. Most agree that there is a crisis and over 70% said they'd tried and failed to reproduce another group's experiments. Read more and delve into the survey data: [1,500 scientists lift the lid on reproducibility](#). 25 May 2016

HAVE YOU FAILED TO REPRODUCE AN EXPERIMENT?

Most scientists have experienced failure to reproduce results.



<https://dx.doi.org/10.1038/533452a>

For the transparency, verifiability, and liability of scientific results.

Scientific Misconduct



Dutch Daily News
DAILY DUTCH NEWS IN ENGLISH

NEWS BUSINESS TECHNOLOGY ENTERTAINMENT HEALTH TRAVEL NETHERLANDS

Home » food » Meat eaters are selfish and less social

Meat eaters are selfish and less social

Posted in food, News | 29 comments

"Meat brings out the worst in people". This is what psychologists of the Radboud University Nijmegen and Tilburg University concluded from various studies on the psychological significance of meat.

RECENT NEWS

- Why The Netherlands dominates the World Happiness Report rankings
Posted by Dutch Daily News on 3-20-20
- More British people moving to the Netherlands
Posted by Dutch Daily News on 7-7-20


<https://dutchdailynews.com/meat-eaters-selfish-less-social/>


Why Open Science?

For your own benefit. Open Science is science as it was always meant to be.

Virtual Democracy

Joy, fun, and love in open science

 Bruce Caron



How much joy do you get from your research?

Tibor Simko hat retweetet

 **Kati Lassila-Perini** @KatiLassila · 3. Juni

Feeling motivated: see refs [33] & [34] in @CMSExperiment paper journals.aps.org/prl/pdf/10.110... !! That's how it goes: 1. Release #OpenData - cool! 2. External people do great work and publish papers - awesome! 3. The results are relevant to @CMSExperiment - mind blowing!

[Tweet übersetzen](#)

[33] A. Larkoski, S. Marzani, J. Thaler, A. Tripathee, and W. Xue, Exposing the QCD Splitting Function with CMS Open Data, *Phys. Rev. Lett.* **119**, 132003 (2017).
[34] A. Tripathee, W. Xue, A. Larkoski, S. Marzani, and J. Thaler, Jet substructure studies with CMS open data, *Phys. Rev. D* **96**, 074003 (2017).

1 5 11

OPEN SCIENCE

Public Engagement / Citizen Science

Outreach &
valorisation



Evaluation

Open Peer Review

Preregistration

Initiation



Planning



RDM/ FAIR Data & Software

Data acquisition,
analysis &
documentation

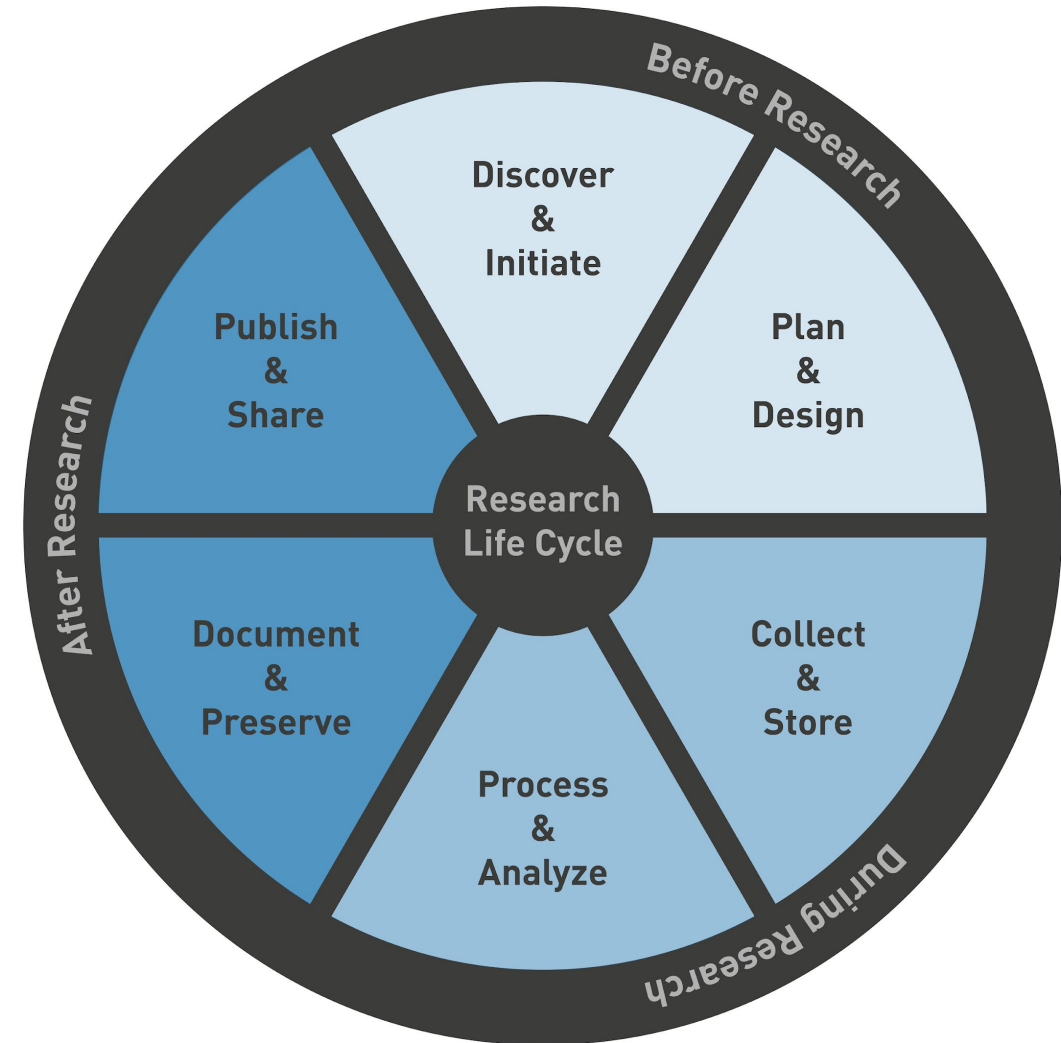
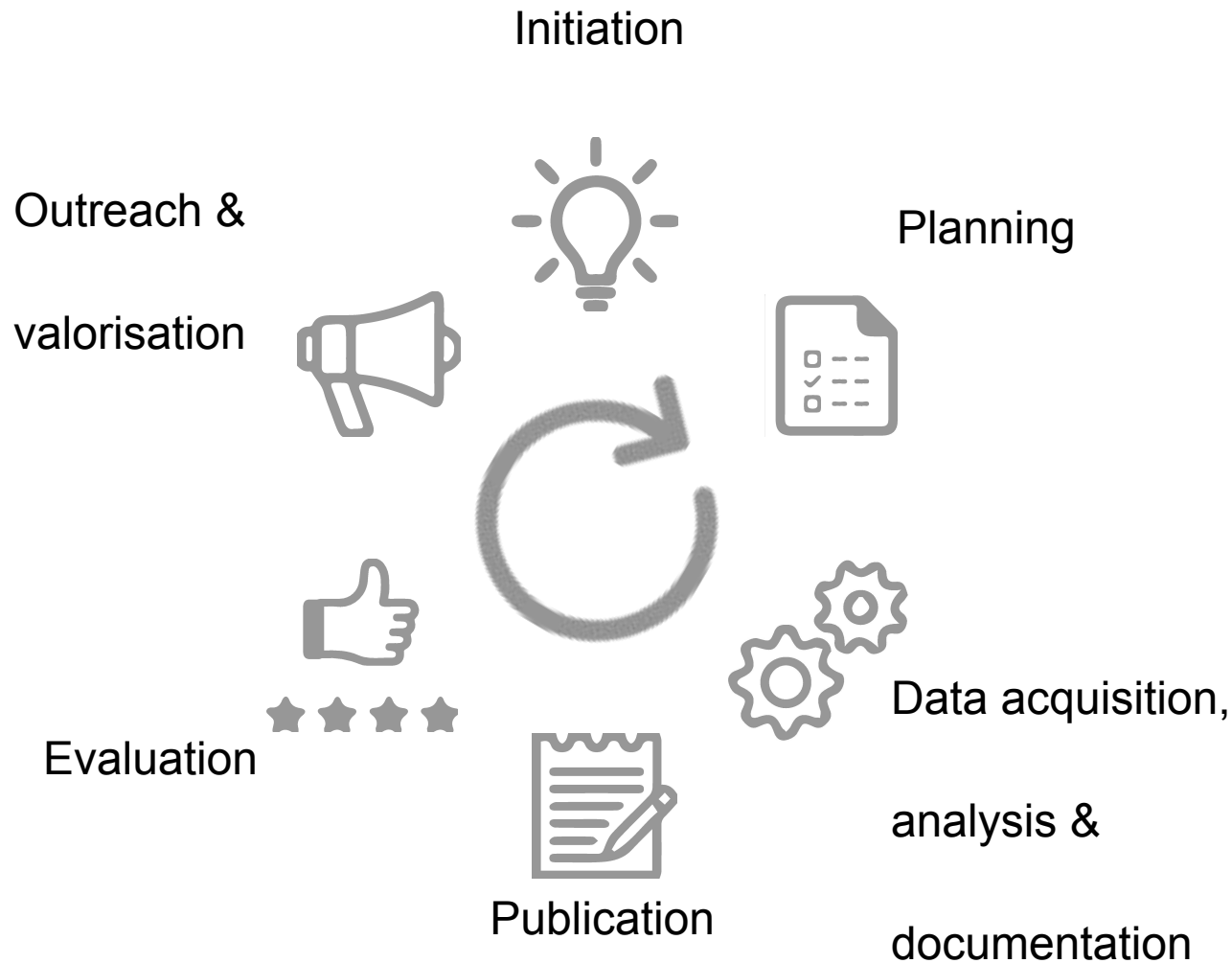


Publication

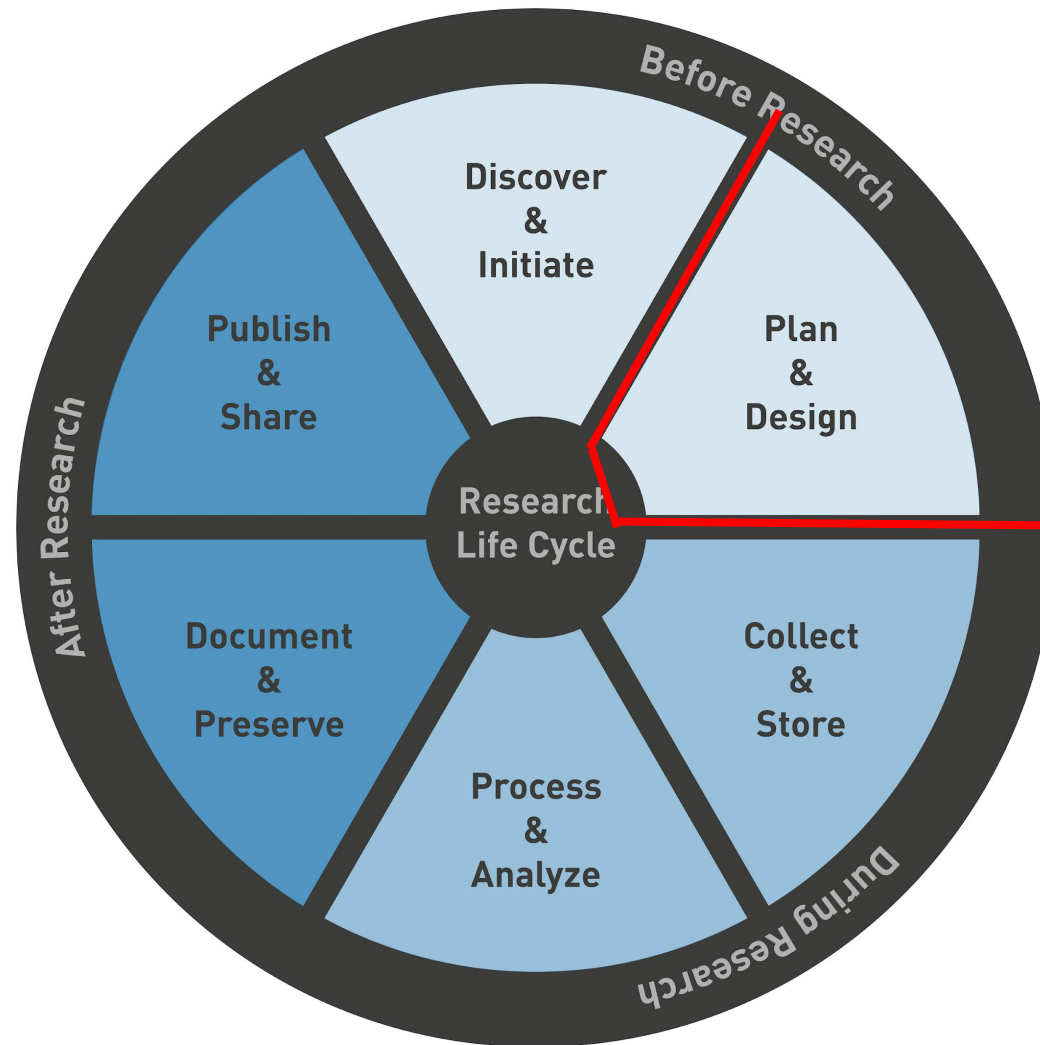
Open Access, Open Data

Academia is in transition
towards a more transparent
way of doing and sharing
research.

