

Why not *Diamond Open Access* ?

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LSMS, IIC, ENAC, EPFL



Graphic from [PHD Comics](#)

Introduction

Outlook

1 History of (academic) press

- Foundation
- Authors rights
- Research Budgets
- Symbiotic relation between Publishers and Universities
- Advent of Open Access
- Scientific Production so far

2 Open Access

- Open Access models
- SNF Open Access recommendations

3 Publication Costs

- Rigorous publication costs estimation
- Article Processing Charges
- Publisher Revenues
- Publisher Margins

4 Diamond Open Access

- Definition
- DOA in Switzerland
- Overlay Journals

5 JTCAM example

- Community
- FAIR principles addressed
- Publication process
- Data Curation process
- Chronology
- Costs
- Structural Challenges
- Problematic of science metrics

6 Conclusion

A small history of (Academic) Press...

References:

- S. Buranyi, Is the staggeringly profitable business of scientific publishing bad for science? The Guardian (2017).
- Against Parasite Publishers: Making Journals Free (2022)

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That are **highly** recommended to read...



The History of the model
is that publishing scientific
manuscripts was...

...expensive.

Graphic from **PHD Comics**

History

First scientific press:

- 1450: Printing Press (in europe)
- 1534: Foundation of Cambridge University Press
- 1665: *Journal des Sçavans* (France), *Philosophical Transactions of the Royal Society* (UK)

History

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Defined the purpose of scientific journals:

- registration: authorship/priority claim
- certification: usually peer-review
- dissemination: provide (targeted) access
- archiving: permanent access link (citable)

Author and Copy rights

- 1710: *Statute of Anne*: British authors can control the copying of their books
- 1852: articles published (in FR/UK) can be freely reprinted and translated (unless reserved rights are explicitly mentioned)
- Foundation of Nature (1869) and Elsevier (1880)
- 1886: Berne Convention governing copyright: grants a CC BY licence by default.
- 1908: Berlin Act reverses the standards: reproduction implicitly forbidden.
- 1928: Rome Act: author's rights \neq copyright

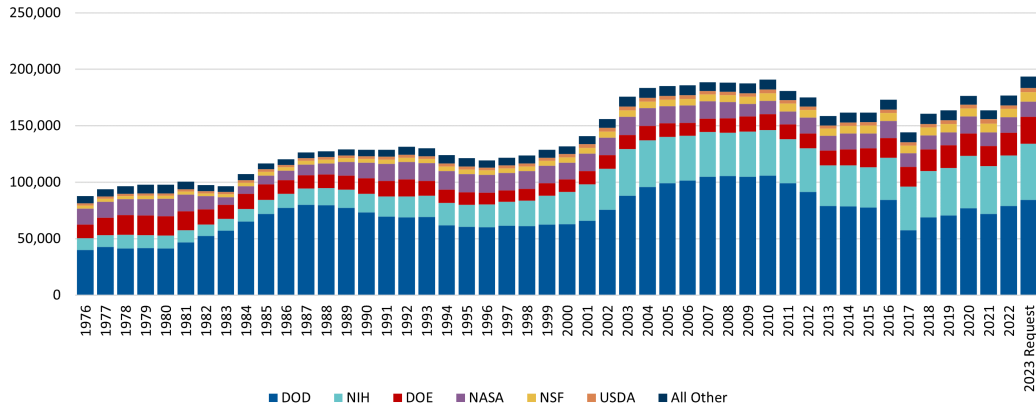
Post-World War II Research budgets increase enormously

The average yearly growth of the US federal budget dedicated to non-defense R&D between 1953 and 1973 is more than 15%

