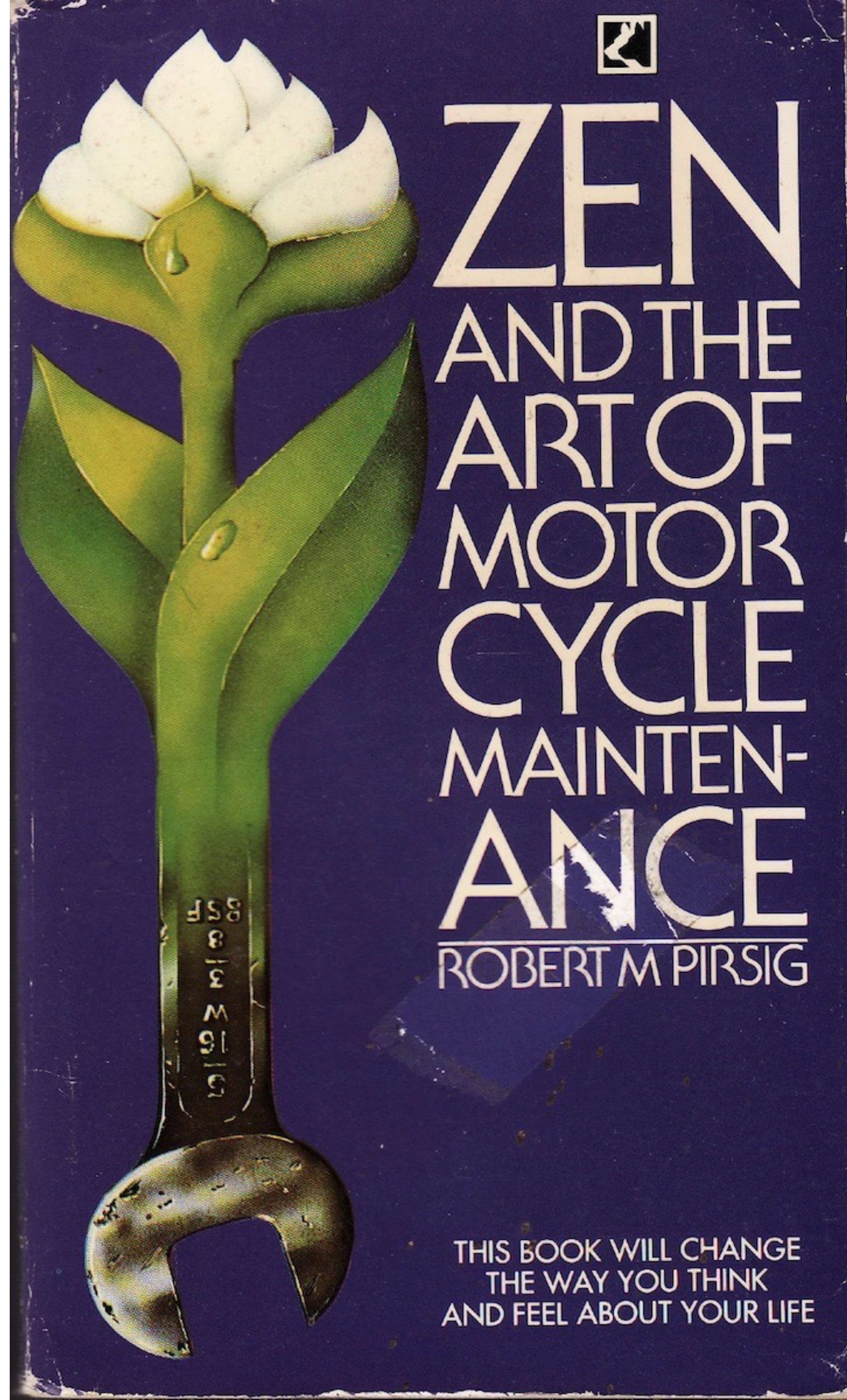


# ZEN AND THE ART OF ACADEMIC MAINTENANCE

STEPHEN CURRY  
IMPERIAL COLLEGE

MUNIN CONFERENCE ON SCHOLARLY PUBLISHING | 21–22 Nov 2016 | TROMSØ, NORWAY

An Inquiry into Values



“this book will change the way you **think** and **feel** about your life”

# Why do people become researchers?

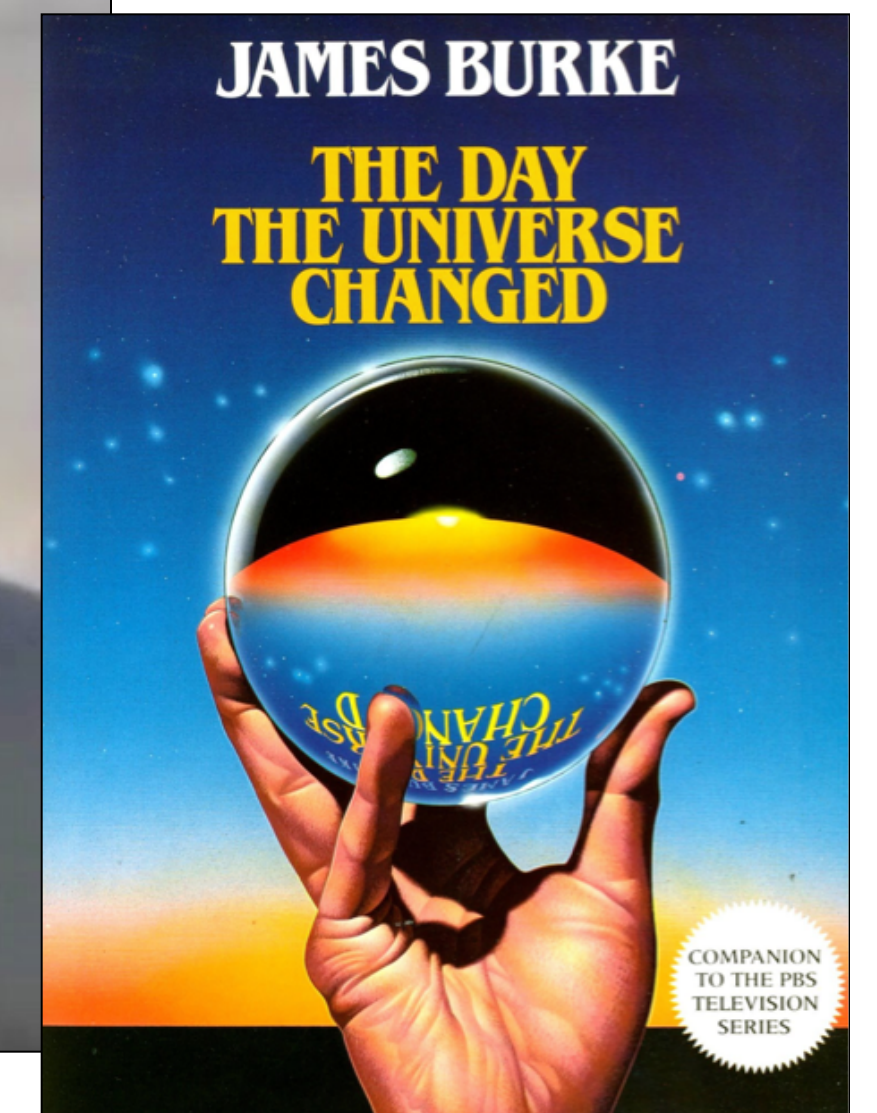
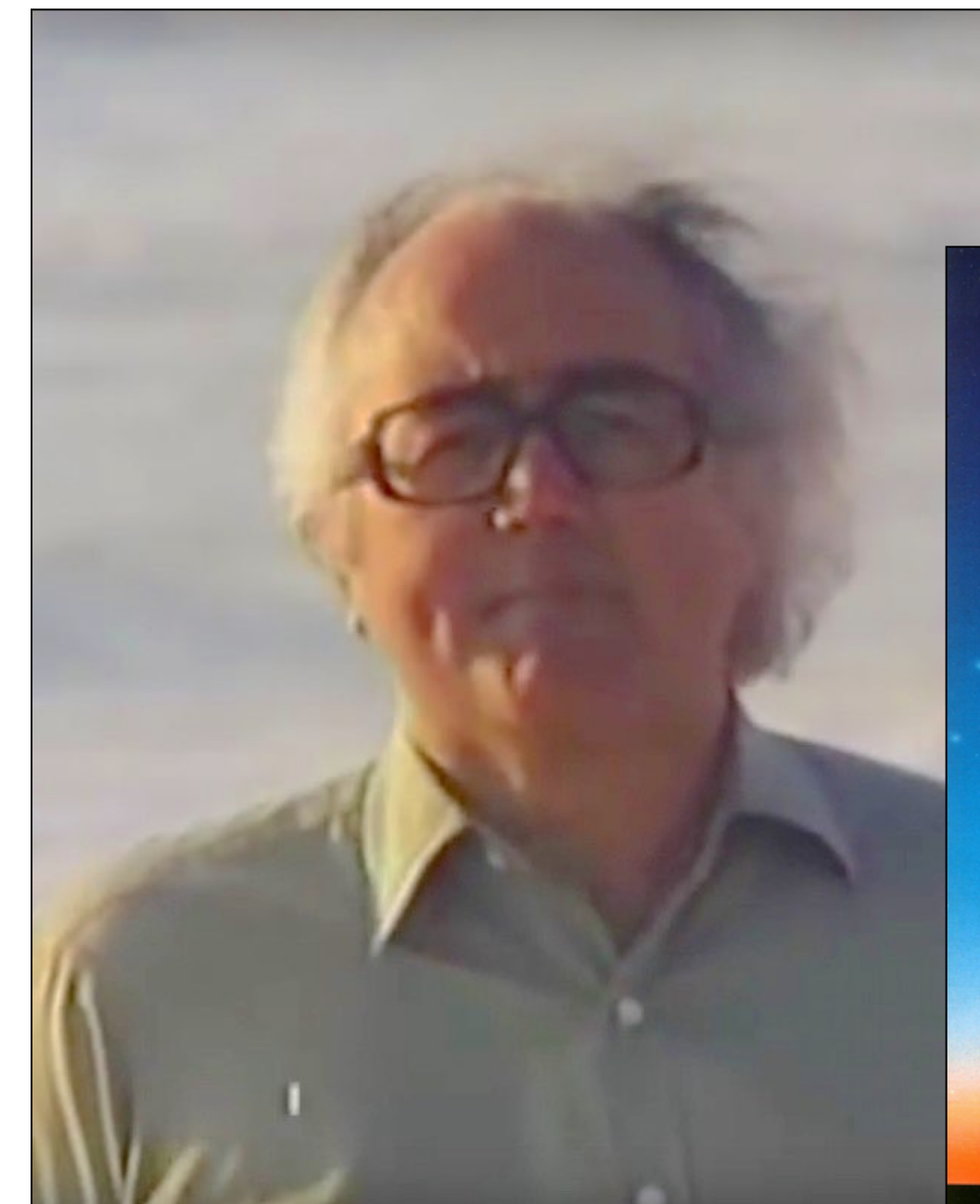
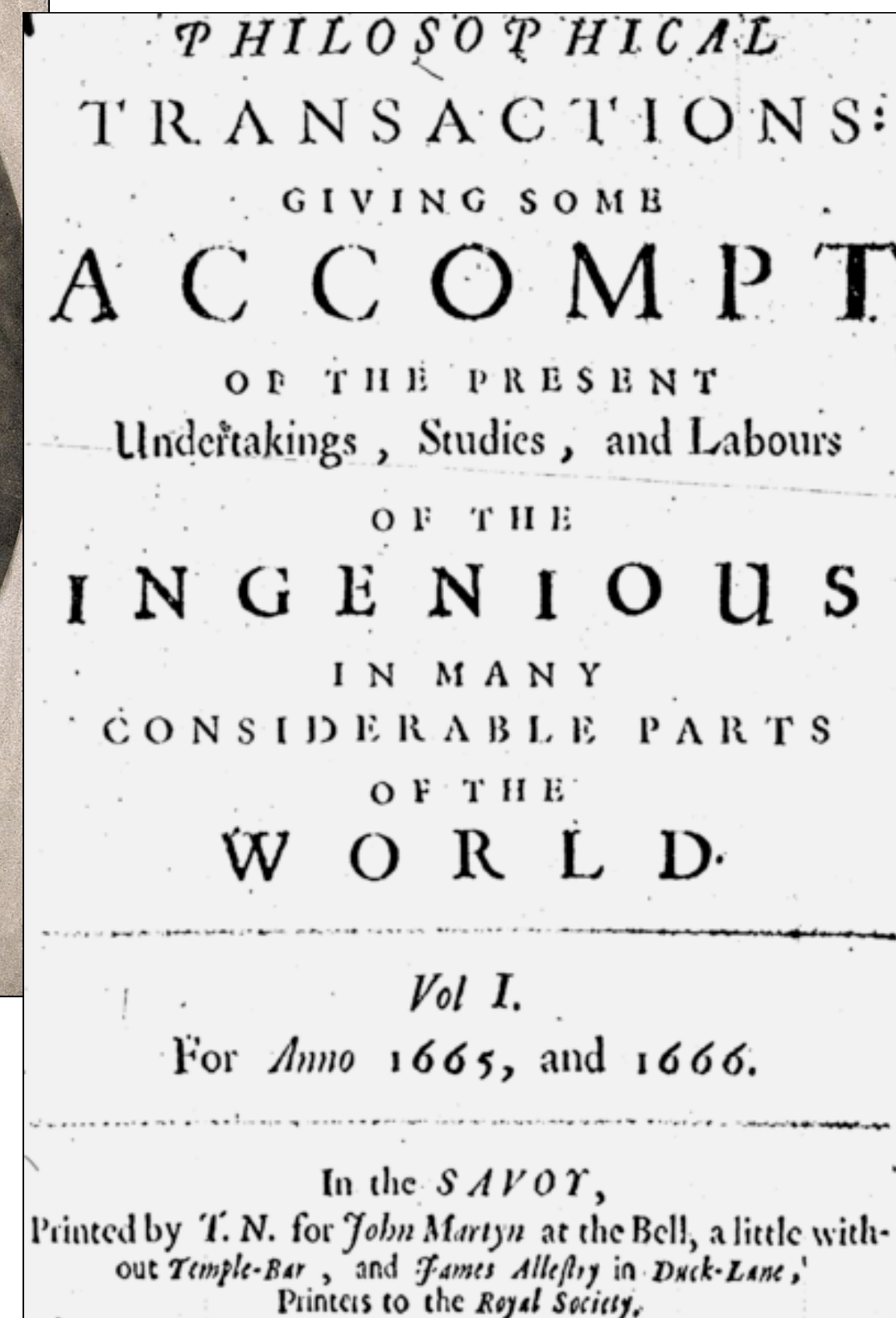
To earn a living  
To be remembered  
To understand the world  
To change the world

