

Prof. Martin Vetterli – President

Ecole Polytechnique Fédérale de Lausanne – EPFL



EPIC Lunch Talk, July 14 2017

What is Open Science?



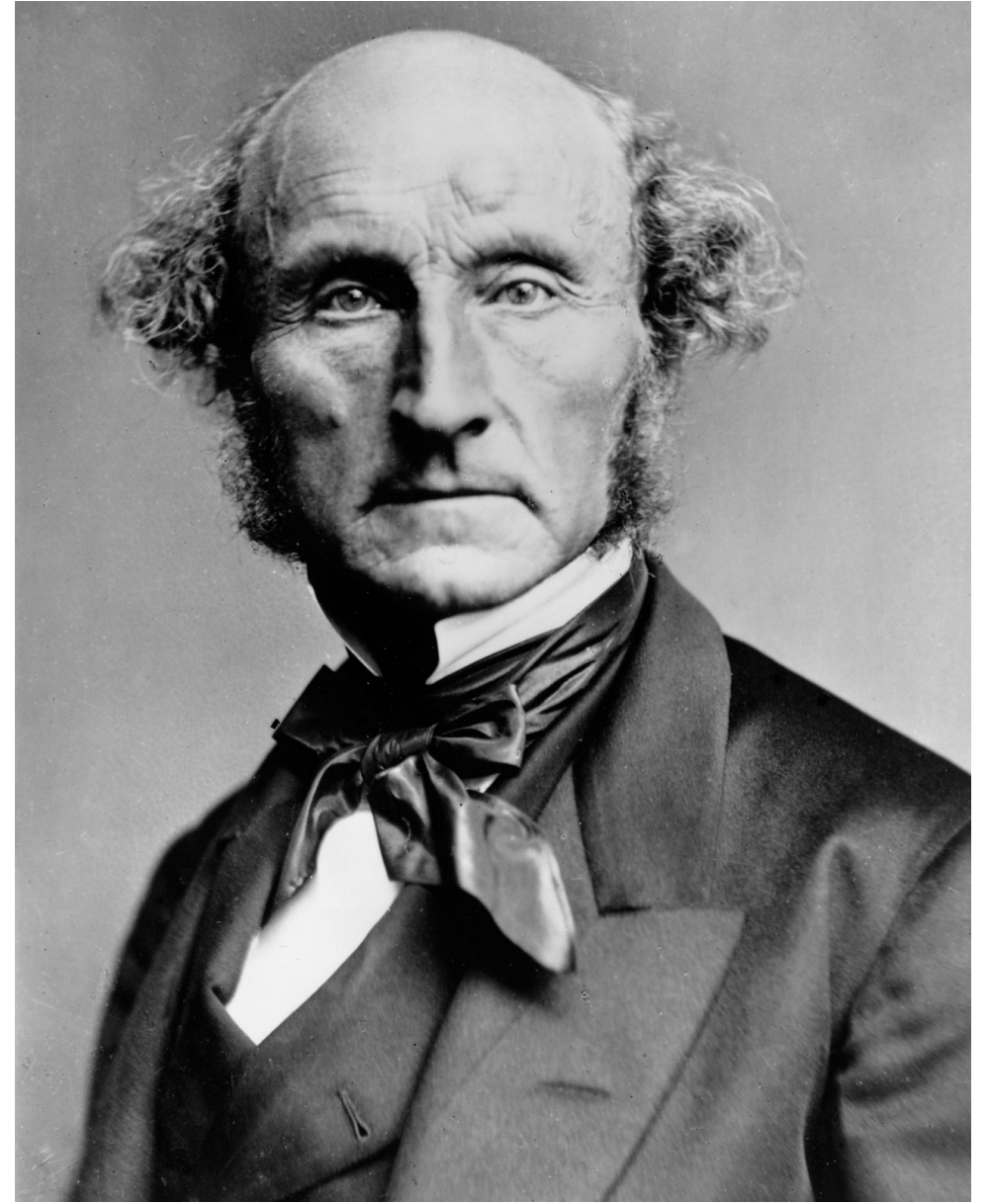
Image credits: ©2016 Annette Unser

“Open Science is at a stage where no-one is quite sure what it is, but they think it’s a good idea.”

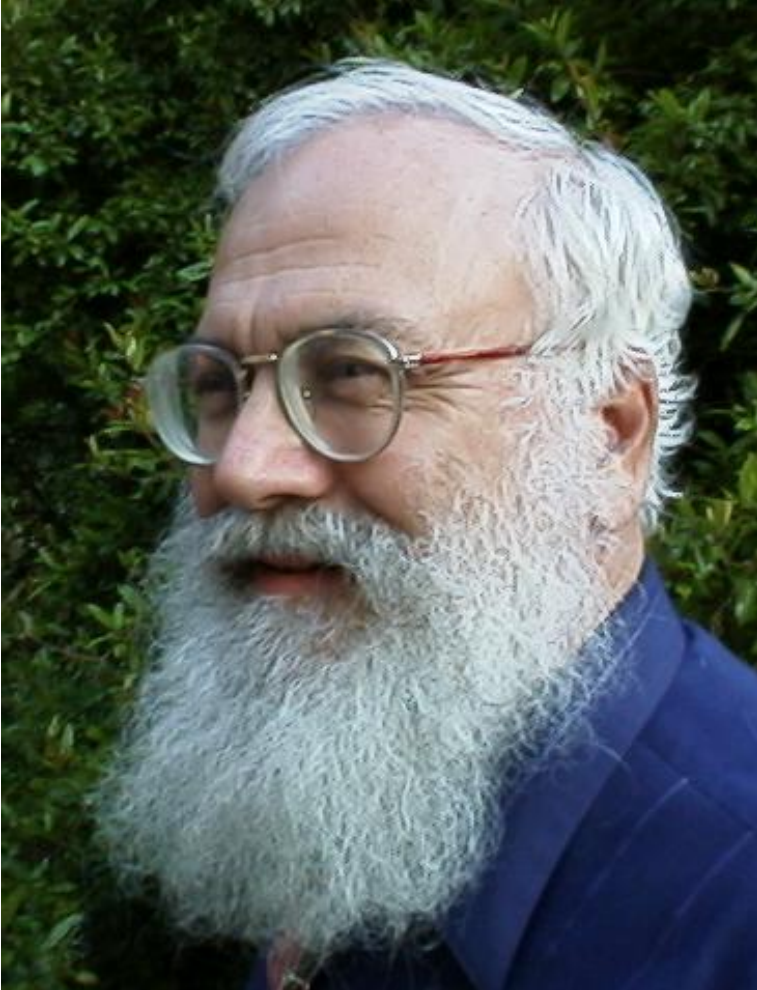
Open is in our DNA

“ A university exists for the purpose of laying **open** to each succeeding generation the accumulated treasures of the thoughts of mankind. ”

John Stuart Mill addressing students as newly elected Rector of St Andrews University in 1867.




Why I support Open Science



“An article about computational result is advertising, not scholarship. The actual scholarship is the full software environment, code and data, that produced the result.”

Why it is good for EPFL?

