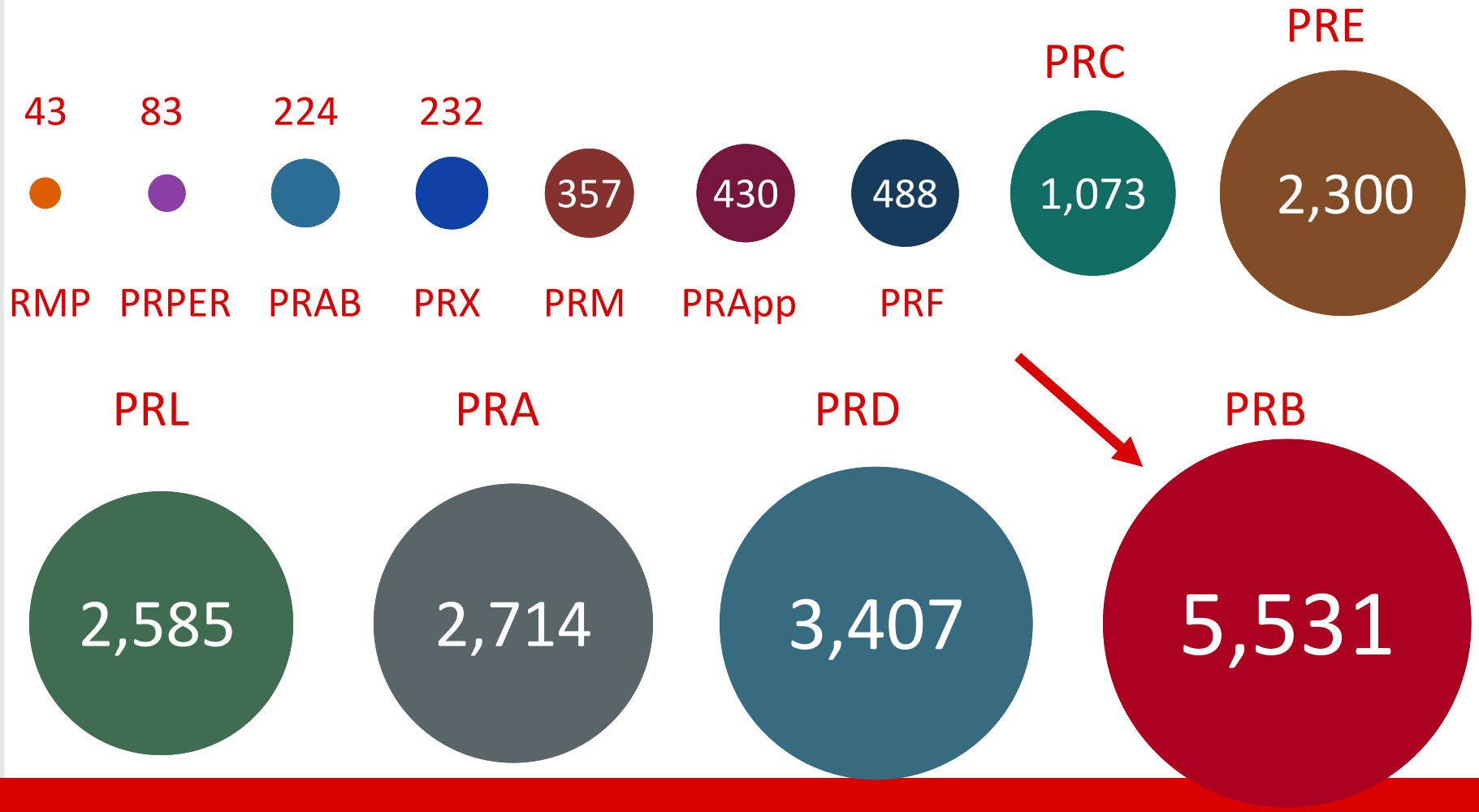
What's been happening at PRB?

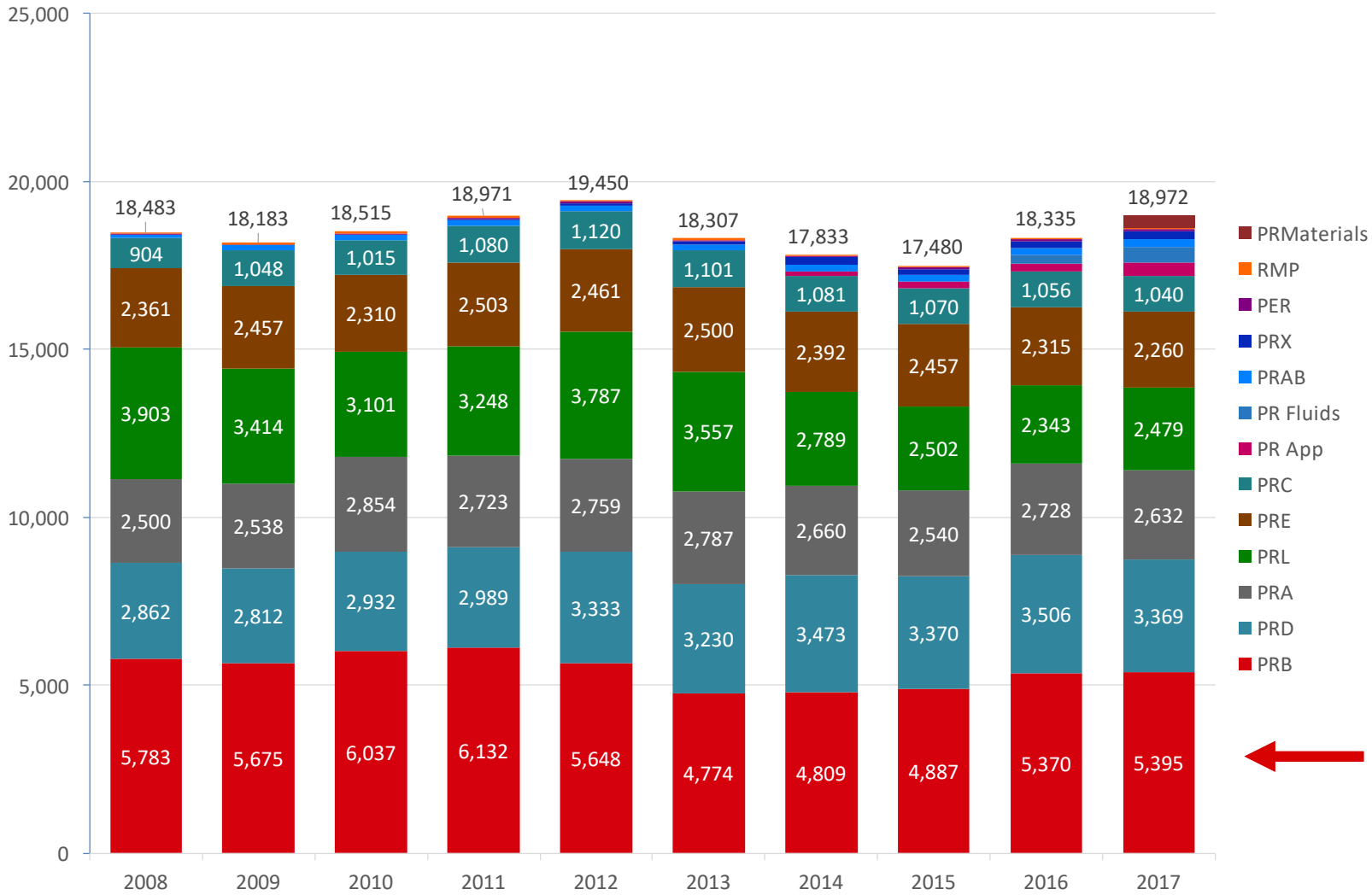
Laurens Molenkamp, Lead Editor

The *Physical Review* journal portfolio

Relative size, published papers (2017)