Easier to achieve these if  
publishing is open



# What does the world expect of them? (Academic world vs the 'real' world)

Have those expectations changed?















“Technology manufactures not gadgets, but social change...”

# The digital world and the myth of measurement



# Measurement has its uses. In sports...

Position	Club	Played	Won	Drawn	Lost	GF	GA	GD	Points
1 ●	 Leicester City	38	23	12	3	68	36	32	81
2 ▲	 Arsenal	38	20	11	7	65	36	29	71
3 ▼	 Tottenham Hotspur	38	19	13	6	69	35	34	70
4 ●	 Manchester City	38	19	9	10	71	41	30	66
5 ●	 Manchester United	38	19	9	10	49	35	14	66
6 ▲	 Southampton	38	18	9	11	59	41	18	63
7 ▼	 West Ham United	38	16	14	8	65	51	14	62
8 ●	 Liverpool	38	16	12	10	63	50	13	60
9 ▲	 Stoke City	38	14	9	15	41	55	-14	51
10 ▼	 Chelsea	38	12	14	12	59	53	6	50
11 ▲	 Everton	38	11	14	13	59	55	4	47
12 ▼	 Swansea City	38	12	11	15	42	52	-10	47



English Premier League Table (2015-16)

...and in business...



<http://www.aronline.co.uk/blogs/news/news-uk-car-manufacturing-enjoys-bumper-2013/>



<https://www.nuh.com.sg/patients-and-visitors/patients-and-visitors-guide/choice-of-accomodation/ward-types.html>

...but where are the limits?

“How do I love thee? Let me count the ways.”

*Sonnet 43, Elizabeth Barrett Browning*

***Marry***

1. Children — (if it Please God)
2. Object to be beloved & played with. — better than a dog anyhow.
3. Charms of music & female chit-chat.

...



Charles Darwin

***Not Marry***

1. Conversation of clever men at clubs
2. Not forced to visit relatives, & to bend in every trifle.
3. To have the expense & anxiety of children — perhaps quarrelling
4. Less money for books &c

...



...but where are the limits?

The *Times Higher Education* World University Rankings

# World University Rankings 2013-2014

1	<u>California Institute of Technology (Caltech)</u>	United States	94.9
2	<u>Harvard University</u>	United States	93.9
2	<u>University of Oxford</u>	United Kingdom	93.9
4	<u>Stanford University</u>	United States	93.8
5	<u>Massachusetts Institute of Technology (MIT)</u>	United States	93.0
6	<u>Princeton University</u>	United States	92.7
7	<u>University of Cambridge</u>	United Kingdom	92.3
8	<u>University of California, Berkeley</u>	United States	89.8
9	<u>University of Chicago</u>	United States	87.8
10	<u>Imperial College London</u>	United Kingdom	87.5
11	<u>Yale University</u>	United States	87.4

# Focusing researcher assessment on publishing is problematic

## My Word

### The mismeasurement of science

Peter A. Lawrence

Answer from the hero in Leo Szilard's 1948 story "The Mark Gable Foundation" when asked by a wealthy entrepreneur who believes that science has progressed too quickly, what he should do to retard this progress: "You could set up a foundation

release. The song writers would soon find that producing junky Christmas tunes and cosying up to DJs from top radio stations advanced their careers more than composing proper music. It is not so funny that, in the real world of science, dodgy evaluation criteria such as impact factors and citations are dominating minds, distorting behaviour and determining careers.

Modern science, particularly biomedicine, is being damaged by attempts to measure the quantity and quality of research. Scientists are ranked according to these measures, a ranking that impacts on funding of grants, competition for posts and

<http://dx.doi.org/10.1016/j.cub.2007.06.014>

## Sick of Impact Factors

Posted on August 13, 2012 by Stephen

I am sick of impact factors and so is science.

The impact factor might have started out as a good idea, but its time has come and gone. [Conceived by Eugene Garfield](#) in the 1970s as a useful tool for research libraries to judge the relative merits of journals when allocating their subscription budgets, the impact factor is [calculated](#) annually as the mean number of citations to articles published in any given journal in the two preceding years.