Research Life Cycle



Plan & Design



You need a plan

THE 5-YEAR PLAN

XXXXX's Plan 2003-'07

	Jan	Feb	March	April	May	June	July	August	Sep	Oct	Nov	Dec
'03				Beginning AAA proposal				Beginning AAS proposal	22 Conf T. Grant		1 Wen-Gren 1 JPNF 3 SSRC 23 AAA	31 JPN Genders 1st
'04	1 NSF	23 Conf T. Grant	4-7 AAS 8 Diss. T. Grant	1 AAA proposal	15 Bester 17 Prelim 31 Prelim	1 SHA 14 Prelim 29 JPN Genders 2nd	9 Prelim 12-8/10 Res in J. (15-29?)	6 AAS proposal 10 Oral 22 Move. 31 Book Ch Final	Conf T. Grant		15 AAUW 17-21 AAA SFO	Beginning IPRH Fellowship 10 SSRC (Sexuality)
'05		1 Guggenheim	31-4/3 AAS Chicago Conf. T. grant	Beginning -Diss. Comp. Fellowship -AAA proposal				Beginning AAS proposal	JPN Genders Publication		30-12/4 AAA DC.	
'06				Beginning AAA proposal 6-9 AAS SFO				Beginning AAS proposal				
'07			22-25 AAS Boston	Beginning AAA proposal		Diss. Defense!		Beginning AAS proposal				

No matter what your goals are—a vision board can help [keep you accountable](#)

A plan is a present-moment statement of intent

Every planning requires updates

Data Management Plan

Data Management Plan (DMP) - How will you manage your research data during and after your research project?

Tool: <https://dmponline.vu.nl/>

Sander's Plan

Project Details	Plan overview	Write Plan	Share	Request feedback	Download
-----------------	---------------	------------	-------	------------------	----------

expand all | collapse all 0/29

- 0. General information (0 / 3) +
- 1. Data description (0 / 3) +
- 2. Legal and ethical requirements (0 / 4) +
- 3. Storage and back-up during the research process (0 / 4) +
- 4. Data sharing and long-term preservation (0 / 8) +
- 5. Documentation and data quality (0 / 5) +
- 6. Data management responsibilities and resources (0 / 2) +

Open Science Framework (OSF)



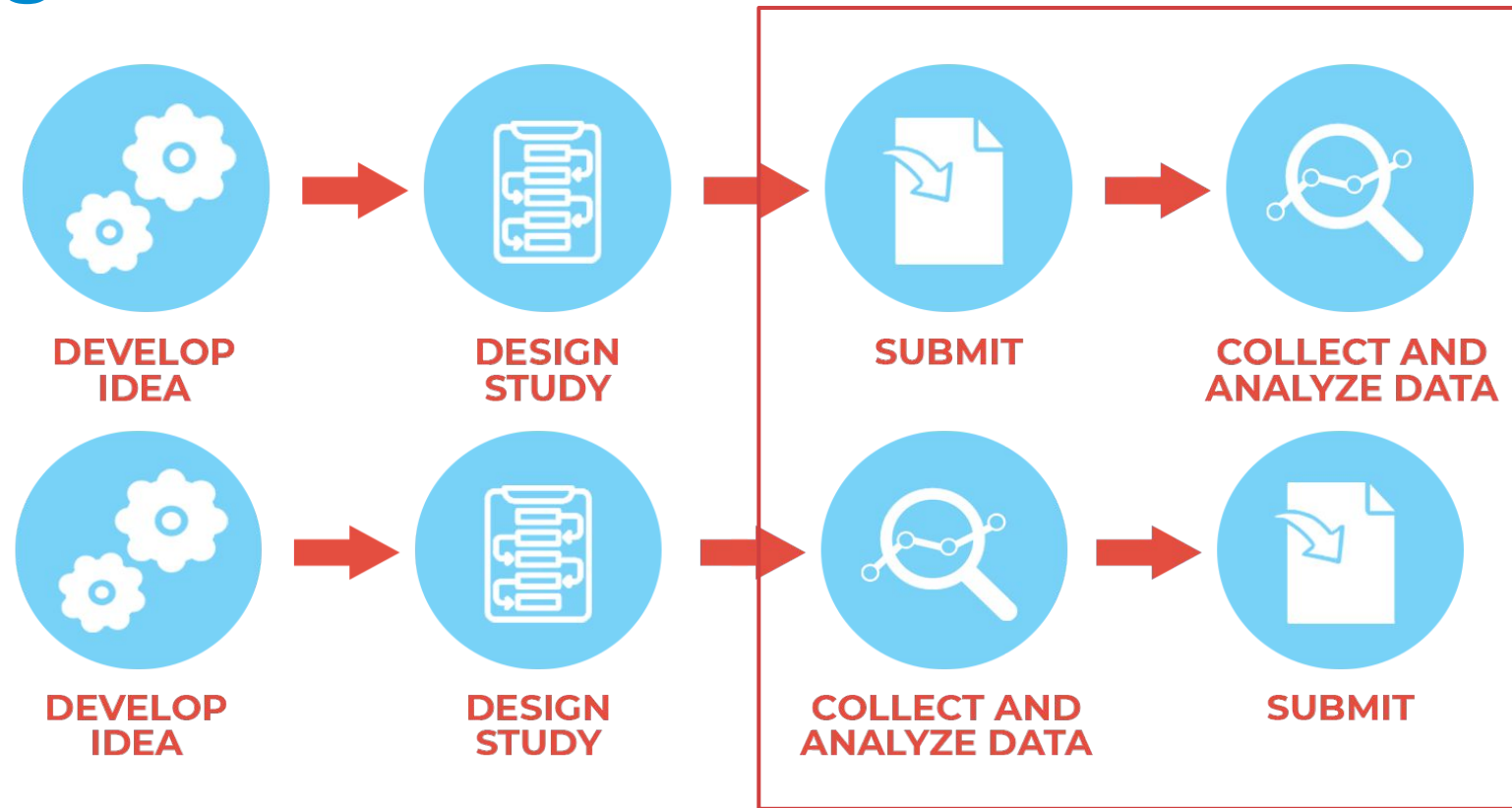
A Research Data Management Tool for the Vrije Universiteit Amsterdam Research Community | VU OSF Getting Started Guide | VU Research Data Support | Contact RDM Support Desk | Join the VU OSF Advocates team

All Projects >

Collections	Name ^ v	Contributors	Modified ^ v
All Projects	Factors Influencing Attribution to Hurtful Behavior: Ability versus Motivation	Devi, Righetti + 1	an hour ago
All Registrations	Generations2: Longitudinal study on the development of parenting and mental health	Oosterman, Schuengel + 7	13 days ago
Contributors < 1/17 >	Transdiagnostic treatment of depression and anxiety: Protocol for a meta-analysis	Cuijpers, Miguel + 4	a month ago
Only contributors on loaded resources are filterable.	When Do Evaluators Publicly Express their Legitimacy Judgments? An Inquiry into the R...	van den Broek	a month ago
Carlo Schuengel	Bart's Test Project Test Link	Hattink	2 months ago
Mirjam Oosterman	Jessica's component	Hrudey	2 months ago
Marije Verhage	OSF training at the VU	Sandt, Hofstra + 2	2 months ago
Anne Tharner	VU OSF Documentation	Vos, Olivier + 2	2 months ago
Tags < 1/4 >	Impact of research about early development of children with intellectual disability: A sc...	Schuengel, van Rest + 2	2 months ago
Only tags on loaded resources are filterable	Attachment and the transgenerational effects of loss and trauma	Bakkum, Schuengel + 3	2 months ago
COVID-19	Collaboration on Attachment Research Synthesis (CARS)	Schuengel, Verhage + 9	2 months ago
OSF	People with intellectual disabilities living in care facilities engaging in virtual social cont...	Bakkum, Schuengel + 6	2 months ago
sandbox	Understanding burnout among parents of children with complex care needs: A scopin...	Patty, van Meeteren + 4	2 months ago
training	Longitudinal assessment of maternal parenting stress and its association with parental...	Holopainen, Verhage + 3	2 months ago



Preregistration



Publish your hypotheses / analysis plan / protocol before starting your project

- Creates a distinction between exploratory and confirmatory research
- See <https://osf.io/3tbwc/>, <https://www.protocols.io/> or <https://aspredicted.org/>
- Also for qualitative research: <https://www.cos.io/blog/qualitative-preregistration>

ORCID

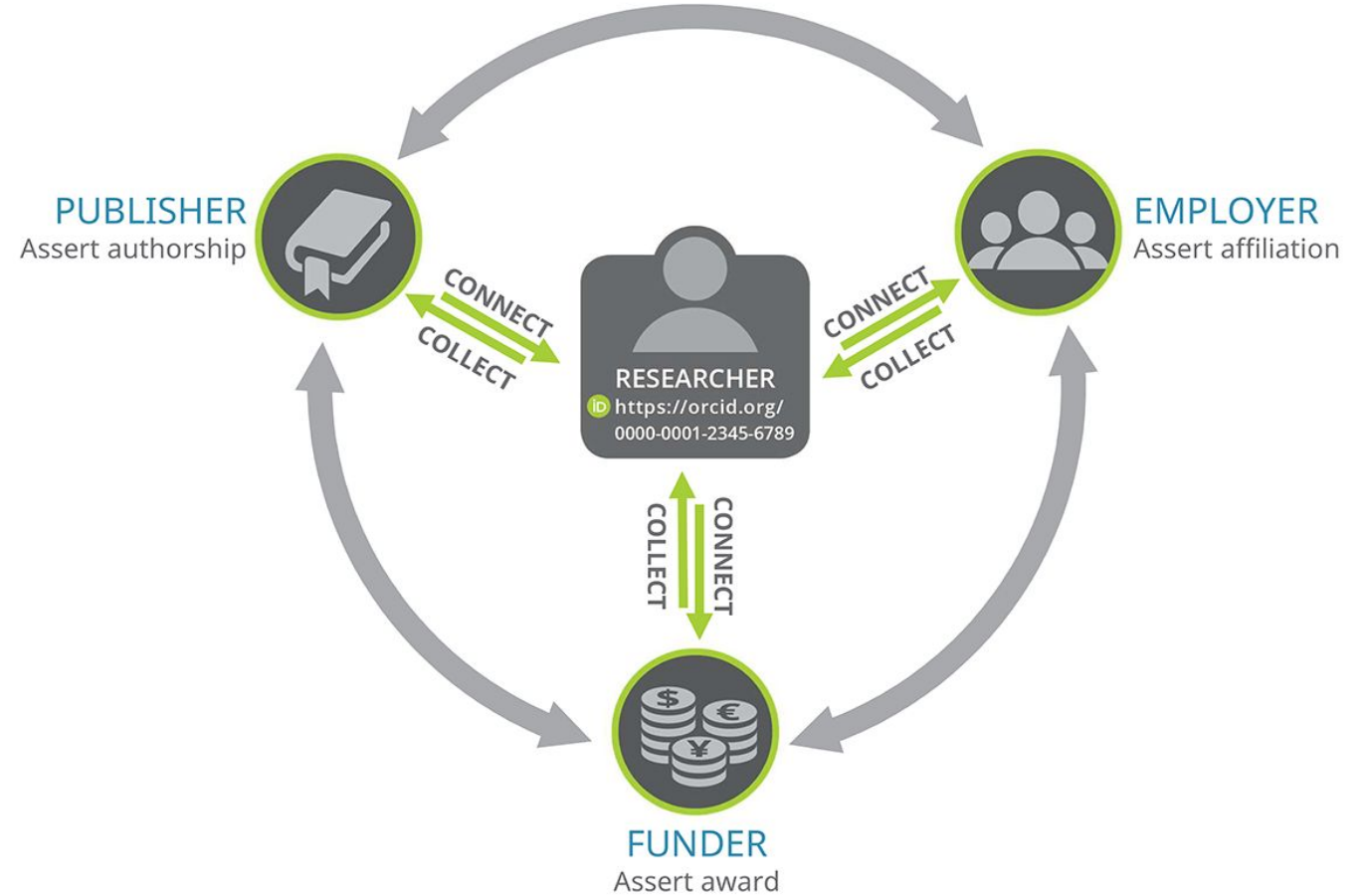
Find people/papers/datasets

Profiles: ResearcherID, ScopusID, academia.edu,
Mendeley, Publons

Open **R**esearcher and **C**ontributor ID:

- Efficiency
- Visibility and findability
- Personal and under your control
- Widely adopted in scholarly infrastructure

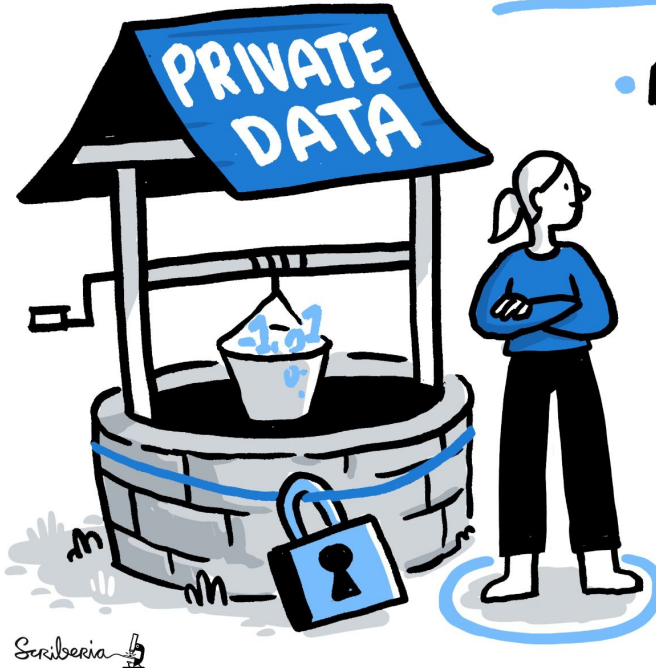
Registering is easy and only takes a few minutes at <https://orcid.org/signin>



Working with sensitive data

As Open as Possible, as Closed as Necessary: not all data can or should be open!

PEOPLE DESERVE:



- DIGNITY
- AGENCY
- PRIVACY RIGHTS
- CONFIRMED CONSENT

CONSIDER
NECESSARY
RESTRICTIONS
AROUND
SHARING
DIFFERENT
TYPES OF DATA



The Turing Way project illustrations by Scriberia

Quiz time

How do you feel about what we discussed and what do you remember?