Research publications in the *Physical Review* journals



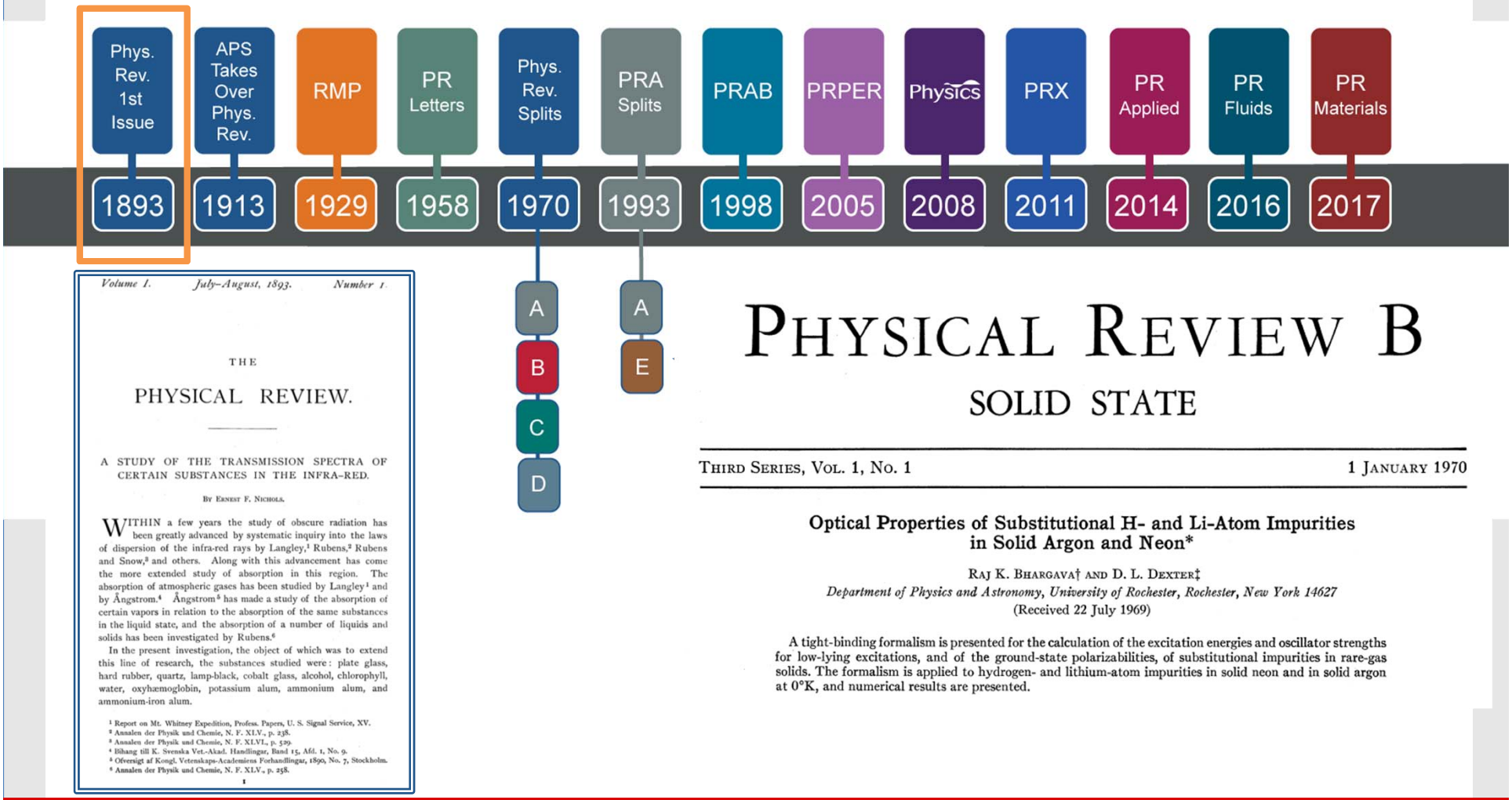
Physical Review B

journals.aps.org/prb

Laurens Molenkamp, tour of Brazil 2018

APS physics

125th Anniversary
PHYSICAL REVIEW JOURNALS



Volume 1. *July–August, 1893.* *Number 1.*

THE

PHYSICAL REVIEW.

A STUDY OF THE TRANSMISSION SPECTRA OF CERTAIN SUBSTANCES IN THE INFRA-RED.

By Ernest F. Nichols.

WITHIN a few years the study of obscure radiation has been greatly advanced by systematic inquiry into the laws of dispersion of the infra-red rays by Langley,[1] Rubens,[2] Rubens and Snow,[3] and others. Along with this advancement has come the more extended study of absorption in this region. The absorption of atmospheric gases has been studied by Langley[4] and by Ångstrom.[4] Ångstrom[5] has made a study of the absorption of certain vapors in relation to the absorption of the same substances in the liquid state, and the absorption of a number of liquids and solids has been investigated by Rubens.[6]

In the present investigation, the object of which was to extend this line of research, the substances studied were: plate glass, hard rubber, quartz, lamp-black, cobalt glass, alcohol, chlorophyll, water, oxyhæmoglobin, potassium alum, ammonium alum, and ammonium-iron alum.

[1] Report on Mt. Whitney Expedition, Profess. Papers, U. S. Signal Service, XV.
[2] Annalen der Physik und Chemie, N. F. XLV., p. 238.
[3] Annalen der Physik und Chemie, N. F. XLVI., p. 529.
[4] Bihang till K. Svenska Vet.-Akad. Handlingar, Band 15, Afd. 1, No. 9.
[5] Öfversigt af Kongl. Vetenskaps-Academiens Forhandlingar, 1890, No. 7, Stockholm.
[6] Annalen der Physik und Chemie, N. F. XLV., p. 258.

1

PHYSICAL REVIEW B

SOLID STATE

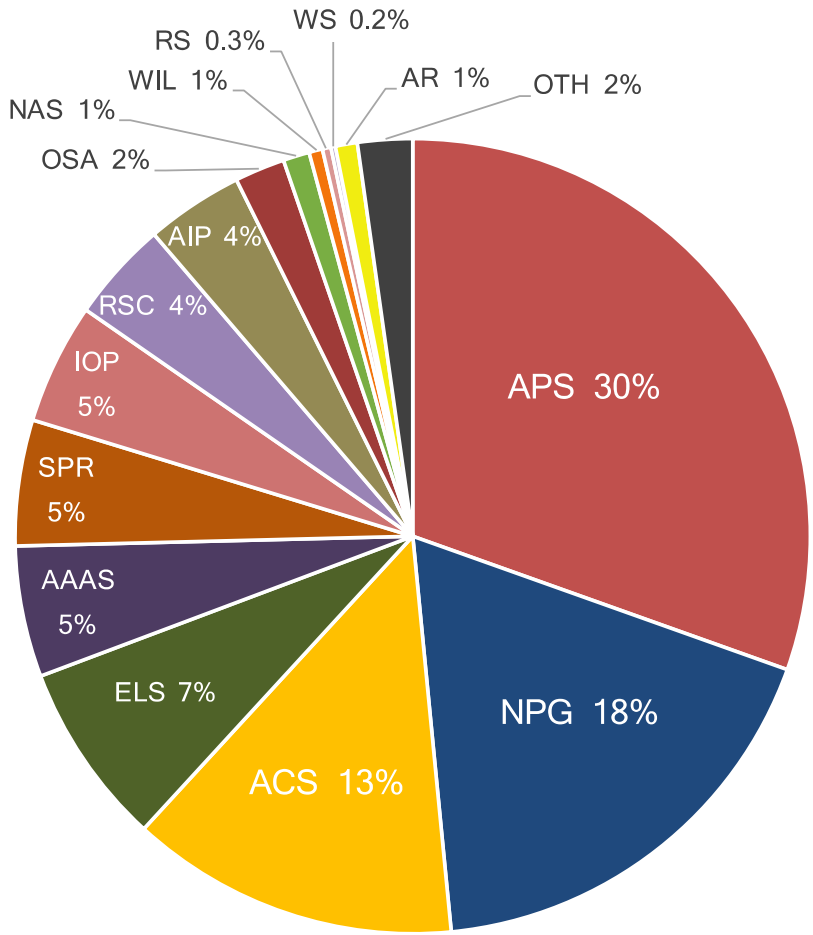
THIRD SERIES, VOL. 1, NO. 1 — 1 JANUARY 1970

Optical Properties of Substitutional H- and Li-Atom Impurities in Solid Argon and Neon*

RAJ K. BHARGAVA† AND D. L. DEXTER‡
Department of Physics and Astronomy, University of Rochester, Rochester, New York 14627
(Received 22 July 1969)

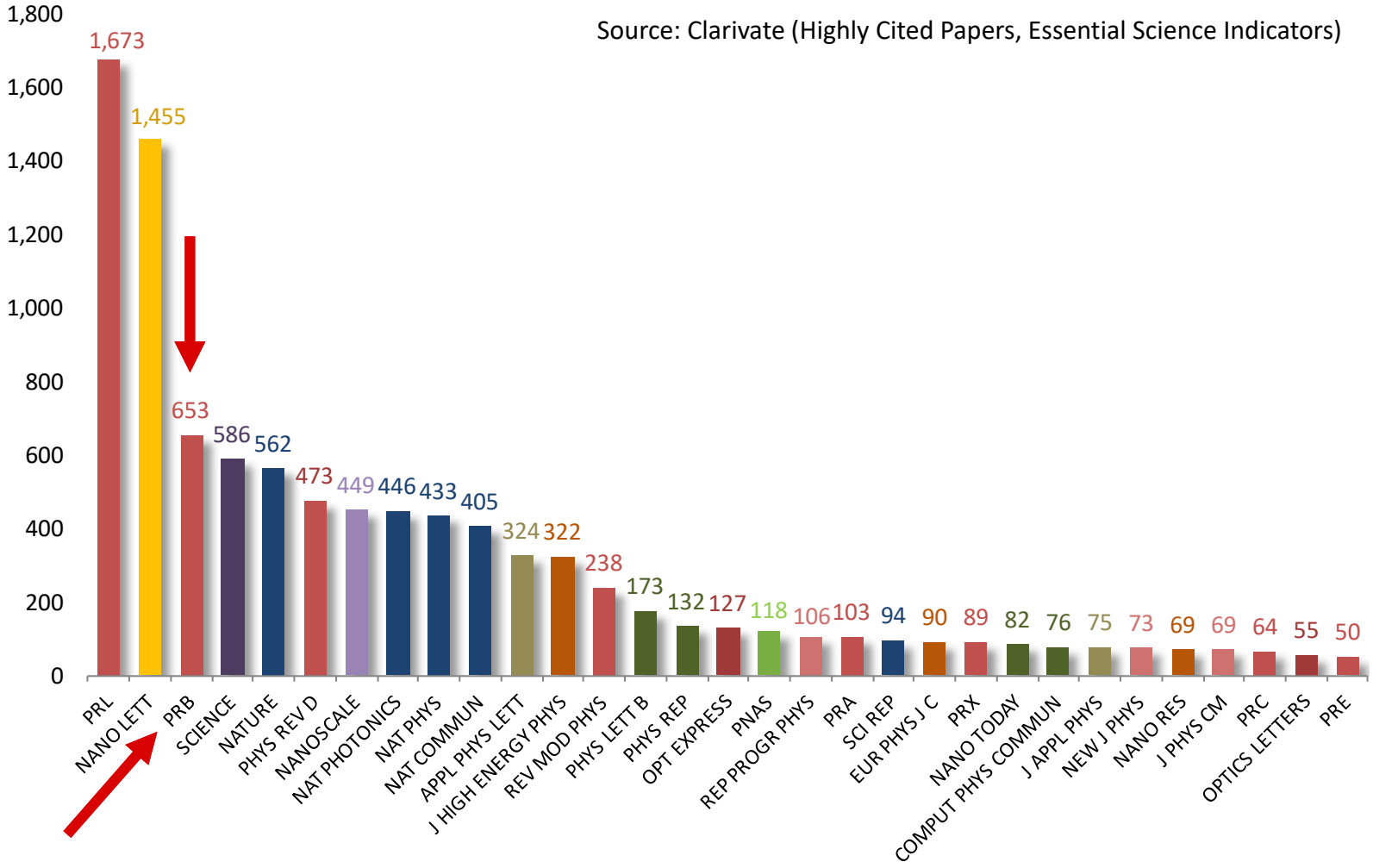
A tight-binding formalism is presented for the calculation of the excitation energies and oscillator strengths for low-lying excitations, and of the ground-state polarizabilities, of substitutional impurities in rare-gas solids. The formalism is applied to hydrogen- and lithium-atom impurities in solid neon and in solid argon at 0°K, and numerical results are presented.

