



The Power, Perils and Pitfalls of Peer Review in Public

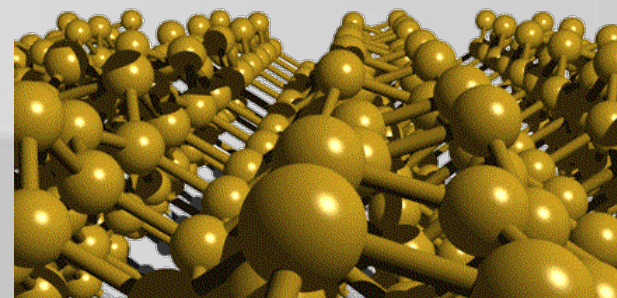
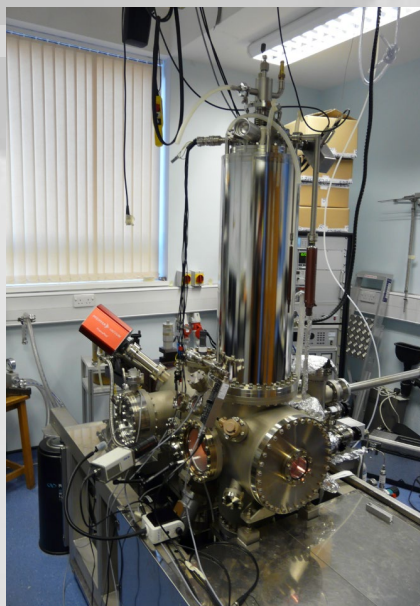
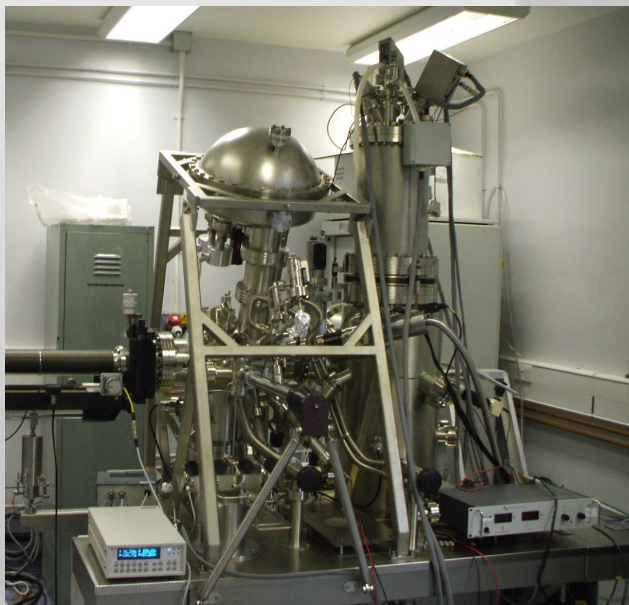
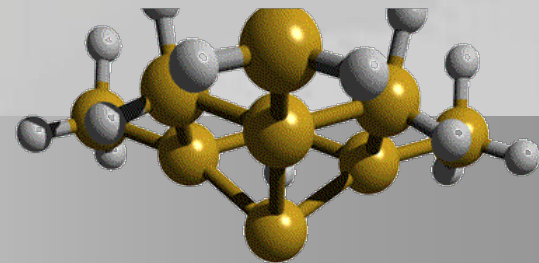
Philip Moriarty
School of Physics & Astronomy
University of Nottingham

www.nottingham.ac.uk/physics/research/nano

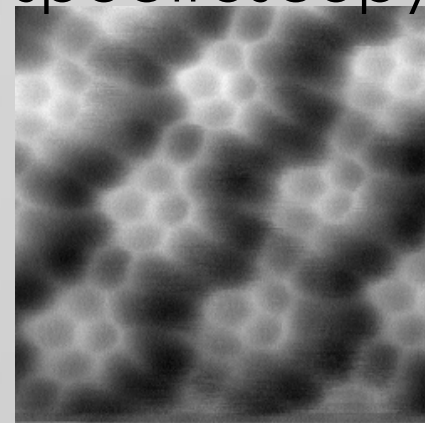
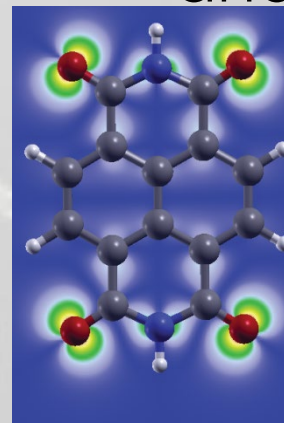
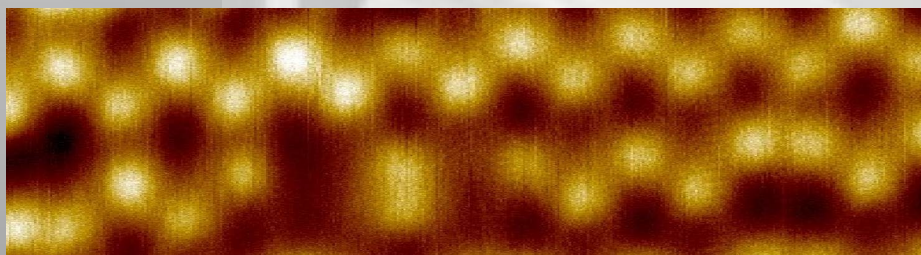
@Moriarty2112

<http://physicsfocus.org/author/philipmoriarty/>

The day job



Single atom/bond
imaging,
positioning
and spectroscopy





“Sloppy science is a larger evil than research misconduct”

Lex Bouter, WCRI-2015

“...large underestimation of the importance of fear”

Brian Martinson, WCRI-2015



In 2013 the Institute of Physics (IOP) published data on the numbers of academic physics staff at UK higher education institutions (<http://ow.ly/Lr3N2>). In the academic year 2011/12 there were 745 professors, 1350 lecturers and senior lecturers and 2110 postdoctoral researchers in UK physics departments. About 40% of all permanent academic appointments at UK physics departments go to overseas candidates. Assuming a steady-state population of permanent academic staff and postdocs, and that academic appointments are held by people aged between 30 and 65, on average 36 appointments will be made annually to postdocs in the UK, or 1.7% of the postdoc population. If we exclude appointments to professorships, the successful fraction is 1.1%.

These numbers should be pinned up on prominent notice-boards in every physics department across the country.

Letter from Prof. Adrian Sutton, Imperial College London in last month's *Physics World*

Outright fraud gets through the net

NATURE | NEWS



Publishers withdraw more than 120 gibberish papers

Conference proceedings removed from subscription databases after scientist reveals that they were computer-generated.

[Richard Van Noorden](#)

24 February 2014 | Updated: [25 February 2014](#)

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The publishers Springer and IEEE are removing more than 120 papers from their subscription services after a French researcher discovered that the works were computer-generated nonsense.

Over the past two years, computer scientist Cyril Labbé of Joseph Fourier University in Grenoble, France, has catalogued computer-generated papers that made it into more than 30 published conference proceedings between 2008 and 2013. Sixteen appeared in publications by Springer, which is headquartered in Heidelberg, Germany, and more than 100 were published by the Institute of Electrical and Electronic Engineers (IEEE), based in New York. Both publishers, which were privately informed by Labbé, say that they are now removing the papers.



Nano 'chopsticks'...