<https://www.menti.com/>

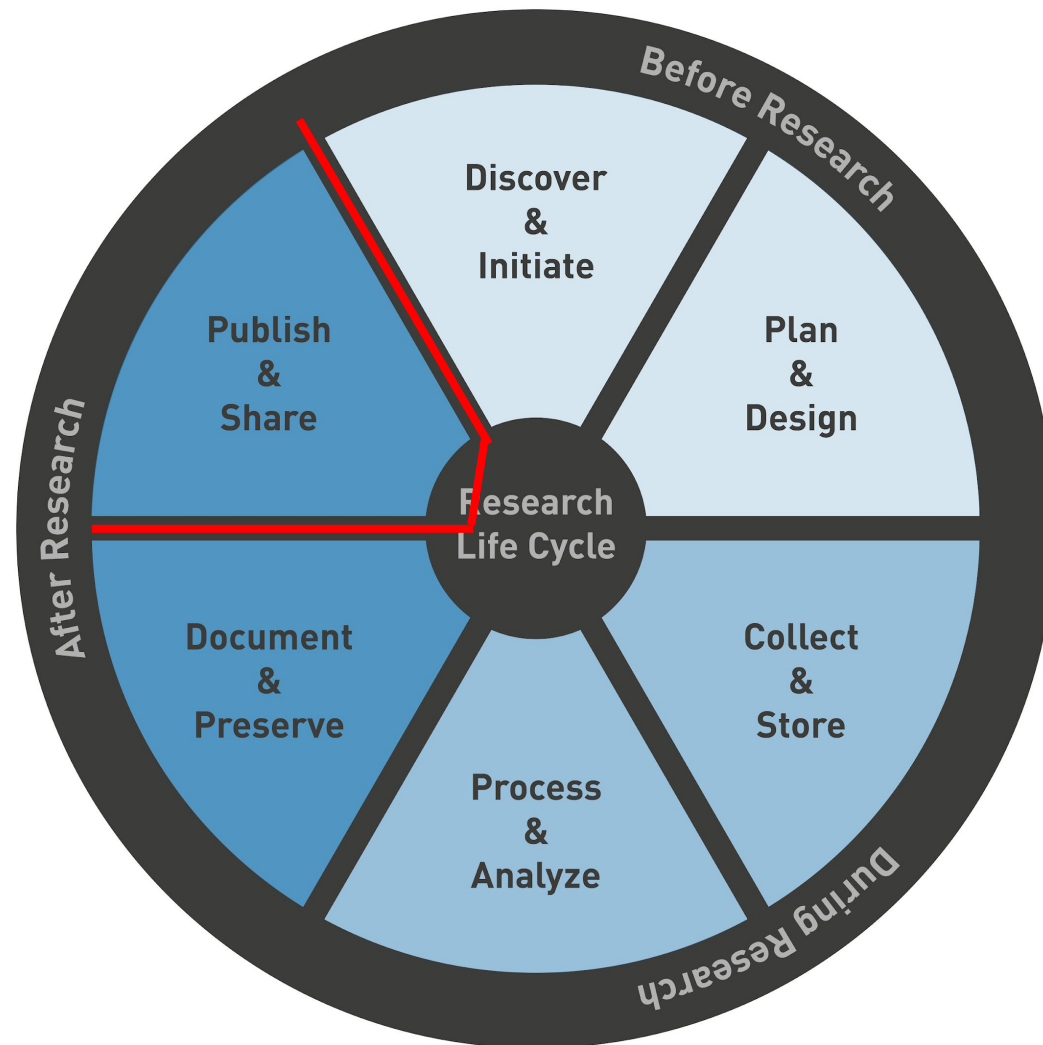
use code **6385 9484**



Or use QR code

Coffee Break





Publishing Data & Software

Publishing vs. Archiving

STORAGE AND ARCHIVING



Publishing

- Enables data reuse
- With publishing your dataset will be automatically archived as well

Archiving

- Enables verification
- Potentially allows for data reuse under certain conditions

Archiving Data

The right archival option depends on the nature of your data and your community!

Examples for data archives:

DarkStor

- an offline archive for storing sensitive information/data.

ArchStor

- Data stored in ArchStor can only be accessed for verification purposes

More information can be found here: <https://libguides.vu.nl/rdm/selecting-archive>

Publishing Data

Why Publishing Data?

Publishing Data has many advantages:

- it prevents data loss and helps you to find your data in the future.
- published data helps reviewers and readers to verify your research.
- published data can be found and reused by others.



Where to publish data?

Research Data Repositories

Research data repositories are one of the best options for storing and publishing research data in the long term.

Subject-specific research data repositories

- focuses on a domain / discipline / subject.
- for users outside the institutional community.

National / Institutional repositories

- collects the research output of a nation / institution.

Generalist research data repositories

- no specific disciplinary focus
- for users outside the institutional community.

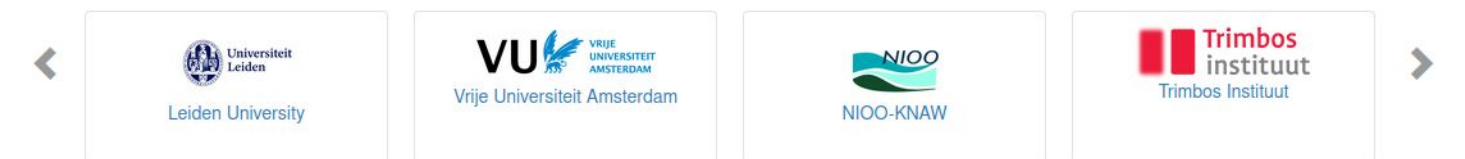
Research Data Repositories

DataverseNL is a publicly accessible data repository platform, open to researchers of affiliated institutes and their collaborators to deposit and share research data openly with anyone.



Welcome to DataverseNL

Store, share and publish research data online. Use the slider below to access the dataverses of the DataverseNL partners.



Search this dataverse... [Advanced Search](#)

Dataverses (517)

Datasets (5,957)

Files (154,280)

Dataverse Category

- Research Project (128)
- Organization or Institution (123)
- Department (73)
- Research Group (72)
- Researcher (20)

[More...](#)

Publication Year

- 2022 (361)
- 2021 (4,140)
- 2020 (375)

1 to 10 of 6,474 Results

Non-invasive diode laser, an effective and safe treatment of Iris cysts in 46 eyes of 35 horses

May 16, 2022 - UU Veterinary Medicine

Stas, Emanuël, 2022, "Non-invasive diode laser, an effective and safe treatment of iris cysts in 46 eyes of 35 horses", <https://doi.org/10.34894/S9PTKL>, DataverseNL, V1

BSummary Background: Iris cysts in horses are often asymptomatic and noticed incidentally. However, cysts can cause local corneal oedema and erratic behaviour like shying, decreased performance and headshaking. Objectives: To describe the use of diode laser as a non-invasive trea...

Transparent Enforcement: Access to Information related to the Monitoring of EU Environmental Law

May 13, 2022 - International and European Law

Müller, Mathias Nikolaus, 2022, "Transparent Enforcement: Access to Information related to the Monitoring of EU Environmental Law", <https://doi.org/10.34894/UMF5VF>, DataverseNL, V1

This study examines to what extent the right to access environmental information that is enshrined in the Aarhus Convention, the Environmental Information Directive and national law can be used by the public to access information related to compliance with EU environmental law wi...

Subject-specific Research Data Repositories

Examples for subject-specific research data repositories:

ICPSR



Generalist Research Data Repositories

Examples for generalist research data repositories:



DRYAD

zenodo

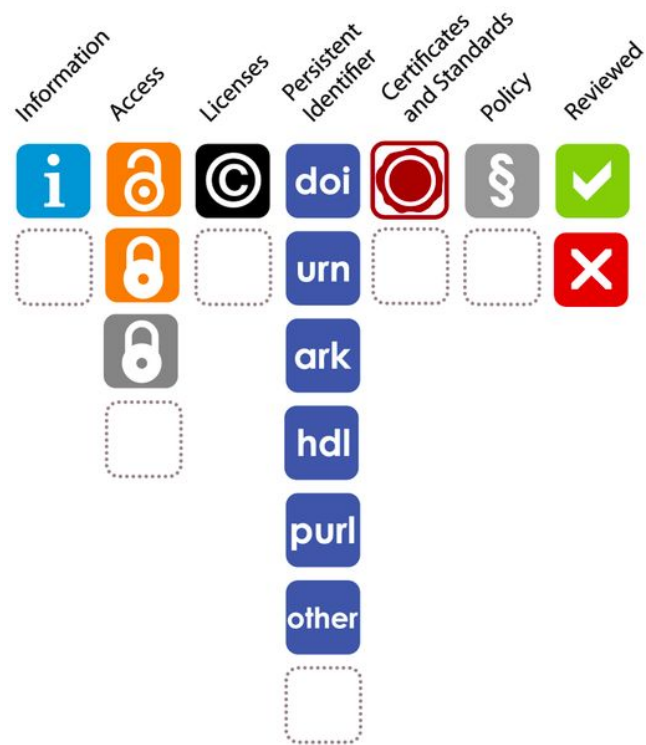
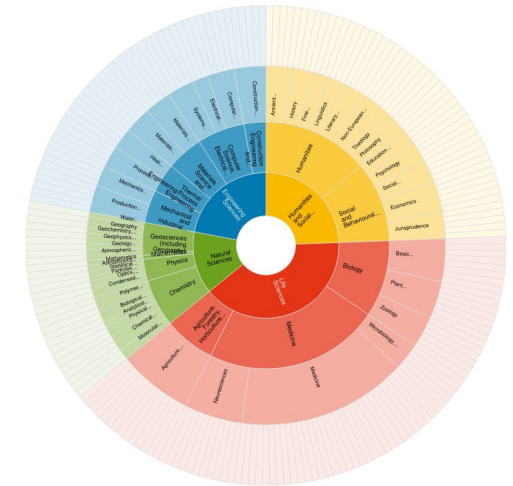


figshare

How to Find the Right Repository?

re3data is a registry for **research data** repositories.

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES



vrje universiteit amsterdam

← Previous 1 Next →

Found 3 result(s)

OSF - Vrije Universiteit Amsterdam

Subject(s): Classical Archaeology, Humanities and Social Sciences, Ancient Cultures, Humanities

Content type(s): Raw data, Scientific and statistical data formats, Standard office documents, Images, Structured text, Audiovisual data, Images, Databases, Plain text, Source code

Country: Netherlands, United States

A Research Data Management Tool for the Vrije Universiteit Amsterdam Research Community.

DataverseNL

Subject(s): Humanities and Social Sciences, Life Sciences, Natural Sciences, Engineering Sciences

Content type(s): Images, Standard office documents, Plain text, Archived data, Scientific and statistical data formats, other, Raw data, Audiovisual data, Databases

Country: Netherlands, International

Online storage, sharing and registration of research data, during the research period and after its completion. DataverseNL is a shared service provided by participating institutions and DANS.

Longitudinal Aging Study Amsterdam

LASA

Subject(s): Social Sciences, Social and Behavioural Sciences, Humanities and Social Sciences

Content type(s): Standard office documents, Audiovisual data, Plain text

Country: Netherlands

The Longitudinal Aging Study Amsterdam (LASA) at the VU University and VU University Medical Centre is initiated by the Ministry of Health, Welfare and Sports in 1991 to determine predictors and consequences of ageing. LASA focuses on, physical, emotional, cognitive and social functioning in late life, the connections between these aspects, and the changes that occur in the course of time

Publisher Recommendations

Some publishers offer guidance to authors on data sharing, with some suggesting specific repositories:

- [Elsevier](#)
- [PLOS](#)
- [NATURE Scientific Data](#)
- [Springer](#)
- [Taylor & Francis](#)

How to publish data?

Metadata

Metadata are describing data about digital objects.

They are an essential component to

- make your data understandable / reusable.
- make your data findable.
- assign credit.
- create citations.
- link your data to other objects.
- clarify how your data must be used.
- define access rights.

There are several metadata standards that vary between communities.

Basic information required ▾

Digital Object Identifier

Optional. Did your publisher already assign a DOI to your upload? If not, leave the field empty and we will register a new DOI for you. A DOI allows others to easily and unambiguously cite your upload. Please note that it is NOT possible to edit a Zenodo DOI once it has been registered by us, while it is always possible to edit a custom DOI.

Reserve DOI

Publication date *

Required. Format: YYYY-MM-DD. In case your upload was already published elsewhere, please use the date of first publication.

Title *

Required.

Authors *

<input type="text" value="van de Sandt, Stephanie"/>	<input type="text" value="CERN"/>	<input type="text" value="0000-0002-9576-1974"/>	✕
		<small>Optional.</small>	
<input type="text" value="Nielsen, Lars Holm"/>	<input type="text" value="CERN"/>	<input type="text" value="0000-0001-8135-3489"/>	✕
		<small>Optional.</small>	

[+ Add another author](#)













Description *


Required.


Version


Optional. Mostly relevant for software and dataset uploads. Any string will be accepted, but semantically-versioned tag is recommended. See semver.org for more information on semantic versioning.


Open Licenses for Data


CREATIVE COMMONS LICENSES		 COPY & PUBLISH	 ATTRIBUTION REQUIRED	 COMMERCIAL USE	 MODIFY & ADAPT	 CHANGE LICENSE
	PUBLIC DOMAIN	✓	✗	✓	✓	✓
	CC BY	✓	✓	✓	✓	✓
	CC BY-SA	✓	✓	✓	✓	✗
	CC BY-ND	✓	✓	✓	✗	✗
	CC BY-NC	✓	✓	✗	✓	✓
	CC BY-NC-SA	✓	✓	✗	✓	✗
	CC BY-NC-ND	✓	✓	✗	✗	✗

 You can redistribute (copy, publish, display, communicate, etc.)

 You have to attribute the original work

 You can use the work commercially

 You can modify and adapt the original work

 You can choose license type for your adaptations of the work.

License selector for publications, data, software:
<https://ufal.github.io/public-license-selector/>

Questions?

