

OPEN SCIENCE, VERSION 3.0: Breaking down barriers for equitable and efficient research communication

Dr. Wendy Patterson



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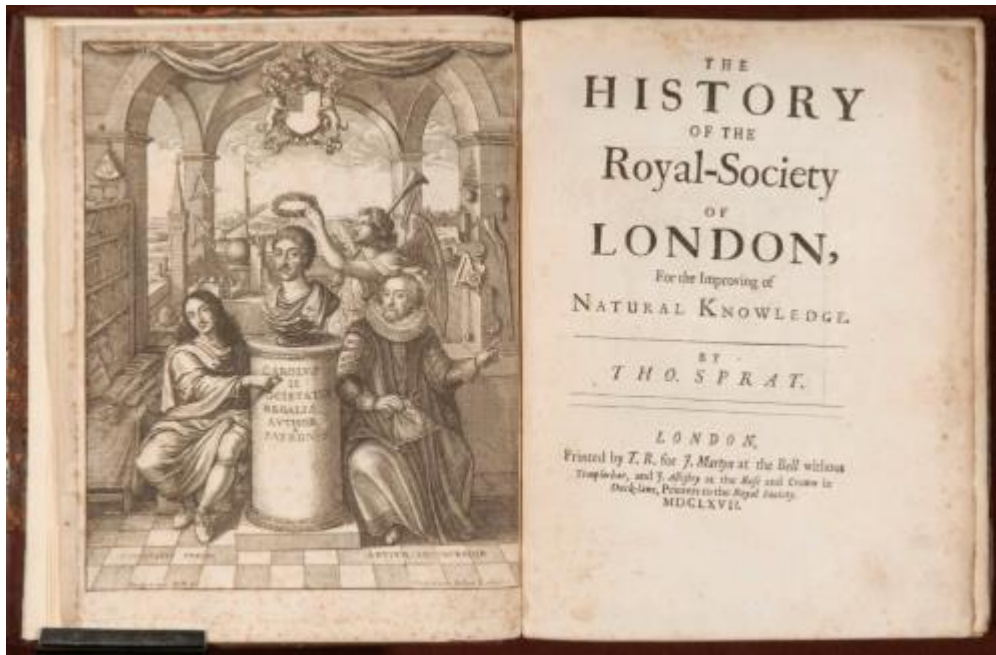
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Open Science Forum 2022
Goethe-Universität Frankfurt
July 1, 2022 / 11:15 AM CET
Slides: <https://osf.io/enxwy>

History of Open Science, Version 1.0 (pre-1960s)



Source: <https://www.rct.uk/collection/1057783/the-history-of-the-royal-society-of-london-for-the-improving-of-natural-knowledge>
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ELSEVIER
LOGO
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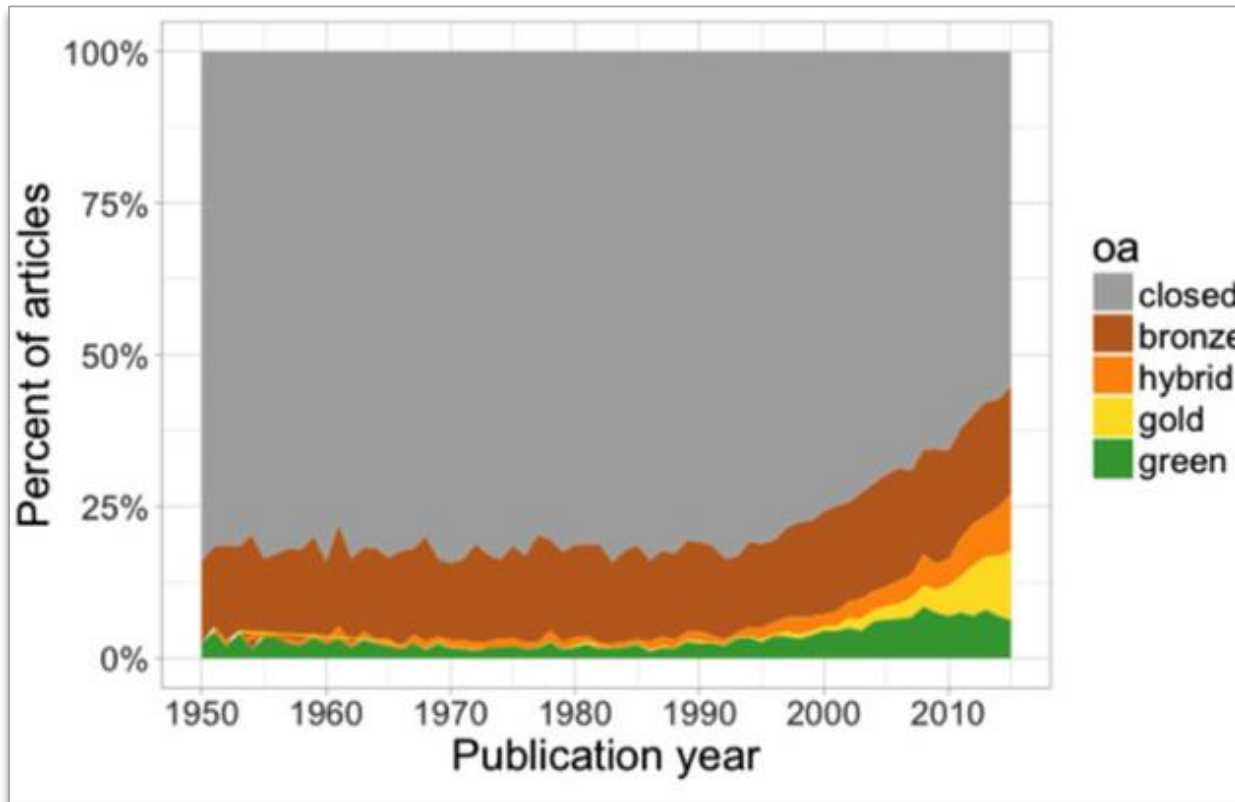
payWALL
The Business of Scholarship

