Editors' Session

Manolis Antonoyiannakis
Editor, Physical Review Letters
Ling Miao （缪凌）
Editor, Physical Review X

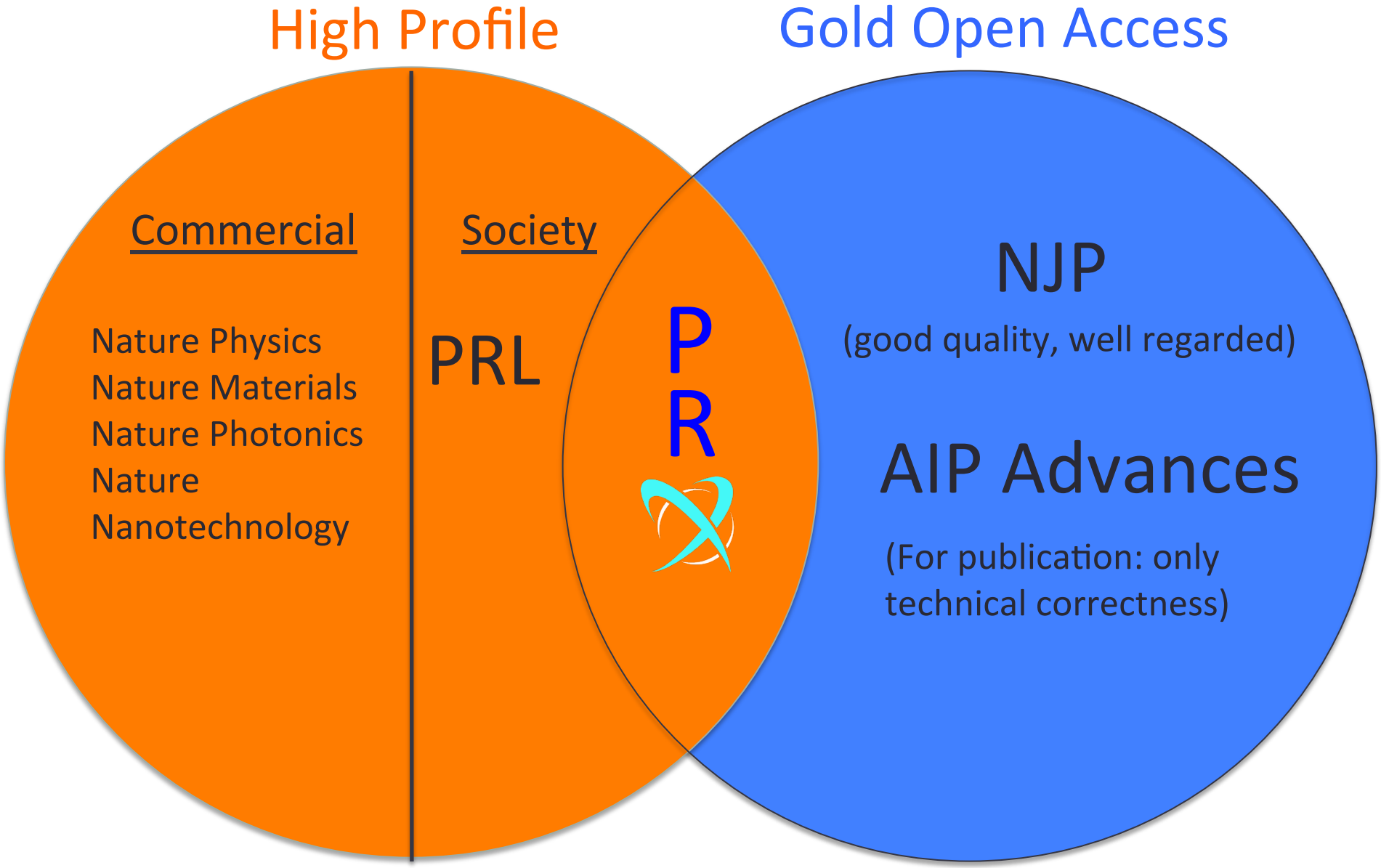
APS physics

Outline

- *Physical Review X*
- The editors' point of view:
  - Editors' role and challenges
  - What papers we are looking for
  - Some key questions in the field
  - Editorial standards: do they evolve?
  - Top-quality papers: fast-tracking, highlighting
  - Unsuitable papers: editorial rejection
- Impact statistics

APS physics

Why PRX


High Profile
Gold Open Access
Commercial
Society
Nature Physics
Nature Materials
Nature Photonics
Nature
Nanotechnology
PRL
PRX
NJP
(good quality, well regarded)
AIP Advances
(For publication: only technical correctness)

Physical Review X

- all areas of physics
- highly selective standards:
  eXceptional in
  originality, quality & substance, significance
- eXpress editorial/review process
- well-informed, responsible editorial judgment
- no length limit
- online only; integrated multimedia
- eXpanded access

APS physics

http://prx.aps.org

Physical Review
committed to excellence
American Physical Society
APS physics
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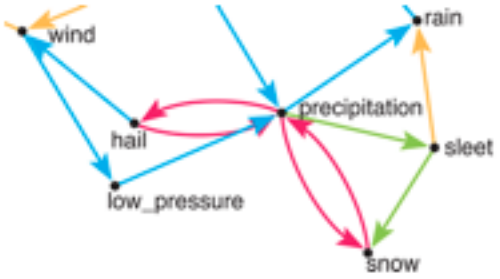
RSS Feeds | Email Alerts

Physics: The Value of Circular Definitions

September 27, 2012



Methods from statistical physics and graph theory help uncover the structure of human language.
[Synopsis on Phys. Rev. X **2**, 031018 (2012)]

Read Article | More Synopses

Editorial: PRX's Scope and Standards: A Case in Point

July 31, 2012

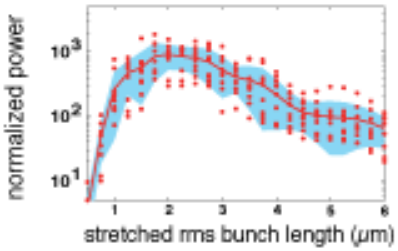
The editors of PRX and David DiVincenzo share with readers their views of the just published paper by Jones et al. on quantum-computer architecture.

Read More | More Editorials

Recent Articles

Demonstration Scheme for a Laser-Plasma-Driven Free-Electron Laser

A. R. Maier, A. Meseck, S. Reiche, C. B. Schroeder, T. Seggebrock, and F. Grüner



Having a table-top x-ray free-electron-laser source at their disposal must be the dream of every x-ray scientist. A new design based on the currently available laboratory-scale laser-plasma particle accelerators shows that this dream should be within reach before too long.

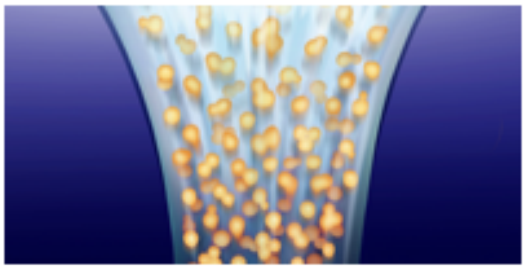
Subject Areas: Photonics, Plasma Physics

Published Thu Sep 27, 2012 – Phys. Rev. X 2, 031019 (2012)

Read article | Show Popular Summary | Show Abstract

Continuous Inertial Focusing and Separation of Particles by Shape

Mahdokht Masaeli, Elodie Sollier, Hamed Amini, Wenbin Mao, Kathryn Camacho, Nishit Doshi, Samir Mitragotri, Alexander Alexeev, and Dino Di Carlo



Inertial effect of a flowing fluid, often a complicating factor in hydrodynamics, offers a way to high-purity, high-throughput shape-based separation of manmade particles or biological cells in microfluidic channels.

Subject Areas: Biological Physics, Fluid Dynamics, Interdisciplinary Physics

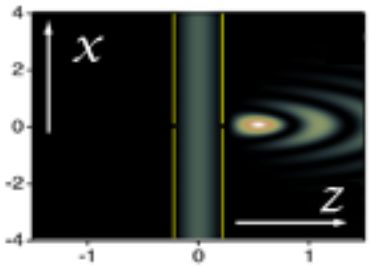
Published Wed Sep 12, 2012 – Phys. Rev. X 2, 031017 (2012)

Read article | Show Popular Summary | Show Abstract

Highlighted in *Physics Today*

Pinholes Meet Fabry-Pérot: Perfect and Imperfect Transmission of Waves through Small Apertures

R. Merlin

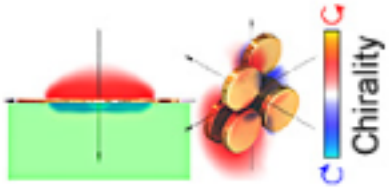


Getting electromagnetic waves through an aperture whose size is significantly smaller than the wavelength is very difficult. Roberto Merlin from University of Michigan shows how this difficulty can be overcome by coupling such a subwavelength aperture to an electromagnetic resonant device.

Subject Areas: Metamaterials, Nanophysics, Photonics

Published Wed Sep 5, 2012 – Phys. Rev. X 2, 031015 (2012)

Read article | Show Popular Summary | Show Abstract



Tailoring Enhanced Optical Chirality: Design Principles for Chiral Plasmonic Nanostructures

Martin Schäferling, Daniel Dregely, Mario Hentschel, and Harald Giessen

A plasmonics group at University of Stuttgart discover optimal designs for nanoscale metallic structures that can enable sensitive detection or discrimination of chiral molecules.