Contact your library

Persistent Identifiers



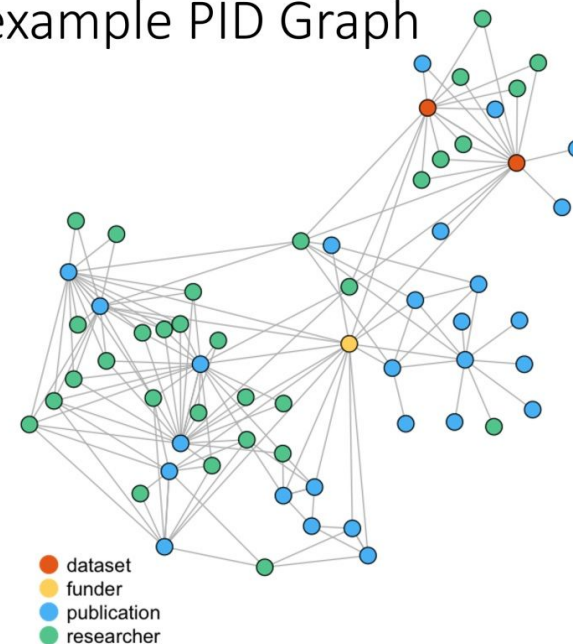
Persistent Identifiers (PIDs) uniquely identify a publication, dataset, or person, or any digital object. PIDs are standardized, registered identifiers that resolve to a defined landing page.

- helps to slow link rot.
- citeability of digital objects even after the file is no longer available.
- connectivity between different kinds of digital objects.

Examples for PIDs:

- DOIs, accession numbers, ARKs, handle
- ORCID
- ROR
- URN
- ISBN, ISSN

An example PID Graph

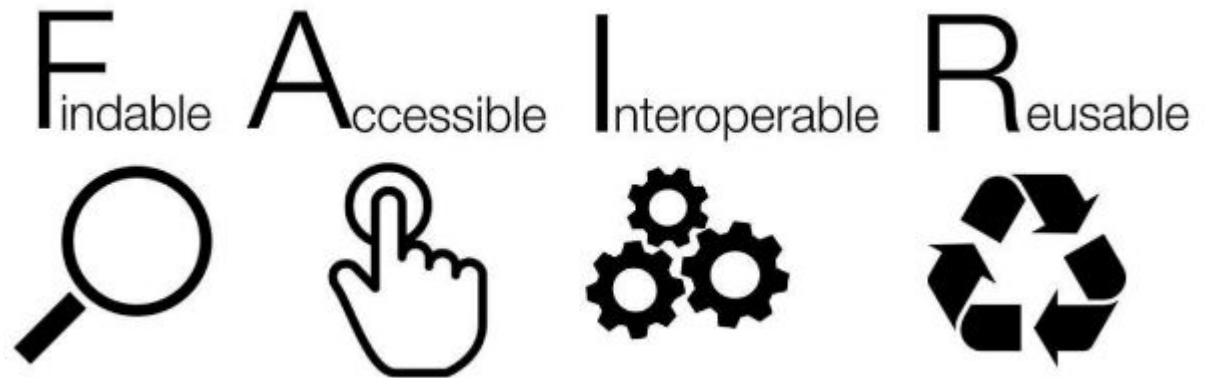


Why invest all this effort?

FAIR Principles

Why?

1. Increase visibility and findability of your work
2. Improve reproducibility and reliability
3. Foster collaboration with others
4. Achieve maximum impact



What is FAIR?

Findable

- Data / Metadata are assigned a PID
- Rich metadata
- Registered in a searchable resource

Accessible

- How can the data be accessed?
- Authentication and authorization.
- Metadata are accessible even when the data is no longer available

Interoperable

- The data need to interoperate with applications or workflows for analysis, storage, and processing

Reusable

- Metadata and data should be well-described
- Data usage license
- Community standards

FAIR-Aware tool

Applying the FAIR principles to your data will help yourself and others to find, cite and reuse your data more easily.

The FAIR-Aware tool can be used at any point during the research project before the data will be published.



Your first step towards your FAIR
data(set)

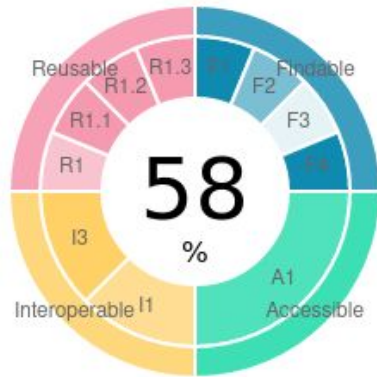
FAIR assessment



F-UJI

Automated FAIR Data Assessment Tool

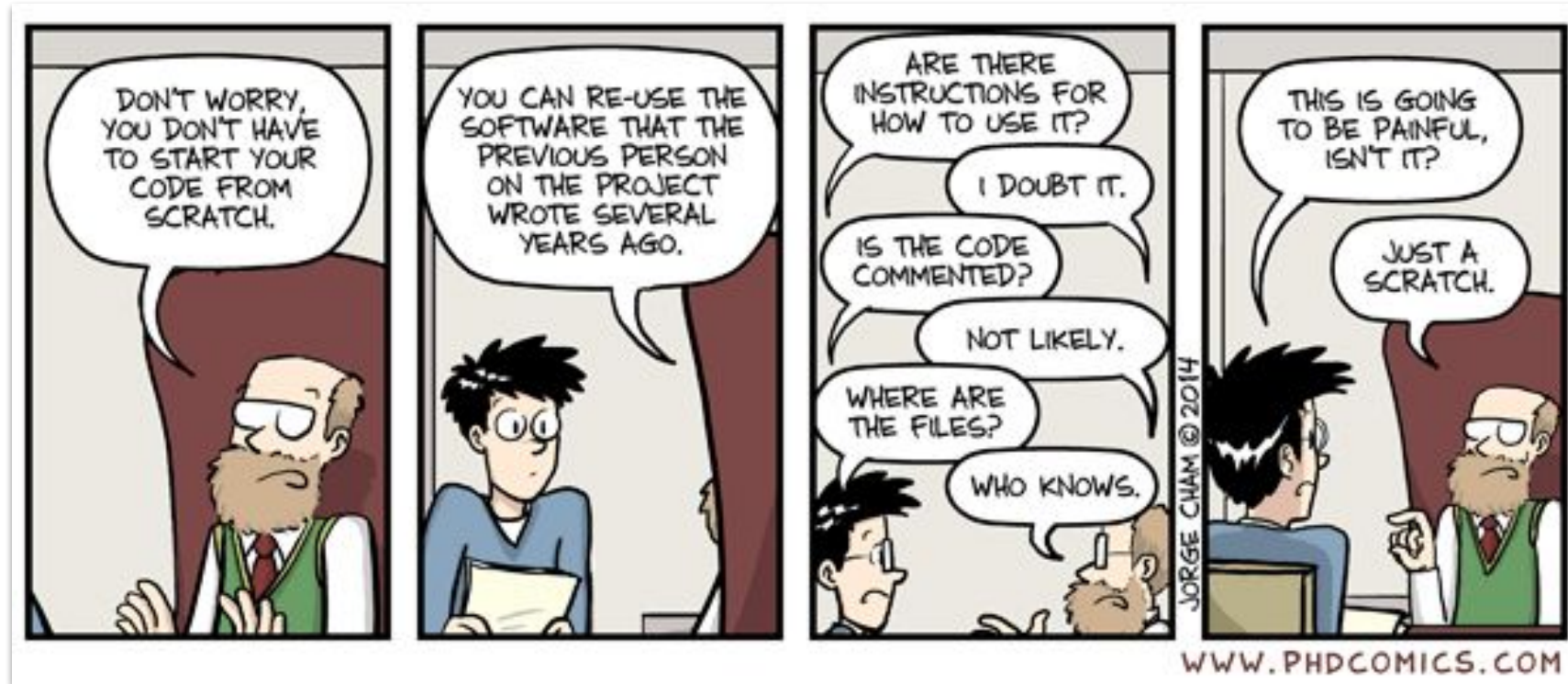
Summary:



	Score earned:		Fair level:
Findable:	5 of 7		moderate
Accessible:	2 of 3		moderate
Interoperable:	3 of 4		moderate
Reusable:	4 of 10		initial

Sharing & Publishing Code

Why is it important to publish code?



Sharing Code

You can share your code with your team or collaborators even before you end your project!

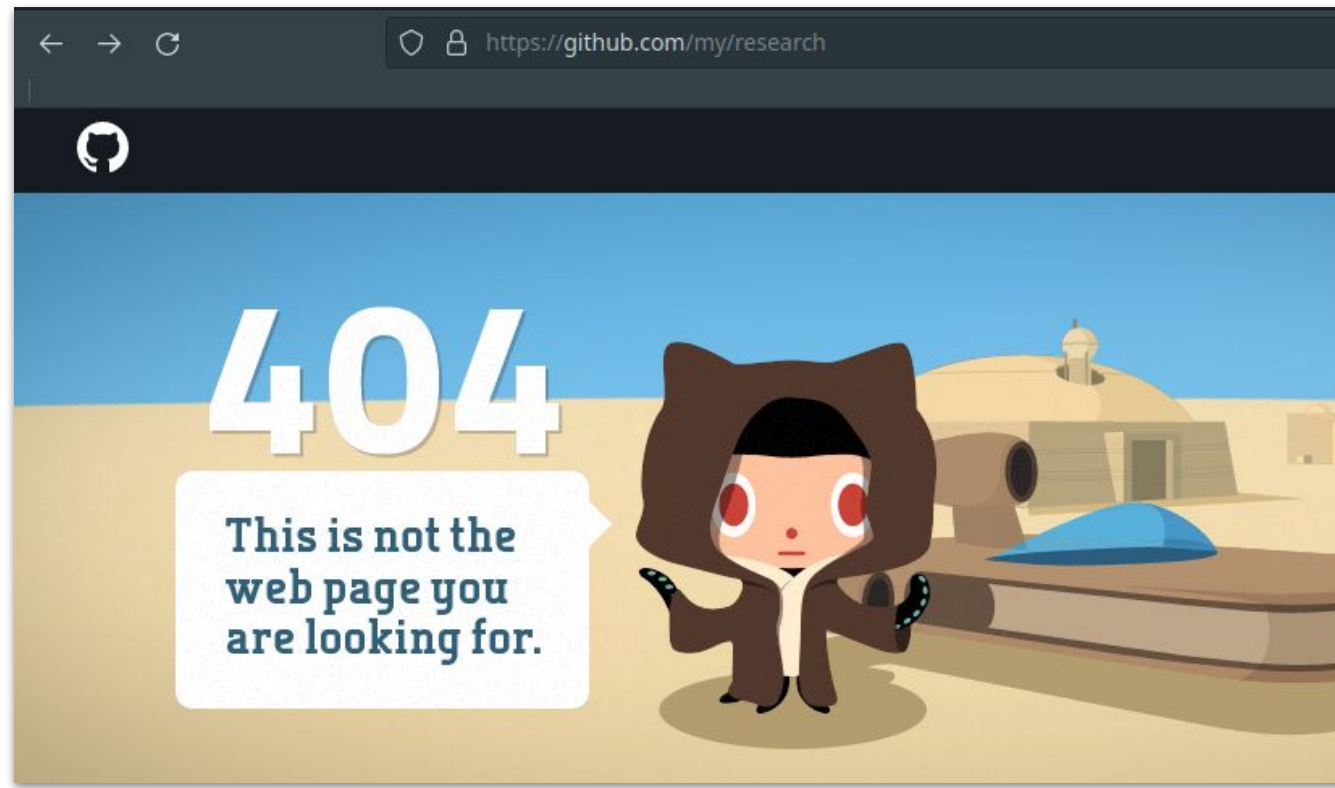
The screenshot shows the GitLab interface for a repository named 'reproducible-stan' by Jon Zelner. The repository is public and has 8 stars. It contains 49 commits, 1 branch, 0 tags, 236 KB of files, and 236 KB of storage. The description reads: 'An example of a fully reproducible Stan project using RStan + pandoc in a docker container'. The current branch is 'master'. A commit titled 'fixed hashbang' by Jon Zelner is highlighted, with a commit hash of '03cf3a23'. Below the commit, there are buttons for 'README', 'CI/CD configuration', and 'No license. All rights reserved'. A table lists the repository's structure:

Name	Last commit	Last update
data	Update parameters.csv	5 years ago
munge	Update extract_parameters.R	5 years ago
presentations	a bunch of updates	5 years ago
src	fixed hashbang	5 years ago
.gitignore	added docker.job.ID.tmp file to .gitignore	5 years ago


The screenshot shows the Zenodo repository page. The header includes a search bar and navigation links for 'Pull requests', 'Issues', 'Marketplace', and 'Explore'. The main content area features the Zenodo logo and profile information: 'Research. Shared.', 'Geneva, Switzerland', and 'https://www.zenodo.org'. Below this, there are tabs for 'Overview', 'Repositories (14)', 'Projects', 'Packages', and 'People (3)'. The 'Pinned' section displays three repositories: 'zenodo' (Public, Research. Shared., Python, 673 stars, 216 forks), 'developers.zenodo.org' (Public, Zenodo Developers Site, JavaScript, 3 stars, 10 forks), and 'zenodo-docs-user' (Public, Zenodo User Documentation, CSS, 3 stars, 13 forks). The 'Repositories' section has a search bar and filters for 'Type', 'Language', and 'Sort'. The 'People' section shows profile pictures and 'Top languages' (HTML, Python, JavaScript, CSS, Jupyter Notebook). The 'Most used topics' section lists 'invenio', 'research-data-management', and 'zenodo'. A 'Report abuse' link is visible at the bottom.

Why is that not enough?

GitHub and GitLab do not offer long-term preservation of your code.



Publishing Code



Making Your Code Citable

🕒 10 minute read

Digital Object Identifiers (DOI) are the backbone of the academic reference and metrics system. If you're a researcher writing software, this guide will show you how to make the work you share on GitHub citable by archiving one of your GitHub repositories and assigning a DOI with the data archiving tool [Zenodo](#).