Open Science  **Visibility = larger impact**
Scrutiny = better quality
Reuse = higher efficacy
Public access = fair opportunity

rr.epfl.ch : reproducibility since 2007

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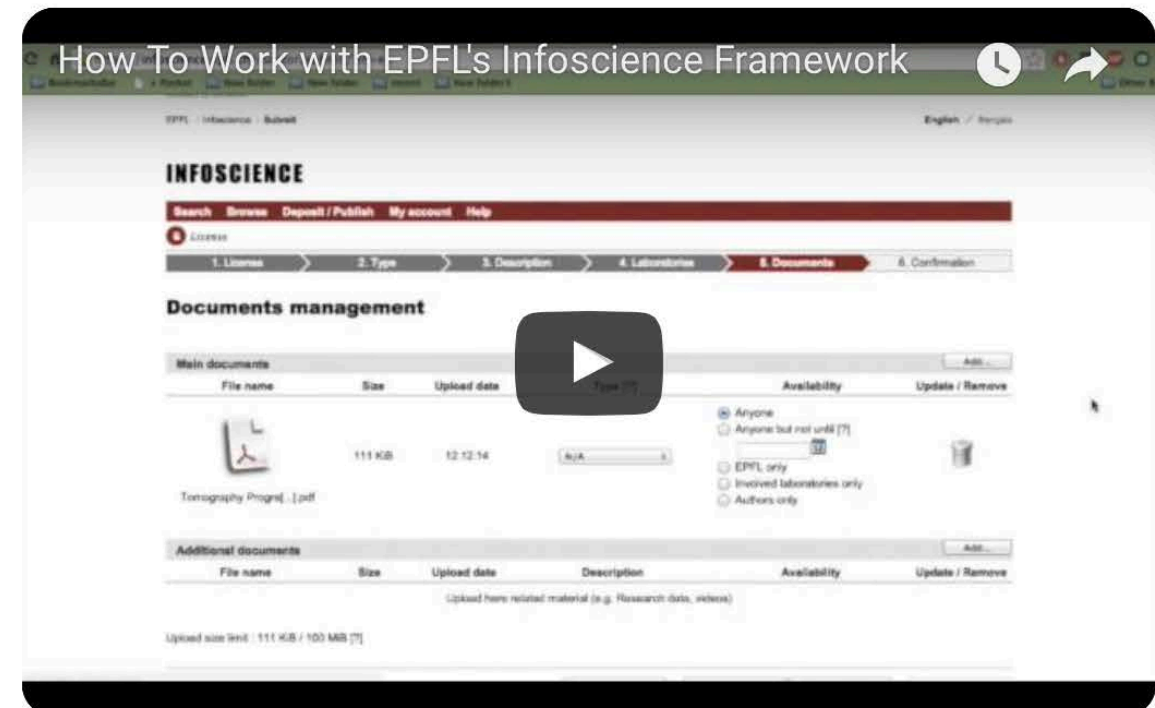
Sharing your findings, in a few simple steps

LCAV reproducible research framework makes sharing outcomes of your research supereasy! In a few simple steps, you can share your code, data and paper/report files with your colleagues at LCAV, EPFL and the world.

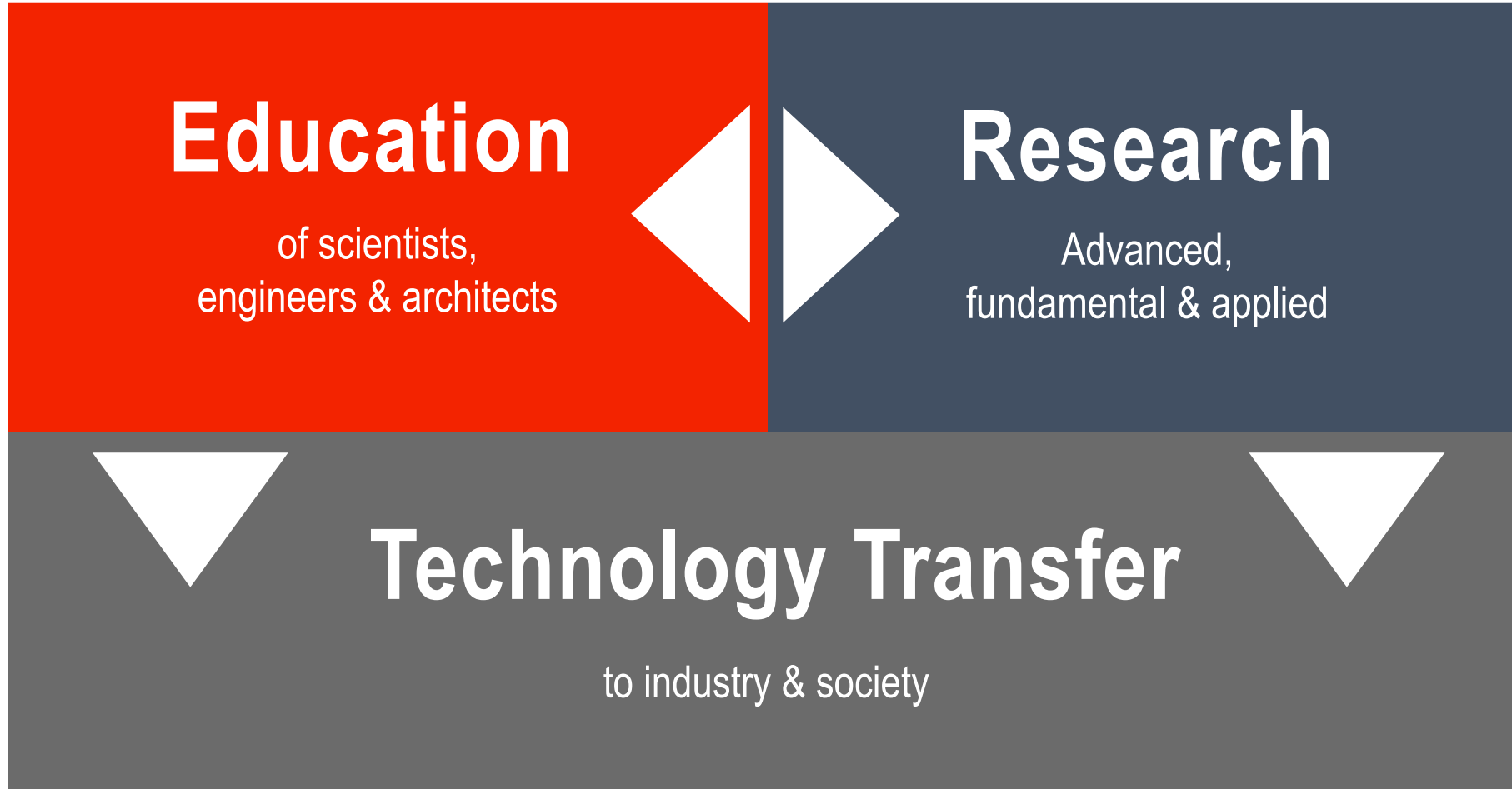
What you need to do is to import your files through EPFL's [infoscience](#) platform and they will be automatically imported to our website. Here's [an example](#) of how the end result will look like.

The video on the right explains the process of uploading to *infoscience* more clearly. In case you had any difficulties or questions regarding this process or how other sections of the site works, please [contact us](#).

