



Open Science :

An introduction

Table of contents

- **Introduction**
 - What Is Open Science?
 - Brief History
- **Open Access**
 - State of the Publishing Industry
 - Types of Open Access Models
- **Open Data**
 - What Is Data?
- **Citizen Science**
 - What Is It and How Does It Work?

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?

Modifiable

Unrestricted dissemination of research results in order to reuse them

Transparency of the research assessment process

Opening and sharing educational resources

Open Science



Reusable

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**



**CITIZEN
SCIENCE**

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

Open Peer Review

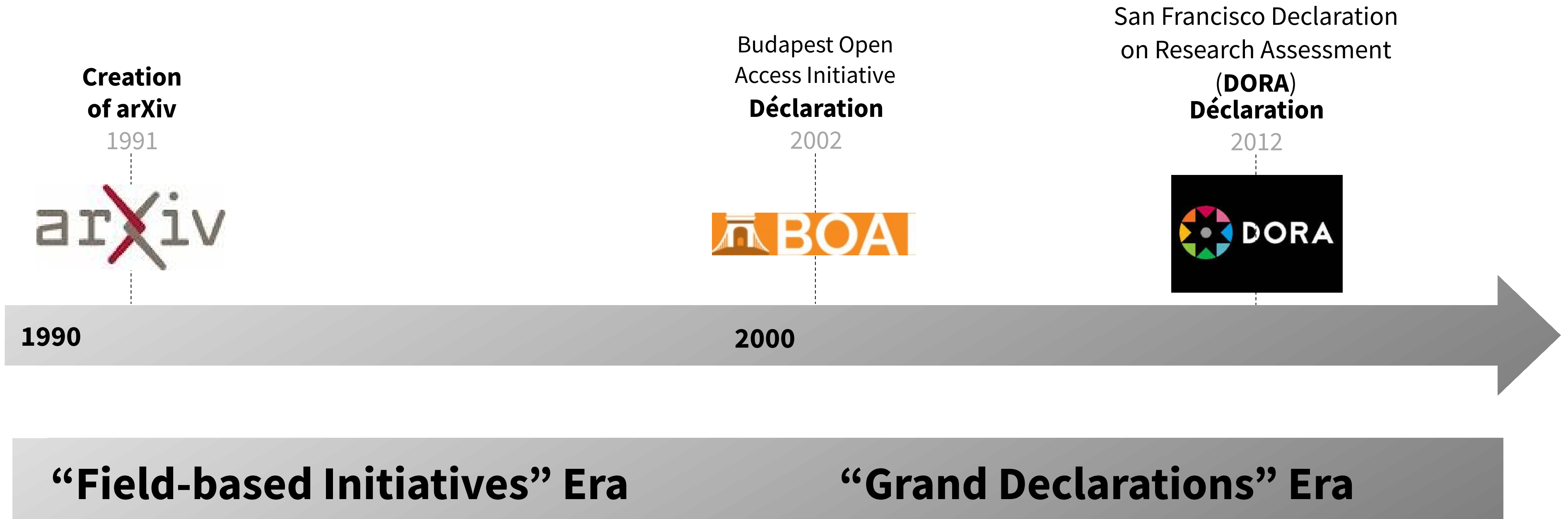
OPEN
PEER
REVIEW

A short video explaining the opening of peer-reviewing (with english subtitles available)

<https://tubedu.org/w/m7CJrpJaPhgHq1XcxeG1cK>



A brief history of Open Science



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

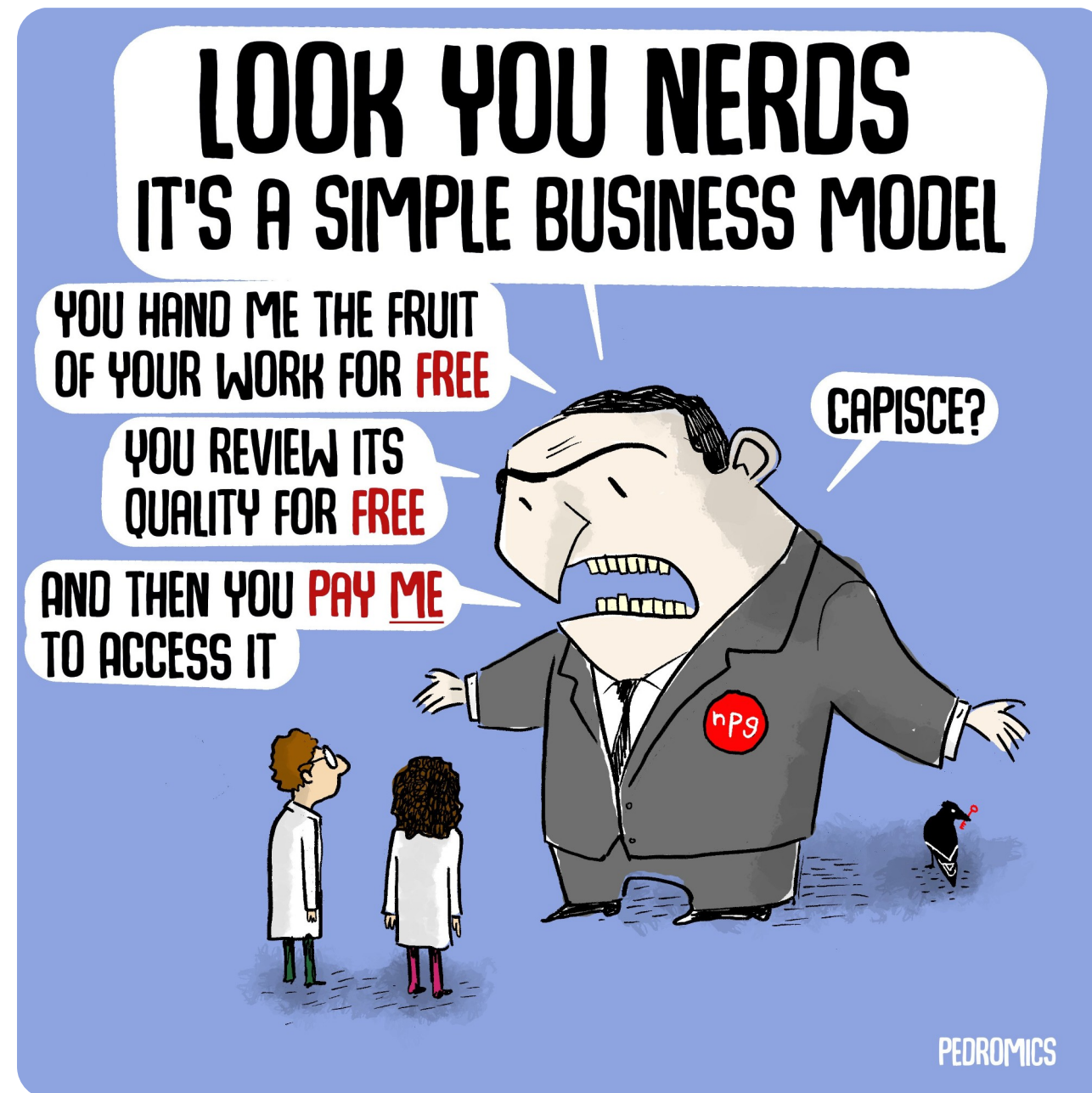
Open Access to Publications

Open Access: some context

OPEN
ACCESS

Science is cumulative...

...but **research results** are hidden behind a paywall



Choose an option to locate/access this article:

Check if you have access
through your login
credentials or your
institution.

or

Purchase

Check Access

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)

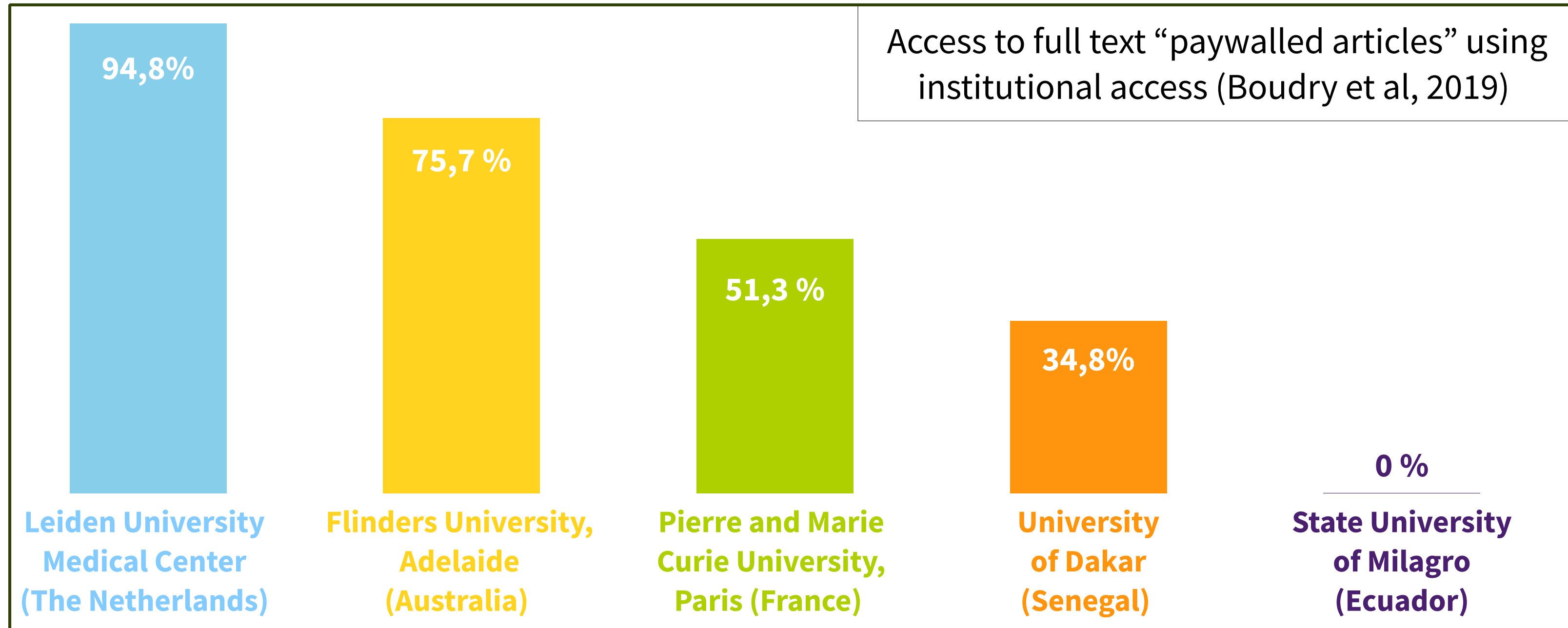
Public
Funding

↘ 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

OPEN ACCESS

Disparity in access to research publications...