ProTip: This tutorial is aimed at researchers who want to cite GitHub repositories in academic literature. Provided you've already set up a GitHub repository, this tutorial can be completed without installing any special software. If you haven't yet created a project on GitHub, start first by [uploading your work](#) to a repository.

Intro

- [Choosing Your Repo](#)
- [Login to Zenodo](#)
- [Check Repo Settings](#)
- [Create a New Release](#)
- [Minting a DOI](#)
- [Finishing up](#)

Where to publish code?

There are multiple options for publishing code:

- Zenodo
- Figshare
- Software Heritage Archive



Navigation and action buttons for Figshare:

- [My data](#)
- [Projects](#)
- [Collections](#)
- [+ Create a new item](#)
- [Import from GitHub](#)

NAME		SYNC	MODIFIED
<input checked="" type="checkbox"/> awesome	updated 3 <input type="checkbox"/>	<input checked="" type="checkbox"/> ON ↻	16.09.2016
<input type="checkbox"/> awesome-1	No release here, the last commit will be added		16.09.2016
<input type="checkbox"/> computer-science	No release here, the last commit will be added		16.09.2016

A screenshot of a Zenodo project page for "zenodo-testing/my-project". The page shows a list of releases with their respective DOIs and publication dates. The releases are: 1.0.14 (DOI: 10.5072/zenodo.147412, 1 year, 11 months ago), 1.0.12 (DOI: 10.5072/zenodo.147410, 1 year, 11 months ago), 1.0.0 (DOI: 10.5072/zenodo.135430, 2 years ago), and 11 (DOI: 10.5072/zenodo.73410, 2 years ago). Each release is marked as "Published" and includes a "test" tag.

zenodo-testing/my-project ON

DOI: 10.5072/zenodo.147412

GitHub / Releases [Create release ...](#)

- 1.0.14 zenodo-testing/my-project: test Published 1 year, 11 months ago
DOI: 10.5072/zenodo.147412
test
- 1.0.12 zenodo-testing/my-project: test Published 1 year, 11 months ago
DOI: 10.5072/zenodo.147410
test
- 1.0.0 zenodo-testing/my-project: Test Published 2 years ago
DOI: 10.5072/zenodo.135430
Test
- 11 zenodo-testing/my-project: test2 Published 2 years ago
DOI: 10.5072/zenodo.73410
test2

How to publish your code?

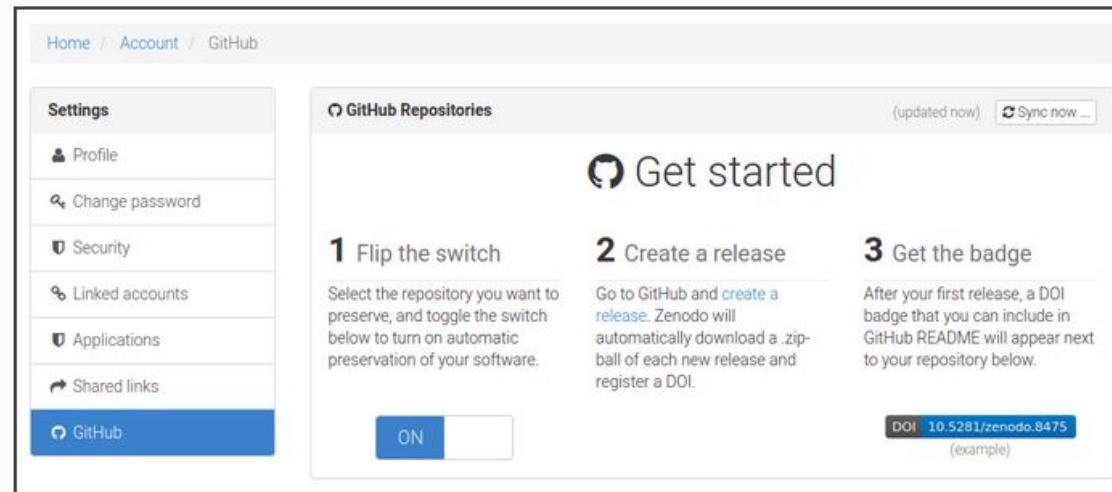
Follow the step-by-step instructions provided by the CodeRefinery, or take part in one of our Software Carpentry workshops!

Step 2: Activate the repository on Zenodo (sandbox)

i We will exercise in the Zenodo sandbox

We will practice on <https://sandbox.zenodo.org/> and not on the "real" <https://zenodo.org/> to make sure we do not create "real" DOIs which we cannot remove.

- Visit <https://sandbox.zenodo.org/account/settings/github/>:



The screenshot shows the 'GitHub Repositories' settings page in Zenodo. On the left is a 'Settings' sidebar with options: Profile, Change password, Security, Linked accounts, Applications, Shared links, and GitHub (highlighted). The main content area is titled 'GitHub Repositories' and includes a '(updated now)' status and a 'Sync now ...' button. Below this is a 'Get started' section with three numbered steps: 1. Flip the switch (with a toggle switch currently set to 'ON'), 2. Create a release, and 3. Get the badge. An example DOI '10.5281/zenodo.8475' is shown at the bottom right.

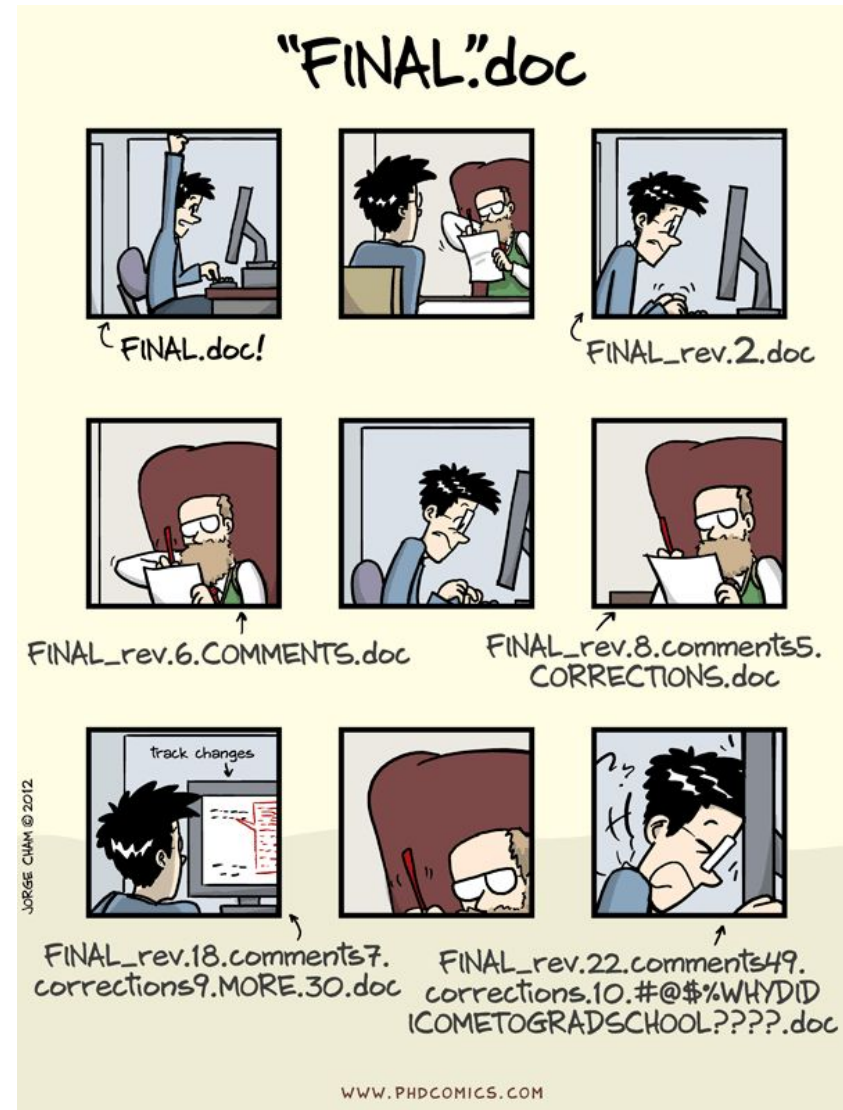
- Select the repository you wish to preserve:

And then?

Version Control

Version control is relevant at all stages of your project!

- History** full record of changes to your files
- Traceability** where did the error occur (and who made it)?
- Time machine** revert back to earlier versions if you need to
- Collaboration** work efficiently on files together with others
- Automatic cloud back-up!**



See <http://swcarpentry.github.io/git-novice/> or <https://coderefinery.github.io/git-intro/>

http://phdcomics.com/comics/archive_print.php?comid=1531

Versioning Data and Code Releases

Once a dataset/ code has been published and assigned a persistent identifier, the file itself cannot be changed or replaced.

Updating a dataset/code may be done via versioning.

Versions	
Version 112 10.5281/zenodo.6529876	May 1, 2022
Version 111 10.5281/zenodo.6481639	Apr 24, 2022
Version 110 10.5281/zenodo.6466120	Apr 17, 2022
Version 109 10.5281/zenodo.6438032	Apr 10, 2022
Version 108 10.5281/zenodo.6409765	Apr 3, 2022

[View all 113 versions](#)

Cite all versions? You can cite all versions by using the DOI 10.5281/zenodo.3723939. This DOI represents all versions, and will always resolve to the latest one. [Read more.](#)

zenodo Search Upload Communities

May 1, 2022 Dataset Open Access

A large-scale COVID-19 Twitter chatter dataset for open scientific research - an international collaboration

Banda, Juan M.; Tekumalla, Ramya; Wang, Guanyu; Yu, Jingyuan; Liu, Tuo; Ding, Yuning; Elena; Chowell, Gerardo

If you have an updated version of your files, you can create a new record version, with a completely new DOI.

[New version](#)

Related/alternate identifiers recommended

Specify identifiers of related publications and datasets. Supported identifiers include: DOI, Handle, ARK, PURL, ISSN, ISBN, PubMed ID, PubMed Central ID, ADS Bibliographic Code, arXiv, Life Science Identifiers (LSID), EAN-13, ISTC, URNs and URLs.

Related identifiers e.g. 10.1234/foobar.567890 is new version of this upload Software

Optional. Resource type of the related identifier.

[+ Add another related identifier](#)

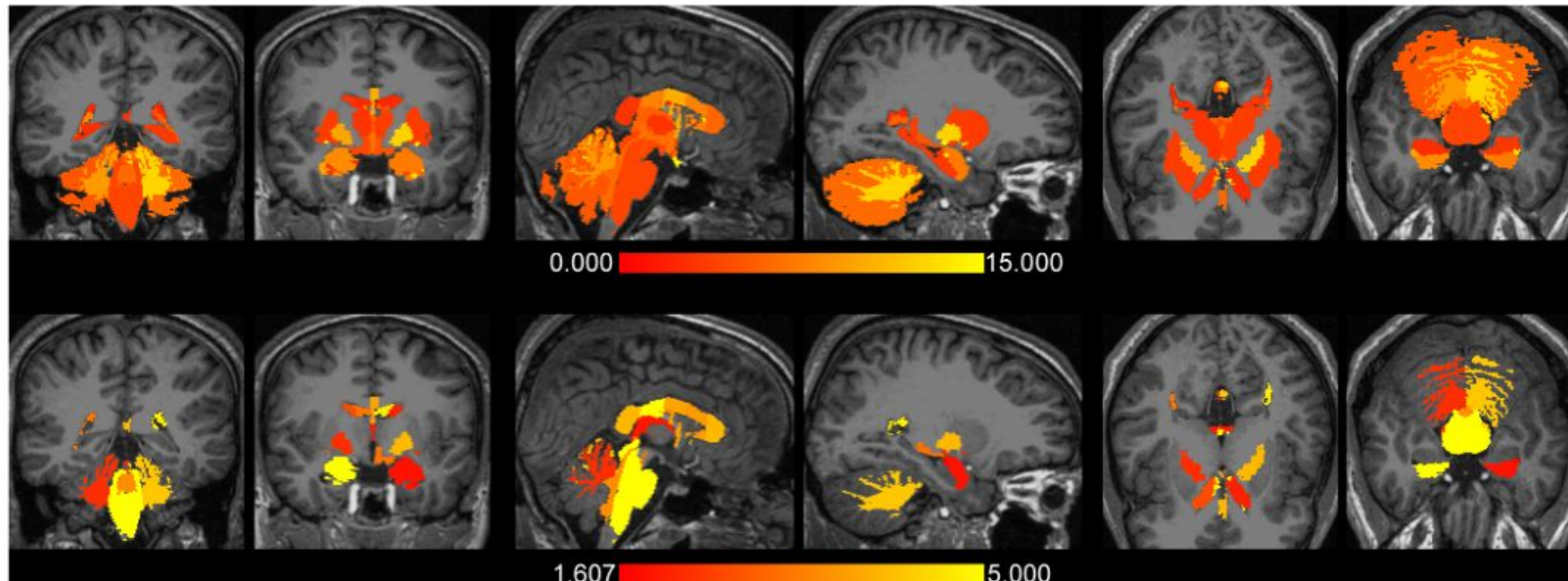
Reproducibility crisis solved?

Why Code is actually not enough

The Effects of FreeSurfer Version, Workstation Type, and Macintosh Operating System Version on Anatomical Volume and Cortical Thickness Measurements

Ed H. B. M. Gronenschild , Petra Habets, Heidi I. L. Jacobs, Ron Mengelers, Nico Rozendaal, Jim van Os, Machteld Marcelis

Published: June 1, 2012 • DOI: 10.1371/journal.pone.0038234



$8.8 \pm 6.6\%$ (volume) and $2.8 \pm 1.3\%$ (cortical thickness)

Publishing papers

Preprints

Preprints are a good way to share your research openly in a timely manner.

A preprint is a version of a scientific paper that precedes formal peer review and publication in a peer-reviewed scientific journal.



Where to share preprints



Citation advantage of preprints

Publications that were published as a preprint before were found to be cited more often.