US Budgets

Trends in R&D by Agency

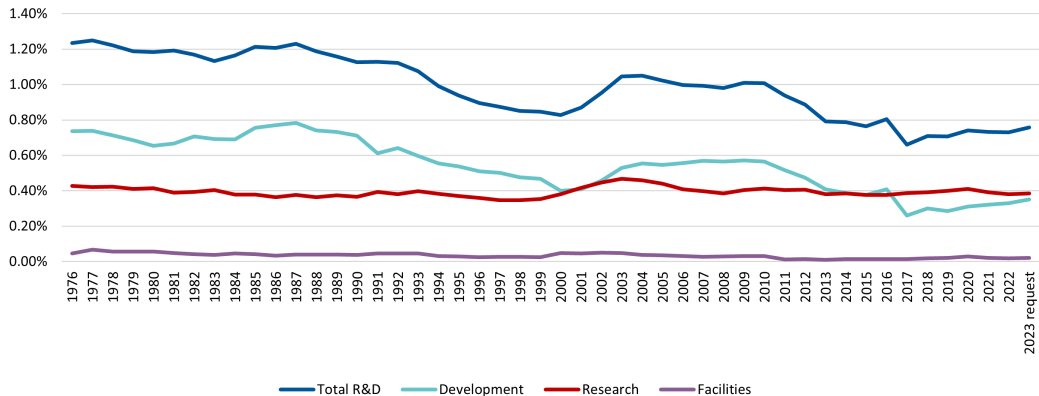
in billions of constant FY 2022 dollars



Source: historical AAAS analyses of OMB and agency R&D budget data and documents. Includes conduct of R&D and R&D facilities | AAAS 2022

US Budgets

Federal R&D as a Percent of GDP

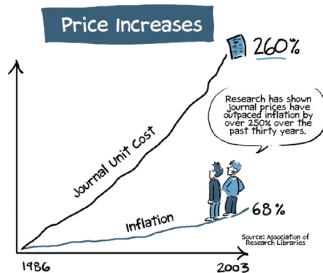
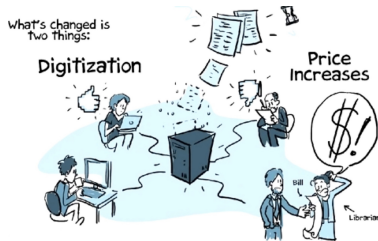


Note: Total R&D figures account for DOD adjustments to rectify differences in total obligational authority and new budget authority.

Source: AAAS R&D report series, based on OMB and agency R&D budget data. Includes conduct of R&D and R&D facilities. | AAA

New scientific publishing mechanisms

- 1951: Pergamon Press (now **Elsevier**) and R. Maxwell: many new thematic journals
- 1955: appearance of **impact factor**
- 1970s: rise of journals subscriptions \Rightarrow emerging crisis
- 1991: creation free archive *xxx.lanl.gov* at Los Alamos National Laboratory (to become **arXiv.org**).
- By 1994, three years after acquiring Pergamon, Elsevier had raised its prices by 50%. Librarians began cancelling subscriptions to less popular journals.



Graphic from **PHD Comics**

Advent of open access

- 2000: Foundation of **BioMed Central** publisher (now in Springer Nature) and online open-access with **article processing charge (APC)**
- 2000: 34,000 scientists petition:
“we will publish in, edit and review for, and personally subscribe to only those scholarly and scientific journals that have agreed to grant unrestricted free distribution rights to any and all original research reports.”

Leads to **the Public Library of Science (PLOS)**, with APC

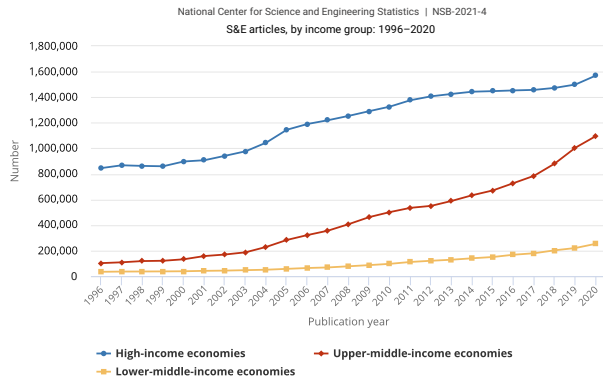
- 2002: **Budapest Open Access Initiative (BOAI)**: promotes open access **but** no recommendation for the costs
- 2005: The Wellcome Trust foundation: **funding requires output open access**
- 2018: **SNF allows to budget OA APC**
- 2021: **The Plan/cOAlition S**: requires Open Access journals or platforms. Followed by many institutions

