Opening Science with Open Science

Possibilities and Difficulties at Open Peer Review and Citizen Science

22nd June 2022, Oberseminar Szöllösi-Janze @ MPDL

Martin Boosen
boosen@mpdl.mpg.de

Dr. Yves Vincent Grossmann
grossmann@mpdl.mpg.de

MAX PLANCK
digital library

Structure

1. MPDL and Open Science
2. Aspects of Open Science
3. Open Peer Review
4. Citizen Science
5. Discussion
6. Short site visit
7. Lunch (again in R213)

Speaker

Martin

- Historian / Library and Information Scientist
- Repository Manager for MPG.PuRe PuRe (Max Planck Publication Repository)

Yves

- Historian by training (PhD in 2017 at LMU Historisches Seminar, Szöllösi-Janze&Geyer)
- Research Data Management Officer
- Repository Manager for Edmond (an Open Data Repository)
- and more RDM topics

MPDL and Open Science

The Max Planck Society

- 86 research institutes
- also Italy, Luxembourg, Netherlands and US (Florida)
- Max Planck Digital Library (central service unit)
- Local libraries at the institutes
- Three main computing facilities
- One Administrative Headquarter

- Around 24.000 employees
- Budget of 2 Billion € in 2020
- 29 Nobel laureates

https://www.mpg.de/zahlen_fakten
https://www.mpg.de/preise/nobelpreis

https://www.mpg.de/institute_karte

Two Principles within the MPG

Subsidiary Principle

"*MPDL – pursuant to the subsidiary principle – takes on only those tasks which achieve true additional value creation.*" (https://www.mpg.de/mpdl-en)

Harnack Principle

"*The fundamental principle of the Max Planck Society is to allow outstandingly creative scientists, who think in interdisciplinary terms, scope for independent scientific development.*" (p. 6, https://www.mpg.de/39596/MPG_Introduction.pdf)

Max Planck Digital Library

- Information Services since 2007
- located in Amalienstrasse 33, 80799 Munich
- no part of MPG Administrative Headquarter
- about 80 heads
- Developers, librarians, purchasers, administration
- www.mpdl.mpg.de

the only bookcase in the MPDL

Max Planck Digital Library

- MPDL Service Catalog
- Basic literature supply
- Bibliometric
- Publication and data repositories
- Research services
- and much more …

MPDL Internal Organisation

- Department Information
- **Department Collections**
- Department Digital Labs
- Big Data Analytics Group
- Software Licensing Group
- MPDL Infrastructure
- MPDL Services gGmbH (DEAL)

Open Science Services by Collections

- MPG.PuRe (Publication Repository)
- Edmond (Open Data Repository)
- FACES (Database of facial expressions)
- DOI Service

Open Science Days

- https://osd.mpdl.mpg.de
- 2014
- 2016: Citizen Science
- 2017: Open Data
- 2019: Open Source
- 2021

Open Science in Practice

- https://osip.mpdl.mpg.de
- Talk Series in 2021
- OSIP-Newsletter

- Speaker from:
  - European Commission
  - Heidelberg University Library
  - TU Delft
  - Vienna University of Economics and Business
  - CNRS
  - Kompetenzzentrum Open Data
  - University of Basel
  - Zurich’s central library
  - LMU Open Science Center
  - …

Open Science Ambassadors

- https://osambassadors.mpdl.mpg.de
- Remote Conference on 9th and 10th May 2022

- Objectives were:
  - **train** early career researchers from the Max Planck Society on open science
  - **promote** the integration of principles of openness and transparency
  - **push** for real changes and a sustainable transition towards open science

