Open Science :

An introduction

Nantes Université

BU Nantes - 2024

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What is Open Science?

Rotating Interviews about Open Science

- **In groups of three**, 5 minutes per interview before rotating until everyone had each role.
  - 1 Interviewer
  - 1 Interviewee
  - 1 Note Taker
- **Questions for the interview :**
  - Who are you? (Name, PhD Year, Research Area)
  - What is Open Science for you?
  - Have you ever had Open Science practices?
  - Have you ever felt confronted with Open Science challenges?

Open Science

Modifiable

Reusable

Unrestricted dissemination of research results in order to reuse them

Transparency of the research assessment process

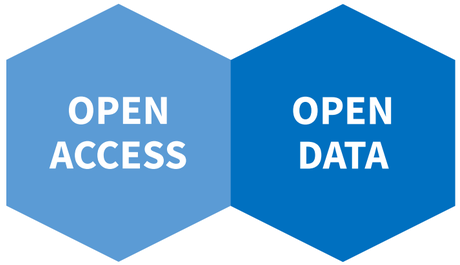
Opening and sharing educational resources

Reproducibility of experiments, surveys, and other research practices

Involvement of the non-scientific general public in the research process

Open Science

Unrestricted dissemination of research results in order to reuse them

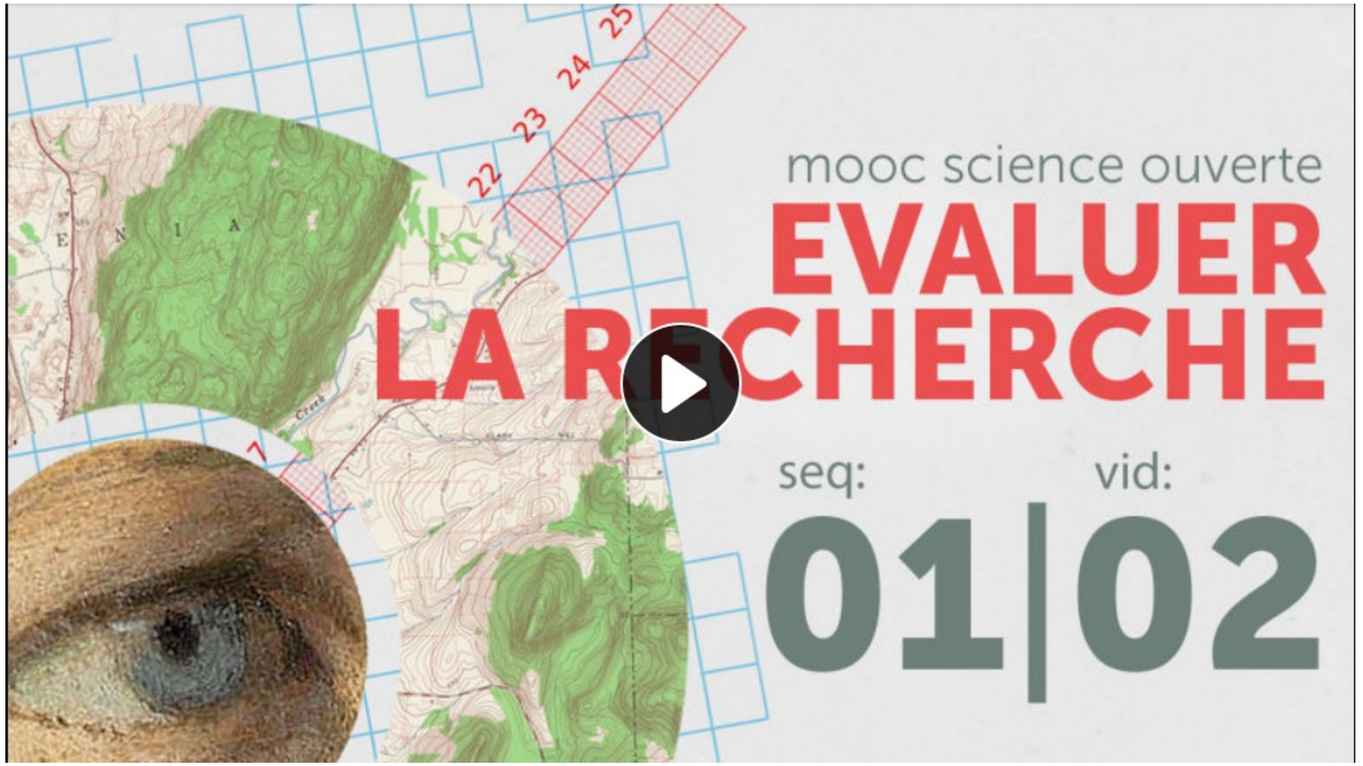


Involvement of the non-scientific general public in the research process

Open Peer Review

OPEN PEER REVIEW

A short video explaning the opening of peer-reviewing (with english subtitles available)
https://tubedu.org/w/m7CJrpJaPhgHq1XcxeG1cK



A brief history of Open Science

Creation of arXiv
1991

Budapest Open Access Initiative
Déclaration
2002

San Francisco Declaration on Research Assessment (**DORA**)
Déclaration
2012

1990

2000

“Field-based Initiatives” Era

“Grand Declarations” Era

A brief history of Open Science

Law for a Digital Republic
2016

National Plan for Open Science
2018

Plan S
2018

Second National Plan for Open Science
2021 - 2024

2010 **2020**

“Public Policies” Era **“Mandatory Requirement” Era**

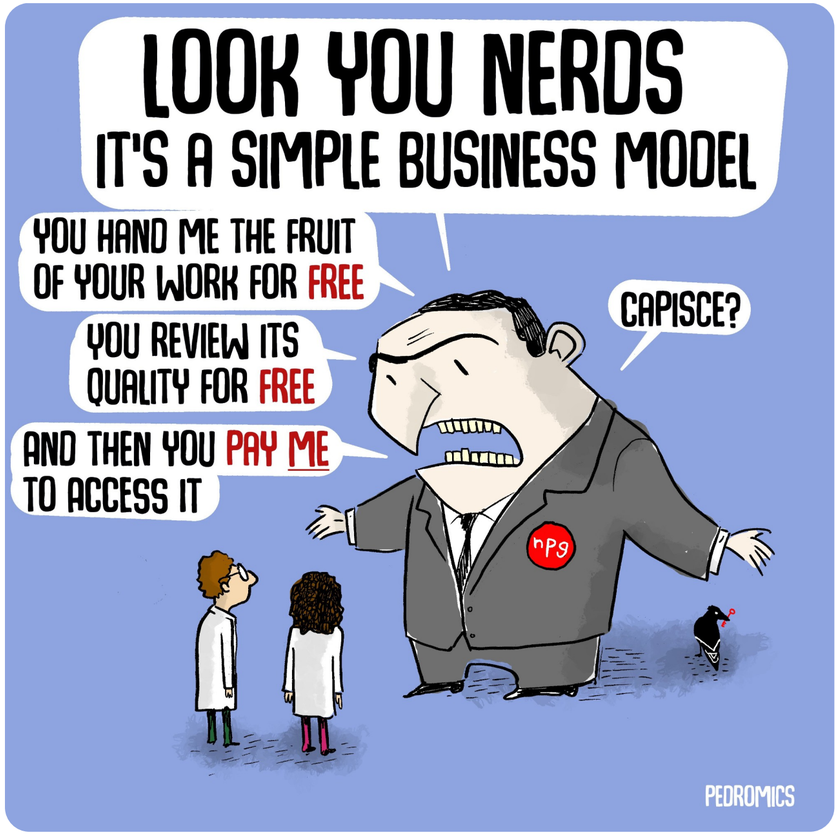
OPEN ACCESS

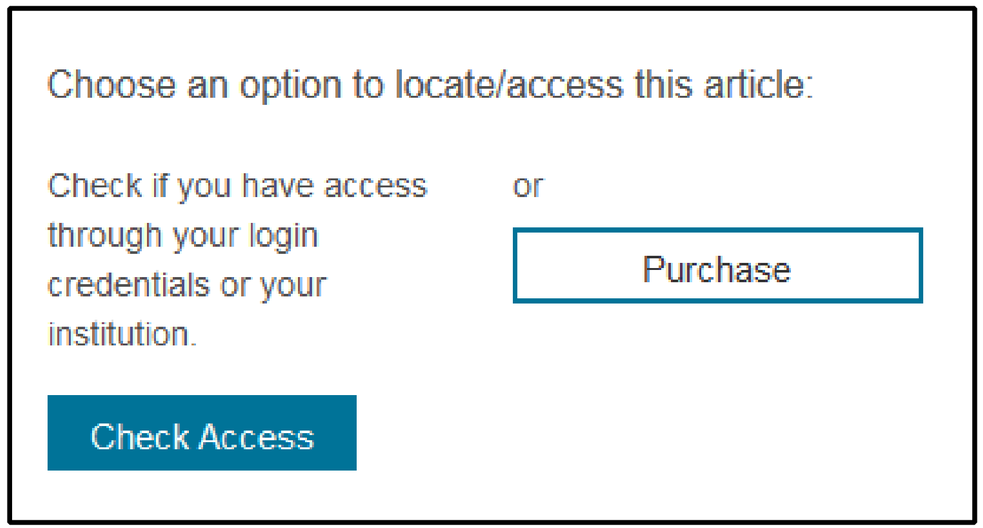
Open Access to Publications

Open Access: some context

Science is cumulative…

…but research results are hidden behind a paywall





Open Access: some context

OPEN ACCESS

Rising cost of access to scientific journals…

…oligopoly of the "big four"