Highly cited physics papers by journal 2007-2017

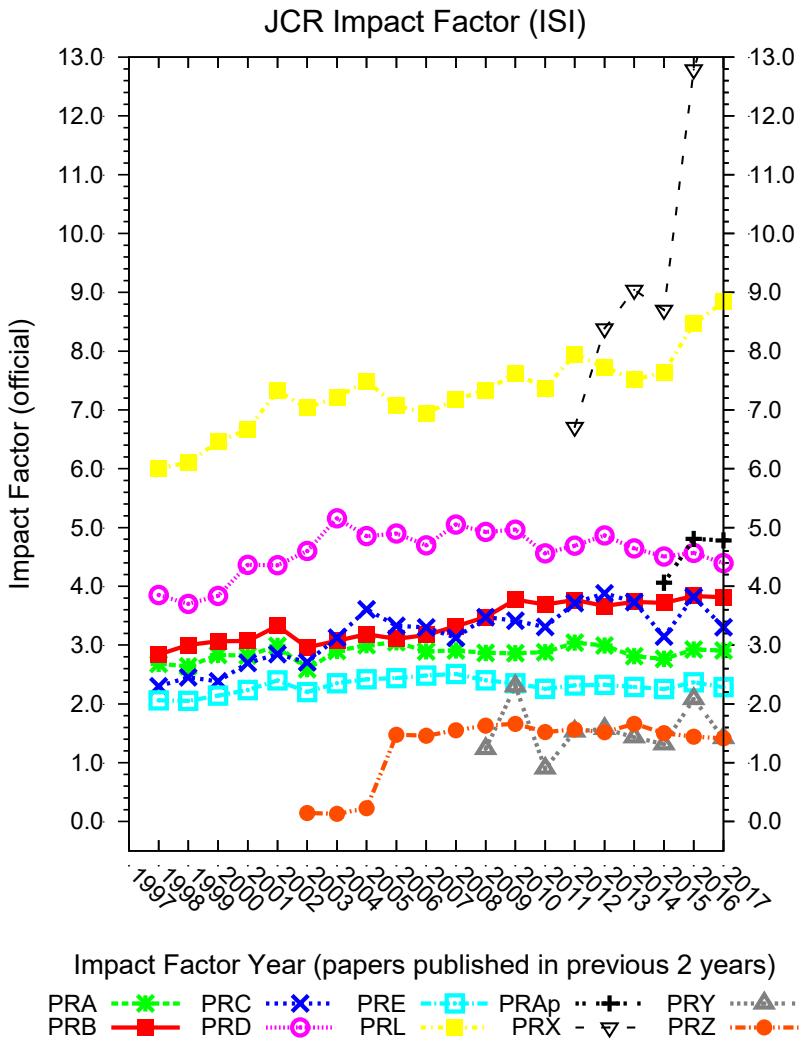


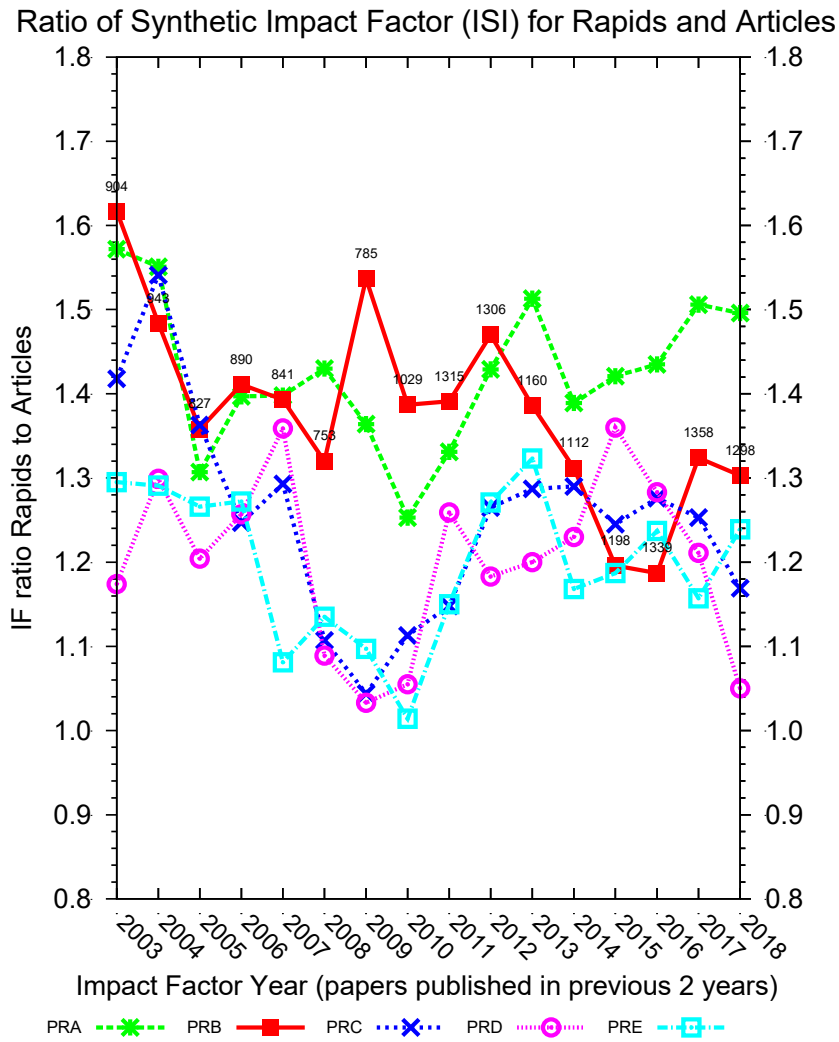
Source: Clarivate (Essential Science Indicators)

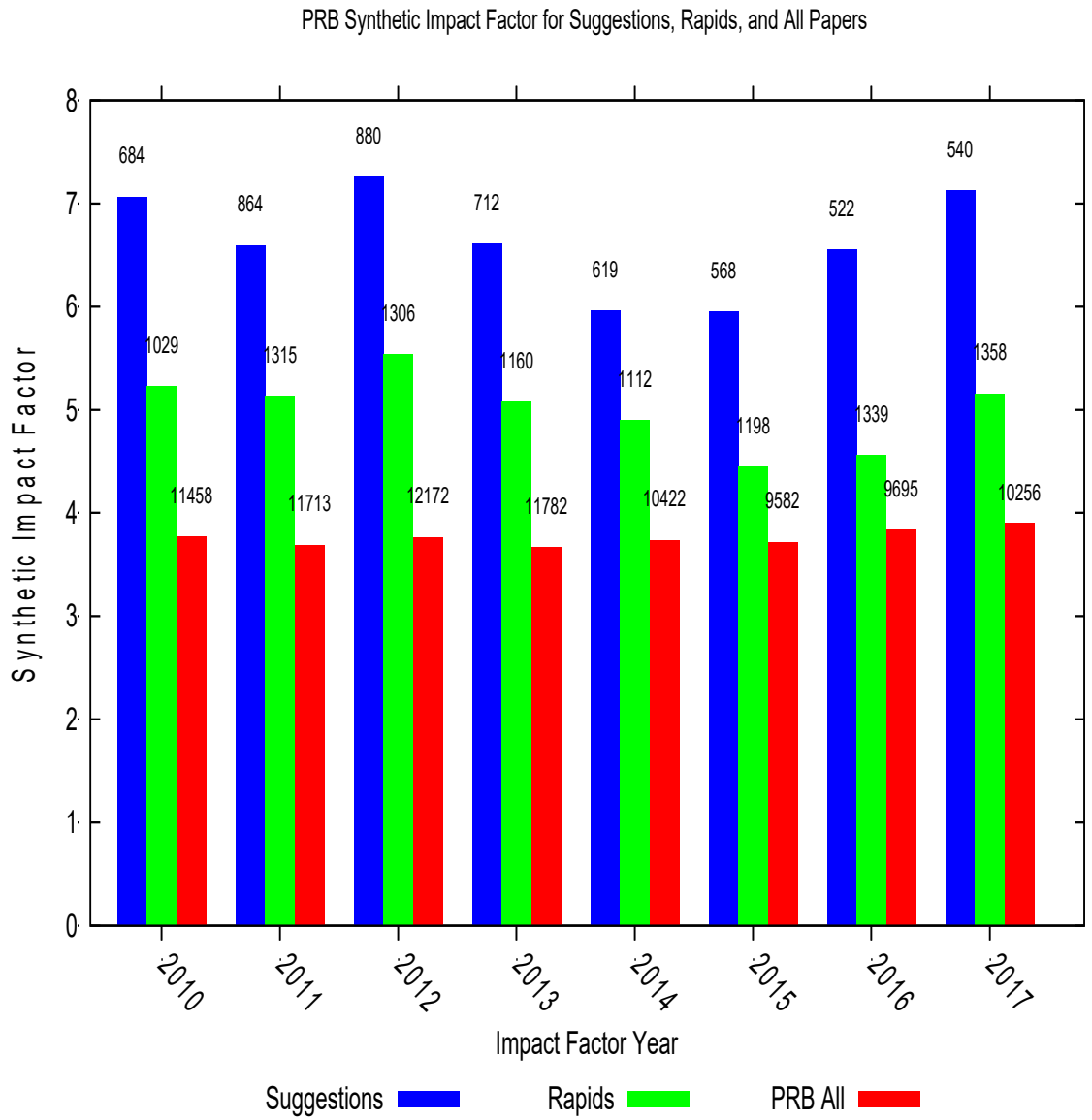
Highly cited physics papers by journal 2007-2017 Top 1% of cited papers, n≥ 50

