

Open Science and its impact on Mathematics

[Collaborations in Algebra, Representation theory and Ethics](#)

Florence Codet (ENS de Lyon), Alain Marois (ENS de Lyon), Filippo A. E. Nuccio (Inria and UJM)

ENS de Lyon – 27 octobre 2025

Introduction : “Academic Publishing” by



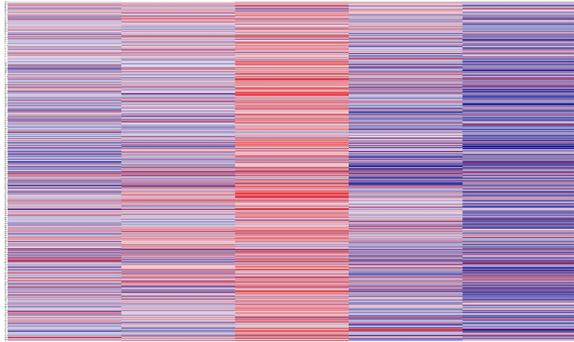
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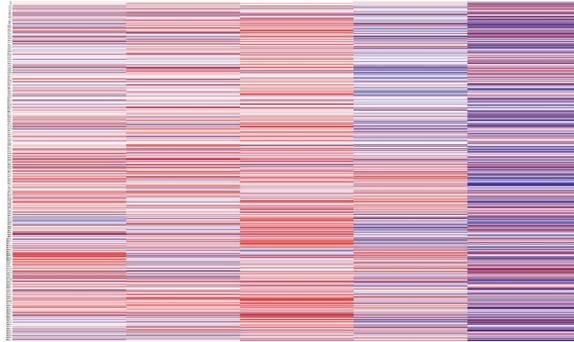


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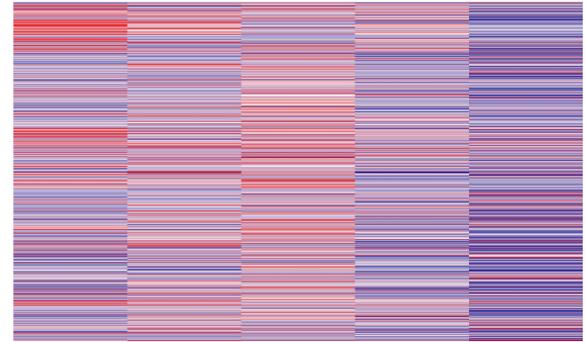
Impact factor inflation: policies can have an effect



Biology



Mathematics



Physics

IF evolution by 2-year steps: period 2014-2024 in Biology, Mathematics and Physics

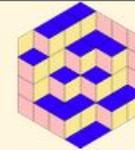
Journals subscription costs



Press Release 2017-07-27

***Journal of Algebraic Combinatorics* flips to Fair Open Access.**¹

At the end of June 2017, the four editors-in-chief of the *Journal of Algebraic Combinatorics* informed Springer that they will not renew their contracts, which terminate on 31 December 2017. Nearly all of the editorial board members will also resign, to form the editorial board of a new journal that will be called *Algebraic Combinatorics*, run according to Fair Open Access Principles. The new journal *Algebraic Combinatorics* will be up and running very shortly, with interim editors-in-chief Satoshi Murai and Vic Reiner. The transition to Fair Open Access is supported by the organisation *Mathematics in Open Access* (MathOA).