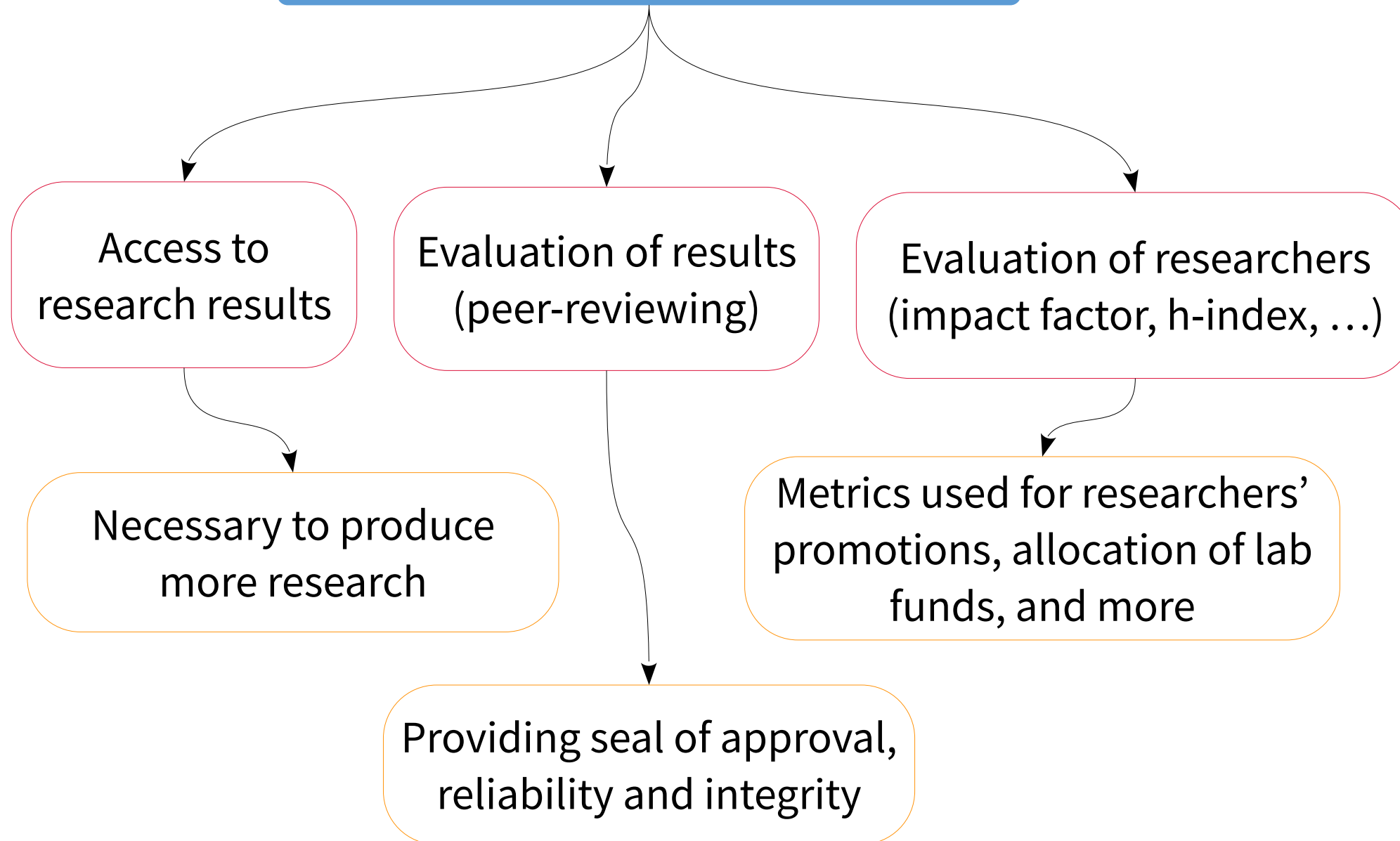


... leads to **disparity** in the production of research

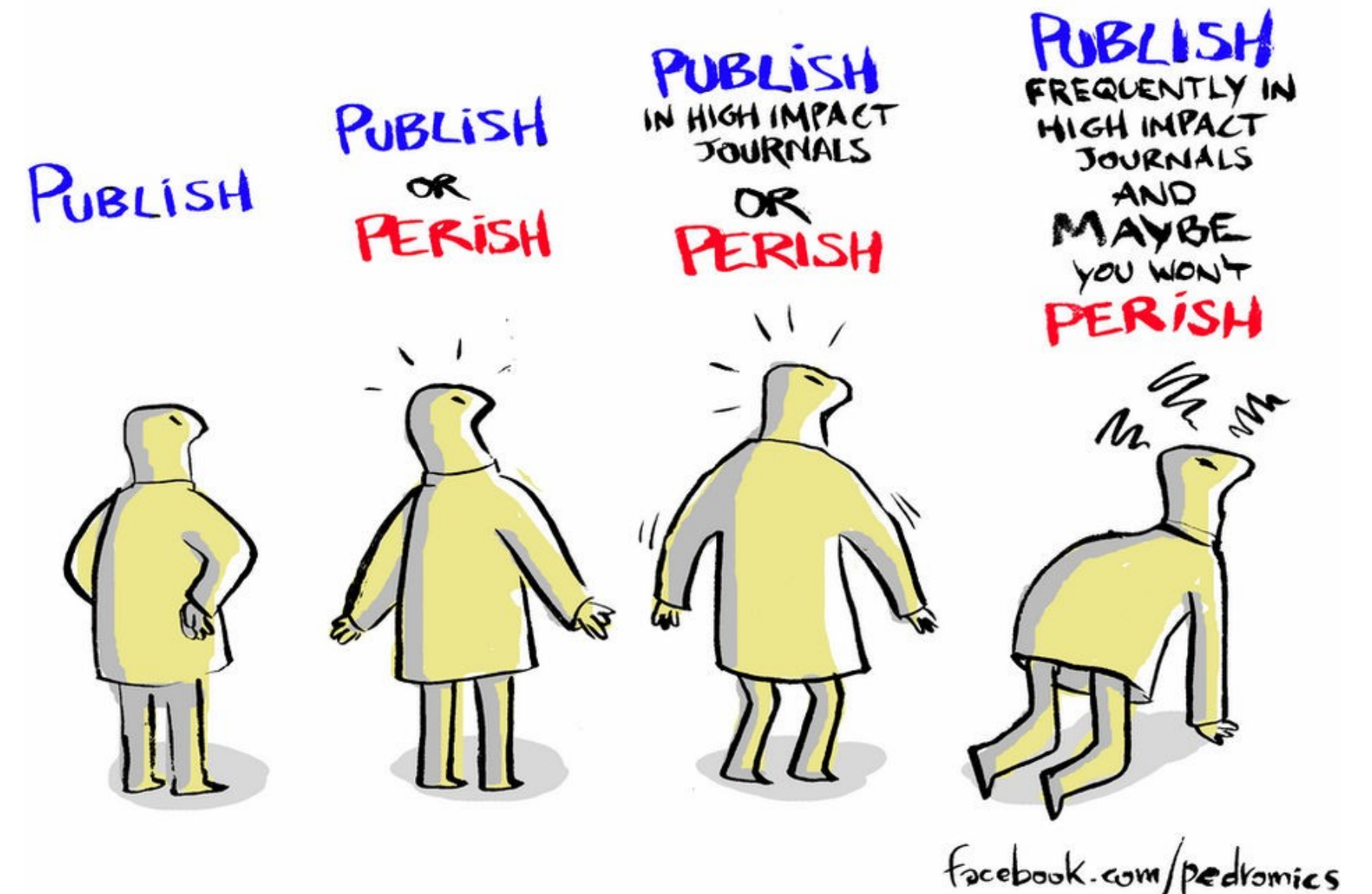
Open Access: some context

OPEN ACCESS

Academic Publishers

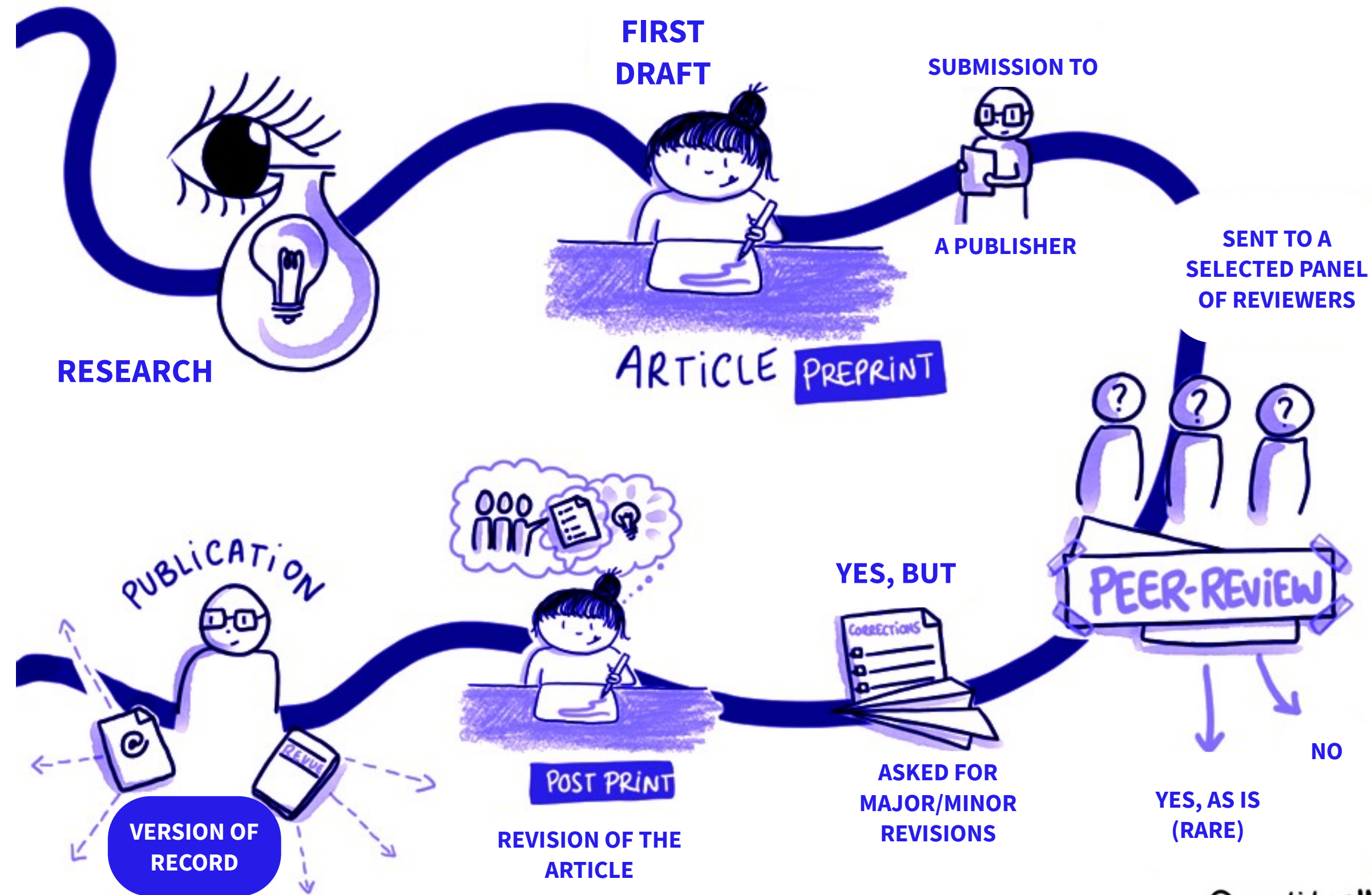


