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Common practices in transnational research, ICT case and challenges

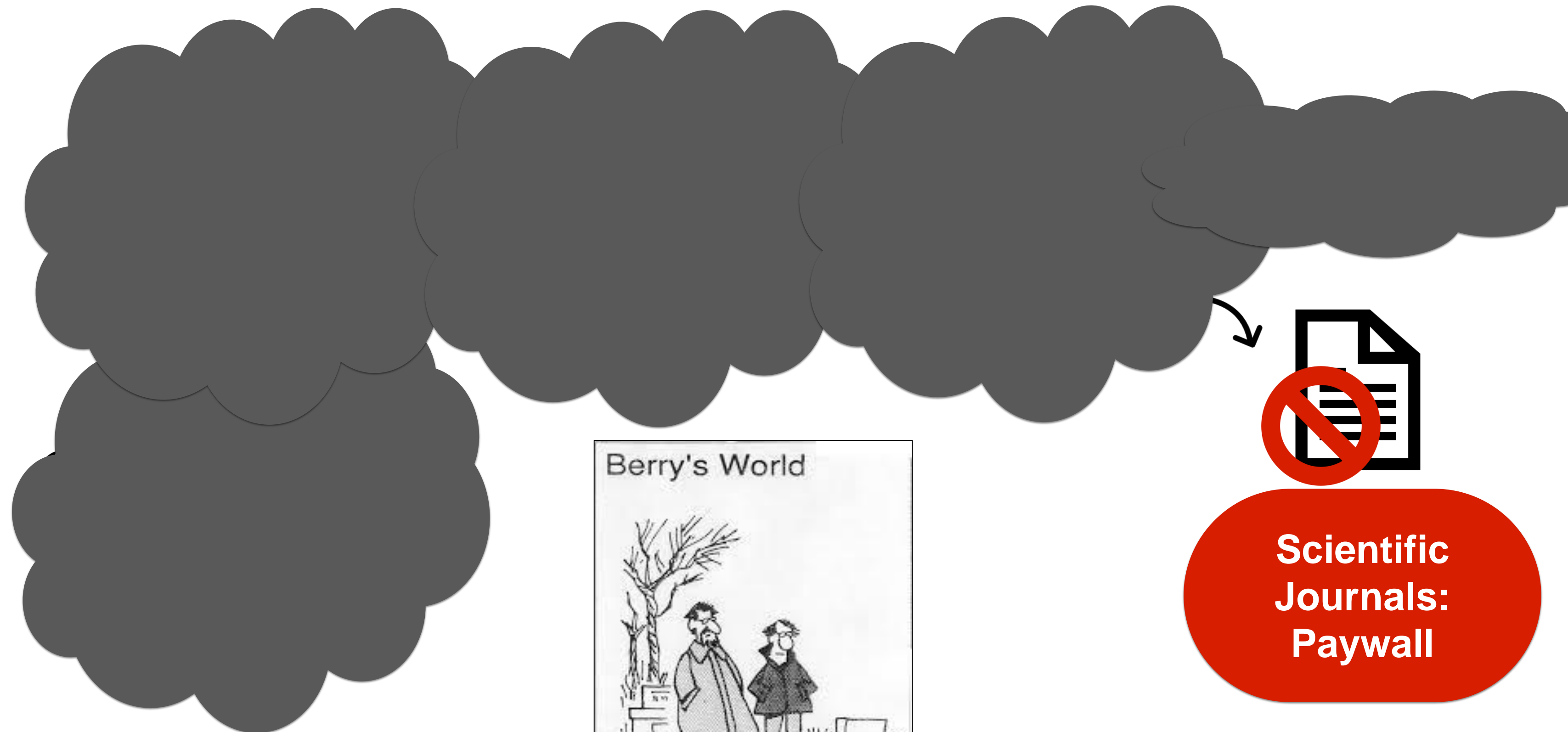
Why do we need Open Science?

The researcher perspective





How does Science work today?



