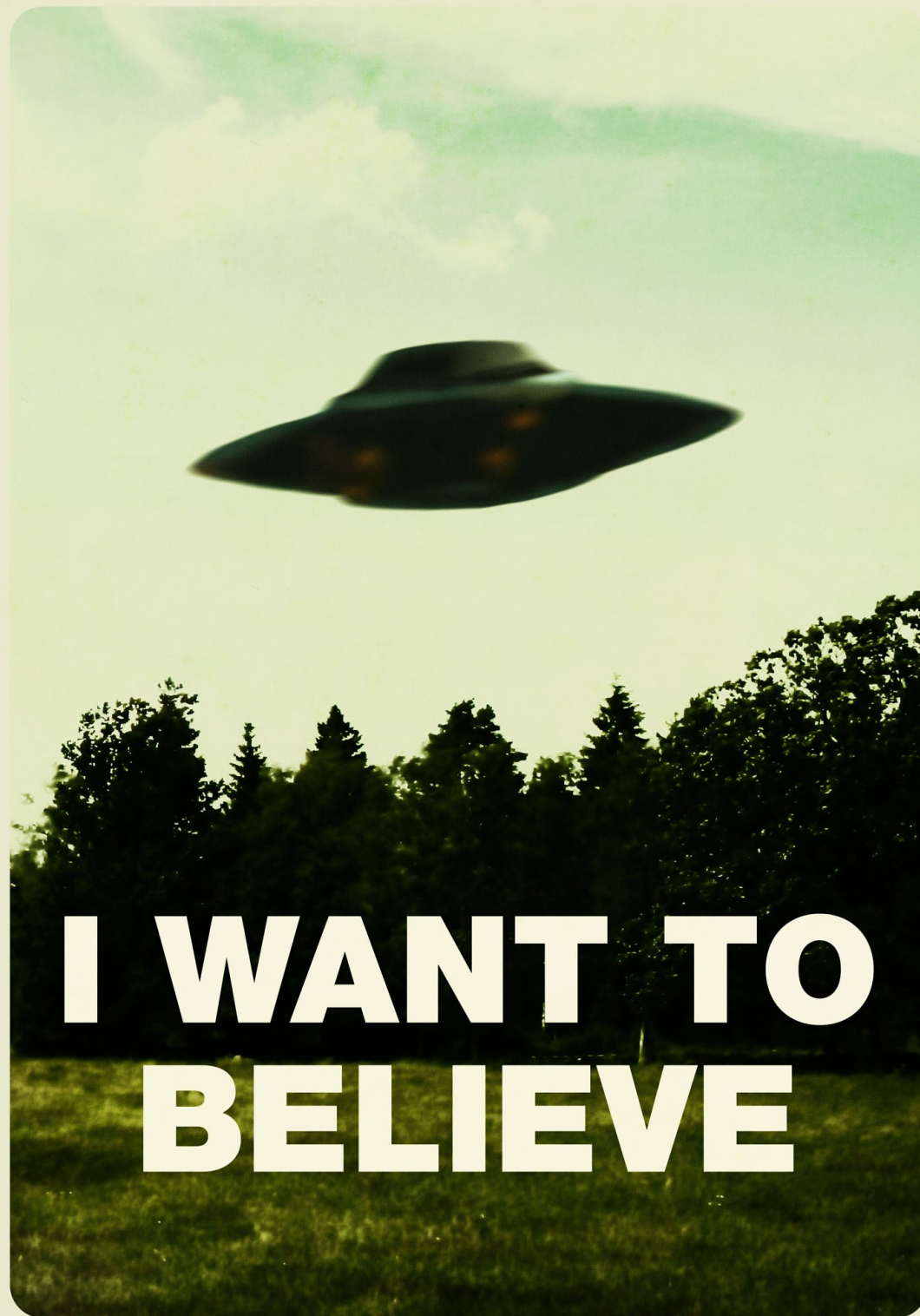


Escepticismo

Jaime E. Forero Romero
Universidad de los Andes
Astronomía Popular



Montag,
20. Juni, 18.30 Uhr
Uni Regensburg · Hörsaal: siehe Web*

» Wissenschaft auf Abwegen?