THE EVOLUTION OF ACADEMIA



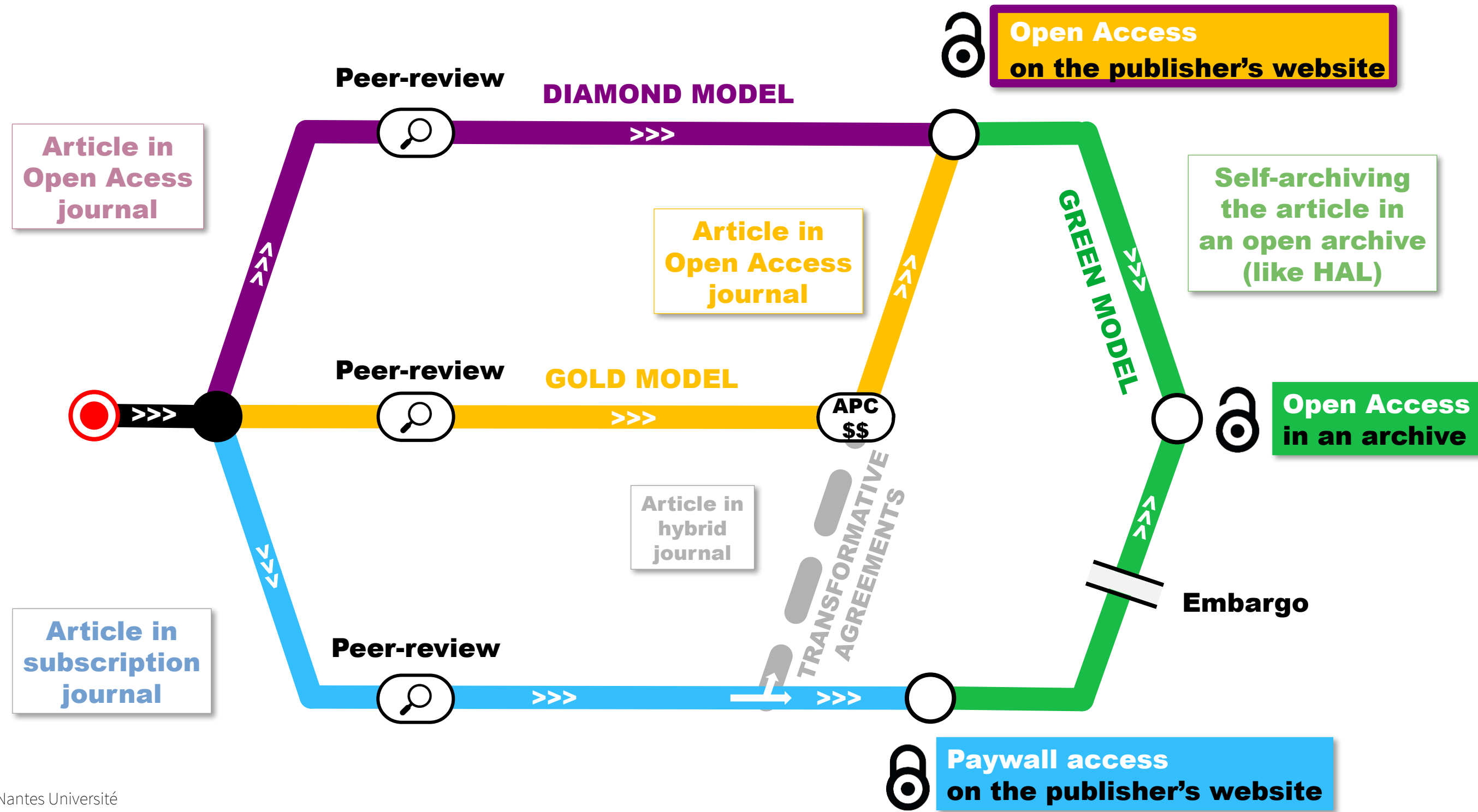
Open Access: from draft to publication


OPEN ACCESS



@magalielegal

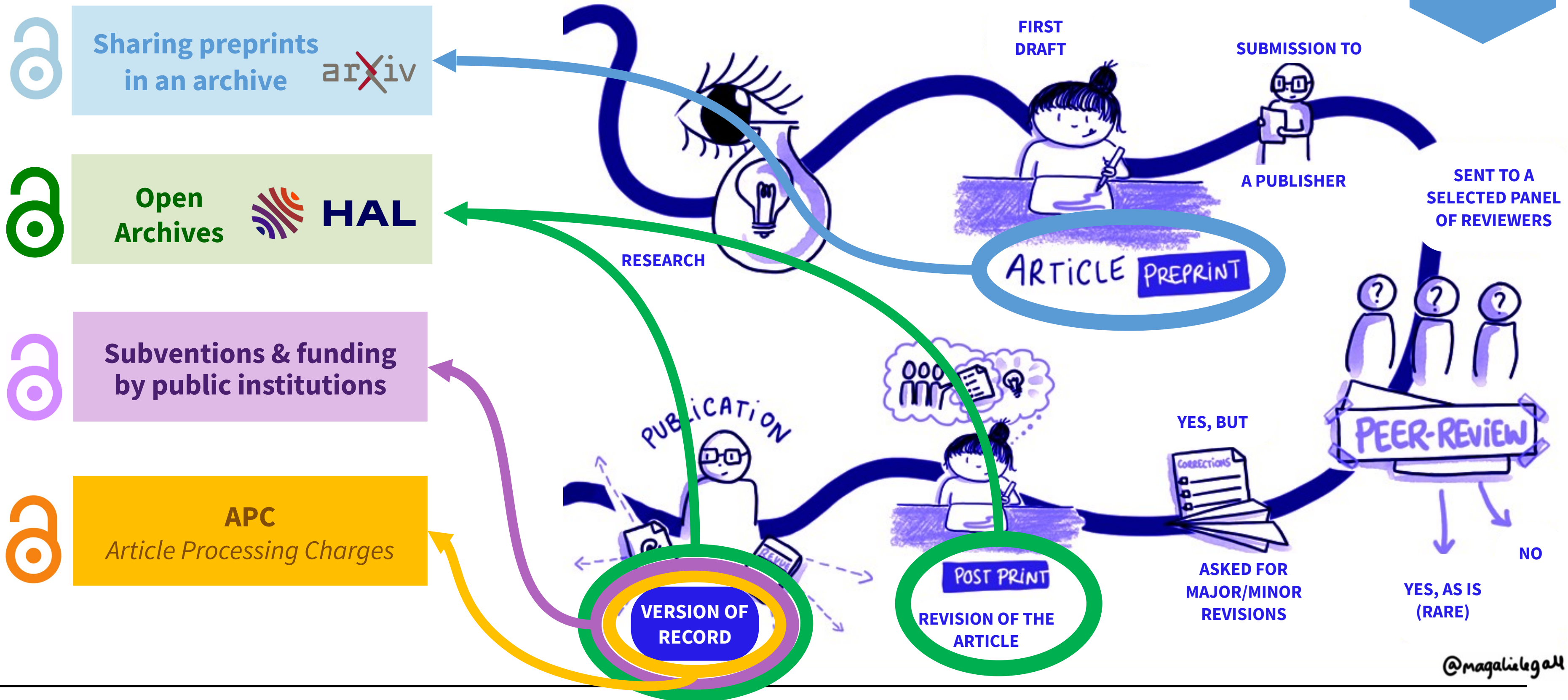
Open Access: different publication models