<http://occamstypewriter.org/scurry/2012/08/13/sick-of-impact-factors/>

OPEN ACCESS Freely available online

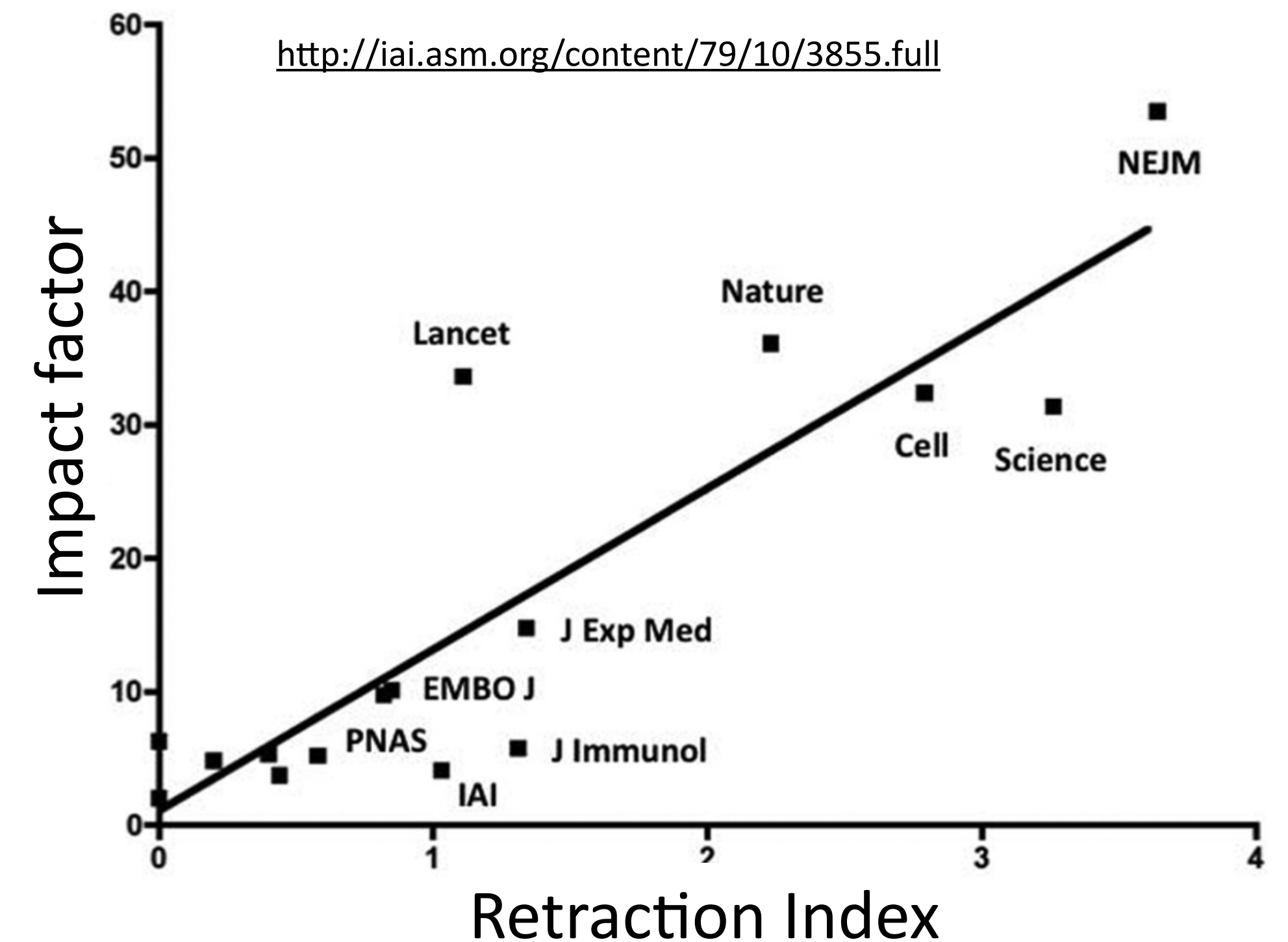
PLOS MEDICINE

Essay

## How to Make More Published Research True

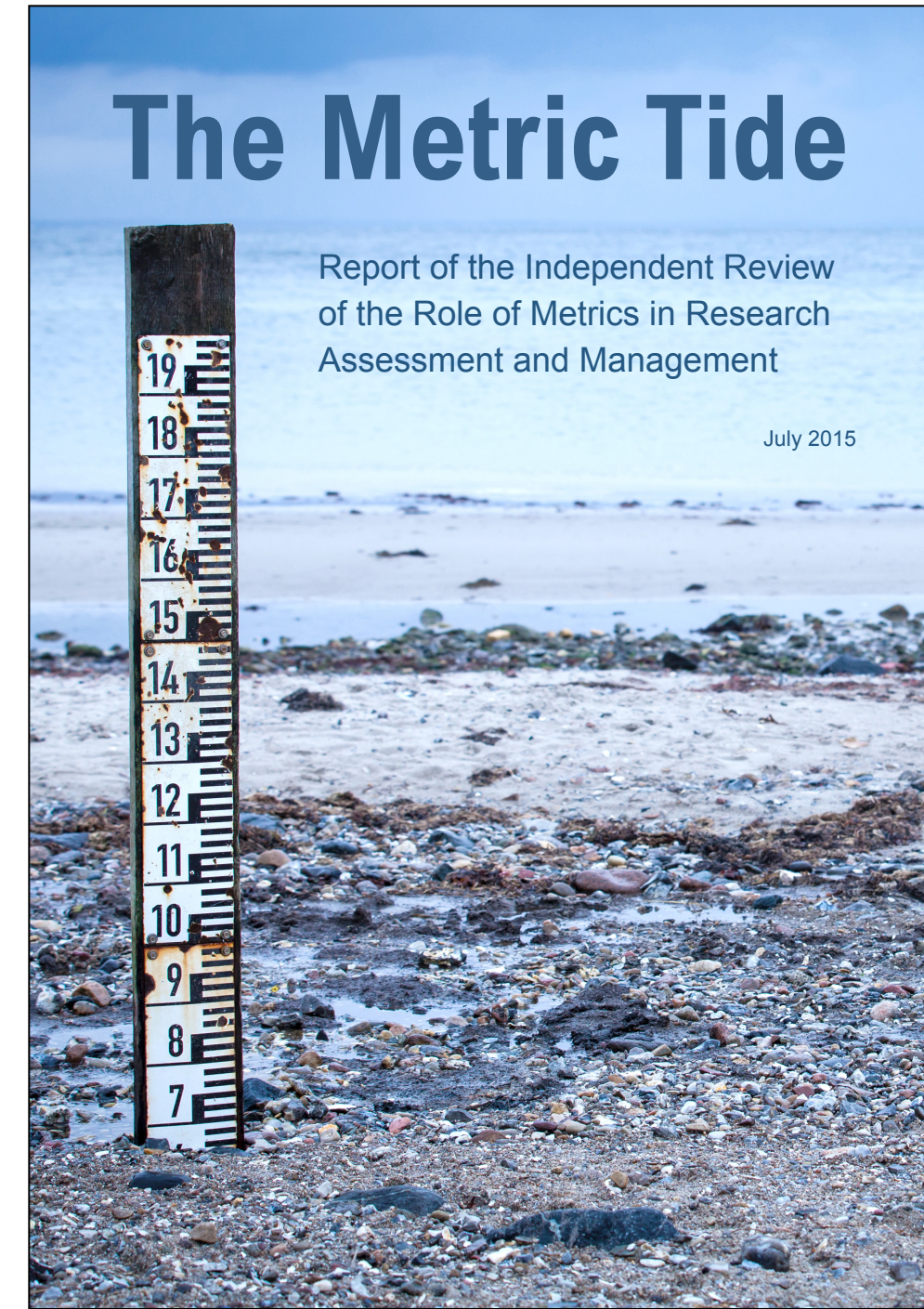
John P. A. Ioannidis<sup>1,2,3,4\*</sup>

<http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001747>



# The Metric Tide (2015): Main conclusions

- **Responsible metrics**
- Mind your language: *indicators*, not metrics
- Metrics inform but do not replace judgement
- Institutions need to be transparent about use
  - Clear statement of principles for assessment
  - Do not delegate measures of excellence to league tables or journals
  - Dialogue with staff
- Data need to be transparent (challenge to providers)
- Builds on DORA/Leiden Manifesto & other initiatives

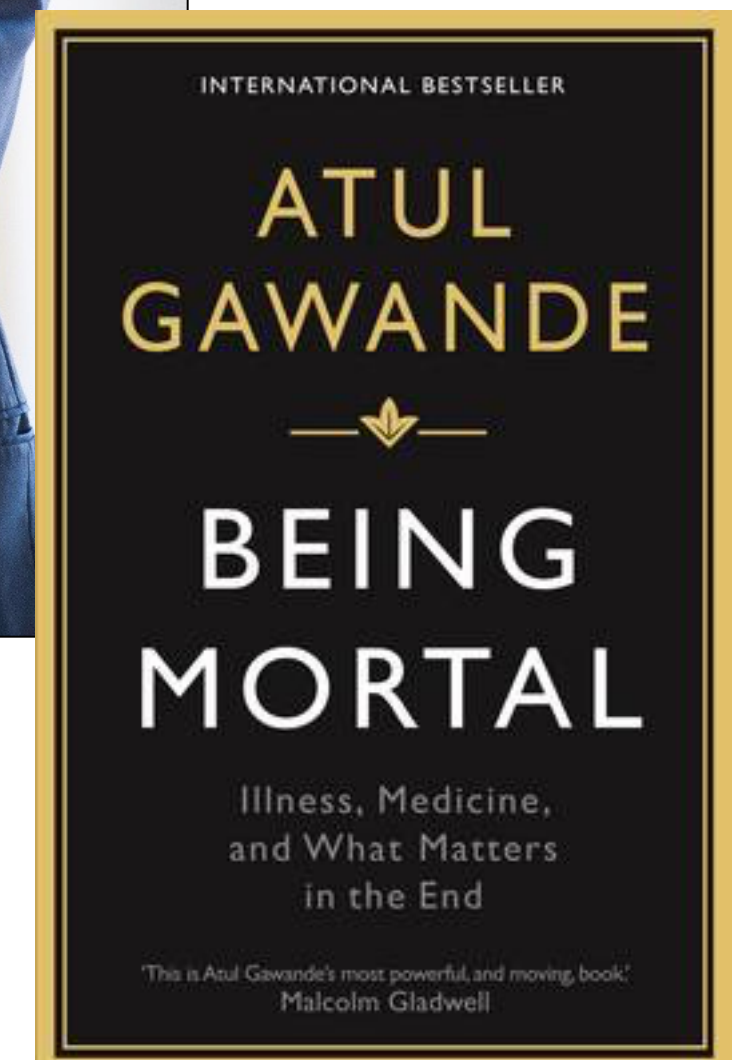


<http://www.ascb.org/dora/>

# Can we swim against the metric tide?

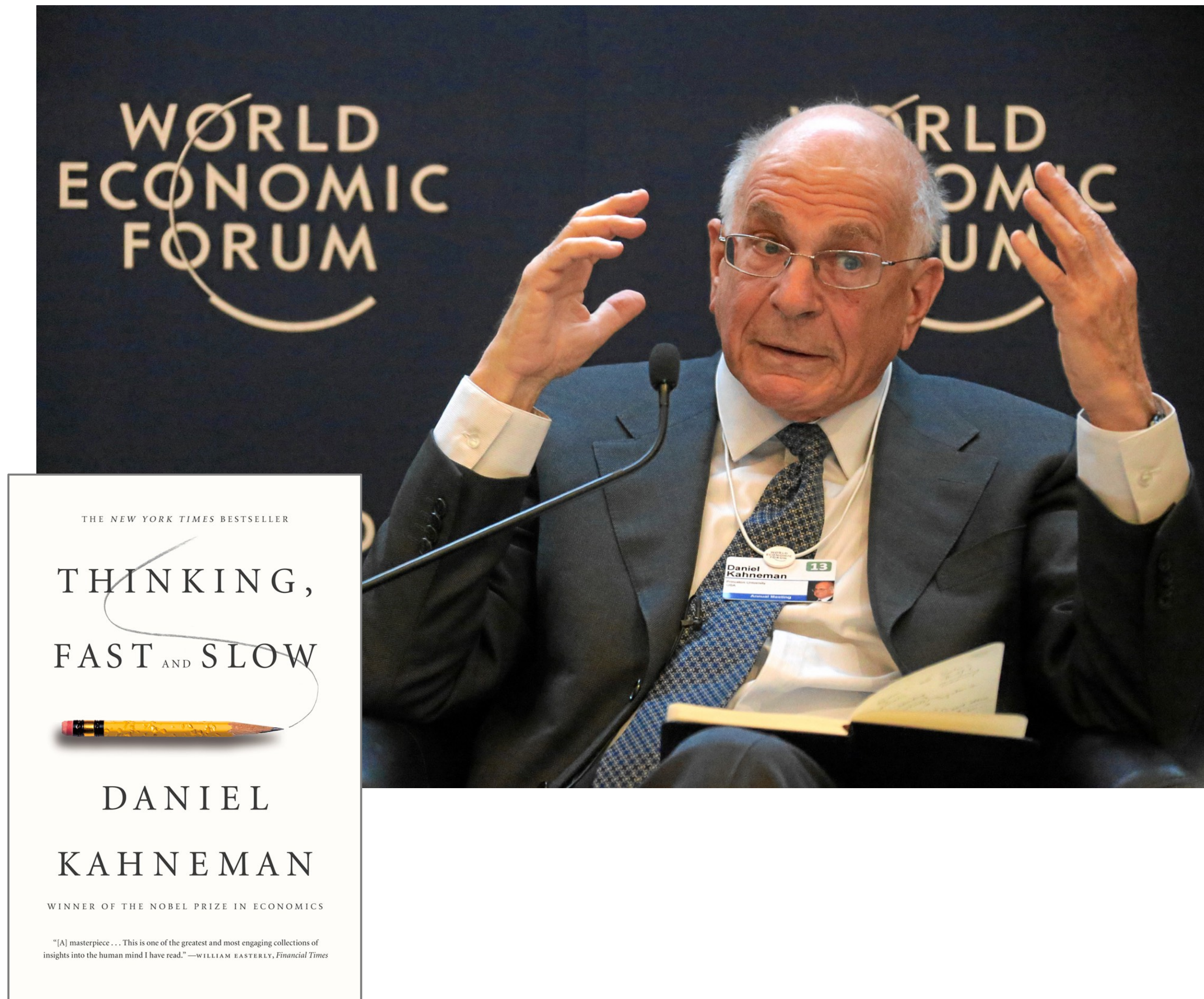
“In the end, people don’t view their life as merely the average of all its moments – which, after all, is mostly nothing much plus some sleep.