Around **125 millions euros per year** spent on subscriptions to academic publishers in France in 2022 (Couperin, 2023)

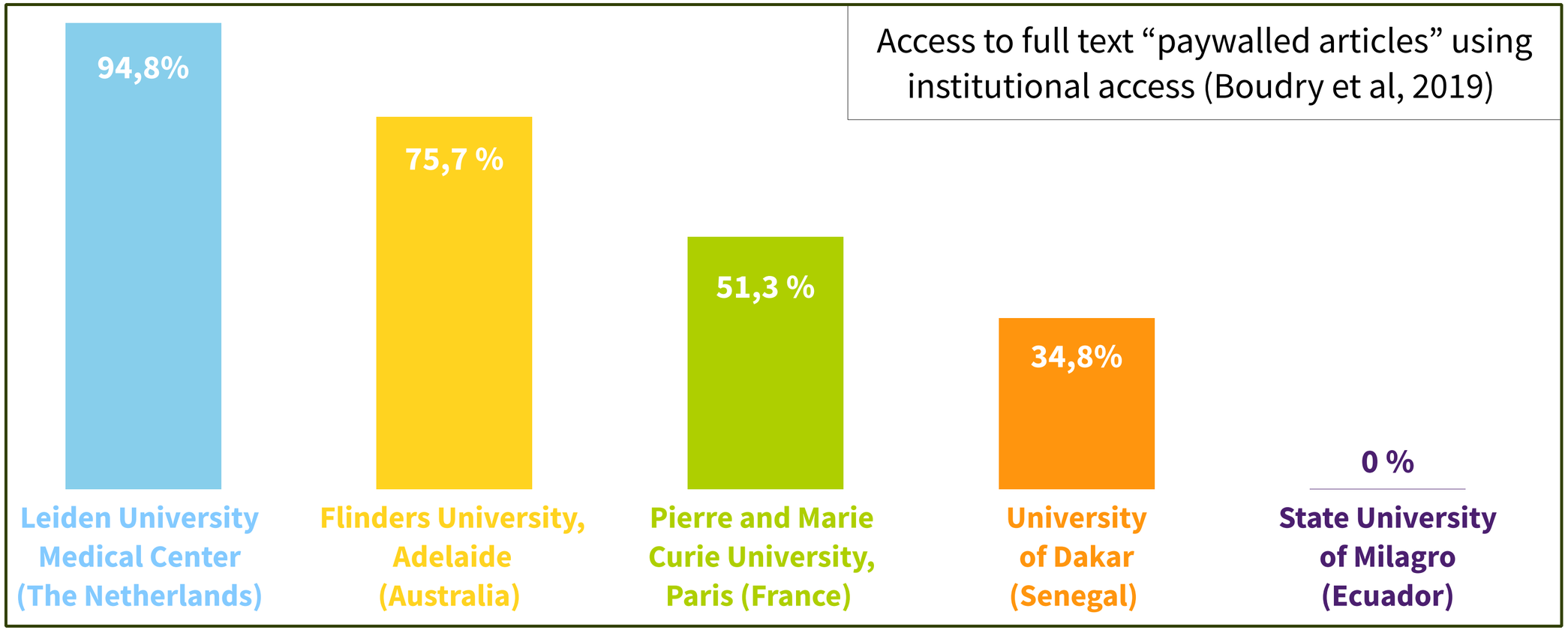
In the UK, between 2010 & 2014, subscription costs to specific journals **increased by 50%** (Times Higher Education)

Public Funding

In 2018, the University of Liège stated that the **increased cost** in journals subscriptions equalled to the loss of **3 research positions** each year

Open Access: some context

Disparity in access to research publications…



… leads to disparity in the production of research

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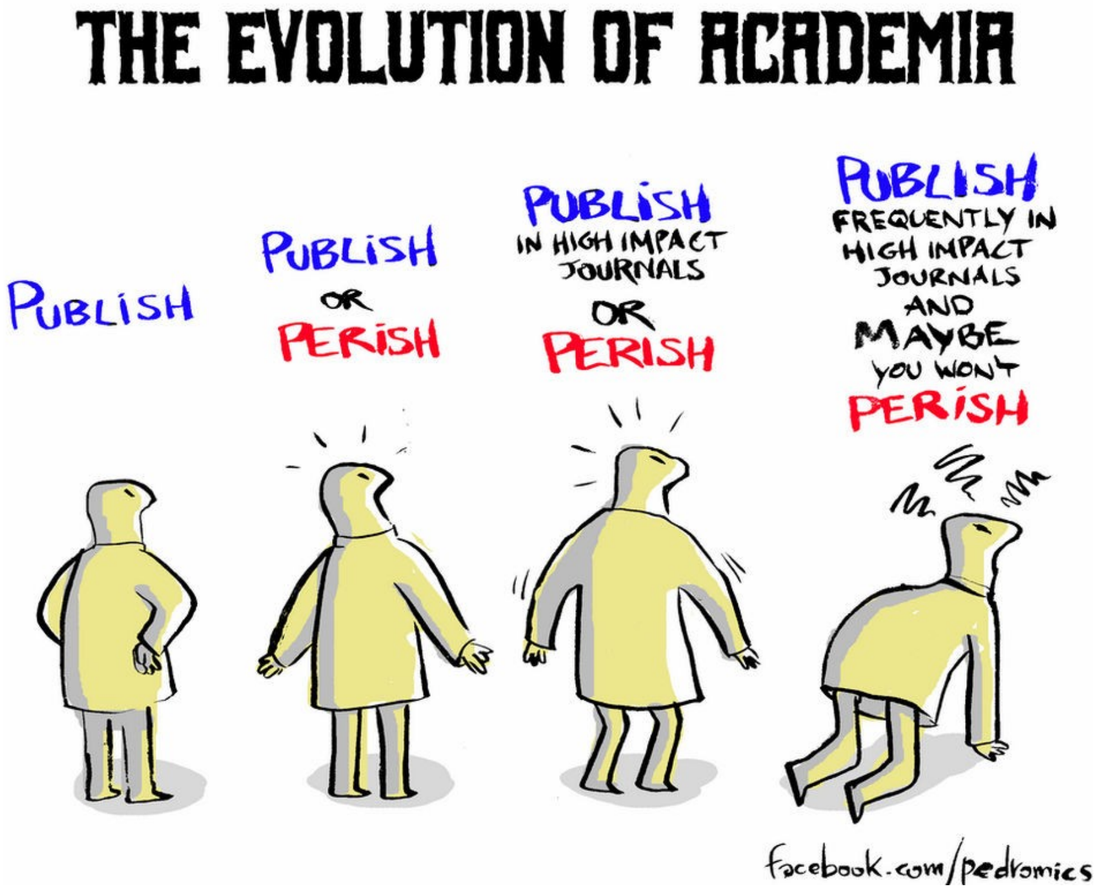
Source: Boudry, Christophe et al. “Worldwide inequality in access to full text scientific articles: the example of ophthalmology.” *PeerJ* vol. 7 e7850. 30 Oct. 2019, doi:10.7717/peerj.7850