 Bibliothèque Universitaire Nantes Université
 Adapted from: Bibliothèque de l'UNIGE
 This work is licensed under Creative Commons Attribution-ShareAlike 4.0 International

Open Access: different publication models

OPEN ACCESS



Open Access: APC or Article Processing Charges

OPEN ACCESS



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

Antoine Blanchard
Diane Thierry
Maurits van der Graaf
Full report:
doi:10.52949/26

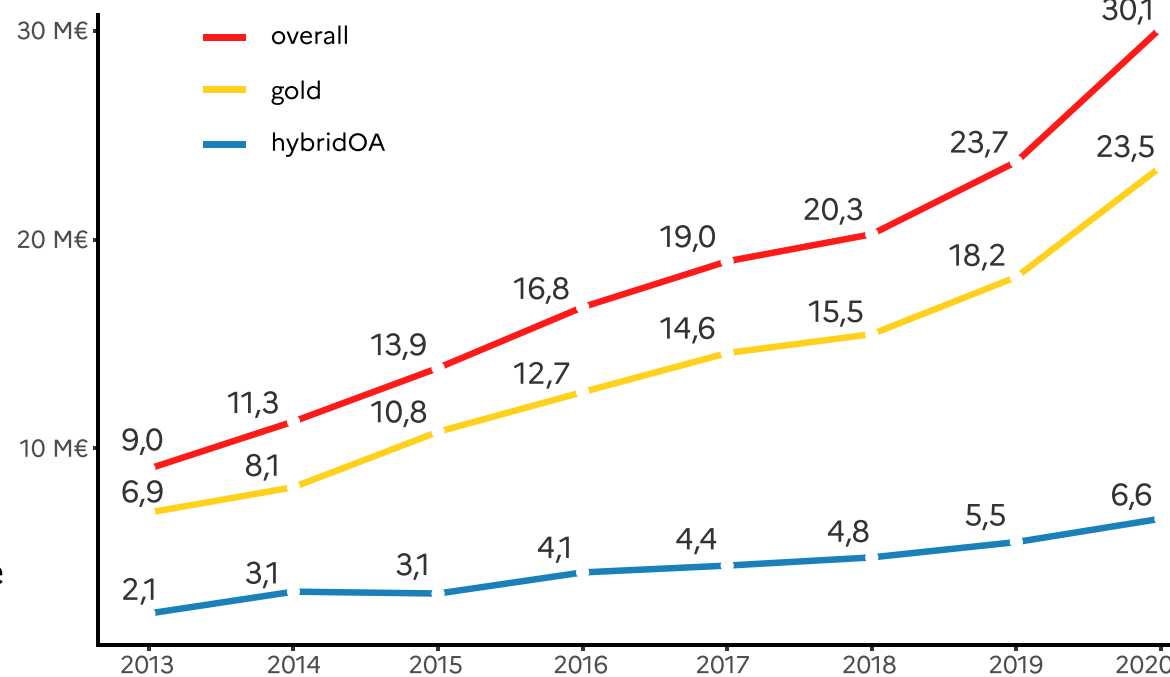
2013-2020 The highest growth rate is due to Springer Nature, Wiley and MDPI

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

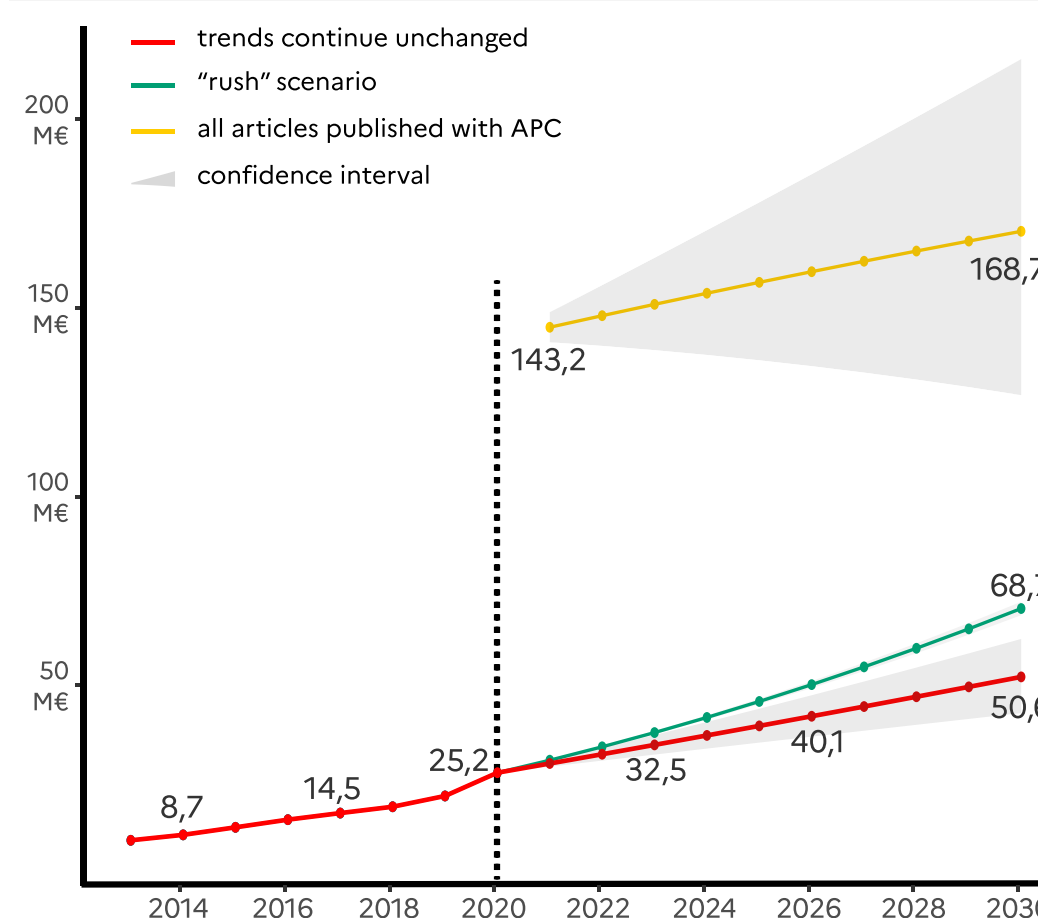
25 %
of all articles published in France have paid APC in 2020

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! © 12/2022

Open Access: pros & cons of preprints

OPEN ACCESS



Sharing preprints
in an archive



and **more** on the DOAR!

FOR RESEARCHERS



Very short
time-to-
publish



Open Licences



Increased
visibility



Recognition of
your work



Early feedback



Can be cited,
if DOI available



Very low costs



A few journals do not accept
manuscripts previously
published as preprints

FOR RESEARCHERS AND THE PUBLIC



Free access to
work



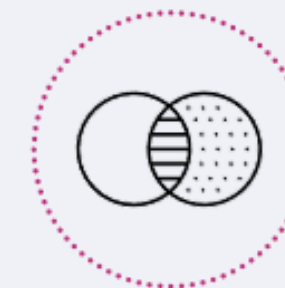
Accelerate
science
by rapidly
building upon
each other's
work



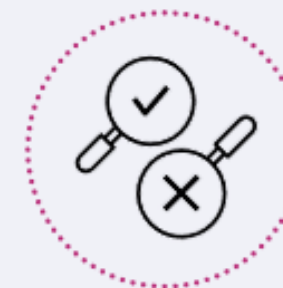
Earlier
development
of potential
collaborations



Everybody can
comment



Risk of
pseudoscience



Novelty and quality of
research not validated:
harder to distinguish
between
low- and high-quality research

Open Access: diamond model

OPEN
ACCESS

freemium



institutional funding



subscribe
to
open



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/>

The screenshot shows the HAL Nantes Université website. At the top, there is a dark blue header with the HAL logo, a search bar, and a 'Se connecter' link. Below the header is a banner image of a woman using a microscope, with the Nantes Université logo overlaid. A navigation menu includes 'Accueil', 'Consulter', 'Collaborations internationales', and 'Autres archives ouvertes'. The main content area is titled 'Publications scientifiques des unités de recherche de Nantes Université' and lists various research units. On the right, there are three summary boxes: 'Contact' with the email 'bu-science-ouverte@univ-nantes.fr', 'Dépôts sans document' with a count of 60 197, and 'Dépôts avec document' with a count of 37 378. At the bottom right, an 'Open access' box shows a percentage of 44 %.

Unité de recherche
Pôle Humanités
Pôle Santé
Pôle Sciences et Technologie
Pôle Sociétés
Instituts, écoles, hors pôles
Centrale Nantes
Ecole nationale supérieure d'architecture de Nantes
Travaux universitaires de Nantes Université
Revue éditée à Nantes Université
Derniers dépôts

Metric	Value
Contact	bu-science-ouverte@univ-nantes.fr
Dépôts sans document	60 197
Dépôts avec document	37 378
Open access	44 %

Open Access: What can you find in HAL?