Theoriebildung unter
sozialem Druck

Sabine Hossenfelder (Frankfurt Institute for Advanced Studies)

Expertengespräche aus dem Spannungsfeld

Naturwissenschaft, Religion und Kultur

WAS-IST-WIRKLICH.DE

<https://www.youtube.com/watch?v=DSbkIMh-aoY>

Un problema elemental

- A) Los científicos son humanos.
- B) Los humanos son influenciados por su ambiente social.
- C) Los científicos son influenciados por su ambiente social.

Fuentes de error

- Los efectos sociales y las distorsiones cognitivas pueden desviar las capacidades de razonamiento de un individuo.
- Ejemplos:
 - Escuchamos mejor cuando lo que dicen confirma nuestras creencias.
 - Creemos que algo es importante cuando lo oímos varias veces.
 - Nos ilusionamos con facilidad.
 - No nos gusta estar por fuera de un grupo.
 - No nos rendimos fácilmente (Loss aversion)

¿Por qué es importante ahora?

- Las cosas hubieran podido ir más rápido.
- Empieza a ser importante cuando los datos experimentales se demoran en llegar.
- El ambiente de trabajo del científico ha cambiado de manera radical en el último siglo.
-

Los cambios de las ciencias

- Aumento en:
 - Número de científicos.
 - Comunicación.
 - Colaboración.
- Menos:
 - Apoyo para proyectos de larga duración.
 - Autores individuales.
 - Heterogeneidad.

Los cambios de las ciencias

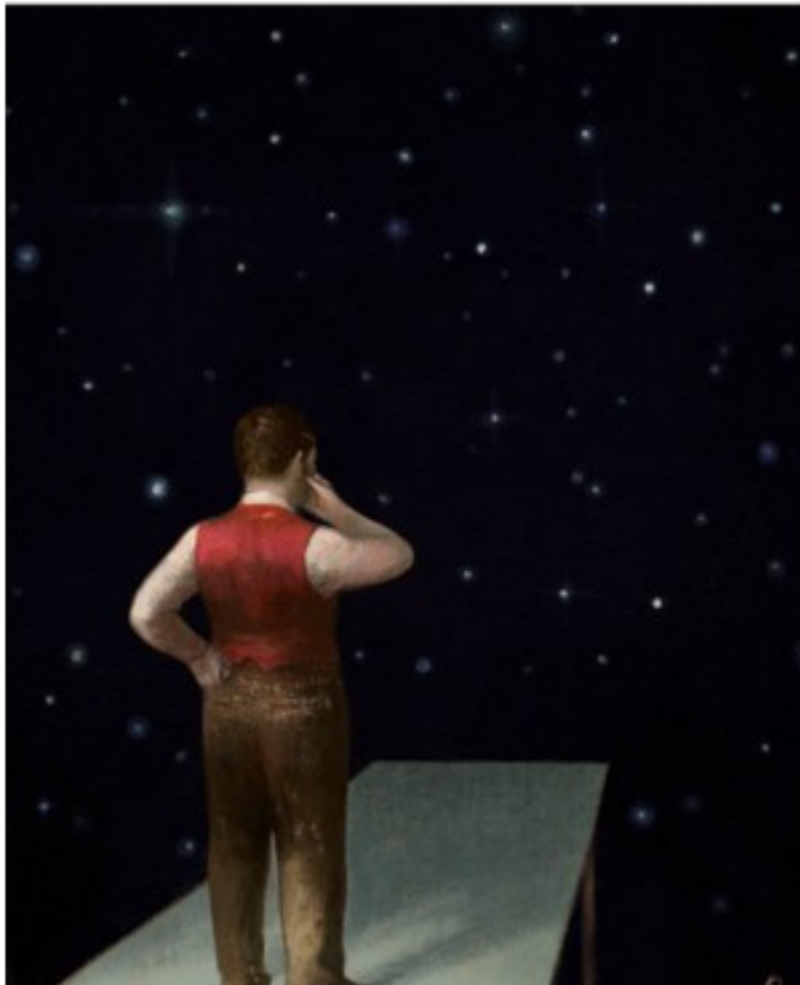
- Aumento en:
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 - Colaboración.
- Menos:
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 - Autores individuales.
 - Heterogeneidad.