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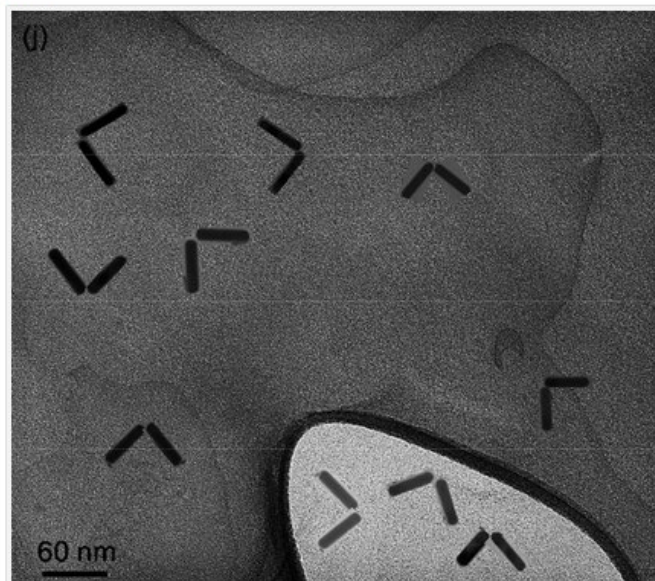
[How Should the Online Community Handle Suspicious Papers?](#) »

Some VERY Suspicious TEM Images in Nano Letters

August 14th, 2013

Mitch at Chemistry-Blog has a new [post](#) about a set of very suspicious TEM images that was [published](#) recently in the journal *Nano Letters*.

The associated [paper](#) reports the fabrication of pairs of gold nanorods in "chopstick" structures where the two rods touch at their tips and form an angle that the authors say they can tune. Some of the TEM data can be viewed for free in the associated [SI file](#). If you zoom in on the images, it appears that the background immediately around many of the rods is different from the rest of the background field. Hmmm...



from Nano Lett.



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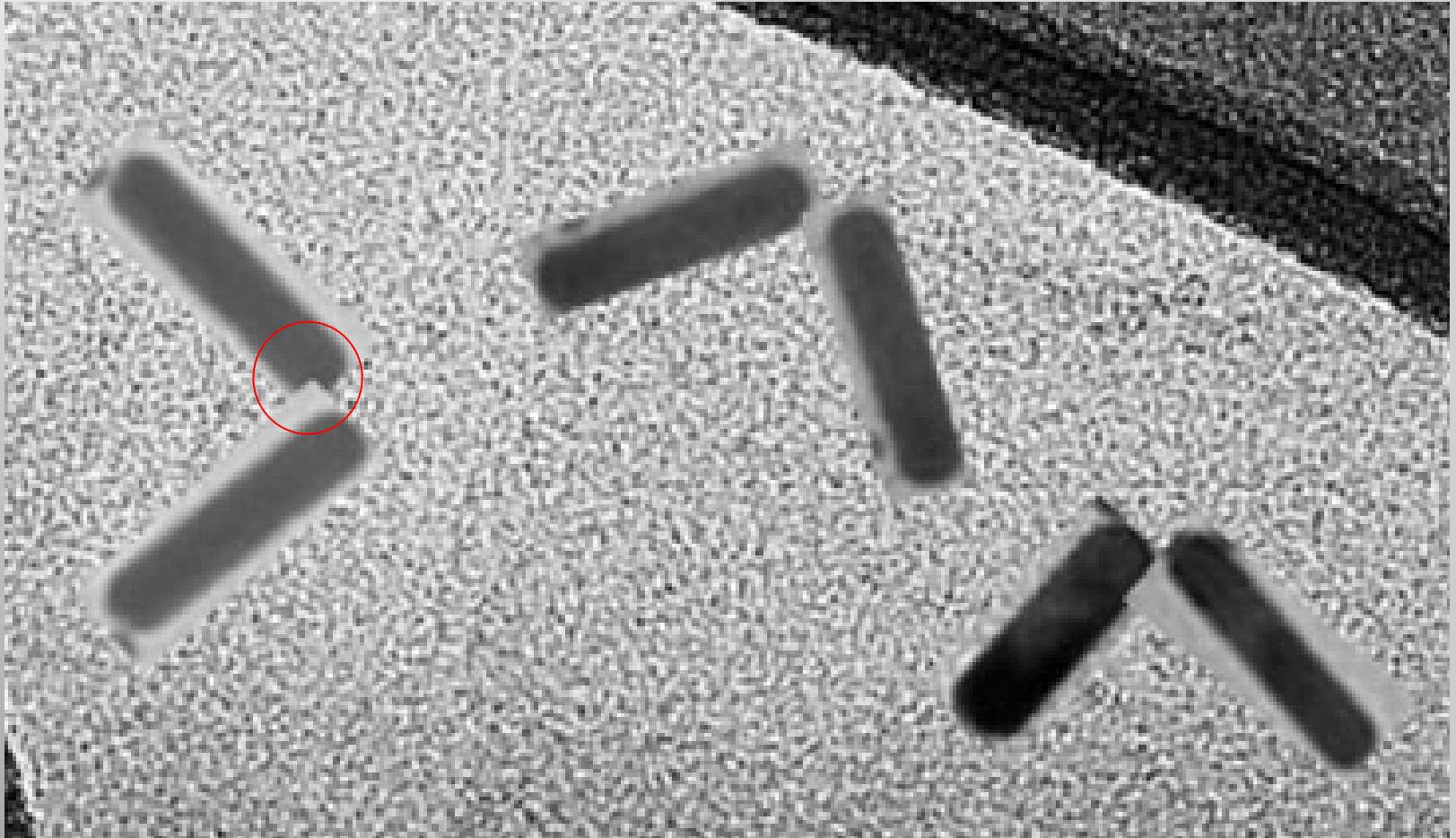


ChemBark
@ChemBark

7 Feb

So, there is no consensus about whether "heat of ____" is delta H or negative delta H. Means teachers need to be careful attaching context.

...or painfully poor Photoshopping?



Chopstick Nanorods: Tuning the Angle between Pairs with High Yield

Rajasekhar Anumolu *, Benjamin J. Robinson , and Leonard F. Pease , III

Nano Lett., 2013, 13 (9), pp 4580-4580

DOI: 10.1021/nl400959z

Publication Date (Web): June 19, 2013

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First Page

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Withdrawn

This paper was withdrawn on August 15, 2013.

COS Section: Surface Chemistry and Colloids

Note: In lieu of an abstract, this is the article's first page.

Click to increase image size

NANO LETTERS

Addition/Correction

pubs.acs.org/NanoLett

Chopstick Nanorods: Tuning the Angle between Pairs with High Yield

Rajasekhar Anumolu,* Benjamin J. Robinson, and Leonard F. Pease, III

Nano Letters 2013 ASAP

This article is being retracted due to concerns over the integrity of the data. The originally published PDF of this article is available as Supporting Information.

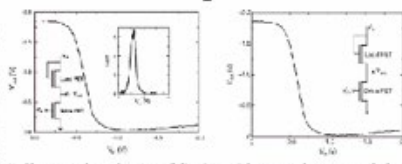
The unsettling Schon case

Bell Labs launches inquiry into allegations of data duplication

Good From Bad, Washington
One of neuroscience's big stories in the media is the use of brain scans in litigation. Following the *Jury*, data on some of the subjects were made public.

Jim Hudak, a scholar, a researcher at Ball State in Muncie, Ind., says he faces an independent inquiry after scientists noted striking similarities between different groups in a number of his published papers.

But he dismisses the allegations, saying they are "ridiculous." Many researchers are worried about the damage that could be done to basic research if critics of Ball State's participants



Misconduct finding at Bell Labs shakes physics community

Physicians are coming to terms this week with one of the most audacious scientific frauds ever uncovered. The results in question were laid out at one of the nation's top 40 women industrial laboratories and published in top journals—including this one (see editorial statement on page 42).

[illegible]

In a statement accompanying the report, Schneider said he made "mistake," but, according to the report, he did not say "I made a mistake."



For Heraldik, Solutions Good from Wolf Lufmann
an inquiry toward a betterment state.