Measurements of people’s minute-by-minute levels of pleasure and pain miss this fundamental aspect of human existence... *We have purposes larger than ourselves.*”



On your deathbed - will your bibliography or h-index be uppermost in your mind?

# Can we swim against the metric tide?



“Nothing in life is as important as you think it is when you are thinking about it.”

Halo effects

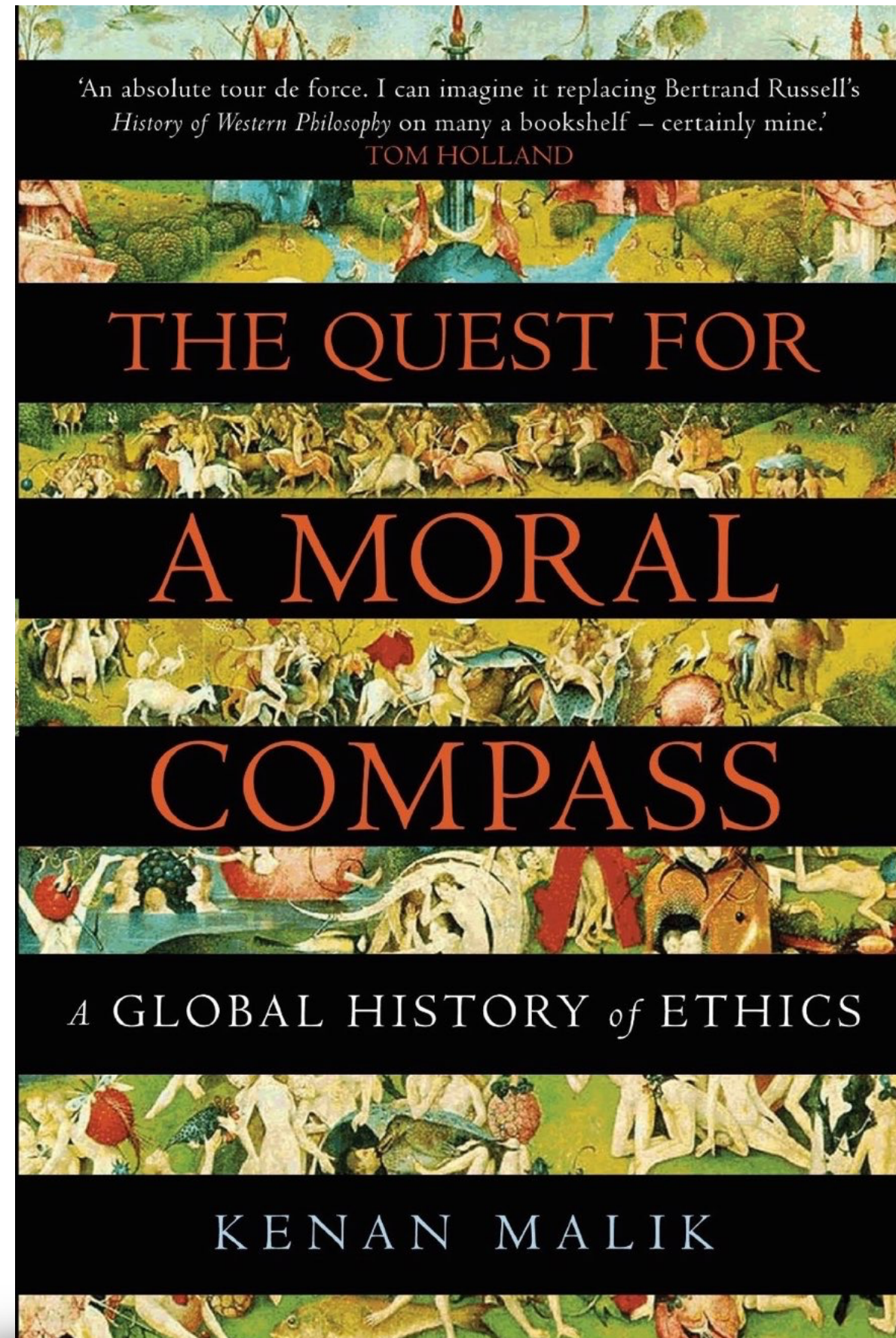
Anchoring effects

Hindsight bias

Loss aversion – the sunk cost fallacy

The fallacy of **What You See Is All There Is**

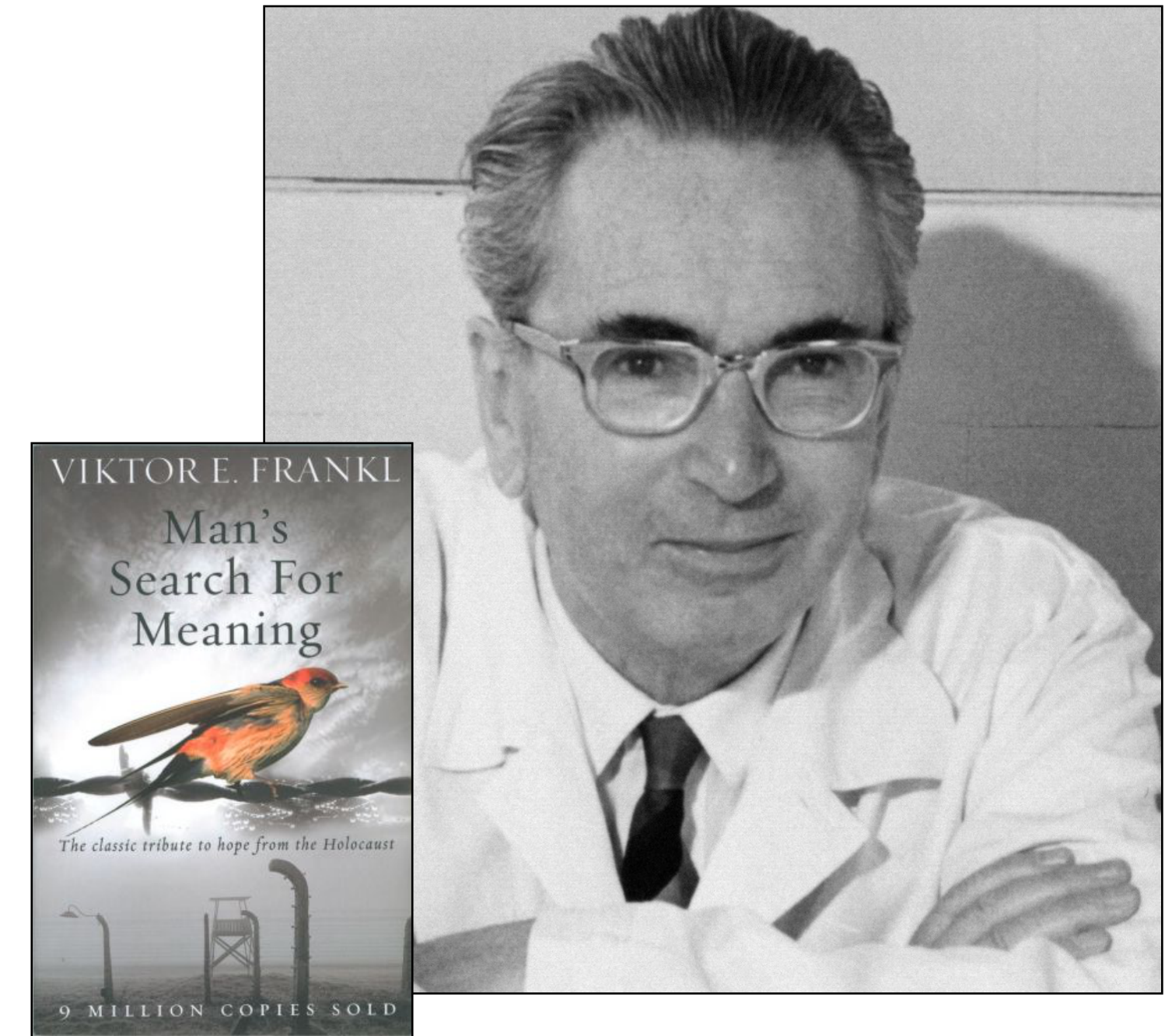
# Can we swim against the metric tide?



“As new possibilities of social transformation were opened up... people asked themselves not simply ‘**What moral claims are rational given the social structure?**’, but also... **What kind of society... will best allow human beings to flourish?**”

## Paraphrasing Viktor Frankl

“Humans find themselves only through creating meaning in the world... They do so by acting upon the world.”



*“Don't aim at success—the more you aim at it and make it a target, the more you are going to miss it. For success, like happiness, cannot be pursued; it must ensue, and it only does so as the unintended side-effect of one's dedication to a cause greater than oneself...”*

# Does the mechanisation of assessment turn us into machines?



“The nature of academia is that career advancement is achieved by attending conferences and writing papers for other academics, creating a self-referential bubble where our critical knowledge gets trapped within the university. The separation of thought from action, of university from the social world, is a key way that inequalities are maintained.”

Have we lost sight of the things that matter?



*"I've seen things you people wouldn't believe."*



# The killer question: incentives

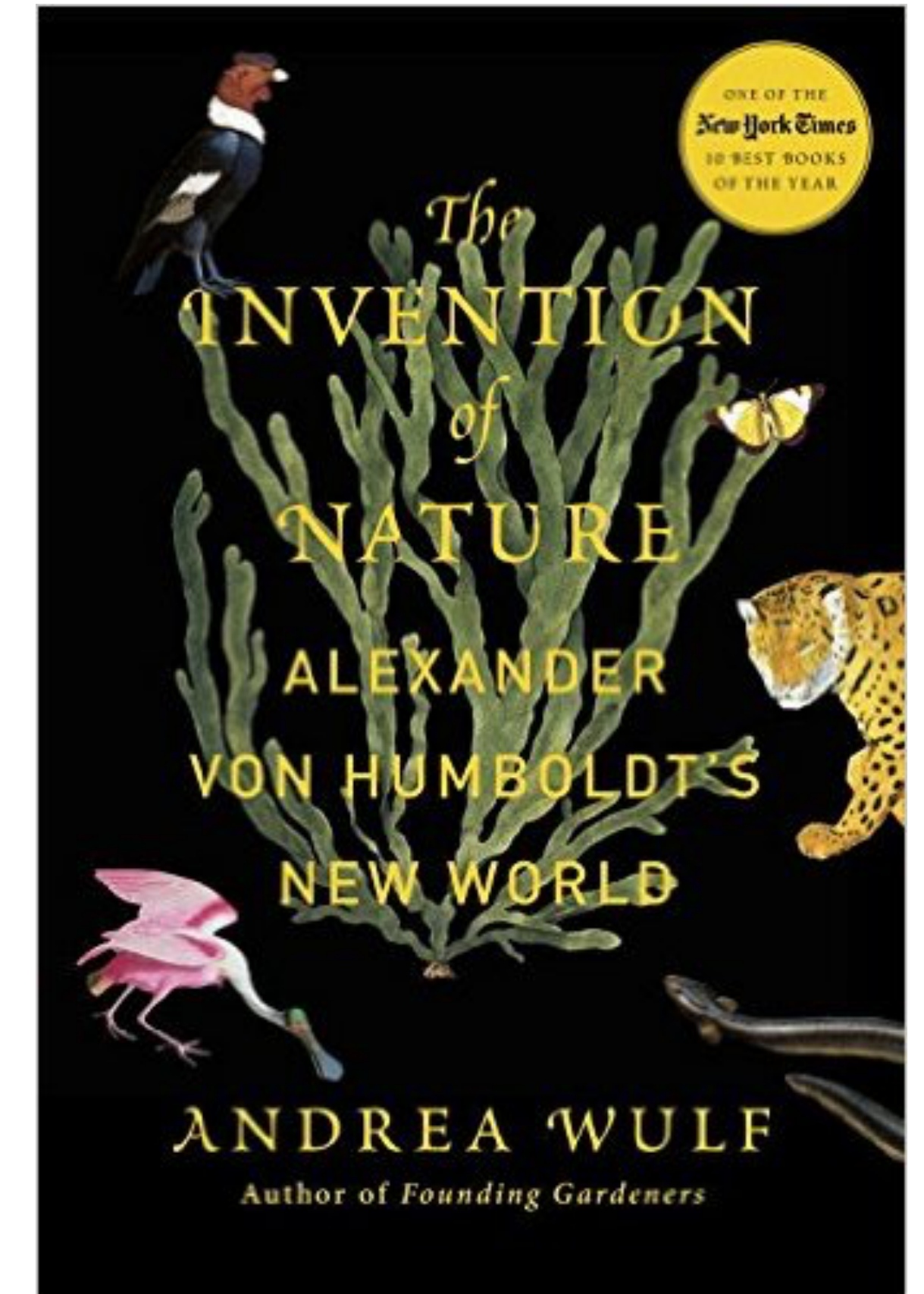
Can the benefits (of OA) to researchers be aligned with the benefits to society?