Subject Areas: Metamaterials, Optics, Plasmonics

Published 14 August 2012 *(9 pages)*

031010 [**View** PDF (5,120 kB)] | Show Popular Summary | Show Abstract

Physical Review X Editorial Board

Broad, International, Distinguished

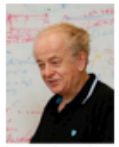
David Awschalom, Condensed matter physics
University of California, Santa Barbara

Huib J. Bakker, Chemical physics and physical chemistry
FOM-Institute for Atomic and Molecular Physics, Amsterdam

Sergio Bertolucci, Experimental particle physics
CERN

Jonathan Billowes, Nuclear physics
University of Manchester

Lyderic Bocquet, Soft matter physics, hydrodynamics, nanoscience
Universite Lyon-I



Federico Capasso, Photonics, electronics and device physics
Harvard University

Hong Ding, Condensed matter physics
Chinese Academy of Sciences

George F. R. Ellis, Astrophysics, gravitational physics and cosmology
University of Cape Town

Taek-jip Ha, Biological physics
University of Illinois, Urbana-Champaign

Ryugo S. Hayano, Nuclear and atomic physics
The University of Tokyo

Anthony M. Johnson, Ultrafast optics and optoelectronics
University of Maryland at Baltimore County

Barbara A. Jones, Condensed matter physics
IBM Almaden Research Center

Sir Peter Knight, Quantum optics and information
Kavli Royal Society International Centre

Juan C. Lasheras, Fluid dynamics
University of California, San Diego

Stanislas Leibler, Systems biology and biological physics
The Rockefeller University and Princeton University

Ernesto Marinero, Industrial physics
Hitachi San Jose Research Center

Michael McGehee, Energy research (organic semiconductors, nanostructures, solar cell research)
Stanford University

Margaret Murnane, Atomic and molecular physics
University of Colorado

Stewart C. Prager, Plasma physics
Princeton University

Sergio M. Rezende, Condensed matter physics
Universidade Federal de Pernambuco, Brazil

Bernard Schutz, Astrophysics, gravitational physics, and cosmology
Max Planck Institute for Gravitational Physics, Potsdam, Germany

Todd Squires, Fluid dynamics
University of California, Santa Barbara

Jin-long Yang, Computational condensed matter physics, computational materials physics, and quantum chemistry
University of Science and Technology of China

Marcela Carena, Theoretical particle physics
Fermilab/University of Chicago

To Learn More

Visit PRX's Website at http://prx.aps.org

The editors and the Editorial Board invite you to submit your eXceptional work to PRX

The APS Editorial Office

- Editor in Chief:
  Gene D. Sprouse

Research areas:
Nuclear Physics
Atomic Physics

Stony Brook Univ.

- In-house editors: 42 (predominantly for PRL, PRB)
- Remote editors (mostly active researchers): 61
  PRA, PRC, PRD, PRE, and RMP
- Technical supporting staff: 100

37,000 papers (2011) = A new submission every 3 office minutes

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Every two minutes
someone cites a PRL

Editor's Role:
Assess & promote research quality

- Help good papers get published on a timely basis
- Filter clearly unsuitable papers by editorial rejection & peer review
- Help scientists become skilled referees
- Add value to papers:
  - Improve papers via editorial & peer review
  - Select the best papers to highlight: in *Physics*,

    or as *Editors' Suggestions,* etc.
- But, editors:
  - Operate under serious time restrictions (eg PRL: 900 papers/year)
  - Limited expertise; must handle papers from several fields
  - Evolve into general, nonspecialist readers

Let us know if you think
we mishandled your paper

Challenges for Editors

- Influential papers are frequently controversial
- Experts' judgments: not always faultless or perfectly objective
- Editors' own knowledge of field and people is limited
- Editors' time constraints (15 papers processed daily/editor)
- Selective journals are subjective by definition (41st Chair effect)
- Interdisciplinary "cultural" barriers:
  - What belongs in a physics journal?
  - How to find referees for interdisciplinary papers?
- Social, cultural factors affect behavior of authors & referees and thereby the fate of papers

Experts' judgments are not always faultless

Example:

- In 50% of the top-20 cited papers in PRL (published in 1991-2000 in plasmonics, photonic crystals and negative refraction) editors received conflicting referee recommendations in 1st round or review

Selective journals are subjective by necessity (41st Chair effect)

Robert Merton

41st Chair effect:

In any highly selective process, it is impossible to select all and only the 'best' candidates

41st Chair Effect

"The **French Academy** decided early that **only a cohort of 40 could qualify as members** and so emerge as immortals. This limitation of numbers made inevitable, of course, the exclusion through the centuries of many talented individuals who have won their own immortality. The familiar list **of occupants of this 41st chair includes Descartes, Pascal, Moliere, Bayle, Rousseau, Saint-Simon, Diderot, Stendhal, Flaubert, Zola, and Proust.**

What holds for the French Academy holds in varying degree for every other institution designed to identify and reward talent."

R. K. Merton, *Science* **159**, 56, (1968)

Developing an editorial philosophy

- Have intellectual humility and open-mindedness:
  Being aware of the limit of our knowledge and understanding
  Being open to the possibility of being wrong
  Accept that we make mistakes, but always learn from them

- Stay true to what really matters to physics research:
  i.e. being willing to:
  - Publish specific papers knowing they'll be little cited
  - Reject others while knowing they'll likely be highly cited

- Never stop developing editorial judgment and acquiring professional knowledge

What papers we are looking for

We look for papers that:

Create a paradigm shift by thinking the 'impossible'
(eg negative refraction and superlens; cloaking)

Provide a fruitful analogy between fields
(eg general relativity – classical electromagnetism, via transformation optics)

Connect two previously isolated areas of physics in a nontrivial way
(eg graphene + metamaterials)

Push a field into a new direction (eg from optics of invisibility to illusion optics)

Advance the state-of-the art of a field
(eg from cloaking in microwaves to cloaking of macroscopic objects for visible light)

Provide substantive follow-up to important papers

People in the field should not miss, and people in related fields would be interested in

Creativity & Innovation Quality & Substance Impact & Interest

Some key questions & expected developments

Overcome losses, especially towards optical frequencies
Nonlinear metamaterials
Light harvesting
Functionality & tunability
All-dielectric metamaterials at optical wavelengths
Broadband
Metamaterial circuits (metatronics)
Increased emphasis on experimental papers, novel applications & devices
e.g. cloaking:
after a surge of theoretical proposals, the bar is higher now for theory

We also anticipate unexpected developments!

Editorial Standards Evolve

- When a field or topical area is new or emerging:
  - Initial growth stage:
    - Flurry of papers, lots of ideas
    - Proposals, theoretical papers
    - Proof-of-principle experiments
    - 'Easy' results quickly attained

- As a field or topical area matures:
  - Slower growth stage
  - Smaller questions, but also harder ones

Top-quality papers: fast-tracking, highlighting

2 reviews in 2 days
accepted in 6 days

PRL **106,** 033901 (2011) PHYSICAL REVIEW LETTERS week ending 21 JANUARY 2011

Macroscopic Invisibility Cloak for Visible Light

Baile Zhang,[1,2] Yuan Luo,[1,2] Xiaogang Liu,[1] and George Barbastathis[1,2,*]

Received 14 December 2010; published 18 January 2011

Physics spotlighting exceptional research

PRL **102,** 253902 (2009) PHYSICAL REVIEW LETTERS week ending 26 JUNE 2009

Illusion Optics: The Optical Transformation of an Object into Another Object

Yun Lai, Jack Ng, HuanYang Chen, DeZhuan Han, JunJun Xiao, Zhao-Qing Zhang,* and C. T. Chan†

Department of Physics, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong, China

(Received 21 April 2009; revised manuscript received 26 May 2009; published 22 June 2009)

Selected for a Viewpoint in *Physics*

PRL **102,** 093901 (2009) PHYSICAL REVIEW LETTERS week ending 6 MARCH 2009

Complementary Media Invisibility Cloak that Cloaks Objects at a Distance Outside the Cloaking Shell

Yun Lai, Huanyang Chen, Zhao-Qing Zhang, and C. T. Chan

Department of Physics, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong, China

http://physics.aps.org

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Viewpoint: The Longevity of Rankings

September 17, 2012
Guido Caldarelli

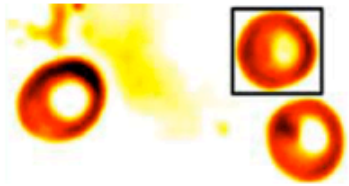
A phase transition controlled by noise determines how volatile rankings are.

Viewpoints

Photoreceptors Measure Photon Statistics
September 10, 2012
Sergey Kulik

Measurements with live retinal rod cells reveal their capacity for detecting the statistical properties of different light sources.

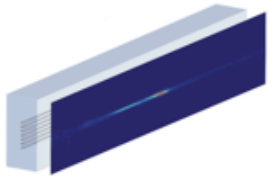
Synopses



How Much Does a Cell Weigh?
September 13, 2012

Optical microscopes can be adapted to measure the mass of individual cells.

Focus



Taming Light Filaments
September 14, 2012

Thin filaments of intense laser light have many potential uses but are unstable. Experiments demonstrate that they can be stabilized by sending them through glass whose properties vary periodically in space.

Read More About

- Astrophysics
- Atomic and Molecular Physics
- Biological Physics
- Complex Systems
- Fluid Dynamics
- Interdisciplinary Physics
- Magnetism
- Materials Science
- Nanophysics
- Optics
- Photonics
- Plasma Physics
- Quantum Information
- Soft Matter
- Statistical Physics
- Topological Insulators

View All Subjects

Editors' Suggestions

Papers the editors and referees find of particular interest, importance, or clarity.

