# Building a FAIR scientific system: current trends in open science

Paola Galimberti – Direzione Performance assicurazione qualità, valutazione e politiche di Open science

## Why am I here?

Member of the presidio della Qualità

Member of the Osservatorio della ricerca

Member of the cabina di regia per l'accreditamento

Member of the cabina di regia sulla VQR

GDL on Open science of  LERU and 4eu+

Editor of the DOAJ for Italy and German speaking countries

Task leader of the project 4eu+ University publishing

Founder of AISA and member of the steering board

Member of the competence center ICDI (Italian Computing and Data Infrastructure)

Member of the editorial board of Open-science.it and of ROARS

Member of the library advisory group of ORE (Open Research Europe)

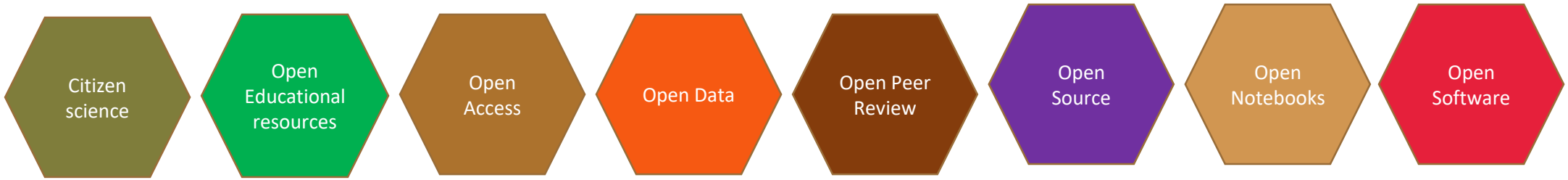
Member of the Joint Research Unit of Operas Italia

# Some questions to be answered

- Your community is historically open access oriented. Is it also open science oriented?
- What about FAIR data?
- What about Research data management?
- What about Open peer review?
- What about preregistration?

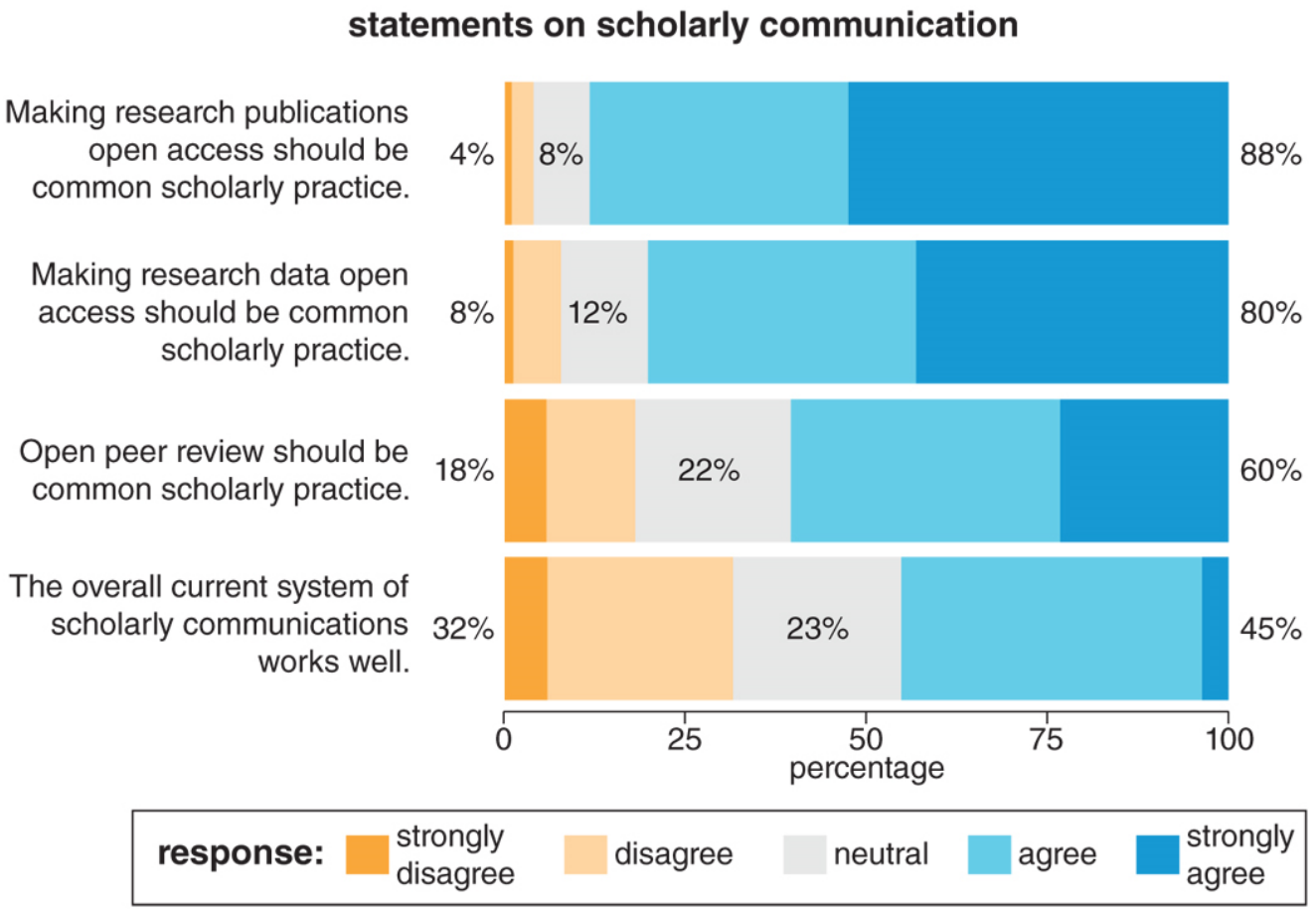
# What is open science?

Is the standard method of working  under Horizon Europe. Is the policy priority for the EC as a key factor to improve the quality, efficiency, and responsiveness of research



# Do we have a problem?

Probably yes!




Ross-Hellauer T et al. (2017) https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0189311

ACCESSIBILITY

TRANSPARENCY

REPRODUCIBILITY

# Accessibility

Not so relevant for publications in physics

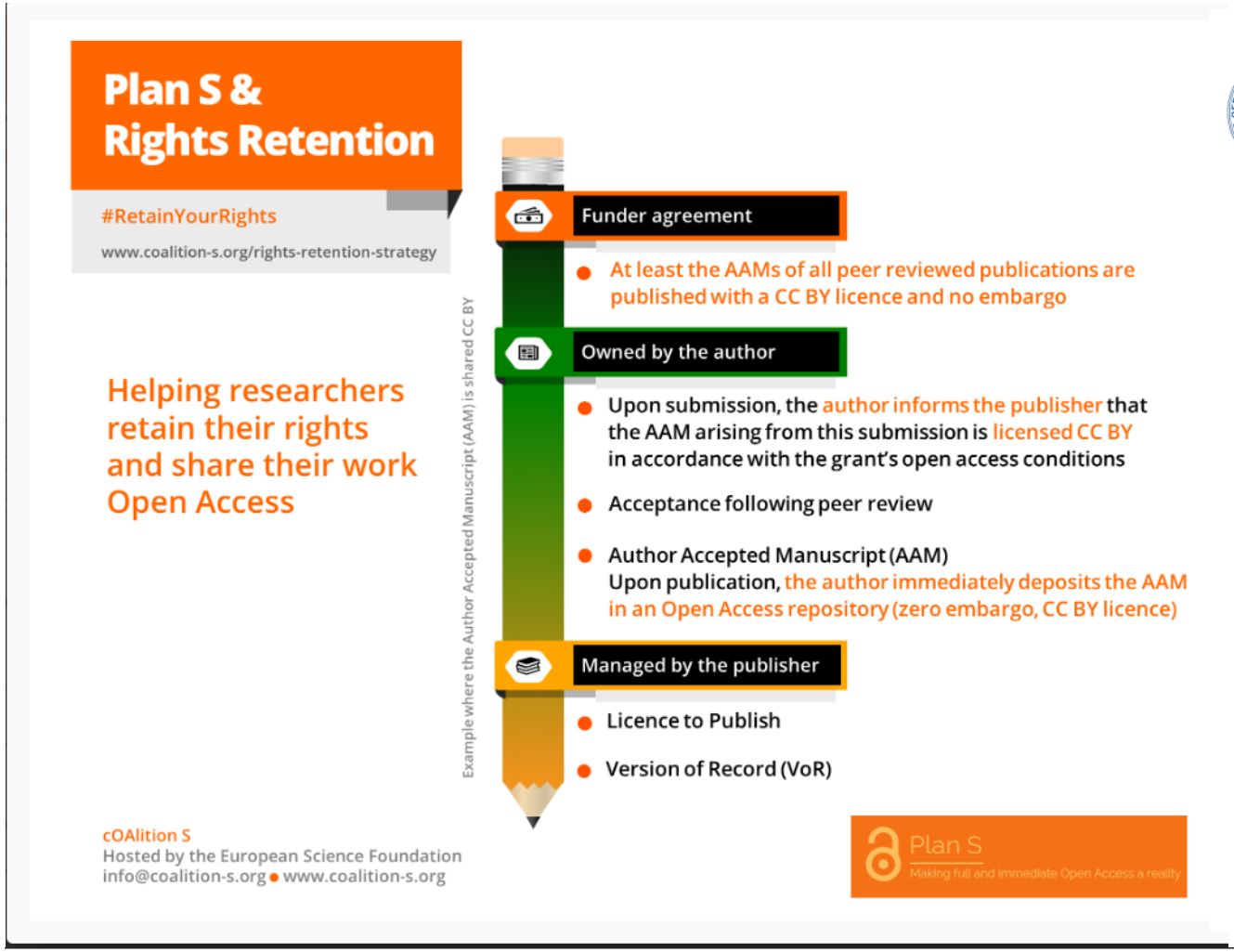
Very relevant for other disciplines (high APCs or Subscription prices)