He'll also be sending in his own post review in the wake of *Scientific Misconduct* verdict.

single molecules and induce superconductivity in carbon buckyballs with a technique, and his findings showed the

Bell Labs inquiry spreads to superconductors

Geoff Brumfiel, Washington
An investigation *in press* by the *Los Angeles Times* of B-6 Laboratory mice has been reported to include three important papers on superconductivity published in *Nature*.

The need for the investigation, which is being conducted by a panel chaired by Mahan at Boulder, is Stanford University's, California, now alarmed physicists' doubts of what have been engaged in efforts to replicate the superconductivity work.

any time soon. "The telecommunications sector is not a downer," says Scott. "Glad to be off the 'sourcerer' Croup a Washington-based mutant and evil firm. Many of these companies, including Linear, are finding 'willing buyers'."

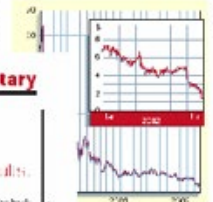
David Fisher, a professor of telecommunications at the University of Pennsylvania, adds, "It's definitely a better market than it used to be. It's also seen tough times ahead for the short-term." "We can just count on the drive to get your feet back into the water," he says. It's

Farber doesn't believe that the laboratory will become a location where scientists visit its business with little research activity being carried out in the very room, he says.

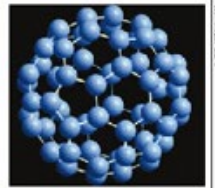
Sandra Dussan, spokeswoman for Bell Labs, expressed optimism about the future of the basic research there. "We continue to be committed to creating the next generation of technologies to make our companies successful," she says. "Physical sciences research will be an essential part of our plan." ■

JAMES F. HARRIS, Chief Executive Officer of IBM Corp., said:

The expansion is the crowding-trip center at the Lanes in Murray Hill, New Jersey—its sprawling center, Lanes Technologies, lost a 10th floor, and a wider, more complex, valuation last week (see graph, right), as investors traded to news of a real-bullion



on Technologies' share price, in 2004, fell sharply last month.

[illegible]Balls of iron pyrites showing superconductivity at 4.2 K when δ_{Fe} are being carried into operation.

|Is a bell tolling for Bell Labs?

It would be wise of Bell Labs to help others reproduce their scientists' results.

Paul Grant
Dark of night quickly began to gather over the exceptional finding of superconductivity at 117 K reported last year by Heidek, Seiden and co-workers at Bell Laboratories in Murray Hill, New Jersey. Soon after the publication of the paper, I was asked by a reporter aware of my reputation as a sceptical observer of



thermal decomposition of all materials, the background pressure of the system is in the same 10⁻⁷ mbar range where water vapour is the major component. The presence of aluminium hydroxide in plasma deposited films of aluminium has been documented (J.M. Schreier *et al.* *Appl Phys Lett* 75: 200–202 1999) and is a source of some of the concern over the variability shown reported in sample yield and thickness. This is discussed in more detail in the next section.

PLASTIC FANTASTIC

HOW THE BIGGEST FRAUD

IN PHYSICS SHOOK THE SCIENTIFIC WORLD

EUGENIE SAMUEL REICH

<http://archiv.ethlife.ethz.ch/images/scientificfraud>

Faulty rather than fraudulent

News > Science > Peer review and scientific publishing

Nobel winner declares boycott of top science journals

Randy Schekman says his lab will no longer send papers to Nature, Cell and Science as they distort scientific process

Ian Sample, science correspondent
The Guardian, Monday 9 December 2013 19.42 GMT



Randy Schekman, centre, at a Nobel prize ceremony in Stockholm. Photograph: Rob Schoenbaum/Zuma Press/Corbis



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loaded from www.sciencemag.org on Feb

www.sciencemag.org

Key importance of
'iconography' and
imagery in modern
scientific 'story-
telling'

Headline trumps
rigour

I Fooled Millions Into Thinking Chocolate Helps Weight Loss. Here's How.



John Bohannon

Filed to: DEBUNKERY 5/27/15 1:23pm

748,395 🔥 256 ★



Our paper was accepted for publication by multiple journals within 24 hours. Needless to say, we faced no peer review at all. The eager suitor we ultimately chose was the **the International Archives of Medicine**. It used to be run by the giant publisher

Pass the Easter Egg! New study reveals that eating chocolate doesn't affect your Body Mass Index ... and can even help you LOSE weight!

- New research from Roy Morgan reveals there's no proof that chocolate consumption affects BMI
- Currently two thirds of Australians eat chocolate at least once a month
- A study from German researchers has also found there's a connection between cocoa diets and increased weight loss
- Chocolate also found to benefit brain, heart and stress levels

By SAM BAILEY FOR DAILY MAIL AUSTRALIA

PUBLISHED: 01:22 EST, 31 March 2015 | UPDATED: 16:14 EST, 31 March 2015



From the endless chocolate blocks passed around the office, to the glaring supermarket aisles and the family relatives who miraculously appear with baskets of eggs, Easter can be a minefield to navigate if you're trying to watch your waistline.

But according to new research, there's no need to go easy on the eggs this week, with a Roy Morgan study revealing there is no direct connection between chocolate consumption and an increasing Body Mass Index (BMI).

This should come as sweet relief for chocoholics when according to Roy Morgan, two thirds of Australians admit to munching on chocolate at least once a month.

Scroll down for video



Eggsellent news: A chocolate a day is found to not affect your Body Mass Index

Daily **Mail**.com

I Fooled Millions Into Thinking Chocolate Helps Weight Loss. Here's How.



John Bohannon

Filed to: DEBUNKERY 5/27/15 1:23pm

748,395 🔥 256 ★



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Home Life & Style Health Chocolate accelerates weight loss: Research claims it lowers



Pollen threat: How foreign ragweed will increase risks for...



Blood pressure breakthrough: Jab every six months could



'Beautiful, brave and very, very talented' Jenny Eclair...



Ben can high

Chocolate accelerates weight loss: Research claims it lowers cholesterol and aids sleep

CAN you indulge your sweet tooth and lose weight? If it's chocolate that you crave than the answer seems to be yes.

By SARAH BARNES

PUBLISHED: 10:31, Mon, Mar 30, 2015 | UPDATED: 20:28, Sat, Apr 4, 2015

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GETTY

Chocolate can aid weight loss when combined with a low-carb diet, study claims

I Fooled Millions Into Thinking Chocolate Helps Weight Loss. Here's How.



John Bohannon

Filed to: DEBUNKERY 5/27/15 1:23pm

748,395 🔥 256 ★



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Scientists say eating chocolate can help you lose weight



10.6K



34



Monday, March 30, 2015

Adding chocolate to a diet led to the "easiest and most successful weight loss", scientists said.



Retraction Watch

Tracking retractions as

Should the chocolate–diet sting study be retracted? And why the coverage doesn't surprise a news watchdog

with 39 comments

Note: This story has been updated to include the journal's response. See below.

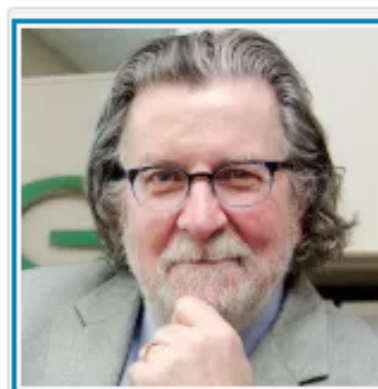
Yesterday, John Bohannon [described in i09.com how he successfully "created" health news](#) — he conducted a flawed trial of the health benefits of chocolate, gamed the data to produce statistically significant results, and published the findings in the [International Archives of Medicine](#):

“

It was terrible science. The results are meaningless, and the health claims that the media blasted out to millions of people around the world are utterly unfounded.