Number of papers produced

*In 2006, **50 million** papers have been published since scholarly articles first appeared. Over three centuries, the annual number of published articles has grown exponentially at a **3% rate**.*

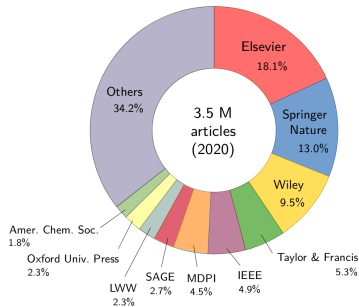
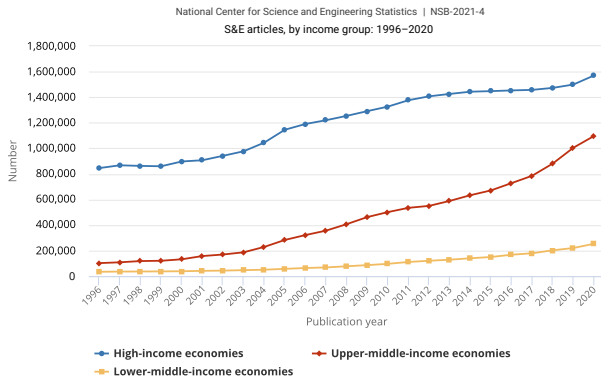
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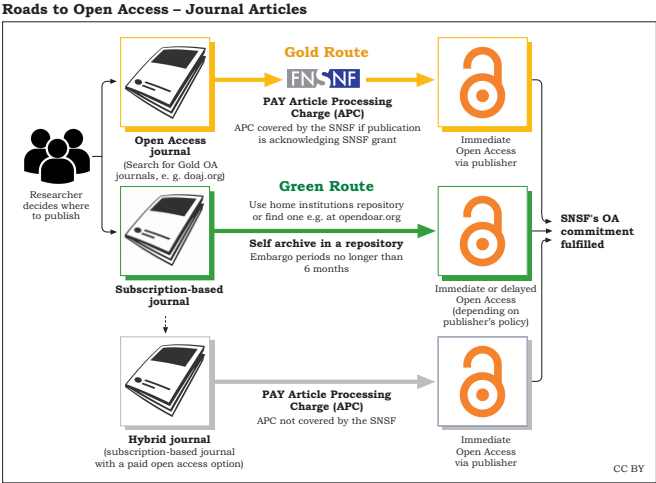
Against Parasite Publishers: Making Journals Free (2022)

Open Access Models

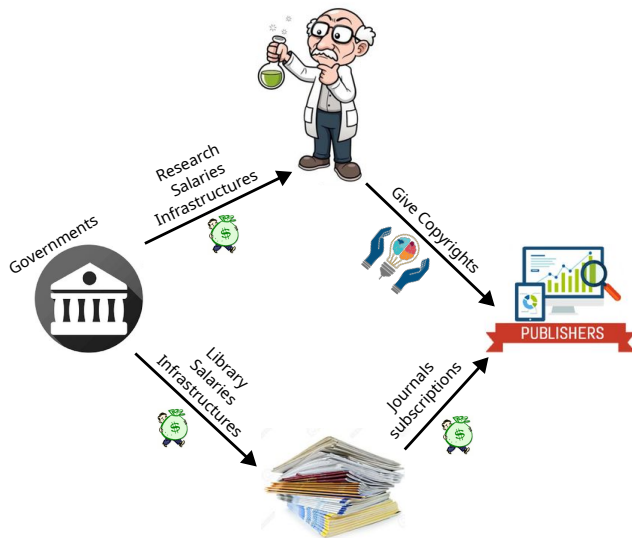
- Gold:
 - Immediate open access publication
 - created by the publisher
 - made available by publisher online platform
 - published under a licence that permits reuse (CC) licence.
- Green (self-archiving):
 - A version of the publication is archived online, e.g., in a repository (arXiv, HAL, infoscience).
 - does not include the (publisher) work of copyediting, proofreading, typesetting, indexing, metadata tagging, marketing or distribution.
 - Not listed by publishers (no metrics)
 - can be freely accessed (with possible embargo period)
 - Limited licencing