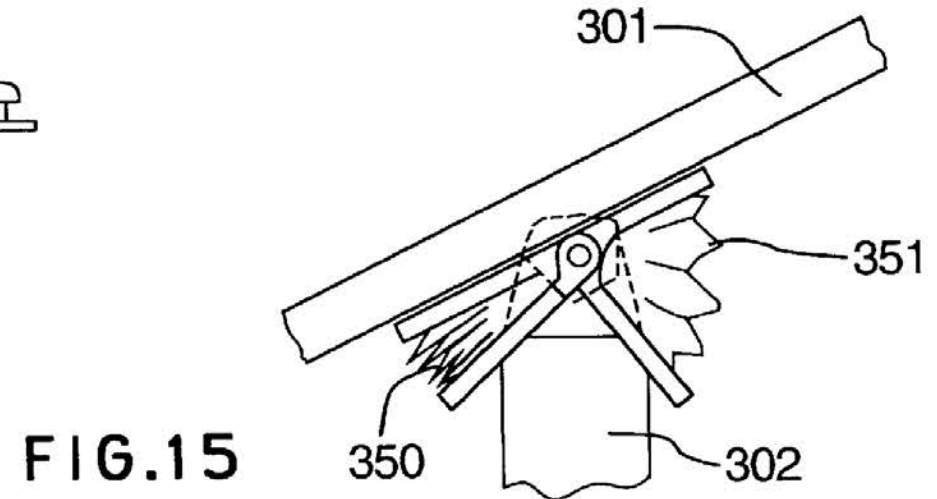
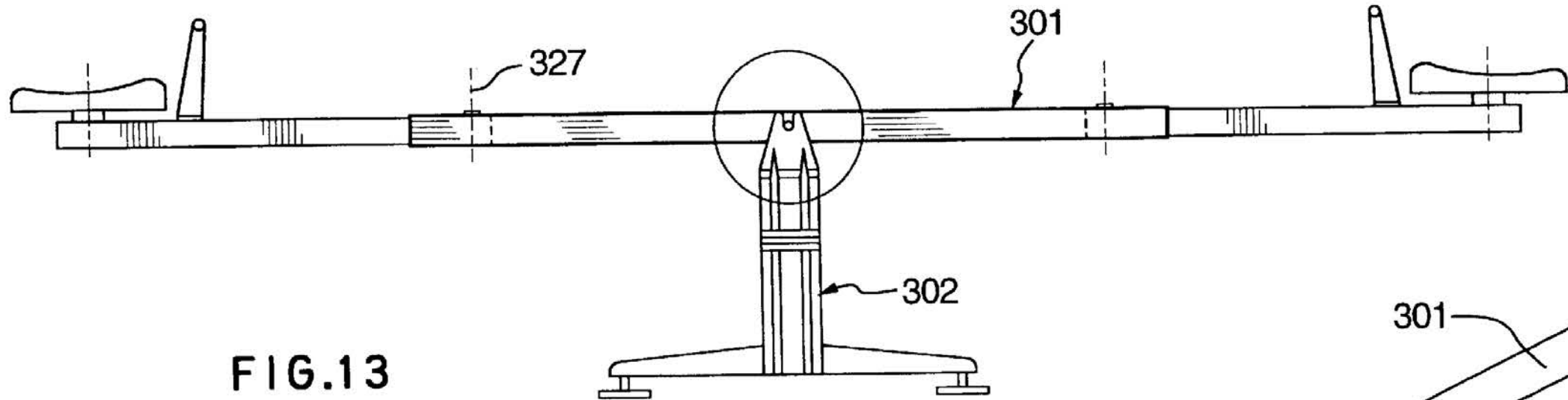
Here is how it works!



Our missions



A potential conflict?



U.S. Patent

Sep. 14, 1999

Sheet 8 of 8

Thank you!



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ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Martin Vetterli | President EPFL