OPEN
ACCESS

2001 1
 1996 1
 1994 4

Langue

français 18
 anglais 10
 indéterminé 5
 espagnol 2


Laboratoire


Recherche


Laboratoire d'études en Géophysique et océanographie spatiales 6
 Littératures, Savoirs et Arts 4
 Groupe de Sociologie Pragmatique et Réflexive 2
 Institut de biologie de l'ENS Paris 2
 Végétaux marins et biomolécules 2
 Adaptation et diversité en milieu marin 1
 Center for Plant Systems Biology 1
 Centre Alexandre Koyré - Centre de Recherche en Histoire des Sciences et des Techniques 1
 Centre François Viète : épistémologie, histoire des sciences et des techniques - EA1161 1
 Centre d'études Biologiques de 4


Auteur


Environnement océanique des Marquises
Keitapu Maamaatuaiahutapu , E. Martinez , M. Rodier
Biodiversité terrestre et marine des îles Marquises, Polynésie française, Société française d'Ichtyologie, pp.123-136, 2016, 2-9514628-9
Chapitre d'ouvrage hal-01629926v1

 **The *Ectocarpus* genome and the independent evolution of multicellularity in brown algae**
J. Mark Cock , Lieven Sterck , Pierre Rouzé , Delphine Scornet , Andrew E. Allen et al.
Nature, 2010, 465 (7298), pp.617-621. (10.1038/nature09016)
Article dans une revue cea-00906990v1

 **Une histoire de la station biologie marine de Roscoff (1872-1921)**
Josquin Debaz
2004
Pré-publication, Document de travail halshs-00380634v1

 **EURASLIC: Asociación Europea de Bibliotecas y Centros de Información en Ciencias Acuáticas - Una oportunidad para cooperar en los gateways temáticos de Internet en ciencias marinas**
Enrique Wulff Barreiro
I Congreso Internacional Online sobre Tecnologías de la Información en Ciencias de la Vida (TICvida 2005), Mar 2005, Madrid, España
Communication dans un congrès hal-01232100v1

 **Digital thesaurus: metadata resources for marine biology**
Enrique Wulff-Barreiro
27th Annual Conference of the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSILIC) and the 9th Conference of the European Association of Aquatic Sciences (EURASLIC), Oct 2001, Brest, France
Poster de conférence hal-01234426v1

 **Analyse d'échantillon prélevé dans le Golfe du Lion : Dinoflagellate Peridinium Conicum**
Nicholas Hall
Photography. Banyuls, Méditerranée, France. 2008

Open Access to Research Data

What is data?

Open Data: What is data?

OPEN
DATA

Research Data

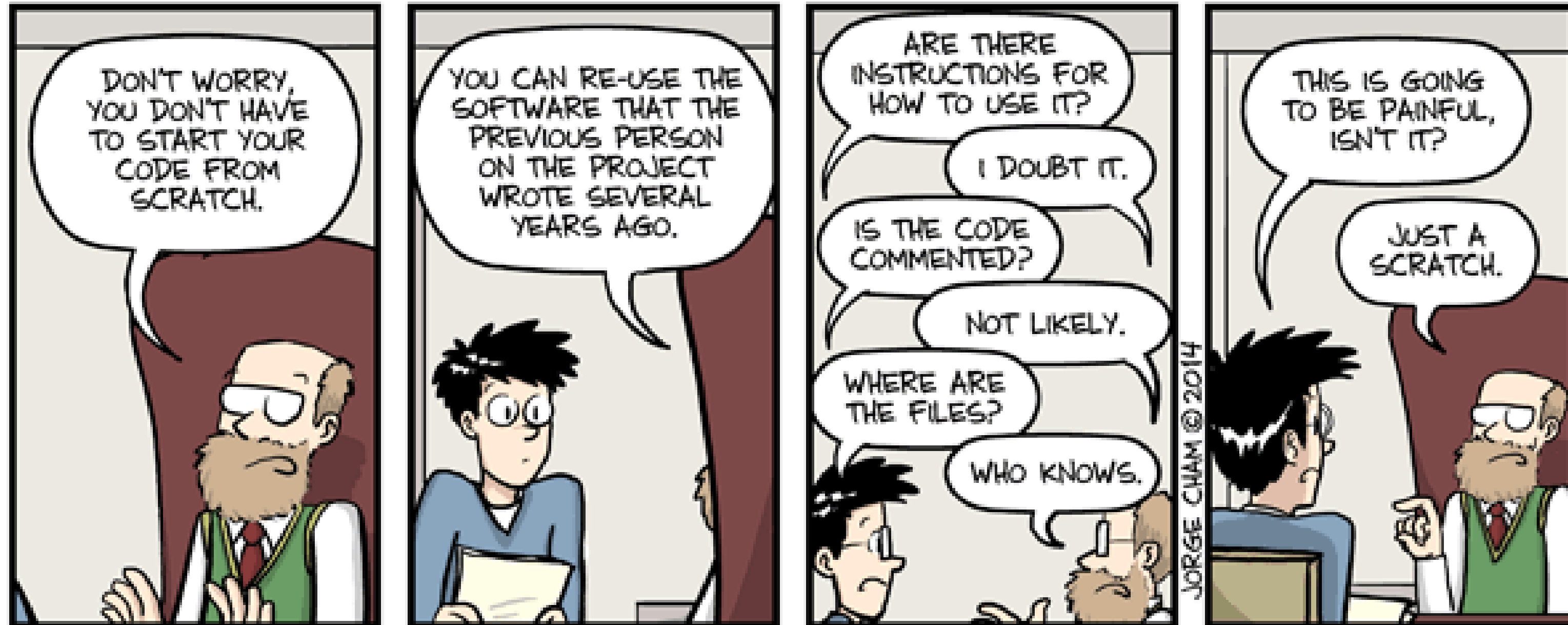
“factual records (numerical scores, textual records, images and sounds) used as primary sources for scientific research, and that are commonly accepted in the scientific community as necessary to validate research findings”

Research data can be sound recordings, video images, satellite images, images taken with a microscope, a corpus of texts, transcripts, a table of results from a survey or test, temperature readings from a time series or any other measurements in the field, the content of a database...



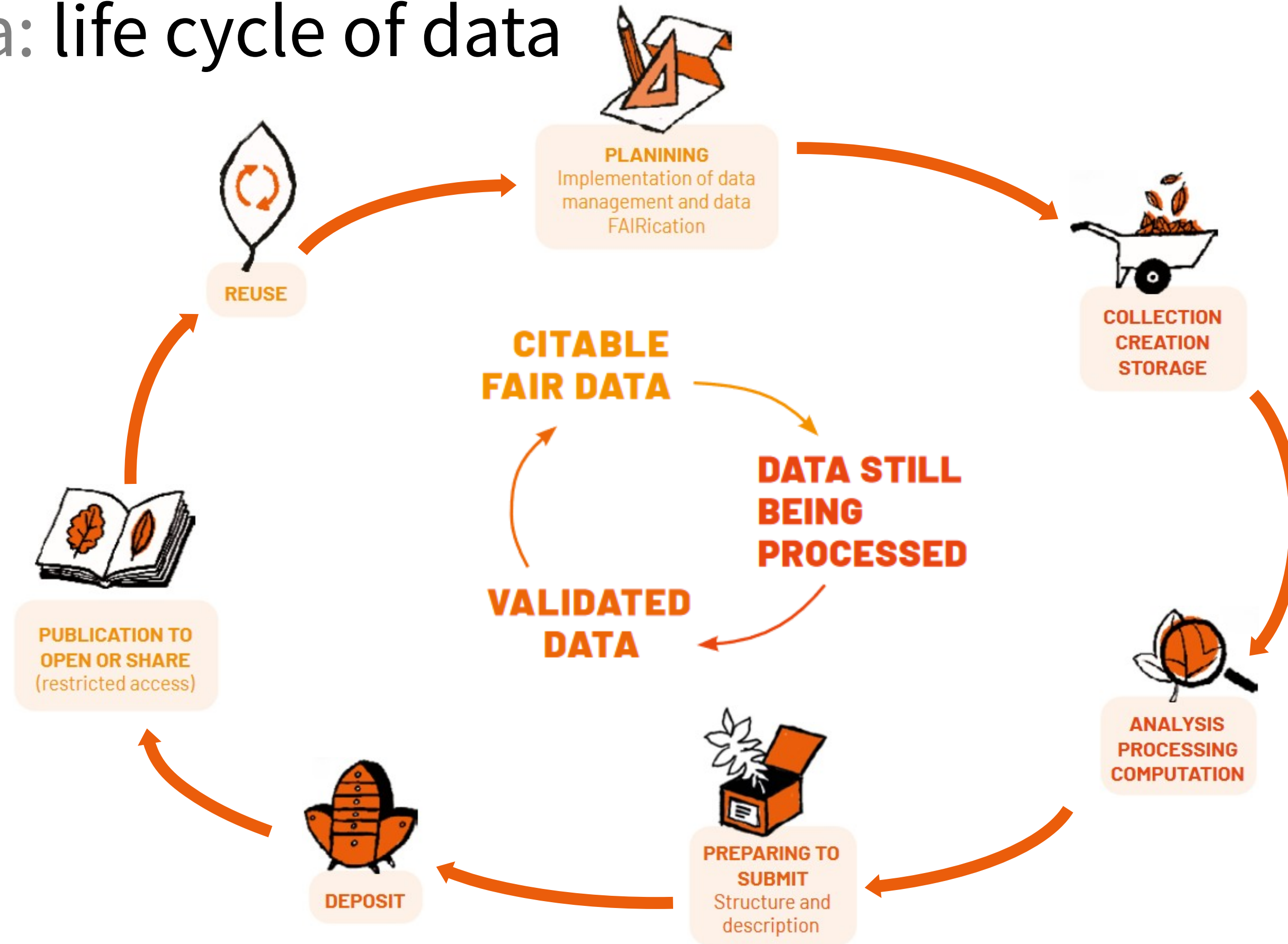
Open Data: importance of open data

OPEN
DATA



WWW.PHDCOMICS.COM

Open Data: life cycle of data



Open Data: data repositories

OPEN
DATA


RÉPUBLIQUE FRANÇAISE
recherche.data.gouv.fr
zenodo

generalist

GenBank

PANGAEA.