Physical Review Letters
Physical Review B

Keep Up With *Physics*

Highlighted papers are highly cited

In 2009-2010:

154 papers in APS journals were selected
for a Viewpoint in *Physics*:
→ 2011 'impact factor' ~ 19

424 papers in PRL were selected
for Editors' Suggestions:
→ 2011 'impact factor' ~ 13

71 metamaterials papers in PRL
→ 2011 'impact factor' ~ 13

Unsuitable papers: Editorial Rejection

- Editors assess a new paper:

  Does the paper meet the journal's acceptance criteria?

- If no:

  Editors send an editorial rejection letter

For Authors: Problems to Avoid

For Editors: Red Flags for Editorial Rejection

- Obvious marginal extension or incremental advance
- Problem solved or issues addressed too specialized (in particular for PRL and PRX)
- Subject matter or readership does not fit

For Authors: Problems to Avoid

For Editors: Red Flags for Editorial Rejection

- Poor presentation:
  - no compelling motivation:
    Why was the work done?
    What open and important problem do you solve?
  - no punch line:
    What are the main message(s) or results?
    Why are they new & important?
  - too focused on technical details

Useful resources for authors

(1) "Whitesides' Group: Writing a Paper", George M. Whitesides, *Advanced Materials* **16**, 1375 (2004)

A classic paper on how to write scientific papers that every researcher should read.

(2) "Writing a Scientific Paper: One, Ideosyncratic, View.", George M. Whitesides, 231st ACS National Meeting, Atlanta, GA, March 26-30, 2006

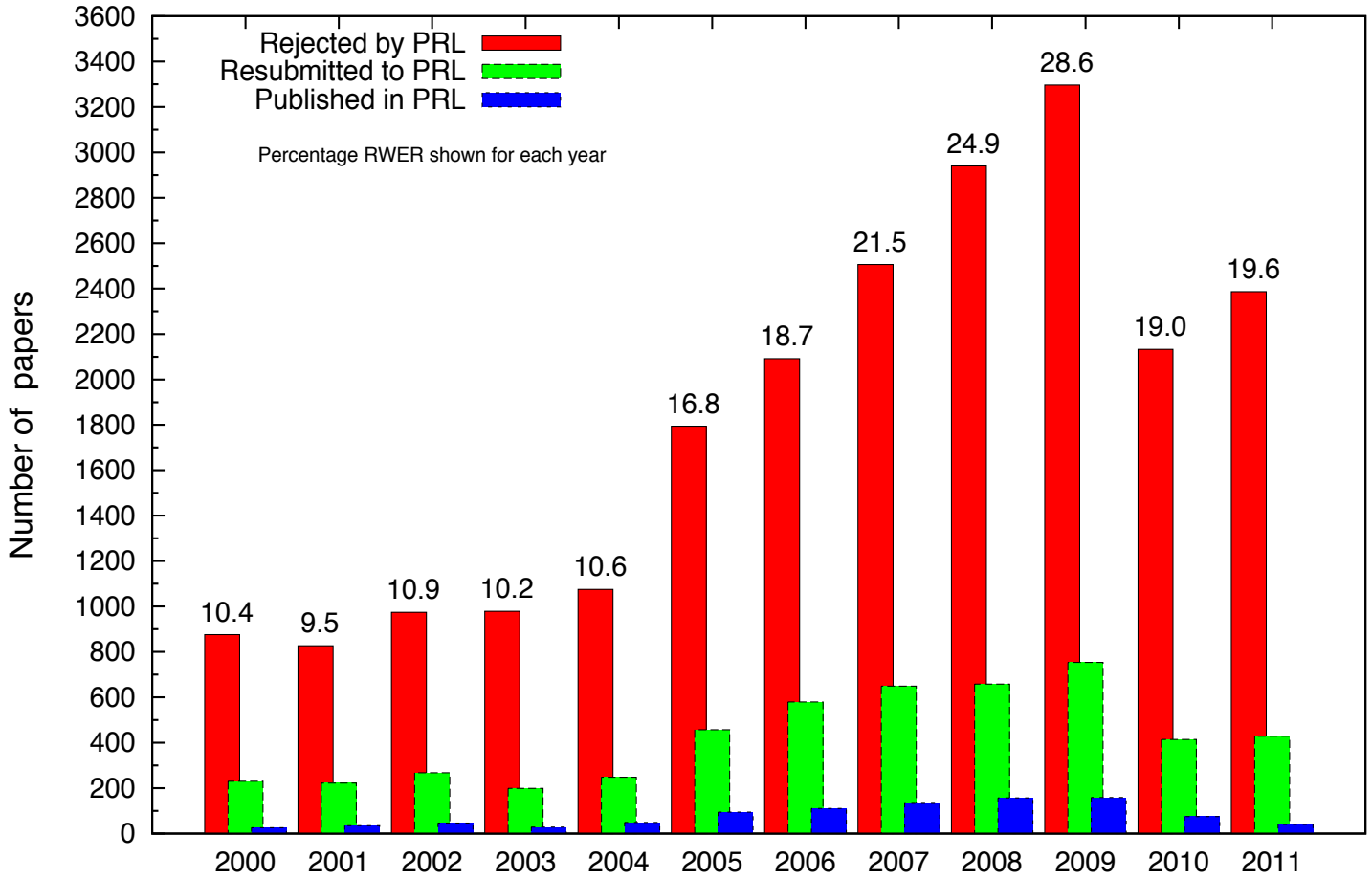
Follow-up talk on how to write a paper, with examples.

(3) *"What Editors Want"*, Lynn Worsham, *The Chronicle of Higher Education*, September 8, 2008
http://chronicle.com/jobs/news/2008/09/2008090801c.htm

A journal editor reveals the most common mistakes academics make when they submit manuscripts.

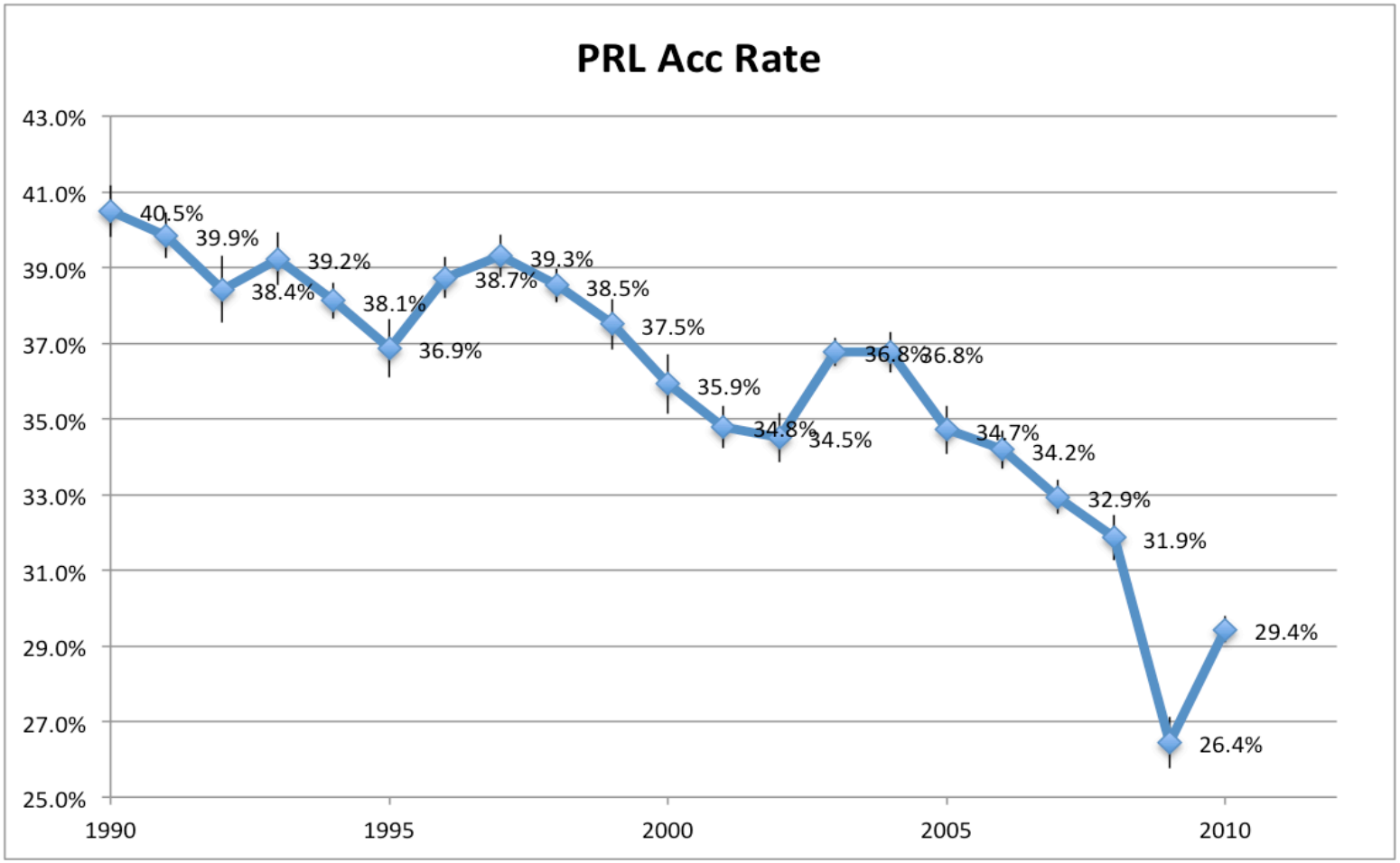
Check out workshops on authoring & refereeing
at the APS March and April Meetings