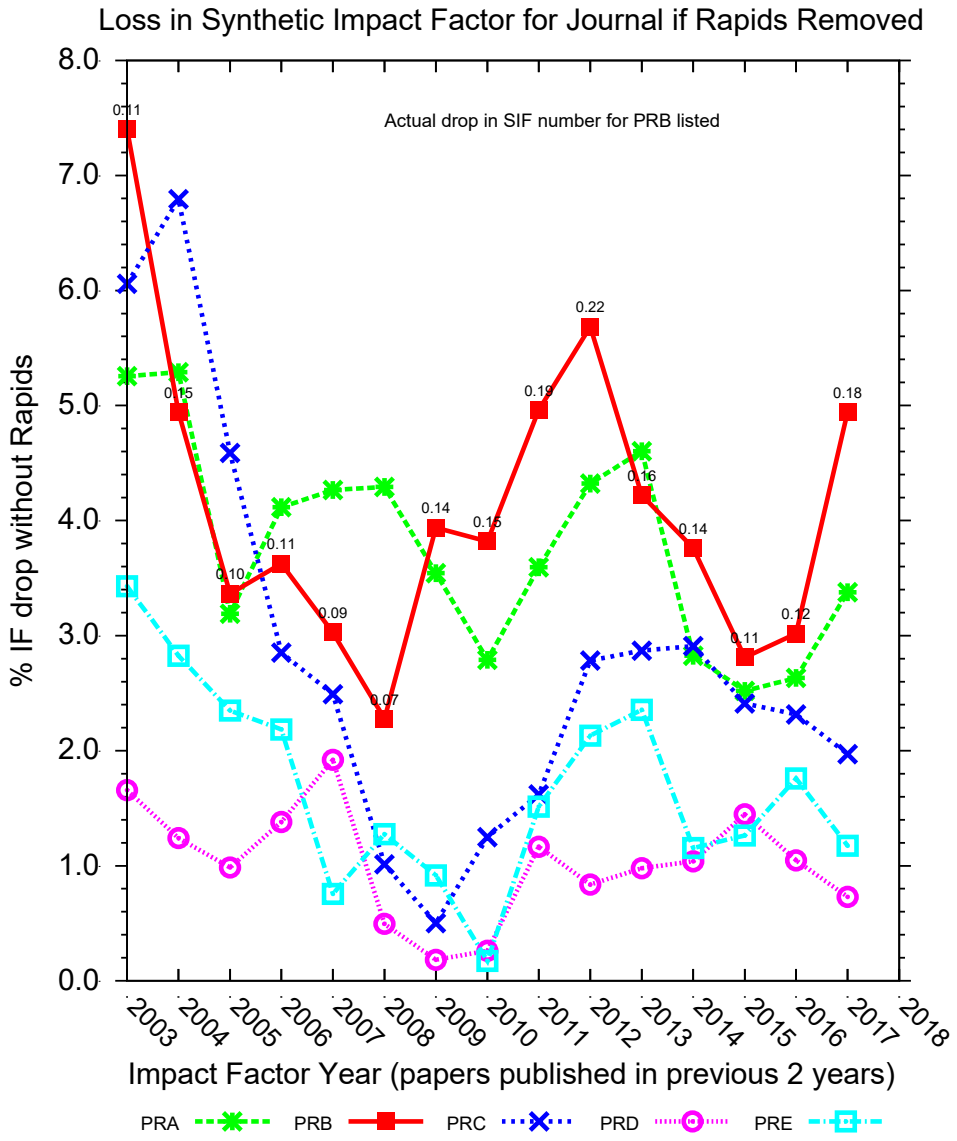


- Journal humming along nicely.
- IF good. Receipts steady, publications steady (100 a week)
- Rejection without external review stable. Efficient, thoughtful editing
- New Publisher to guide us. New Editor in Chief.
- Strong transfers from PRL, PRX. Lot of soliciting of rejected papers
- PRB Suggestions becoming more well known
- Good use of the Editorial Board. Editors in touch with community
- More consultation between journals, esp. PRL and PRB
- Phys. Rev. Applied interface
- Phys. Rev. Materials interface
- Start new journals, especially Open Access?
- Q1/Q2 concern for certain countries (Spain, Italy)


JCR Impact Factor (ISI)
Impact Factor (official)
Impact Factor Year (papers published in previous 2 years)
PRA
PRB
PRC
PRD
PRE
PRL
PRAp
PRX
PRY
PRZ


Ratio of Synthetic Impact Factor (ISI) for Rapids and Articles
IF ratio Rapids to Articles
Impact Factor Year (papers published in previous 2 years)
PRA
PRB
PRC
PRD
PRE


PRB Synthetic Impact Factor for Suggestions, Rapids, and All Papers
Synthetic Impact Factor
Impact Factor Year
0
1
2
3
4
5
6
7
8
2010
2011
2012
2013
2014
2015
2016
2017
684
1029
11458
864
1315
11713
880
1306
12172
712
1160
11782
619
1112
10422
568
1198
9582
522
1339
9695
540
1358
10256
Suggestions
Rapids
PRB All


Loss in Synthetic Impact Factor for Journal if Rapids Removed
Actual drop in SIF number for PRB listed
% IF drop without Rapids
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.11
0.15
0.10
0.11
0.09
0.07
0.14
0.15
0.19
0.22
0.16
0.14
0.11
0.12
0.18
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Impact Factor Year (papers published in previous 2 years)
PRA
PRB
PRC
PRD
PRE

Question for you:

What do you think about splitting off the Rapid Communications section of PRB to be a separate journal?

With an Impact Factor.

FATE of PRB papers

PRB received received 17,800 papers in 2015 and 2016, rejected 6800, and we found 4034 of these published in a non-APS* journal.

Much can be made of such data.

We can calculate the Synthetic Impact Factor (SIF) for each journal or for certain fields (based on journal titles)

What happens to rejected PRB papers?

We can find them based on title/author matching via the Web of Science
Data for ex-PRB papers ending up published in 2015 or 2016 (for 2017 SIF)

Most popular journals:

Published Journal	Papers	Sum	% Share
JOURNAL OF APPLIED PHYSICS	527	4034	13.10
JOURNAL OF PHYSICS-CONDENSED MATTER	407	4034	10.10
SCIENTIFIC REPORTS	198	4034	4.90
APPLIED PHYSICS LETTERS	139	4034	3.40
JOURNAL OF PHYSICAL CHEMISTRY C	138	4034	3.40
PHYSICAL CHEMISTRY CHEMICAL PHYSICS	128	4034	3.20
NEW JOURNAL OF PHYSICS	121	4034	3.00
JOURNAL OF CHEMICAL PHYSICS	120	4034	3.00
JOURNAL OF PHYSICS D-APPLIED PHYSIC	91	4034	2.30
JOURNAL OF THE PHYSICAL SOCIETY OF	88	4034	2.20
EPL	87	4034	2.20
AIP ADVANCES	86	4034	2.10
JOURNAL OF MAGNETISM AND MAGNETIC M	86	4034	2.10
EUROPEAN PHYSICAL JOURNAL B	73	4034	1.80
RSC ADVANCES	72	4034	1.80
NANOTECHNOLOGY	57	4034	1.40
PHYSICS LETTERS A	57	4034	1.40
JOURNAL OF ALLOYS AND COMPOUNDS	56	4034	1.40
SUPERCONDUCTOR SCIENCE & TECHNOLOGY	52	4034	1.30
OPTICS EXPRESS	49	4034	1.20
COMPUTATIONAL MATERIALS SCIENCE	43	4034	1.10
SOLID STATE COMMUNICATIONS	41	4034	1.00
MATERIALS RESEARCH EXPRESS	40	4034	1.00
PHYSICA STATUS SOLIDI B-BASIC SOLID	37	4034	0.90
ACTA MATERIALIA	34	4034	0.80

What happens to rejected PRB papers

Ending up published in 2015 or 2016, for 2017 SIF

Highest-SIF journals are:

Published Journal	Papers	Sum	SIF
NANOSCALE	25	4034	6.12
ACTA MATERIALIA	34	4034	4.44
JOURNAL OF PHYSICAL CHEMISTRY C	138	4034	3.71
JOURNAL OF MATERIALS CHEMISTRY C	21	4034	3.38
SCIENTIFIC REPORTS	198	4034	3.21
PHYSICAL CHEMISTRY CHEMICAL PHYSICS	128	4034	3.18
CARBON	20	4034	3.15
OPTICS EXPRESS	49	4034	2.86
APPLIED PHYSICS LETTERS	139	4034	2.81
NEW JOURNAL OF PHYSICS	121	4034	2.65
JOURNAL OF CHEMICAL PHYSICS	120	4034	2.38
APPLIED SURFACE SCIENCE	20	4034	2.25
JOURNAL OF APPLIED PHYSICS	527	4034	2.12
COMPUTATIONAL MATERIALS SCIENCE	43	4034	2.05
NANOTECHNOLOGY	57	4034	2.05