# COALITION S (Italy participates with INFN): Trials and errors


Transformative agreements were a big hoax and didn't reached the expected results.

Fortunately, Coalition S has recognized the error, and this measure will be discontinued in 2024

# Rights retention strategy (RRS)




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

August 25, 2022

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

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

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

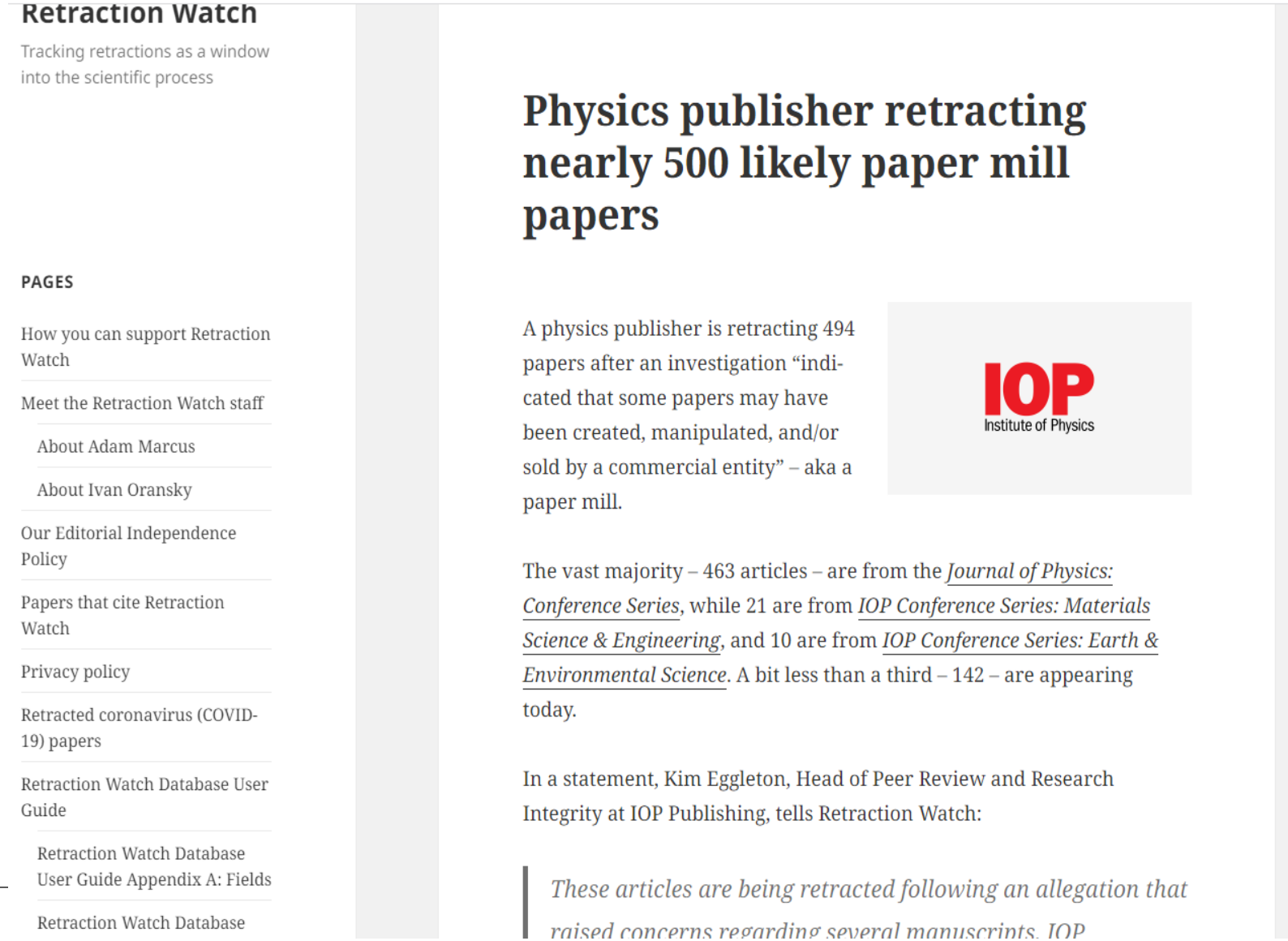
This memorandum provides policy guidance to federal agencies with research and development expenditures on updating their public access policies. In accordance with this memorandum, OSTP recommends that federal agencies, to the extent consistent with applicable law:

1. Update their public access policies as soon as possible, and no later than December 31st, 2025, to make publications and their supporting data resulting from federally funded research publicly accessible without an embargo on their free and public release;
2. Establish transparent procedures that ensure scientific and research integrity is maintained in public access policies; and,
3. Coordinate with OSTP to ensure equitable delivery of federally funded research results and data.

**1. Background and Policy Principles**

# Transparency

- The research processes should be transparent, evident, explained



Retraction Watch

Tracking retractions as a window into the scientific process

PAGES

How you can support Retraction Watch

Meet the Retraction Watch staff

About Adam Marcus

About Ivan Oransky

Our Editorial Independence Policy

Papers that cite Retraction Watch

Privacy policy

Retracted coronavirus (COVID-19) papers

Retraction Watch Database User Guide

Retraction Watch Database User Guide Appendix A: Fields

Retraction Watch Database

## Physics publisher retracting nearly 500 likely paper mill papers

A physics publisher is retracting 494 papers after an investigation "indicated that some papers may have been created, manipulated, and/or sold by a commercial entity" – aka a paper mill.

IOP Institute of Physics

The vast majority – 463 articles – are from the *Journal of Physics: Conference Series*, while 21 are from *IOP Conference Series: Materials Science & Engineering*, and 10 are from *IOP Conference Series: Earth & Environmental Science*. A bit less than a third – 142 – are appearing today.