Editorially rejected manuscripts - PRL

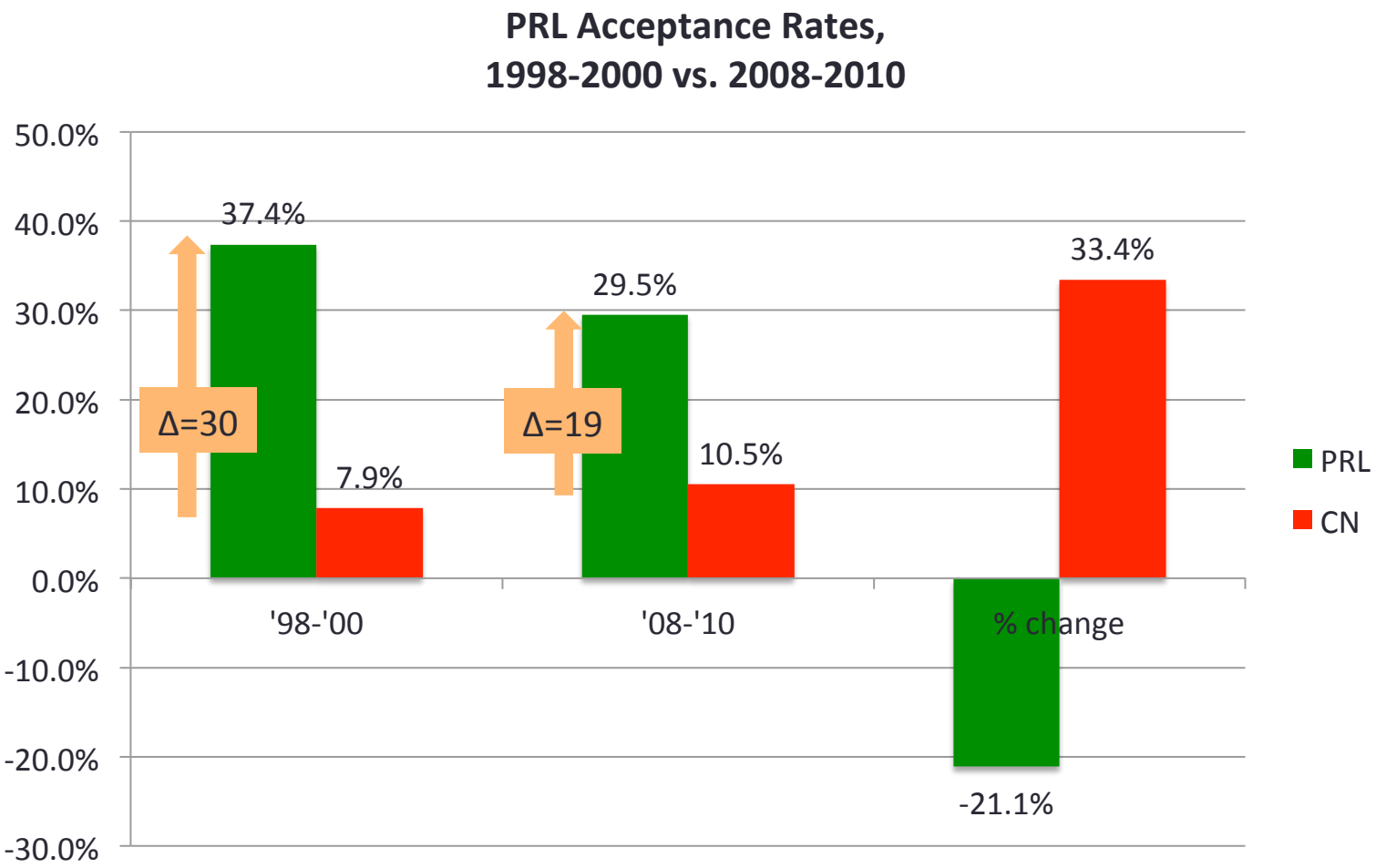


APS physics

Acceptance rates

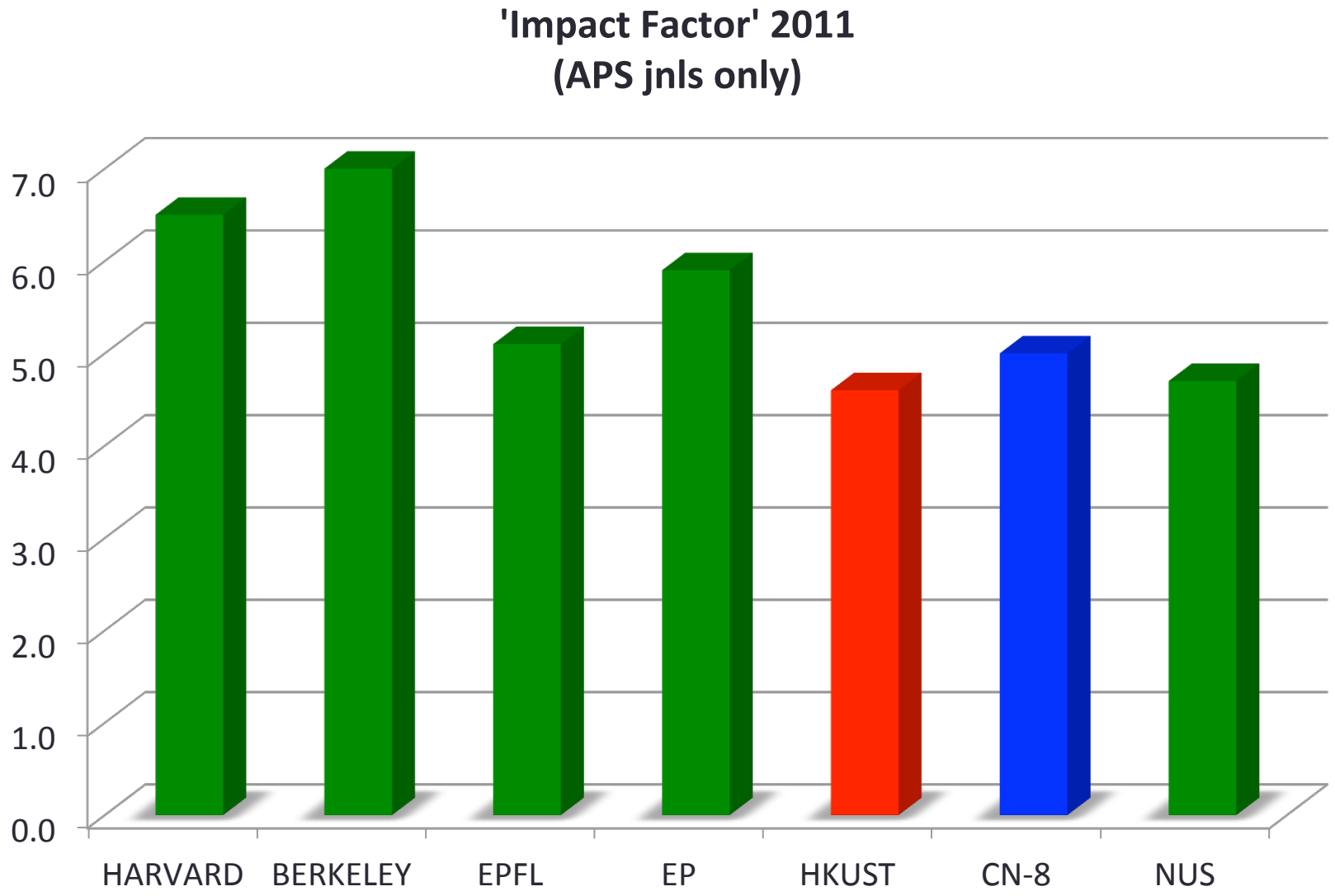


Acceptance rates for Chinese papers in PRL: Still below US & Europe… but gap is closing!



Citation-based "impact measure" for physics papers from top institutions in China:

For APS journals, similar to US and European counterparts



How do the editors select referees for a paper?

We look for referees in:

- **references** (authors of, referees of)
- **related papers** in Web of Science, SPIN, NASA, Google, APS database (authors, citing papers)
- **suggested referees**
- **referee expertise** in APS database
- **mental database**

We generally avoid:

- **Coauthors** (current or previous)
- Referees **at same institution** as authors
- **Acknowledged** persons
- Direct **competitors** (if known)
- **Busy** referees (currently reviewing for PR/PRL)
- **Overburdened** referees (> 15 mss/past year)
- **Consistently slow** referees (>8 weeks to review)
- Referees who **consistently provide poor reports**

APS physics

APS journals are strongly relying on expert input (majority of papers are reviewed)

- 2011: 17,248 referees reviewed papers for Phys. Rev. Letters
- 60,000 Referees on our APS database
- Each year, we select 150 *Outstanding Referees* 

- In this meeting, we have some excellent referees:

  Roberto Merlin, John Pendry, Ping Sheng, Costas Soukoulis, Eleftherios Economou, Ulf Leonhardt, JG de Abajo,

  Eli Yablonovitch, CT Chan, Ross McPhedran, Shanhui Fan

Together, these 11 referees reviewed > 2,500 papers for APS!

PRL Divisional Associate Editors (DAE's):

Costas Soukoulis, Roberto Merlin

Impact Statistics

"My question is: Are we making an impact?"