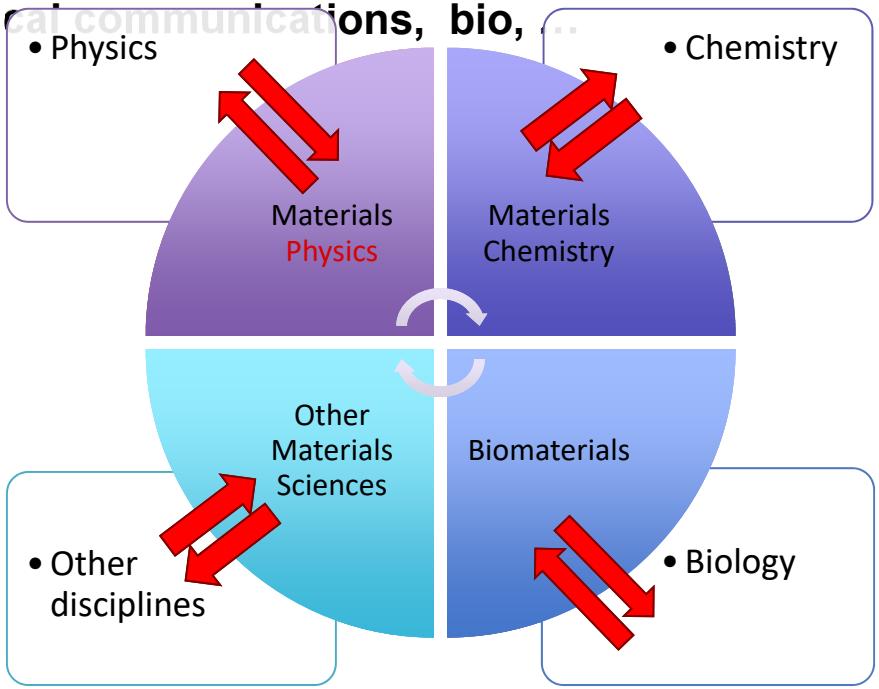
Fate: PRB to Materials Journals by IF (10%, SIF=2.36)

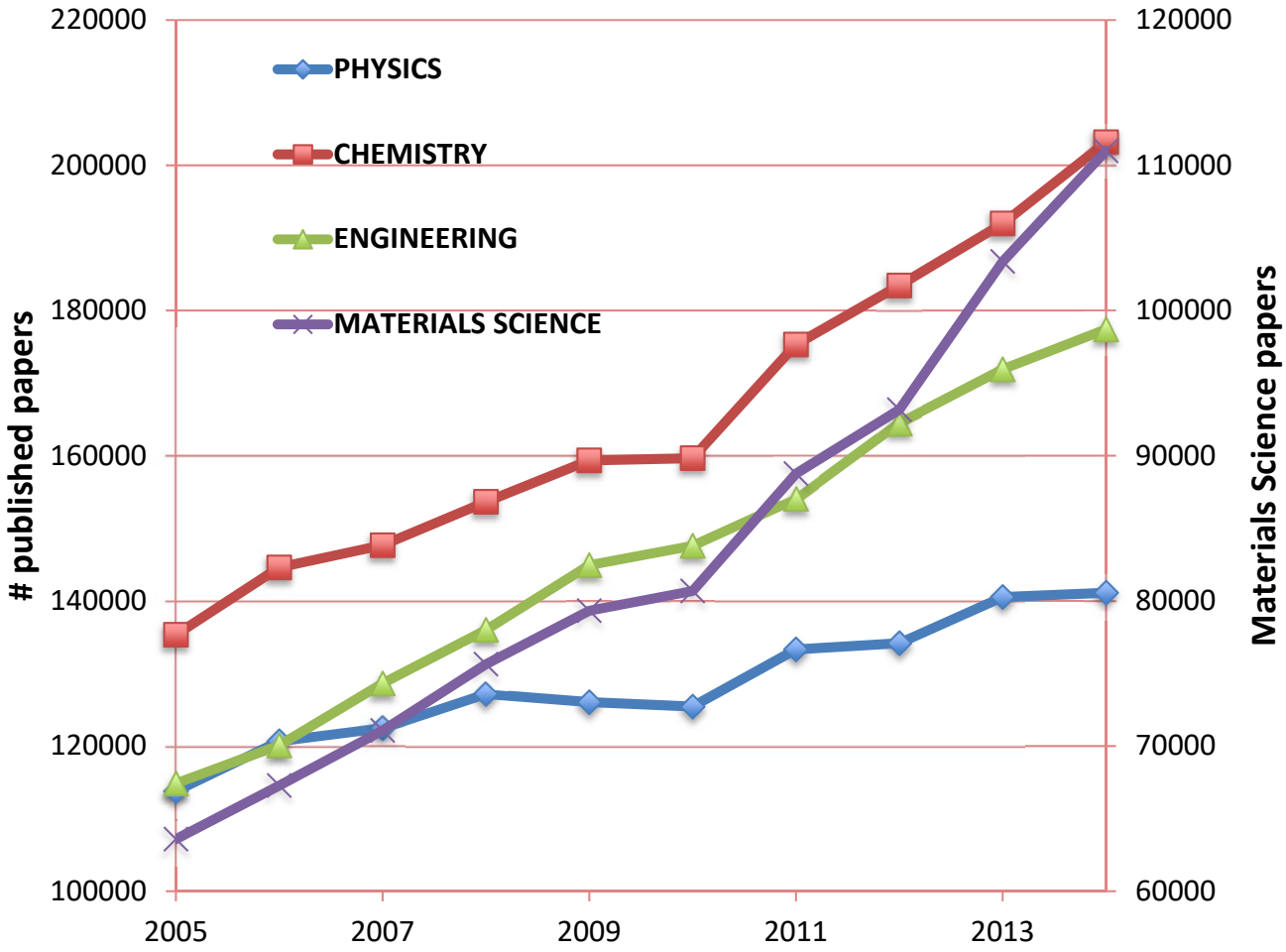
Field	Hit	Total	Average
ACS APPLIED MATERIALS & INTERFACES	17	403	7.71
MATERIALS SCIENCE AND ENGINEERING A	5	403	5.40
ACTA MATERIALIA	34	403	4.44
2D MATERIALS	10	403	4.00
JOURNAL OF MATERIALS SCIENCE	9	403	3.89
JOURNAL OF MATERIALS CHEMISTRY C	21	403	3.38
JOURNAL OF NUCLEAR MATERIALS	12	403	3.08
MATERIALS & DESIGN	8	403	2.75
COMPUTATIONAL MATERIALS SCIENCE	43	403	2.05
SCRIPTA MATERIALIA	11	403	1.91
OPTICAL MATERIALS EXPRESS	10	403	1.50
JOURNAL OF ELECTRONIC MATERIALS	6	403	1.17
JOURNAL OF MAGNETISM AND MAGNETIC M	86	403	1.17
MATERIALS CHEMISTRY AND PHYSICS	12	403	1.17
MATERIALS RESEARCH EXPRESS	40	403	1.05
APPLIED PHYSICS A-MATERIALS SCIENCE	6	403	0.83
MODELLING AND SIMULATION IN MATERIA	11	403	0.73
APL MATERIALS	6	403	0.50

The creation of PR Materials

Materials research – interdisciplinary and cross-disciplinary

- **Inspiration/motivation/impact across (and beyond) physics**
- **Broad applications in science and engineering**
  - **Sensors, hybrid systems, optical communications, bio, …**




PHYSICS
CHEMISTRY
ENGINEERING
MATERIALS SCIENCE
published papers
Materials Science papers
220000
200000
180000
160000
140000
120000
100000
120000
110000
100000
90000
80000
70000
60000
2005
2007
2009
2011
2013

Examples of materials papers rejected by PRB

- *Field evaporation mechanism of bulk oxides under ultra fast laser illumination* (JAP 2011) 15 cites
- *First-principles study of fundamental properties of screw dislocation in bcc iron* (Acta Materiala 2011) 18 cites
- *Solution softening in magnesium alloys: the effect of solid solutions on the dislocation core structure and nonbasal slip* (JPCM 2013) 18 cites
- *The role of impurity oxygen in hydrogen bubble nucleation in tungsten* (Journal of Nuclear Materials 2013) 12 cites
- *Lithium-Induced Phase Transitions in Lead-Free Bi0.5Na0.5TiO3 Based Ceramics* (Journal of Physical Chemistry C 2014) 20 cites

Quotes from a 2015 PRB survey of authors

- Materials research; no. Materials Physics: yes. The identity of PRB should be in physics, not materials without physics.

- Condensed matter physics is not material science or chemical physics, but of course papers about the latter with good quality and physical importance deserve publication on PRB

- There may be a case for a new journal (PRF?) in materials and chemical physics. I think that the current balance in PRB is about right.

Materials scope in PR journals pre-PRM

- PRB is expected to concentrate on advances in physics. Many materials related papers received focus on materials properties
- PR Applied is looking for more genuine application papers
- PRE publishes soft matter papers and those papers will continue to reside in PRE. They get few biomaterials.
- PRL and PRX do attract some materials papers but of average quality … they do not currently have a big enough reputation

So … there is currently no journal at the Physical Review level with a focus on materials science or chemical physics to attract such papers. Papers in these areas rejected by us must leave the APS.

We hope to attract many papers submitted now to non-APS journals.

Introductions

Chris Leighton
Lead Editor

Athanasios Chantis
Managing Editor

Mu Wang
Editor

Hari Dahal
Associate Editor

Jason Lashley
Associate Editor

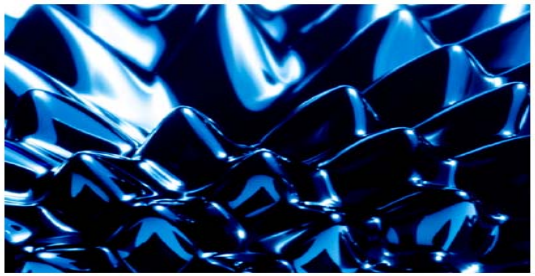
Editorial Board

Laurens Molenkamp, tour of Brazil 2018

Physical Review Materials: Goals

*A new **broad scope** journal publishing **high-quality** papers from the **multidisciplinary** community engaged in **materials research***

- Extends the scope of the Physical Review family; explicit focus on *all aspects* of materials research
- Embraces multi/inter-disciplinary character of materials research
- High quality, thorough, rapid review process
- *Regular Articles* (unrestricted), *Rapid Communications* (4500 words), *Reviews* (~30,000 words)
- Publishing since June 2017; 828 papers published/accepted so far



Laurens Molenkamp, tour of Brazil 2018

About PRM on journals.aps.org/prmater

Physical Review Materials

Physical Review Materials (PRMaterials), launched in 2017, is a broad-scope journal publishing high-quality research on materials. The journal serves the multidisciplinary community working on the prediction, synthesis, processing, structure, properties, and modeling of a wide range of materials.