Open Science, Version 1.5, The Revival (1991–2001)

- 1991 the first preprint server, ArXiv was born
- Open Source started in 1998 with the release of Netscape
- Budapest Conference 2001 – resulting in DORA – **demand**ed open science

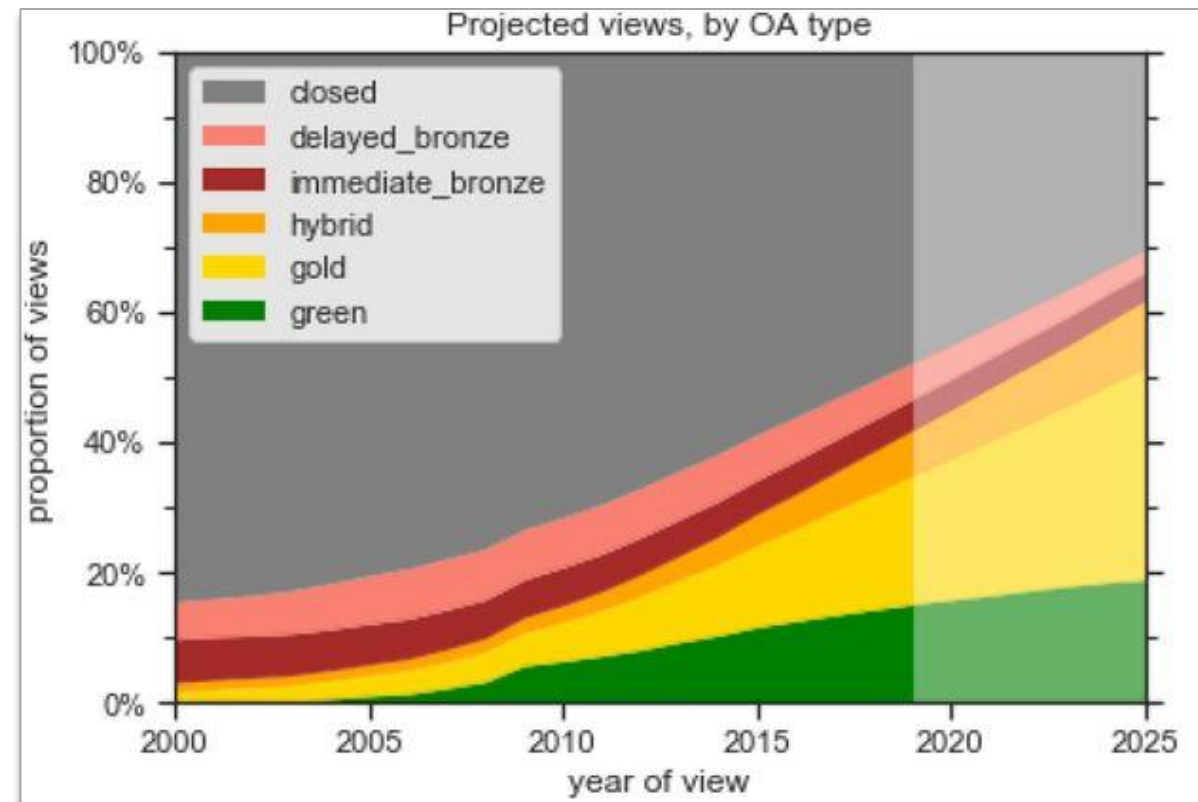


Transition to Open Science V. 2.0 – The Open Access “boom”



doi: <https://doi.org/10.7717/peerj.4375>

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doi: <https://doi.org/10.1101/795310>

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Recent history – OS develops its wings and expands, Version 2.0

- The term "open science" does not have any one fixed definition or operationalization
- Many schools of thought



What is Open Science? Introduction | FOSTER
fosteropenscience.eu



The six core principles of Open Science ...
researchgate.net



What is Open Science? | Op...
openscience-twente.com



Open science, open access, Projekt DEAL ...
ceramics.org



UNESCO Science Commission adopts Open ...
council.science



Open Science – GRRIP Project



Open Science | UNESCO
unesco.org



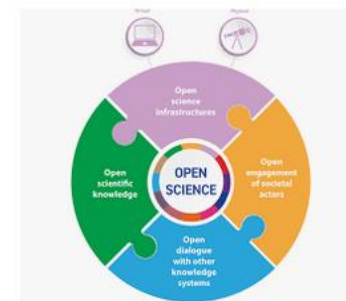
Open Science Monitor : access to ...
aims.fao.org