Open Access: some context

OPEN ACCESS

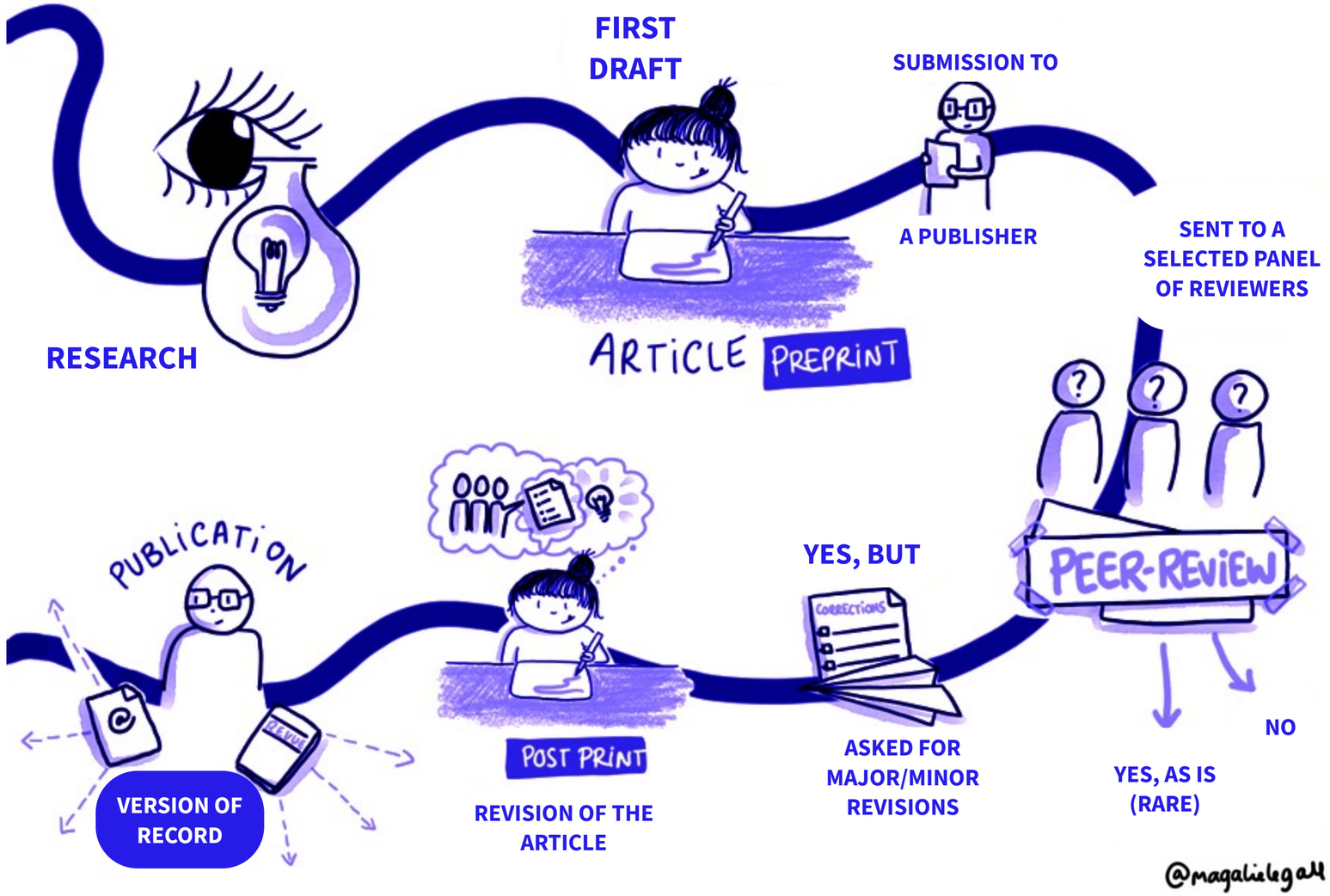
Academic Publishers

- Access to research results
  - Necessary to produce more research
- Evaluation of results (peer-reviewing)
  - Providing seal of approval, reliability and integrity
- Evaluation of researchers (impact factor, h-index, …)
  - Metrics used for researchers' promotions, allocation of lab funds, and more



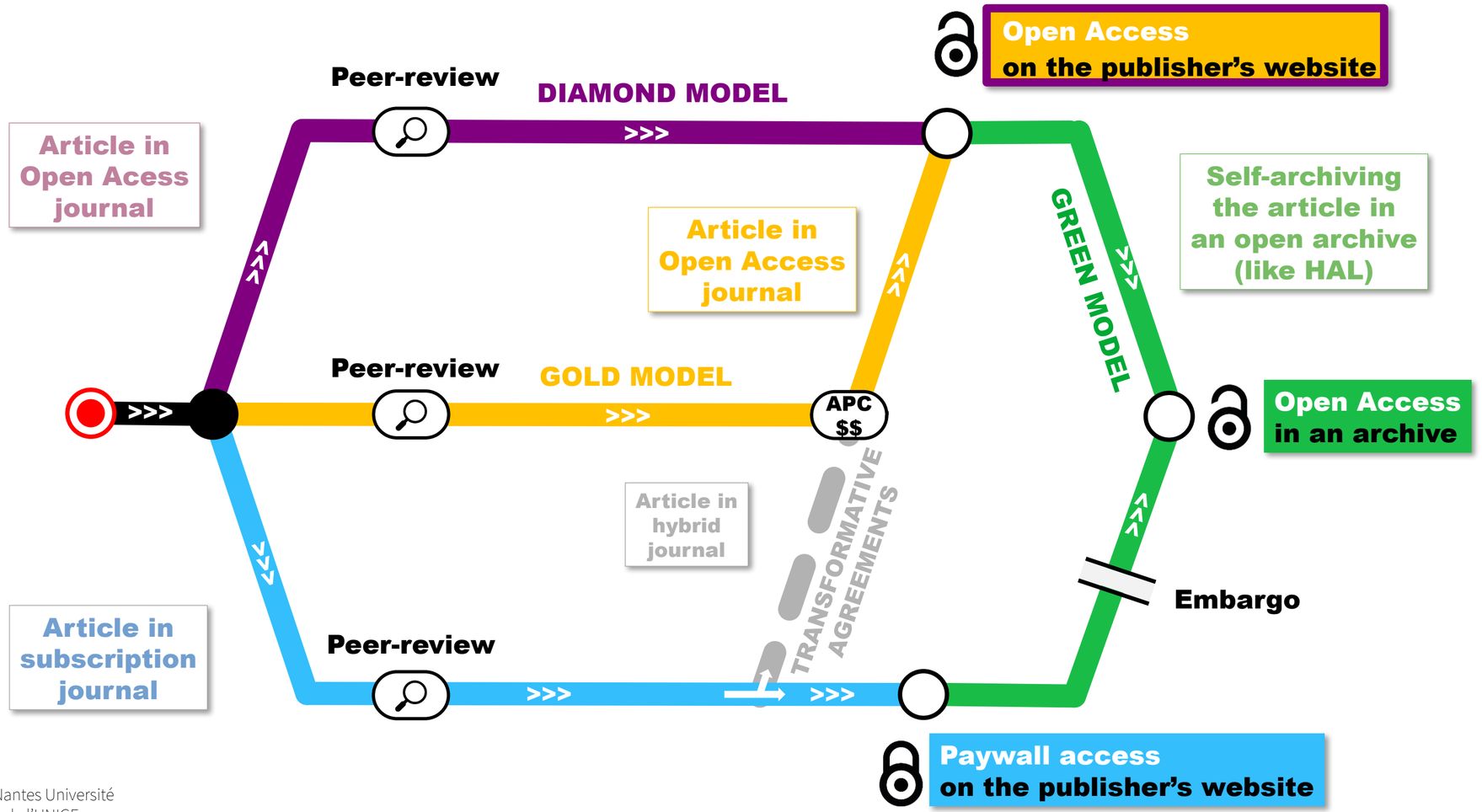
Open Access: from draft to publication

OPEN ACCESS



Open Access: different publication models

OPEN ACCESS



Bibliothèque Universitaire Nantes Université
Adapted from: Bibliothèque de l'UNIGE
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Open Access: different publication models

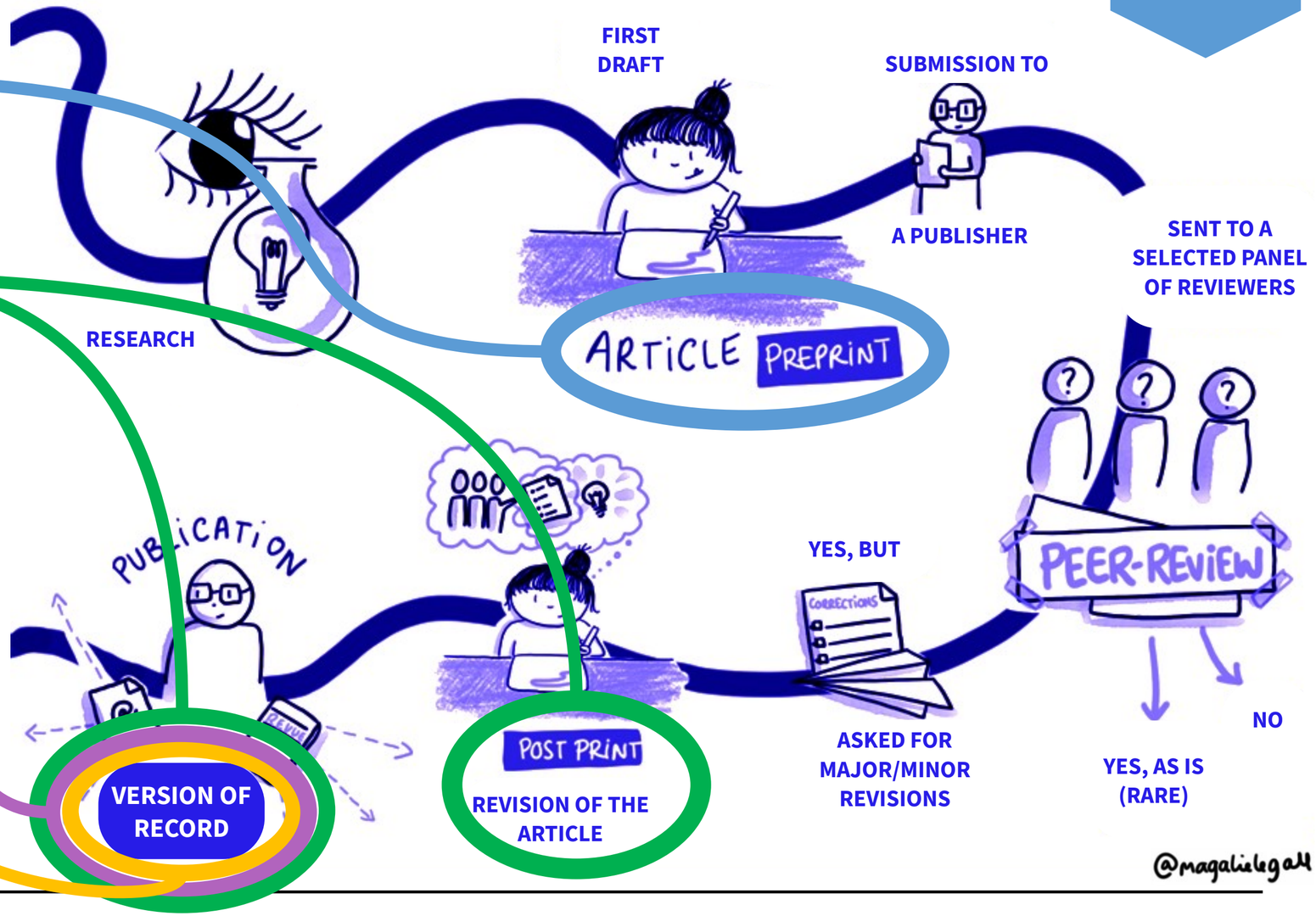
OPEN ACCESS

Sharing preprints in an archive arXiv

Open Archives HAL

Subventions & funding by public institutions

APC
Article Processing Charges



Open Access: APC or **A**rticle **P**rocessing **C**harges

OPEN ACCESS

MINISTÈRE DE L'ENSEIGNEMENT SUPÉRIEUR ET DE LA RECHERCHE
Liberté Égalité Fraternité