Given that the author himself says the study is meaningless, clearly, the journal will retract it, yes?

Not necessarily, given what we've seen in the past. Yes, Bohannon provided a false first name ("Johannes") and affiliation, but to many journals these would be simple corrections: we've seen far worse "errors" that



Gary Schwitzer

Traditional publishers *very* often not interested in correcting scientific record...

-----Original Message-----

From: [REDACTED]

Sent: 29 June 2013 20:21

To: Philip Moriarty
[REDACTED]

Subject: Re: Pre-submission enquiry

Dear Dr. Moriarty:

Thank you for your note and inquiry. However, [REDACTED] does NOT publish papers that rely only on existing published data. In other words [REDACTED] does NOT publish papers that correct, correlate, reinterpret, or in any way use existing published literature data. We only publish papers with original experimental data. Hence I regret but [REDACTED] would not be able to consider or publish the ms you describe.

[REDACTED]
[REDACTED]
Editor, [REDACTED]

Traditional peer review is slow and archaic

[HOME](#) | [NEWS](#)

Slow is no way to go, argues researcher


10 JANUARY 2013 | BY [PAUL JUMP](#)


Nanoscientist waits three years to see critique of controversial 'discovery' printed. Paul Jump writes


A paper that was critical of another lab's body of work and took more than three years to be published raises questions about the effectiveness of peer review and about the way such papers should be handled, a physicist has claimed.

Raphael Levy, a researcher in the University of Liverpool's Institute of Integrative Biology, finally saw the paper "Stripy Nanoparticles Revisited", on which he was senior author, published in the journal *Small* at the end of November, almost exactly three years after it was submitted.

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PubPeer and the role of PPPR

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DENNIS NORMILE



High-Profile Stem Cell Papers Under Fire

17 February 2014 9:15 am | [5 Comments](#)

PubPeer Blog Recent Comments Featured Press About FAQ

Unregistered Submission: (February 6th, 2014 8:01pm UTC)

If the linked image is indeed Figure 1i, it does certainly look as if lane 3 was spliced in. I am under the impression that the correct procedure where two or more images are shown side by side is to leave a small gap. The authors do not appear to have followed the correct publication procedure here. A response from the authors would be welcome.

[Reply](#) [Report](#)

PubPeer screenshot

Challenge. Anonymous comments have sparked an investigation into images included in two attention-getting

Post- and *pre*-publication peer review

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PubPeer > arXiv

"Critical assessment of the evidence for striped nanoparticles -- Preprint"

Julian Stirling, Ioannis Lekkas, Adam Sweetman, Predrag Djuranovic, Quanmin Guo, Josef Granwehr, Raphaël Lévy, Philip Moriarty, arXiv, **1312.6812v1** (2013)

Comments (277):

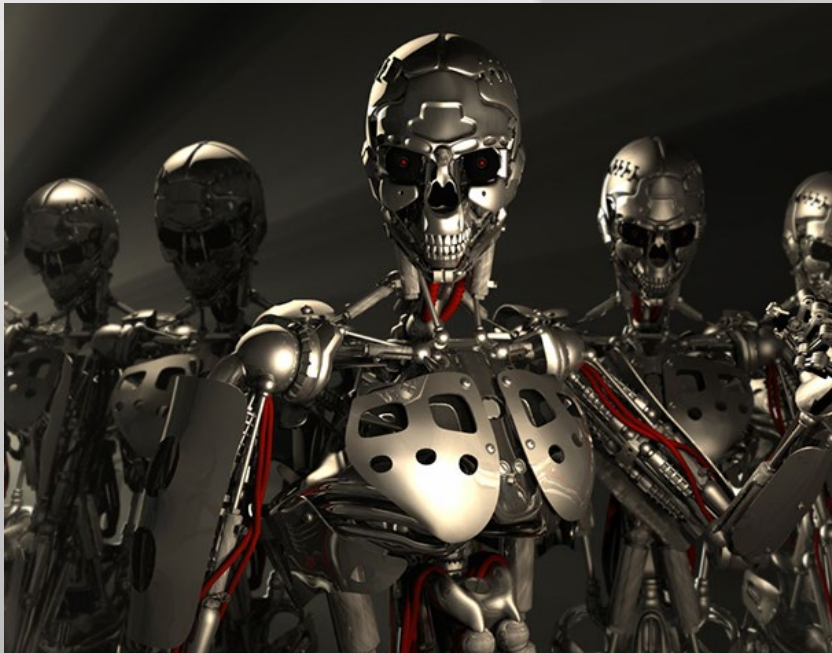
6

Peer 1: (January 3rd, 2014 2:07pm UTC)

This paper should finally lay to rest the whole striped nanoparticles controversy. It is accompanied by a blog post
<http://raphazlab.wordpress.com/2013/12/26/open-science-to-settle-stripy-controversy/>

According to Moriarty
<http://raphazlab.wordpress.com/2013/12/26/open-science-to-settle-stripy-controversy/#comment-2269>
it has been submitted to PLoS One. This is a really sad indictment of science today. Dressing up poor experimental technique and wonky analysis in a fantastical conclusion pays off with multiple papers in high impact journals. However, when the work is done correctly, the reward is PLoS One and

Rise of the cyber-bullies?



physicsfocus 

<http://physicsfocus.org/philip-moriarty-peer-review-cyber-bullies/>



Noah Gray @noahWG

Jan 27

Wow. Scientist likens the post-publication **peer** review comments on his paper to "**cyber-bullying**."

blogs.discovermagazine.com/neuroskeptic/2... by @Neuro_Skeptic

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Katherine Harmon @KHCourage

Jan 27

So also 98% of online comments?! MT @noahWG Scientist likens post-pub **peer** review comments on paper to **cyber-bullying**

blogs.discovermagazine.com/neuroskeptic/2...

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Rockefeller Univ @RockefellerUniv

Jan 27

RT @noahWG: Wow. Scientist likens the post-publication **peer** review comments on his paper to "**cyber-bullying**." ow.ly/t0P10

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Jason H. Moore, Ph.D @moorejh

Jan 27

#research #scichat RT @KHCourage @noahWG Scientist likens post-pub **peer** review comments on paper to **cyber-bullying**

blogs.discovermagazine.com/neuroskeptic/2...