Credits to oabooks-toolkit

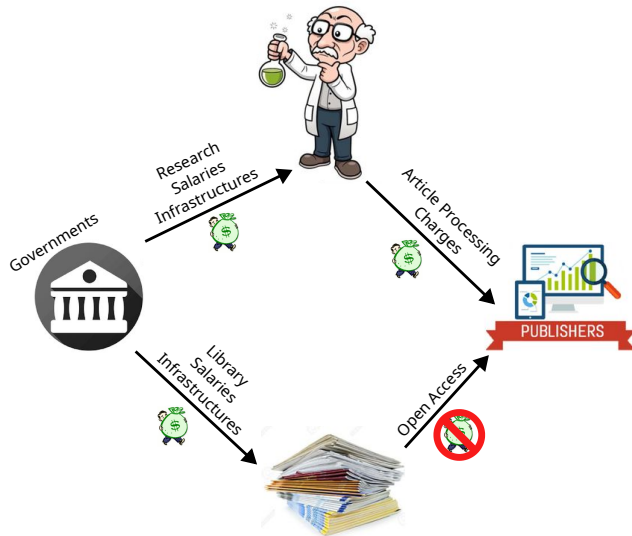
SNF Open access recommendations



What is the problem?



What is the problem?



Cost of a publication?

Grossmann, A. & Brembs, B. Current market rates for scholarly publishing services. (2021)

*[...] conservative estimates show that the publication cost for a representative scholarly article **is around \$400**.*

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How to evaluate such a cost?

Editorial cost of a publication?

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Content acquisition

- Authors (re-)submission
- Dealing with reviewers
- Plagiarism/Similarity check
- DOI for paper&reviews
- APC collection

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Content preparation

- Manuscript tracking
- Production check-in
- Manuscript Technical checking
- Copyediting, Typesetting, Figures/graphs/tables
- Metadata, metrics
- Authors corrections

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Dissemination/archiving

- Web OA platform and hosting
- Long-term digital preservation
- Distribution to indexing services (Scopus, PMC, DOAJ, ...)

Cost of APCs?

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Cost of APCs?

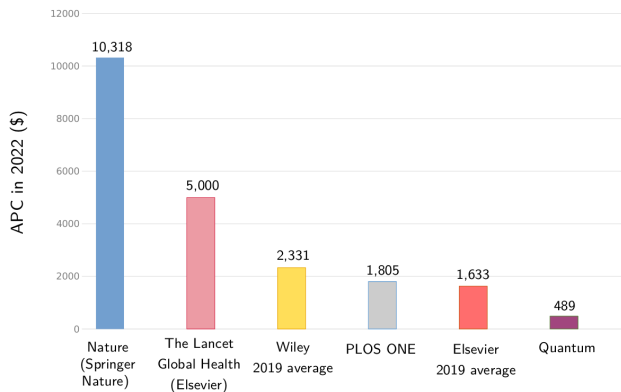
[...] conservative estimates show that the publication cost for a representative scholarly article is around \$400.