APS physics

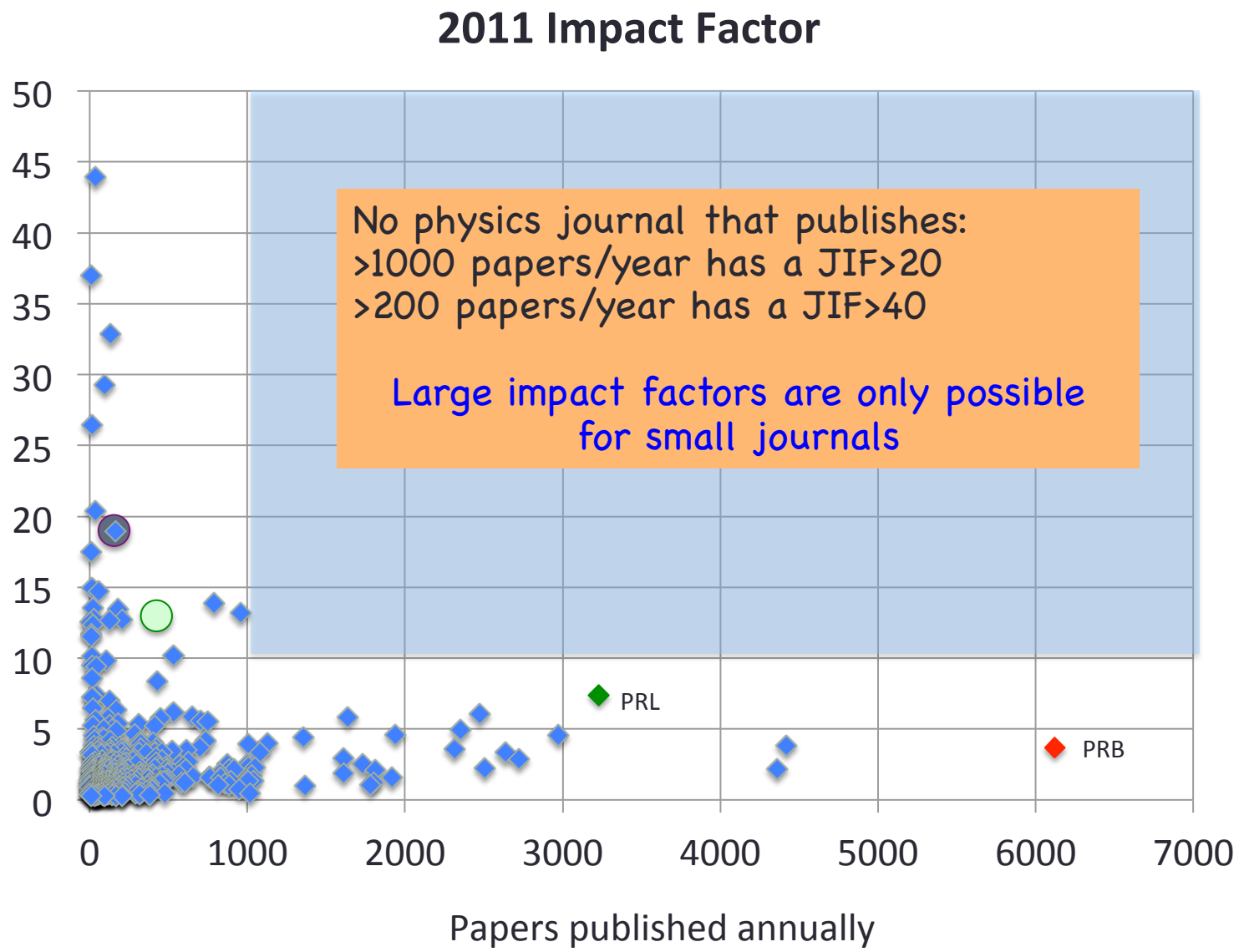
Appeal to all scientists:
Let's quote Impact Factors to just ONE decimal digit please!

"I keep telling journal people that they should never even mention JIF beyond the first decimal place. I mean, to quote a JIF like "12.345" is ridiculous. Its JIF is "12.3"; why do you need these two extra digits? It gives a false idea of precision."

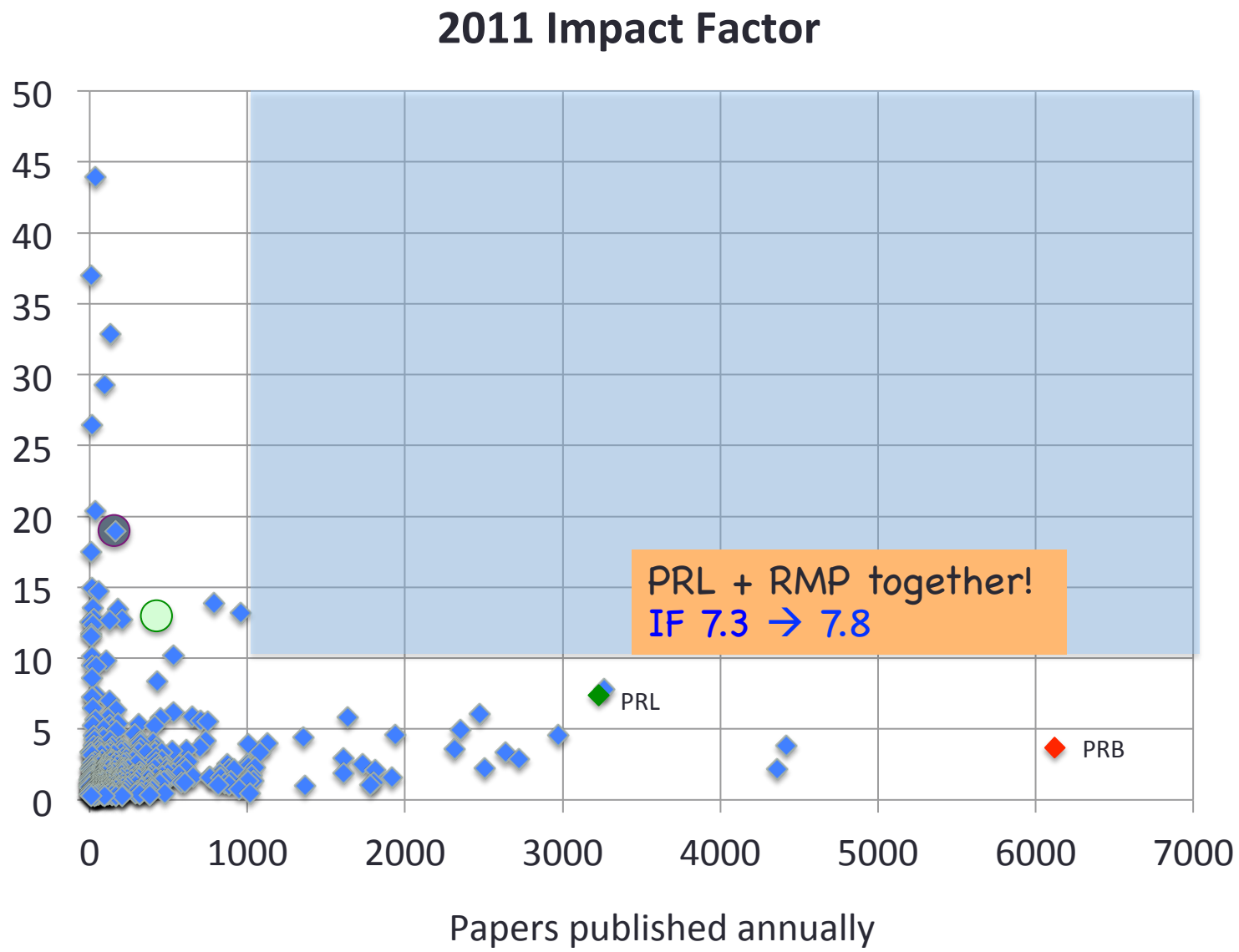
Eugene Garfield
Founder & Chairman Emeritus
Institute for Scientific Information -
now Thomson Reuters
http://www.garfield.library.upenn.edu/

APS physics

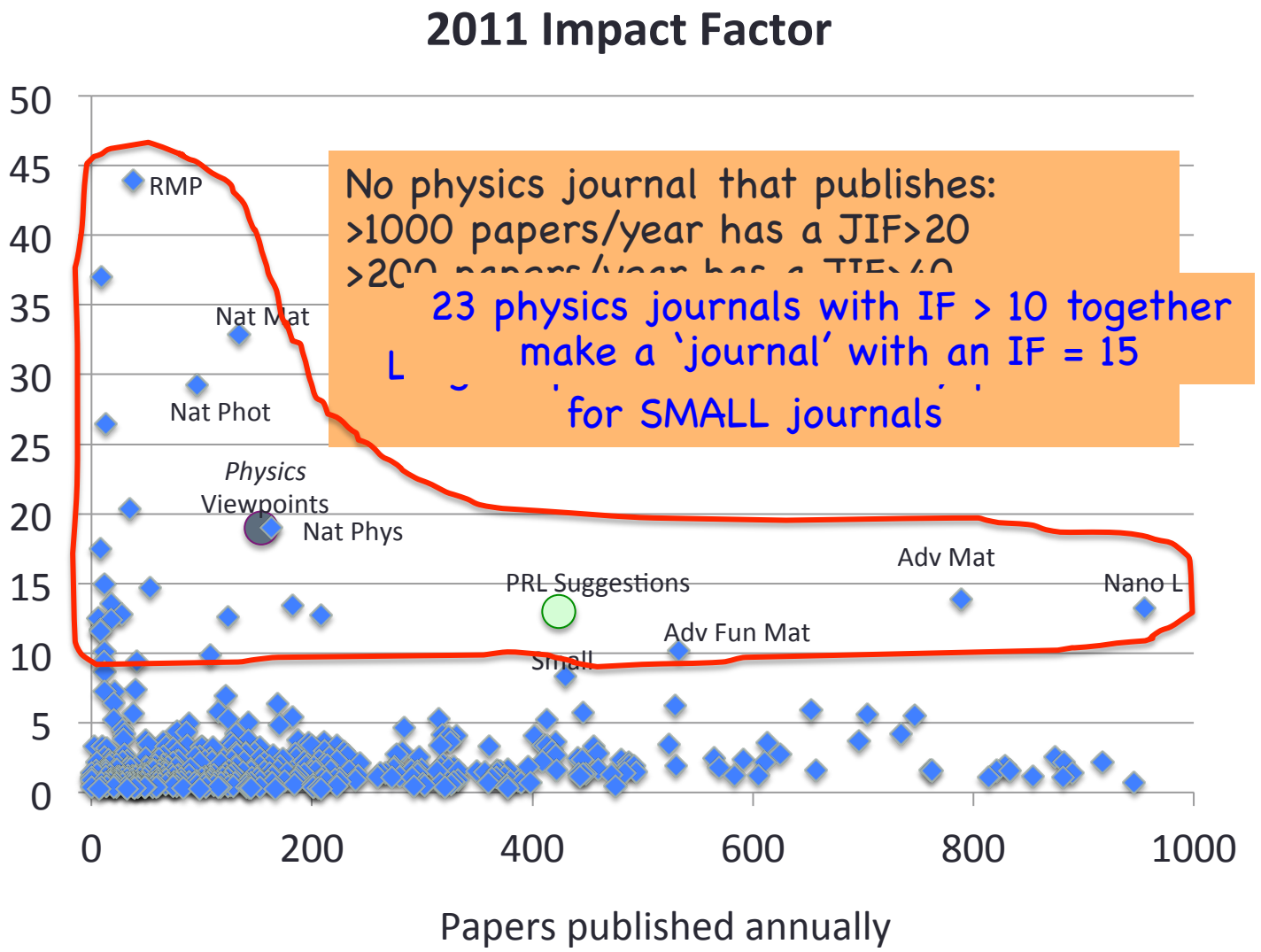
Large Journals cannot have high Impact Factors…