Is that desirable?

If so, how do we go about it?

## Can the **openness** of our scientific heritage help us?

Maths, objective observation and controlled experiments paved this path of reason across the western world. Scientists became citizens of their self-proclaimed 'republic of letters', an intellectual community that transcended national boundaries, religion and language. As their letters zigzagged across Europe and the Atlantic, scientific discoveries and new ideas spread. This 'republic of letters' was a country without borders, ruled by reason and not by monarchs.



Is our amateur (and open) ethos *still* one of the norms of the academy?

# Declarations are not enough

*We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are life, liberty and the pursuit of happiness.*

Hancock et al. (1776)



“The principle that the results of research that has been **publicly funded** should be **freely accessible** in the public domain is a compelling one, and **fundamentally unanswerable.**”

Dame Janet Finch (2012)



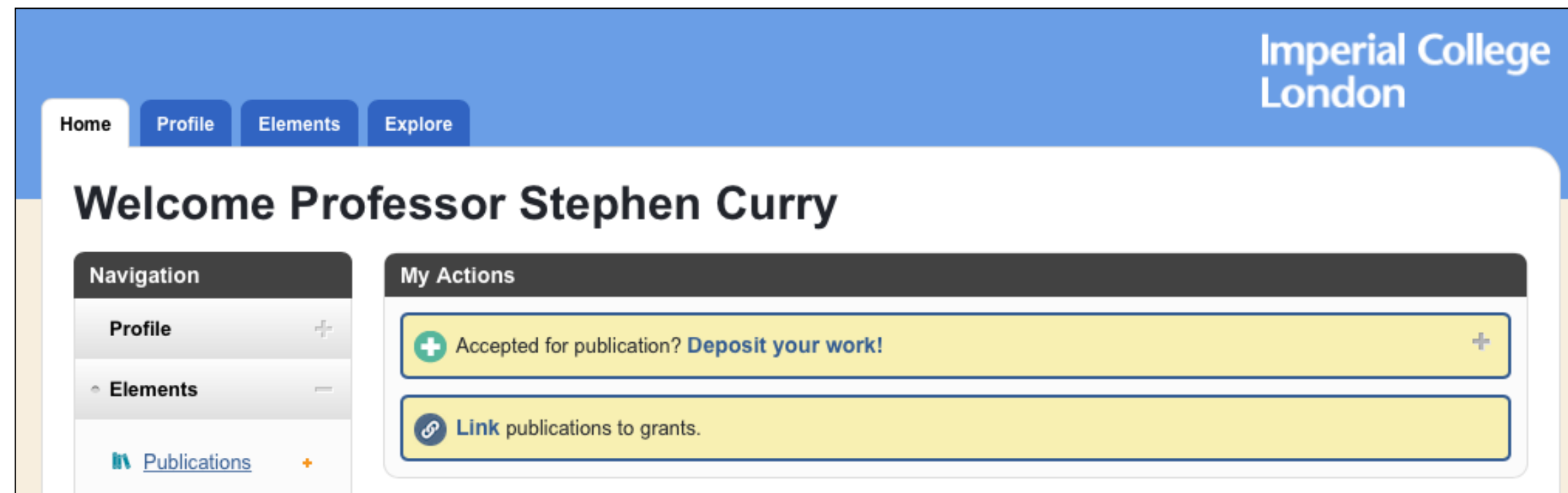
“All scientific papers should be freely available by 2020...”

Commissioner Carlos Moedas (2016)

# Policies can help, but need careful handling & communication...

## Policy for open access in the post-2014 Research Excellence Framework

Updated July 2015



Make compliance frictionless for researchers

Harmonise policies between funders (*e.g.* HEFCE vs RCUK)

**From April 2016:** To be eligible for submission to the post-2014 REF, authors' outputs **must** have been deposited in an institutional or subject repository."

# Good practices don't spread by themselves (or by exhortation, or by sanctions...)

## *Why was anaesthesia adopted more rapidly than antiseptics?*

“**First**, one combatted a visible and immediate problem (pain); the other combatted an invisible problem (germs) whose effects wouldn't be manifest until well after the operation.

“**Second**, although both made life better for patients, only one made life better for doctors.”

“**People talking to people is still how the world's standards change.**”

ANNALS OF MEDICINE JULY 29, 2013 ISSUE

### SLOW IDEAS

*Some innovations spread fast. How do you speed the ones that don't?*

 **By Atul Gawande**

**W**hy do some innovations spread so swiftly and others so slowly? Consider the very different trajectories of surgical anesthesia and antiseptics, both of which were discovered in the nineteenth century. The first public demonstration of anesthesia was in 1846. The Boston surgeon Henry Jacob Bigelow was approached by a local dentist named William Morton, who insisted that he had found a gas that could render

the pain of  
dramatic claim. In  
nor tooth  
ating. Without  
surgeons learned  
speed.  
tients down as  
rashed, until they  
y. Nothing ever tried had made much difference.  
agreed to let Morton demonstrate his claim.



*We yearn for frictionless, technological solutions. But people talking to people is still the way that norms and standards change.*

ILLUSTRATION BY HARRY CAMPBELL



# Some of the work is technical...



Can openness help to change behaviour?

CSH Cold Spring Harbor Laboratory **bioRxiv** beta THE PREPRINT SERVER FOR BIOLOGY HOME | Search

New Results

**A simple proposal for the publication of journal citation distributions**

Vincent Lariviere, Veronique Kiermer, Catriona J MacCallum, Marcia McNutt, Mark Patterson, Bernd Pulverer, Sowmya Swaminathan, Stuart Taylor, Stephen Curry

doi: <http://dx.doi.org/10.1101/062109>

This article is a preprint and has not been peer-reviewed [what does this mean?].

Abstract Info/History Metrics Supplementary material Preview PDF

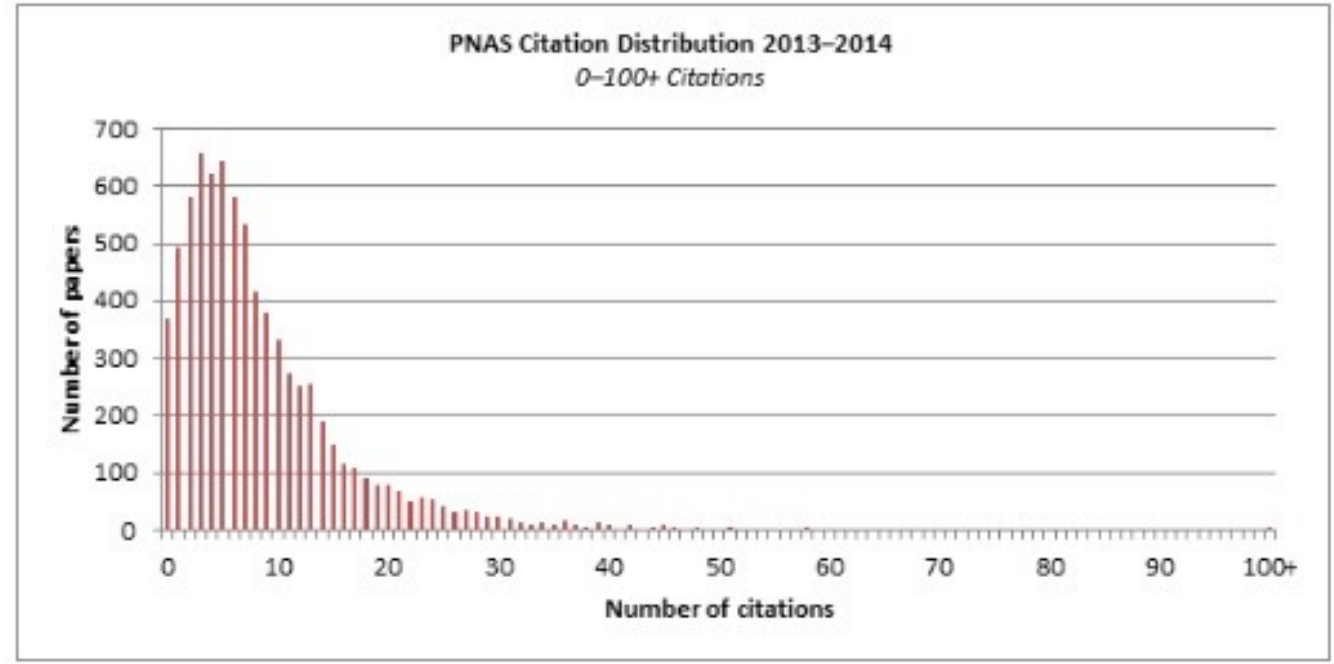
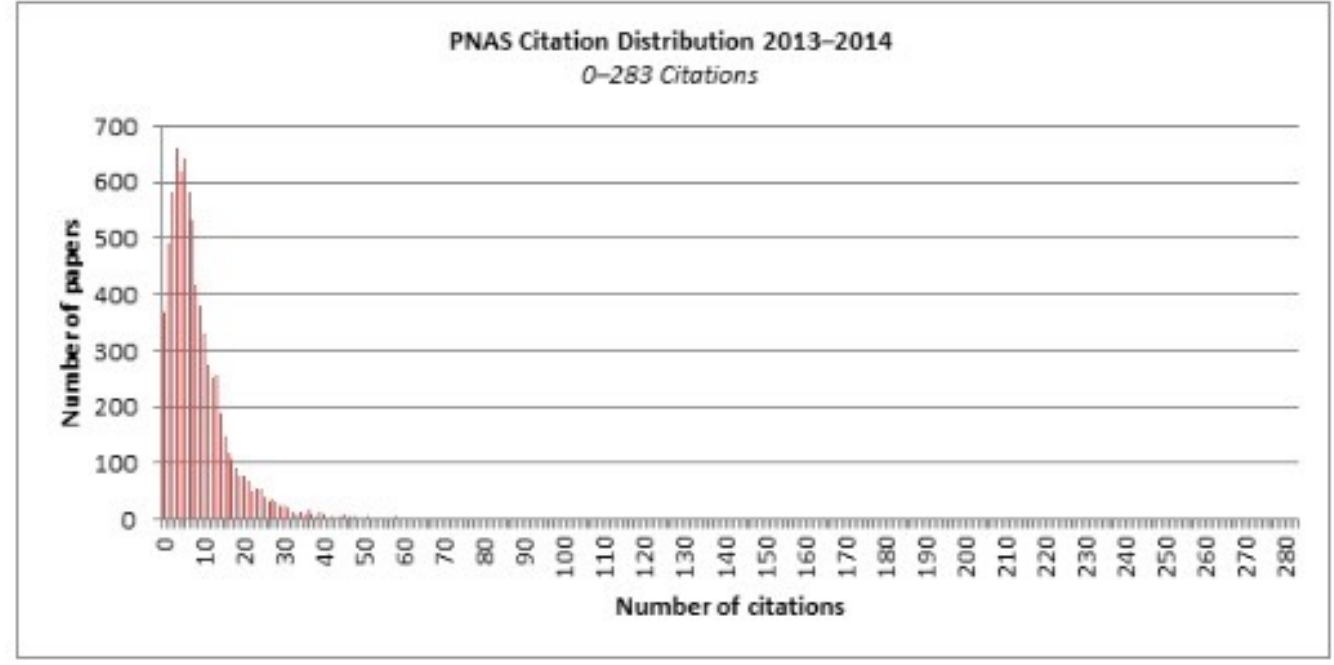
**Abstract**