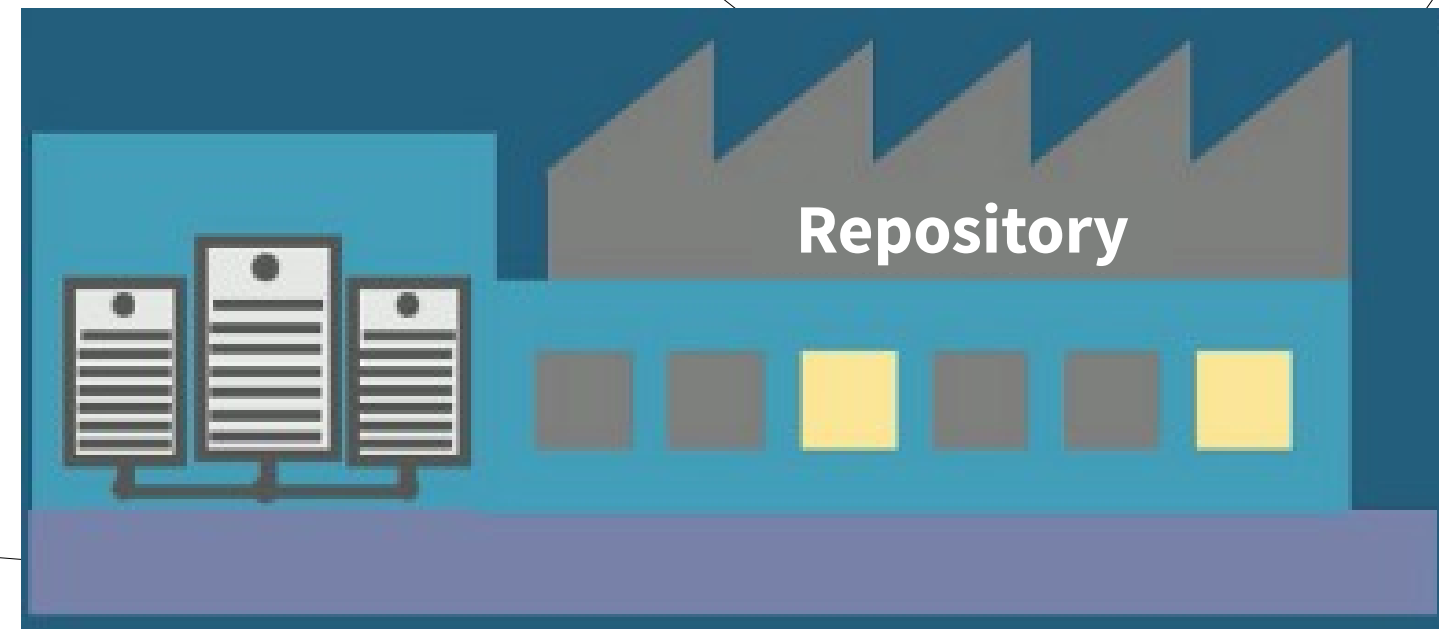
Data Publisher for Earth & Environmental Science

disciplinary


Data INRAE

INRAE

institutional



How to find repositories?

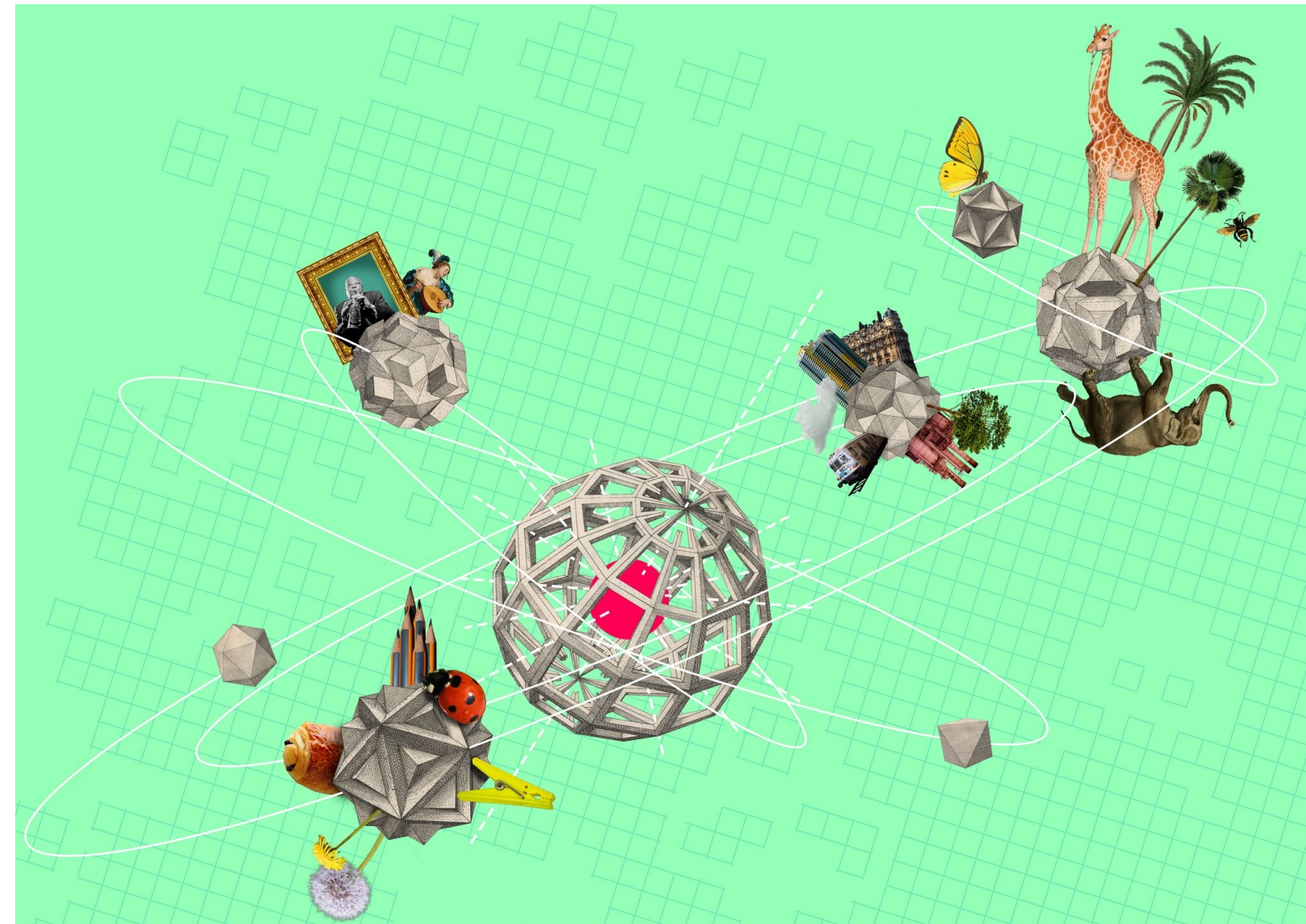

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES

To **find** and also **share** data sets...

Citizen Science

Citizen Science : how & why?

- 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

The logo for the European Citizen Science Association (ECSA) features the letters 'e', 'c', 's', and 'a' in a stylized, rounded font. The 'c' and 's' are filled with a gradient from green to blue.

European
Citizen Science
Association

[EU Citizen Science](#)



[ODySéYeu](#)

The logo for Université des Patients features the text 'Université des Patients' in a teal, sans-serif font. Below the text is a stylized teal graduation cap with a tassel.

[Université des patients](#)



[Museum National d'Histoire Naturelle](#)

The SciStarter logo features the word 'scistarter' in a large, bold, sans-serif font. The 's' is orange, 'ci' is green, and 'starter' is blue. Below it is the tagline 'Science we can do together.' in a smaller, blue, sans-serif font.

[SciStarter](#)

The CoastSnap logo features a smartphone icon on the left displaying a beach scene. To the right, the text 'CoastSnap' is in a large, bold, black font, with 'community beach monitoring' in a smaller font below it. At the bottom, 'PAYS DE LA LOIRE' is written in a teal, sans-serif font.