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Lucy Coles @LucyCColes

Jan 28

Interesting question: @AdisRapidPlus

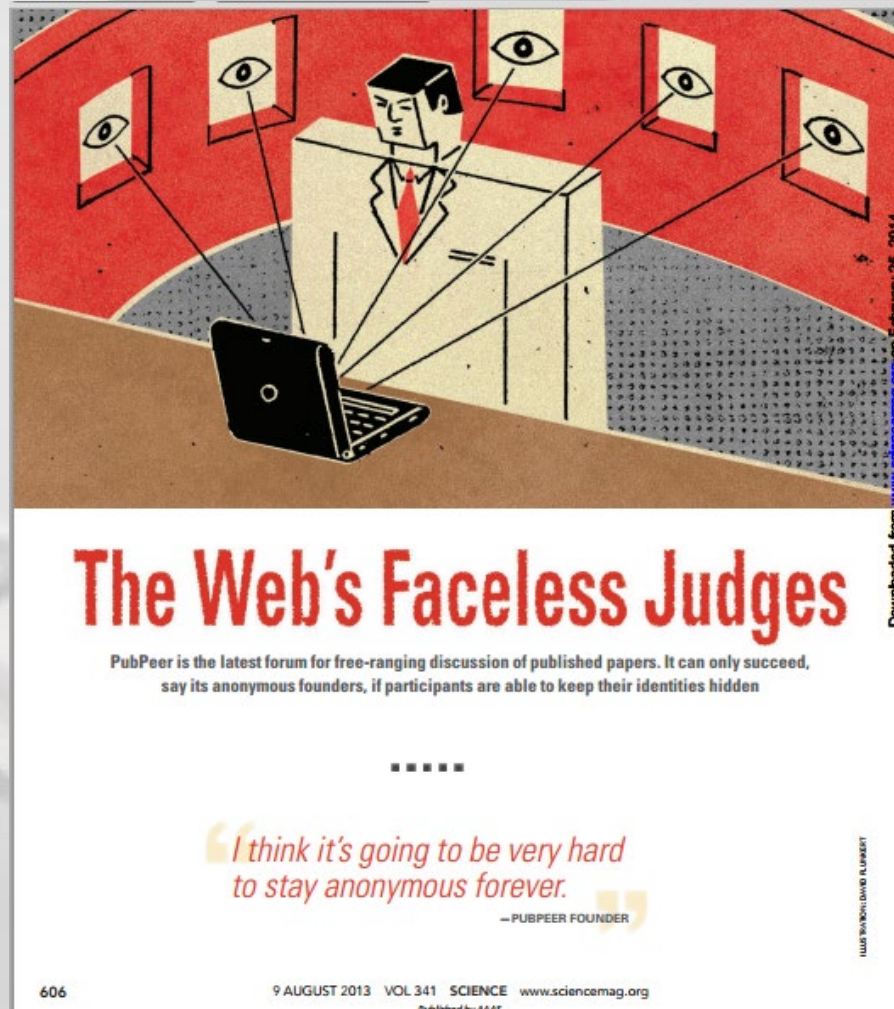
When does post-publication **peer** review become **cyber bullying**?

bit.ly/1jmNUT

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Faceless...fearless...vitriolic?



Anonymous?



The Gish Gallop in Scientific Debate

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"Critical assessment of the evidence for striped nanoparticles"

Julian Stirling, Ioannis Lekkas, Adam Sweetman, Predrag Djuranovic, Quanmin Guo, Josef Granwehr, Raphaël Lévy, Philip Moriarty, arXiv, 1312.6812v1 (2013)

Comments (234): Sort By: Recent ▾

Peer 1: (January 3rd, 2014 2:07pm UTC)

6

This paper should finally lay to rest the whole striped nanoparticles controversy. It is accompanied by a blog post
<http://raphazlab.wordpress.com/2013/12/26/open-science-to-settle-stripy-controversy/>

According to Moriarty
<http://raphazlab.wordpress.com/2013/12/26/open-science-to-settle-stripy-controversy/#comment-2269>
it has been submitted to PLoS One. This is a really sad indictment of science today. Dressing up poor experimental technique and wonky analysis in a fantastical conclusion pays off with multiple papers in high-impact journals. However, when the work is done carefully, the reward is a PLoS One and embarrassed silence from those "top" journals.

That said, the paper really, really should have been submitted to Nature Materials, who ran the original story and whose editor supported it to the hilt. Anyway, I'm sure Pep Pamies will read it with interest and hopefully he will write the nice editorial it deserves.

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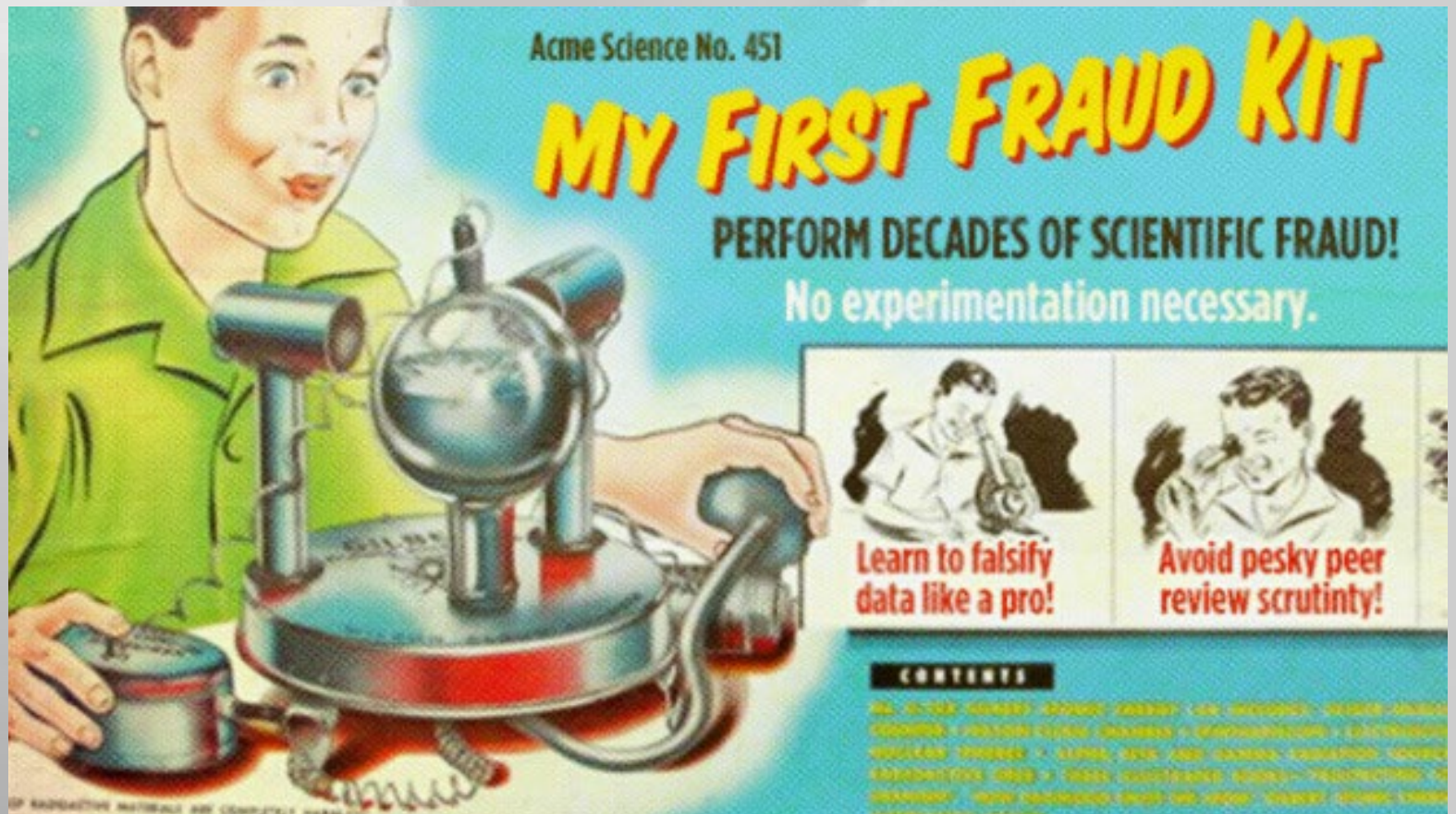
Publication Activity

Blog Activity (6)

- Applied metrology example from literature, and new new-year's SAXS resolutions
- Open science to settle stripy



Faulty or fraudulent, how do we fix things?



http://therefusers.com/refusers-newsroom/fda-official-clinical-trial-system-is-broken-bmj/#.Uw2tVPI_vGI

The Dark Side of Publishing

theguardian

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Academic publishers make Murdoch look like a socialist

Academic publishers charge vast fees to access research paid for by us. Down with the knowledge monopoly racketeers

Follow George Monbiot by email BETA



George Monbiot

The Guardian, Monday 29 August 2011 21.08 BST

Jump to comments (364)



See telescoper.wordpress.com and <http://occamstypewriter.org/scurry/> for *lots* of information on Open Access

In a nutshell: taxpayer funds us to do research; we publish; and taxpayer then has to pay exorbitant prices to read results of research *they've* funded.