**Scientific
Journals:
Paywall**



Why do we spend **public
money** to close the
research results behind
limited access
**subscriptions scientific
journals?**

Research Evaluation



Based on bibliometric
indexes

number of citations

Impact Factor

H-index...

It's all about **Journals!**

”

What are we
missing?

... a great part of researchers work

Negative results

Data

Algorithms

Processes

Software

Methodologies

Educational Resources

Peer-review

Grey Literature

Project proposals

Leadership skills

Product
development

...



Why do
Researchers need
Open Science?

The Stick and the Carrot of Open Science

Requirements

- Compliance with policies (funder, institutional)
- Journal publishers requirements
- Demonstrate responsible practice (improve integrity and validation of results)

Benefits

- Keep research safe and secure (through the deposit in a trustworthy repository)
- Increase research efficiency
- Make research outputs more visible
- Enable collaboration (within or outside a specific discipline)

Current Open Science Practices in the ICT Domain

Software management tools

- GitHub is a development platform
- Based on collaborative environment (community)
- Allows to share software and collaborative develop projects, improve, request reviews, test, and share



CI/CD



Secure development



Code review



Apps



Hosting



Project management



Team management

GitHub is how people build software

We're supporting a community where more than 40 million* people learn, share, and work together to build software.

With Github you do not publish your software!