Articles with a **preprint** are cited more often.

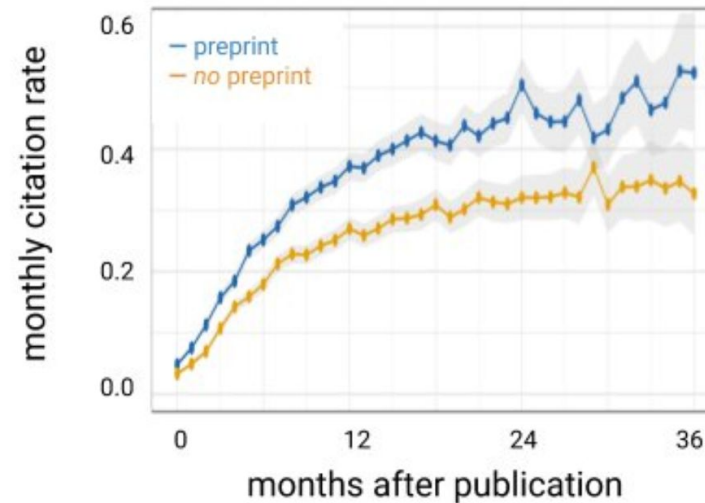
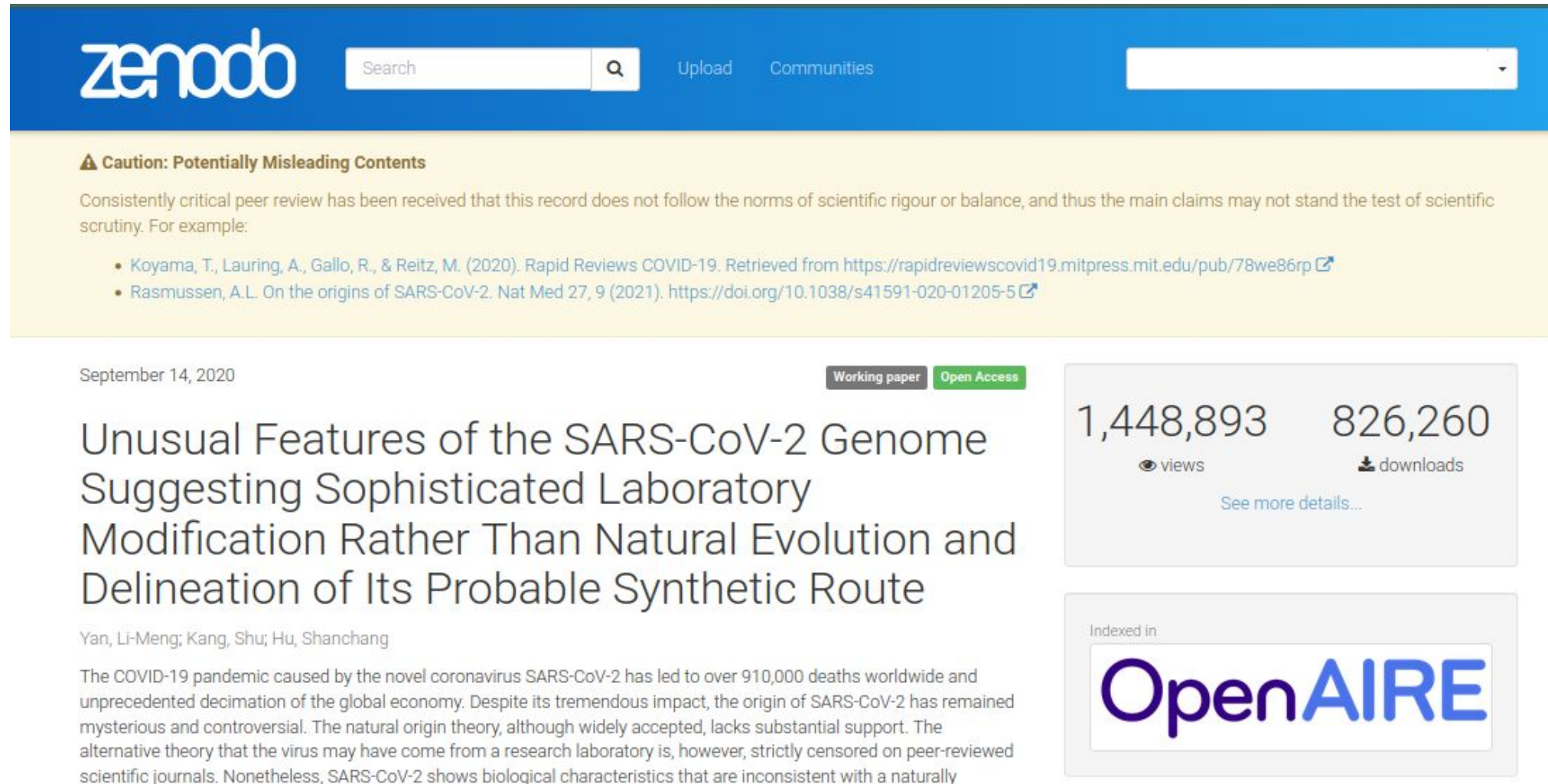


Figure adapted from Fraser et al., Quantitative Science Studies, 2020;
available under CC BY 4.0 license

See also: Fu & Hughey, eLife, 2019; Serghiou & Ioannidis, 2018, JAMA

Quality control for preprints?



The screenshot shows the Zenodo interface for a preprint. At the top, there is a blue header with the Zenodo logo, a search bar, and navigation links for 'Upload' and 'Communities'. Below the header, a yellow warning box contains a caution message: 'Caution: Potentially Misleading Contents'. The text explains that a consistently critical peer review has been received, suggesting the record may not follow scientific norms. Two references are listed: Koyama et al. (2020) on Rapid Reviews COVID-19 and Rasmussen et al. (2021) on the origins of SARS-CoV-2. The main content area shows the preprint title, authors, date (September 14, 2020), and status (Working paper, Open Access). The title is 'Unusual Features of the SARS-CoV-2 Genome Suggesting Sophisticated Laboratory Modification Rather Than Natural Evolution and Delineation of Its Probable Synthetic Route'. The authors are Yan, Li-Meng; Kang, Shu; Hu, Shanchang. A summary paragraph discusses the COVID-19 pandemic and the controversy surrounding the origin of SARS-CoV-2. On the right side, there are statistics for views (1,448,893) and downloads (826,260), along with a 'See more details...' link. Below that, it indicates the preprint is indexed in OpenAIRE.

zenodo Search Upload Communities

⚠ Caution: Potentially Misleading Contents

Consistently critical peer review has been received that this record does not follow the norms of scientific rigour or balance, and thus the main claims may not stand the test of scientific scrutiny. For example:

- Koyama, T., Lauring, A., Gallo, R., & Reitz, M. (2020). Rapid Reviews COVID-19. Retrieved from <https://rapidreviewscovid19.mitpress.mit.edu/pub/78we86rp>
- Rasmussen, A.L. On the origins of SARS-CoV-2. Nat Med 27, 9 (2021). <https://doi.org/10.1038/s41591-020-01205-5>

September 14, 2020 Working paper Open Access

Unusual Features of the SARS-CoV-2 Genome Suggesting Sophisticated Laboratory Modification Rather Than Natural Evolution and Delineation of Its Probable Synthetic Route

Yan, Li-Meng; Kang, Shu; Hu, Shanchang

The COVID-19 pandemic caused by the novel coronavirus SARS-CoV-2 has led to over 910,000 deaths worldwide and unprecedented decimation of the global economy. Despite its tremendous impact, the origin of SARS-CoV-2 has remained mysterious and controversial. The natural origin theory, although widely accepted, lacks substantial support. The alternative theory that the virus may have come from a research laboratory is, however, strictly censored on peer-reviewed scientific journals. Nonetheless, SARS-CoV-2 shows biological characteristics that are inconsistent with a naturally

1,448,893 views 826,260 downloads

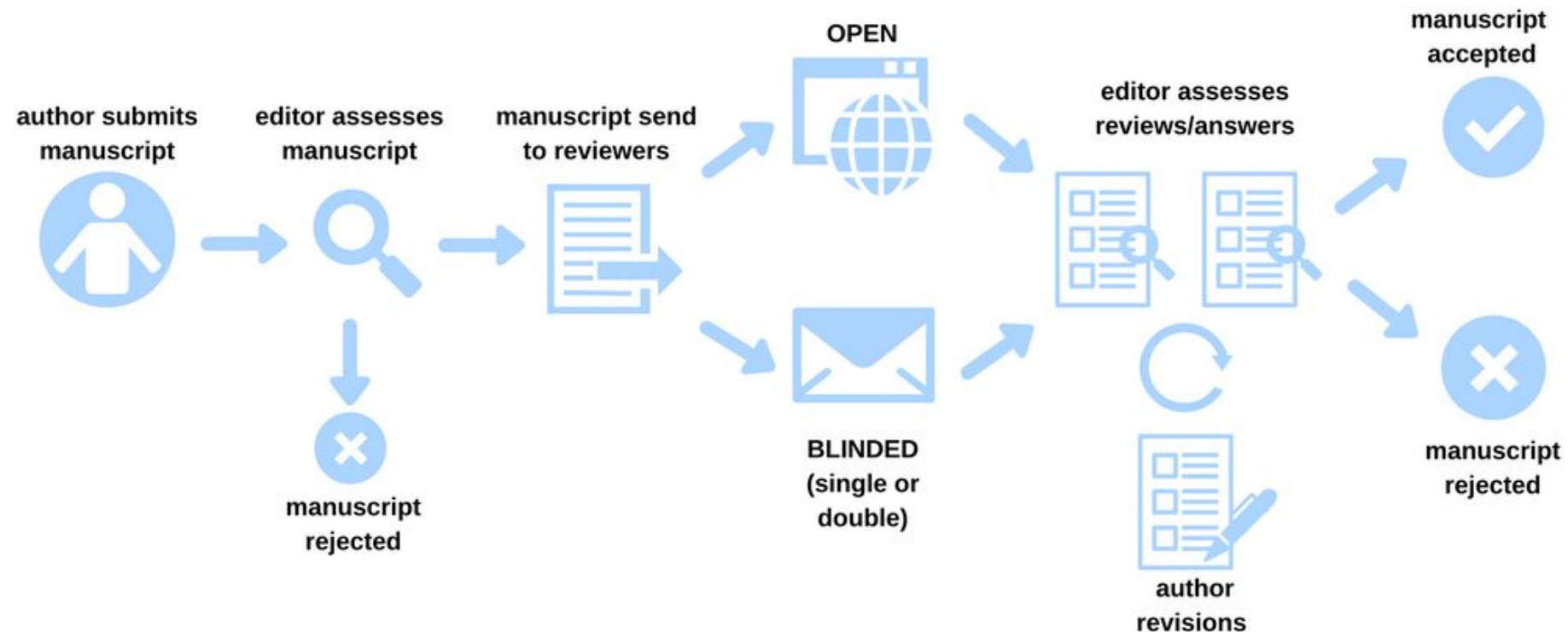
See more details...

Indexed in OpenAIRE

Peer Reviews

Open Peer Review

Concept of open and blinded Peer Review



Example: PeerJ

Review History Software citation principles

To increase transparency, PeerJ operates a system of 'optional signed reviews and history'. This takes two forms: (1) peer reviewers are encouraged, but not required, to provide their names (if they do so, then their profile page records the articles they have reviewed), and (2) authors are given the option of reproducing their entire peer review history alongside their published article (in which case the complete peer review process is provided, including revisions, rebuttal letters and editor decision letters).

New to public reviews? Learn more about [optional signed reviews](#) and [how to write a better rebuttal letter](#).

Table 1:
Varieties of softw
(2015).

Mention type
Cite to publication
Cite to user's manual
Cite to name or websit
Instrument-like
URL in text
In-text name only
Not even name

DOI: [10.7717/peerj.2](https://doi.org/10.7717/peerj.2)

Ask a question about this section

Close

[Learn more about Q&A](#)

Summary

The initial submission of this article was received on June 24th, 2016 and was peer-reviewed by 2 reviewers and the Academic Editor.

The Academic Editor made their initial decision on July 8th, 2016.

The first revision was submitted on August 2nd, 2016 and was reviewed by 1 reviewer and the Academic Editor.

A further revision was submitted on August 22nd, 2016 and was reviewed by the Academic Editor.

The article was Accepted by the Academic Editor on August 23rd, 2016.

Version 0.3 (accepted)

 **Silvio Peroni** · Aug 23, 2016 · Academic Editor

ACCEPT

I would like to thank the authors for their revisions and responses, and the reviewers for their incredible contribution to this paper. I think they have done an impressive job to finalise this work as it is in the current form.

Thus, I'm pleased to say that it is now ready to be published as part of PeerJ Computer Science.

Thanks again for your incredible work!