10 % of QR funding on journal subscriptions (i.e. ~ £100M per year!!)

[Publishing industry has huge vested interest in REF]

c.f. arXiv -- \$400K per annum; 10% of QR ~ £100M on journal subsl

Elsevier and The Cost of Knowledge

Tim Gowers
(Cambridge
mathematician) set
up a boycott of
Elsevier.

>15,000 signed up to
this.

*"Elsevier and Springer
as well as a number of
other commercial
publishers all exploit
our volunteer labour
to extract very large
profits from the
academic
community"* [Profit
margins estimated at
20% - 30%]

Gowers's Weblog

Mathematics related discussions

« SOPA — my part in its downfall <http://thecostofknowledge.com> »

Elsevier — my part in its downfall

The Dutch publisher Elsevier publishes many of the world's best known mathematics journals, including *Advances in Mathematics*, *Comptes Rendus*, *Discrete Mathematics*, *The European Journal of*

NATURE | NEWS FEATURE



Open access: The true cost of science publishing

Cheap open-access journals raise questions about the value publishers add for their money.

" Philip Campbell, editor-in-chief of Nature, estimates his journal's internal costs at £20,000–30,000 (\$30,000–40,000) per paper"

What?! £20,000 per paper ? *Really?*

RIN/CEPA: 2011			Houghton: 2009		
First copy	£1,261	50%	Article processing	£1,234	46%
Variable	£581	23%	Other fixed and variable	£1,007	37%
Indirect	£666	27%	Management and investment	£455	17%
Total cost	£2,508	100%	Total cost	£2,696	100%
Profit/surplus	£586	19%	Profit/surplus	£552	17%
Total incl. profit/surplus	£3,095		Total incl. profit/surplus	£3,247	

<i>operating profit</i>	<i>company</i>	<i>industry</i>
7%	Woolworths	supermarkets, pokies
12%	BMW	automobiles
23%	Rio Tinto	mining
35%	Apple	premium computing
34%	Springer	scholarly publishing
36%	Elsevier	scholarly publishing
40%	Wiley	scholarly publishing

📅 January 9, 2013

Scholarly publishers and their high profits

I recently published the below chart to document the outrageous profit margins of scholarly publishers in the sciences.

operating profit	company	industry
7%	Woolworths	supermarkets, pokies

This post is to provide the sources for the

<https://alexholcombe.wordpress.com/2013/01/09/scholarly-publishers-and-their-high-profits/>

**So why don't we just publish
everything in Open Access
journals (e.g. Beilstein J. Nanotech.) Or
on “arXiv 2.0”?**



We pay for the brand



The “statistical illiteracy” of impact factors

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Sick of Impact Factors: Coda →

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.

By the early 1990s it was clear that the use of the arithmetic mean in this calculation is problematic because the pattern of citation distribution is so skewed. [Analysis by Per Seglen](#) in 1992 showed that typically only 15% of the papers in a journal account for half the total citations. Therefore only this minority of the articles has more than the average number of citations denoted by the journal impact factor. Take a moment to think about what that means: the vast majority of the journal's papers —

Stephen Curry: scientist who uses X-rays to look at the atoms of protein molecules. Wonders about the place of science in the world. Works at [Imperial College](#) but views

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Impact Factors — Letter to RCUK

Posted on [March 21, 2013](#) by [Stephen](#)

Following [my post of last week](#) asking RCUK to include in the [guidelines](#) on their new open access policy a statement disavowing the use of impact factors in assessing funding applications, I want to thank everyone who registered their support. I also wanted to provide the text of the letter that I sent yesterday to Alexandra Saxon, RCUK's Head of Communications. All the signatories are listed below.

As we now know, Alexandra left a [comment](#) on that post indicating that RCUK will respond positively by amending the guidelines in accordance with our request. I am grateful to RCUK for such swift action on this and look forward to the revised text with great interest.

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[The Hunters →](#)

Impact factors declared unfit for duty

Posted on [May 16, 2013](#) by [Stephen](#)

Regulars at this blog will be familiar with the [dim view](#) that I have of impact factors, in particular their misappropriation for the evaluation of individual researchers and their work. I have [argued for their elimination](#), in part because they act as a brake on the roll-out of open access publishing but mostly because of the corrosive effect they have on science and scientists.

I came across a particularly dispiriting example of this recently when I was asked by a well-known university in North America to help assess the promotion application of one of their junior faculty. This was someone whose work I knew — and thought well of — so I was happy to agree. However, when the paperwork arrived I was disappointed to read the following statement the description of their evaluation procedures:

"Some faculty prefer to publish less frequently and publish in higher impact journals. For this reason, the Adjudicating Committee will consider the quality of the journals in which the Candidate has published and give greater weight to papers published in first rate journals."

Which means of course that they put significant weight on impact factors when assessing their staff. Given the position I had developed in public (and at some length) I felt that this would make it difficult for me to participate. I wrote to the institution to express my reservations:

"...I think basing a judgement on the name or impact factor of the journal rather than the work that the scientist in question has reported is profoundly misguided. I am therefore not willing to participate in an assessment mechanism that perpetuates the corrosive effects of assessing individuals by considering what journals they have published in. I would like to be able to provide support for Dr X's application but feel I can only do so if I can have the assurance of your head of department that the Committee will work under amended criteria and seek to evaluate the applicant's science, rather than placing

Assessing Academic Researchers

Richard N. Zare*



Richard N. Zare
Immediate Past Chairperson
Department of Chemistry
Stanford University

On a recent trip to China and India, I had the opportunity to discuss with many young researchers at various universities about the expectations that they must meet in order to succeed professionally. Many of them thought that the road to success was measured in

members to whom we give tenure determine the quality, reputation, and atmosphere of our department. Begin-

In judging researchers early in their career, the h-index seems

faculty members become good teachers because anyone who aspires to achieve that status can do so. Teaching is a critical component of our service to a teaching and research institution, and we owe it to students to take our instruction to the highest level possible.

Re-evaluate how we evaluate

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 process for grants and promotions are deeply ingrained in institutions and funding agencies and have been altered very little in the past several decades, despite substantial changes that have taken place in the scientific work force, the funding landscape, and the way that science is being conducted. This article examines how scientific productivity is being evaluated, what it is rewarding, where it falls short, and why richer information than a standard curriculum vitae/biosketch might provide a more accurate picture of scientific and educational contributions. The article also explores how the evaluation process exerts a profound influence on many aspects of the scientific enterprise, including the training of new scientists, the way in which grant resources are distributed, the manner in which new knowledge is published, and the culture of science itself.

Monitoring Editor

David G. Drubin
University of California,
Berkeley

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The scientific profession is fundamentally a meritocracy. As part of this meritocracy, our scientific work is constantly scrutinized through "peer review," a system that is solid and arguably adopts higher standards of fairness and rigor than those of many other occupations. Manuscripts are evaluated for publication by reviewers and journal editors, and scientists vie for precious real estate in what are perceived to be the prime journals. Published papers, in turn, are

ARE WE EVALUATING SCIENTIFIC QUALITY OR OUTSOURCING THIS RESPONSIBILITY TO JOURNALS?