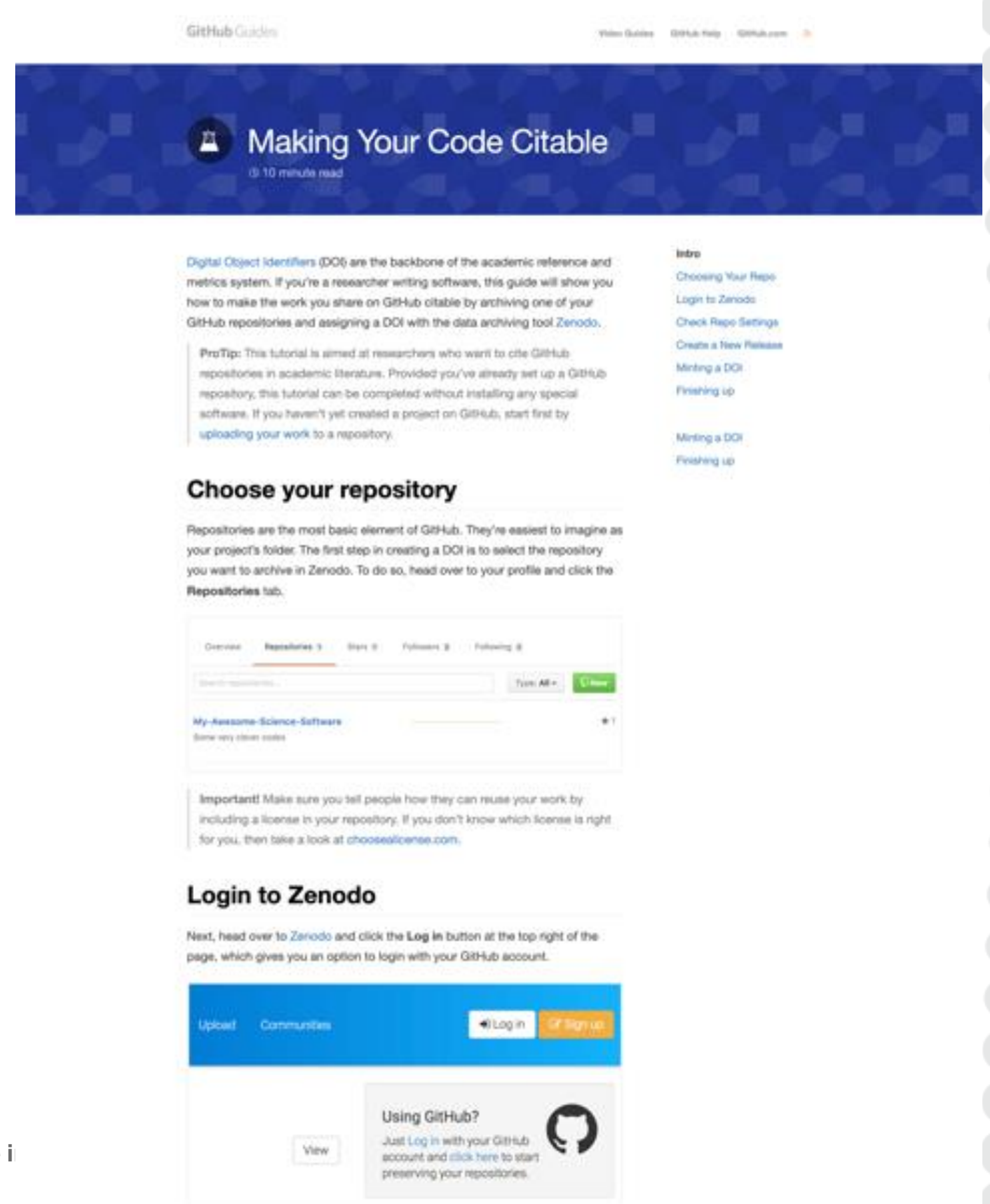


GitHub

What is missing?

GitHub does not allow to

- Publish your software (in the academic sense),
- Preserve your software,
- Make your software findable,
- Give attribution,
- Make your software citable.



The screenshot shows a GitHub Guide titled "Making Your Code Citable" with a 10-minute read time. The guide is part of the "GitHub Guides" series. It discusses Digital Object Identifiers (DOIs) and how to make GitHub repositories citable by archiving them with Zenodo. The guide includes a "ProTip" about researchers and a "Choose your repository" section. It also features a "Login to Zenodo" section with a "Log in" button. The guide is written by "My-Awesome-Science-Software" and includes a "View" button for the full guide.

Making Your Code Citable
(10 minute read)

Digital Object Identifiers (DOIs) are the backbone of the academic reference and metrics system. If you're a researcher writing software, this guide will show you how to make the work you share on GitHub citable by archiving one of your GitHub repositories and assigning a DOI with the data archiving tool Zenodo.

ProTip: This tutorial is aimed at researchers who want to cite GitHub repositories in academic literature. Provided you've already set up a GitHub repository, this tutorial can be completed without installing any special software. If you haven't yet created a project on GitHub, start first by [uploading your work to a repository](#).

Choose your repository

Repositories are the most basic element of GitHub. They're easiest to imagine as your project's folder. The first step in creating a DOI is to select the repository you want to archive in Zenodo. To do so, head over to your profile and click the **Repositories** tab.

Login to Zenodo

Next, head over to [Zenodo](#) and click the **Log in** button at the top right of the page, which gives you an option to login with your GitHub account.

Using GitHub?
Just [Log in](#) with your GitHub account and [click here](#) to start preserving your repositories.

Zenodo

- Zenodo is a **catch all repository** developed thanks to a collaboration with CERN and OpenAIRE
- Zenodo provides free **DOI** to make the software **citable** and give credit to the developers/contributors
- By making the software citable, you make it **findable**
- Additional researchers can then use the same software for **different purposes**, leading to **credit** for the developers
- Citation of specific software used is necessary for **reproducibility**, although not sufficient.



zenodo Search Upload Communities emma.lazzeri@isti.cnr.it

February 17, 2017 Software Open Access

gdup: a big graph entity deduplication system - Release 1.0

18 views 1 downloads See more details...

Claudio Atzori; Paolo Manghi

dnet-gdup

gdup is a extension of the services included in a D-Net bundle.

The D-Net software toolkit, is a software framework for the realization of aggregative data infrastructures (https://github.com/dnet-team/dnet-basic-components) and eduput adds its functionalities by providing the web-based and the command-line interfaces.