Past and future article processing charges (APC) for French institutions

Antoine Blanchard
Diane Thierry
Maurits van der Graaf

Full report: doi:10.52949/26

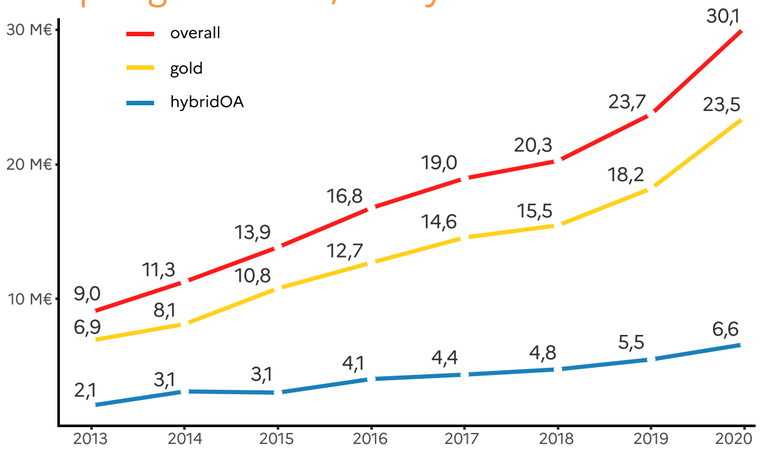
2013-2020 The highest growth rate is due to Springer Nature, Wiley and MDPI

x 3
The total cost of APC has tripled between 2013 and 2020

30 M€
is the estimated cost of APC for French institutions in 2020

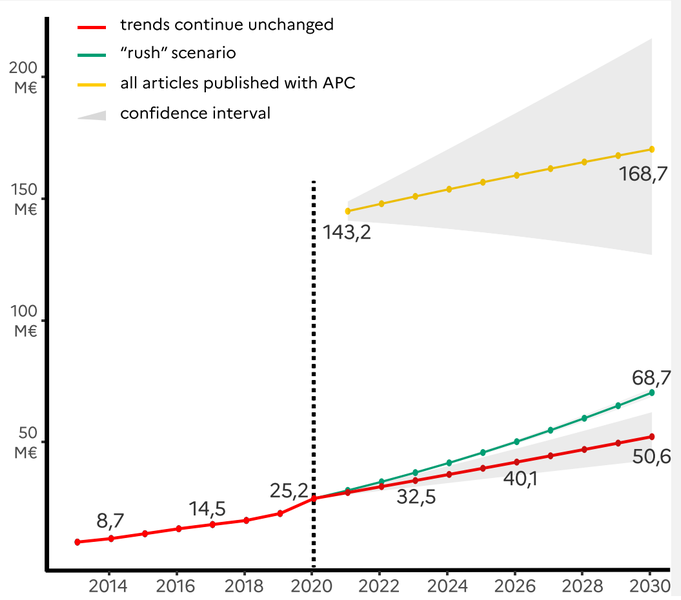
25 %
of all articles published in France have paid APC in 2020

Data: 1 032 517 articles from BSO enriched with OpenAlex, Web of science, Couperin, QOAM



The methodology is based on known and trusted data sources, with extrapolation for missing data.

2021-2030 During the decade, APC cost will increase again



50 M€ in 2030…
current trend of APC paid by French institutions

…up to 68 M€…
paid by French institutions in an alternative scenario

…at most 168 M€
paid by French institutions if all articles (except 10% diamond) had APC

Subscription expenditures: 87,5 M€ in 2020, going up to 97,5 M€ in 2030

APC: Article processing charges
BSO: Baromètre de la science ouverte
QOAM: Quality of Open Access Marker
HybridOA: open access article in subscription journal
Gold: article in fully open access journal with APC
Diamond: article in fully OA journal without APC

Ouvrir la science ! CC BY 12/2022

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Source : Antoine Blanchard, Diane Thierry, Maurits van der Graaf. *Retrospective and prospective study of the evolution of APC costs and electronic subscriptions for French institutions*. (2022)

Open Access: pros & cons of preprints

OPEN ACCESS

Sharing preprints in an archive arXiv

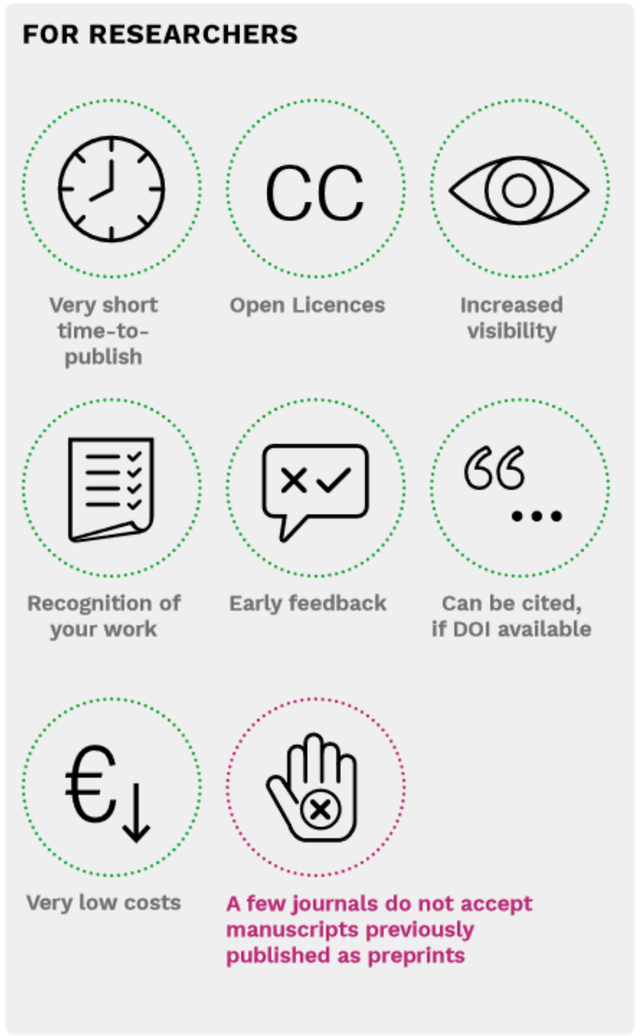
SOC ARXIV

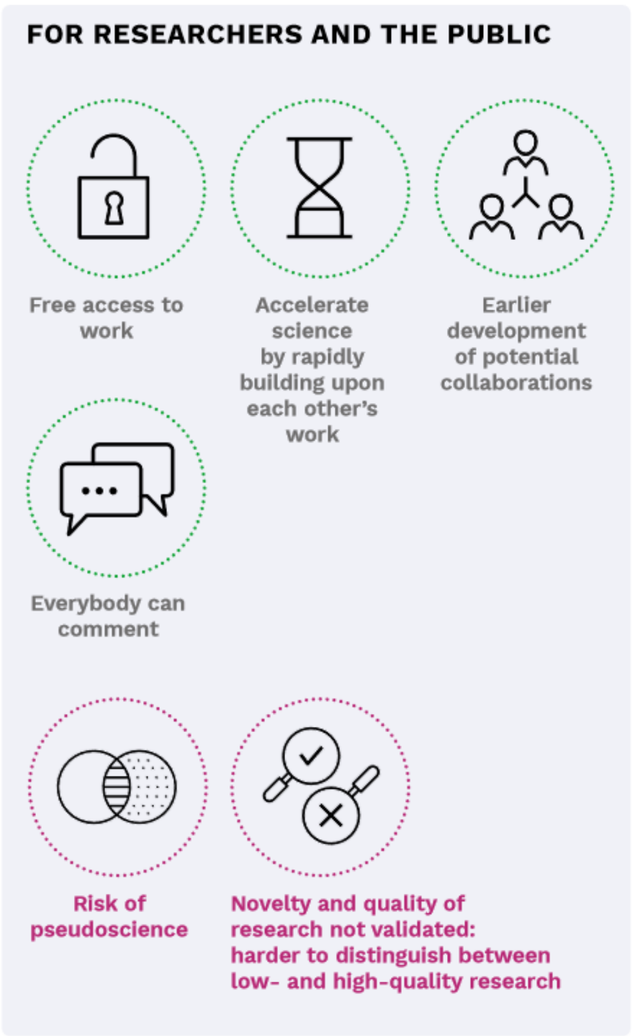
arXiv

SciELO Preprints

PsyArXiv

and more on the DOAR!