Esto **intensifica** los efectos sociales.

A Crisis at the Edge of Physics

Gray Matter

By ADAM FRANK and MARCELO GLEISER JUNE 5, 2015



DO physicists need empirical evidence to confirm their theories?

You may think that the answer is an obvious yes, experimental confirmation being the very heart of science. But a growing controversy at the frontiers of physics and cosmology suggests that the situation is not so simple.

A few months ago in the journal *Nature*, two leading researchers, George Ellis and Joseph Silk, published a controversial piece called “Scientific Method: Defend the Integrity of Physics.” They criticized a

http://www.nytimes.com/2015/06/07/opinion/a-crisis-at-the-edge-of-physics.html?_r=0

Perimeter Institute and the crisis in modern physics

Neil Turok talks to Paul Wells about the ever-increasing complexity of theoretical physics

Paul Wells

September 5, 2013

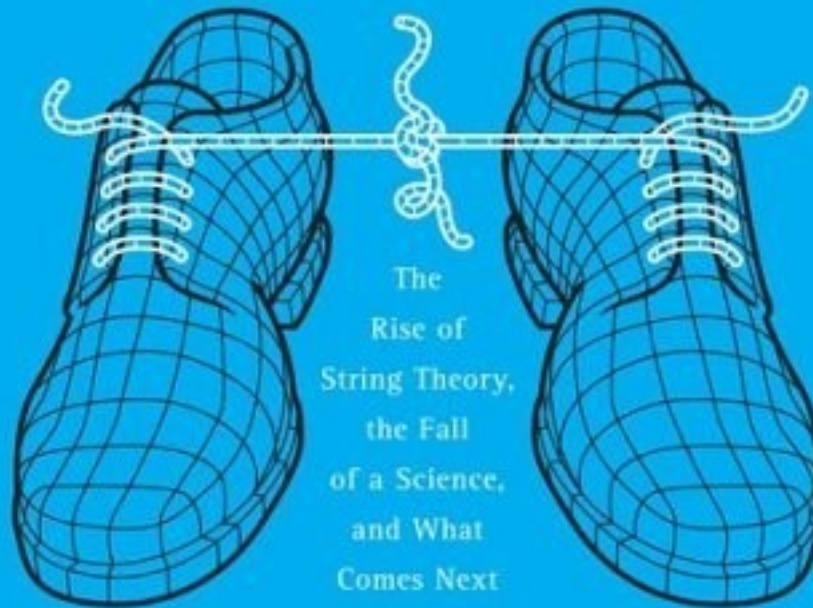


In his welcome speech to this year's Perimeter Scholars International — captured on video and archived

online as is every lecture ever delivered at Perimeter Institute — Neil Turok briefly