Aspects of Open Science

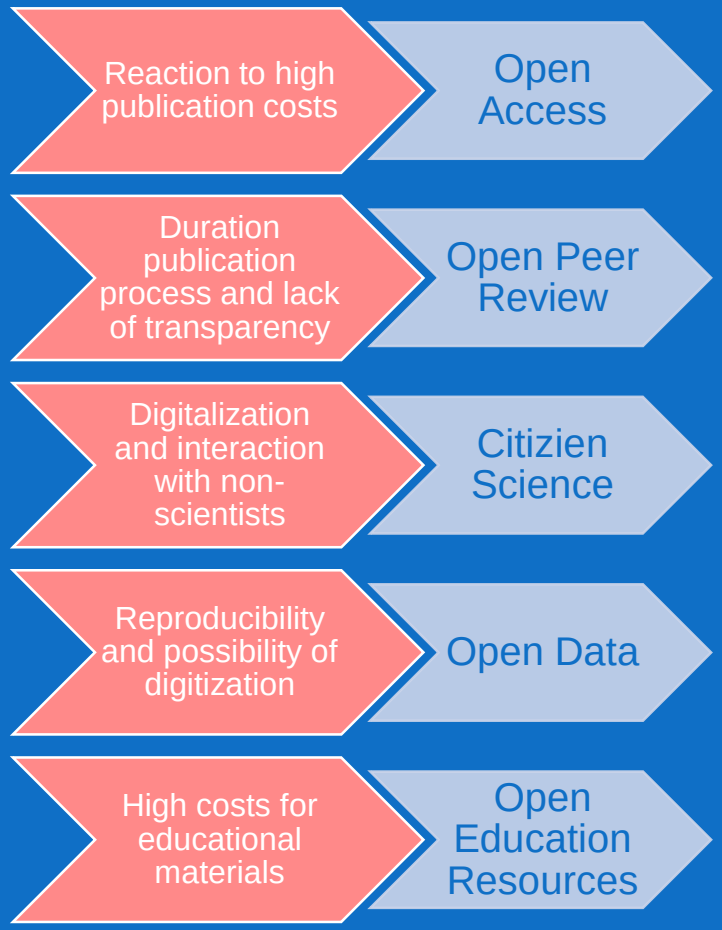
Aspects of Open Science I

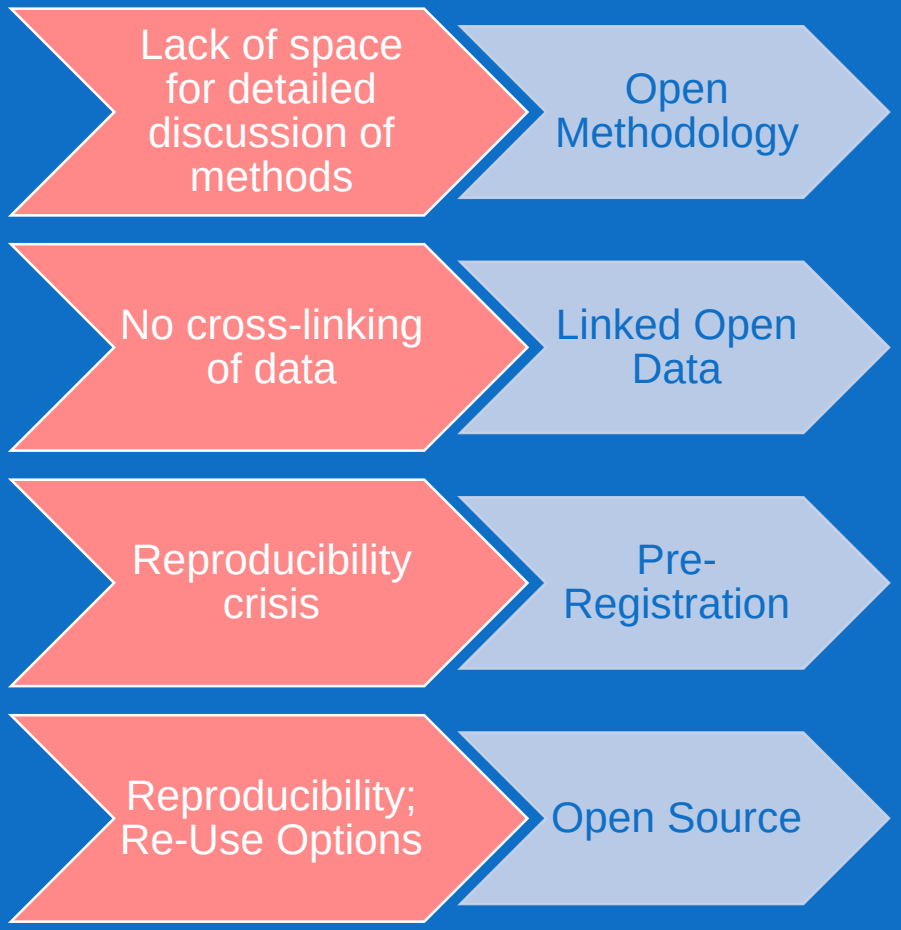
- **Open Access** Public access to research results in the form of publications
- **Open Research Data**: Free availability of research data/raw data
- **Linked Open Data**: Accessibility and networking of public data repositories
- **Open Peer Review**: Search for alternatives to the traditional review processes of journal publishers to ensure greater transparency in this area

Aspects of Open Science II

- **Open Source**: Development and use of open source software for science
- **Citizen Science**: Involving non-professional scientists in the scientific process
- **Open Education**: Free access to digital teaching material and (recordings of) courses
- **Pre-registration**: Deposit and peer review of a project and method plan including hypotheses to be tested on a suitable platform
- **Open Methodology**: Detailed description of the method section (away from character restrictions in the publication)

Hypothesis: OS as Reactions on …





UNESCO Recommendation on Open Science

- Adopted in November 2021
- https://en.unesco.org/science-sustainable-future/open-science/recommendation and https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en

UNESCO, https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en, CC BY-SA 3.0

G6 Statement on Open Science

https://www.cnrs.fr/sites/default/files/download-file/G6%20statement%20on%20Open%20Science.pdf

Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003)

Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

Die Berliner Erklärung über den offenen Zugang zu wissenschaftlichem Wissen vom 22. Oktober 2003 wurde in englischer Sprache verfasst. Sie ist einer der Meilensteine der Open Access-Bewegung. Der Wortlaut der englischen Version ist maßgebend.

Preface

The Internet has fundamentally changed the practical and economic realities of distributing scientific knowledge and cultural heritage. For the first time ever, the Internet now offers the chance to constitute a global and interactive representation of human knowledge, including cultural heritage and the guarantee of worldwide access.

We, the undersigned, feel obliged to address the challenges of the Internet as an emerging functional medium for distributing knowledge. Obviously, these developments will be able to significantly modify the nature of scientific publishing as well as the existing system of quality assurance.

In accordance with the spirit of the Declaration of the Budapest Open Access Initiative, the ECHO Charter and the Bethesda Statement on Open Access Publishing, we have drafted the Berlin Declaration to promote the Internet as a functional instrument for a global scientific knowledge base and human reflection and to specify measures which research policy makers, research institutions, funding agencies, libraries, archives and museums need to consider.