Yet APCs scale with impact factor

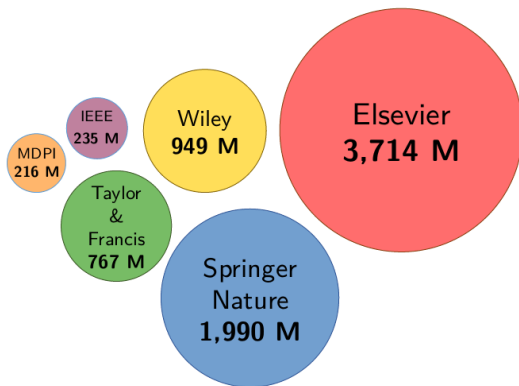
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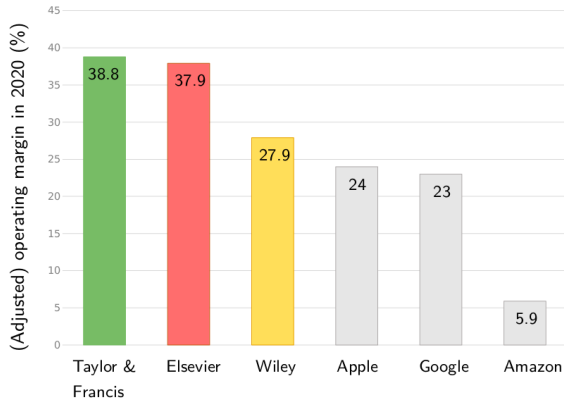


Publisher revenues



Revenues in 2020 of the biggest publishers in \$
Against Parasite Publishers: Making Journals Free (2022)

Publisher margins



*Declared Operating margins in 2020 in %
Against Parasite Publishers: Making Journals Free (2022)*

Diamond Open Access

Wikipedia Definition:

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OA Diamond Journals Study. Part 1: Findings. (2021)

Landscape

- ~ 29000 DOA journals (30% in DOAJ)
- Fewer articles (356000 per year vs. 453000 APC ones), average ~ 25 articles/year
- Since 2018 ↘ DOA articles while ↗ of APC-ones
- 45% in Europe, 25% in Latin America, 16% in Asia, 5% in the US/Canada
- 60% HSS, 22% science, 17% medicine

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Sustainability and funding

- 60% of DOA journals depend on volunteers
- The majority (53%) run with less than 1 FTE
- 70% declared less than \$/€10,000 annual costs.
- Funding mainly by Universities, and much less by Funding agencies

Diamond open in CH

1. Projet PLATO: l'Open Access Diamant est en bonne voie en Suisse - Bibliothèque - UNIGE. <https://www.unige.ch/biblio/fr/actus/projet-plato/> (2023).

Overlay Journals

Definition

*An **open access** academic **overlay journal** does not produce its own content, but selects from texts that are **already freely available online**.*



Journal of Theoretical,
Computational and
Applied Mechanics

■ Overlay Journal

- Always a preprint shared on Open Archives (even for refused papers)
- Diamond Open Access
- FAIR open access (**F**indable, **A**ccessible, **I**nteroperable, **R**eusable)



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■ Team

- Technical board: creators of the journal + data/software editor
- Scientific Board: invited
- Editorial board: elected
- Collegial decisions, no editor in chief



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- Publish reviewers' work as Open Reviews



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- Strong incentive for **reproducibility** (ongoing)



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■ **Copy-editing**

- Very high quality
- Script to check the correctness of bibliographic entries

JTCAM: Research Community

- Solid Mechanics (Not well aware of Open Access good practices)
- Wide spectrum: theoretical, applied, numerical, experimental
- Classical journals and publishers
 - IJP, JMPS, IJSS, CMAME, IJMM, TI, IJES, Wear, ActaMat (Elsevier)
 - IJNME, Adv Mat (Wiley)
 - Comp Mech, Meccanica (Springer)
 - PRS (Cambridge)
 - Mechanics of Adv Mat and Struct (Taylor & Francis)
- Alternate journals (Diamond Open Access)
 - CRAS (Mersenne)
 - Archives of Mechanics (since 1950)
 - Technische Mechanik
 - Mathematics and Mechanics of Complex Systems (half-diamond)
 - JACM
 - ACM