Although the Journal Impact Factor (JIF) is widely acknowledged to be a poor indicator of the quality of individual papers, it is used routinely to evaluate research and researchers. Here, we present a simple method for generating the citation distributions that underlie JIFs. Application of this straightforward protocol reveals the full extent of the skew of these distributions and the variation in citations received by published papers that is characteristic of all scientific journals. Although there are differences among journals across the spectrum of JIFs, the citation distributions overlap extensively, demonstrating that the citation performance of individual papers cannot be inferred from the JIF. We propose that this methodology be adopted by all journals as a move to greater transparency, one that should help to refocus attention on individual pieces of work and counter the inappropriate usage of JIFs during the process of research assessment.

**Impact factor:** a measure of the frequency with which the "average article" in a journal has been cited in a particular year or period. The journal impact factor is calculated by dividing the number of current year citations to source items published in that journal during the previous 2 years.

**Immediacy index:** the average number of times an article is cited in the year it is published.

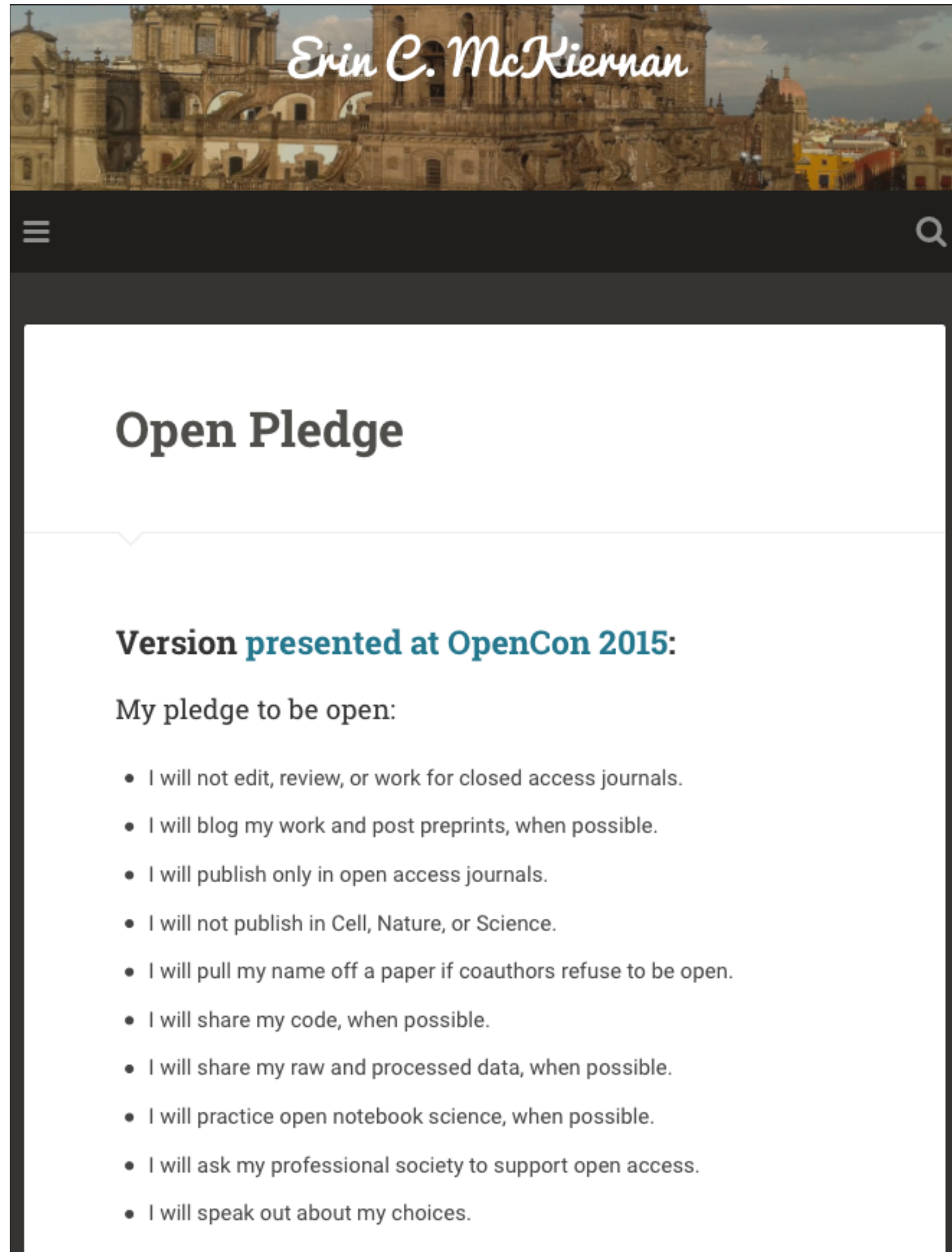
**Cited half-life:** the number of years, going back from the current *Journal Citation Reports* (JCR) year, that account for 50% of citations received by the journal in the current JCR year.



**Citation distribution:** the distribution of citations to articles over the previous 2 years that contributes to the current JCR year's impact factor.

See "A simple proposal for the publication of journal citation distributions," by Vincent Lariviere, Veronique Kiermer, Catriona J MacCallum, Marcia McNutt, Mark Patterson, Bernd Pulverer, Sowmya Swaminathan, Stuart Taylor, and Stephen Curry. BioRxiv. Posted July 5, 2016. <http://dx.doi.org/10.1101/062109>.

# Brave souls in the next generation can help...



Erin C. McKiernan

## Open Pledge

Version presented at OpenCon 2015:

My pledge to be open:

- I will not edit, review, or work for closed access journals.
- I will blog my work and post preprints, when possible.
- I will publish only in open access journals.
- I will not publish in Cell, Nature, or Science.
- I will pull my name off a paper if coauthors refuse to be open.
- I will share my code, when possible.
- I will share my raw and processed data, when possible.
- I will practice open notebook science, when possible.
- I will ask my professional society to support open access.
- I will speak out about my choices.

<https://emckiernan.wordpress.com/pledge/>



the first website in the world to provide mass & public access to research papers

# SCI-HUB

...to remove all barriers in the way of science

open

**Alexandra Elbakyan**

# Leaders and institutions have to do their bit...

## Evaluating how we evaluate

Ronald D. Vale

Department of Cellular and Molecular Pharmacology and the Howard Hughes Medical Institute, University of California, San Francisco, San Francisco, CA 94158

**ABSTRACT** Evaluation of scientific work underlies the process of career advancement in academic science, with publications being a fundamental metric. Many aspects of the evaluation

Vale, R. D. (2012) *Mol Biol Cell* **23**, 3285–3289.

## Researcher assessment at UMC Utrecht

1. Research, publications, grants
2. Managerial responsibilities & academic duties
3. Mentoring & teaching
4. Clinical work (if applicable)
5. Entrepreneurship & community outreach



## Fewer numbers, better science

Scientific quality is hard to define, and numbers are easy to look at. But bibliometrics are warping science — encouraging quantity over quality. Leaders at two research institutions describe how they do things differently.



# Feedback and rewards can help

Imperial College London

Home Profile Elements Explore

## Structure of a Murine Norovirus NS6 Protease-Product Complex Revealed by Adventitious Crystallisation

Journal article

Leen EN, Baeza G, Curry S  
PLOS ONE 7(6):7 pages Article number ARTN e38723 07  
Jun 2012 [Author URL](#) [DOI](#)

Labels: MD Multidisciplinary, Amino Acid Sequence, Animals, Binding Sites, Crystallography, X-Ray, Mice, Models, Molecular, Mutation and 22 more

Journal Rankings				
ISSN	SNIP	SJR	ERA2010	Impact Factor
1932-6203	1.034	1.300	-	3.2340

Citations: Scopus (9), WoS (9), Europe PMC (9)

Altmetrics: 42

Navigation: Mark as Favourite, Add to Workspace

Reporting Dates: 07/06/2012

History

## FiveThirtyEight

Politics Sports Science & Health Economics Culture

MAY 12, 2016 AT 2:06 PM

# Even Psychologists Respond To Meaningless Rewards

All they needed to be more open with their data was the promise of a badge showing they did it.