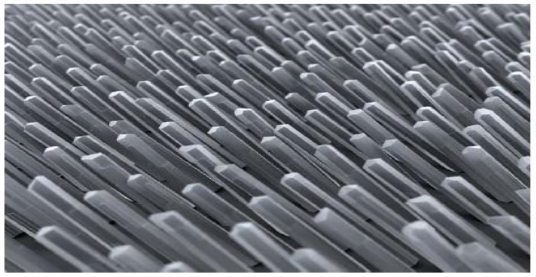
Embracing Multidisciplinary Materials Research

Materials research has grown rapidly in recent years and increasingly transcends conventional subject boundaries. PRMaterials provides a publication and reference venue to the expanding community of physicists, materials scientists, chemists, engineers, and scientists in related disciplines, carrying out high-quality, original research in materials. PRMaterials coordinates with other members of the *Physical Review* journal family to serve new subspecialties as they develop. As such, PRMaterials expands the scope of *Physical Review's* journals, providing an explicit focus on materials research.

Physical Review Materials: Scope

Discovery, synthesis, processing, structure, properties, performance, modeling of materials
For materials scientists, materials physicists, chemists, engineers

- Crystal growth, film growth, crystallization, kinetics
- Magnetic, ferroic, multiferroic, and superconducting materials
- Thin films, interfaces, surfaces, heterostructures
- 2D materials
- Metamaterials and plasmonic, optical, photonic materials
- Materials for energy harvesting, storage, generation
- Glasses and amorphous materials
- Soft materials, polymers, self-assembly, biomaterials
- Electronic materials: semiconductors, metals, insulators (including organics)
- Topological materials
- Mechanical properties, structure, phase transformations
- Nanostructures, nanocomposites, nanomaterials

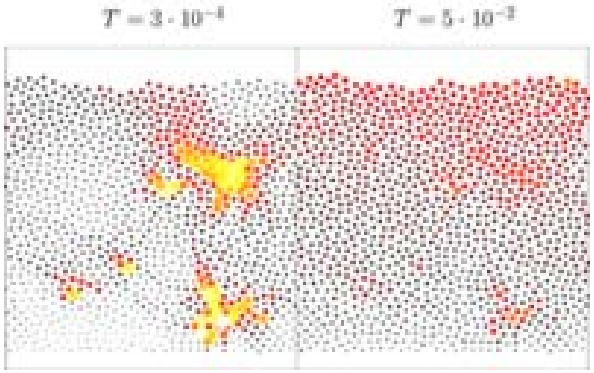


Physical Review Materials: Breadth

Low temperature anomalies of a vapor deposited glass

Seoane, Reid,
de Pablo, Zamponi

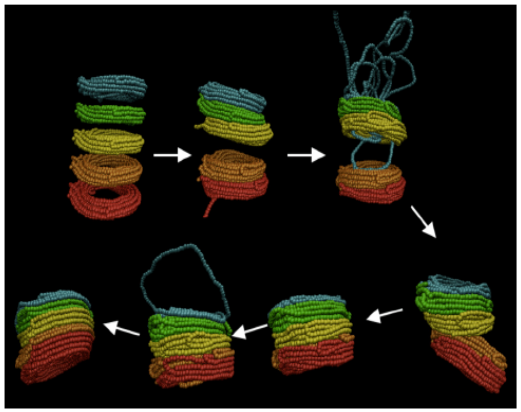
Phys. Rev. Mater. **2**, 015602 (2017)



Rapid conformational fluctuations in a model of Methylcellulose

Li, Bates, Dorfman

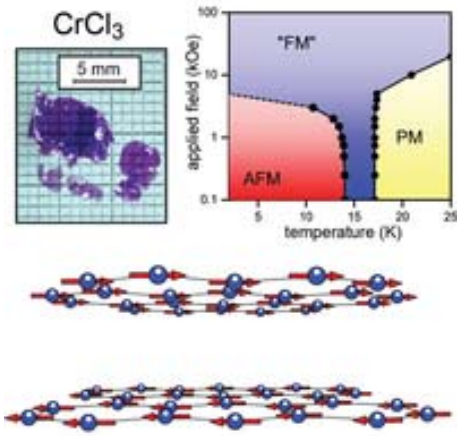
Phys. Rev. Mater. **1**, 025604 (2017)



Magnetic behavior and spin-lattice coupling in cleavable van der Waals $CrCl_3$ crystals

McGuire, Clark, Santosh, Chance, Jellison, Cooper, Xu, Sales

Phys. Rev. Mater. **1**, 014001 (2017)



Editorial: Materials Research in the *Physical Review* Journals

Chris Leighton, Laurens W. Molenkamp, Eli Ben-Naim, and Stephen Forrest
Phys. Rev. Materials **1**, 030001 – Published 23 August 2017

• *Physical Review B* focuses on the exploration and understanding of the physical properties and phenomena in materials of relevance to condensed matter physics and allied disciplines.

• *Physical Review Materials* emphasizes the prediction, discovery, synthesis, characterization, processing, structure, properties, and modeling of materials of interest to the multidisciplinary materials community.

PRM


properties
phase
structure
electron
films
spin
principles
dimensional
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electronic
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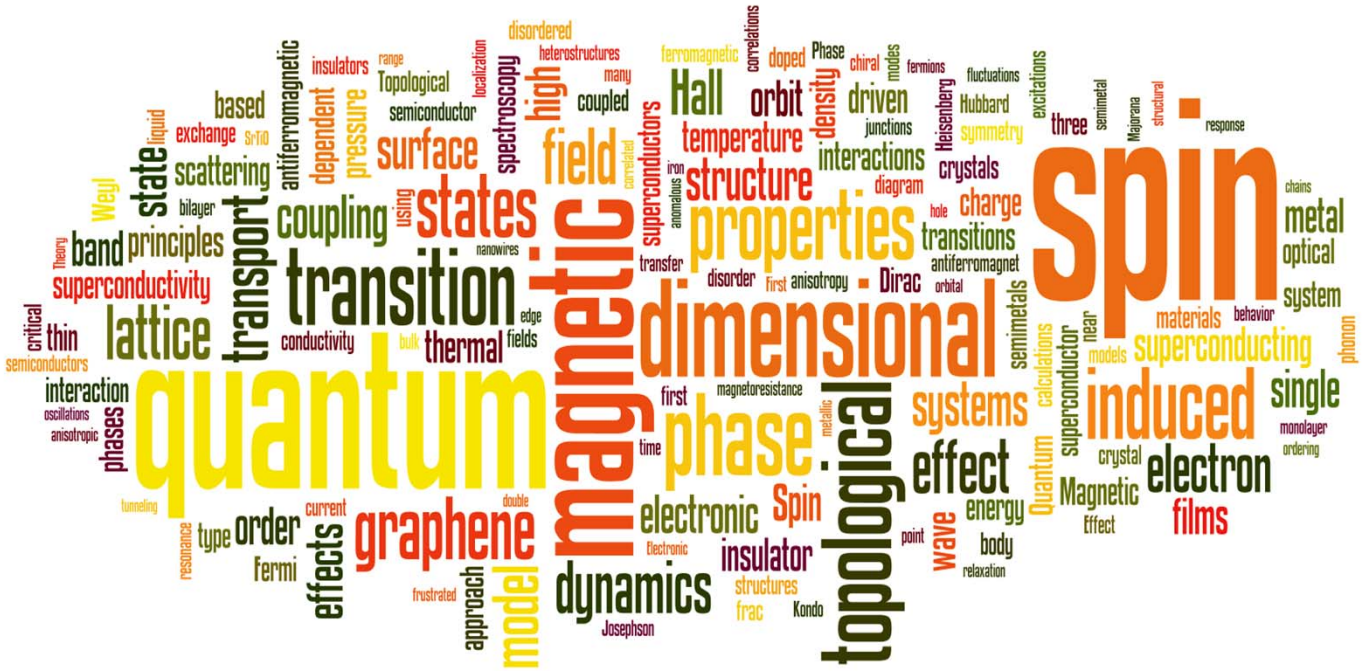
PRB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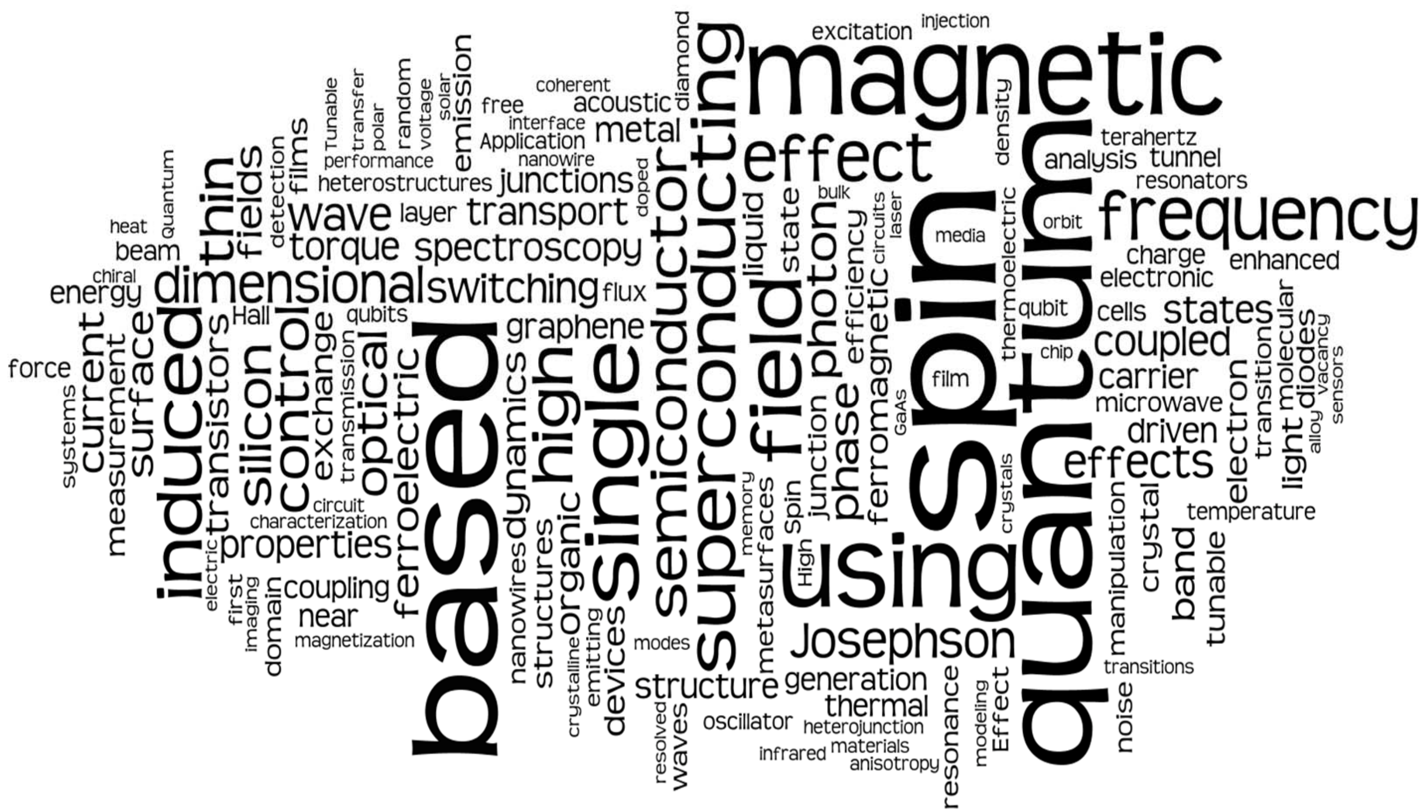
PRAp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performance
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graphene
flux
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random
voltage
solar
emission
diamond
doped
excitation
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terahertz
analysis
tunnel
resonators
orbit
charge
enhanced
electronic
cells
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coupled
carrier
microwave
driven
effects
temperature
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transition
light
molecular
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vacancy
alloy
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qubit
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density
thermoelectric
bulk
laser
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ferromagnetic
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crystals
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coupling
near
magnetization
domain
imaging
first
electric
properties
characterization
circuit
transmission
exchange
transistors
surface
current
measurement
systems
force