Installation

gdup workflow

Available in

Publication date:
February 17, 2017

DOI:
DOI 10.5281/zenodo.292980

Keyword(s):
workflow big data entity resolution deduplication
record linkage graph information space

Grants:
European Commission:

- OpenAIRE2020 - Open Access Infrastructure for Research in Europe 2020 (643410)

Related identifiers:
Supplement to
<https://github.com/claudioatzori/dnet-gdup/tree/1.0>

License (for files):
[Apache License 2.0](#)

ub
AIRE
on deduplication
space
ccess
rch in Europe 2020
ri/dnet-
+
(2017, February 17).
ation system -
o.
92980
Core DCAT
MARCXML



What Else?

Software Heritage

An international initiative
to preserve software



Software Heritage
THE GREAT LIBRARY OF SOURCE CODE

Software Papers

- Software papers are written to **describe** software and are based on the same principles of Data Papers
- The DOI attached to the article makes it **citable**
- **However the software itself should be cited on the same basis as any other research product**
- If a software paper exists and it contains results (performance, validation, etc.) that are important to the work, then the software paper should also be cited (in addition to the software).



Software Reproducibility

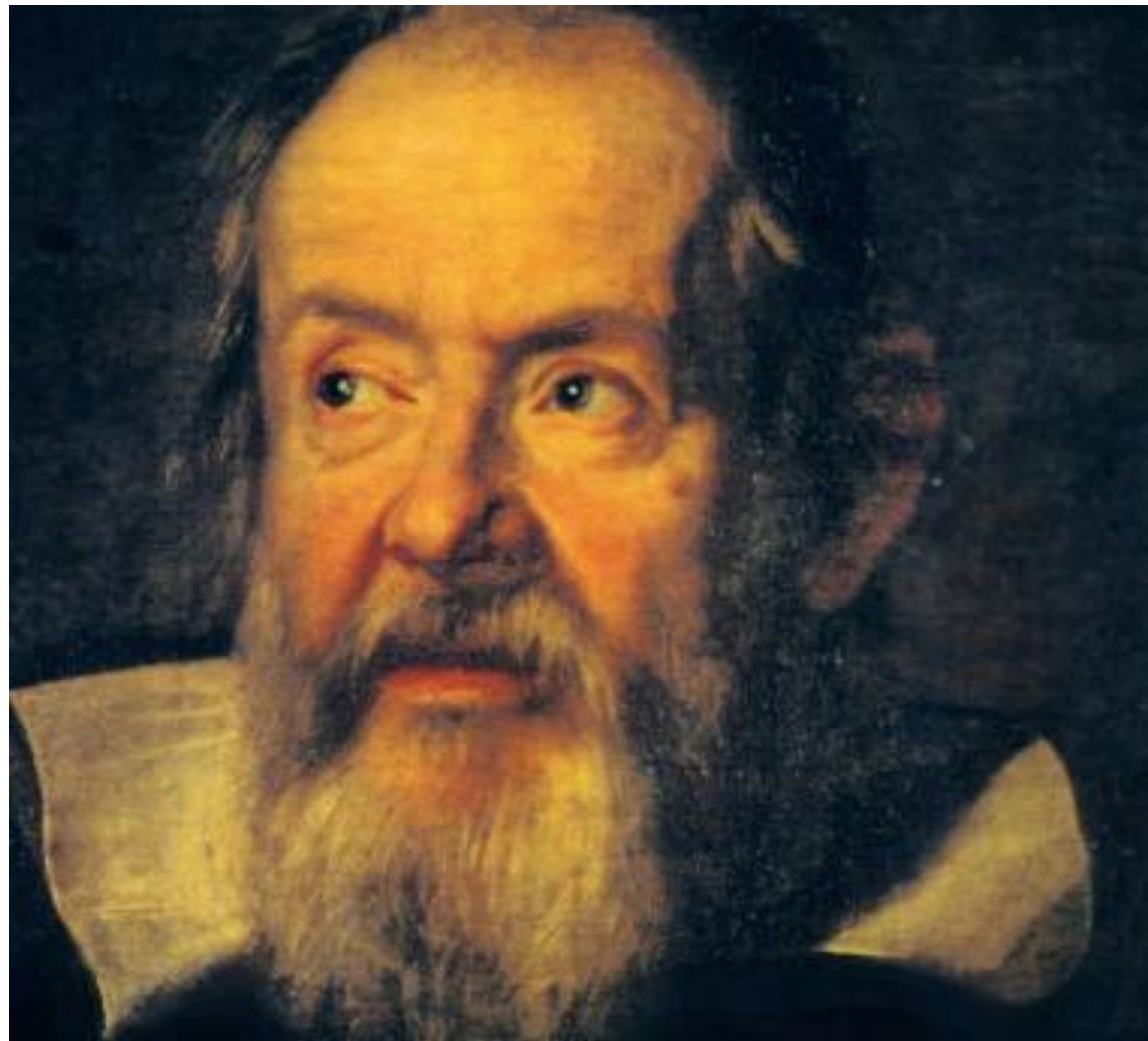
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An experiment is
reproducible until another
laboratory tries to repeat it