In a statement, Kim Eggleton, Head of Peer Review and Research Integrity at IOP Publishing, tells Retraction Watch:

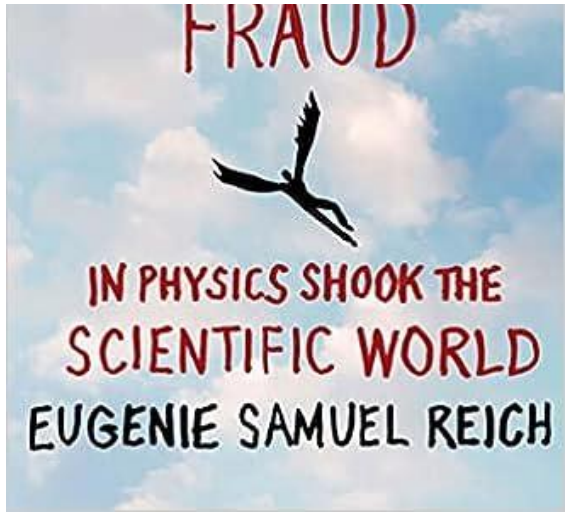
> *These articles are being retracted following an allegation that raised concerns regarding several manuscripts. IOP*

# Reproducibility

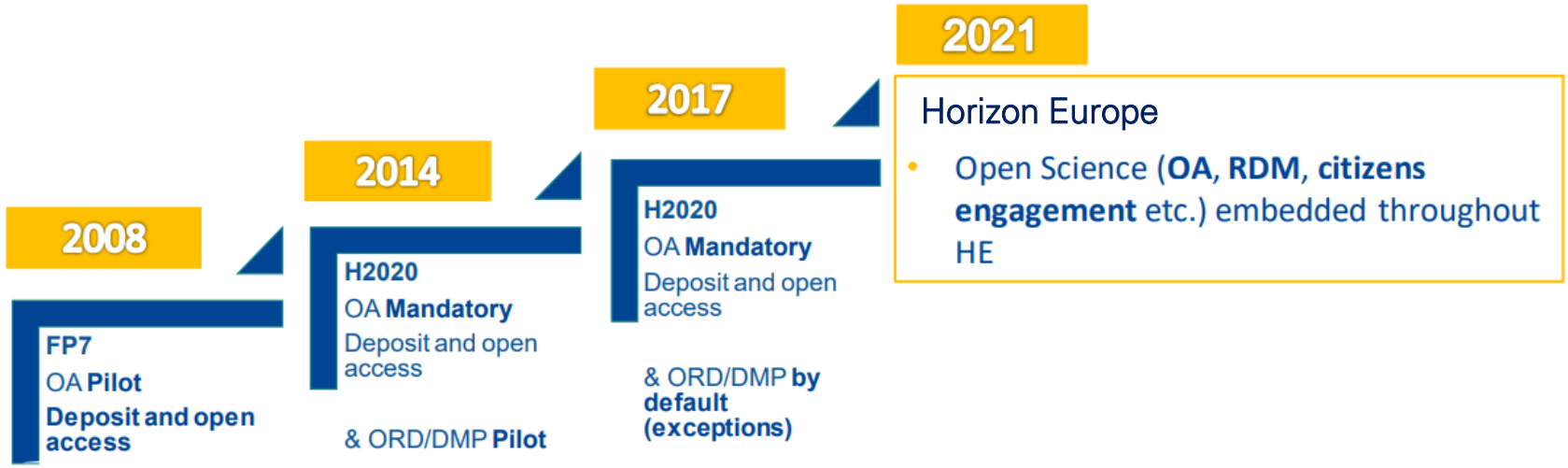
**Jan Hendrik Schön** (Verden, agosto 1970) è un ex fisico tedesco che salì velocemente alla ribalta dopo una serie di scoperte apparentemente rivoluzionarie che in seguito risultarono essere false.[1]

Prima della scoperta delle falsificazioni Schön aveva ricevuto il premio Otto-Klung-Weberbank per la fisica nel 2001, il premio Braunschweig nel 2001 e il premio Outstanding Young Investigator della Materia Research Society nel 2002, premi che in seguito gli furono ritirati.

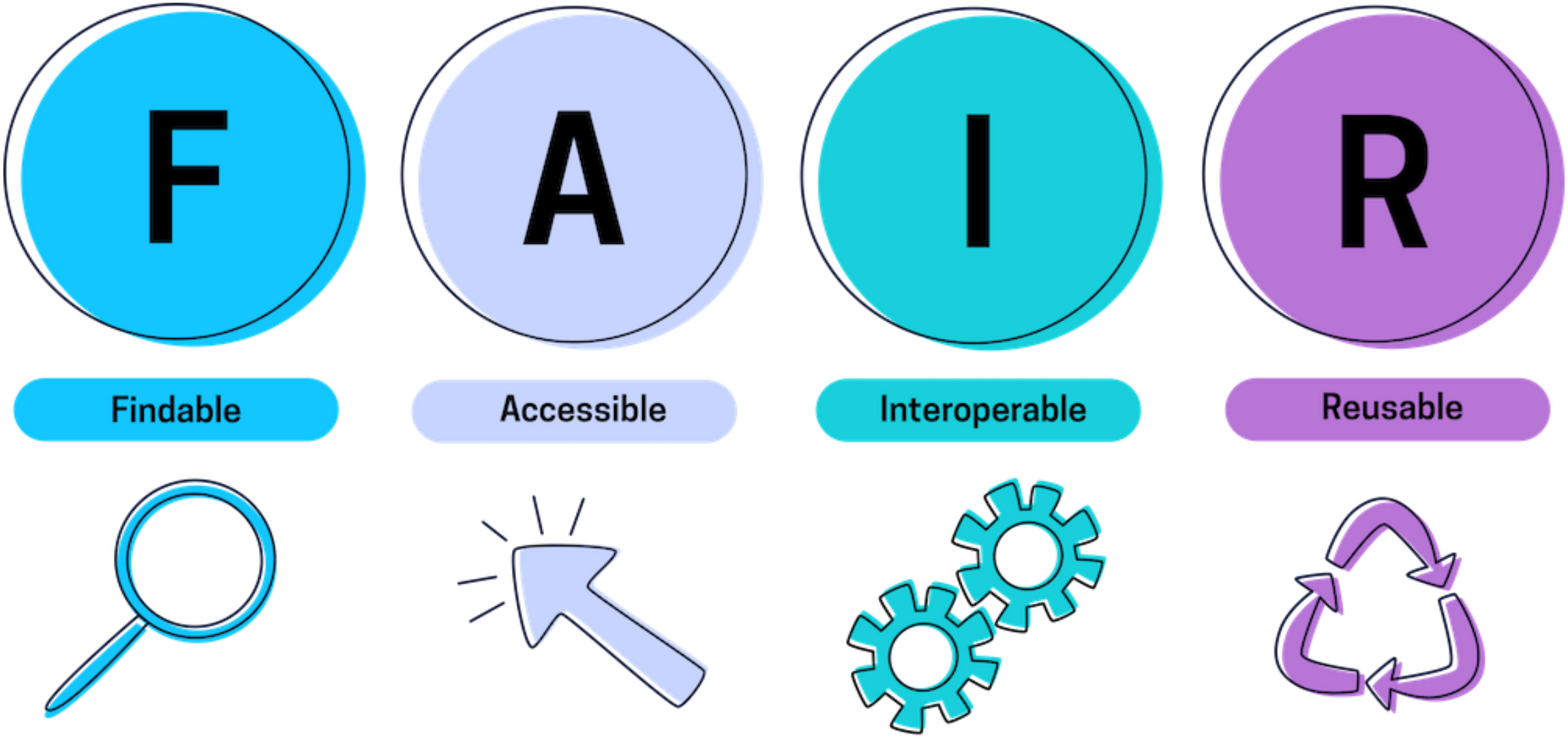
Lo "scandalo Schön" provocò nella comunità scientifica un dibattito sul grado di responsabilità dei coautori e dei revisori degli articoli scientifici. Il nocciolo del dibattito era se il sistema della *peer review*, tradizionalmente inteso a individuare errori e determinare la rilevanza e l'originalità degli articoli, dovesse anche avere il compito di scoprire frodi intenzionali.


# Evolution of open science policy across FPs




European Commission




https://medium.com/fluree/making-data-f-a-i-r-93629e82c459

# FAIR data

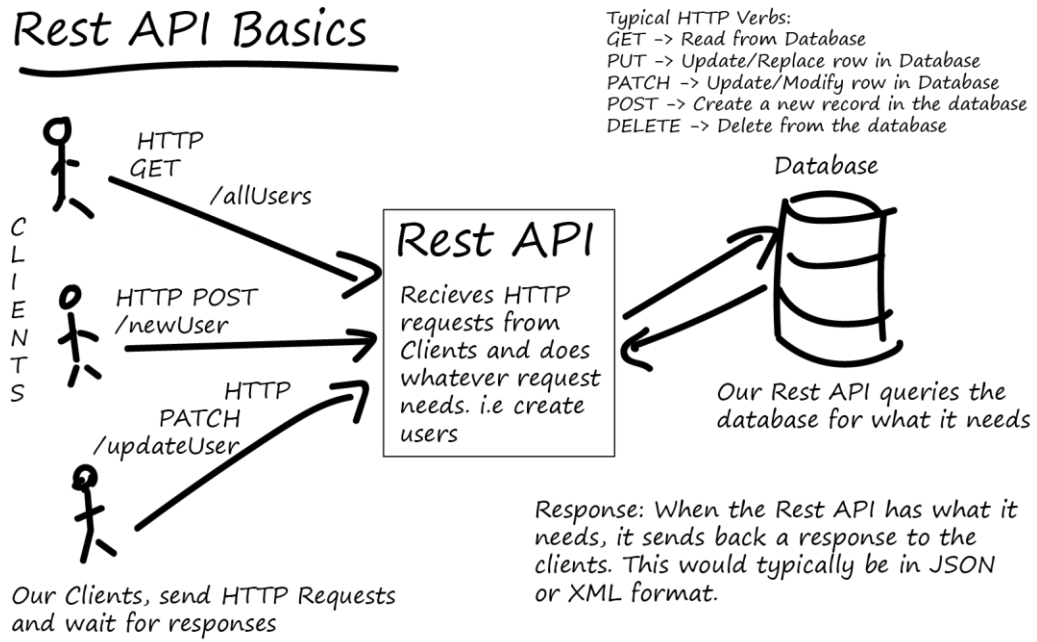
## Findable

The data must be easily traceable by both humans and machines. This property is ensured through the use of persistent identifiers and descriptive metadata, which must be recorded in "catalogs" or in repositories that can also be indexed by machines.