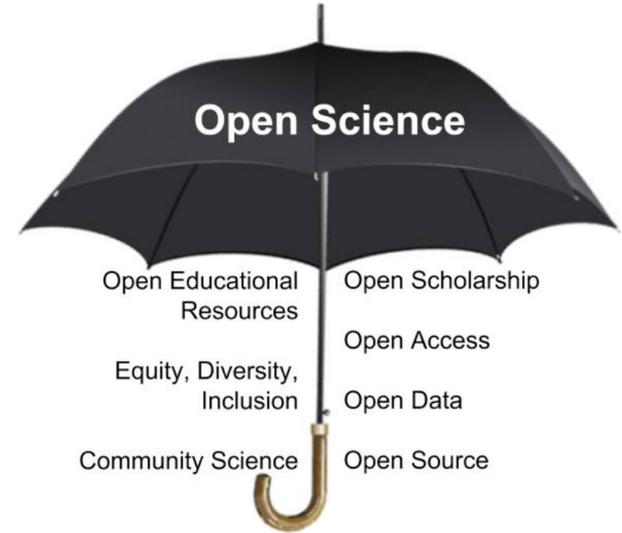
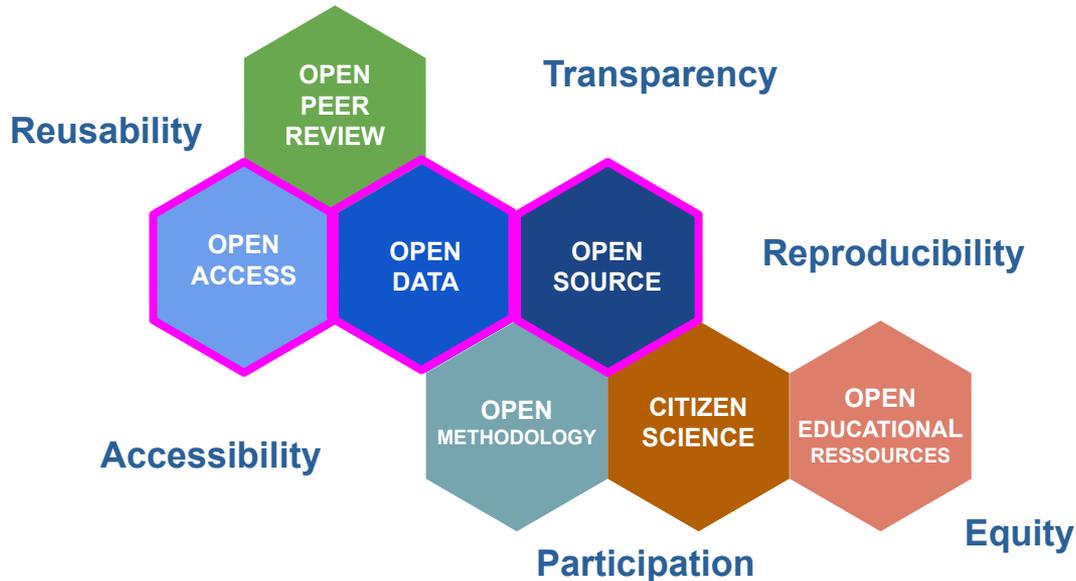


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Open Science : what are we talking about ?

“Open Science is the free dissemination of the results, methods and products of scientific research. It is based on the opportunity the digital transformation represents to help develop open access to publications and – as far as possible – to data, source codes and research methods.” [Comité pour la Science Ouverte, 2018](#)