https://openaccess.mpg.de/Berliner-Erklaerung

Signatoren

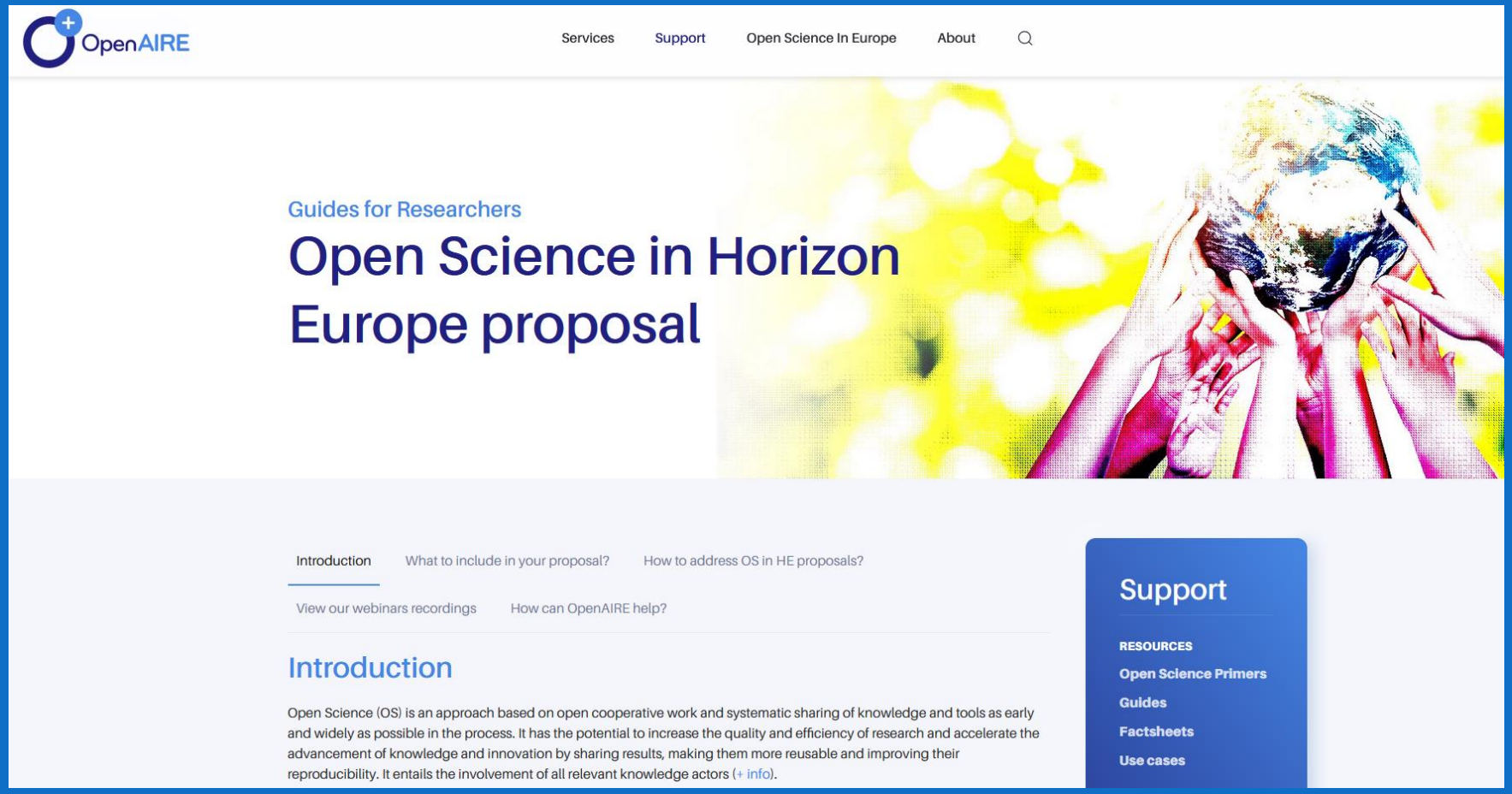
Nr	Datum	Organisation	Person
745	09.05.2022	Katholische Hochschule Nordrhein-Westfalen	Hans Hobelsberger, Bernward Robrecht
744	12.04.2022	Universidad La Salle	Alvaro Fernández Del Carpio
743	05.04.2022	Technische Hochschule Ingolstadt	Walter Schober
742	28.03.2022	Universidad Católica Los Ángeles de Chimbote	Wilberto Rubio Cabrera
741	24.03.2022	Universidad Nacional Toribio Rodríguez de Mendoza de Amazonas	Policarpio Chauca Valqui
740	24.03.2022	Medizinische Universität Wien	Michaela Fritz
739	24.03.2022	Walter Sisulu University	Rushiella Songca
738	12.03.2022	Management Science Research Journal	Siti Epa Hardiyanti
737	22.02.2022	Institute of Chemistry (Republic of Moldova)	Aculina Aricu
736	22.02.2022	Instituto Nacional de Salud	Ofelia Mamani

https://openaccess.mpg.de/3883/Signatories

Open Science Policy by the University of Konstanz

https://www.kim.uni-konstanz.de/typo3temp/secure_downloads/121290/0/87efd6413916f9f827ccd61bcbb5554c982cd34a/Open-Science-Policy-UKON-2021-en.pdf

Open Science in Horizon Europe



OpenAIRE, https://www.openaire.eu/open-science-in-horizon-europe-proposal, CC BY 4.0