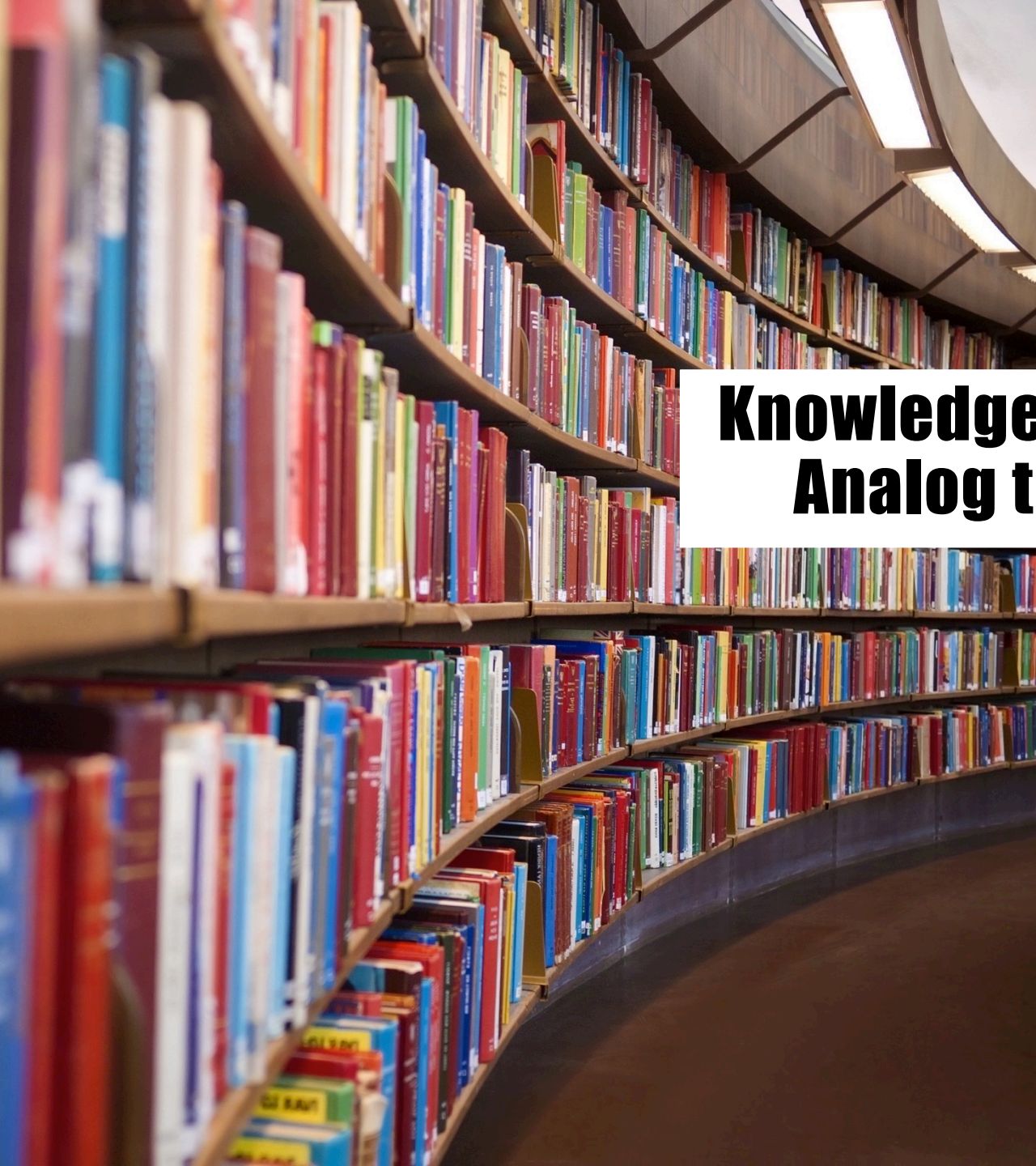
Luc Henry, Scientific Advisor



EPIC Lunch Talk, July 14 2017

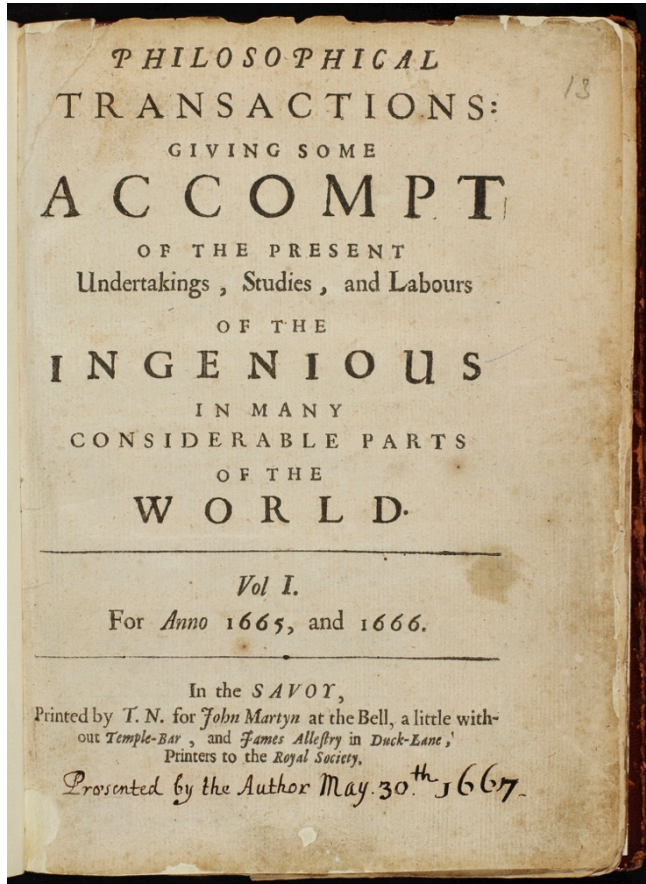
Why Open Science Happens Now?





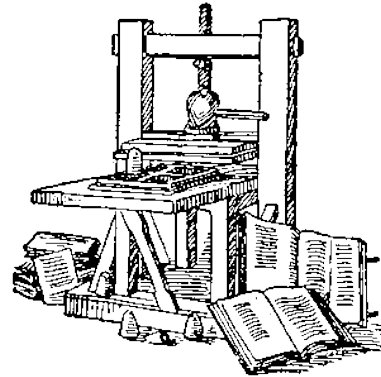
**Knowledge goes from
Analog to Digital**

The First Scientific Revolution



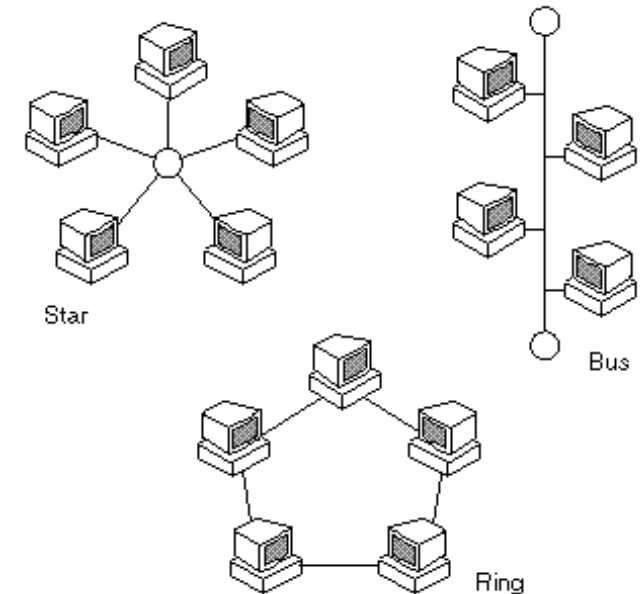
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Central role for print



2017

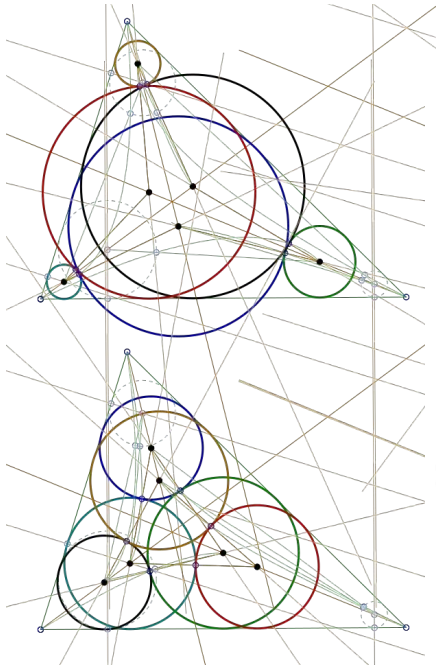
Digital technologies
and international collaborations



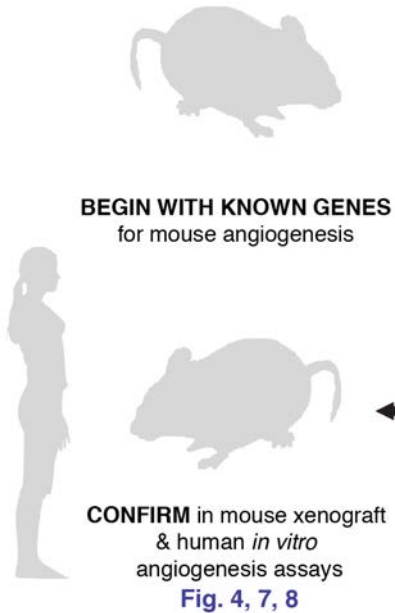
Philosophical Transactions – the world's first science journal

The scientific method is expanding

Deductive



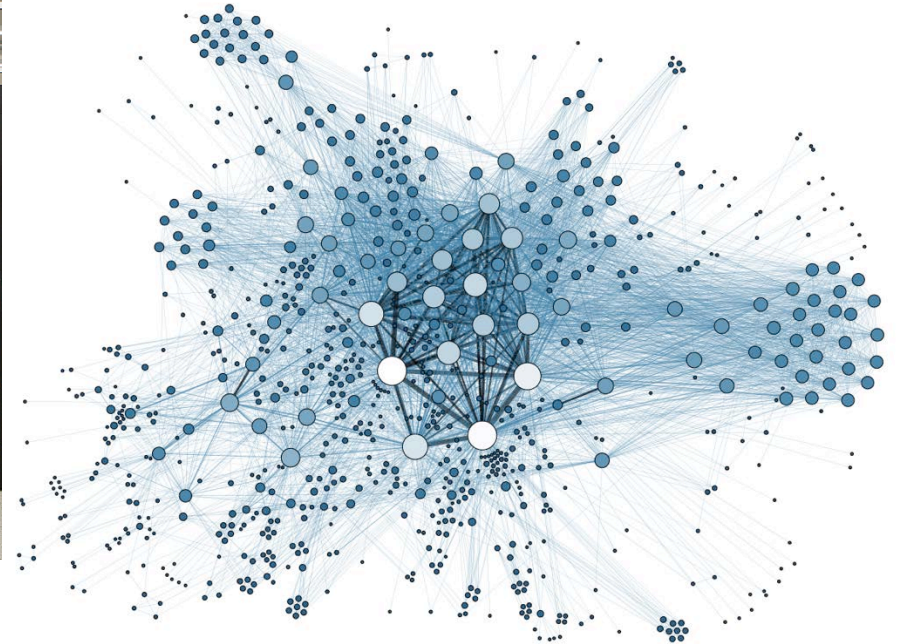
Empirical



Computational



Data driven (aka “Big Data”)