R.Champieux; D. Robinson

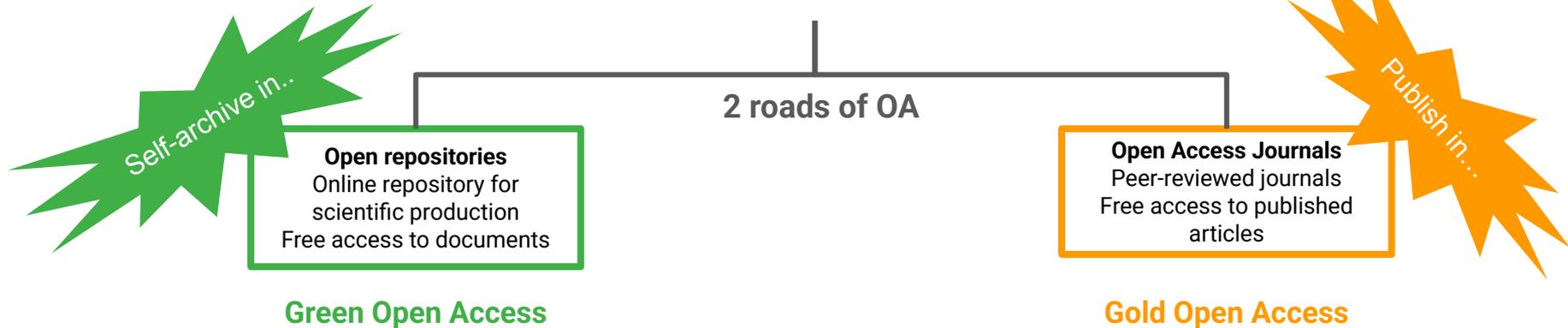


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Open Access : The devil is in the details #1

The screenshot shows the eScholarship website interface. At the top, it says 'eScholarship | Open Access Publications from the University of California'. Below that is the 'Combinatorial Theory' journal header. The article title is 'The critical group of a combinatorial map' by Merino, Criel, Moffatt, Iain; Noble, Steven. A red box highlights the Creative Commons Attribution (CC BY) license logo in the bottom right corner of the article information section.

<https://doi.org/10.5070/C65365550>

The screenshot shows the EMS Press website interface. The article title is 'Prismatic F -crystals and Lubin-Tate (φ_q, Γ) -modules' by Samuel Marks. A red box highlights the Creative Commons Attribution (CC BY) license logo in the bottom right corner of the page.

<https://doi.org/10.4171/dm/1009>

Open Access : The devil is in the details #2

The screenshot shows the Cambridge University Press website interface. At the top, there is a navigation bar with 'Cambridge Core' and 'Open research' menus. The article title is 'Two dynamical approaches to the notion of exponential separation for random systems of delay differential equations'. Below the title, there are tags for 'Functional-differential and differential-difference equations' and 'Smooth dynamical systems: general theory'. The authors listed are Marek Kryspin, Janusz Mierczyński, Sylvia Novo, and Rafael Obaya. A 'Rights & Permissions' button is visible at the bottom of the article content area.

<https://doi.org/10.1017/prm.2025.15>

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The screenshot shows the top navigation bar with 'View PDF', 'Download full issue', and 'View Open Manuscript' buttons. Below is the journal information: 'Advances in Mathematics', Volume 358, 15 December 2019, 106827. The article title is 'Chaos, ergodicity, and equilibria in a quantum Kac model' by Eric A. Carlen, Maria C. Carvalho, and Michael P. Loss. A red box highlights the link 'Under an Elsevier user license' and a red arrow points to a red question mark icon next to the 'Open archive' link.

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ELSEVIER Advances in Mathematics Volume 358, 15 December 2019, 106827

Chaos, ergodicity, and equilibria in a quantum Kac model

Eric A. Carlen ^{a b c}, Maria C. Carvalho ^{a b}, Michael P. Loss ^b

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Abstract

We introduce quantum versions of the Kac Master Equation and the Kac Boltzmann Equation. We study the steady states of each of these equations, and prove a propagation of chaos theorem that relates them. The Quantum Kac Master Equation (QKME) describes a quantum Markov semigroup $\mathcal{P}_{N,t}$, while the Kac Boltzmann Equation describes a non-linear evolution of density matrices on the single particle state space. All of the steady states of the N particle quantum system described by the QKME are separable, and thus the evolution described by the QKME is entanglement breaking. The results set the stage for a quantitative study of approach to equilibrium in quantum kinetic theory, and a quantitative study of the rate of destruction of entanglement in a class of quantum Markov semigroups describing binary interactions.