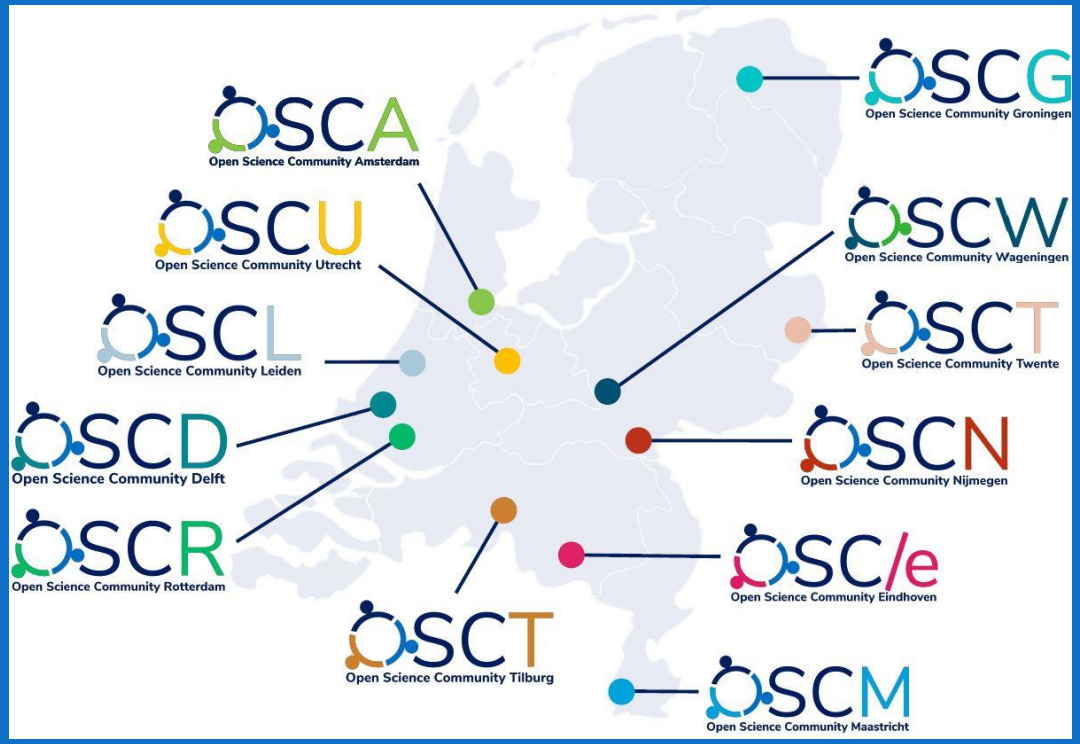
Funding Agencies

i.e. Volkswagenstiftung (Open) Data Reuse: https://www.volkswagenstiftung.de/unsere-foerderung/unser-foerderangebot-im-ueberblick/data-reuse-zusaetzliche-mittel-fuer-die-Aufbereitung-von-Forschungsdaten-open-science

Open Science Communities

Example The Netherlands

- https://www.osc-nl.com
- https://www.openscience.nl



Open Science at the LMU

- Open Science Center (https://www.osc.uni-muenchen.de/index.html)
  - also institutional members: https://www.osc.uni-muenchen.de/members/institutional-members/index.html
- Research Data Management at the LMU University Library (forschungsdaten@ub.uni-muenchen.de)

Open Peer Review

General information and Clarification of Open Peer Review

Open Peer Review at the End of 20th C

“Anonymous peer review, despite the criticisms often leveled against it, is used in more or less the same form by the great majority of scientific journals. The British Medical Journal (BMJ), however, has recently taken the bold step of abolishing referee anonymity, and now requires all referees to identify themselves to the authors.

The editor, Richard Smith, justifies this move primarily on ethical grounds, arguing that "*a court with an unidentified judge makes us think immediately of totalitarian states and the world of Franz Kafka*".

Many other journals, including Nature Neuroscience, will await the results of this experiment with interest. Yet, whatever the results, there are a number of reasons to think that open review may not be the best solution for all journals.”

Editor Notice on “Pros and cons of open peer review”, in: Nature Neuroscience 2 (1999), pp.197-198, https://doi.org/10.1038/6295.

What is Open Peer Review?

1. Peer Review

“Peer review is the evaluation of work by one or more people with similar competencies as the producers of the work (peers).”

https://en.wikipedia.org/wiki/Peer_review

A review (German: “Rezension”) of a book, for example, is a common form of internal discourse in the humanities. What is new is the **pre-review** rather than **post-review** of a publication.

Some Types of Peer Review

Single Blind Peer Review	Author does not know the identify of the reviewer
Double Blind Peer Review	Author and reviewer do not know the identify of the opposite
Open Peer Review	Identity(ies) is/are known

- Several process stages are possible
- Plus rebuttal („Gegendarstellung“ possible)

Problems with Peer Review

- Unreliability and inconsistency
- Delay and expense
- Lack of accountability and risks of subversion
- Social and publication biase
- Lack of incentives
- Wastefulness

Ross-Hellauer, T. (2017): What is open peer review? A systematic review, F1000Research, https://doi.org/10.12688/f1000research.11369.2.

What is Open Peer Review?

2. Open Components of Peer Review

Open Identities	Disclosure of the persons involved
Open Reports	Open communication of the results
Open Participation	Open access for contributors
Open Interaction Communication	open, direct, two-way communication between submitters and assessors

from: DHd-Konferenz 2022 (edit) (2022): Offen für alle(s)? Open Identities im Reviewprozess der DHd-Konferenz, https://zenodo.org/record/6328145, p. 5.

Open Peer Review

no common standard, i.e.:

- the colleagues know the articles in advance
- reviews name will be published with the article
- there are preprints
- there is a comment function on the article
- …