Alexander Kohn

Reproducibility

Is (**still**) a principle of
the Scientific Method!



WHEN?

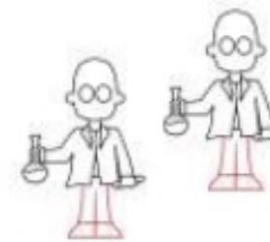


Can I **repeat** my method?

DEFEND

same experiment, set up, lab

submit article
(and move on...)



Can I **replicate** your method?

CERTIFY

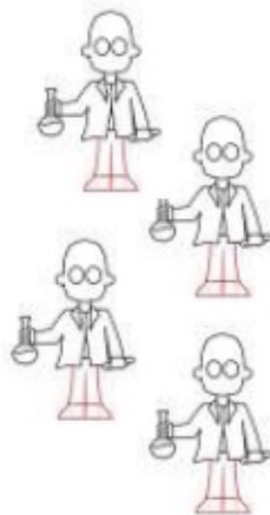
same experiment, set up, independent lab

(a window before decay sets in ...)

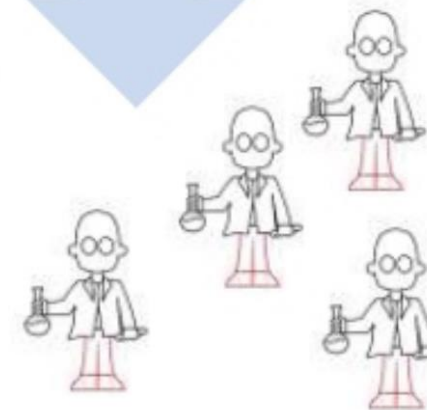
publish article

COMPARE

Can I **reproduce** my results using your method or your results using my method?



variations on experiment, set up, lab



TRANSFER

Can I **reuse** your results / method in my research ?

different experiment

* Adapted from Mesirov, J. Accessible Reproducible Research *Science* 327(5964), 415-416 (2010)

Slide by Prof. **Carol Goble**, "Reproducibility and Scientific Research: why, what, where, when, who, how"



Ian Holmes
@ianholmes



You can download our code from the URL supplied.
Good luck downloading the only postdoc who can get it
to run, though [#overlyhonestmethods](#)