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OA and the academic publishing ecosystem

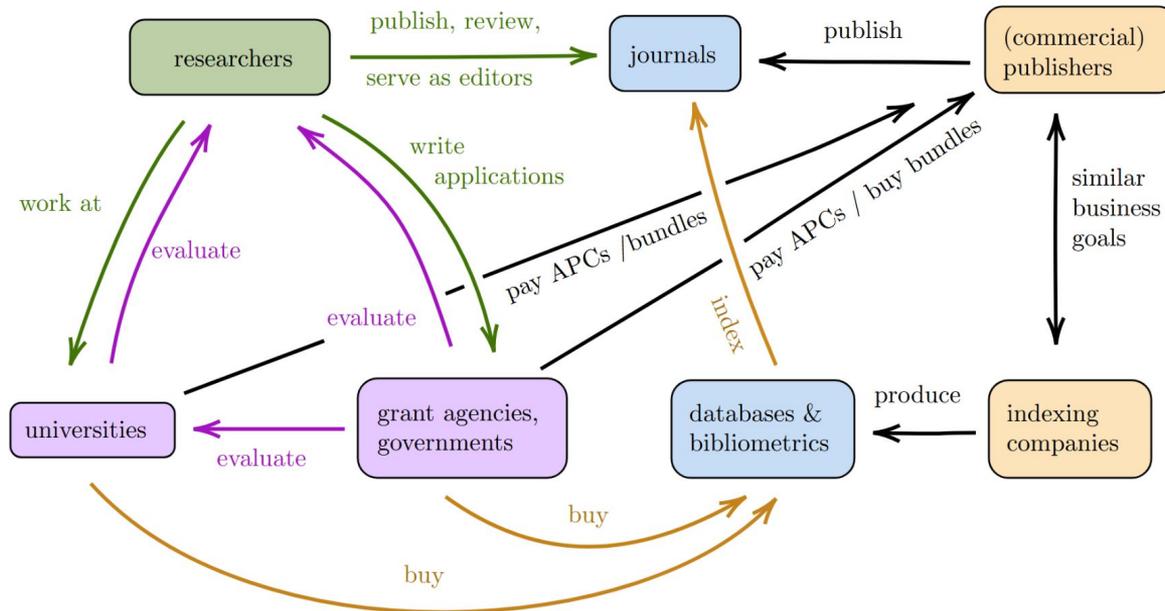
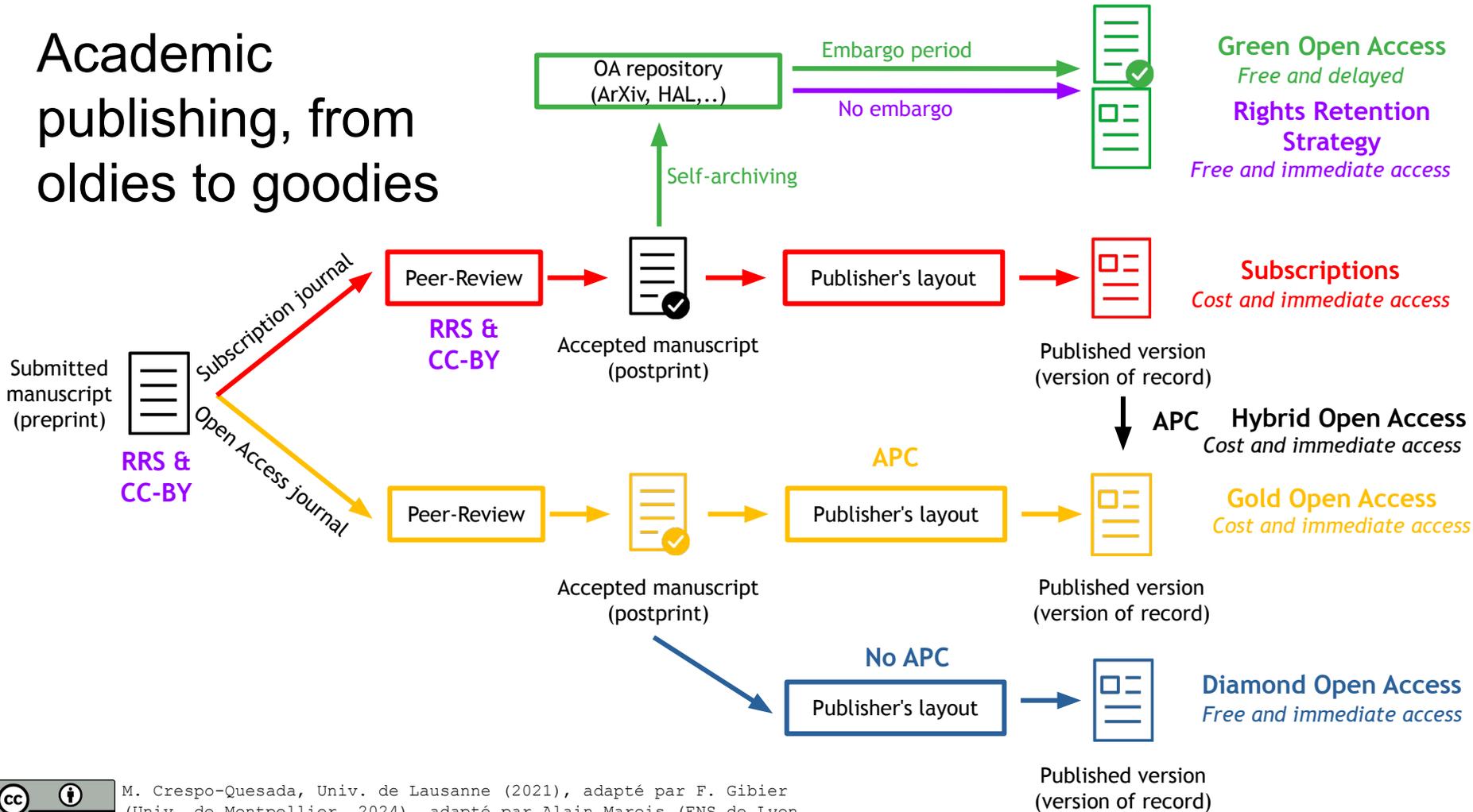