# FAIR data

Accessible

The data must always be accessible, persistent over time, and retrievable on the web through standard protocols. If making the data "open" is not possible, authentication systems can be used, provided that at least the metadata is always available.

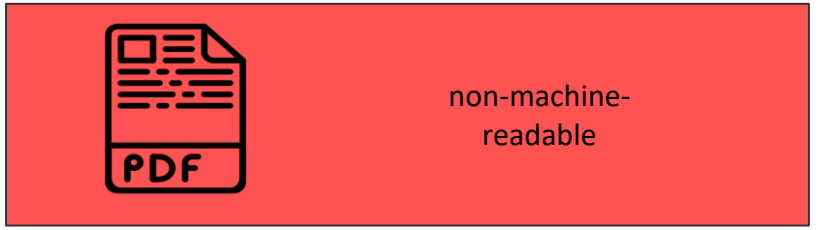


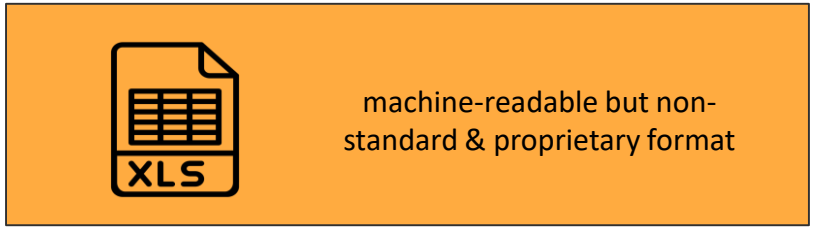

https://tutorialedge.net/software-eng/what-is-a-rest-api/

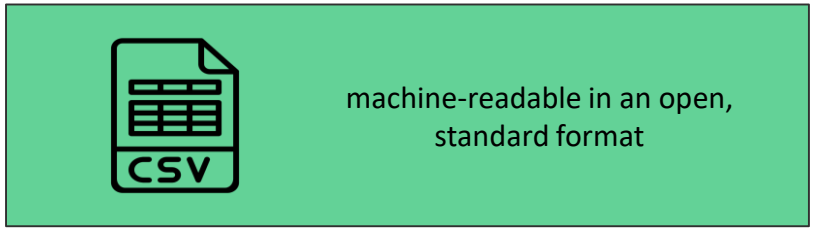
# FAIR data

## Interoperable

The data (and metadata) must be interoperable, meaning they should be able to be combined with other data and tools. This implies that their format must be open (a CSV is, an XLS is not), and the content and descriptive metadata must be represented in a standardized language (using ontologies and controlled vocabularies, where possible).



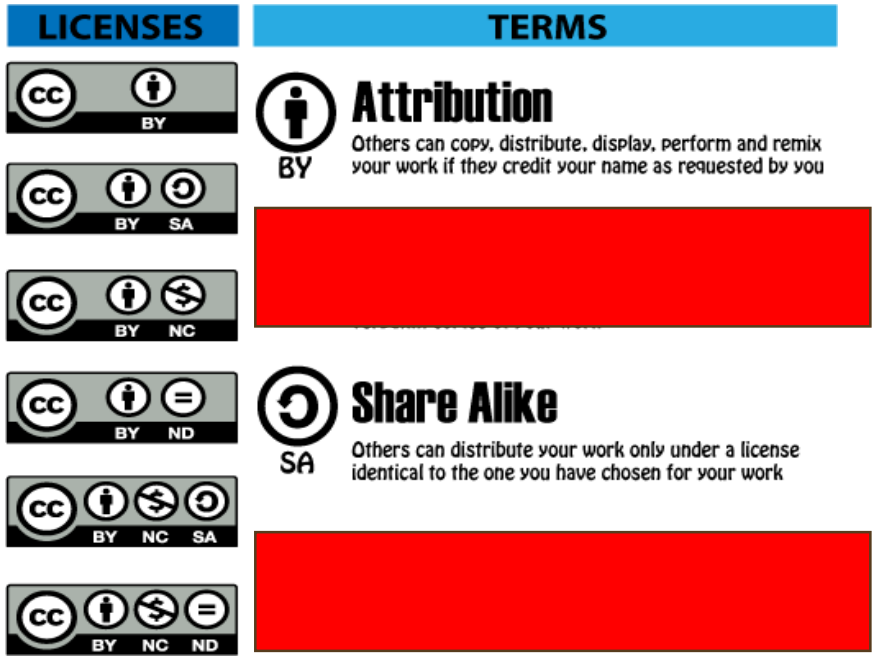



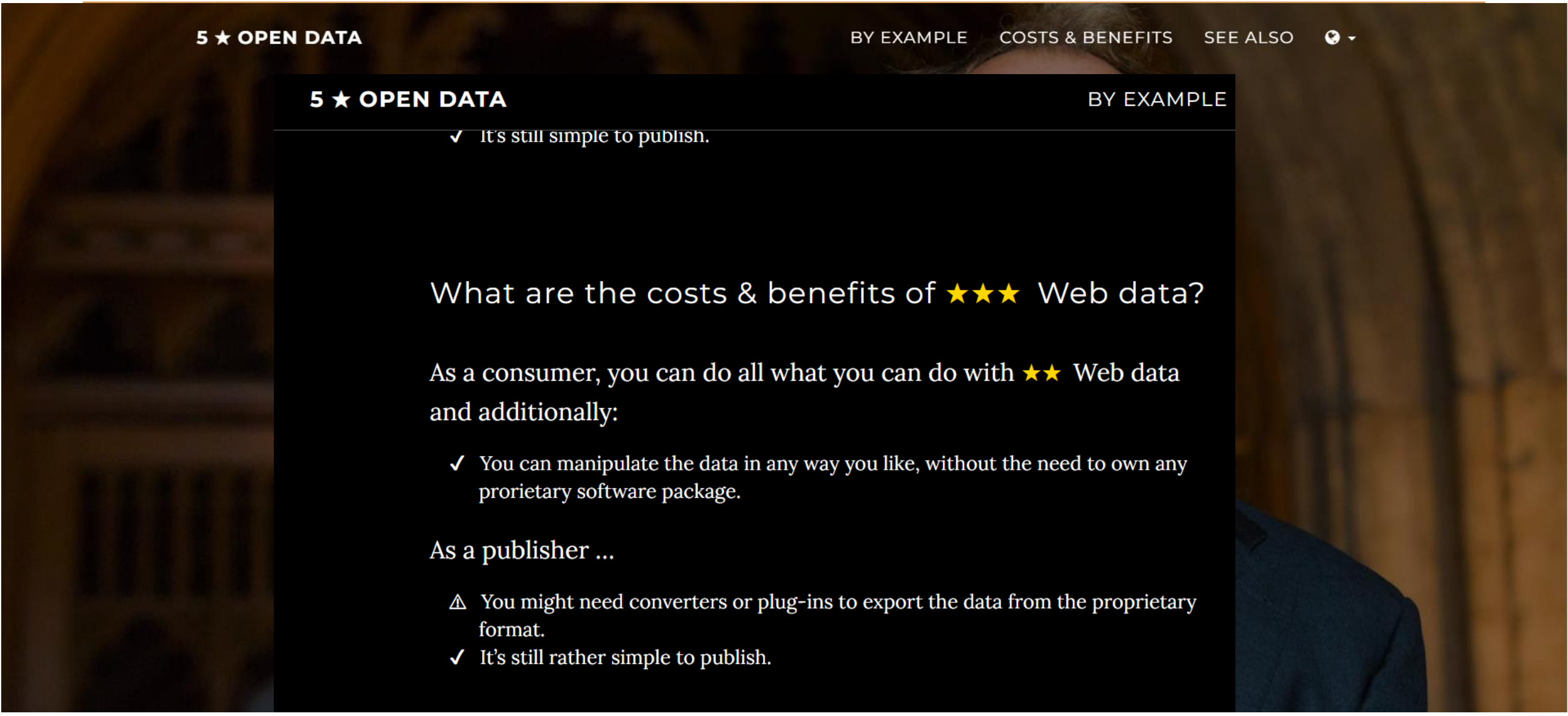



# FAIR data

## Reusable

The data must be reusable, so it should be clear how both the data and metadata can be reused (replicated, used in different contexts, for different purposes, etc.). This also means providing the data with one or more open licenses that are clear, accessible, and preferably internationally recognized.






https://5stardata.info/en/

# Principles

1.