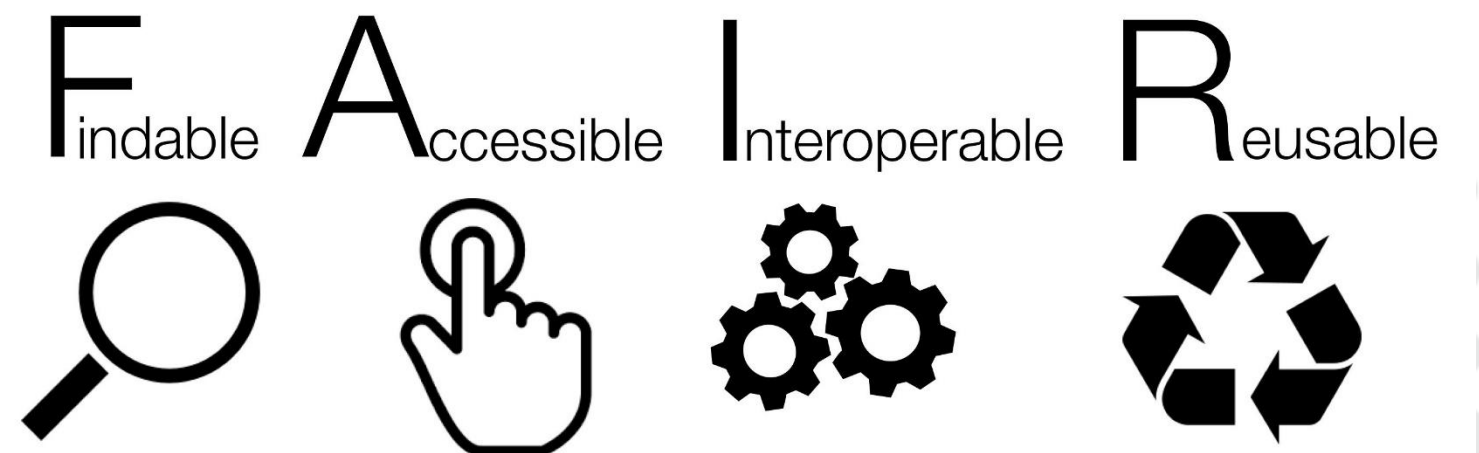
[Traduci il Tweet](#)

5:52 PM · 8 gen 2013 · [Twitter for iPhone](#)

344 Retweet **141** Mi piace

Make software FAIR

- ORCID to identify the authors/contributors
- Develop in a structured – and collaborative/open – way (GitHub)
- Deposit and preserve in a trustworthy repository: get a DOI! (Zenodo)
- Choose a clear license
- Deposit a (updated) README file with your code
- Use versioning
- Link to other research objects (articles, data, ...)