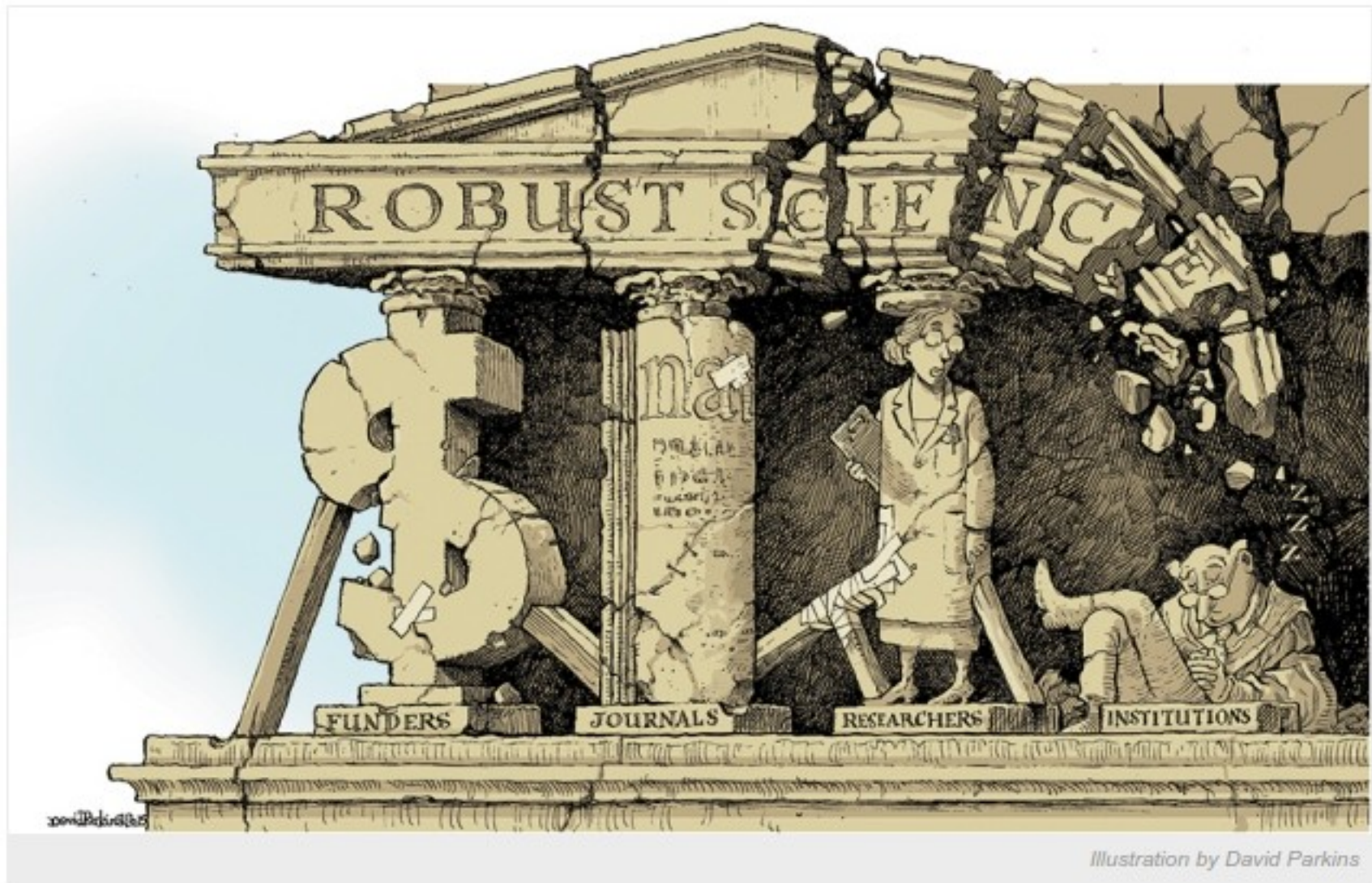
<http://www.macleans.ca/politics/ottawa/perimeter-institute-and-the-crisis-in-modern-physics/>

THE
TROUBLE
WITH
PHYSICS



The
Rise of
String Theory,
the Fall
of a Science,
and What
Comes Next

LEE SMOLIN



Reality check on reproducibility

A survey of *Nature* readers revealed a high level of concern about the problem of irreproducible results. Researchers, funders and journals need to work together to make research more reliable.

25 May 2016



PDF



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Is there a reproducibility crisis in science? Yes, according to the readers of *Nature*. Two-thirds of researchers who responded to a survey by this journal said that current levels of reproducibility are a major problem.

The ability to reproduce experiments is at the heart of science, yet failure to do so is a routine part of research. Some amount of irreproducibility is inevitable: profound insights can start as fragile

Related stories

- [The pressure to publish pushes down quality](#)



The pressure to publish pushes down quality

Scientists must publish less, says [Daniel Sarewitz](#), or good research will be swamped by the ever-increasing volume of poor work.