**Open By Default**

2.

**Timely and Comprehensive**

3.

**Accessible and Usable**

4.

**Comparable and Interoperable**

5.

**For Improved Governance & Citizen Engagement**

6.

**For Inclusive Development and Innovation**

ADOPT THE ODC PRINCIPLES

martedì 15 agosto 2023

https://opendatacharter.net/

# What is a DMP

A **data management plan** or **DMP** is a formal document that outlines how data are to be handled both during a research project, and after the project is completed. The goal of a data management plan is to consider the many aspects of data management, metadata generation, data preservation, and analysis before the project begins; this may lead to data being well-managed in the present, and prepared for preservation in the future. [Wikipedia]

**Legend:**

DATA MANAGEMENT

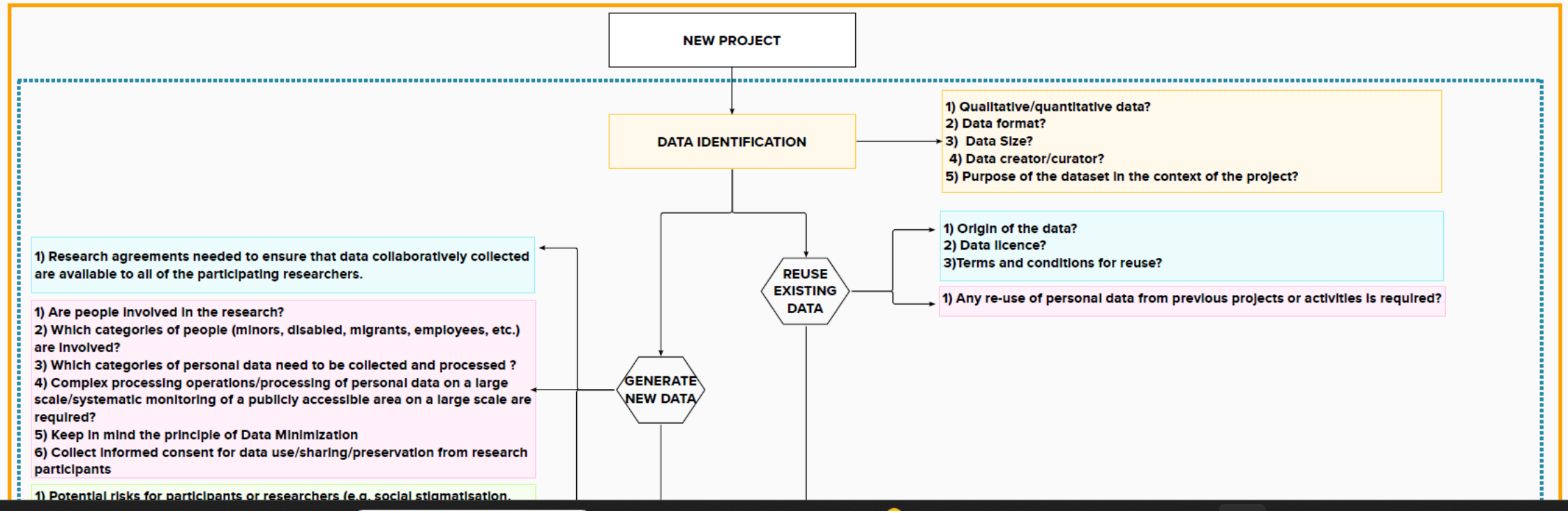
INTELLECTUAL PROPERTY RIGHTS

PRIVACY

ETHICS

# DECISION TREE FOR DATA MANAGEMENT

Data management



# 4 main challenges for scientific communication

## Lack of openness (publications, data, protocols, methods, code)

Plan S
Making full & immediate Open Access a reality

## Delays and inefficiency

ASAPbio

Review COMMONS

## Excessive costs and inequities

DIAMAS

AmeliCA

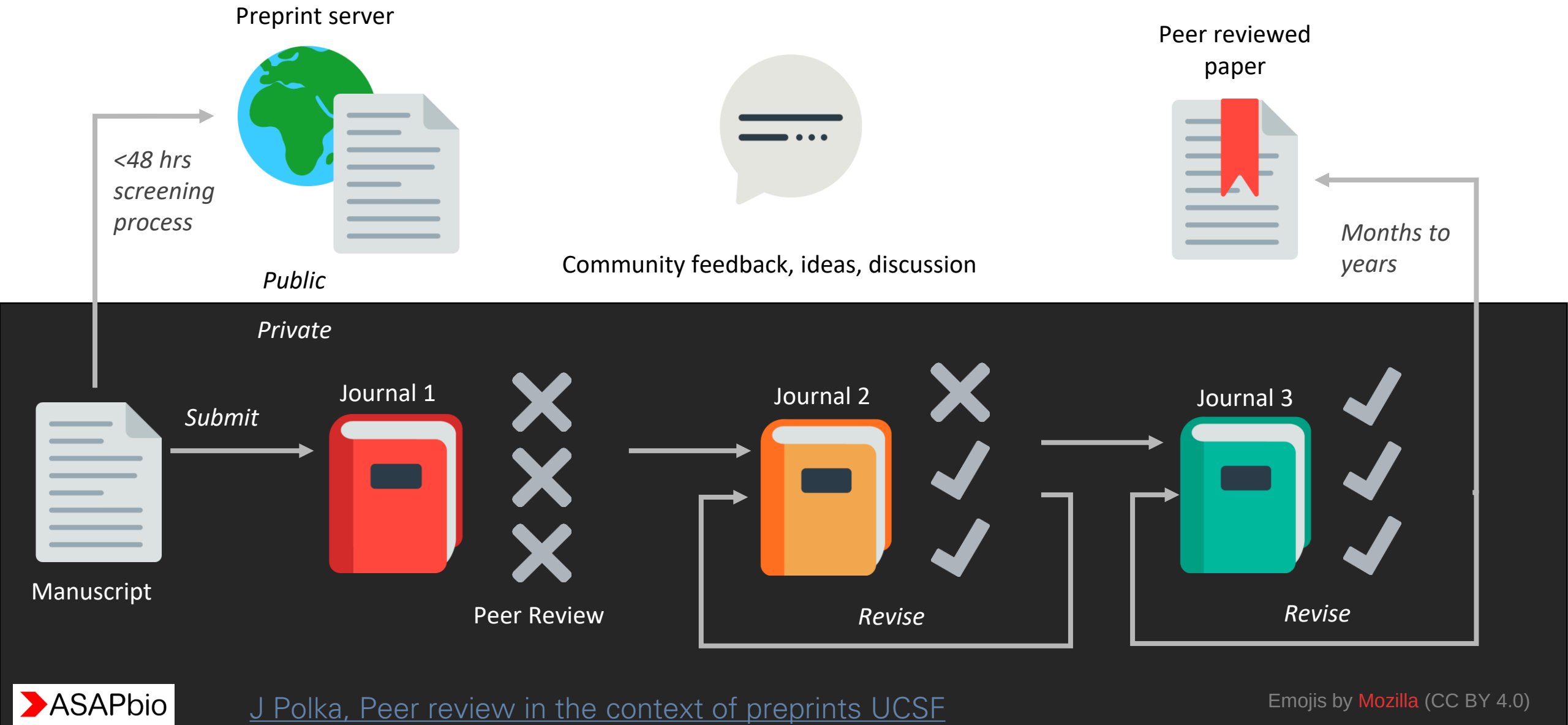
## Lack of incentives

DORA

CoARA

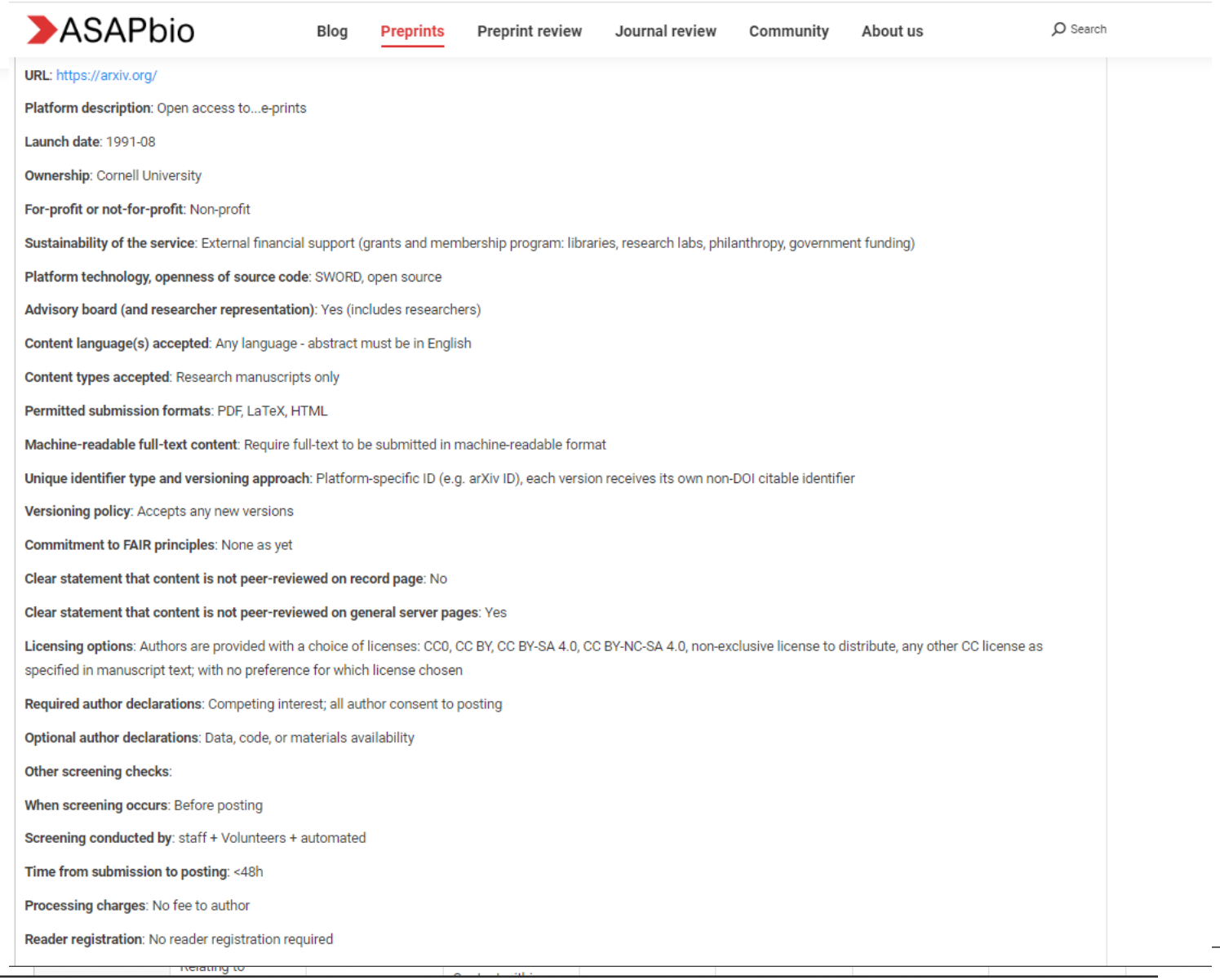
L Waltman The rise of preprinting, implication for research intelligence 10.5281/zenodo.7415220

# Double track




ASAPbio

J Polka, Peer review in the context of preprints UCSF




https://asapbio.org/preprint-servers

# How old is peer review?

I had not authorized you to show [our manuscript] to specialists before it is printed. I see no reason to address the—in any case erroneous—comments of your anonymous expert. On the basis of this incident I prefer to publish the paper elsewhere [1936 Einstein to the Physical review]

Peer review as we know it today does not originate with the scientific journal but in the Cold War period and is first internal and then becomes external to journals