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Source : Kristina Hettne, Ron Aardening, Dirk van Gorp, Chantal Hukkelhoven, Nicole Loorbach, Jeroen Sondervan, & Astrid van Wesenbeeck. (2021). A Practical Guide to Preprints: Accelerating Scholarly Communication (1.0). Zenodo. https://doi.org/10.5281/zenodo.5600535

Open Access: diamond model

OPEN ACCESS

freemium

OpenEdition érudit

institutional funding

Pergola
Pépinière de revues du Grand Ouest en libre accès

CENTRE MERSENNE

EPIsciences
overlay journals

subscribe to open

Open Library of Humanities Journal

Open Access: self-archiving

OPEN ACCESS

Self-archiving an article's full-text is legal…
…thanks to the Law for a Digital Republic

> Law for a Digital Republic
(*Loi pour une République Numérique*) October 8, 2016 – article 30

> Allows all articles to be self-archived in an open archive if :

- ☑ author funded for **at least 50 %** by public funds
- ☑ in the author accepted manuscript version (**postprint**)
- ☑ after a maximum embargo of **6 months** in science, technology and medicine and **12 months** in the humanities and social sciences

Useful links

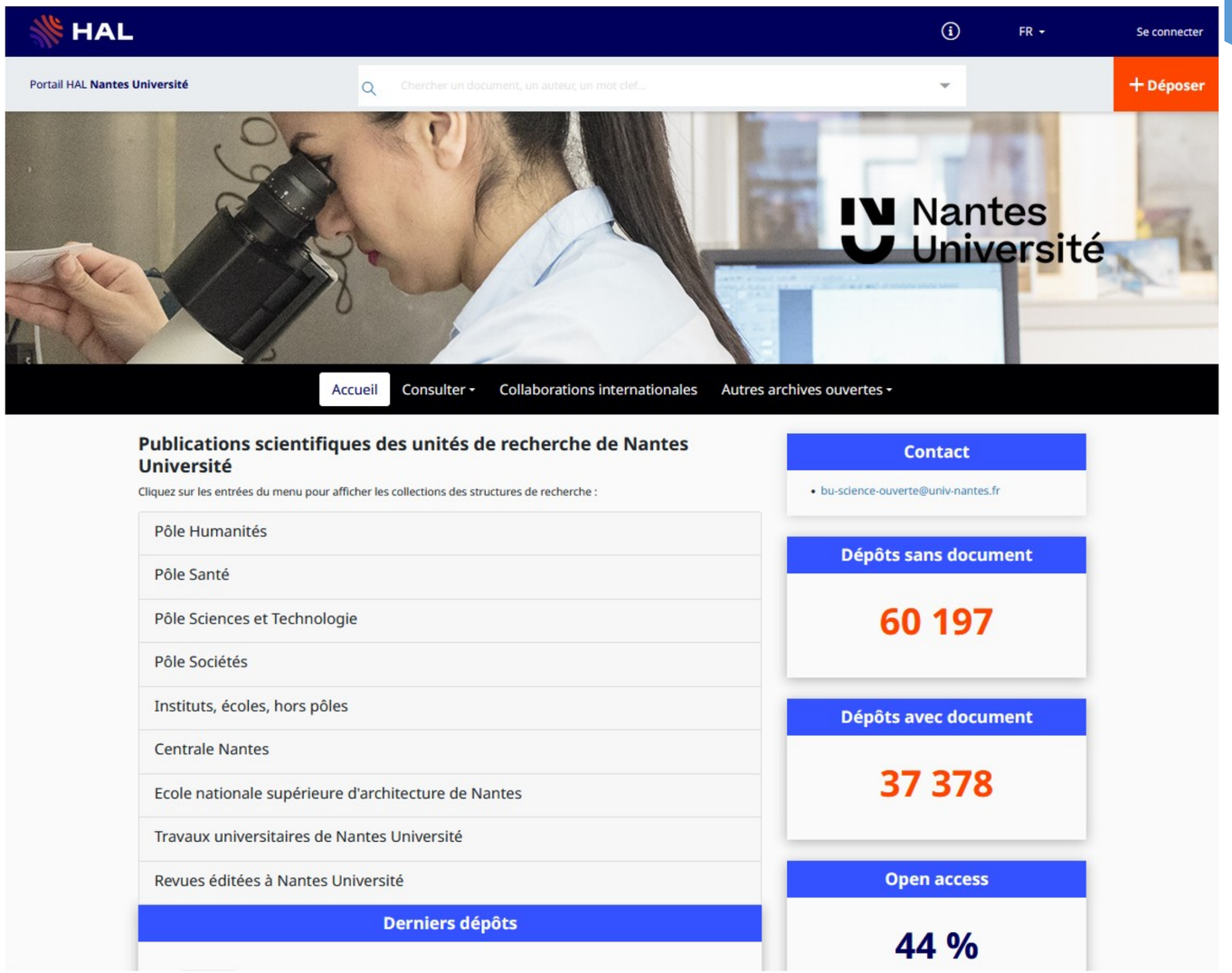
- **Article 30** of the law (in French)
- **Guide** on how to apply the law (in French)

Open Access: HAL & Nantes Université

OPEN ACCESS

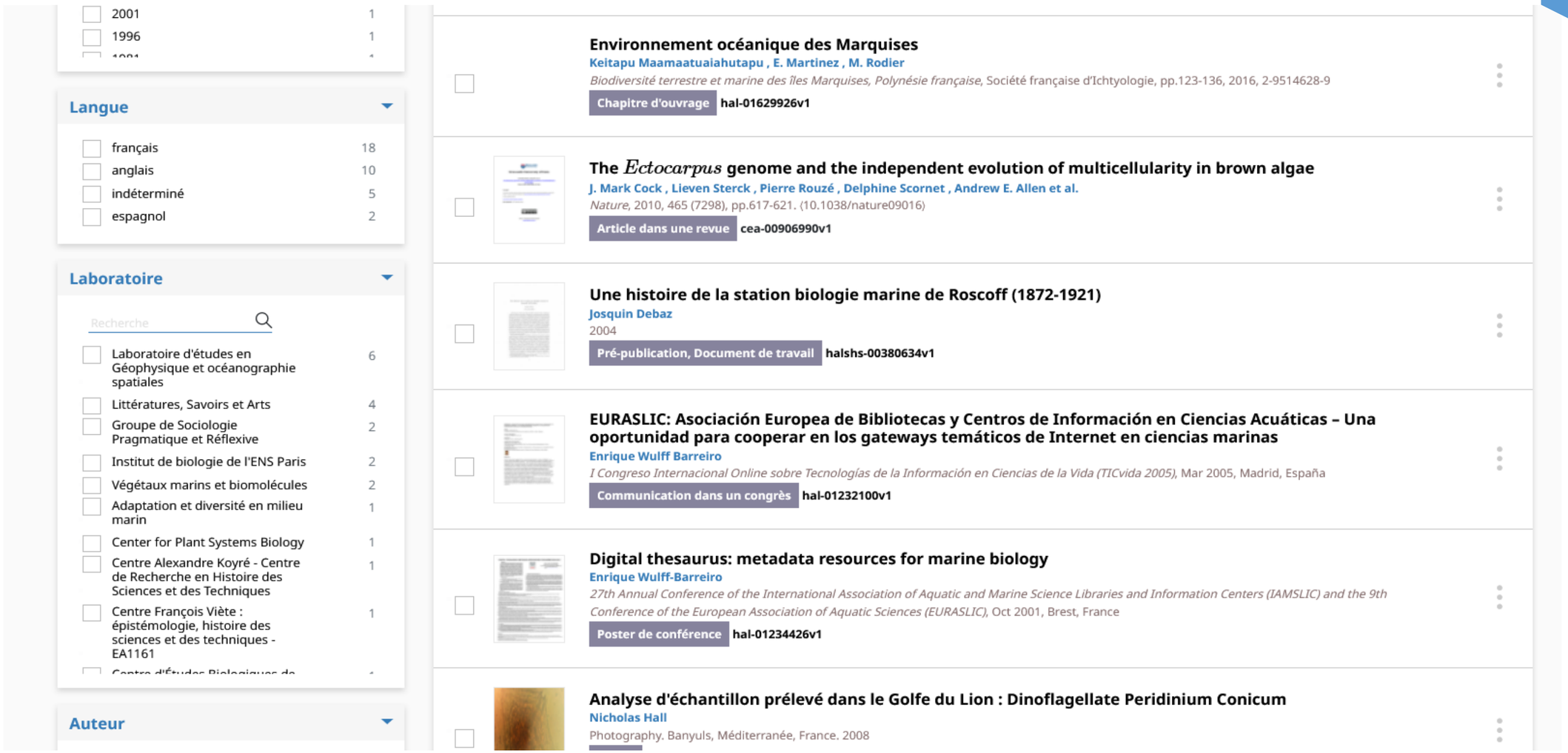
Accessible via :

https://nantes-universite.hal.science/



Open Access: What can you find in HAL?