Research is more collaborative

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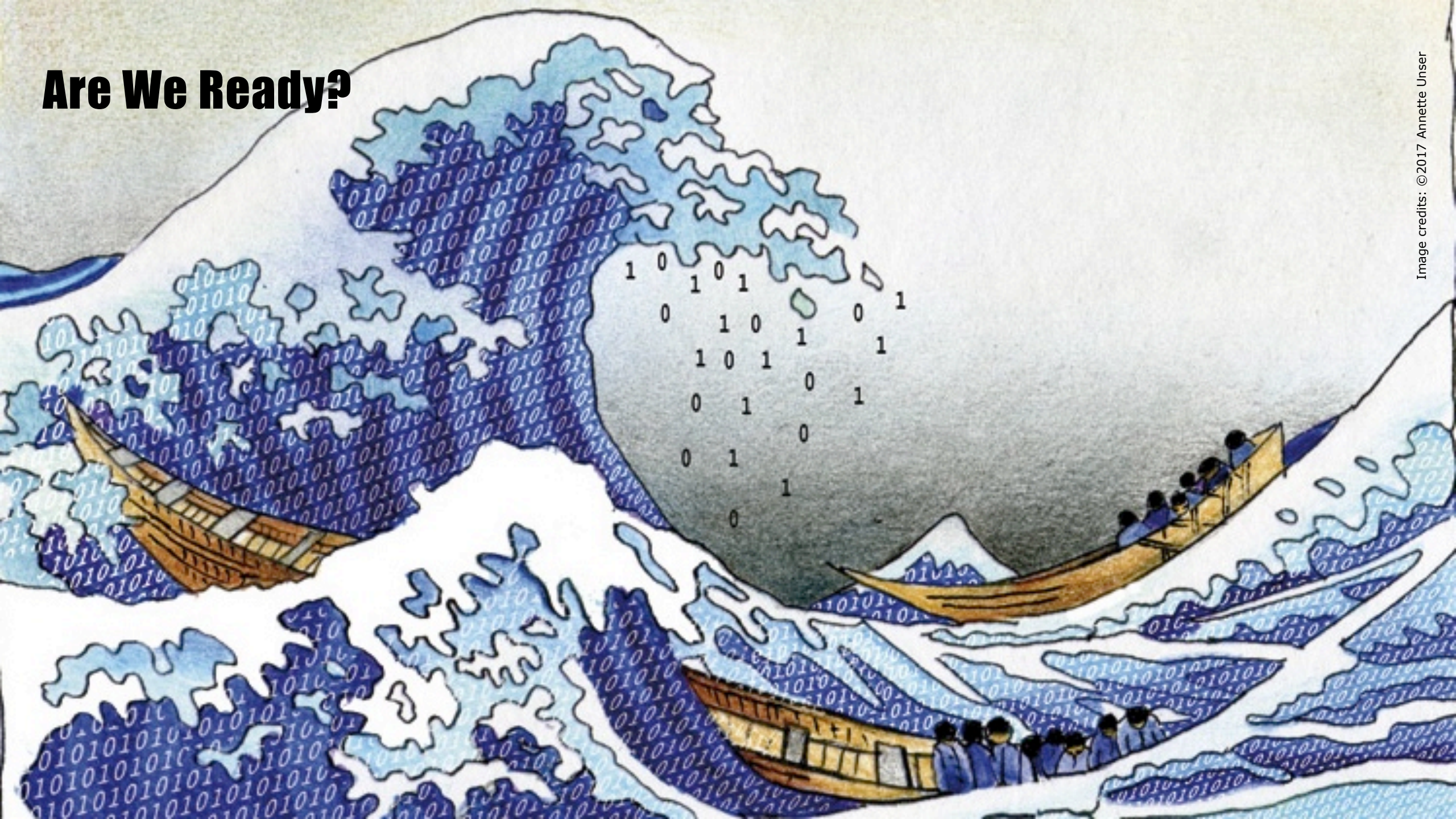
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Are We Ready?



We've been there before



PASSERIFORMES: MUSCICAPIDÆ.



PASSERIFORMES: MUSCICAPIDÆ. CAMPOPHAGIDÆ.



PASSERIFORMES: HIRUNDINIDÆ, MUSCICAPIDÆ.

Too much to know?



Is it Time for a second Scientific Revolution?



Image credits: © CERN

“ Universities behave like the internet never happened. ”

Cathy Davidson, Duke University

The trigger (part I)

PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A

MATHEMATICAL, PHYSICAL AND ENGINEERING SCIENCES



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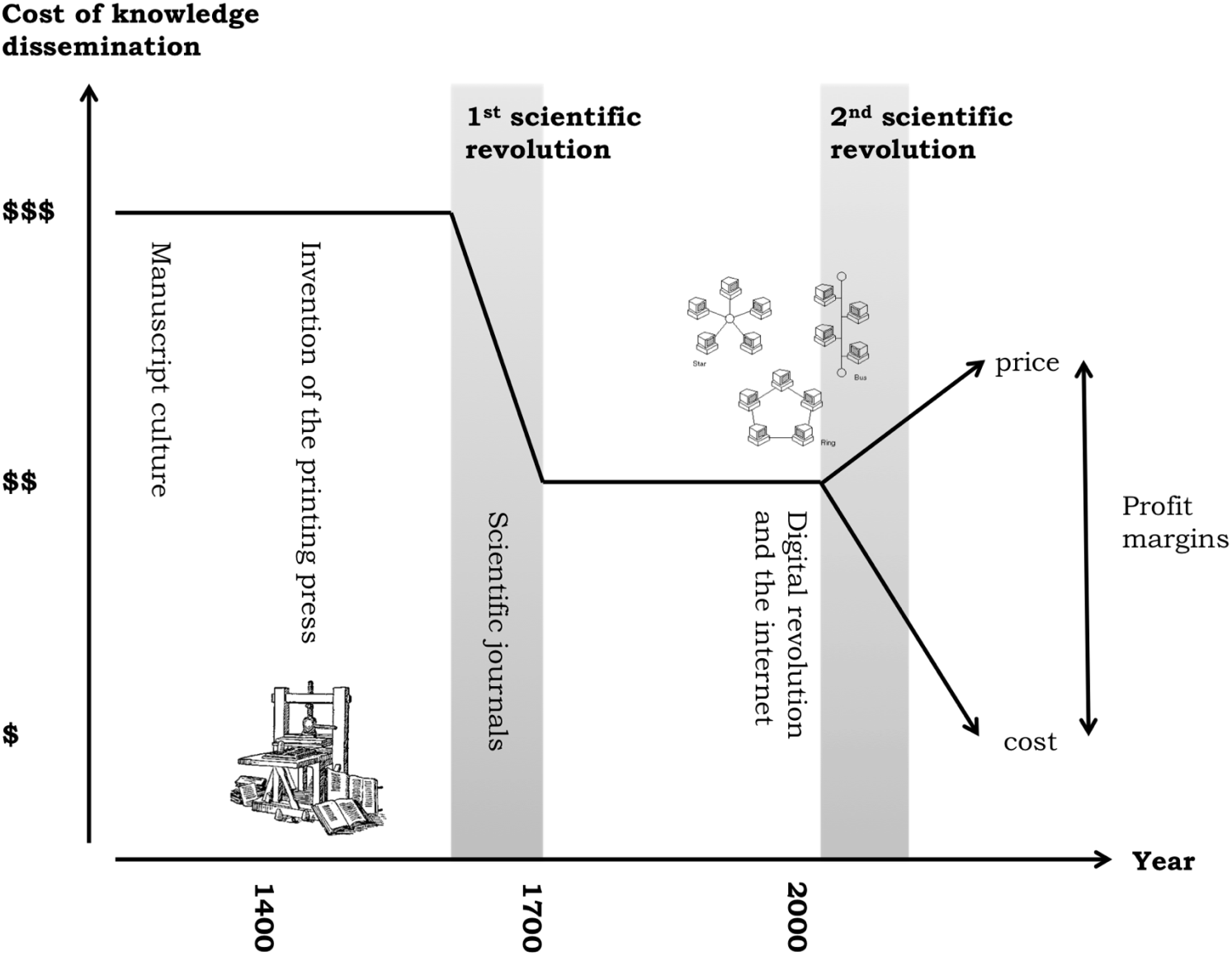
Kinetics of low-temperature transitions and a reaction rate theory equilibrium distributions