What is Open Science? | What is Open ...
fosteropenscience.eu

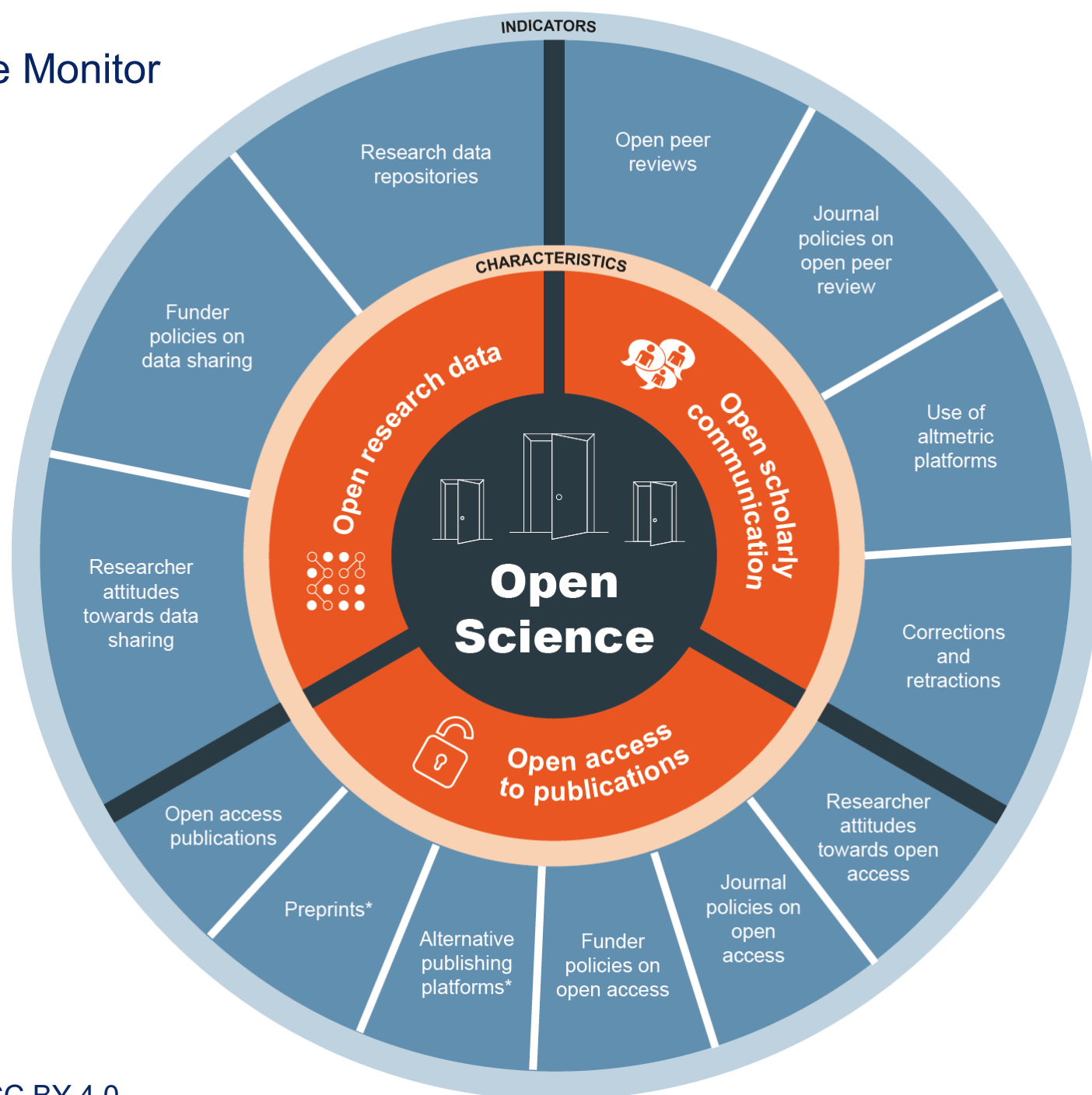


European Research Libraries ... ra...
zbw-mediatalk.eu



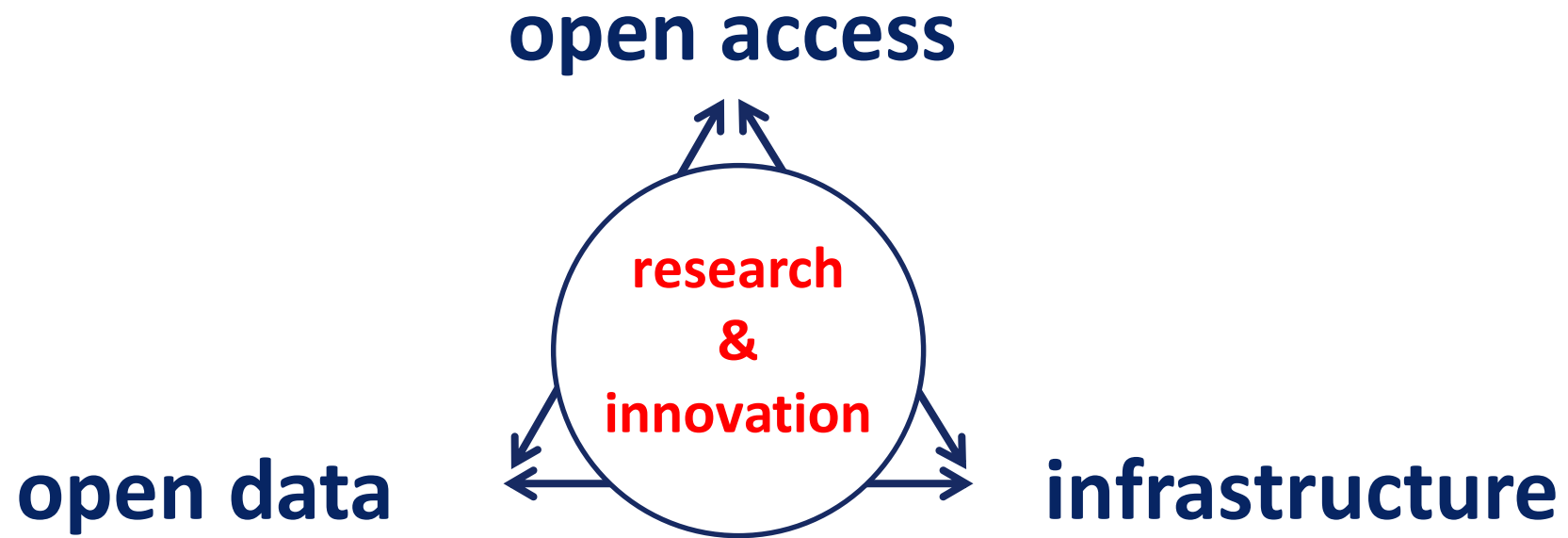
What is Open Science? | Open Sci...

Foster / Open Science Monitor





Open Science



open educational resources, open source, citizen science

Open Science 2.0 – Risks and Opportunities

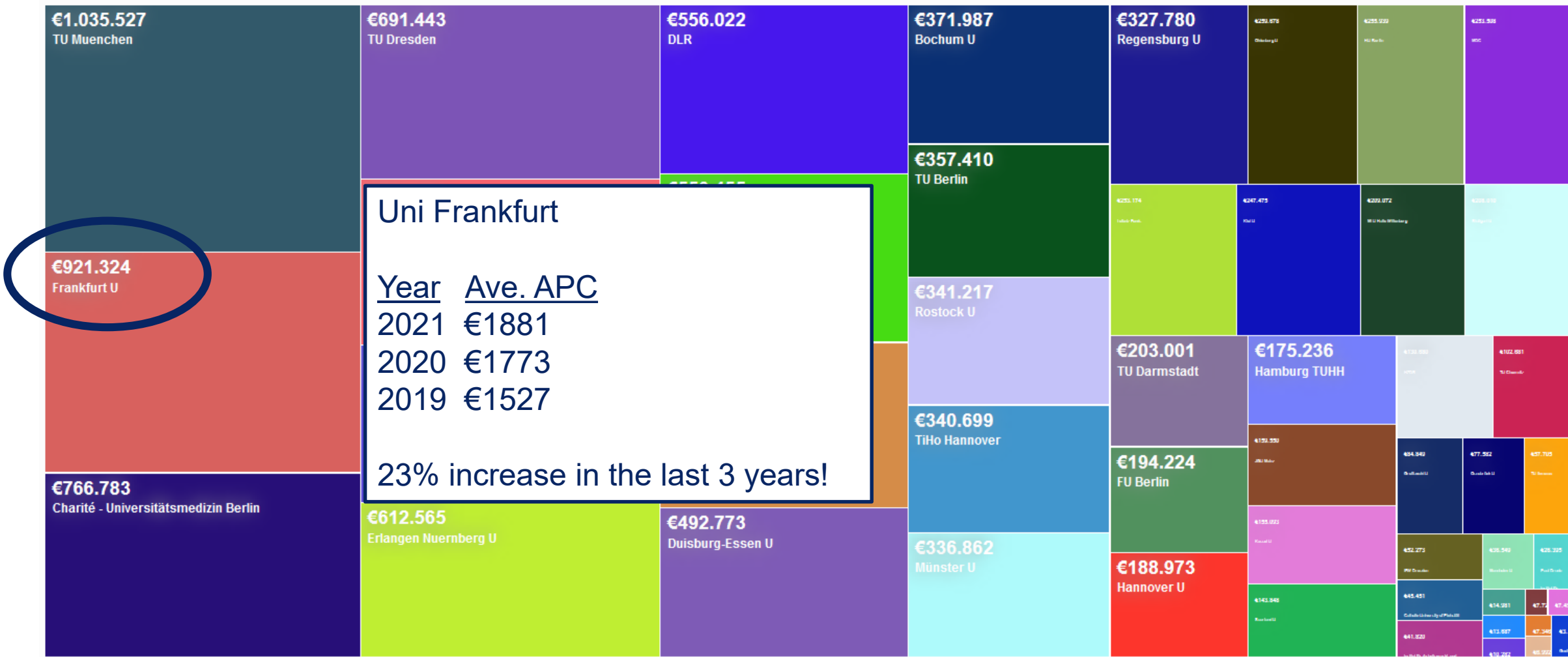
Risks

- APCs and database subscriptions increase faster than budgets

Opportunities

OPENAPC

View: Publisher Journal Institution Data & Embed Filter: Year: 2021 Hybrid Status: All Country: DEU



OPENAPC

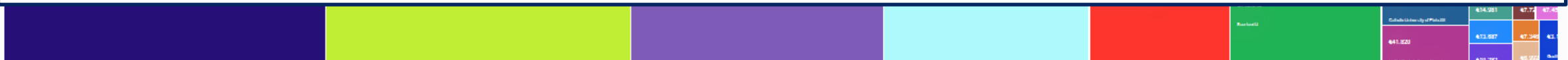


From 2012–2018 the average APC for the four largest journal publishers rose between 25% and 60% (Khoo, [2019](#))

From 2005–2018 the average APC paid by German universities increased from 858€ to €1600 (accounting for inflation €1100) (Aasheim et al., [2019](#))

Trend of APCs scaling with JIF, not cost of publishing

Meanwhile the top 5 publishers are seeing record profits...