 Download Version 0.3 (PDF)

 Download author's rebuttal letter

- submitted Aug 22, 2016

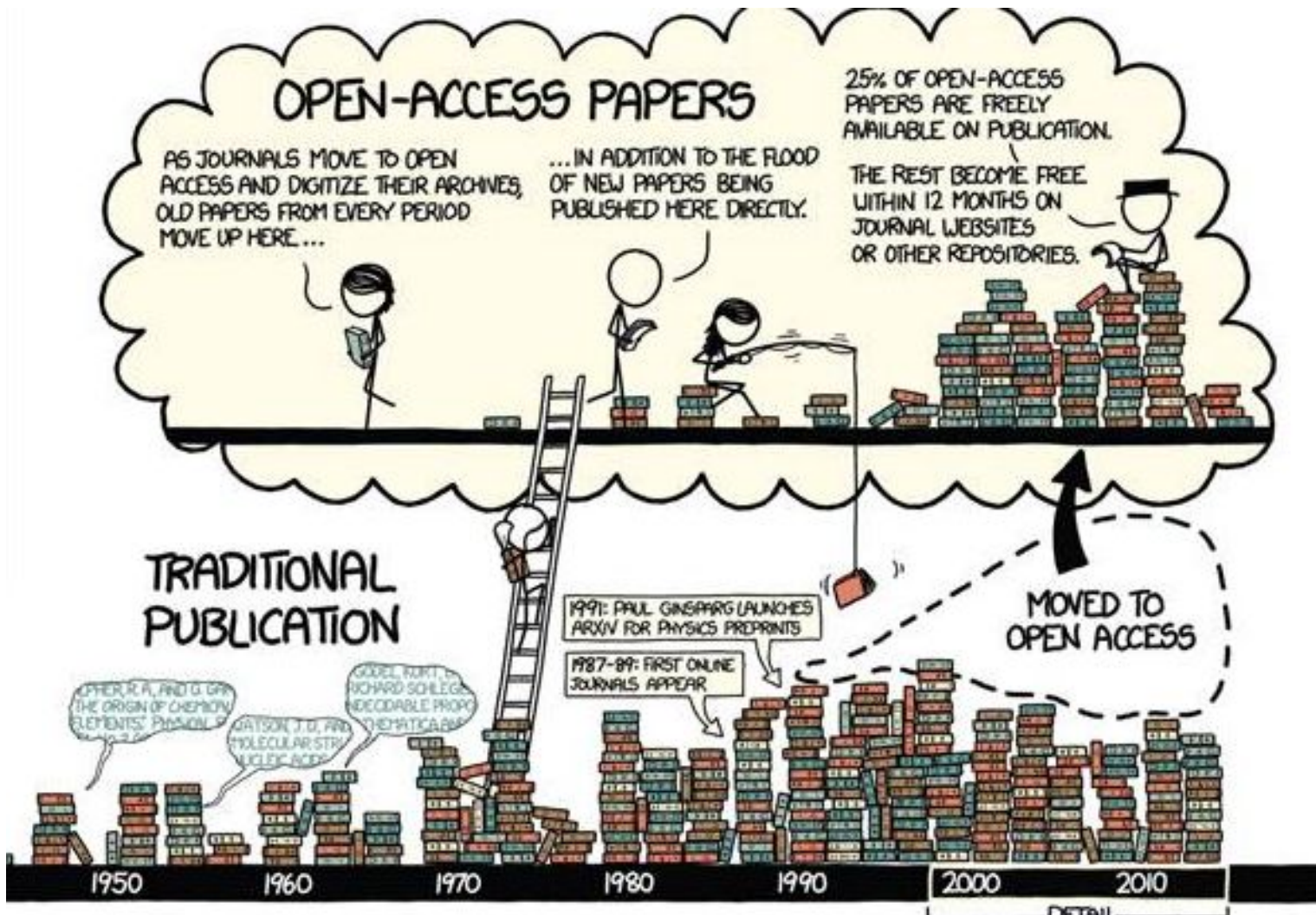
Reviews as citeable units:

Klyne G (2016) Peer Review #2 of "Software citation principles (v0.1)". PeerJ Computer Science

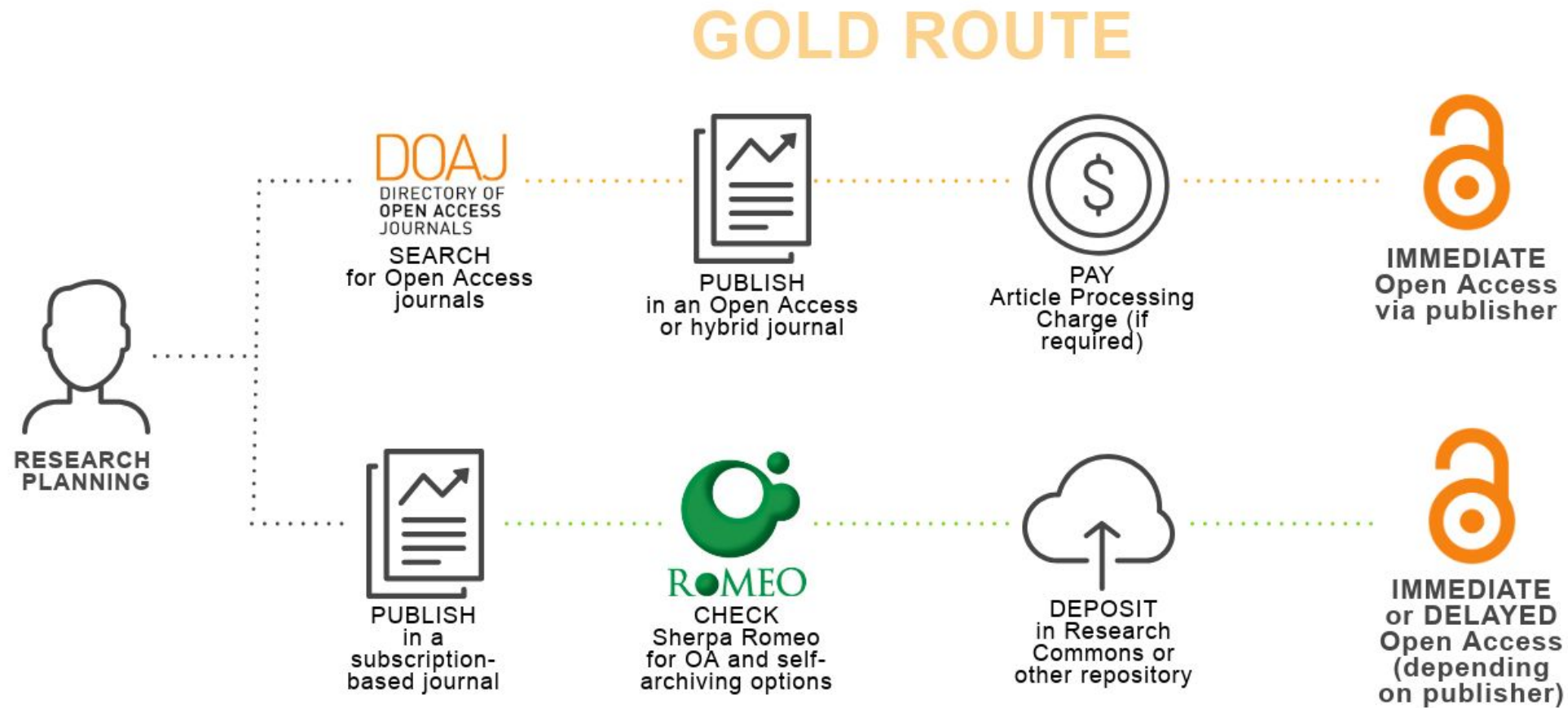
<https://doi.org/10.7287/peerj-cs.86v0.1/reviews/2>

Open Access

Open Access as Process



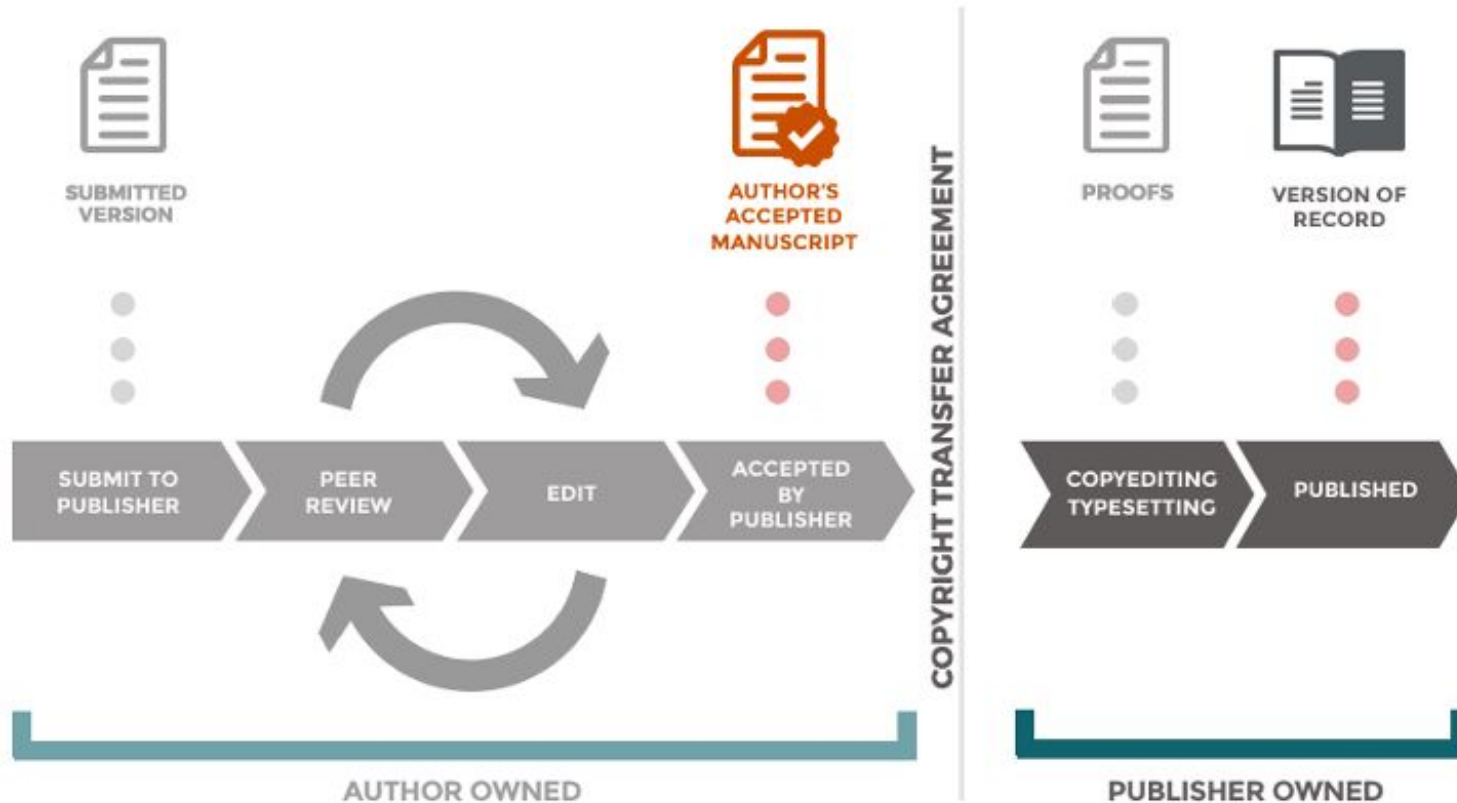
Routes to Open Access



GREEN ROUTE



Gold vs Green



Gold	Green
Published version of record (VOR)	VOR or author-accepted manuscript (AAM)
CC-BY licence	VOR: CC-BY licence not possible due to transfer agreement AAM: CC-BY often not possible
Immediate access	VOR: embargoed AAM: immediate access possible
Publisher organizes access	Self-archiving
Author-pay	No extra costs for author

<https://camacuk.zendesk.com/hc/en-us/articles/115005898287-W-hat-is-the-author-accepted-manuscript-AAM->

OA Options at the VU

Gold Open Access

- Is your journal part of a big deal? Check: <https://journalpublishingguide.vu.nl/>

Questions? Contact us openaccess.ub@vu.nl

Green Open Access

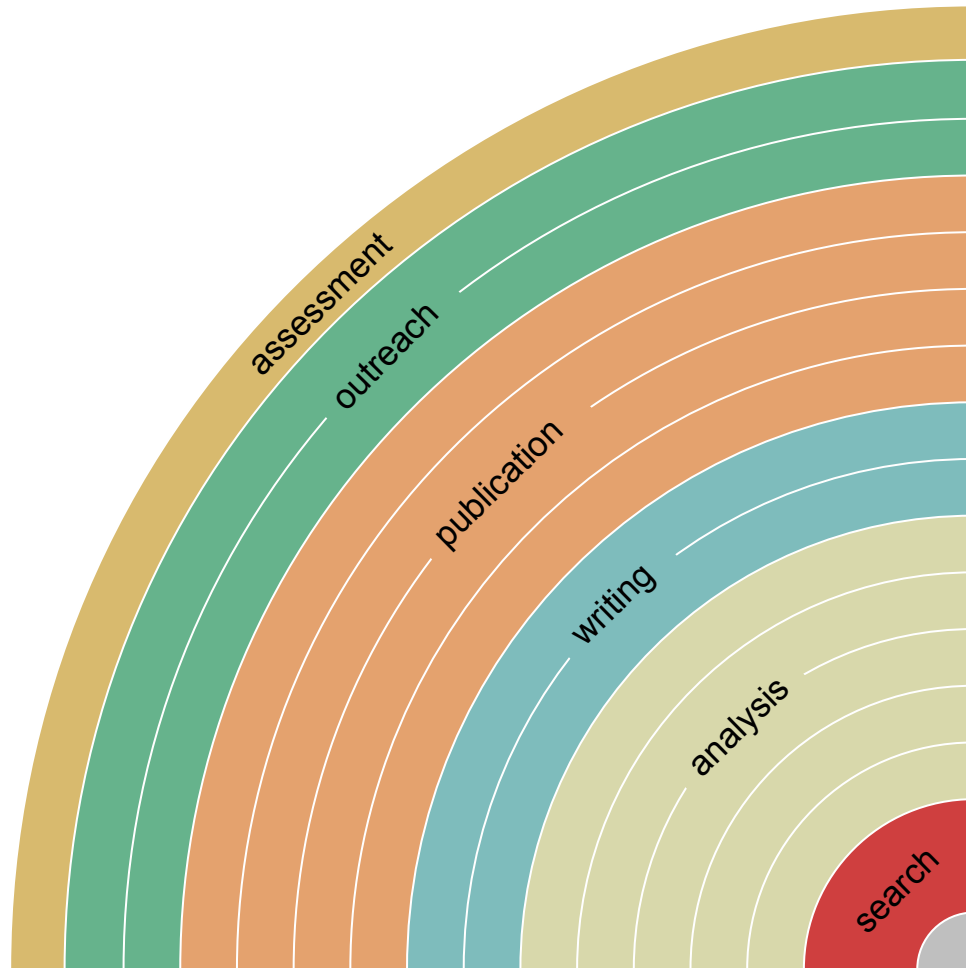
- For older publications (more than 6 months) You Share, We Take Care – sign up [here](#)
 - *Questions? See our [Questions&Answers page](#) or green.open.access.taverne.ub@vu.nl*
- Uploading an AAM on bioRxiv upon publication, **without delay** and under an open licence ([CC-BY](#)), is compliant with Plan S / Horizon Europe (bioRxiv is listed in the [OpenDOAR](#) list of trusted repositories)
 - *Publishers usually don't allow you to do this due to the copyright agreement and may ask you to take this version offline*