Vincenzo Aquilanti, Nayara Dantas Coutinho, Valter Henrique Carvalho-Silva

Published 20 March 2017. DOI: [10.1098/rsta.2016.0201](https://doi.org/10.1098/rsta.2016.0201)



The trigger (part II)

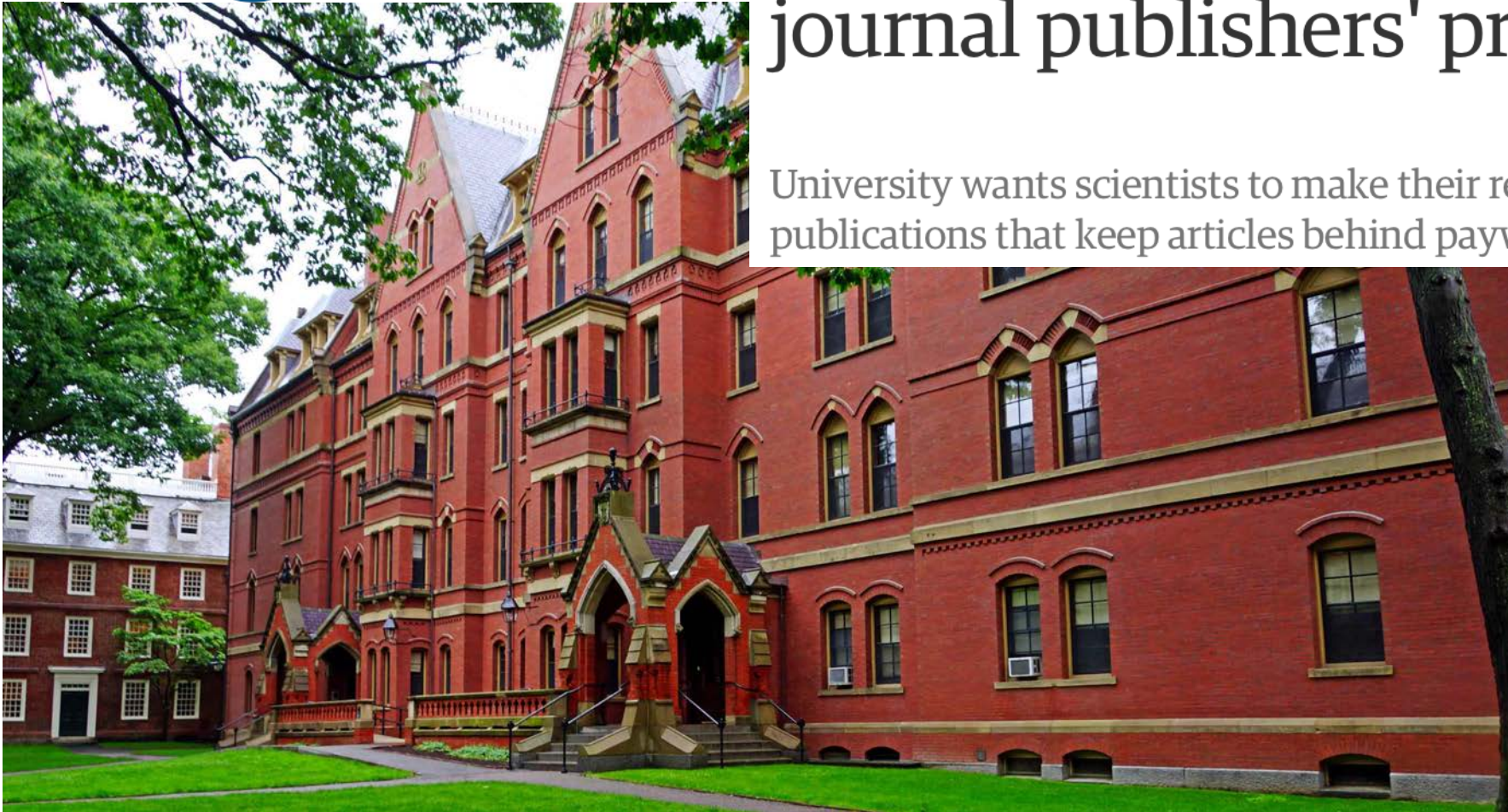


The consequence

theguardian

Harvard University says it can't afford journal publishers' prices

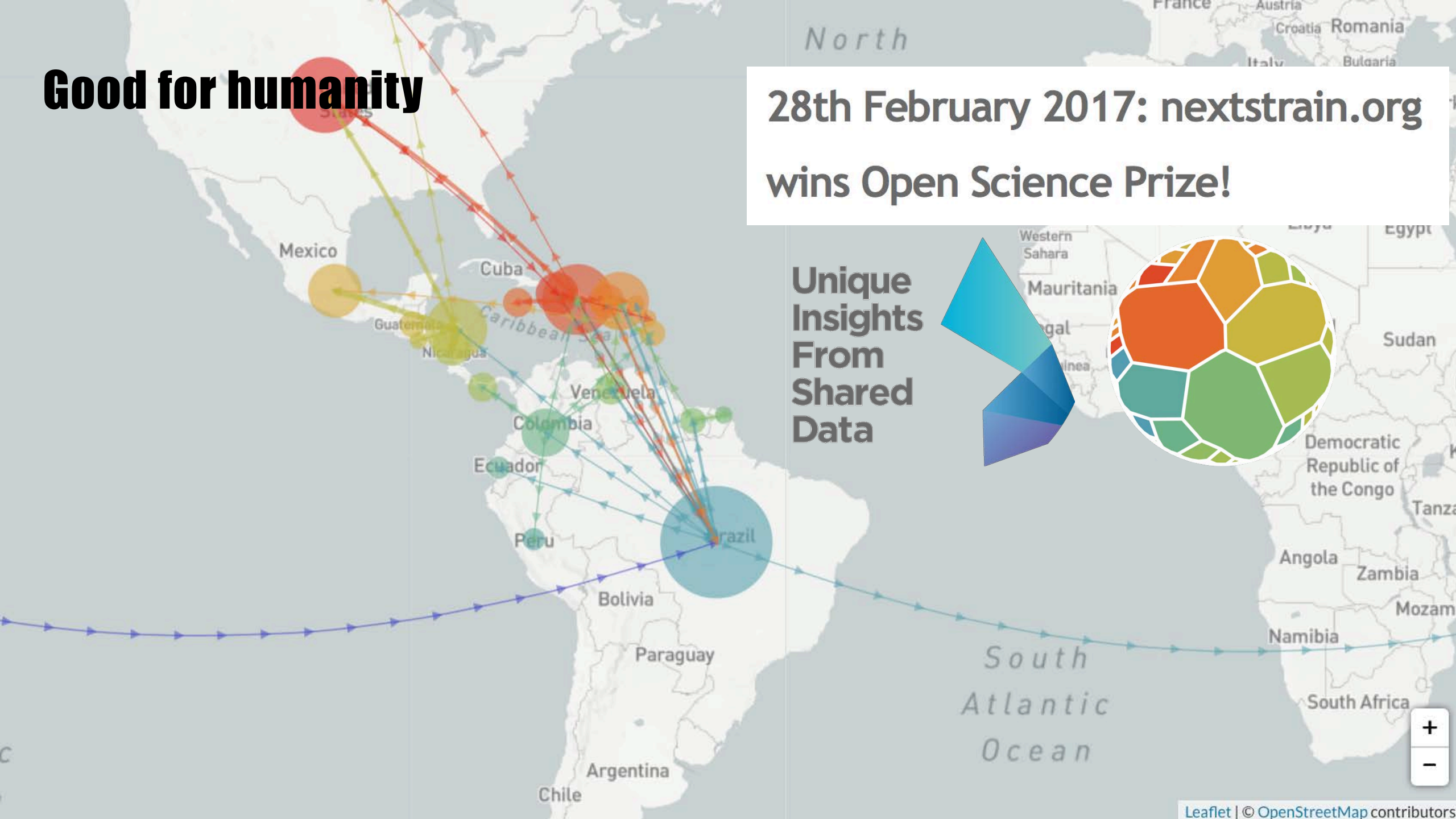
University wants scientists to make their research open access and resign from publications that keep articles behind paywalls