Figure 1: A simplified depiction of the academic publishing ecosystem

Academic publishing, from oldies to goodies



Publishing in Gold OA : examples

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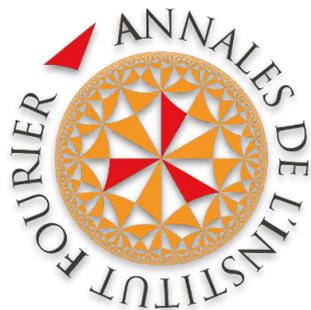
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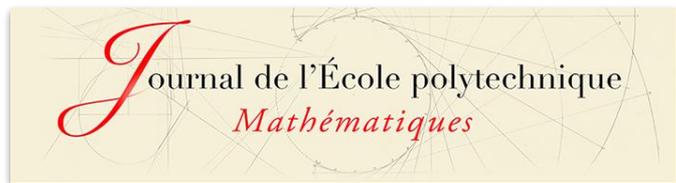
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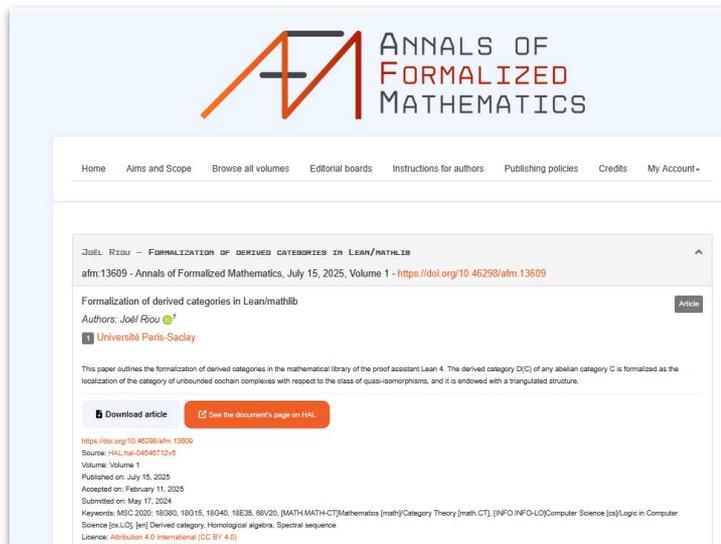
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Publishing in Diamond OA : examples of overlay journals