Arguments pro and contra Open Peer Review

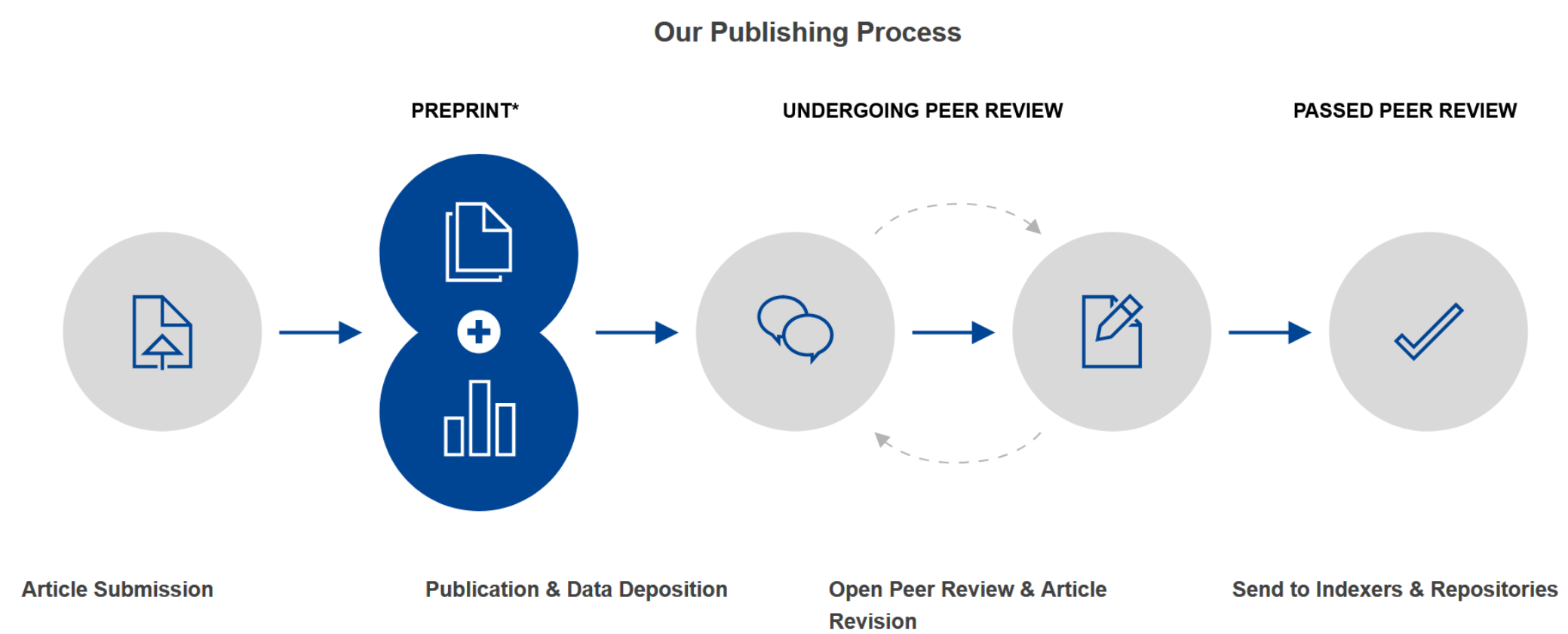
Some Advantages

- Quality improvement
- Community based
- Prevent grievances
- More recognition for review work
- Transparency of communication
- All documents of the discourse in one place
- …

from: Svenja Guhr & Walter Scholger (2022): Pro Open Identities, in: Offen für alle(s)? Open Identities im Reviewprozess der DHd-Konferenz, edit. DHd-Konferenz 2022, https://zenodo.org/record/6328145, p. 9-14.

Publications Process Becomes Faster

Open Access Publishing on Open Research Europe



Disadvantages of Open Peer Review

https://twitter.com/petersuber/status/1412455826397204487?s=20&t=Shw40-smRVOYgkV6Bf6n6Q

Information on Peter Suber: He is the Senior Advisor on Open Access (in Harvard Library) and Director of the Harvard Open Access Project (https://library.harvard.edu/staff/peter-suber)

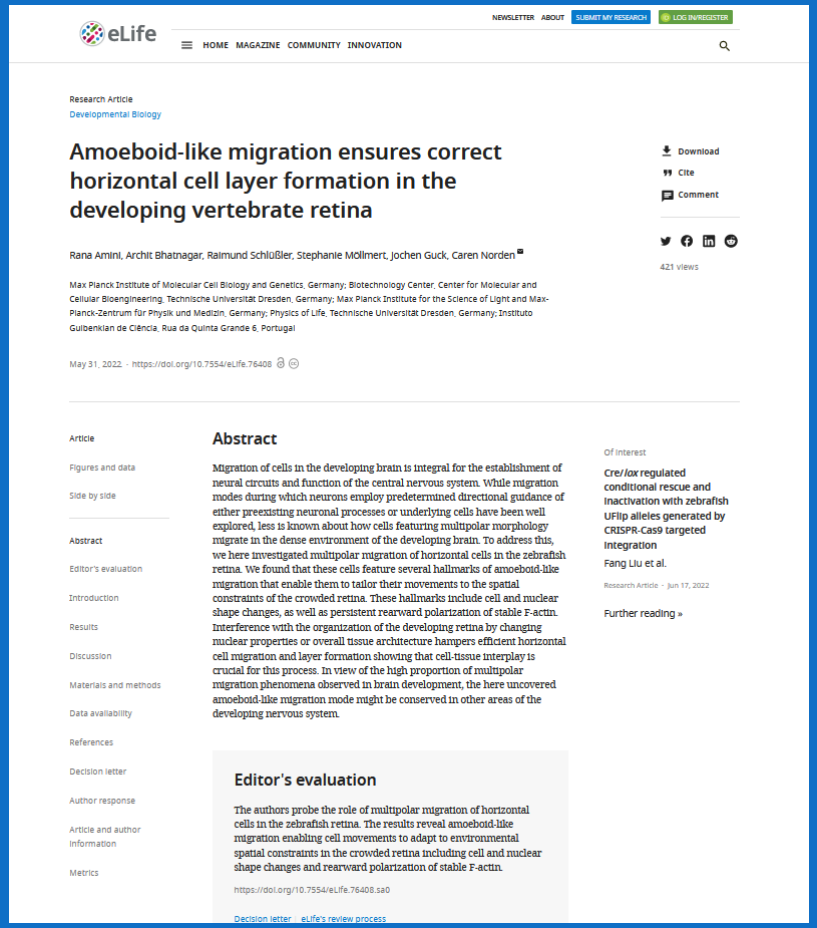
Examples of Open Peer Review

Open Peer Review Example: F1000

- F1000Research is an Open Research publishing platform, specially for life scientists and clinical researchers
- “What is open peer review? A systematic review” by Tony Ross-Hellauer
- https://f1000research.com/articles/6-588/v2
- Open Peer Review directly towards the artice
- Two versions of the article
- Four reviews

Open Peer Review: eLife

- eLife is a non-profit organization
  - receives financial support from the Howard Hughes Medical Institute, the Knut and Alice Wallenberg Foundation, the **Max Planck Society** and Wellcome
- only paper as preprint will be reviewed
- → publish article on eLife at the end of the review process



eLife, https://doi.org/10.7554/eLife.76408, CC BY 4.0.