Open Science 2.0 – Risks and Opportunities

Risks

- APCs and database subscriptions increase faster than budgets
- Even worse.. marginalization of a large portion of scientists worldwide

Opportunities

CORRESPONDENCE | 10 August 2021

What costs half a year's pay for African scholars? Open access

[Addisu Mekonnen](#) , [Colleen Downs](#), [Edu O. Effiom](#), [Onja Razafindratsima](#), [Nils Chr. Stenseth](#) & [Colin A. Chapman](#)

Open access to the scholarly literature is crucial for African academics but, without urgent action, the move from paywall to pay-to-publish wall will continue to disenfranchise researchers.

An average APC can represent the salary of half a year (or more) for African authors (Mekonnen et al., [2021](#); Okere, [2022](#))

Open Science 2.0 – Risks and Opportunities

Risks

- APCs and database subscriptions increase faster than budgets
- Even worse.. marginalization of a large portion of scientists worldwide
- Unethical behavior – co-author bribing
- For-profit motives incentivize publication of quantity over quality
- The Big Buyout
 - Society publishers and society journals die out or are sold off
 - Subject area monopolies – large publishers buying up the small
 - Infrastructure (including educational resources) being bought up by commercial companies

Opportunities

Take home message: **universities are encouraged to create inventories of the infrastructures they use and commit to paying their share to support them**

Suber also suggested that, without community support,

“infrastructures we depend on might die or might be acquired by a corporation that is really more interested in profits than in science”



Emily Drabinski
@edrabinski

We need to own our infrastructure and we need the resources to do so.

Dr. Sarah T. Roberts @ubiquity75 · Jun 19

YouTube has removed all of @Cornell_Library content because of lectures relating to On Our Backs magazine. Not content of the magazine itself, mind you. Content of people TALKING ABOUT the magazine.

“Terminated” - Susie Bright’s Journal [twitter.com/elotroalex/sta...](https://twitter.com/elotroalex/status/1544444444)

[Show this thread](#)

1:28 PM · Jun 19, 2022 · Twitter for iPhone

33 Retweets 177 Likes



Katie Hughes
@KatherineAnneH

The idea that you are buying/subscribing to create a global resource instead of a one-year subscription for just your students [@martin_eve](#)

I think that makes a powerful argument.
[#RLUKCOPIMOA](#)

4:38 PM · Jun 23, 2022 · Twitter Web App

5 Retweets 11 Likes

infrastructure.sparcopen.org/

The future of digital infrastructure for research and education is being built.

Who's in control?

SPARC*

Data and data analytics are playing an increasingly central role at higher education institutions, and the academic community is at a critical juncture. The growing trend of publisher acquisition of critical infrastructure has underscored a pressing need to understand the changing landscape and develop actions that institutions can—individually and collectively—take to maintain and regain control of data infrastructure. These actions will determine who ultimately controls the research and education process and whether we meaningfully address inequities created by legacy players or simply recreate them in new ways.

FROM THE *INTERFOLIO ACQUISITION REPORT*

Potential Institutional Responses to Elsevier's Acquisition of Interfolio

As the pace of market concentration continues to accelerate across the research enterprise, the academic community will be best served by adopting a proactive approach that considers, in advance, the potential for future consolidation and begins to build the case for regulatory intervention before the next merger or acquisition is announced.

2 mins read

There are a variety of actions that institutions may consider to reduce the potential for negative impacts stemming from this acquisition:

1. Documenting any impact the breadth or integration of Elsevier's products has on institutional choices about what products to use.
2. Ensuring regular, cross-institutional information sharing about any engagement with Elsevier.
3. Closely scrutinizing the potential downsides of bundles across product lines or other contractual connections between Elsevier products.
4. Monitoring and documenting shifts in pricing and, where possible, sharing with others to reduce information asymmetries.
5. Negotiating the removal of confidentiality clauses from contracts with Elsevier to increase transparency and the ability for information sharing.
6. Advocating for transparency in metrics as well as the data and algorithms upon which they are based.
7. Closely considering the conflict of interest between Elsevier's publishing portfolio and its research analytics and Faculty Information Systems products when making purchasing decisions.
8. Closely reviewing contract and privacy policy language regarding data use and the protection of data privacy, including monitoring how these