The screenshot shows the homepage of the journal "Annals of Formalized Mathematics". The header features the journal's logo, which consists of a stylized orange and black 'A' with a plus sign, followed by the text "ANNALS OF FORMALIZED MATHEMATICS". Below the header is a navigation menu with links for "Home", "Aims and Scope", "Browse all volumes", "Editorial boards", "Instructions for authors", "Publishing policies", "Credits", and "My Account". The main content area displays an article by Joël Riou titled "Formalization of derived categories in Lean/mathlib", published in Volume 1, July 15, 2025. The article is associated with Université Paris-Saclay. A "Download article" button is visible, along with a link to the document's page on HAL. Metadata includes the URL <https://doi.org/10.46298/afm.13609>, the source HAL:hal-0494971v9, and keywords such as MSC 2020: 18D05, 18G15, 18G40, 18E35, 68V20, [MATH.MATH-CY]Mathematics [math.CY], [INFO.INFO-LQ]Computer Science [cs.LQ], and [cs.LQ] Derived category, Homological algebra, Spectral sequence. The license is Attribution 4.0 International (CC BY 4.0).

<https://doi.org/10.46298/afm.13609>



The screenshot shows the homepage of the journal "Épijournal de Géométrie Algébrique". The header features the journal's logo, which consists of a stylized blue and black 'E' with a plus sign, followed by the text "EPIGA". To the right of the logo is a banner with a blue mosaic background and the text "ÉPIJOURNAL DE GÉOMÉTRIE ALGÈBRE" in white. Below the header is a navigation menu with links for "Accueil", "Comité éditorial", "Conseils pour soumettre", and "A propos de la revue". The main content area displays the journal's description: "L'Épijournal de Géométrie Algébrique est une revue scientifique à comité de lecture fondée en 2016. La sélection des articles suit un processus éditorial classique (évaluation des soumissions par le comité éditorial sur avis de référés). Les articles sont publiés en français (avec un abstract en anglais) ou en anglais. Les domaines couverts par la revue sont la géométrie algébrique au sens large, y compris la géométrie complexe et arithmétique, la théorie des groupes algébriques et des représentations. Pour consulter la composition du comité éditorial de la revue, cliquez ici." The URL <https://epiga.episciences.org/> is displayed below the screenshot.

<https://epiga.episciences.org/>



The logo for EPIsciences, featuring a stylized blue and black 'E' with a plus sign, followed by the text "EPIsciences" in blue and "revues en accès libre" in black below it.

Publishing in closed access : examples

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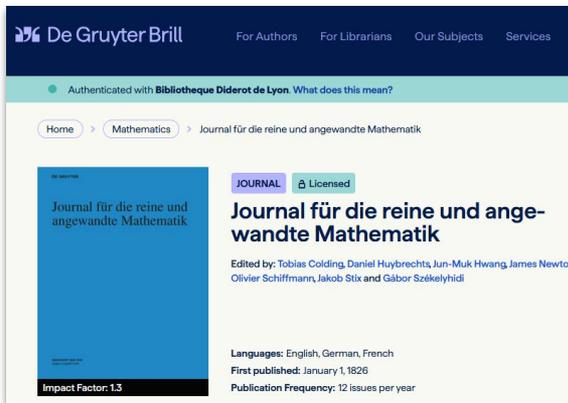
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Publishing in Hybrid OA journals: examples