A step into the Future



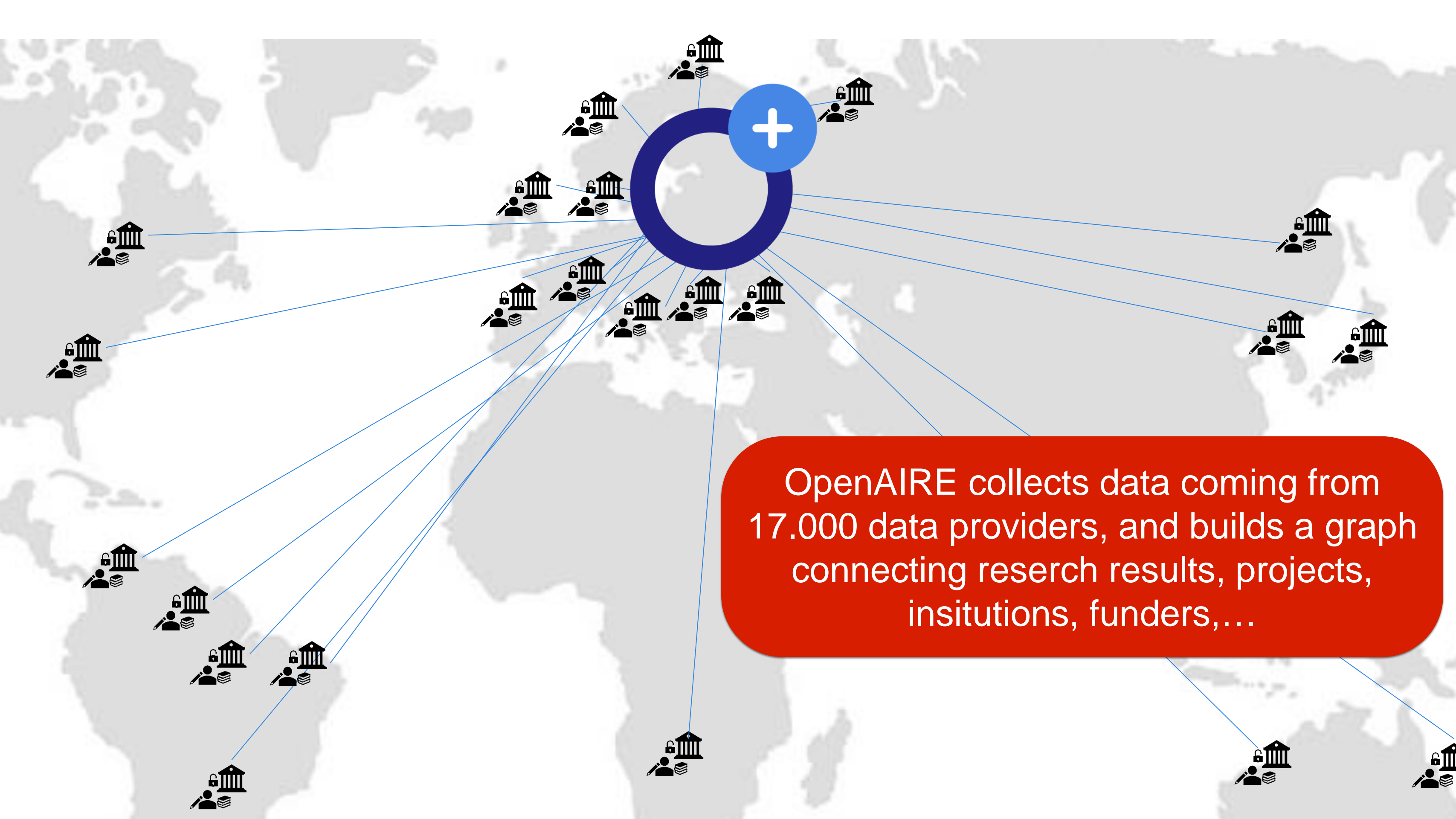
A new research evaluation is coming...

- Based on Open Science and all the **FAIR objects** researchers produce
- Based on the **reuse** that (other) researchers will make of the FAIR products
- Based on the **links** research objects enable
- Researchers (and Funders) need to **prepare** for this

*Make your research **FAIR** today
if you wish to be evaluated tomorrow*



OpenAIRE
Open Access
infrastructure for OA in
Europe
Funded by the EC
since 2009



OpenAIRE collects data coming from 17.000 data providers, and builds a graph connecting research results, projects, insitutions, funders,...