JTCAM FAIR principles

Findable by Journal indexation

- *Directory of Open Access Journals (DOAJ), Free Journal Network (FJN), International Standard Serial Number International Center (ISSN), Mir@bel*

Accessible

- OpenSource **Episcience** CMS (funded by French **CCSD** through CNRS, INRIA, INRAE, OpenAIRE, FNSO)
- Overlay Journal: articles stored in open repositories (**arXiv**, **HAL**)
- Curated/Reviewed Datasets with DOI **@Zenodo (new)**
- **CC-BY license**

Interoperable

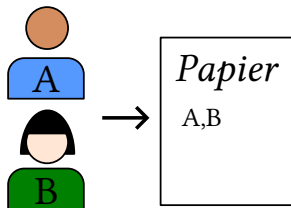
- Provided by the repositories with metadata

Reusable

- Saving Software revision **@Software Heritage** (SWHID ~ DOI for software)
complement datasets

JTCAM: publication process

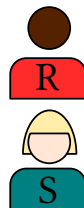
Authors



JTCAM
Editor



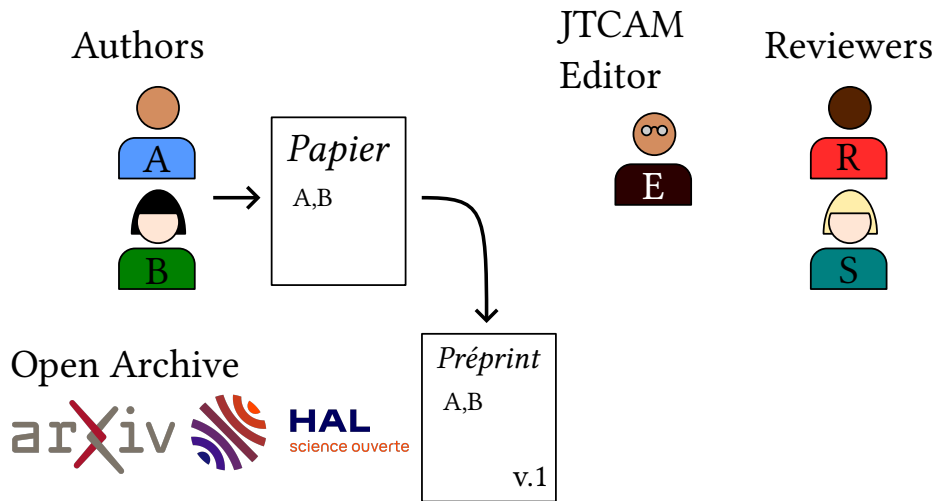
Reviewers



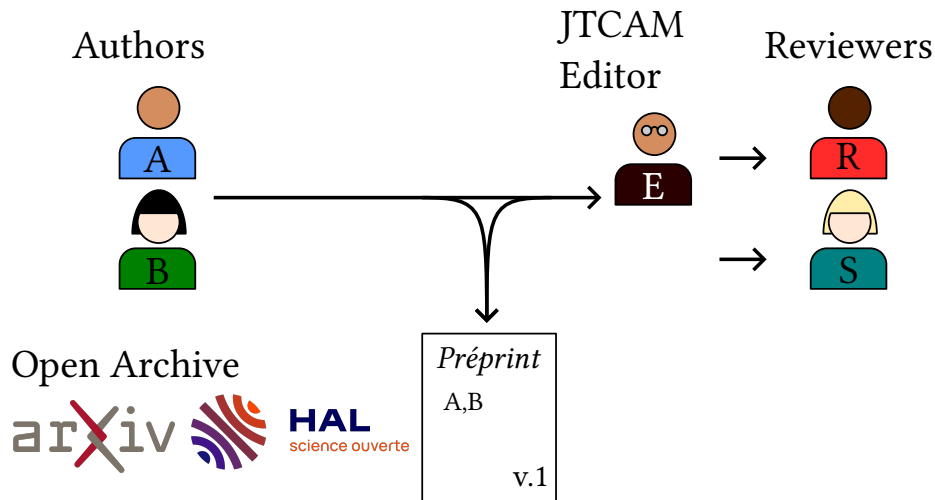
Open Archive



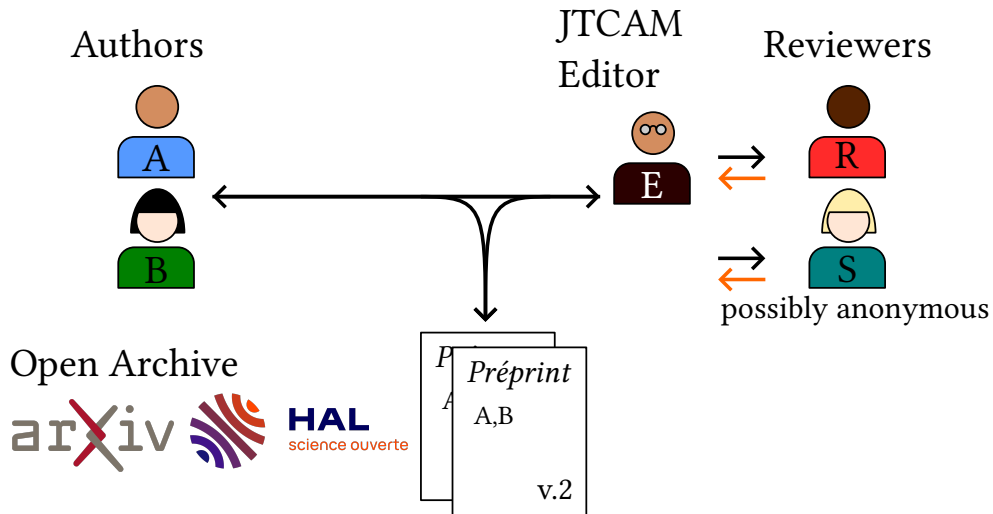
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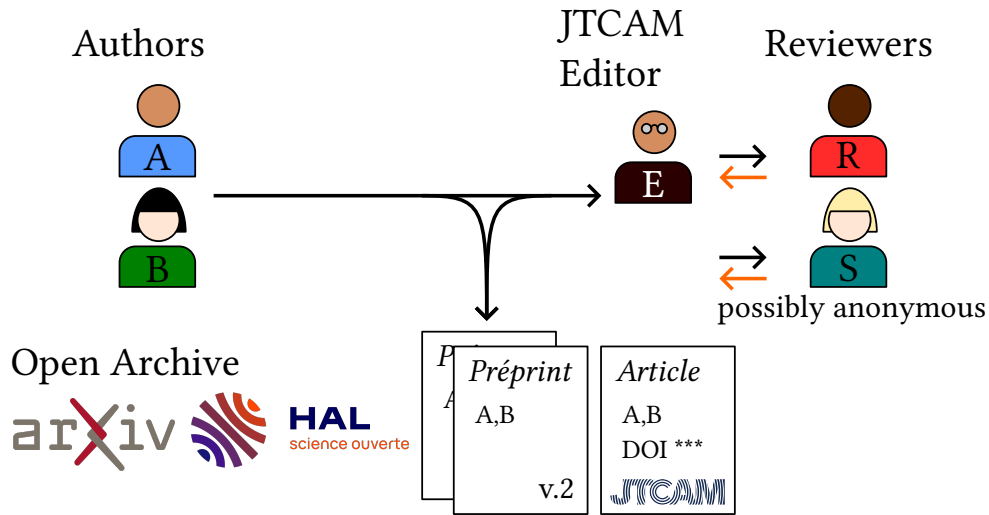
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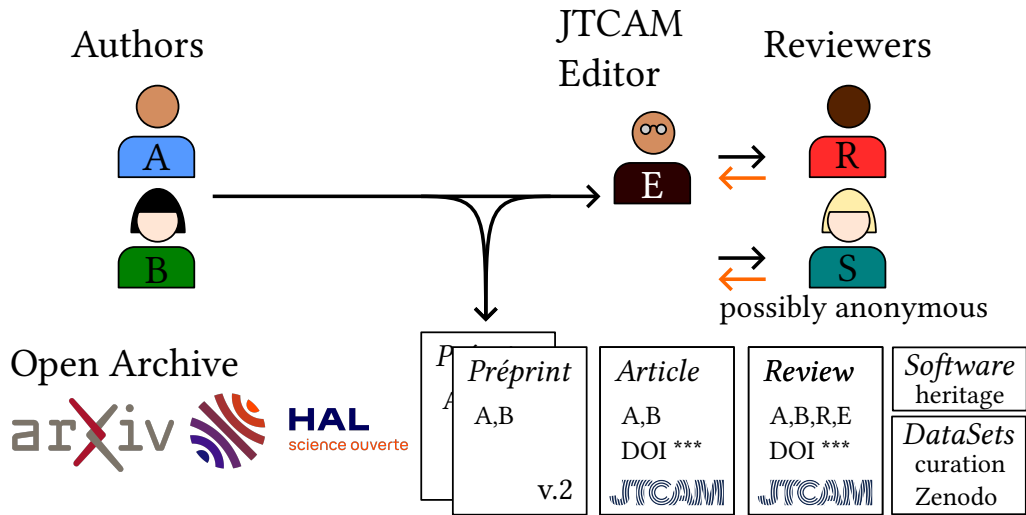
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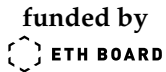