By [Christie Aschwanen](#)

Filed under [Scientific Method](#)

Twitter Facebook

*Don't forget the little steps*

# We need to talk about open access as a good in itself

Peer review and scientific publishing  
Occam's corner

## Peer review, preprints and the speed of science

Peer review is often claimed to be the guarantor of the trustworthiness of scientific papers, but it is a troubled process. Preprints offer a way out

Stephen Curry

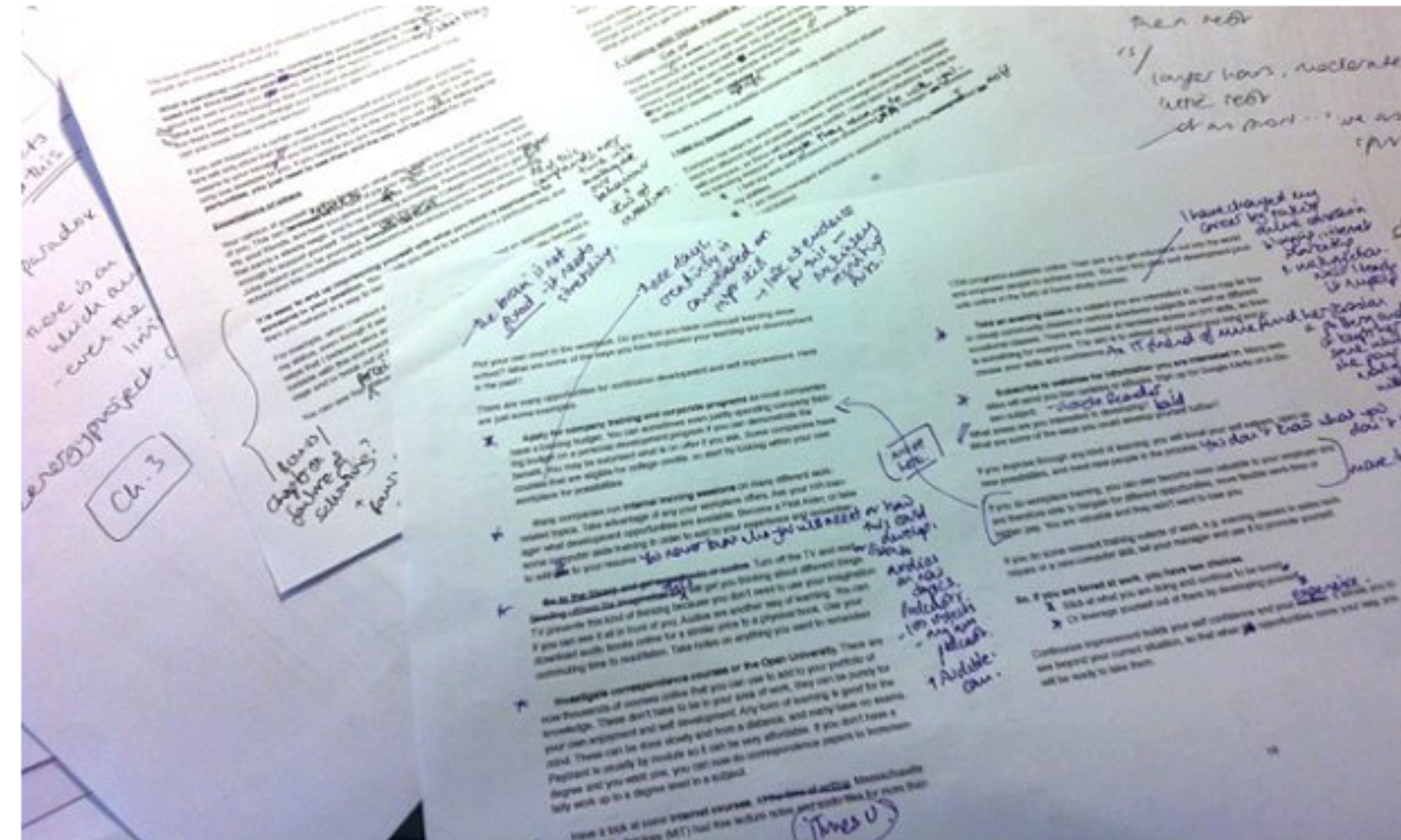
@Stephen\_Curry

Monday 7 September  
2015 11.00 BST



Shares 1  
Comments 14

Save for later



Subediting skills for writers Photograph: Joanna Penn/Flickr

A few weeks ago my collaborators and I submitted our latest paper to a scientific journal. We have been investigating how noroviruses subvert the molecular machinery of infected cells and have some interesting results. If it passes peer review, our paper could be published in three or four months' time. If it's rejected, we may have to re-work the manuscript before trying our luck with another journal. That will delay publication even further - it's not unheard of for papers to take a year or more to get out of the lab and into the world, even in the digital age.

- Preprints: faster, better...
- Worldwide access
- Largest possible audience (sharing & scrutiny)
- Focus on the content, not the container
- Open peer review

# We need to talk about open access as a good in itself

**Science**  
Occam's corner

## Zika virus initiative reveals deeper malady in scientific publishing

**Stephen Curry**


Moves to speed up the release of Zika virus research in response to the public health crisis highlight a systemic failure in scientific publishing. Help could be at hand at the ASAPbio meeting today in the USA

Contact author  
@Stephen\_Curry

Tuesday 16 February  
2016 11:54 GMT

539 Shares 4 Comments

Save for later



Too far behind a screen - Zika scientists are set to benefit from the rapid release of research on the virus  
Photograph: Victor Moriyama/Getty Images

In response to the rapid spread of Zika virus across Central and South America, now **declared to be an international public health emergency** by the World Health Organisation, a consortium of research funders, institutes and publishers have committed to sharing data and results relevant to the crisis “as rapidly and openly as possible.”

Data sharing (re-use & scrutiny benefits)  
Better for changing the world

# OPEN WHEAT BLAST

MAKING DATA INSTANTLY ACCESSIBLE

CONSEQUENCES OF INACTION OUR MISSION WHO WE ARE HOW YOU CAN HELP

DATA DOWNLOAD RESOURCES CONTACT US

## LET'S MAKE A DIFFERENCE

Type here to search...

### RECENT POSTS

- Wheat Blast in Bangladesh  
APRIL 4, 2016

### WHEAT BLAST IN NEWS

- The Daily Star - 'Wheat Blast' threatens yield in Bangladesh
- YouTube - nTV News
- Centre for Strategic & International Studies - Severe, Climate Change-driven Wheat Fungus Found in Bangladesh

Wheat blast is a fearsome fungal disease of wheat. It was first discovered in Paraná State of Brazil in 1985. It spread rapidly to other South American countries such as Colombia, Bolivia, Paraguay, and Argentina, where it infects up to 3 million hectares and causes serious crop losses. Wheat blast was also detected in Kentucky, USA, in 2011.

Wheat blast is caused by a fungus known as *Magnaporthe oryzae* although scientists are still debating its exact identity. There is a risk that wheat blast could expand beyond South America and threaten food security in wheat growing areas in Asia and Africa.

# We need to talk about open access as a good in itself

**Principles for Predicting RNA Secondary Structure Design Difficulty**

Jeff Anderson-Lee<sup>1,†</sup>, Eli Fisker<sup>1,†</sup>, Vineet Kosaraju<sup>1,2,†</sup>, Michelle Wu<sup>1,3,†</sup>, Justin Kong<sup>1,4</sup>, Jeehyung Lee<sup>1,4</sup>, Minjae Lee<sup>1,4</sup>, Mathew Zada<sup>1</sup>, Adrien Treuille<sup>1,4,5</sup> and Rhiju Das<sup>1,2,6</sup>  
Eterna Players<sup>1,‡</sup>

1 - Eterna Massive Open Laboratory  
2 - Department of Biochemistry, Stanford University, Stanford, CA 94305, USA  
3 - Program in Biomedical Informatics, Stanford University, Stanford, CA 94305, USA  
4 - Department of Computer Science, Carnegie Mellon University, Pittsburgh, PA 15213, USA  
5 - Robotics Institute, Carnegie Mellon University, Pittsburgh, PA 15213, USA  
6 - Department of Physics, Stanford University, Stanford, CA 94305, USA

Correspondence to Rhiju Das: Department of Biochemistry, Stanford University, Stanford, CA 94305, USA.  
rhiju@stanford.edu  
<http://dx.doi.org/10.1016/j.jmb.2015.11.013>  
Edited by A. Pyle

**Abstract**

Designing RNAs that form specific secondary structures is enabling better understanding and control of living systems through RNA-guided silencing, genome editing and protein organization. Little is known, however, about which RNA secondary structures might be tractable for downstream sequence design, increasing the time and expense of design efforts due to inefficient secondary structure choices. Here, we present insights into specific structural features that increase the difficulty of finding sequences that fold into a target RNA secondary structure, summarizing the design efforts of tens of thousands of human participants and three automated algorithms (RNAInverse, INFO-RNA and RNA-SSD) in the Eterna massive open laboratory. Subsequent tests through three independent RNA design algorithms (NUPACK, DSS-Opt and MODENA) confirmed the hypothesized importance of several features in determining design difficulty, including sequence length, mean stem length, symmetry and specific difficult-to-design motifs such as zigzags. Based on these results, we have compiled an Eterna100 benchmark of 100 secondary structure design challenges that span a large range in design difficulty to help test future efforts. Our *in silico* results suggest new routes for improving computational RNA design methods and for extending these insights to assess “designability” of single RNA structures, as well as of switches for *in vitro* and *in vivo* applications.

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Citizen science teaches researchers about:  
new (non-traditional) audiences & scientists

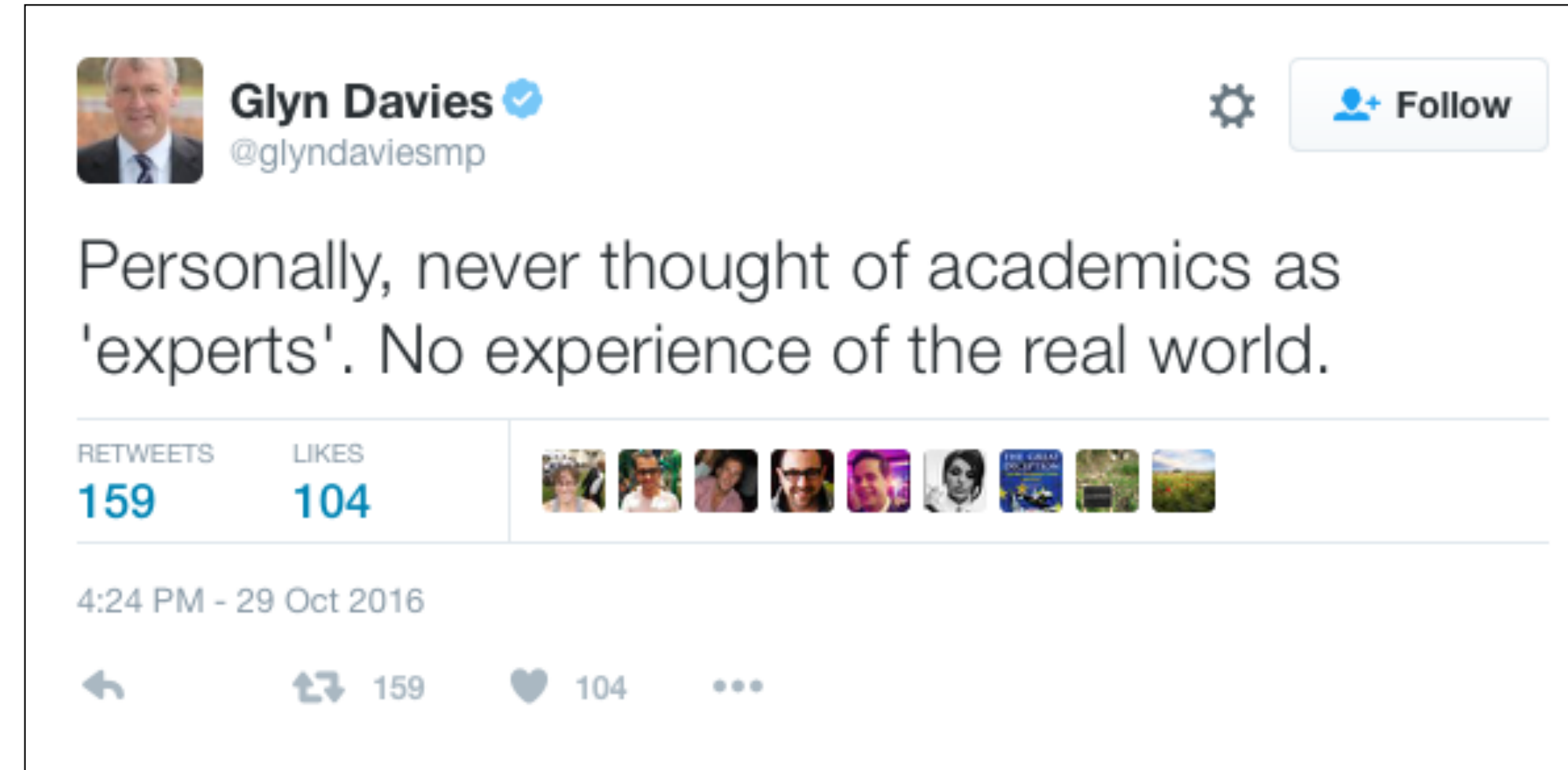
Communication + Participation = **Public Trust**

We have to go public. We have to be open.