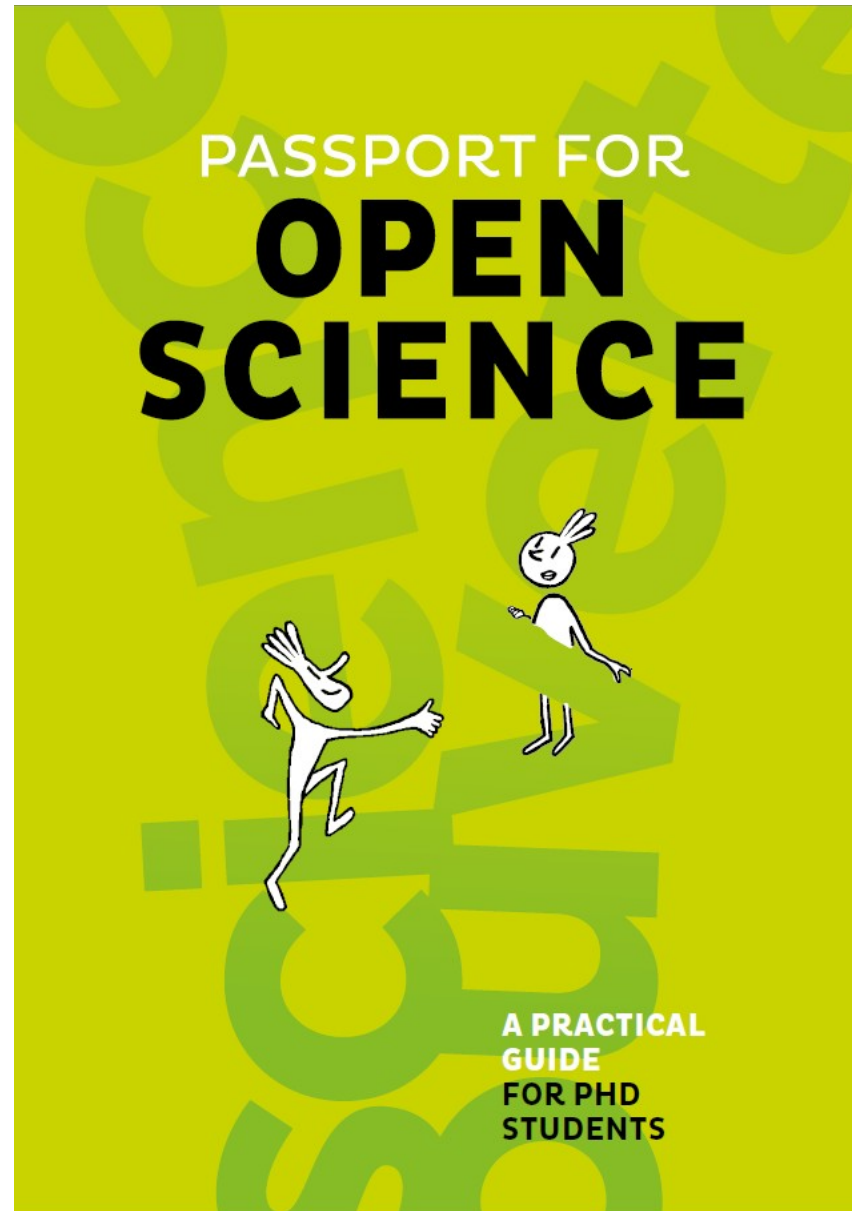
[CoastSnap](#)

The logo for Français de nos régions features the text 'FRANÇAIS DE NOS RÉGIONS' in a large, green, outlined, sans-serif font.

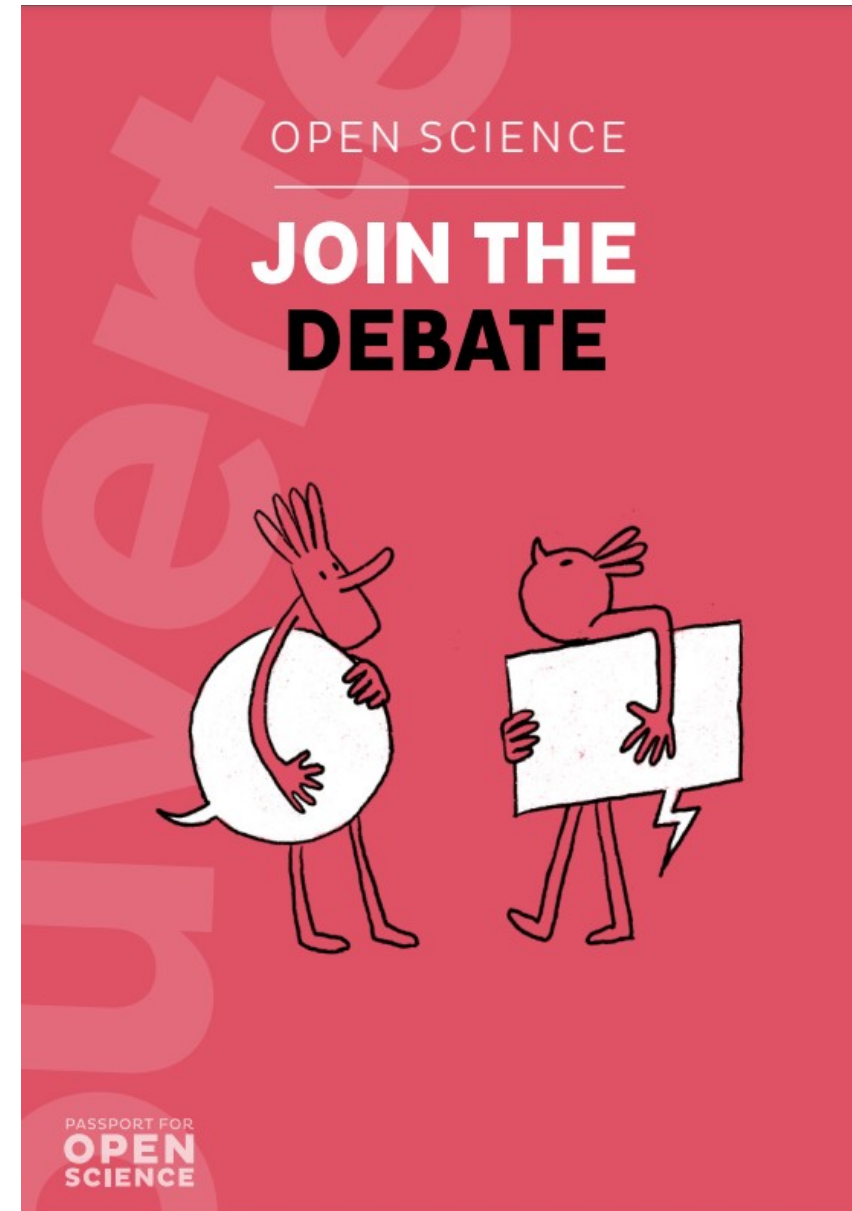
[Français de nos régions](#)

Any questions ?