11 May 2016



PDF



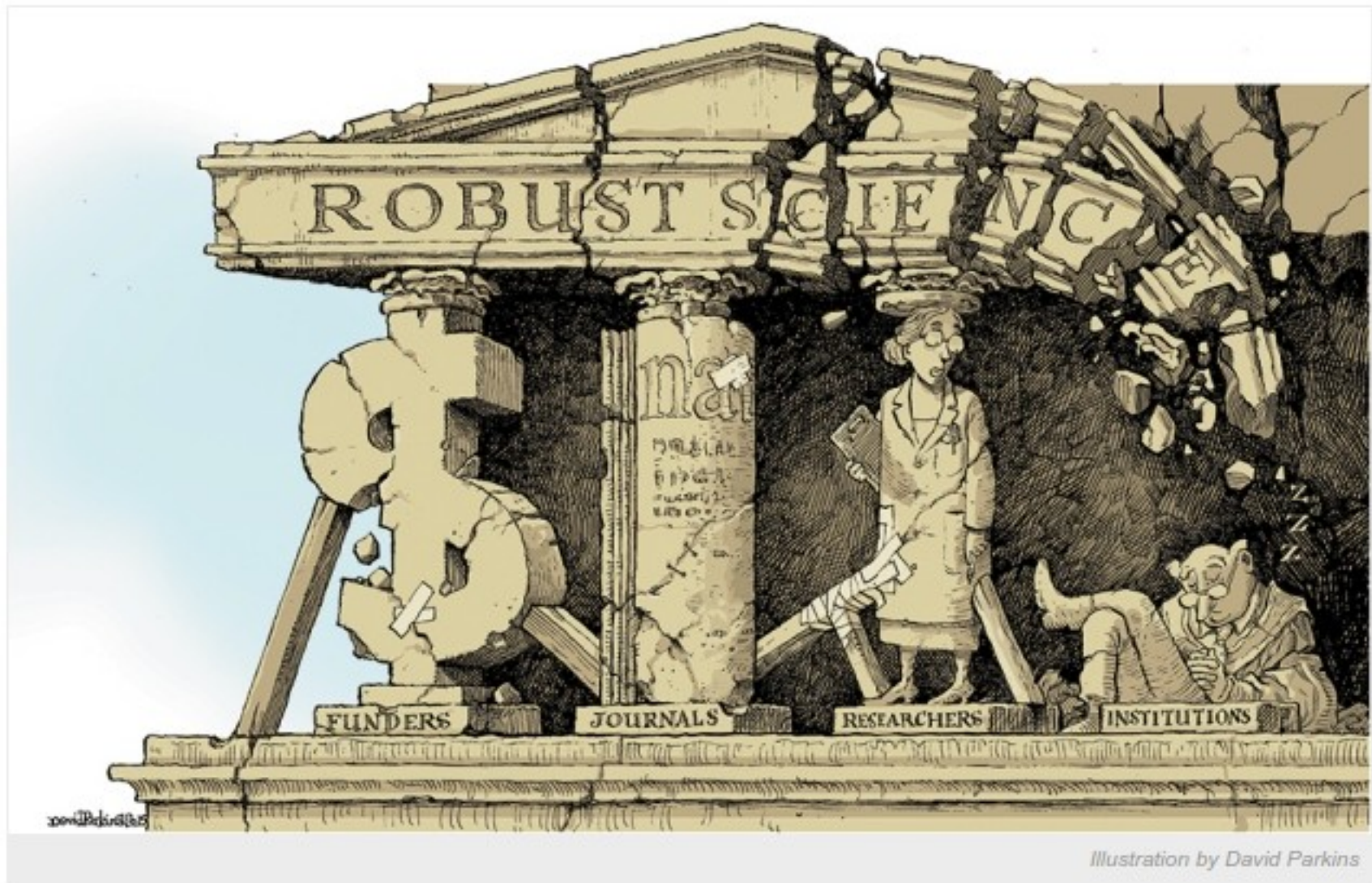
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I am pleased to announce that as of the middle of April, my Elsevier publications had received 30,752 page views and 2,025 citations. I got these numbers in a promotional e-mail from Elsevier, and although I'm not sure what they mean, I presume that it would be even better to have even bigger numbers.

Indeed, the widespread availability of bibliometric data from sources such as Elsevier, Google Scholar and Thomson Reuters ISI makes it easy for scientists (with their employers looking over their shoulders) to obsess about their productivity and impact, and to compare their numbers with those of other scientists.

Related stories

- [Papers with shorter titles get more citations](#)
- [The top 100 papers](#)



¿Cómo afecta esto a los teóricos?

- En esta área el aparato principal es el cerebro.
- En principio se debería tratar de reconocer los errores sistemáticos en su funcionamiento para tenerlos bajo control.