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First published: January 1, 1826
Publication Frequency: 12 issues per year

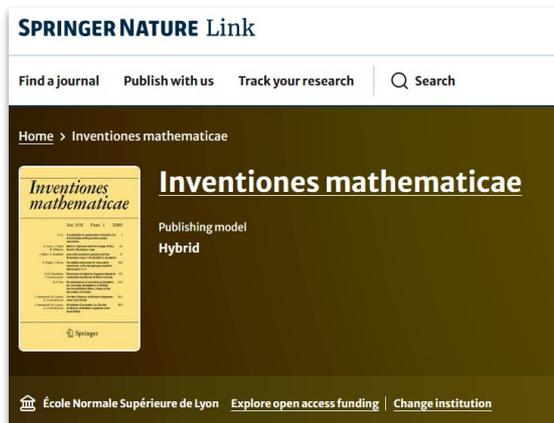
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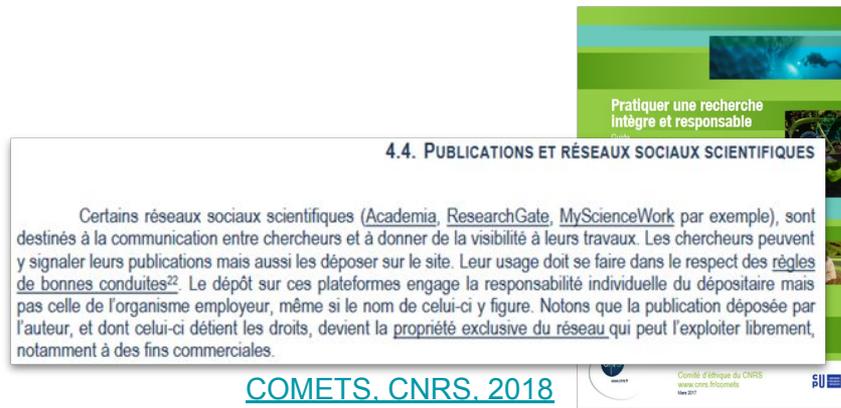
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[Andrew Lewis \(2010\).](#)

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| Send you lots of emails (by default) | No | Yes | Yes |
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[K. Fortney, J. Gonder, 2015](#)



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[COMETS, CNRS, 2018](#)