OPEN ACCESS



https://hal.archives-ouvertes.fr/search/index/?qa%5Bkeyword_t%5D%5B%5D=biologie%20marine

OPEN DATA

Open Access to Research Data

OPEN DATA

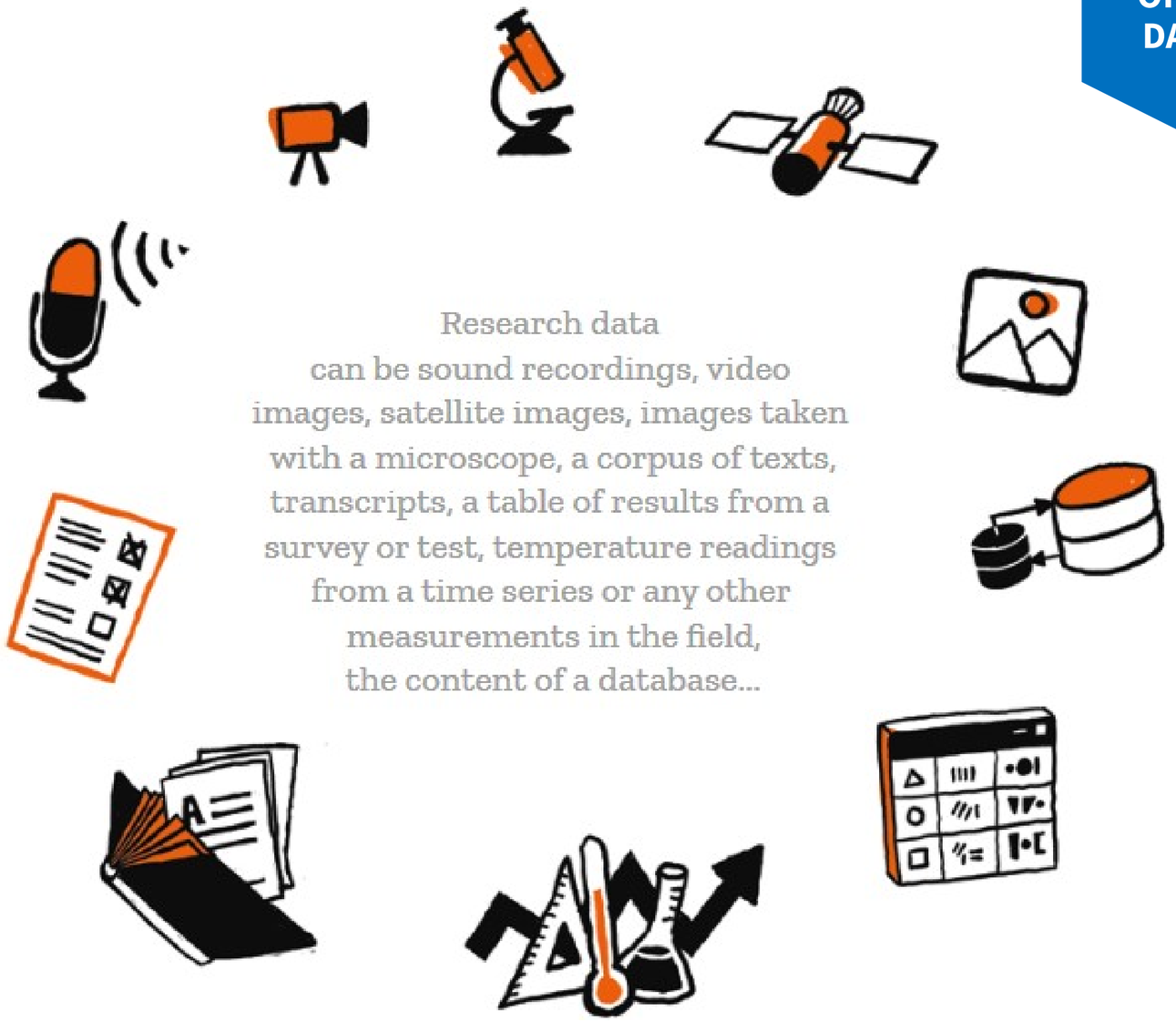
What is data?

Open Data: What is data?

OPEN DATA

Research Data

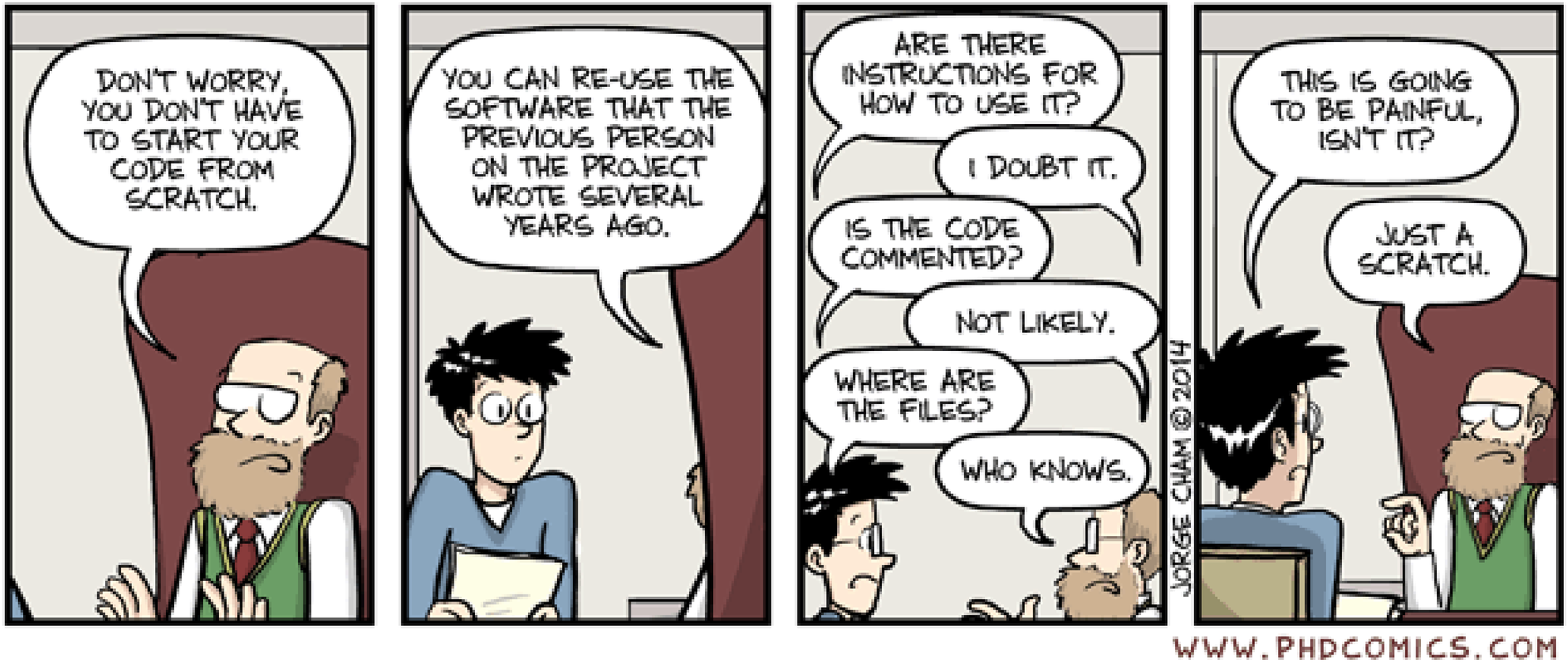
“factual records (numerical scores, textual records, images and sounds) used as primary sources for scientific research, and that are commonly accepted in the scientific community as necessary to validate research findings”



Sources: OECD, 2007 (left), “Open Science – Research Data”, Ouvrir la science, CC-BY-SA, 2024 (right)