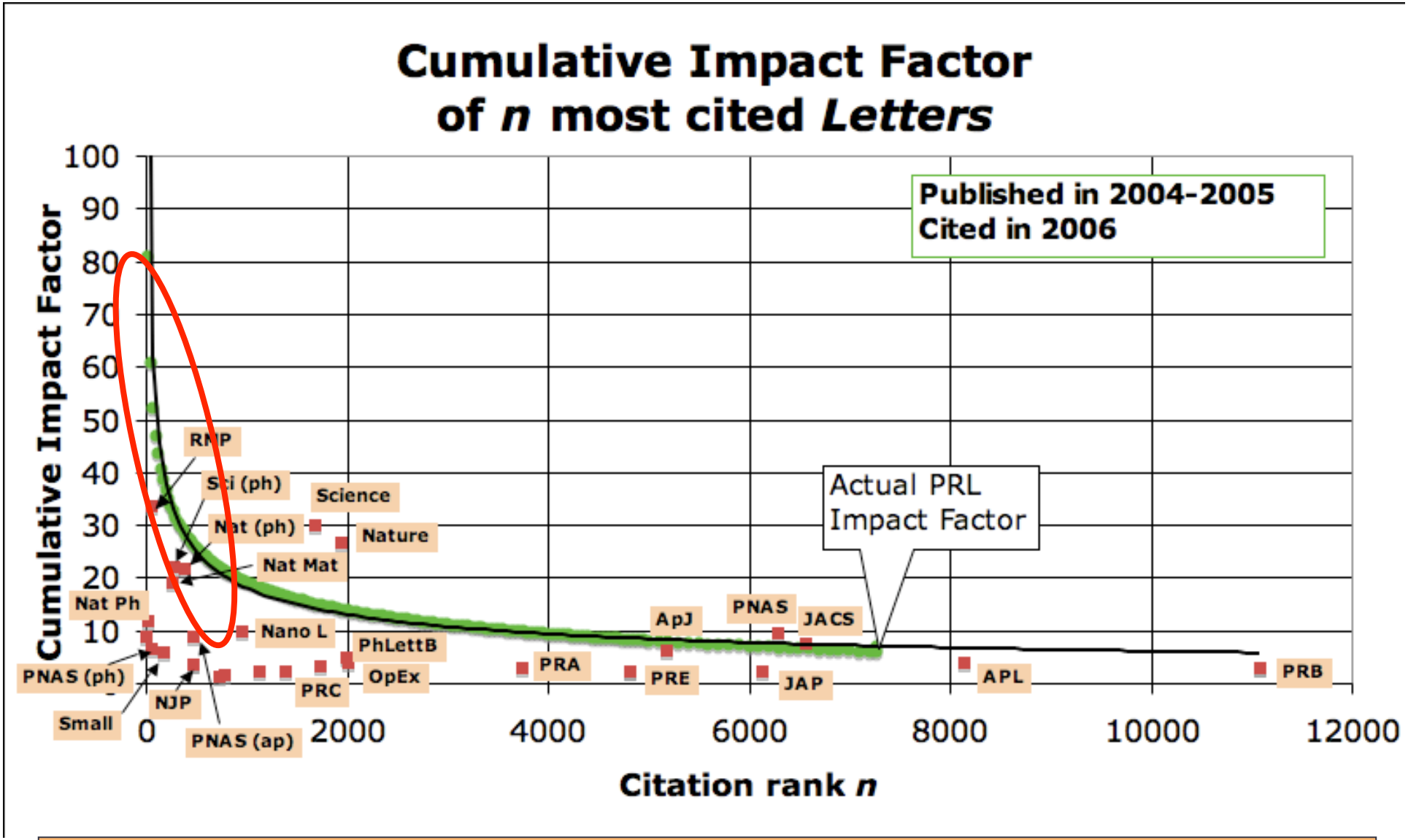
Large Journals cannot have high Impact Factors…



Large Journals cannot have high Impact Factors…



Most journals have a highly-cited subset



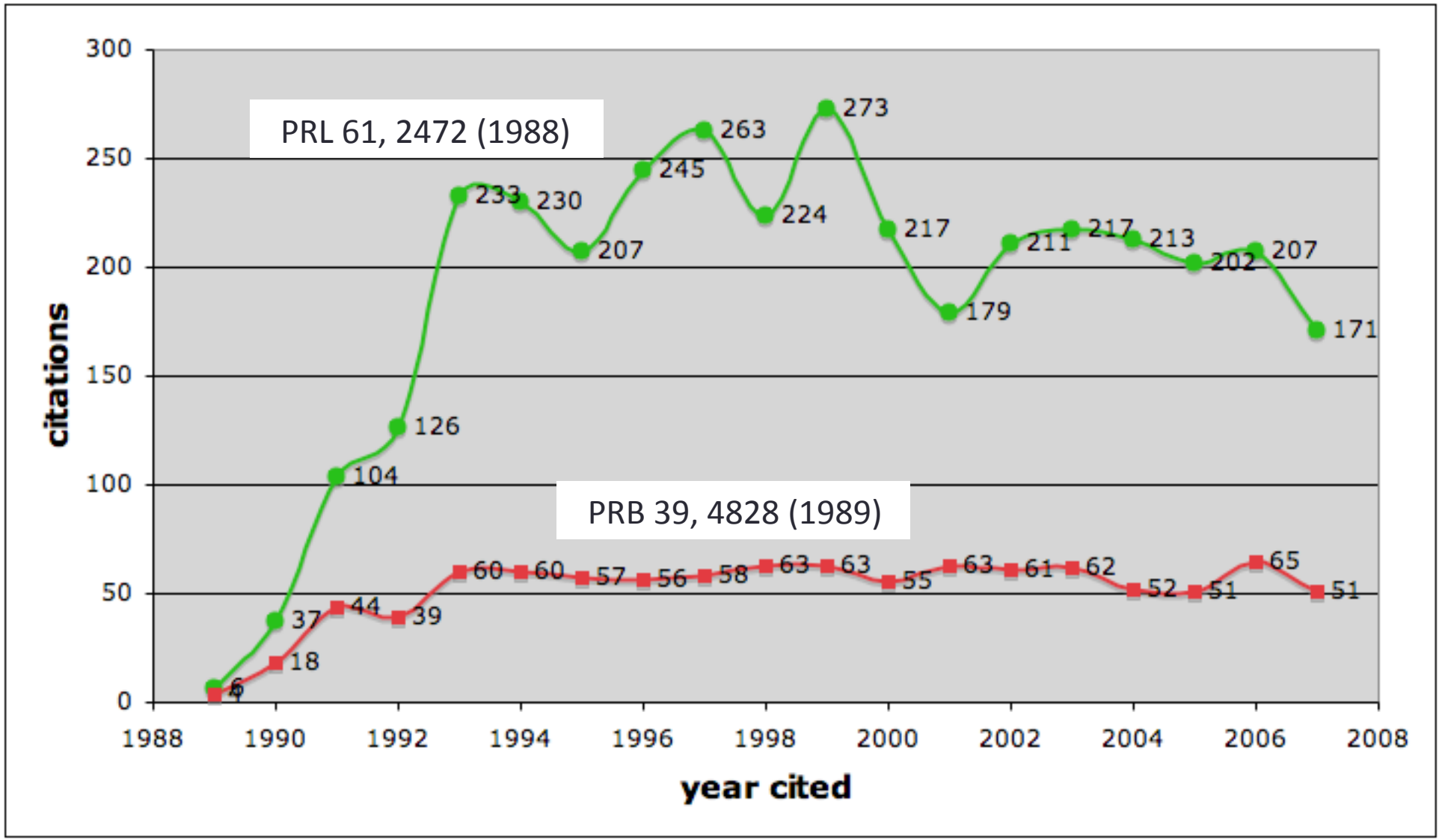
"Is PRL too large to have an 'impact'?", Antonoyiannakis & Mitra, PRL 102, 060001 (2009)