¿Cómo afecta esto a los teóricos?

- En esta área el aparato principal es el cerebro.
- En principio se debería tratar de reconocer los errores sistemáticos en su funcionamiento para tenerlos bajo control.
- Pero los científicos creen que “la mano invisible” del método científico puede por sí sola corregir estos errores.

El método/sistema científico

- Se llega a un conjunto de hipótesis para ser probadas **experimentalmente**.
- Los científicos no prueban todas las hipótesis posibles. Hacen una pre-selección.
- La preselección siempre viene antes de las pruebas **experimentales**.

Pero cuando los experimentos tardan en llegar...

- Los efectos sociales se hacen más fuertes
 - Publicar lo que mis colegas encuentran interesante.
 - Publicar lo que mis colegas van a citar.
 - Publicar algo fácil y rápido, sin desviarse demasiado de lo que se publica en masa.

“My colleagues and I are the intellectual descendants of Albert Einstein; we like to think that we too search for beauty. Some physics equations are so ugly that we cannot bear to look at them, let alone write them down... 'Let us worry about beauty first and truth will take care of itself', Such is the rallying cry of fundamental physicists.” ~ Anthony Zee



“Having tasted beauty at the heart of the world we hunger for more. In this quest, I think, there is no more promising guide than beauty itself.”

~Frank Wilczek



“Certainly when we read about new theories and we see how beautiful and simple they are, then they have a big advantage. We believe such theories have much more chances to be successful” ~ Gerard 't Hooft



THE INTERNATIONAL BESTSELLER

THE
Superstrings, Hidden Dimensions,
and the Quest for the Ultimate Theory
Elegant
UNIVERSE

"Not since the extraordinary success
of *A Brief History of Time* has a
scientific book caused such a stir"
—*Sunday Times*

BRIAN GREENE

Winner of the Aventis Science Book Prize 2000



What No New Particles Means for Physics

Physicists are confronting their **"nightmare scenario."** What does the absence of new particles suggest about how nature works?



Olena Shmahalo/Quanta Magazine

By Natalie Wolchover
August 9, 2016



— MOST VIEWED • RECENT —

<https://www.quantamagazine.org/20160809-what-no-new-particles-means-for-physics/>



<http://www.hep.caltech.edu/~smaria/>

“We had figured it all out,” said Maria Spiropulu, a particle physicist at the California Institute of Technology and a member of CMS. “If you ask people of my generation, we were almost taught that supersymmetry is there even if we haven’t discovered it. We believed it.”

<https://www.quantamagazine.org/20160809-what-no-new-particles-means-for-physics/>

Supersymmetry Bet Settled With Cognac

Yes & No	Yes	No	Abstain
Marius Guedesius	MAKEENKO Stelle SHIH D. O'Connell Egil Børre-Bror Kim SPITZBERG Aina Aina-Spind Giulio Grignani B. Z. (HARTNER) Oliver Schlatterer Yang Zhang Hidetsugu Shimada Aurese Pisci Thomas Sndergaard	g. 't Hooft *) Z. Komargodski A. JENKINS P.H. Damgaard Alexander Karlberg Savvas Nessesis Sven Bassen KOSTA ZAREMBO Albano Gullotti Helger Bech Nielsen S. Caron-Huot Henrik M. Song He Kasper Larsen	Neubayer Kinnar John Geth

(See over.)

*) But both sides will claim victory

Courtesy of Poul Damgaard

The first page of signatures on a 2011 amendment to a supersymmetry bet originally placed in 2000. Click on the image to see the full document.

<https://www.quantamagazine.org/20160822-supersymmetry-bet-settled-cognac/>

simplest or most accessible form. “In the absence of any positive experimental evidence for supersymmetry,” Gross said, “it’s a good time to scare the hell out of the young people in the audience and tell them: ‘Don’t follow your elders. ... Go out and look for something new and crazy and powerful and different. Different, especially.’ That’s definitely a good lesson. But I’m too old for that.”

Fuentes de error

- Los efectos sociales y las distorsiones cognitivas pueden desviar las capacidades de razonamiento de un individuo.
- Ejemplos:
 - Escuchamos mejor cuando lo que dicen confirma nuestras creencias.
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