Melinda Baldwin, "Peer Review," *Encyclopedia of the History of Science* (January 2020) doi: 10.34758/srde-jw27

Presently, the dominant peer review model for the physical sciences is “**single blind**,” meaning that the referees are kept anonymous but the authors are not—their names are visible to the referees. Many scientists, however, say that this system is susceptible to **unfair bias**—papers may be judged, consciously or subconsciously, based on the pedigree of the authors, on their geographical information, and even on their ethnicity

https://physics.aps.org/articles/v14/136

More recently, peer review seems have faced its own moment of crisis. Critics have argued that **the peer review process is not doing a good job of distinguishing good science from bad**. Several high-profile papers have been published in top journals after having passed through peer review, only to be heavily criticized after publication or retracted amid allegations of fraud.[32] Some studies have indicated that women and underrepresented minorities are more likely to receive unfavorable referee reports than their colleagues.[33] Other observers have argued that peer review suppresses innovative research and rewards more familiar, safer projects.[34] In 2011, Great Britain's House of Commons commissioned a report on the state of peer review, and concluded that while peer review "is crucial to the reputation and reliability of scientific research," many scientists believe the system stifles progress, is often biased, and that "there is little solid evidence on its efficacy."[35] In the 1970s, peer review was recast as the system that rewarded good science and corrected bad science; in the 2010s, scientists are now grappling with the fact that it doesn't seem to do either of those things particularly well. [
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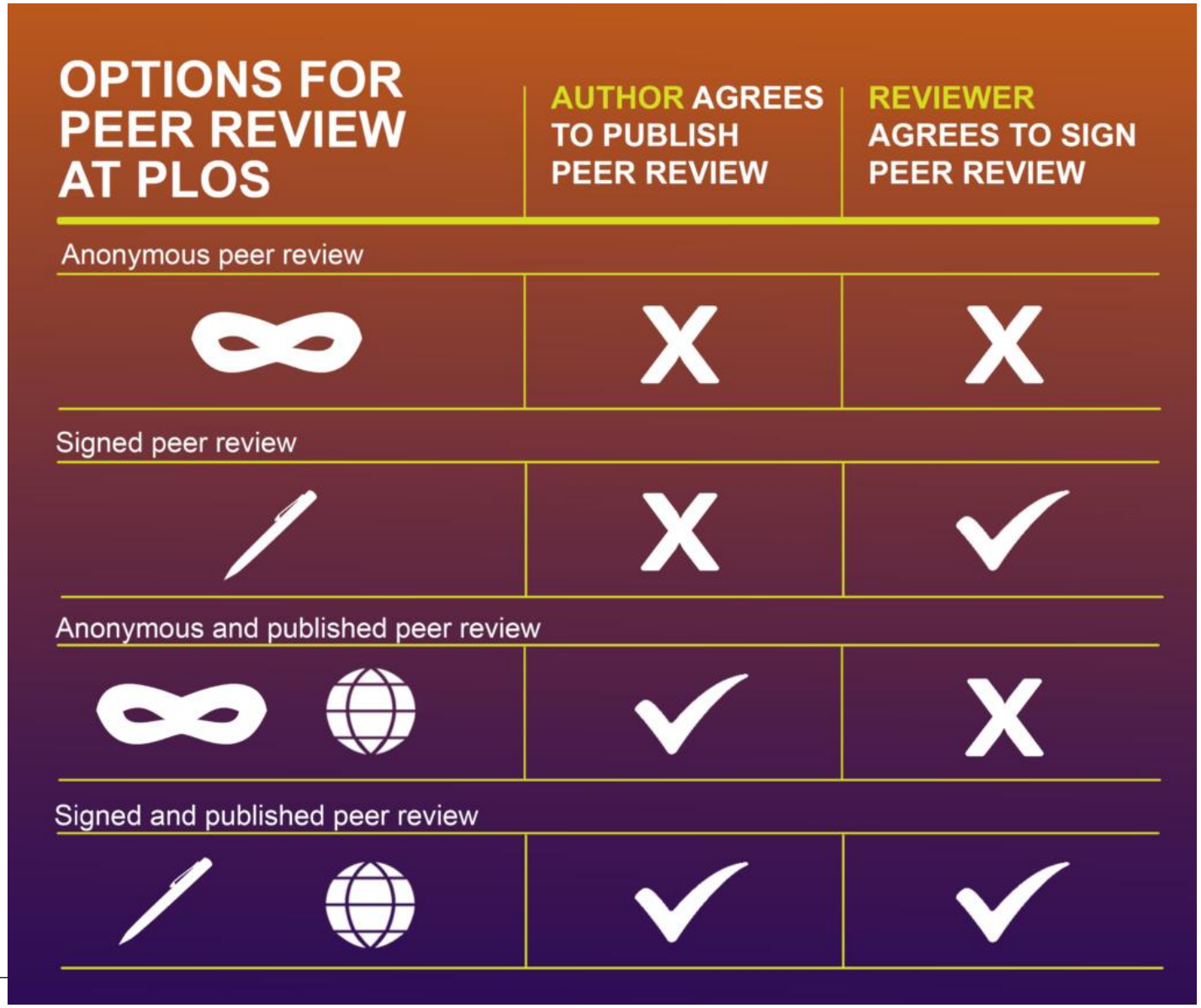
# Different forms of peer review: open reports and open identities