Good for humanity

28th February 2017: nextstrain.org
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**Unique
Insights
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Sharing Data: challenges

2016

Digital Science Report

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OPEN DATA

THE RESEARCHER PERSPECTIVE

Out of 2,000 scientists

- > 80% value data as much as article citations
- > 50% are unsure about how to cite a dataset
- > 60% are unsure about the licensing conditions

Out of 1,200 scientists

- 64% believe they own the data they generate
- 34% do not publish data at all
- 15% share data in a repository

Open Data in Academia

THE PARASITE AWARDS

Celebrating rigorous secondary data analysis

ABOUT THE AWARD

Stairway to the data heaven

Science as an open enterprise

Summary report
June 2012

THE
ROYAL
SOCIETY

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EC042_pAA011
EC042_pAA013

Image credit: © Royal Society

Train



6. Increase the number of qualified data scientists

5. Developing standards for data storage and sharing

4. Development of tools to allow generating, curating and reusing datasets

3. Expanding evaluation criteria to give credit for useful data sharing

2. Mandating *intelligent* openness for data underlying published reports

1. A shift away from a research culture where data is a private good

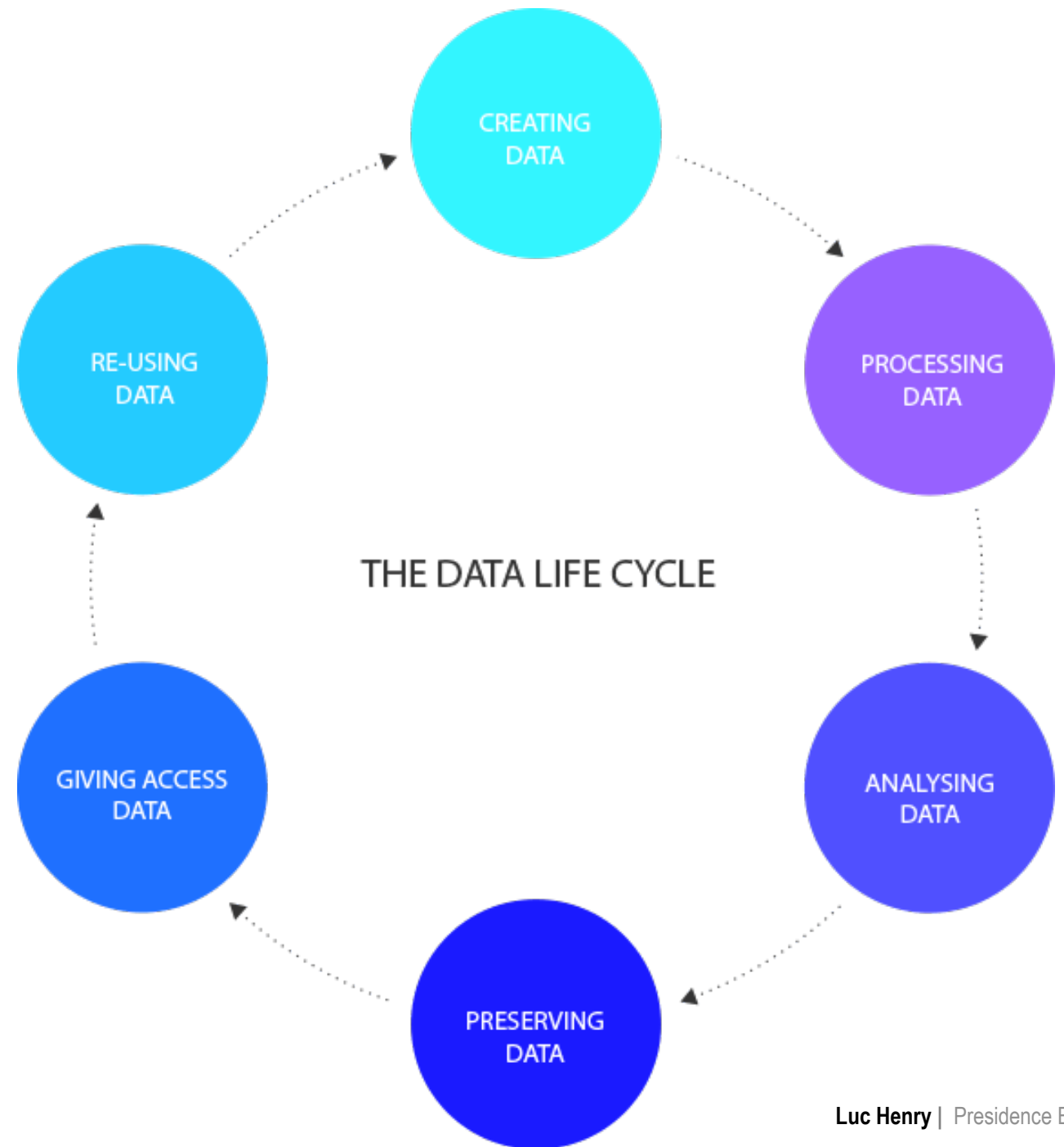


Reward

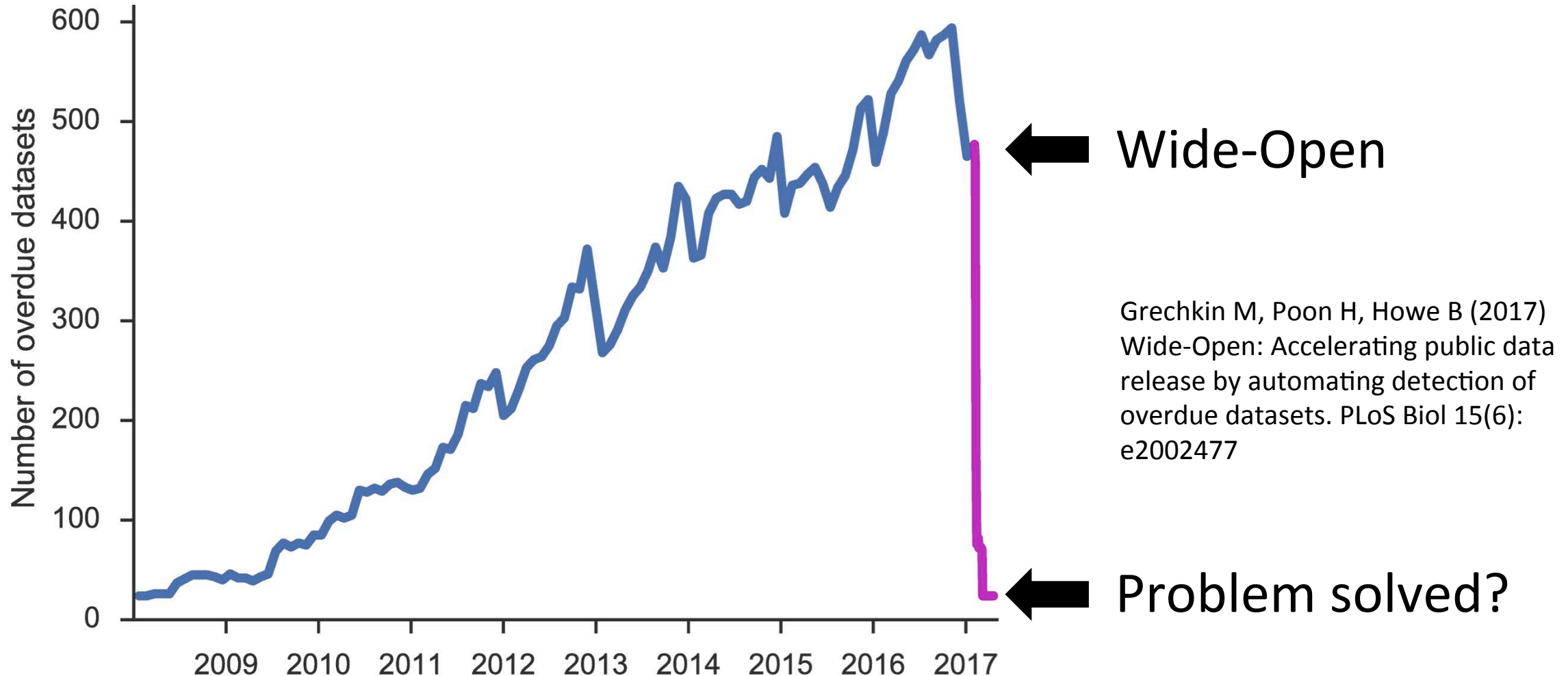
Rubbish in, Rubbish Out

“The open data discourse needs to shift from data publication to data quality.”

Paul Walsh, Chief Product Officer
at Open Knowledge International



The Wonders of Automation



Sharing Code: Reproducibility 101

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NATURE NEUROSCIENCE | EDITORIAL

Extending transparency to code

Nature Neuroscience 20, 761 (2017) | doi:10.1038/nn.4579

Beyond code and data

Reproducibility Project: Cancer Biology

Investigating reproducibility in preclinical cancer research.

NATURE | NEWS



Cancer reproducibility project releases first results

An open-science effort to replicate dozens of cancer-biology studies is off to a confusing start.

Monya Baker & Elie Dolgin

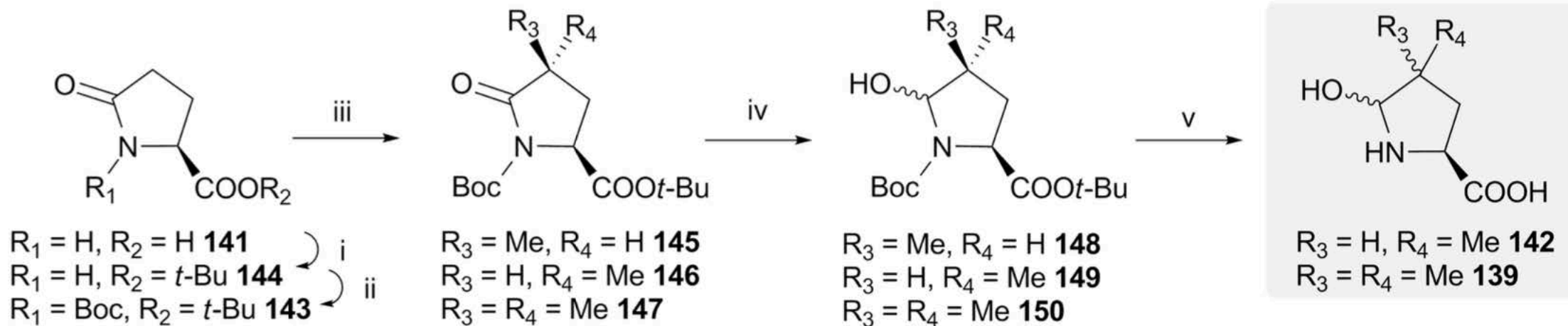
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Train and Reward

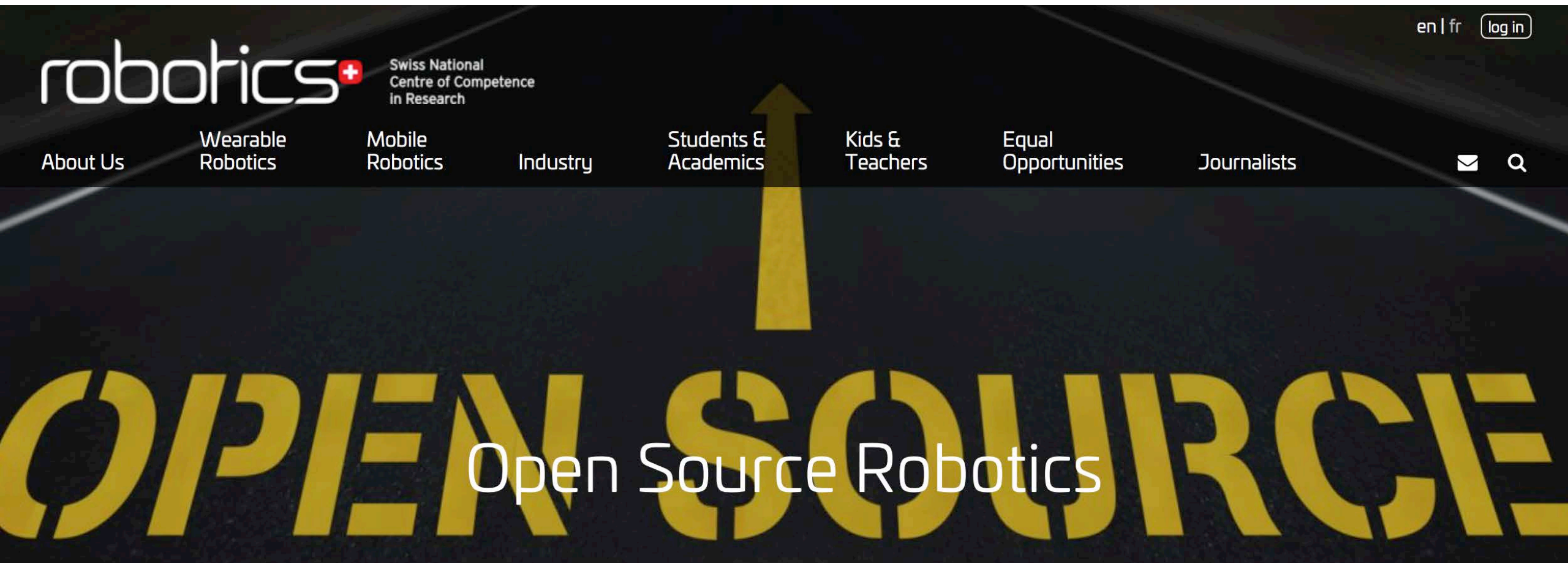
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