Diamond Open Access

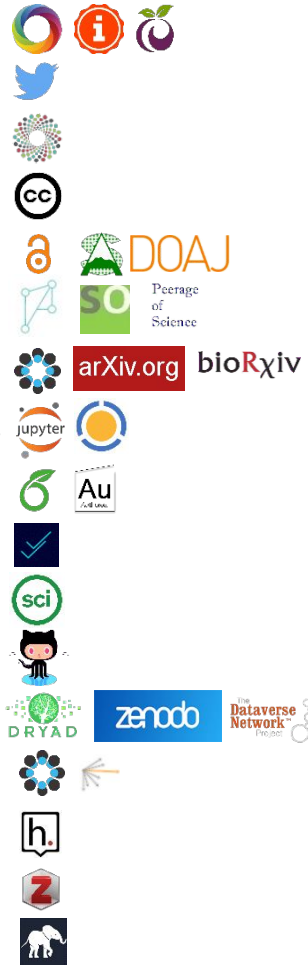
- Benefits of Gold OA, with an institution-pay model – e.g. [openjournals](#)

Summary

Fully OPEN Research Life Cycle?



adding alternative evaluation, e.g. with altmetrics
communicating through social media, e.g. Twitter
sharing posters & presentations, e.g. at FigShare
using open licenses, e.g. CC0 or CC-BY
publishing open access, 'green' or 'gold'
using open peer review, e.g. at journals or PubPeer
sharing preprints, e.g. at OSF, arXiv or bioRxiv
using actionable formats, e.g. with Jupyter or CoCalc
open XML-drafting, e.g. at Overleaf or Authorea
sharing protocols & workfl., e.g. at Protocols.io
sharing notebooks, e.g. at OpenNotebookScience
sharing code, e.g. at GitHub with GNU/MIT license
sharing data, e.g. at Dryad, Zenodo or Dataverse
pre-registering, e.g. at OSF or AsPredicted
commenting openly, e.g. with Hypothes.is
using shared reference libraries, e.g. with Zotero
sharing (grant) proposals, e.g. at RIO



Open Science is NOT



Open Science does NOT make you



Open Science is normal Science

.. maybe just a little bit cooler.



Discussing Open Science

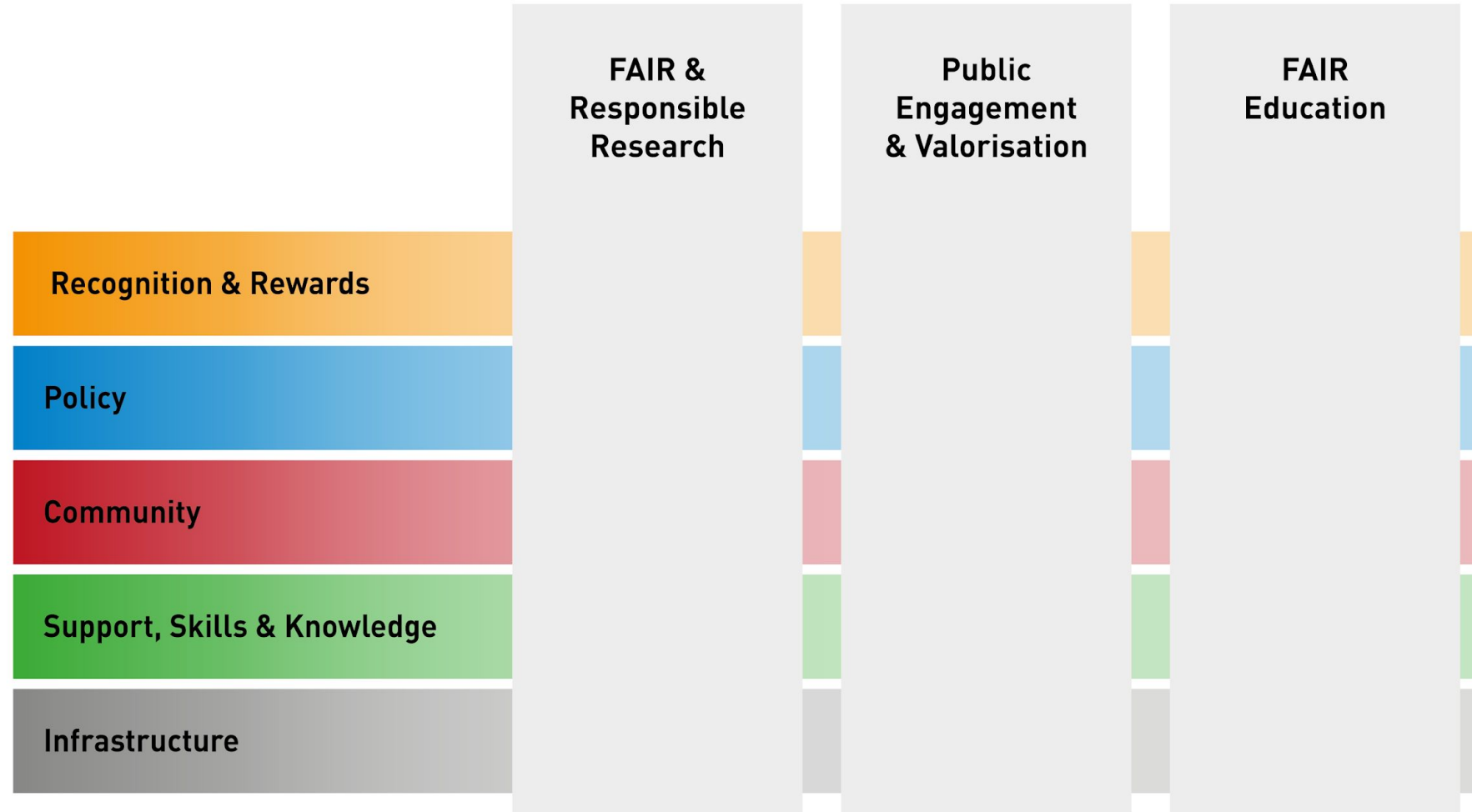
Please join us in breakout rooms to either

- Discuss with your group if you can adopt any of the OS practices that you have learned about. Which ones are useful for your group and will be further explored? What blocks you from opening up your research?
- or alternatively: escape Open Science!



What comes after this workshop?

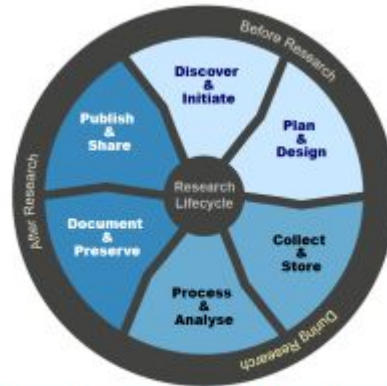
VU Open Science Program



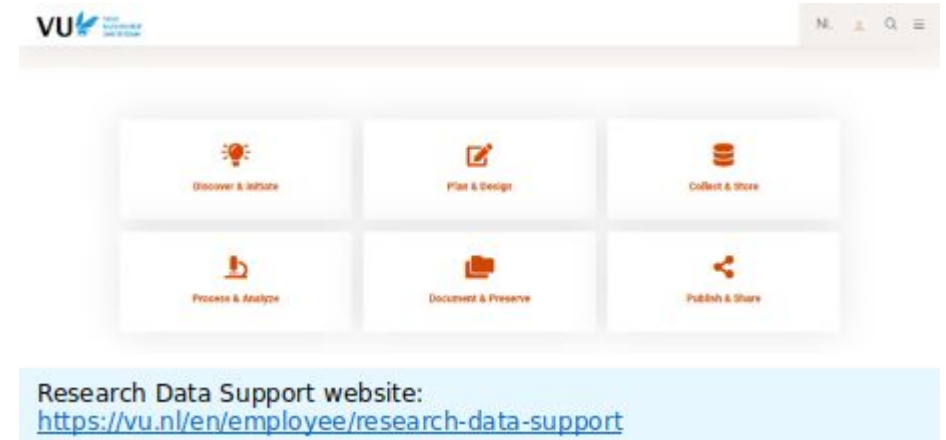
Who is who: Support, Skills & Knowledge

Data stewards	Questions about data (management)
Research software engineers	Questions about software management
Privacy officers	Questions about handling personal data/ GDPR
Ethical committee	Ethical considerations
Librarians	Questions about Open Access/ Open Science (e.g. licensing)
Policy officers	Questions about national and institutional policies
IT	Questions about technical RDM issues

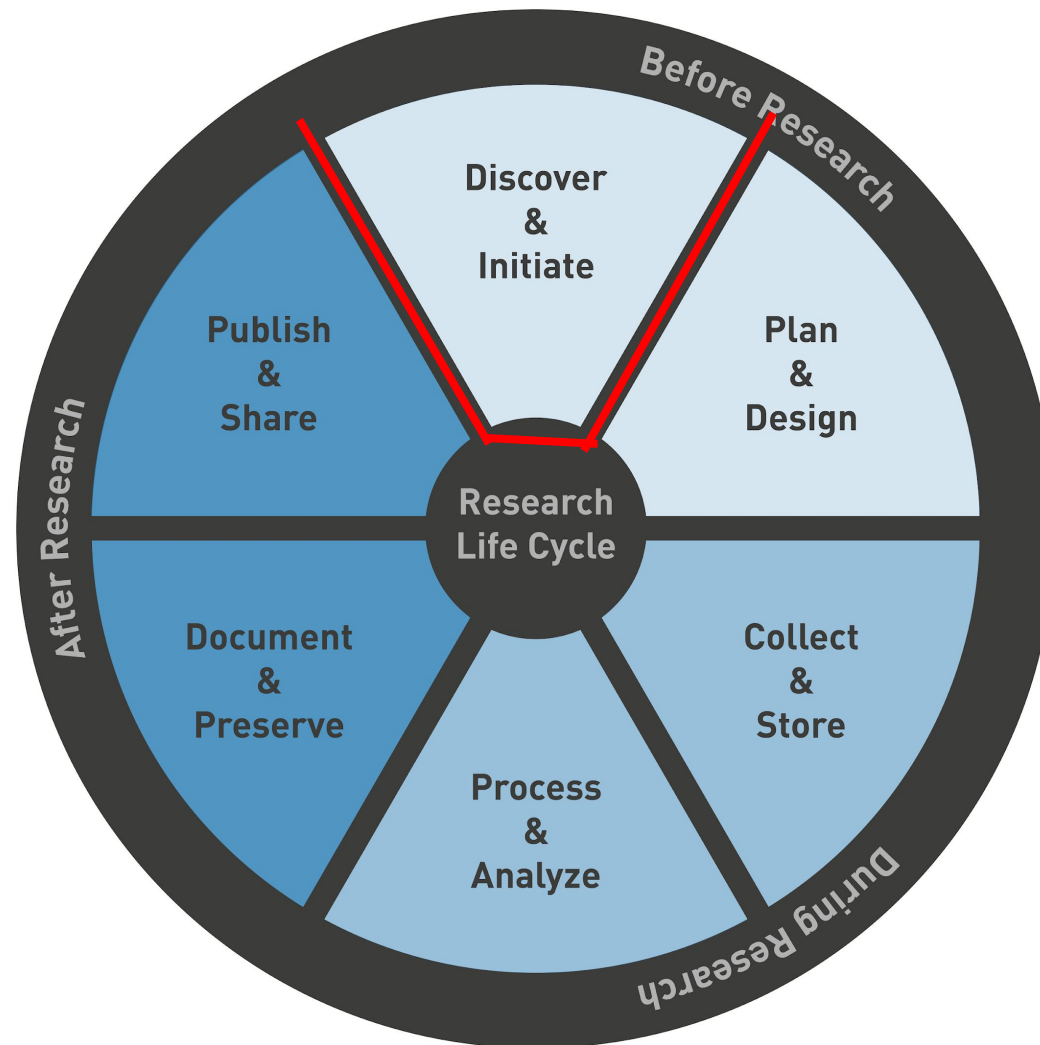
General Support



LibGuide Research Data Management:
<http://libguides.vu.nl/researchdata/>



**After the research project is
before the research project**



Discover & Initiate

At the VU:

Looking for research information? Perhaps our subject-matter specialists can help you!

<https://ub.vu.nl/en/questions-and-advice/subject-librarians/index.aspx>

LibGuides with tips & tricks on:

Finding data - <https://libguides.vu.nl/finding-data>

Systematic reviews - <https://libguides.vu.nl/SystematicReviews>

Searching literature - <https://libguides.vu.nl/PMroadmap>

Where to Find Research Data for Reuse

- General search engine, e.g. 
- Research data sets search engine    
- Find a specialised archive, e.g.  
- Use field specific archives, e.g.   
- Use official (government) data, e.g. 
- Search data via papers, e.g. via  

More useful links

Open Science skills & knowledge

<https://online-learning.tudelft.nl/courses/open-science-sharing-your-research-with-the-world/>

<https://utrechtuniversity.github.io/workshop-computational-reproducibility/>

<https://opensciencemooc.eu/#>

<https://www.lcrdm.nl/spring-training-days>

<https://the-turing-way.netlify.app/welcome.html>

<https://www.openaire.eu/how-to-make-your-data-fair>

Software skills

<https://www.esciencecenter.nl/events/>

<https://coderefinery.org/lessons/>

<https://software-carpentry.org/lessons/>