The dichotomy of peer-reviewed versus non-peer-reviewed science should also be subject to discussion. With more and more preprints becoming available, and increasing opportunities for **post-publication peer-review**, this dichotomy is increasingly scrutinized. Publications that have not yet been peer-reviewed are sometimes seen as less trustworthy than publications that are peer-reviewed, but this distinction is not absolute. Indeed, **differences in quality between preprints and published works seem to be small**. At the same time, in some domains, preprints with incorrect results may do harm when widely circulated, which needs to be considered. One possibility could be to allow a short embargo period where fellow researchers could provide quick initial reviews before a preprint is made publicly available, along with the reviews.

# Retraction Note: A critical assessment of extreme events trends in times of global warming

Retraction Note | Open access | Published: 23 August 2023 | **138**, Article number: 743 (2023)


The European Physical Journal Plus

Aims and scope →

What is interesting here is that the retraction was not the outcome of a scientific discussion, but something imposed by the publisher.
Something that should never happen

The Original Article was published on 13 January 2022

Author information

Rights and permissions

# Regenerate response: what about peer review? (and most of all what are we paying for?)

Tracking retractions as a window into the scientific process

PAGES

- How you can support Retraction Watch
- Meet the Retraction Watch staff
  - About Adam Marcus
  - About Ivan Oransky
- Our Editorial Independence Policy
- Papers that cite Retraction Watch
- Privacy policy

## Signs of undeclared ChatGPT use in papers mounting

Guillaume Cabanac

Last week, an environmental journal published a paper on the use of renewable energy in cleaning up contaminated land. To read it, you would have to pay 40 euros. But you still wouldn't know for sure who wrote it.

Ostensibly authored by researchers in China, "Revitalizing our earth: unleashing the power of green energy in soil remediation for a sustainable future" includes the extraneous phrase "Regenerate response" at the end of a methods section. For those unfamiliar, "Regenerate response" is a button in OpenAI's ChatGPT that prompts the chatbot to rework an unsatisfactory answer.

# Prepublication peer review:should be abolished?



PREVIOUS ARTICLE | NEXT ARTICLE

FREE

## Is Peer Review a Good Idea?

Remco Heesen and Liam Kofi Bright

PDF | PDF PLUS | Abstract | Full Text

SECTIONS

Abstract

1. Introduction

2. Setting the Stage

3. Benefits of Abolishing Peer Review

4. Where Peer Review Makes No Difference

5. Difficulties for Our

**Abstract**

Prepublication peer review should be abolished. We consider the effects that such a change will have on the social structure of science, paying particular attention to the changed incentive structure and the likely effects on the behaviour of individual scientists. We evaluate these changes from the perspective of epistemic consequentialism. We find that where the effects of abolishing prepublication peer review can be evaluated with a reasonable level of confidence based on presently available evidence, they are either positive or neutral. We conclude that on present evidence abolishing peer review weakly dominates the status quo.

Details | Figures | References | Cited by


The British Journal for the Philosophy of Science
Volume 72, Number 3
September 2021

Society: The British Society for the

# The ORE model



SOFTWARE TOOL ARTICLE

## REVISED Knowledge sharing and discovery across heterogeneous research infrastructures [version 3; peer review: 2 approved, 1 not approved]

Siamak Farshidi, Xiaofeng Liao, Na Li, Doron Goldfarb, Barbara Magagna, Markus Stocker, Keith Jeffery, Peter Thijsse, Christian Pichot, Andreas Petzold, Zhiming Zhao

This article is included in Cloud-based Technologies collection

This article is included in Data Science gateway

This article is included in Research Infrastructures gateway

Article | Authors | Metrics


### Abstract

Research infrastructures play an increasingly essential role in scientific research. They provide rich data sources for scientists, such as services and software packages, via catalog and virtual research environments. However, such research infrastructures are typically domain-specific and often not connected. Accordingly, researchers and practitioners face


### Open Peer Review

**Approval Status** ✓ ✗ ✓

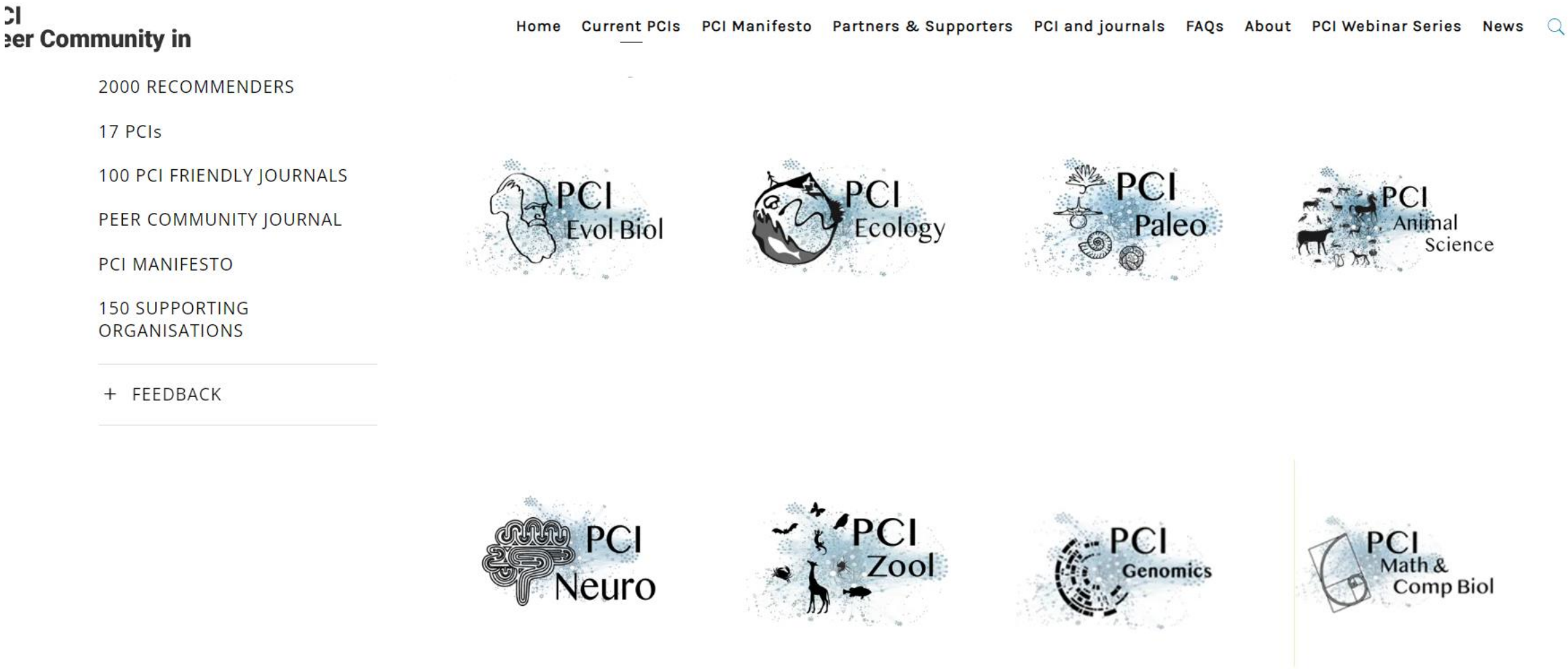
| | 1 | 2 | 3 |
|---|---|---|---|
| Version 3 (Revision) 06 Jun 23 | | | ✓ view |
| Version 2 (Revision) 22 Nov 21 | ✓ view | | ? view |
| Version 1 14 Jun 21 | ✗ view | ✗ view | |