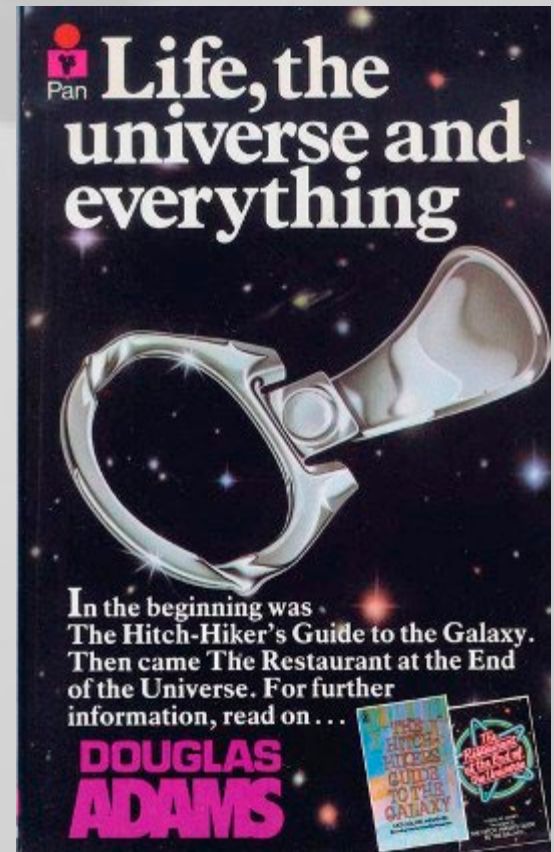
"Let's try for *Science*, *Nature*, or *Cell*!" exclaim a student/postdoc and his/her advisor. These journals reach a wide audience, as many scientists frequently scan their tables of contents. However, scanning tables of contents has become less important now with the availability of search engines such as PubMed than it was in the past.

...and flaws in the literature are not an SEP




“An SEP is something we can’t see, or don’t see, or our brain doesn’t let us see, because we think that it’s somebody else’s problem.... The brain just edits it out, it’s like a blind spot”

Publication represents the start, not the end, of debate.



"It's definitely a duck"



A photograph of two grey rabbit puppets on a light-colored surface. The puppet in the foreground is wearing a red and white checkered shirt with a red strap over its shoulder. The puppet in the background is wearing a yellow dress with a floral pattern. To their right, several puzzle pieces are scattered on the surface. One puzzle piece is clearly visible, showing a landscape with a blue sky, green grass, and a brown tree. Another puzzle piece is partially visible to the left, showing a blue sky and a white cloud. A speech bubble is positioned above the puppets, and another is below the foreground puppet.

What are you doing?

I found these puzzle pieces laying here next to this box. Want to help me put it together?

Puzzle
Paws




No. It's a picture of a duck.
There's no point doing all the work.
The box already told me what it is.



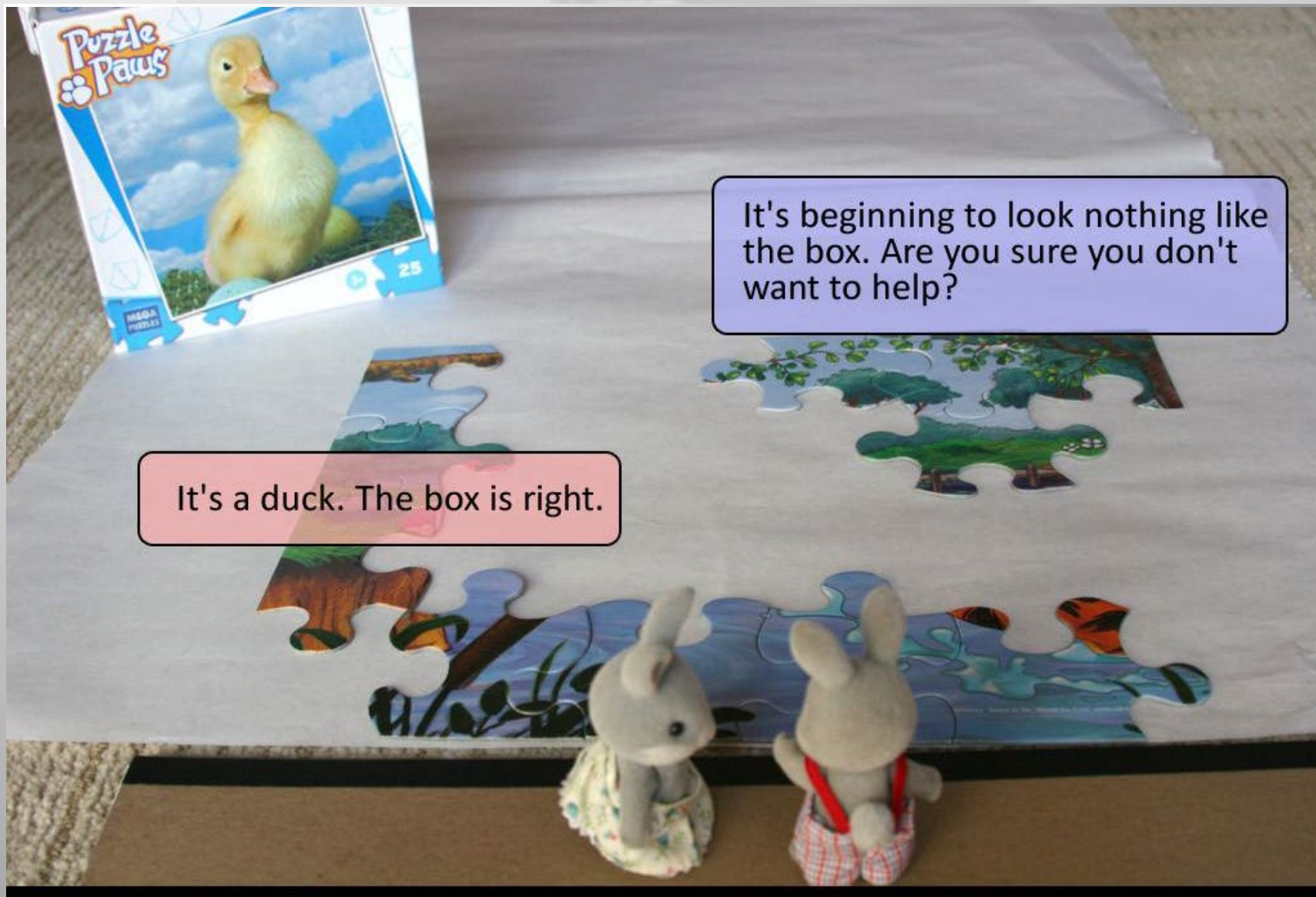
Some of these pieces don't
seem to match the picture.
I'd like to figure out why.



A photograph of two small grey rabbit figurines on a white surface with scattered puzzle pieces. The rabbit on the left is wearing a small floral dress. The rabbit on the right is wearing red and white checkered shorts. In the background, a puzzle box with a picture of a pear is visible. Two speech bubbles are overlaid on the image.