Open Science 2.0 – Risks and Opportunities

Risks

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Opportunities

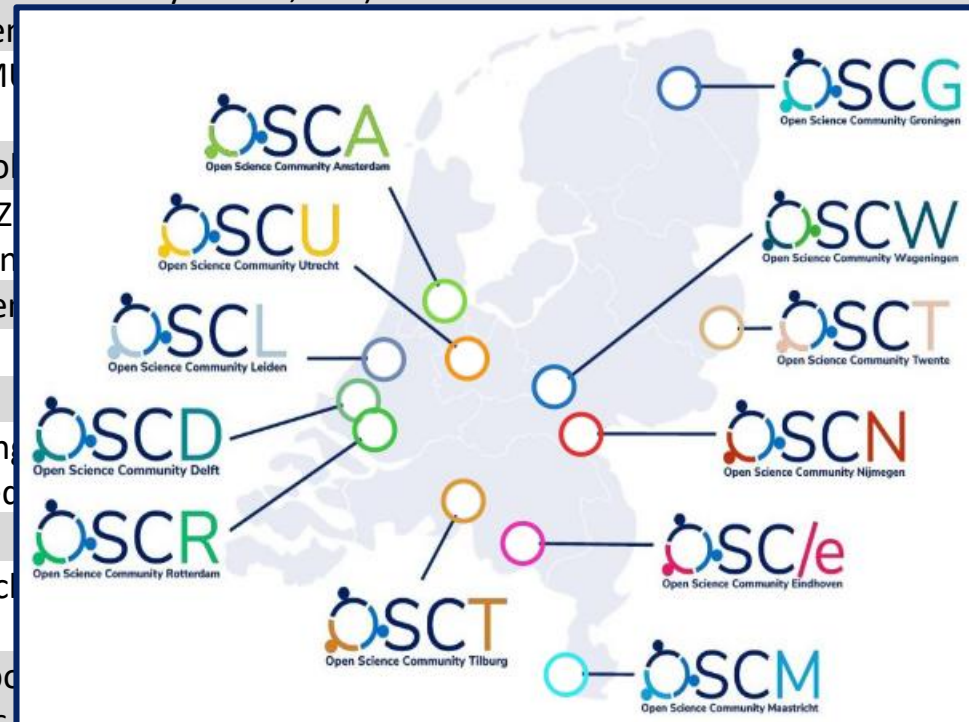
- Improved quality (reliability)
- Improved efficiency (reproducibility)
- Increased trust in science
- The system is in flux. Let's learn from the past: reclaim our science and scientific communication

Many organizations have already seized these opportunities and started their journey towards a better version of open science

Best practice examples – how other academic institutions started and accomplished their path to become more “open”

Uni	Policy	Country
Utrecht University	Towards an Open Science Programme for Utrecht University	Netherlands
TU Delft	TU Delft Guidelines for Open Science	Netherlands
Charité University Hospital	Incentives to raise awareness and nudge clinicians and researchers toward adopting responsible research and open science practices. (e.g., bonus for study, a paper that reuses data previously published by others, etc.) Applicants answer questions related to open science.	Germany
Ludwig-Maximilians-Universität München	The 75 member Open Science Center at LMU supports many open science concepts.	Germany
University of Cologne	Open Science Center (Zentrum für Open Science) supports open science practices.	Germany
University of Jyväskylä	Open Science Center supports open science practices.	Finland
University of Jyväskylä	Open Science Center supports open science practices.	Finland
University of Exeter	Open Science Center supports open science practices.	England
University of Exeter	Open Science Center supports open science practices.	England
University of New Hampshire	Open Science Center supports open science practices.	USA
University of New Hampshire	Open Science Center supports open science practices.	USA
Carnegie Mellon University	Open Science Program that supports collaboration with digital research tools, trainings, events, and outreach.	USA
University of British Columbia	Open UBC - A curated collection of resources for faculty and students to learn about open education practices	Canada

Network of OS Communities in the Netherlands



A focusing on existing open science initiatives in Germany: <https://osf.io/tbkzh/wiki/home/>

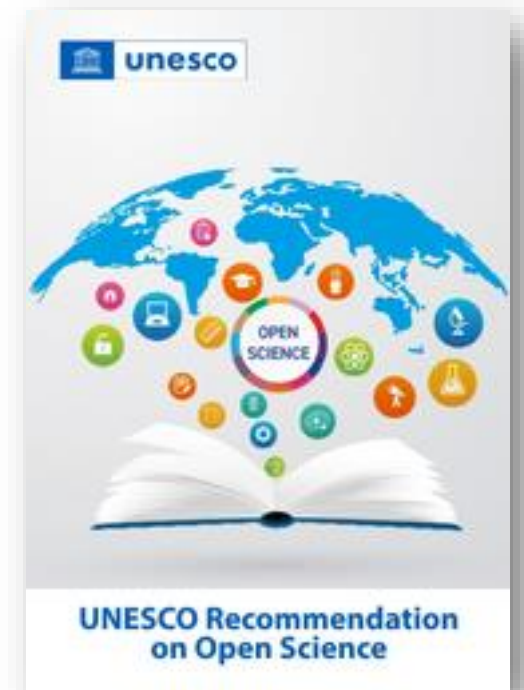
Transitioning towards Open Science, Version 3.0 – Equitable, High-quality and Efficient

- Let's all invest in a future for open science that is equitable, high-quality and efficient
- **High-quality** – OS can from its nature result in higher quality research outputs
 - open peer review + open access → more scrutiny of published results
 - reproducibility studies, pre-registration/registered reports
 - focus on content, not subscribers or quantity (or profit)
 - objective quality criteria is needed

Research Assessment


Policy-level change is underway

- The 27 EU Science Ministers agree: quality of research outcomes more important than JIF and number of citations
- Paris Call on Research Assessment at the Open Science European Conference
- The EUA Open Science Agenda 2025 – developing a responsible and sustainable research assessment system that balances qualitative and quantitative metrics and changes the scholarly reward and incentive system
- UNESCO Recommendation on Open Science
- DORA rebirth / BOAI20 #2 Reform research assessment and rewards to improve incentives



Research Assessment: Change is underway – Will you agree to take part?