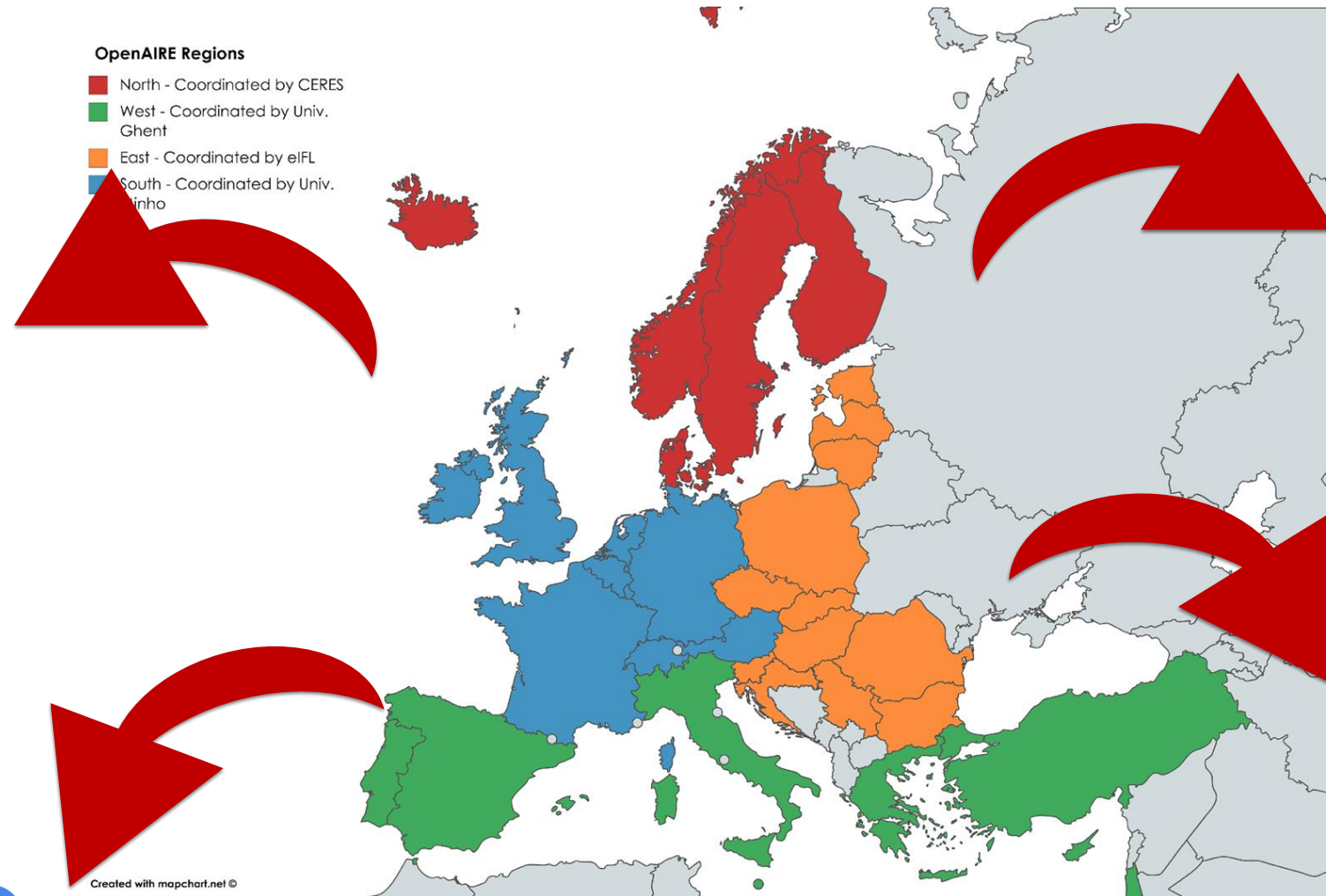


Content Providers 17.000
Publications 40.000.000
Projects 3.000.000
Datasets 10.000.000
Software 230.000
Funders 21

National Open Access Desks (NOADs)

Facts

- Research is global, support is local
- Diversity in culture & maturity of national/local infras
- Not one size fits all in OA and open science



Our pan-European network

→ 34 countries

Key national organizations

→ 4 area coordinators Moving to OS

Linked to infras around the world

How OpenAIRE can help

- Provide templates for RFO policy
- Provide support to the researchers
- **Train the trainers** programme for Institutions and Funders
- Monitoring compliance: dedicated funder service
- Dedicated **services** for researchers to

Deposit and
Preserve



Link



Anonymise



Actionable DMP



My take away messages for a funder policy

- If it is an obligation, make it **easy** and **clear**
- **Guide** your researchers
- **Train and inform** your researcher: make them like Open Science
- **Monitor** the compliance and **sanction** when necessary
- **Build on** successful stories and **learn from** unsuccessful ones
- **Embed** Open Science in your evaluation and review process
- **Align** as much as possible with existing policies to avoid confusion and duplication of efforts



Thank you!

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**CHIST-ERA Workshop on Open Science in Transnational
Research Bern | 6 march 2020**