Nobel Prize Winning Papers in Physical Reviews (*)

Decade	Physics	Chemistry
1970's	1973 1976 1979	
1980's	1980 (1982) 1985 1988 (1989)	
1990's	1990 (1993, 1994) 1995 1997 1998	1998
2000's	(2001) 2002 2004 2005 (2006) 2007 (2008)	2000 2011

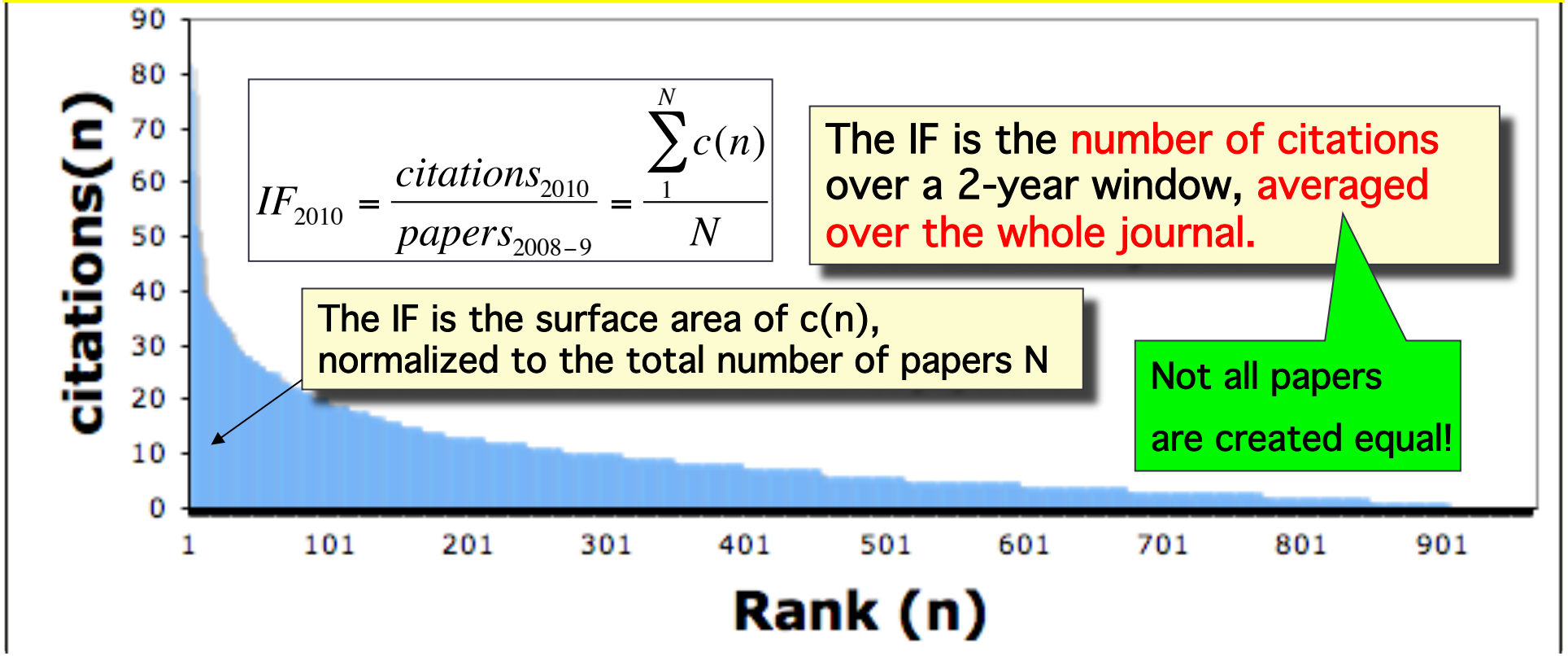
* Counting may not be complete

As typified by the 2007 Nobel papers, highly cited papers often indicate their long-term citation potential early.

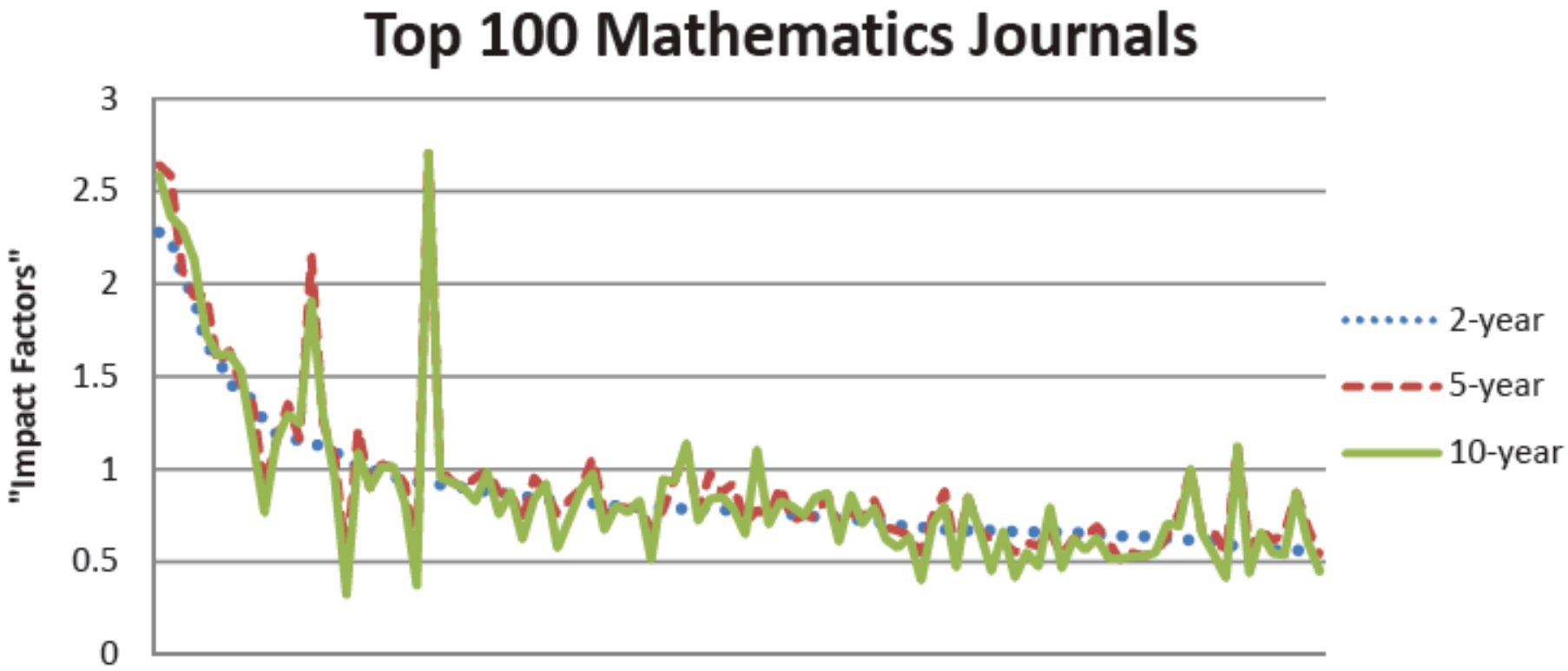


Why the impact factor does not say it all: It is an average.

Impact Factor = Average Citation Density



Journal Impact Factor:
A robust metric of average behavior

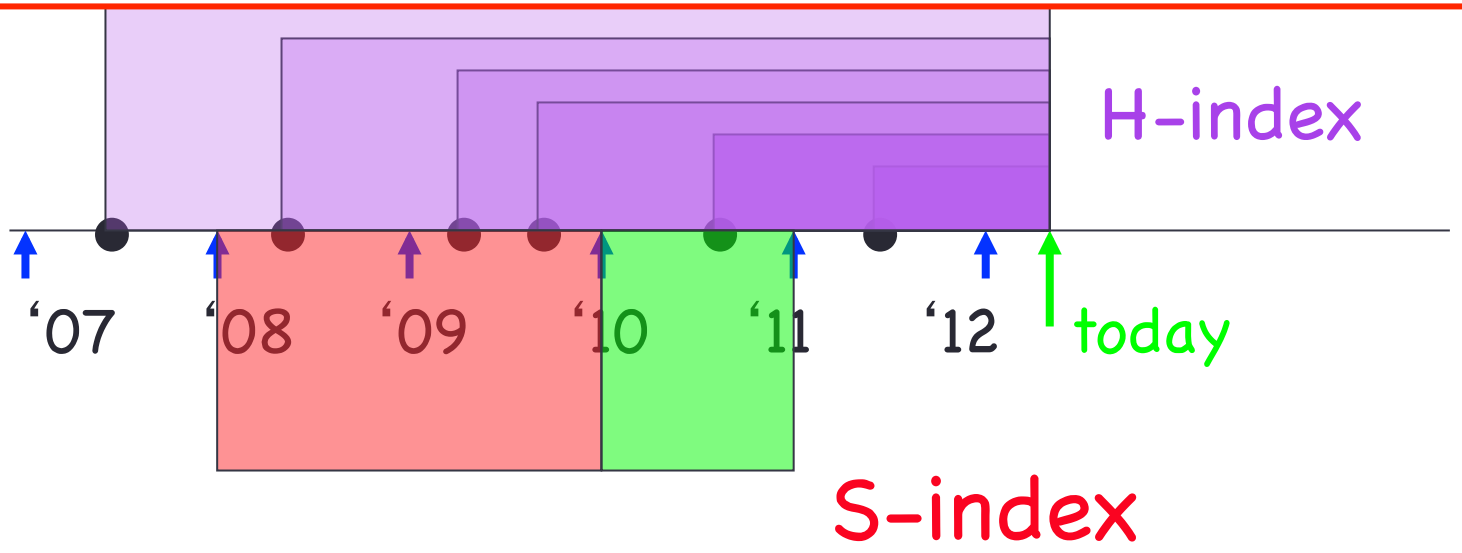


"Impact factors" for 2, 5, and 10 years for 100 mathematics journals. Data from Math Reviews citation database.