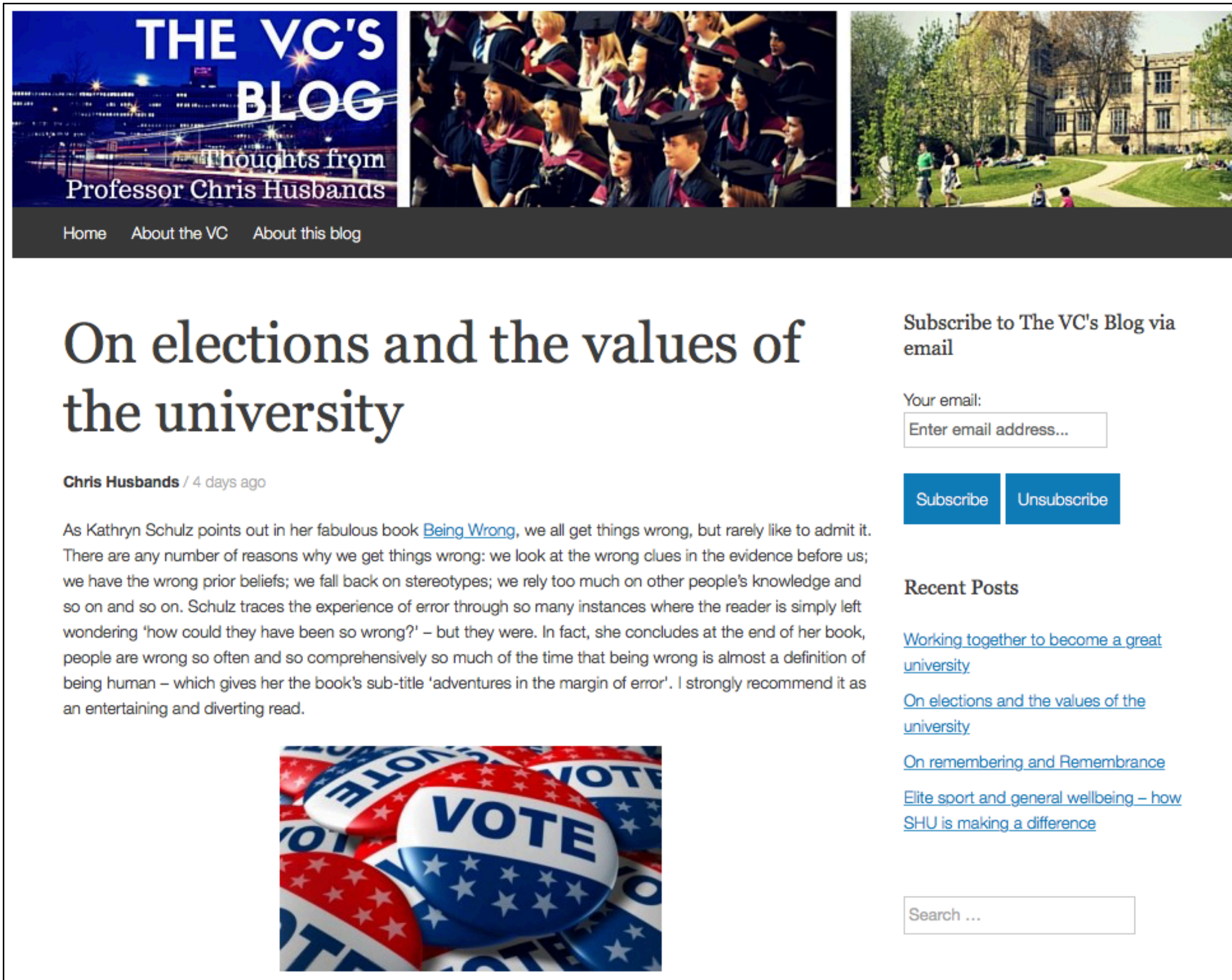


*“People in this country have had enough of experts.”*

Michael Gove, MP



# We have to go public. We have to be open.




**THE VC'S BLOG**  
Thoughts from Professor Chris Husbands

Home About the VC About this blog

## On elections and the values of the university

Chris Husbands / 4 days ago

As Kathryn Schulz points out in her fabulous book [Being Wrong](#), we all get things wrong, but rarely like to admit it. There are any number of reasons why we get things wrong: we look at the wrong clues in the evidence before us; we have the wrong prior beliefs; we fall back on stereotypes; we rely too much on other people's knowledge and so on and so on. Schulz traces the experience of error through so many instances where the reader is simply left wondering 'how could they have been so wrong?' – but they were. In fact, she concludes at the end of her book, people are wrong so often and so comprehensively so much of the time that being wrong is almost a definition of being human – which gives her the book's sub-title 'adventures in the margin of error'. I strongly recommend it as an entertaining and diverting read.



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- [On elections and the values of the university](#)
- [On remembering and Remembrance](#)
- [Elite sport and general wellbeing – how SHU is making a difference](#)

“Trump’s victory appears to be a defeat for almost everything that universities hold dear: their respect for truth and evidence, their belief in the value of rational debate, their commitment to the transformative powers of knowledge and understanding, their valuing of individuals....

...we should be yet more articulate about why universities, and the Enlightenment values they embody, are so important. In a world of bewildering and threatening change, **we have to do more to show how, and why, universities are one of society’s great achievements and best hopes.”**

**Chris Husbands**  
**Vice-Chancellor, Sheffield-Hallam University**

<https://blogs.shu.ac.uk/vc/2016/11/11/on-elections-and-the-values-of-the-university/>

We have to go public. We have to be open.

the guardian  
website of the year

home > science UK world politics sport football opinion culture business all

Science  
Political science

## Why science needs progressive voices more than ever

Amid the row over Brexit, the sector must loosen links to society's elite and speak up for those who have been marginalised



Scientists were among those who participated in the People's Climate March in New York and cities around the world in September 2014. Photograph: Jason DeCrow/AP

Alice Bell 

Wednesday 6 July 2016 16.00 BST

      Save for later

Shares 153 Comments 29

Brexit has thrown British science [into a mess](#). During this period of political upheaval, it might be tempting to duck the challenge of picking sides, and instead

“too often [public engagement initiatives] fail to build meaningful relationships between science and the public, preferring instead to act as fluffy PR agents for the scientific establishment. **We badly need more projects [...] that shares the benefits of expertise and lets people feel part of driving science and engineering.**”

Alice Bell

“People talking to people is still how the world’s standards change.”

OA is *not* the answer to everything but is an opportunity to show:

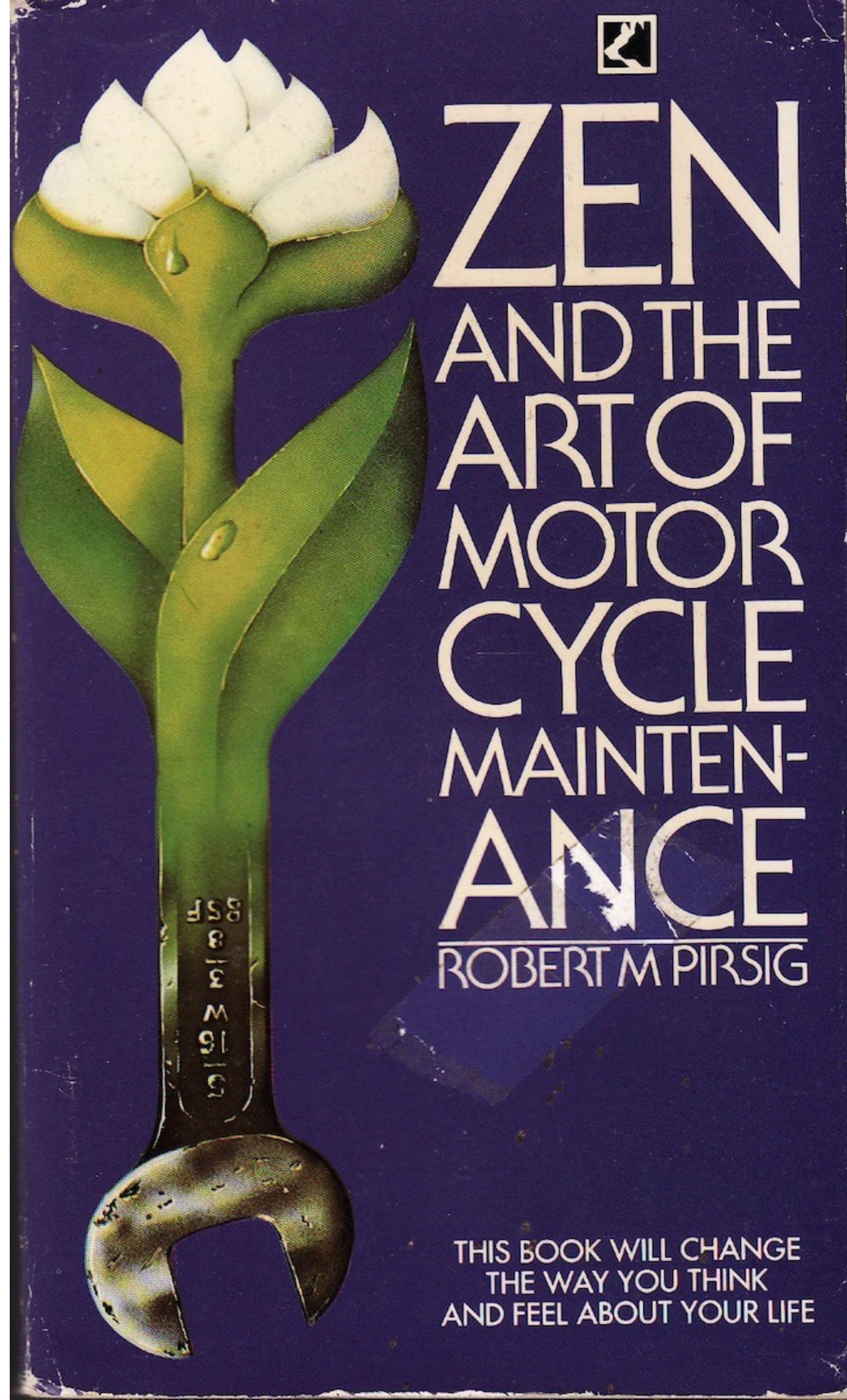
- that openness is integral to the noble calling to be an academic
- that open science can be better science
  - faster
  - more transparent
  - more rigorous
  - more widely read and used
- that the academy is relevant to people’s lives

Keep the faith. Keep talking.



*The incredulity of Saint Thomas, Caravaggio*





Being open will change the way you **think** and **feel** about your life in research



**TUSEN TAKK!**