1. **Robert Huber**, Swiss Federal Institutes of Technology Zurich ETHZ, Zürich, Switzerland
2. **Rebecca Koskela**, University of New Mexico, Albuquerque, NM, USA; Ronin Institute, Montclair, NJ, USA
3. **Giacomo Marzi**, University of Trieste, Trieste, Italy

**Comments on this article**

All Comments (1)

# The PCI model



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Peer Community in

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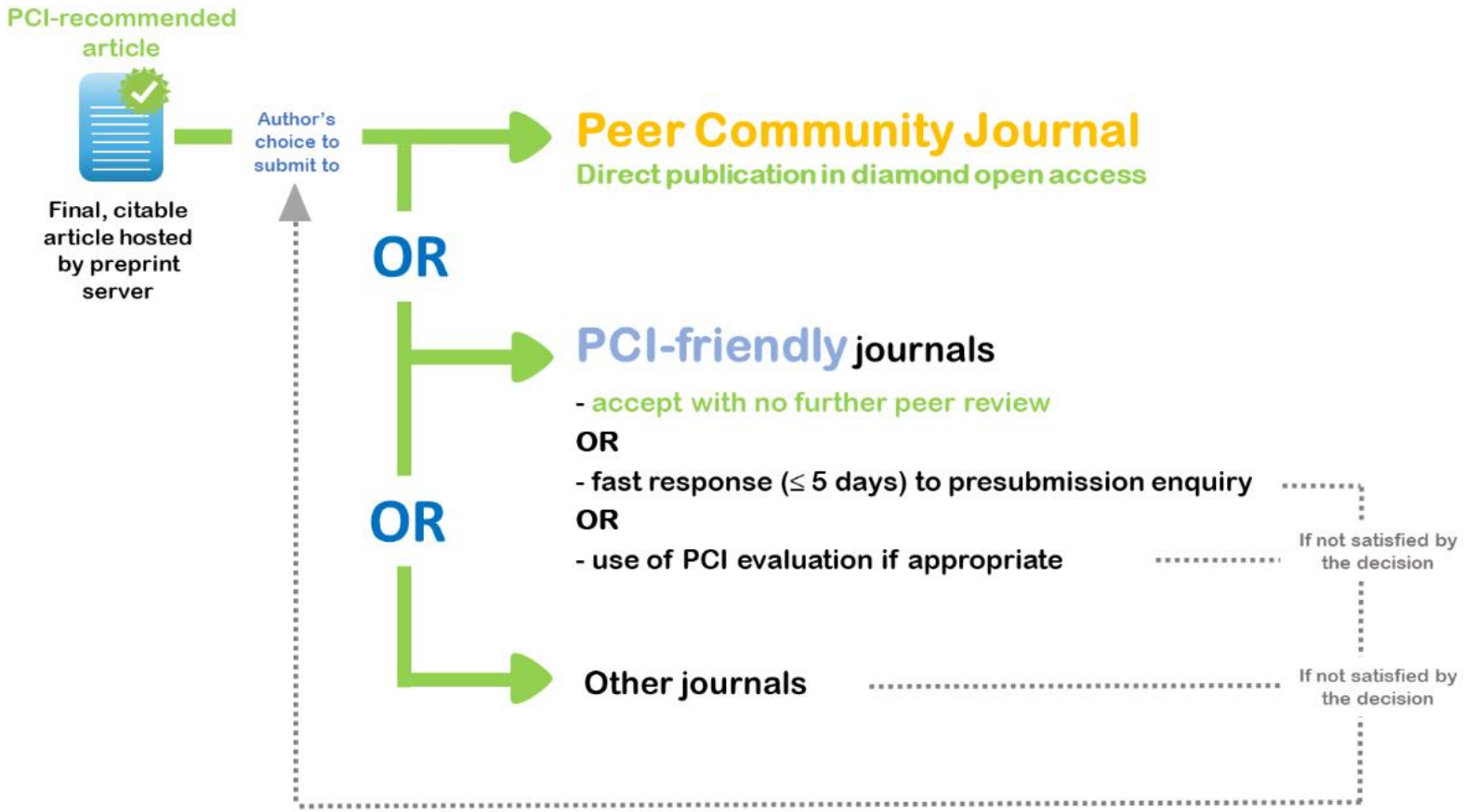
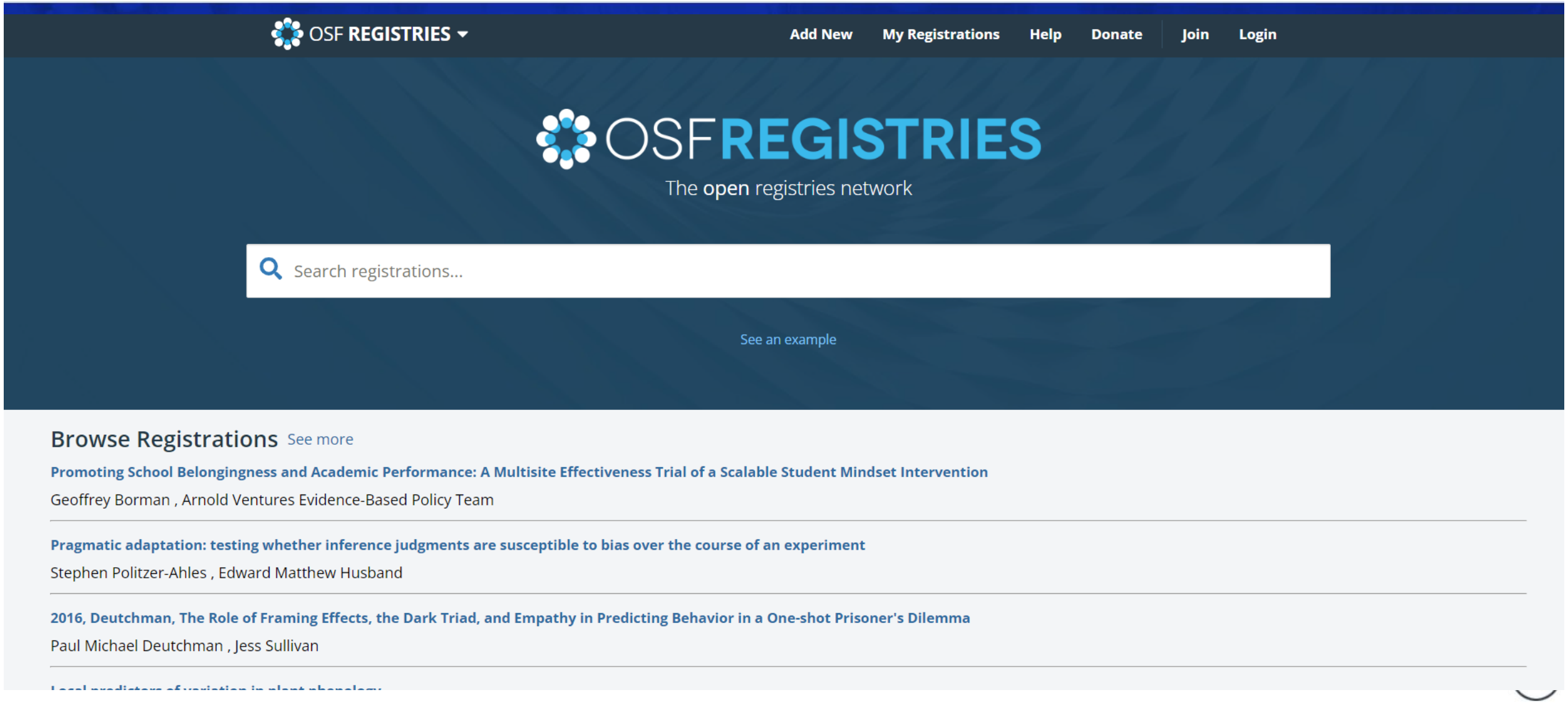


# Preregistration



# Some questions to be answered

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