R Adler, J Ewing and P Taylor, *"Citation Statistics"*, International Mathematical Union report, 2008

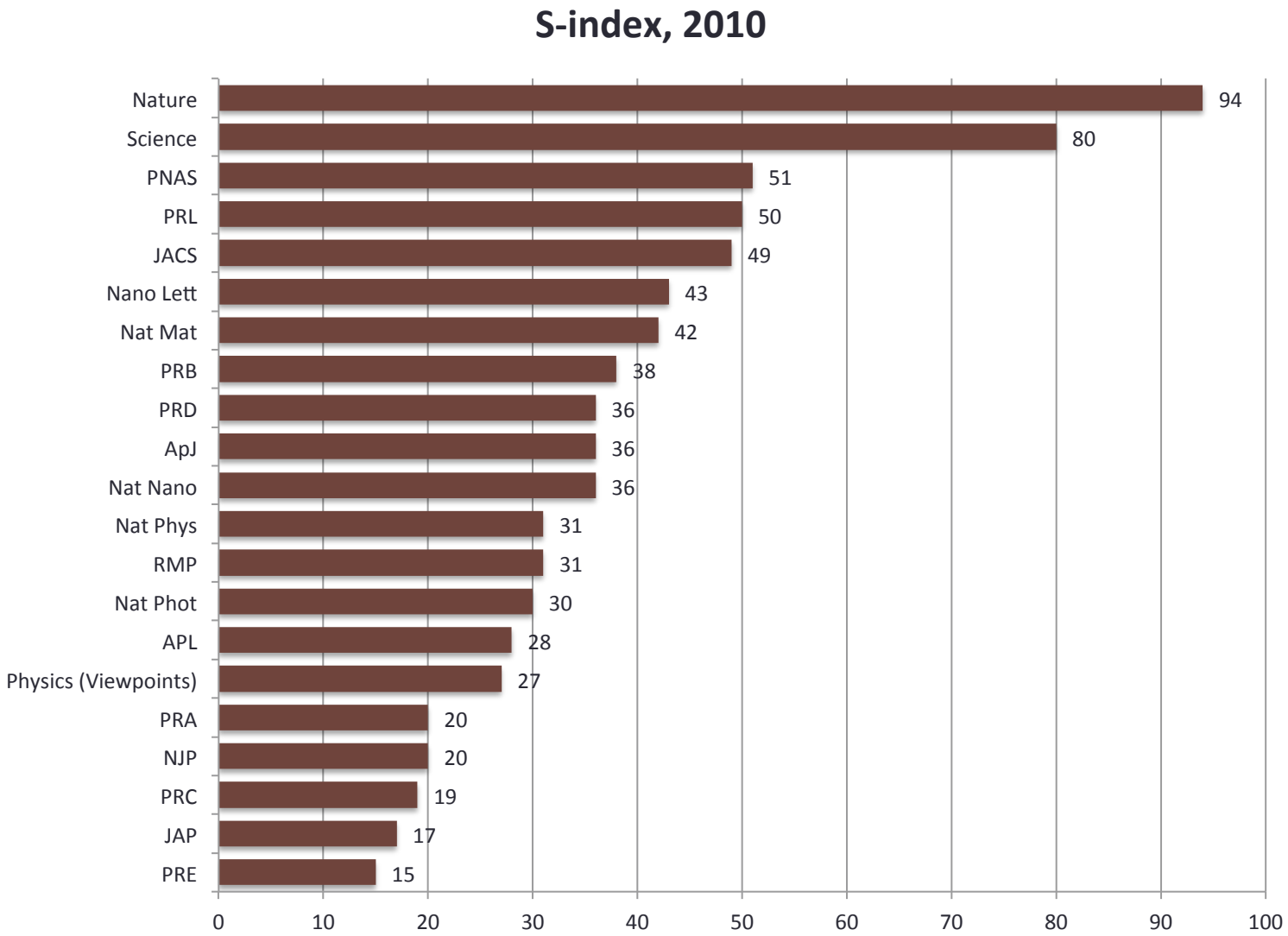
Introduce a new metric for the highly cited papers in a journal: S-index

2011 S index = maximum number S of papers, published in 2009-2010, cited more than S times in 2011

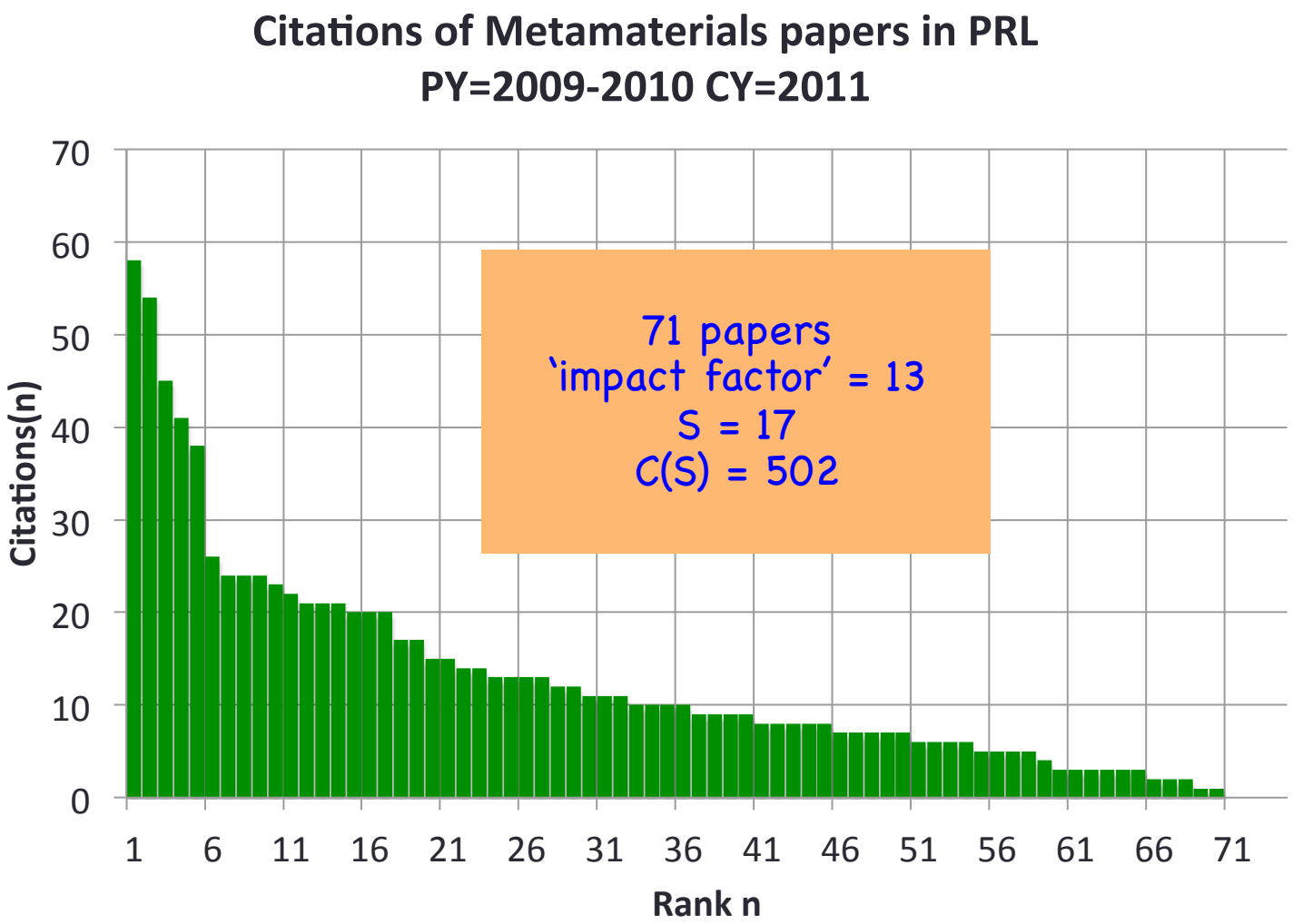


For a set of papers
H-index: full publication window, full citation window
S-index (for 2011): 2009-2010 publication window,
2011 citation window

Ranking journals by the S-index



Metamaterials papers in PRL



To sum up

	average performance indicator	significant performance indicator
Reseacher	citations/paper	H-index
Journal	JIF	S-index, C(S)

- Journal Impact Factors (JIF) are robust but *average* metrics
- Journal size affects JIF strongly
- S-index and C(S):
  - Track *'significant'* citation performance
  - Treat all citations with equal weight
  - Much less sensitive to journal size than JIF
  - Can be generalized for different fields
  - C(S) more sensitive & greater range than S-index

Assessing researcher impact: Quantity and Quality

Number of papers published
(total no. papers)

Number of papers published in influential journals
(no. papers in journal XXX)

Citations of own papers
(total citations, h-index, S-index, etc.)

Quality of citations of own papers
(Eigenfactor, etc.)

Assessing researcher impact: Quantity and Quality

Branding of journals,
and especially researchers,
by a single quantity
is poor practice

谢谢!!!

Ευχαριστούμε!

For feedback, questions, etc., write to us at:

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