Open Data: importance of open data

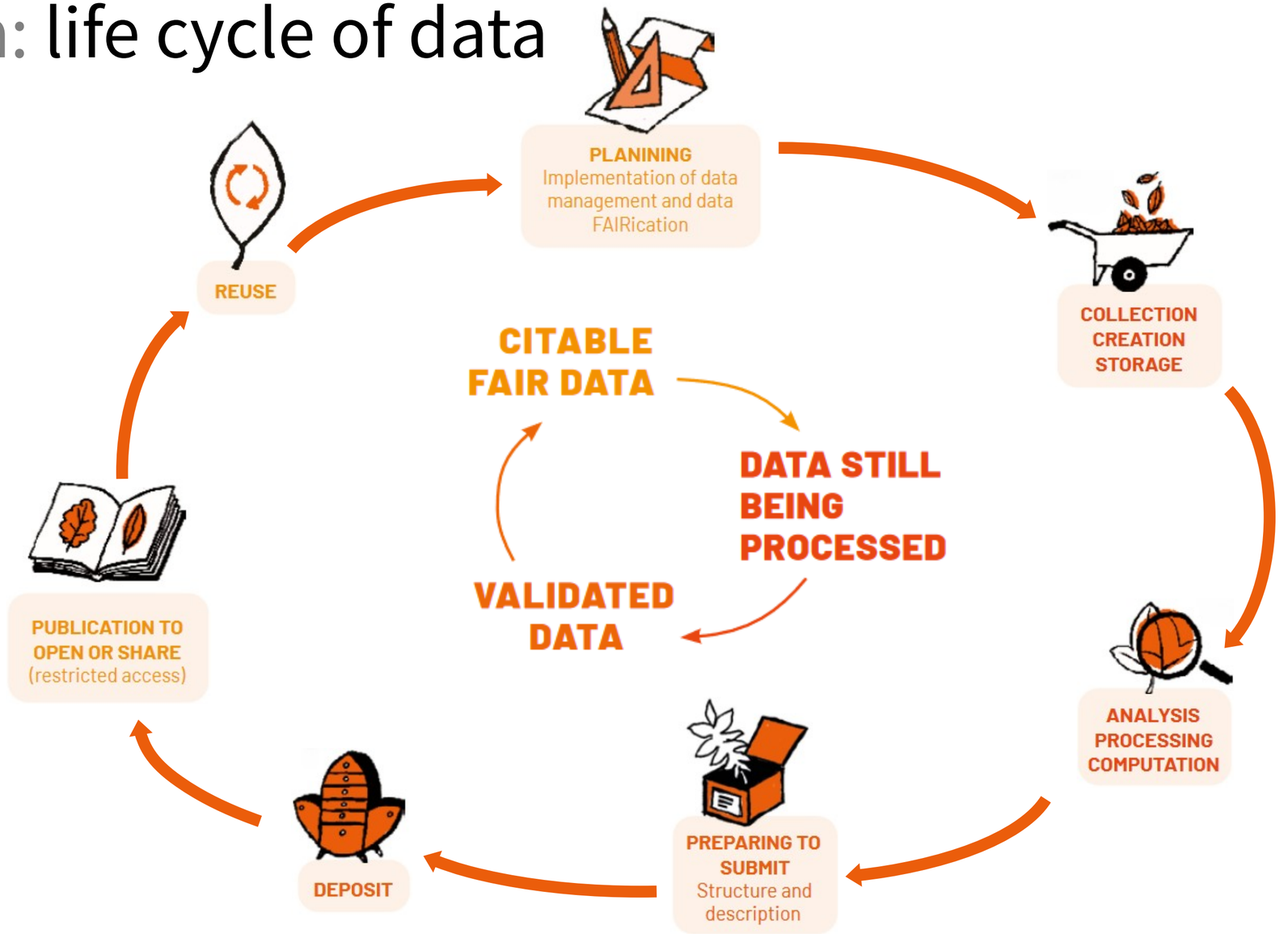
OPEN DATA



Sources: Jorge Cham (PhD Comics)

Open Data: life cycle of data

OPEN DATA



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Sources: "Open Science – Research Data", Ouvrir la science, CC-BY-SA, 2024

Open Data: data repositories

OPEN DATA

RÉPUBLIQUE FRANÇAISE
Liberté Égalité Fraternité

recherche.data.gouv.fr

zenodo

generalist

GenBank

NIH

PANGAEA.
Data Publisher for Earth & Environmental Science

disciplinary

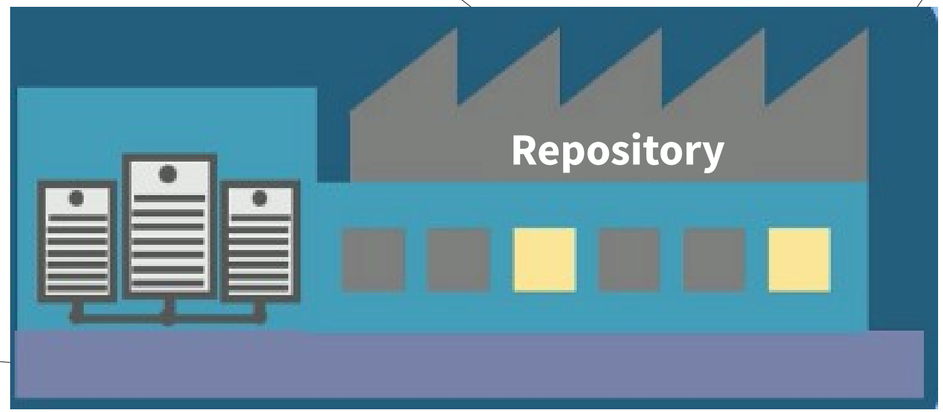
Dataverse

cirad

Data INRAE

INRAE

institutional



How to find repositories?

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES

To find and also share data sets…

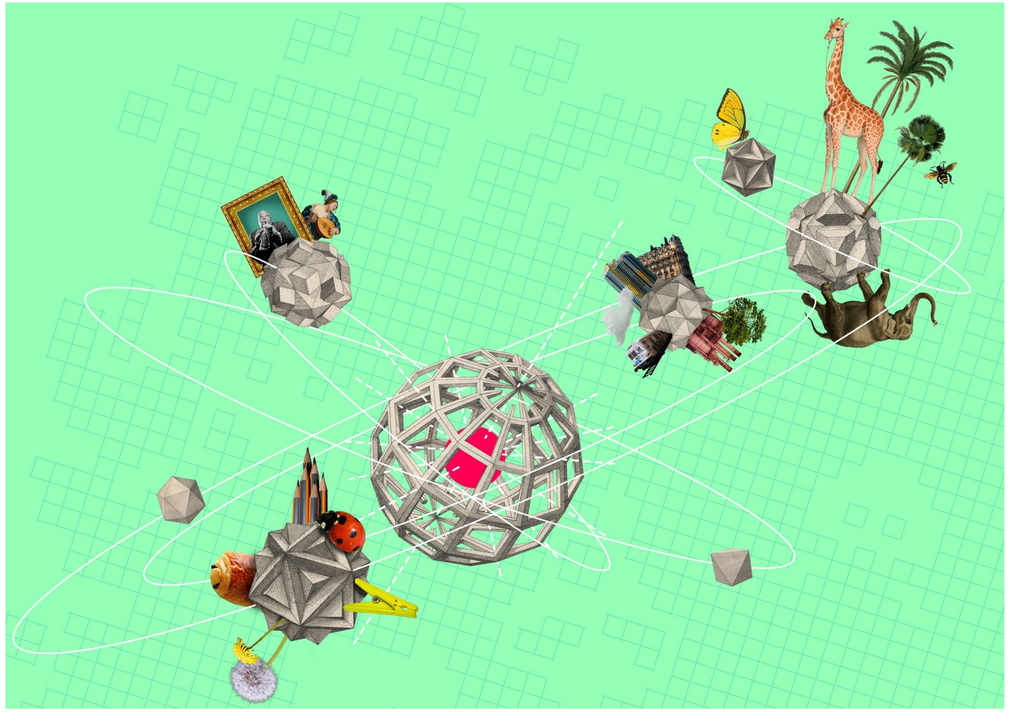
CITIZEN SCIENCE

Citizen Science

Citizen Science : how & why?

CITIZEN SCIENCE

→ Raising the public's awareness of research processes
→ Involvement of non-scientists for production & analysis of data
→ Co-conception of a research project between researchers and non-researchers



Citizen Science : multidisciplinary

CITIZEN SCIENCE

European Citizen Science Association

EU Citizen Science

ODySéYeu

ODySéYeu

Université des Patients

Université des patients

MUSÉUM NAL HIST NATURELLE

Museum National d'Histoire Naturelle

scistarter

Science we can do together.

SciStarter

CoastSnap community beach monitoring PAYS DE LA LOIRE

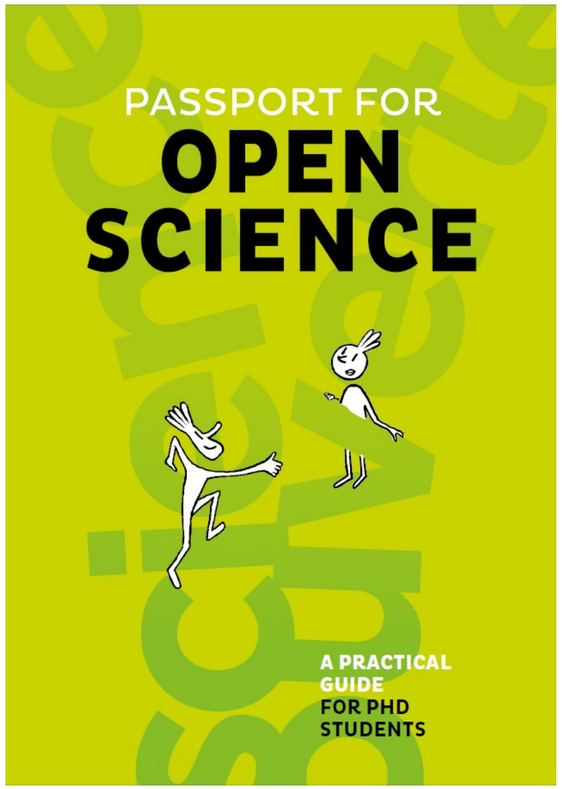
CoastSnap

FRANÇAIS DE NOS RÉGIONS

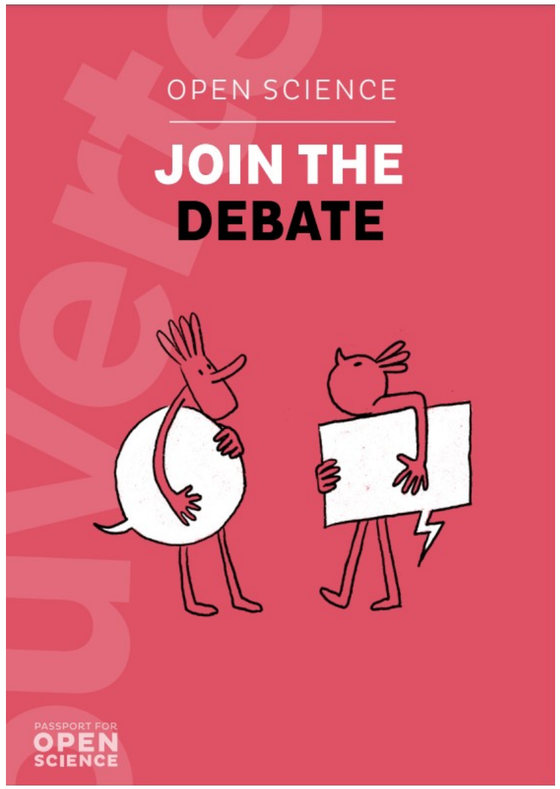
Français de nos régions

Any questions ?