Open Peer Review Example: Embo Press

- Field of Biology
- “An engineered multicellular stem cell niche for the 3D derivation of human myogenic progenitors from iPSCs”
- https://www.embopress.org/doi/abs/10.15252/embj.2022110655
- Collected Open Peer Review documents as supplement in one single pdf file

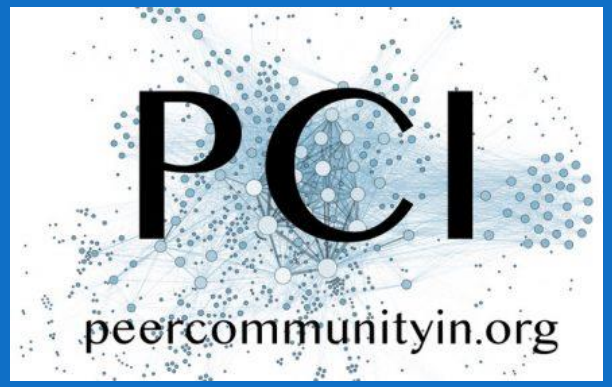
https://www.embopress.org/action/downloadSupplement?doi=10.15252/embj.2022110655&file=embj2022110655.reviewer_comments.pdf

Open Peer Review Example: PeerJ

- Data Mining and Astronomy
- “An approach to fill in missing data from satellite imagery using data-intensive computing and DINEOF”
- https://peerj.com/articles/cs-979/
- Review history as separate website to the article

https://peerj.com/articles/cs-979/reviews/

Open Peer Review Example: PCI

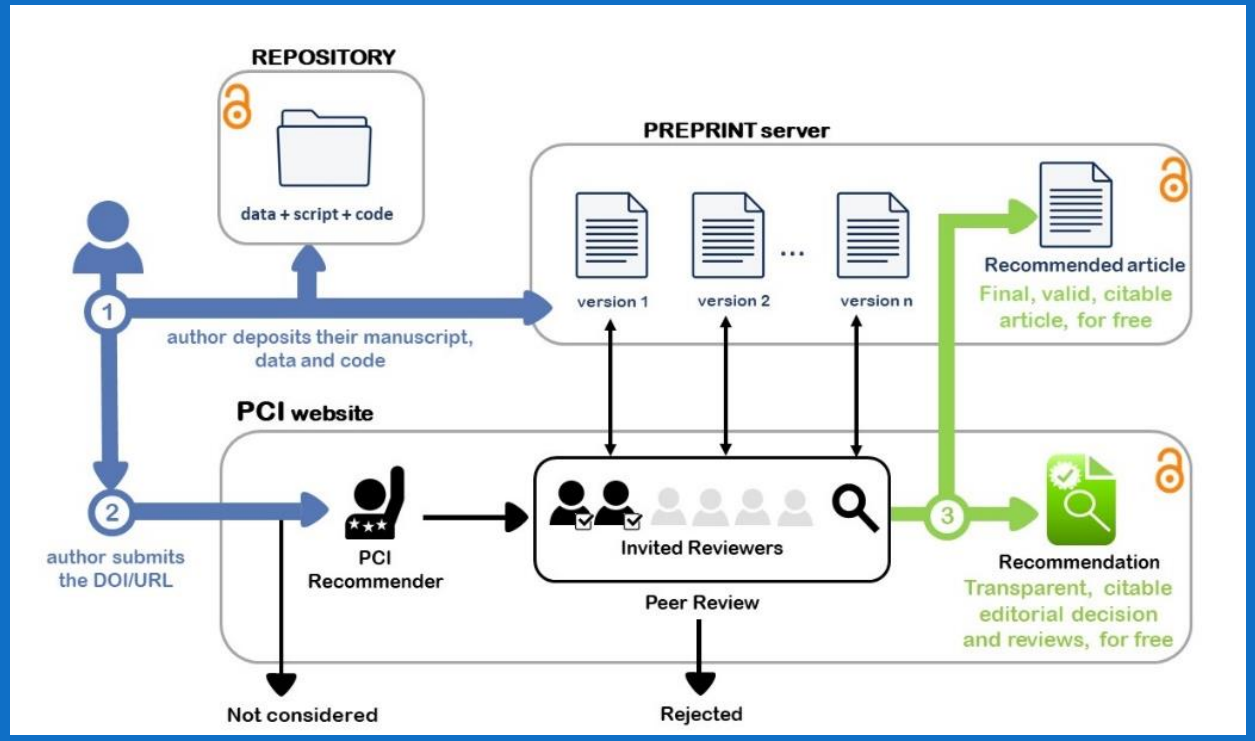


Modified from Martin Grandjean, https://peercommunityin.org/movies-and-posters/, CC-BY-SA-2.0.

- Article on a preprint server
- Recommendation on PCI
- Example Archaeology: https://archaeo.peercommunityin.org

Facts and Figures

- 1.7000 recommenders
- 15 PCIs
- 90 PCI friendly journals
- 100 supporting organisations



Workflow of a preprint evaluation and recommendation by PCI, https://peercommunityin.org/movies-and-posters/, CC-BY-ND.

Reprohack

- Call for hacking the own paper & software
- Submitted by the author(s)
- Aim: Improve reproducibility
- https://www.reprohack.org

ReproHack Hub, https://www.reprohack.org, CC BY 3.0

Discussion
Open Peer Review
in the Humanities

Open Peer Review in the Humanities

Alex Lichtenstein:

“Under my editorship, the American Historical Review has tried many new things. But so far, the traditional form of “double-blind” peer review for article submissions has remained intact, indeed sacrosanct.