Dataset Curation Management

Data curation tool



<https://gitlab.com/dcsm/solidipes>



Time to offer an ethical and open publication model

- 2015/09 First discussion between V. Acary & M. Legrand
- 2017/07 Online discussion with interested contributors
- 2018/05 Steering committee (title, logo, etc)
- 2019/06 Scientific committee (25 members)
- 2020/01 JTCAM accepted by the Episciences platform
- 2020/05 Editorial committee (10 members)
- 2020/08 Official JTCAM kick-off
- 2020/09 First submission
- 2022/10 Referenced in DOAJ

JTCAM: costs

JTCAM: Challenges

- 30 articles published (10 refused)
 - Mostly from French community (90%)
 - Difficult to become international
- Copy-editing
 - Low motivation on authors' side
 - Lots of work for technical editors (about 10h of work per paper)
 - Fairly long time between acceptance and publication
- Open Data/Open Software
 - Cultural limitations
 - Development of curation tool (ETH-ORD funding)

Community adhesion challenge

Lack of journal metrics is fearsome for JTCAM authors

- Authors fear for impact (for young investigators careers)
- Reputation takes time to build
- Imbalance between countries incentives (rich vs. poorer countries)

San Francisco Declaration on Research Assessment (DORA, 2013)

Do not use journal-based metrics, such as Journal Impact Factors, as a surrogate measure of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions.

What is the problem?

Is the staggeringly profitable business of scientific publishing bad for science?, The Guardian (2017)

Randy Schekman

[...] it seems journals hold sway even more prominently than before. It is that influence, more than the profits that drove the system's expansion, that most frustrates scientists today

Elsevier

We help researchers be more productive and efficient, [...] and that's a win for research institutions, and for research funders like governments

guardian

*[...] history shows that betting against science publishers is a risky move. After all, **back in 1988**, Maxwell predicted that in the future there would only be **a handful of immensely powerful publishing companies left**, and that they would ply their trade in an electronic age **with no printing costs**, leading to almost pure profit.*

That sounds a lot like the world we live in now

Conclusion

Where we are

- There is value and costs involved in scientific press

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Time for change?

- If academic press is a market,
 - Diamond Open Access can be a concurrent
 - Breaks monopolies
 - “Could” lower prices
 - Breaks un-ideal search for sensational

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- Saved money can fund repositories (infoscience, research collection, Zenodo), Software development initiatives (ETH-ORD, SNF), or simply research