Towards objective quality criteria

- Narrative approach, e.g., RSC's Resume for Researchers
- Transparency and Openness Promotion (TOP) Guidelines  **TOP FACTOR**
- Utrecht University committing to end the use of JIF in all its hiring and promotions
- OSF resource on model language for job announcements
- An archive of job offers (mostly professorship positions) which require or suggest an open science statement from the applicants

You can participate too: hiring committees, evaluation of your peers, citing quality articles (not based on JIF of the journal), promoting your own open science

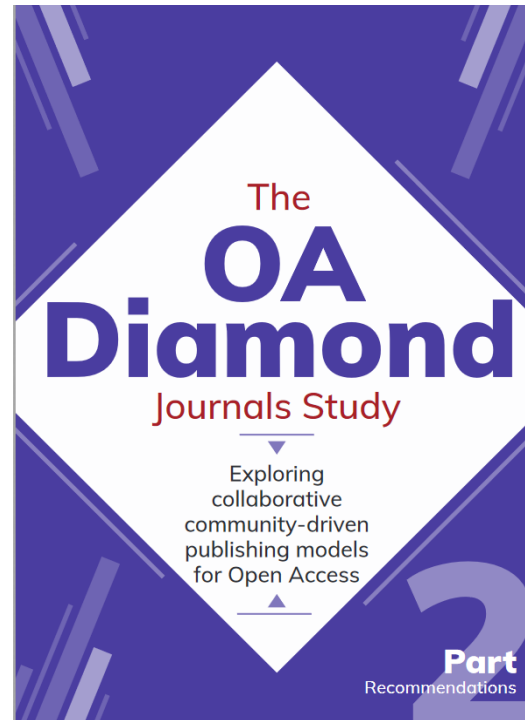
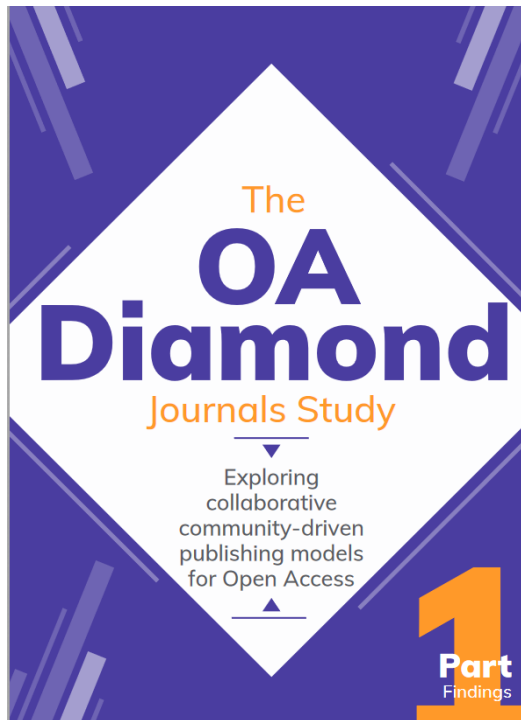
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- **Efficient** – time efficiency, resources/collaboration, economically efficient
through collaboration, less duplication of work and reduced administrative and accounting burden, we have the chance for a more efficient version of OS
- **Equitable**/fair system through non-profit, community supported initiatives

Transitioning towards Open Science, Version 3.0 – Equitable Scholarly Publishing



Diamond unearthed: shining light on community-driven Open Access publishing



- Approximately **29,000 DOA journals** that publish approx. **44% of all OA publications**
- 70% of the OA journals in DOAJ are diamond OA
- Many struggle with technical and financial aspects; most all struggle with **visibility**
- Most are **very small**
- Are often published independent of a publisher
- Most appear to be scholar-led
- Sustainability: many in existence for decades with **very low running costs**

Findings Report – DOI: [10.5281/zenodo.4558704](https://doi.org/10.5281/zenodo.4558704)

Recommendations Report – DOI: [10.5281/zenodo.4562790](https://doi.org/10.5281/zenodo.4562790)

Equitable Scholarly Publishing Success Stories: Models for true scholar-led non-profit open access



Functioning, successful models for supporting diamond OA:

- LYRASIS Open Access Community Investment Program ([OACIP](#))
- National, regional and EU-level funding of diamond OA projects (Netherlands, Finland, France)
- Subscribe to Open ([S2O](#))
- Library Partnership Subsidy (LPS) (like is done for arXiv, the Open Library of the Humanities ([OLH](#)))
- Open Access Community Framework ([OACF](#))
- Various cooperative infrastructure models (e.g. [Sci-Post](#))

Community and non-profit initiatives:

- open.access-network [subgroup](#) scholar-led.network
- [Action Plan](#) for Diamond Open Access (signed by DFG)
- Beilstein-Institut

DOA Funding/Research:

- DFG funding programme “Infrastructures for Scholarly Publishing”
- BMBF-funded CODRIA project (see [published](#) a list of German diamond OA journals)



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QUALITY OPEN SCIENCE

Non-profit foundation

founded in 1951 by the Max Planck Society
based in Frankfurt, Germany

Supports the advancement of the chemical sciences

focus on communication, information and networking
long-term projects
open science

100% Open Science

Open Access



BEILSTEIN JOURNAL OF ORGANIC CHEMISTRY



BEILSTEIN JOURNAL OF NANOTECHNOLOGY



BEILSTEIN ARCHIVES



BEILSTEIN JOURNALS

DIAMOND
OPEN
ACCESS



QUALITY OPEN SCIENCE

Peer-reviewed

Diamond (no-fee) open access

Authors retain copyright with CC-BY

International Editorial Board of experts

Widely archived/indexed in all major repositories

Focus on quality in production and science – not profit

Since 2005: >5500 articles and ≈220 thematic issues to date

100% Open Science

Open Access



BEILSTEIN JOURNAL OF ORGANIC CHEMISTRY



BEILSTEIN JOURNAL OF NANOTECHNOLOGY



BEILSTEIN ARCHIVES

Open Data



Standards for Reporting Enzymology Data +
STRENDA DB



Minimum Information Required for A
Glycomics Experiment

Open Communication



BEILSTEIN SYMPOSIUM



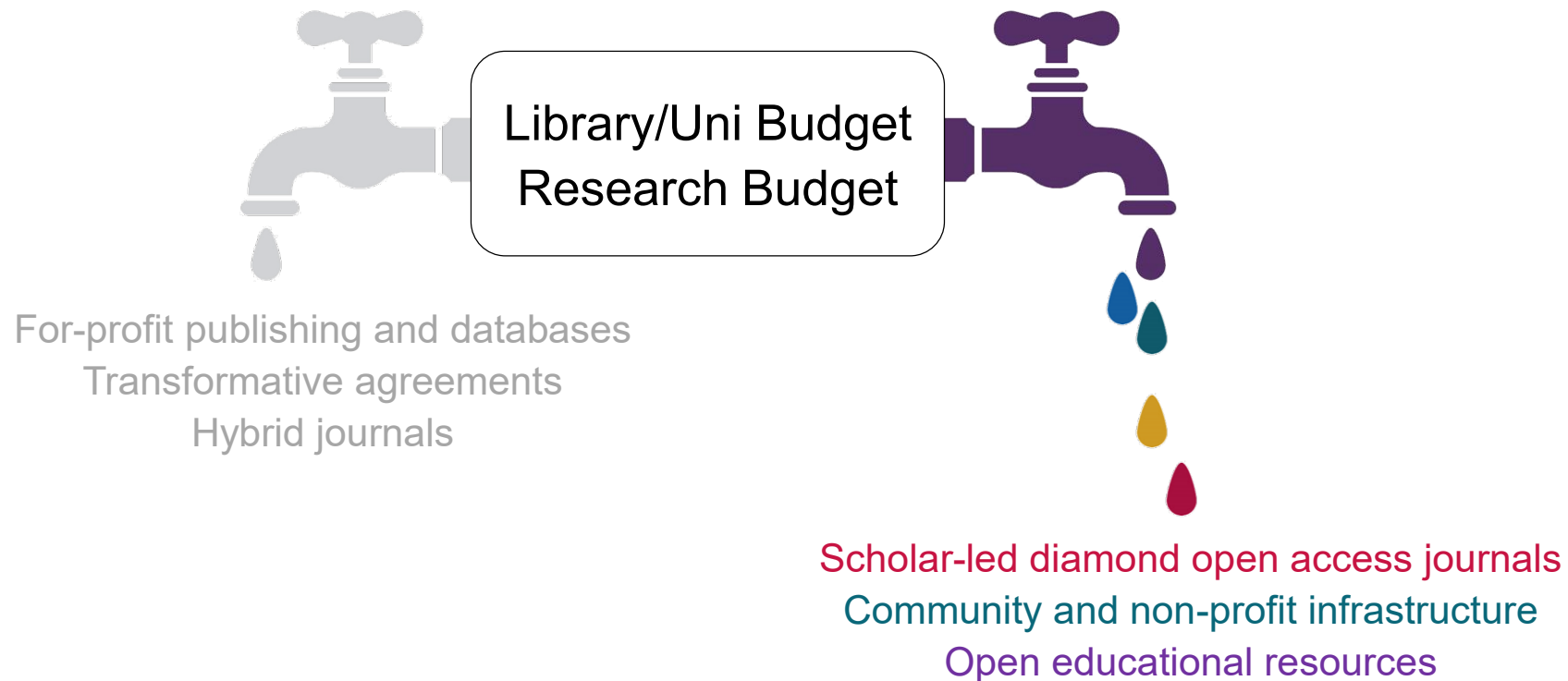
BEILSTEIN TALKS

An equitable, high-quality and efficient version of Open Science is underway – will you join?

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Summary

- Let's invest in and work towards Version 3.0 – equitable, high quality, efficient fueled by non-profit and community-owned infrastructure
- Lots of great examples of universities and non-profit initiatives already investing in this path – call to please join them!



Thank you and please feel free to get in touch.

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<https://www.linkedin.com/in/pattersonwendy/>