Until now.

In the ongoing commitment to experimentation, the AHR invites “open peer review” of a recently submitted manuscript, “History Can be Open Source: Democratic Dreams and the Rise of Digital History,”

from https://ahropenreview.com by The American Historical Review, 2020.

Open Peer Review in the Humanities

Seth Denbo (Director of Scholarly Communication and Digital Initiatives at the American Historical Association):

“Open peer review hasn’t caught on in the humanities.”

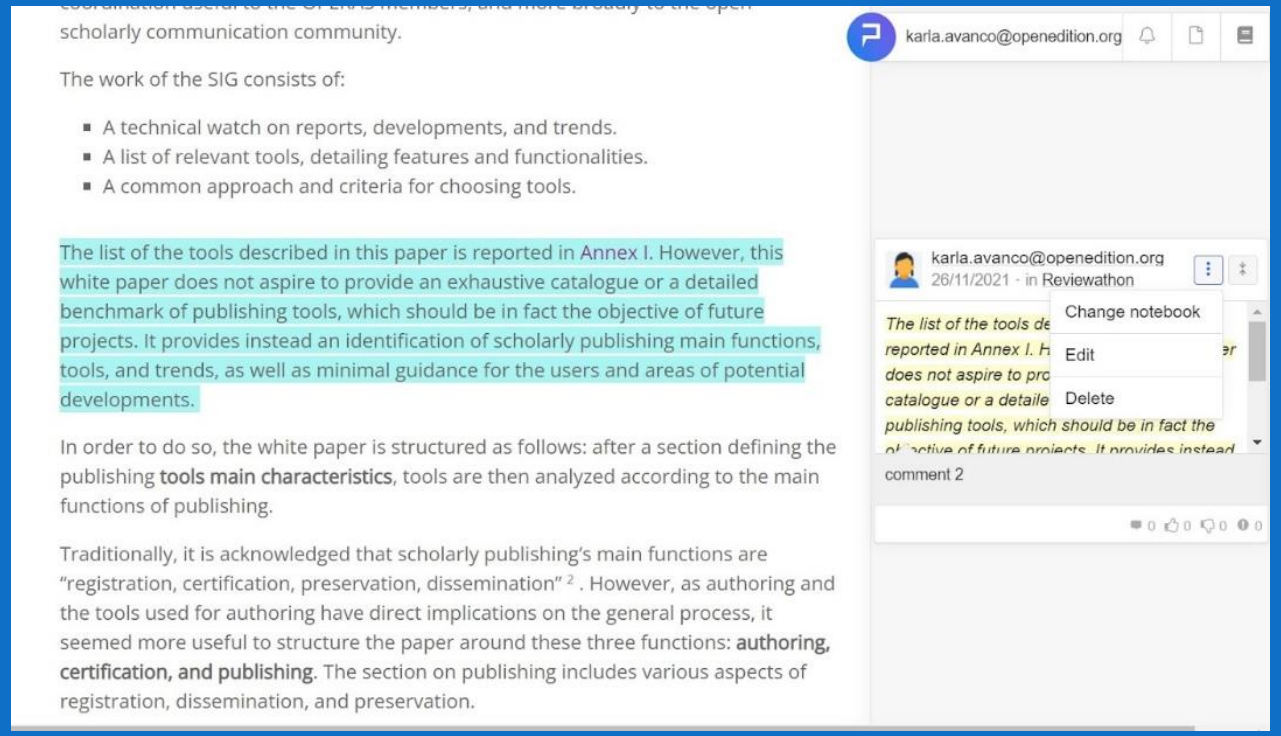
“Why, then, have humanities journals and scholars not taken up open review practices in more than a few notable instances? Openness as both value and practice has infused the discourse around scholarship and the communication of ideas among many in the humanities, but **old practices die hard**. [..]

Most humanities disciplines are comfortable with, and even rely upon, certain kinds of subjective judgments by scholars. It could be that with this outlook, authors and editors in the humanities feel less keenly the necessity to reform review to prevent inconsistency between reviewers.”

Seth Denbo (2020): Open Peer Review in the Humanities, in: The Scholarly Kitchen, https://scholarlykitchen.sspnet.org/2020/03/04/guest-post-open-peer-review-in-the-humanities/.

OPERAS Living Book “Reviewathon”

- European Research Infrastructure for the development of open scholarly communication in the social sciences and humanities
- https://www.operas-eu.org
- Post-Publication Open Peer Review on White Papers
- https://operas.hypotheses.org/5083



Many developments, a kind of competition for ideas?

The Fortune Teller, Caravaggio, Louvre, Paris, https://collections.louvre.fr/ark:/53355/cl010062329, public domain.