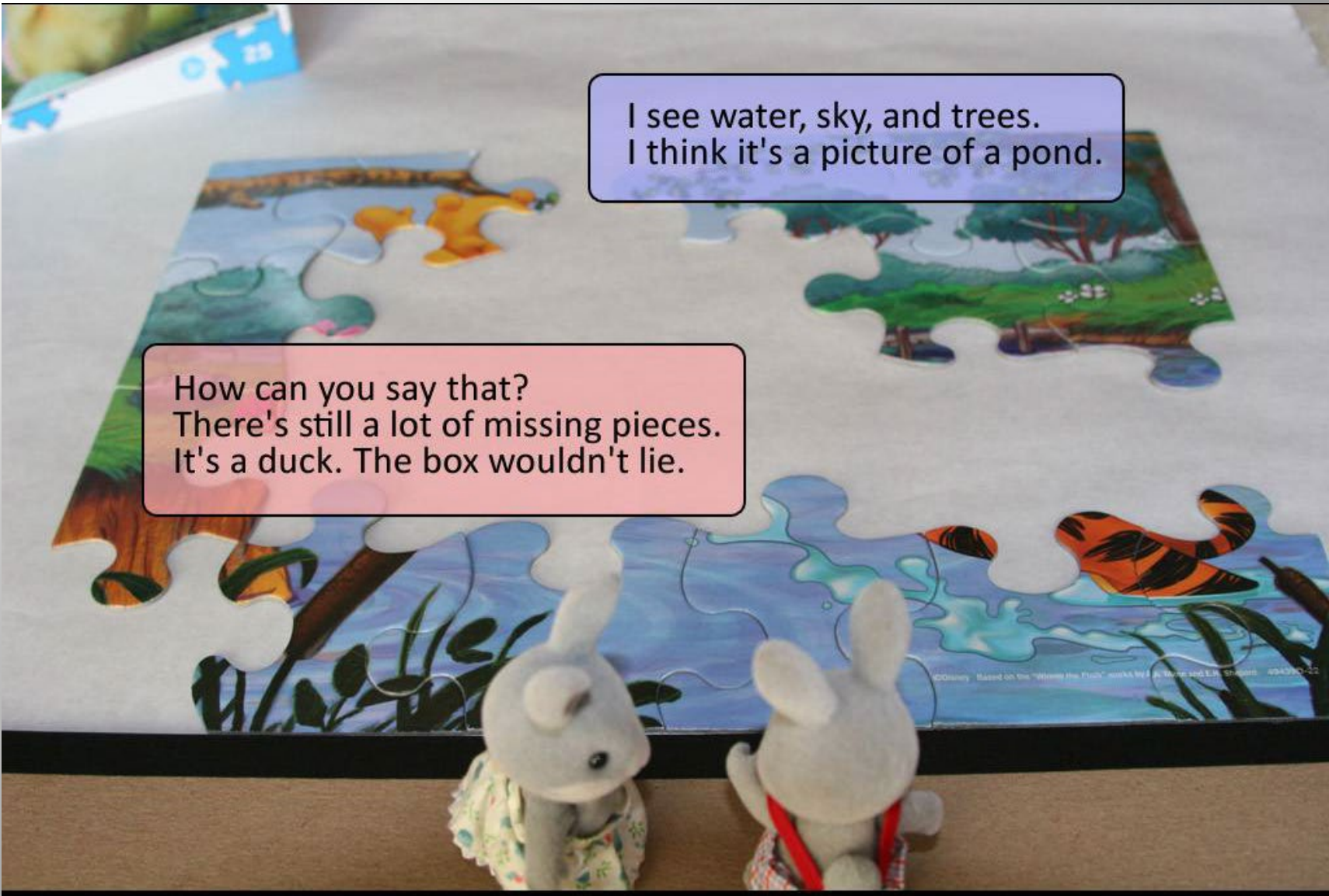
I'm going to trust the box.

I don't think the box is accurate.
Look... there's some trees over here.




It's beginning to look nothing like the box. Are you sure you don't want to help?

It's a duck. The box is right.

A jigsaw puzzle depicting a pond scene with trees, water, and two large orange and black striped fish. Several pieces are missing, leaving large white gaps. In the top left, a puzzle box is partially visible with the number '25' on it. Two small white stuffed rabbits are positioned at the bottom of the frame, looking up at the puzzle. One rabbit is wearing a floral patterned dress, and the other is wearing a red and white striped dress. Two text boxes are overlaid on the image: a purple one at the top right and a pink one in the middle left.

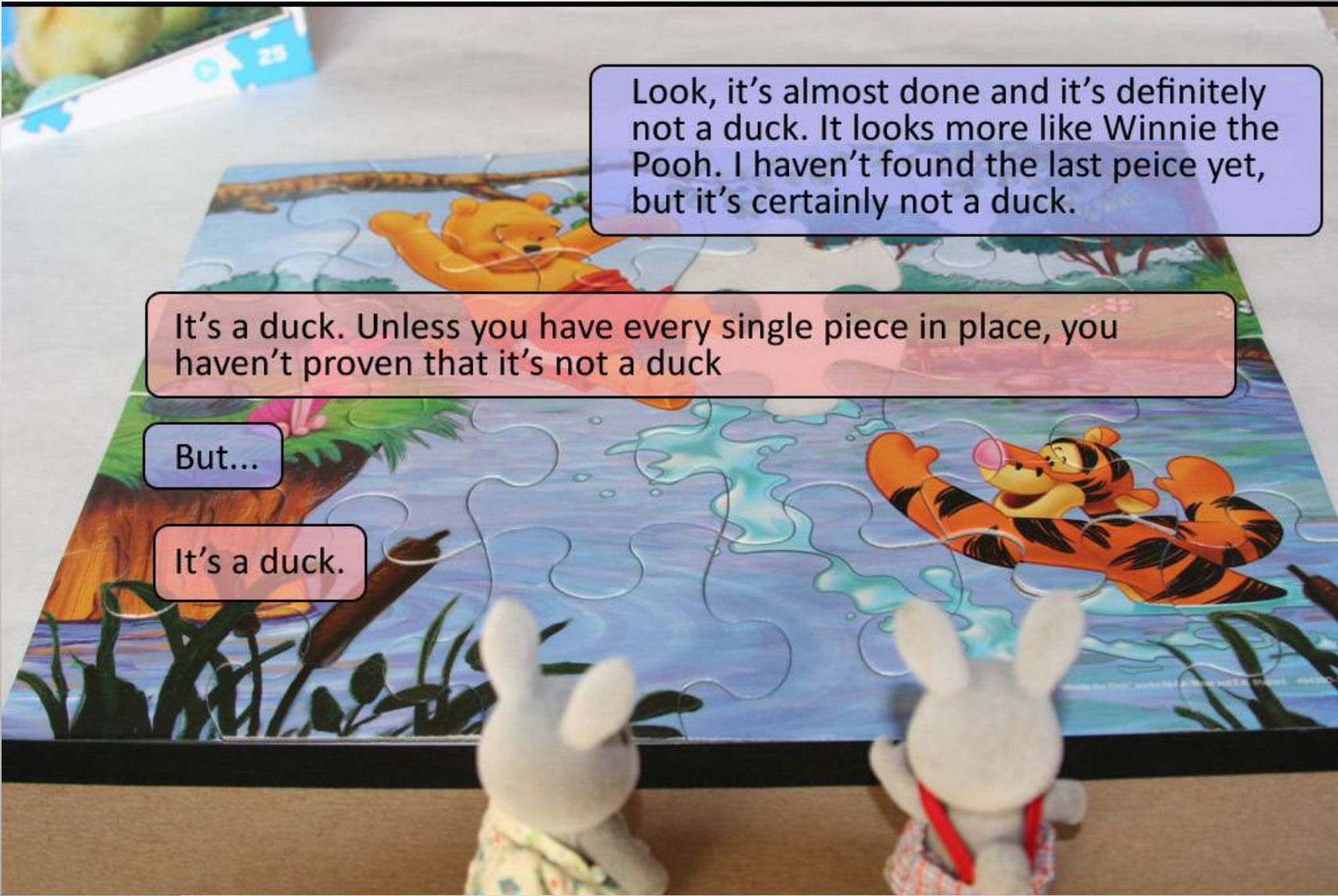
I see water, sky, and trees.
I think it's a picture of a pond.

How can you say that?
There's still a lot of missing pieces.
It's a duck. The box wouldn't lie.



I may not have all the pieces yet
but I can see trees, water, and grass.
So far, no duck.

It's a duck. Until you have every piece,
you can't be sure it's not a duck.



Look, it's almost done and it's definitely not a duck. It looks more like Winnie the Pooh. I haven't found the last piece yet, but it's certainly not a duck.

It's a duck. Unless you have every single piece in place, you haven't proven that it's not a duck

But...

It's a duck.