For further information: Open Science Guides

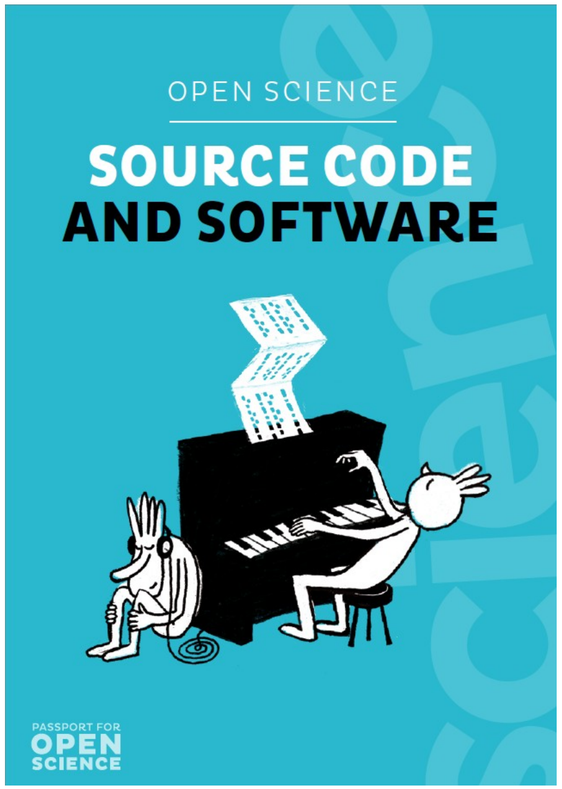


Passport for Open Science



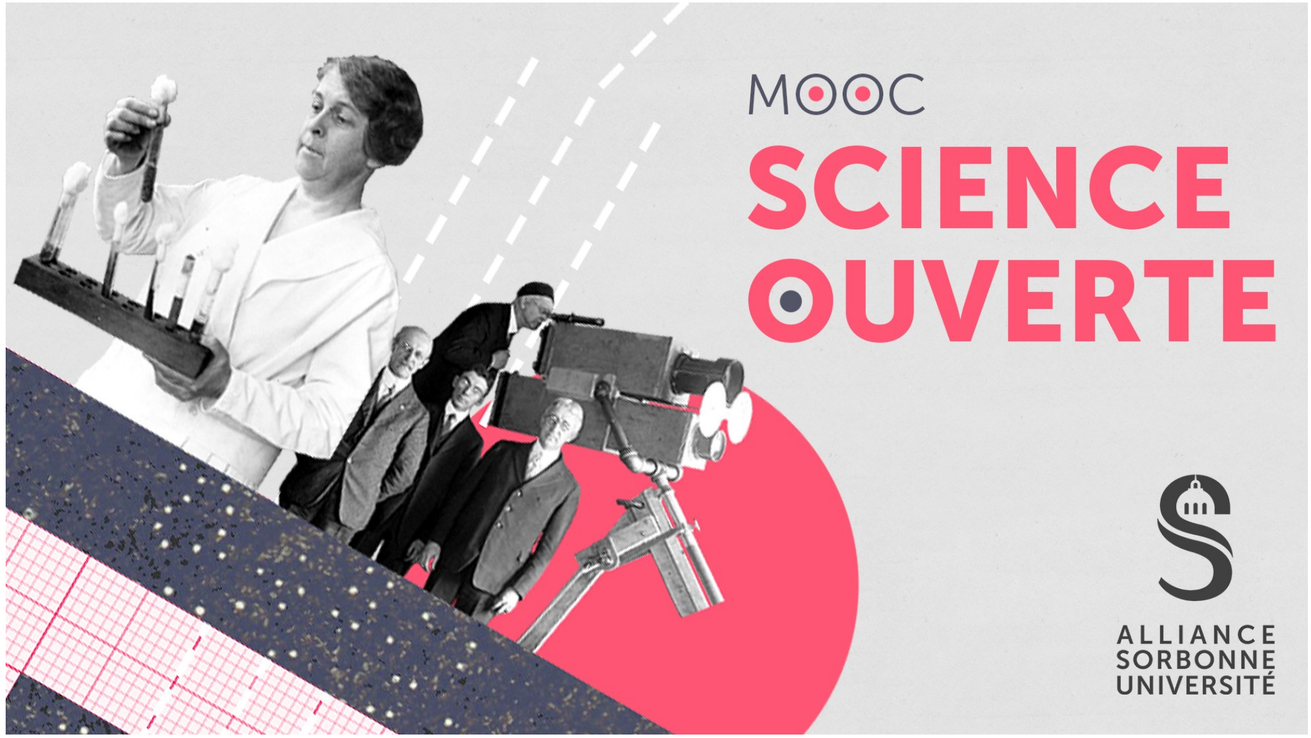
Join the Debate

Research Data



Source Code and Software

For even further information: Online MOOC on Open Science



Course plan

- ⊕ INTRODUCTION module
- ⊕ PUBLICATION module
- ⊕ RESEARCH DATA module
- ⊕ EVALUATION, TRUST, INTEGRITY module
- ⊕ CITIZEN SCIENCE module
- ⊕ SCIENCES AND SOCIETY module
- ⊕ PERSPECTIVES module

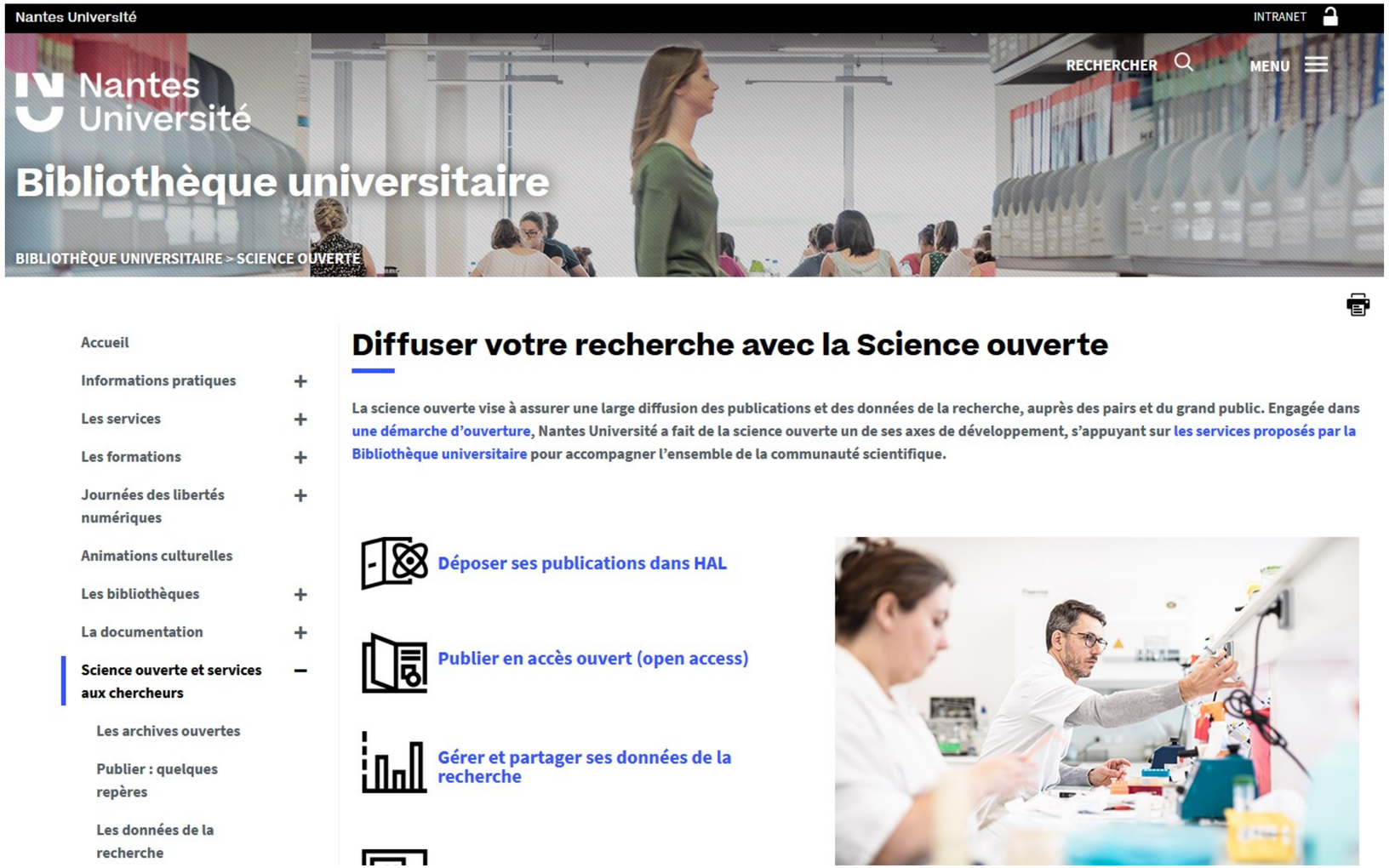
Available on Fun MOOC (in FR & EN)

FUN FRANCE UNIVERSITÉ NUMÉRIQUE

https://www.fun-mooc.fr/en/courses/open-science/

- Open to all. Self-paced. Free. Only require to register on the platform. Bilingual.
- **6 thematic modules** that can be taken in any order.

Don’t hesitate to contact us!



Contact us via email:

bu-science-ouverte@univ-nantes.fr