Citizen Science

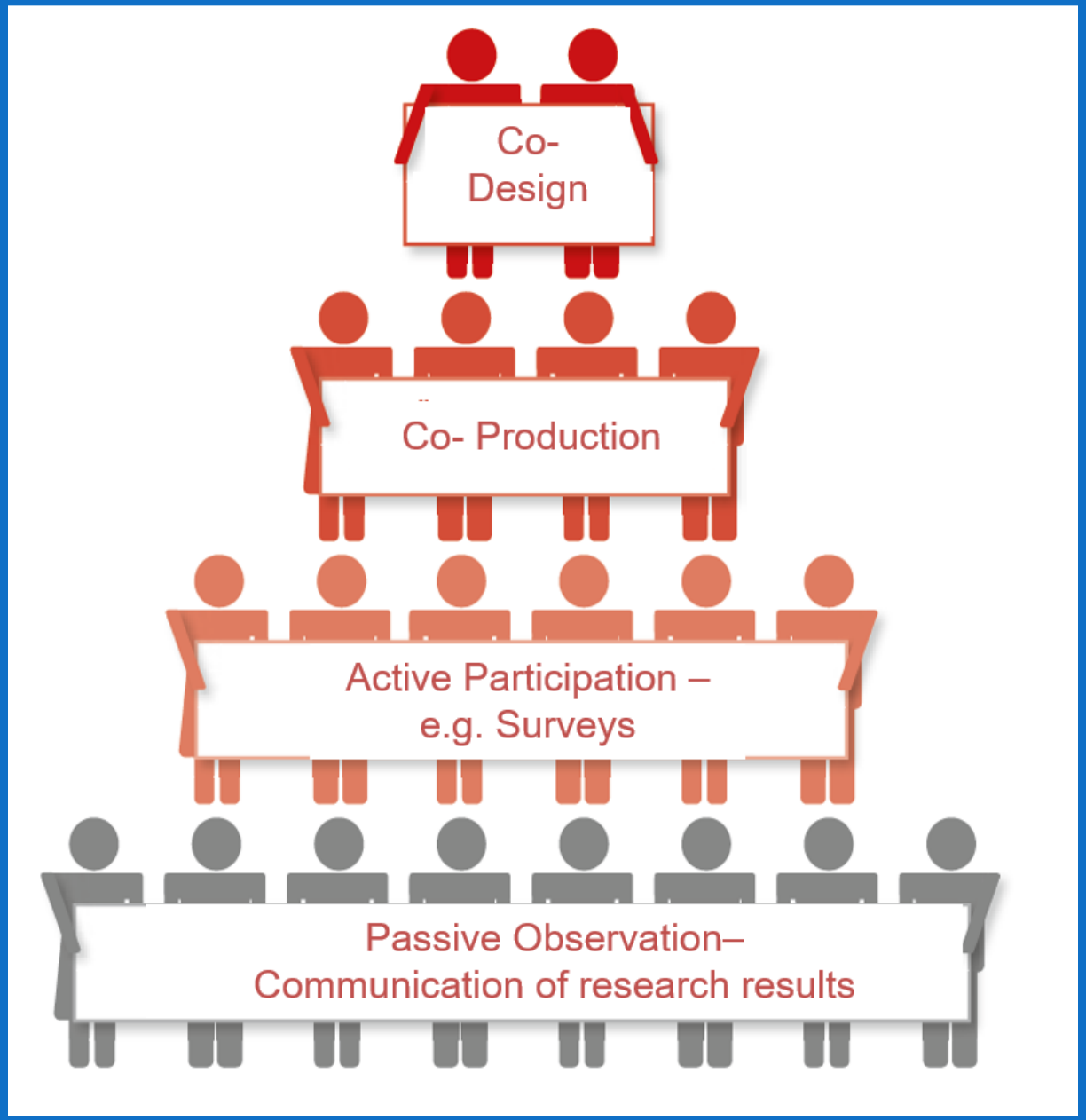
Citizen Science

Involvement of non-scientists in research processes

Topic with a very wide spectrum:

- Heterogeneous community
- Broadly diversified across all disciplines (Environmental research, biology very strong, but e.g. also history)
- Online participation is a central aspect
- Distributed Computing
- Crowdfunding

In the vast majority of cases, the focus is on the collection of data or on the evaluation of content in the broadest sense.



(after Sonja Kreft (MfN) after Bonney et al 2009)

Citizen Science

- Rather “exotic” field of Open Science
- Reproducibility / Replicability of research (credibility crisis) does not matter
- No direct mandates from politics, funding organizations or publishers
- But: Very strong encouragement and promotion (funding) on the political level
- Idealistic element plays a comparatively large role
- Justification towards society (demonstrate your own relevance)
- Transparency
- Real support with the generation or evaluation of data

Criticism

- Unnecessary (idealistic) gimmick
- Exploitation of "cheap" labor
- Research should not be driven too much by the pressure to justify itself

Examples

- Seti@home https://setiathome.ssl.berkeley.edu/
- Einstein@home https://einsteinathome.org/de/home
- Animal Tracker https://www.ab.mpg.de/345422/citizen-science
- Flora Incognita https://floraincognita.com/
- Dawn Chorus https://dawn-chorus.org/
- Chimp&see https://www.zooniverse.org/projects/sassydumbledore/chimp-and-see/
- Quallen-Galaxien https://www.zooniverse.org/projects/apillepich/cosmological-jellyfish

Examples

- Artigo https://www.kunstgeschichte.uni-muenchen.de/forschung/digitalekg/laufende-projekte/artigo/index.html
- Verein für Computer Genealogie https://www.compgen.de/
- Europeana Transcribe https://europeana.transcribathon.eu
- Lil Bubome https://lilbubome.wordpress.com/

Platforms / Documents

Bürgerschaffenwissen
https://www.buergerschaffenwissen.de/

European Open Science Association
https://ecsa.citizen-science.net/

EU platform
https://eu-citizen.science

Zooniverse
https://www.zooniverse.org

Citizen Science @ NASA
https://science.nasa.gov/citizenscience

Grünbuch Citizen Science Strategie 2020 (https://d-nb.info/1104198576/34)

Weißbuch Citizen Science Strategie 2030 für Deutschland (https://doi.org/10.31235/osf.io/ew4uk)

Conclusion

Have the option in mind (Funding, supporting bodies)

Never (!) works by itself - without a tremendous amount of effort on your part

Motivation of (potential) participants is crucial:

- Do you have a good topic that appeals to many people?
- Is there any way to “make” the topic more interesting?
- Include gaming elements or competition aspects to the process
- Offensive advertising needed throughout the entire course

Central question:

Will the expected result of the project justify the enormous effort for myself?

Thanks for the attention!

osip@mpdl.mpg.de