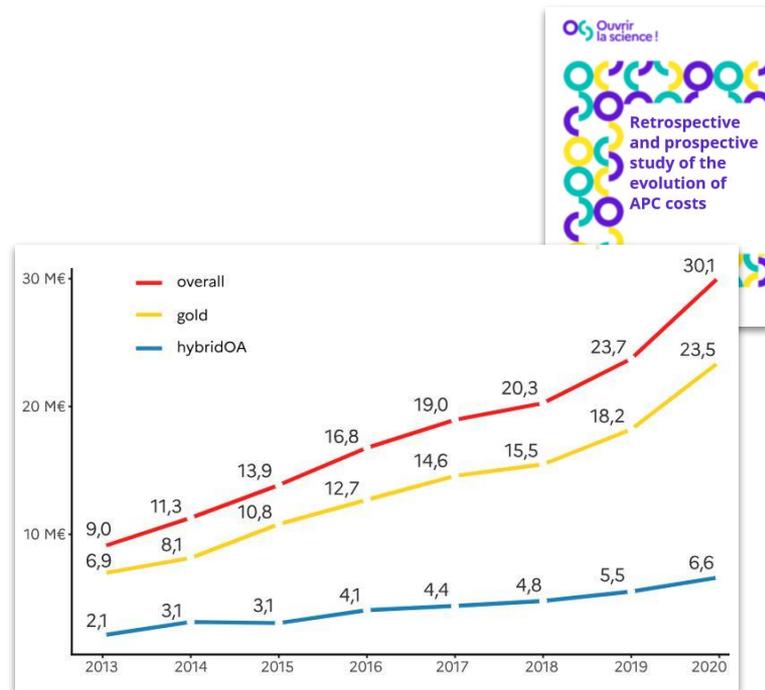


APC and costs

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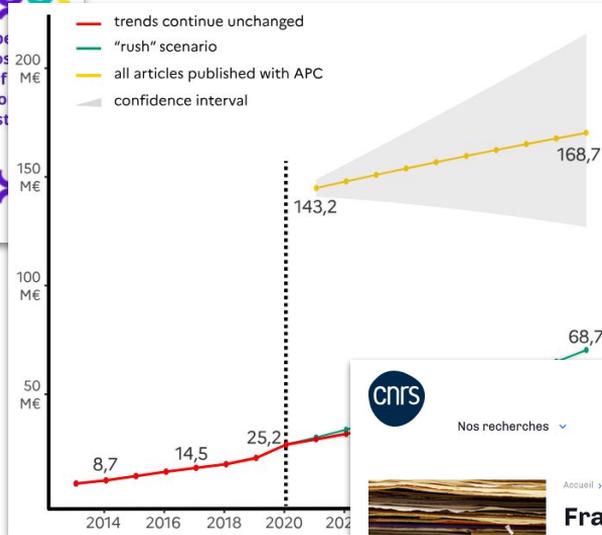
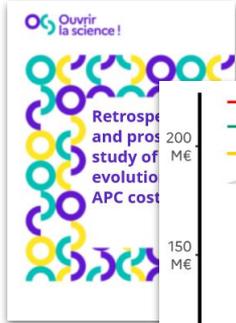


Cumulative APC costs for the ENS de Lyon over the year 2023, hybrid and pure gold OA cumulated, [OpenAPC oct. 2025](#)



Evolution of APCs paid by french corresponding authors from 2013 to 2020, [A. Blanchard, D.Thierry, M. van der Graaf, 2021](#)

APC and costs : an unsustainable model ?



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Frais de publication : « nous sommes au bord du gouffre »

22 juin 2023 INSTITUTIONNEL

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-  Read the [Recommendations of the IMU and the ICIAM on Fraudulent Publishing](#) (sept. 2025)



Predatory criteria v1.0

Some infrastructures for O. A. in Mathematics

→ Mathdoc :  *Mathdoc*

◆ [Centre Mersenne](#), [Numdam](#), [Geodesic](#)

→ [EPIsciences](#)  **EPI**sciences

◆ [EPIGA](#), [Annals of Formalized Mathematics](#), and well beyond Math!

→ [PCI](#) (not very much in Math... *yet!*)

→ [zbMATH Open](#) **zbMATH**  **Open**
THE FIRST RESOURCE FOR MATHEMATICS

Some organisations supporting O. A. in Mathematics

- [MathOA](#)  **MathOA**
Mathematics in Open Access

- [KOALA](#)  **KOALA**
KONSORTIALE OPEN ACCESS LÖSUNGEN
AUFBAUEN — AUSBAUEN — VERANKERN

- [The Combinatorics Consortium](#)



- [The Association for Mathematical Research](#)



- ...

The S2O model

→ What is this?

SUBSCRIBE TO  PEN

→ Who uses it?

◆ [MSP](#)  mathematical sciences publishers

◆ [SMF](#)  Société
Mathématique
de France

◆ [EMS-Press](#) 

→ Is it Diamond Open Access?

Discussion : “academic dream” & open access week 2025 theme

<https://www.openaccessweek.org/theme>



Dr. Glaucomflecken
1,25 M d'abonnés



<https://youtu.be/hoUGiS1LeKU?si=BKP3TJ0hTeiSJ14g>

Thank you!

Questions?



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