Summary of PRM/PRB

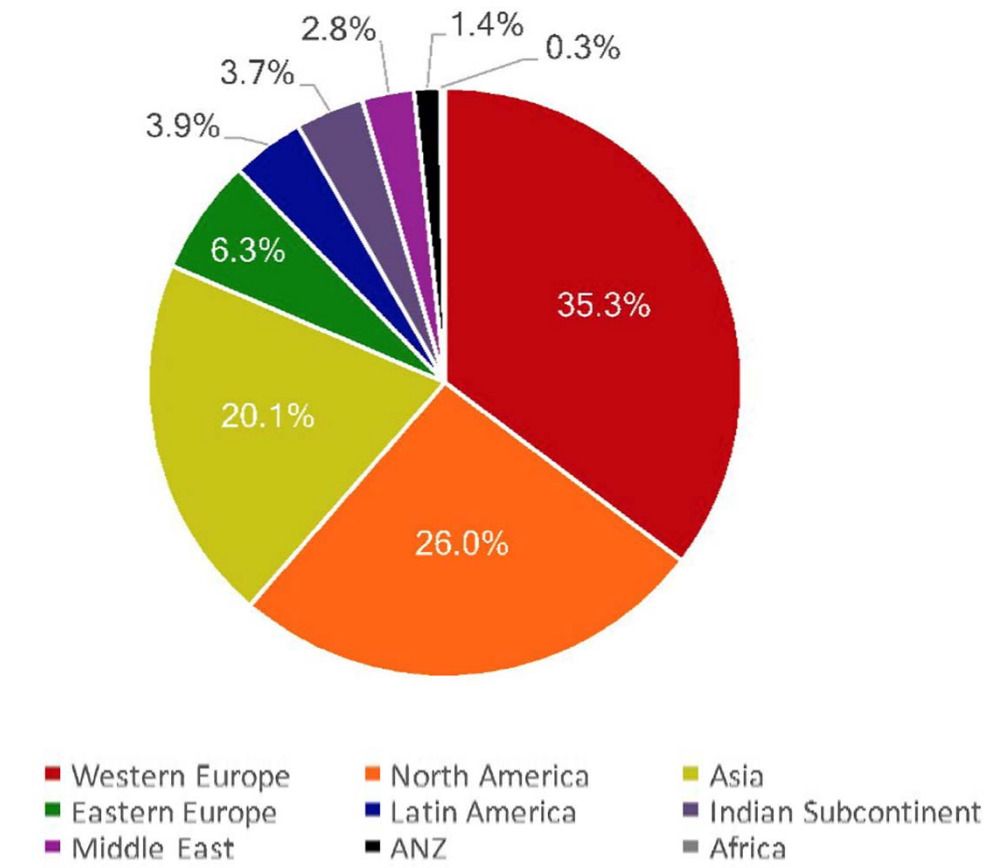
- PRB Editors pushed to start the journal ..
- PRB Editors now run the journal ..
- Not designed to be a dumping ground ..
- Should attract papers PRB does not want ..
- Should attract new papers to APS …
  chem phys, mat chem, mat synthesis
- How much Materials Physics in PRM? ..
- Some overlap inevitable …

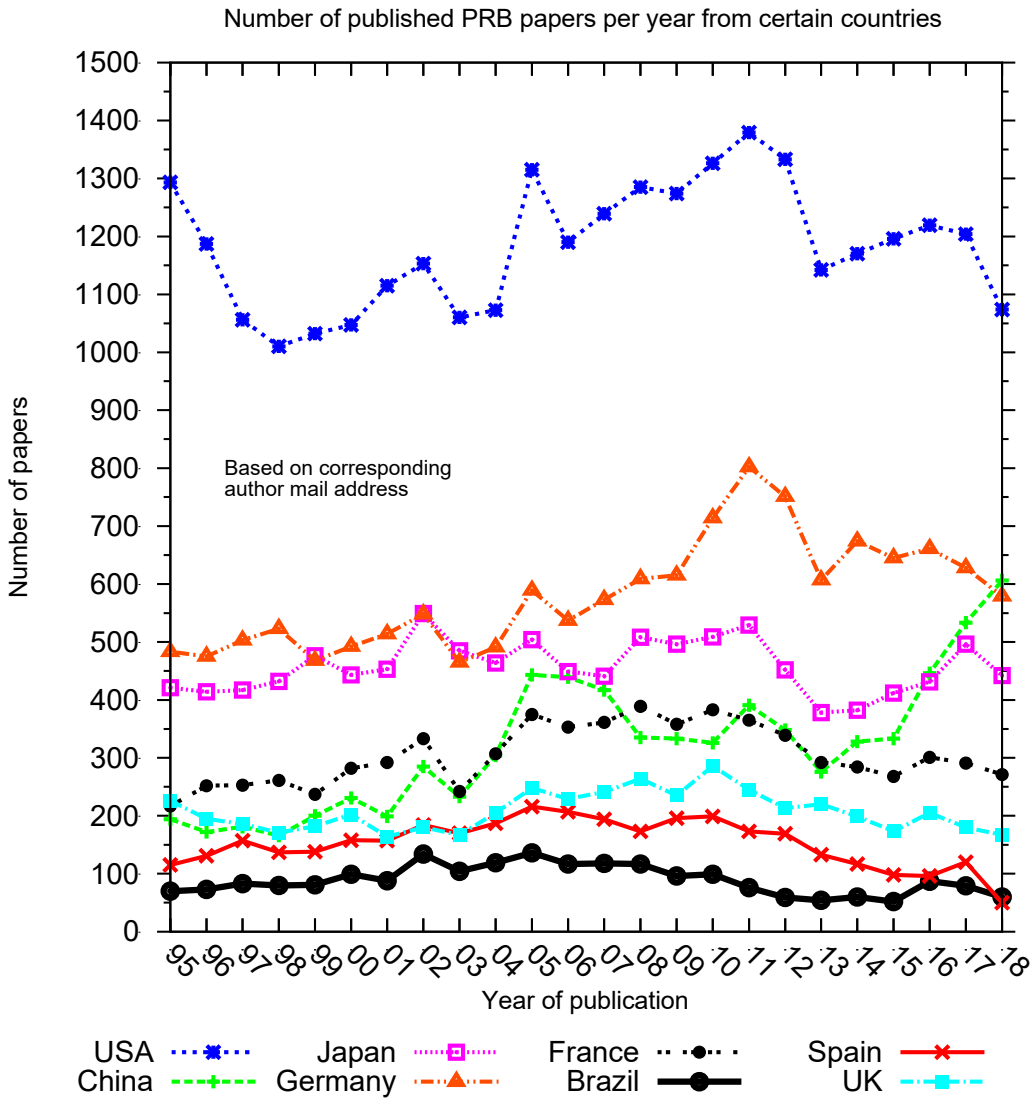
A quote from a respected author:

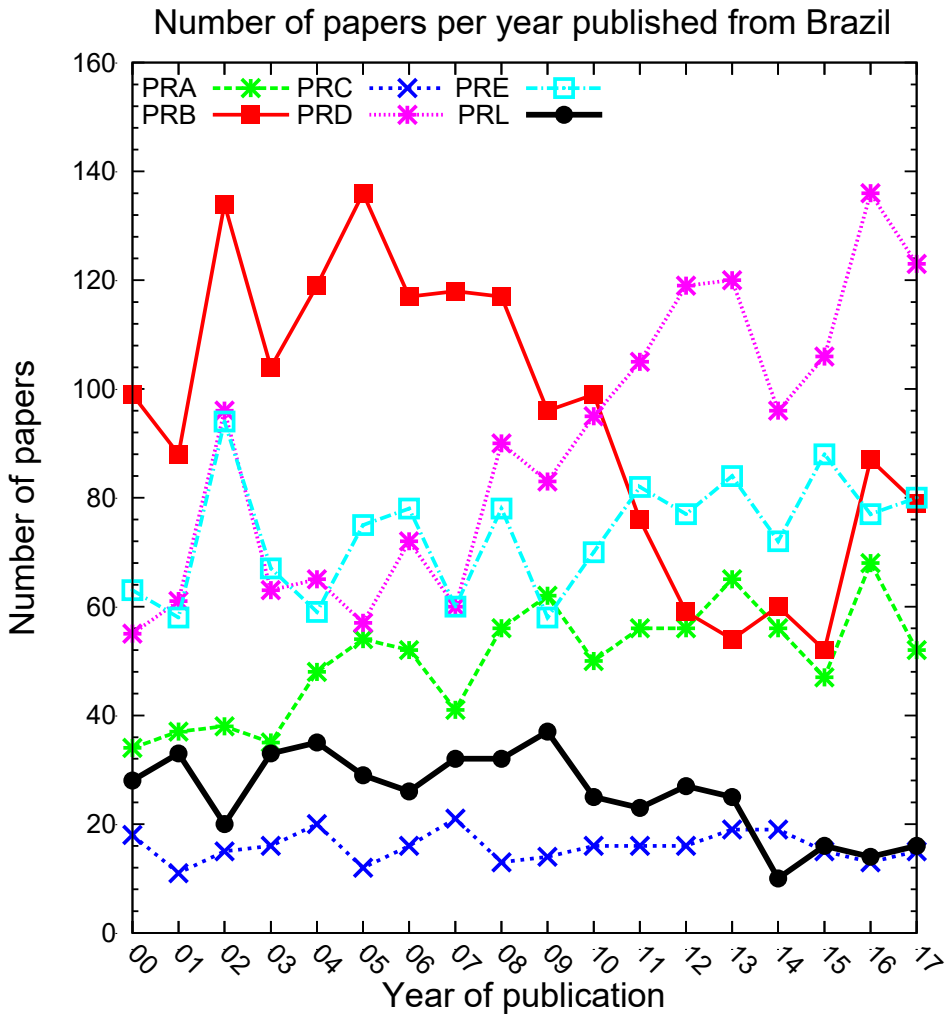
It is VERY important to treat materials physics researchers as equals to condensed matter physicists. In the past this has caused issues. For example, the MRS exists in large part because materials people felt unwelcome in the APS. Likewise, this is the reason there is a Division of Materials Physics and not just a Division of Condensed Matter Physics.

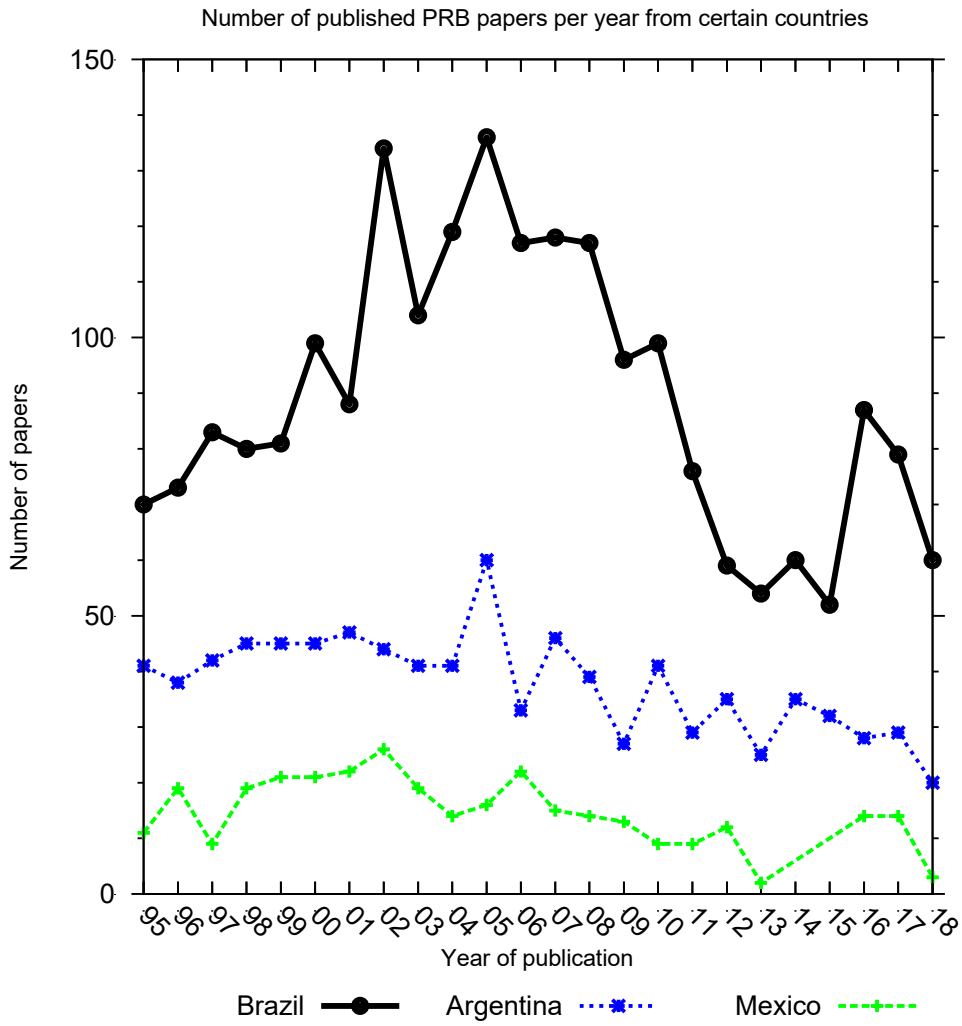
Some data for Brazil

Geographic Distribution of Published Papers in all PR Journals in 2017




Number of published PRB papers per year from certain countries
Number of papers
Year of publication
Based on corresponding
author mail address
USA
China
Japan
Germany
France
Brazil
Spain
UK


Number of papers per year published from Brazil
PRA
PRB
PRC
PRD
PRE
PRL
Number of papers
Year of publication
0
20
40
60
80
100
120
140
160
00
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17


Number of published PRB papers per year from certain countries
150
100
50
0
Number of papers
95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18
Year of publication
Brazil
Argentina
Mexico

Top publishers for PRB in year 2017:

#Pub	Institution
11	Universidade Federal de Pernambuco, BRAZIL
11	Universidade Federal do Rio de Janeiro, BRAZIL
10	Universidade de Sao Paulo, BRAZIL
10	Universidade de Sao Paulo, Sao Carlos, BRAZIL
9	Universidade Estadual de Campinas - UNICAMP, BRAZIL
9	Universidade Federal do Ceara, BRAZIL
9	Universidade Federal Fluminense, BRAZIL
8	Universidade Federal de Sao Carlos, BRAZIL
7	Centro Brasileiro de Pequisas Fisicas, BRAZIL
7	Universidade Federal do Rio Grande do Norte, BRAZIL
7	Universidade Federal de Uberlandia, BRAZIL
5	Universidade de Brasilia, BRAZIL
5	Universidade Federal do ABC, BRAZIL
5	Universidade Federal de Minas Gerais, BRAZIL
5	Universidade Federal do Rio Grande do Sul, BRAZIL
4	Universidade Federal do Piaui, BRAZIL
4	Universidade Federal de Vicosa, BRAZIL
4	Universidade Estadual Paulista, BRAZIL
3	Universidade Federal da Integracao Latino-Americana, BRAZIL
3	Instituto Tecnologico de Aeronautica, BRAZIL

Top publishers for PRL in year 2017:

#Pub	Institution
10	Universidade Federal do Rio de Janeiro, BRAZIL
5	Universidade Federal do Rio Grande do Norte, BRAZIL
4	Universidade Federal do ABC, BRAZIL
3	Universidade Federal Fluminense, BRAZIL
3	Universidade Federal de Minas Gerais, BRAZIL
3	Universidade de Sao Paulo, BRAZIL
3	Universidade de Sao Paulo, Sao Carlos, BRAZIL
2	Universidade Estadual de Campinas - UNICAMP, BRAZIL
2	Universidade Estadual Paulista, BRAZIL
1	Centro Brasileiro de Pequisas Fisicas, BRAZIL
1	Universidade Federal de Santa Catarina, BRAZIL
1	Instituto de Estudos Avancados, BRAZIL
1	Instituto de Matematica Pura e Aplicada, BRAZIL
1	Instituto Nacional de Pesquisas Espaciais, BRAZIL
1	Universidade Federal de Ouro Preto, BRAZIL
1	Universidade Federal da Paraiba, BRAZIL
1	Universidade Federal de Pernambuco, BRAZIL
1	Universidade Federal do Piaui, BRAZIL
1	Universidade Federal do Rio Grande do Sul, BRAZIL
1	Universidade Federal de Sao Joao del Rei, BRAZIL

The End

Physical Review B
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Laurens Molenkamp, tour of Brazil 2018

APS physics