For further information: Open Science Guides



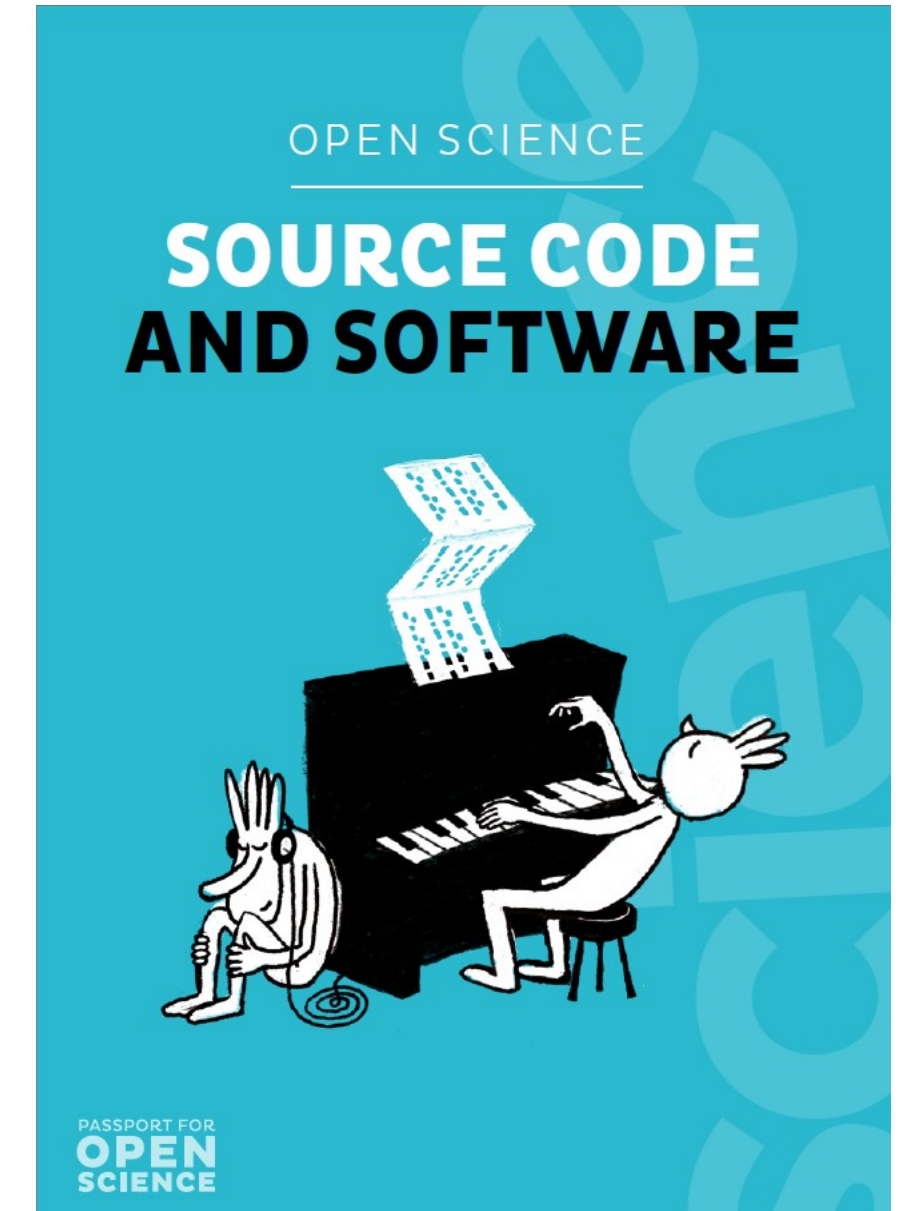
Passport for Open Science



Join the Debate

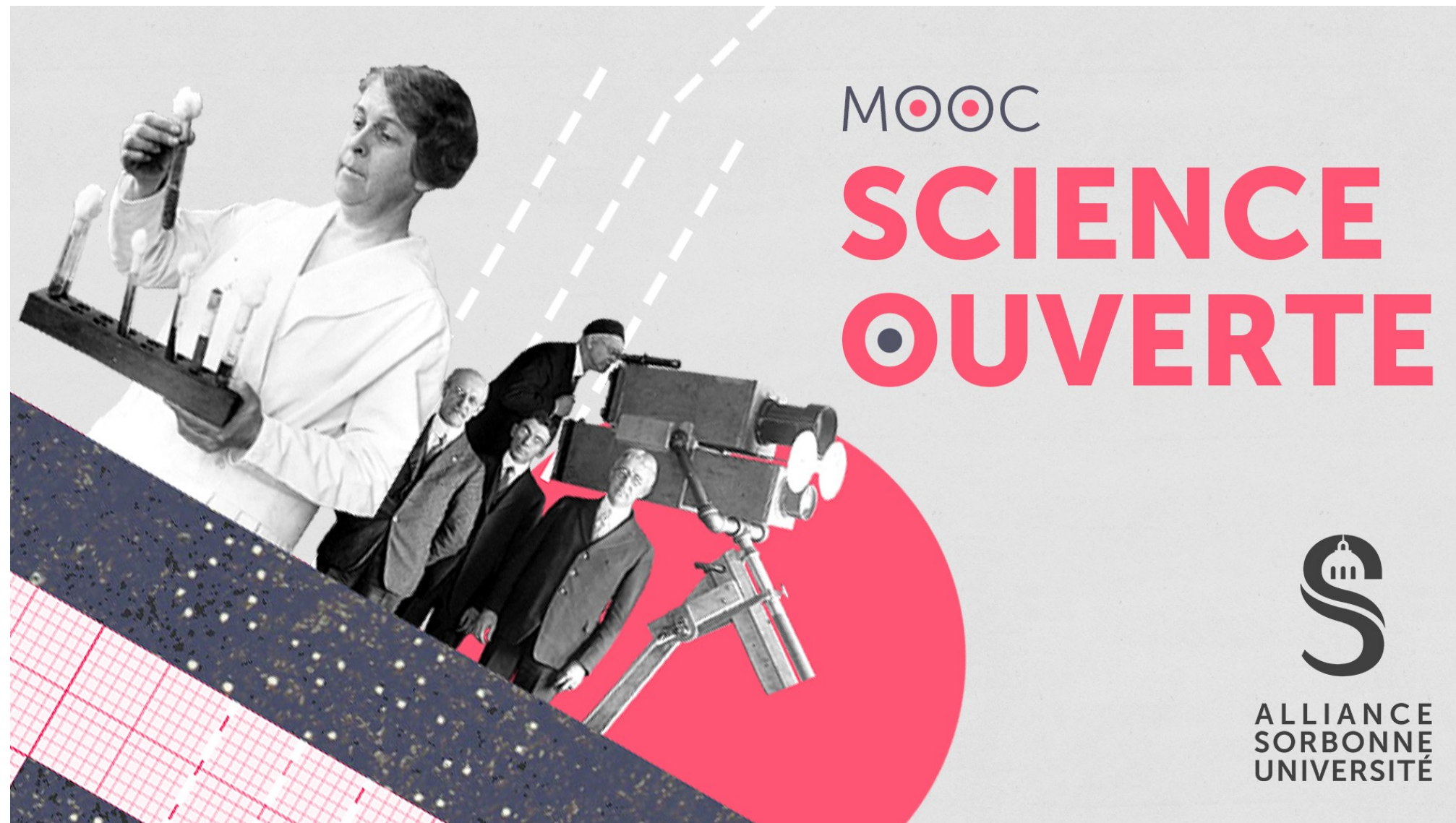


Research Data



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

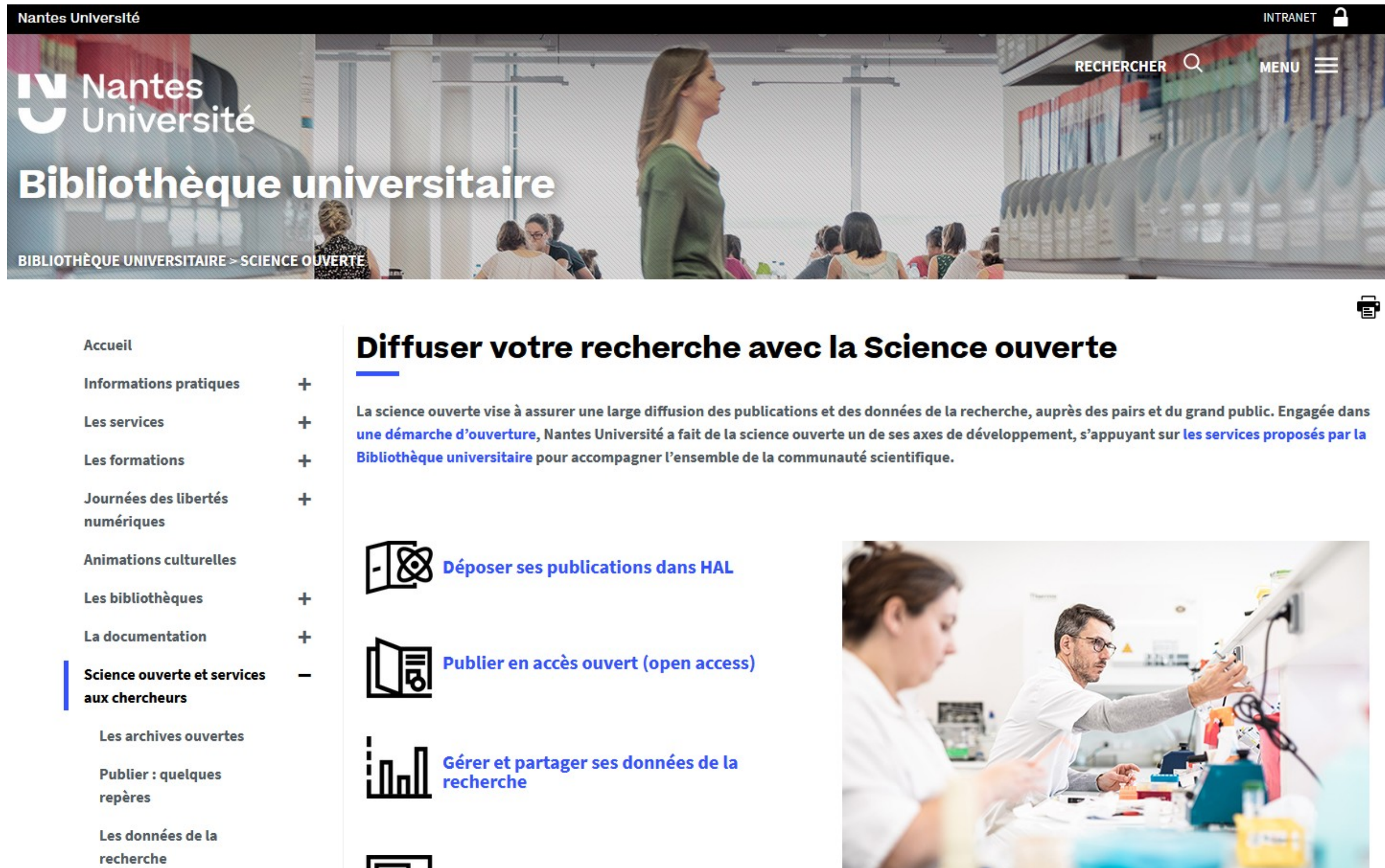
[Available on Fun MOOC \(in FR & EN\)](https://www.fun-mooc.fr/en/courses/open-science/)



<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!



The screenshot shows the website for the Nantes University library's 'Science ouverte' (Open Science) section. The header includes the Nantes University logo and the text 'Bibliothèque universitaire' and 'BIBLIOTHÈQUE UNIVERSITAIRE > SCIENCE OUVERTE'. The main content area is titled 'Diffuser votre recherche avec la Science ouverte' and contains a paragraph explaining the university's commitment to open science. Below this, there are three main actions: 'Déposer ses publications dans HAL', 'Publier en accès ouvert (open access)', and 'Gérer et partager ses données de la recherche'. A sidebar on the left lists various navigation options, with 'Science ouverte et services aux chercheurs' highlighted. A photograph of researchers in a lab is visible on the right side of the page.

Nantes Université

INTRANET

RECHERCHER

MENU

Nantes Université

Bibliothèque universitaire

BIBLIOTHÈQUE UNIVERSITAIRE > SCIENCE OUVERTE

Diffuser votre recherche avec la Science ouverte

La science ouverte vise à assurer une large diffusion des publications et des données de la recherche, auprès des pairs et du grand public. Engagée dans une démarche d'ouverture, Nantes Université a fait de la science ouverte un de ses axes de développement, s'appuyant sur les services proposés par la Bibliothèque universitaire pour accompagner l'ensemble de la communauté scientifique.

- Déposer ses publications dans HAL
- Publier en accès ouvert (open access)
- Gérer et partager ses données de la recherche

Accueil

Informations pratiques +

Les services +

Les formations +

Journées des libertés numériques +

Animations culturelles

Les bibliothèques +

La documentation +

Science ouverte et services aux chercheurs -

- Les archives ouvertes
- Publier : quelques repères
- Les données de la recherche

Contact us via email:
bu-science-ouverte@univ-nantes.fr

12

U