

Elsevier Publishing Campus | Publishing Connect

Bibliometrics

big data and the world of scientific publishing

Prof. dr. Henrik Rudolph
Editor-in-Chief Applied Surface Science

Workshop Brazil Oct. 2018

Defining bibliometrics (in scientific publishing)

Bibliometrics [ˌbɪblɪə(ʊ)ˈmɛtrɪks]



The application of statistical analysis of books, articles, or other publications.

This means “reducing” the published scientific work into key figures, that (hopefully) say something about the quality and/or quantity of the work



Warning: By projecting a multi dimensional space onto a single parameter you loose (a lot of) information

Generating information (big data)

We generate information about ourselves constantly !!



- Information has a monetary value. Most social networks are “free”



- You pay with information about yourself and your desires
- You even allow the social networks to sell information about you
- Search engines thrive on your behaviour (page ranking)
- Your previous searches might even determine, what you pay for your next online purchase (e.g. airline ticket)



YouTube Workshop Brazil Oct. 2018

The “old school” social networks: scientific publishing

1439

Gutenberg and Moveable Type



**Henry Oldenburg
(1618- 1677)**

**Founding editor
and commercial
publisher of the
first scientific
journal**

1580

**Founding of the House
of Elzevir**



Publishing Connect



6th March 1665

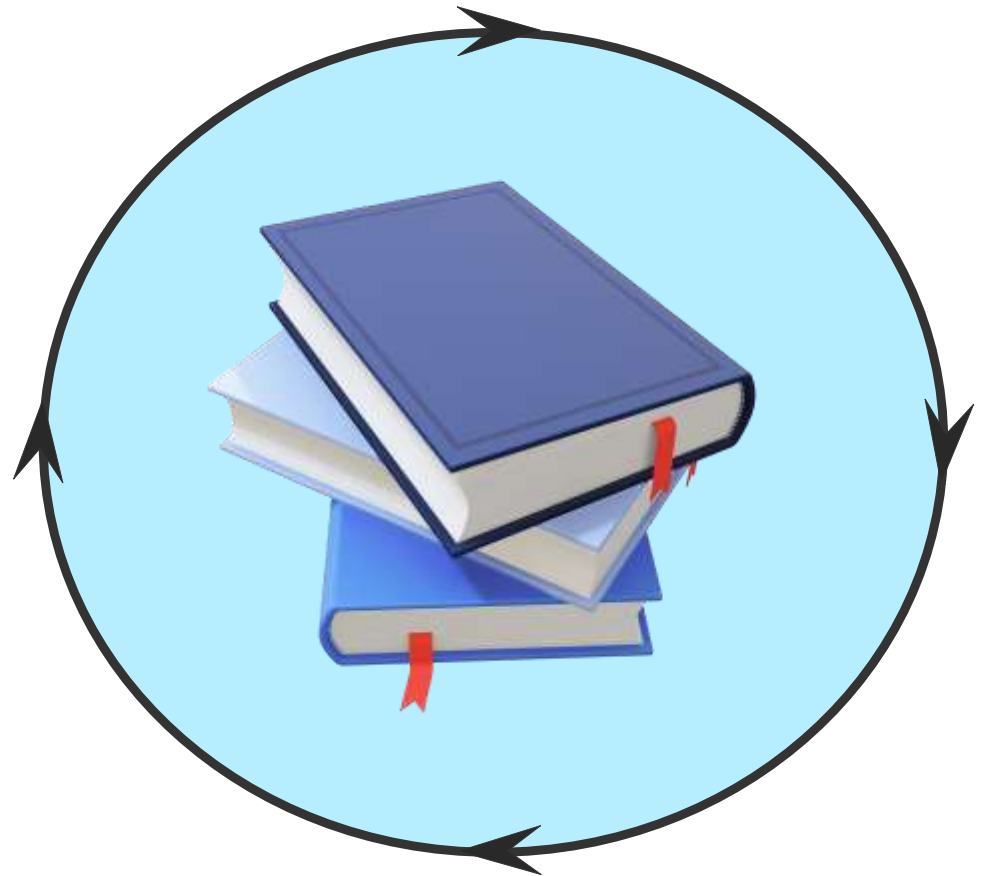
**“Philosophical Transactions
of the Royal Society”**

- **First true scholarly journal**

Stakeholders in the publishing circle

They all have a responsibility in the process

- 1) Funding “agency”
- 2) Academic institution
- 3) Author and co-authors
- 4) Publisher/journal
- 5) Editor
- 6) Reviewers
- 7) Libraries
- 8) Readers



Scientific publishing

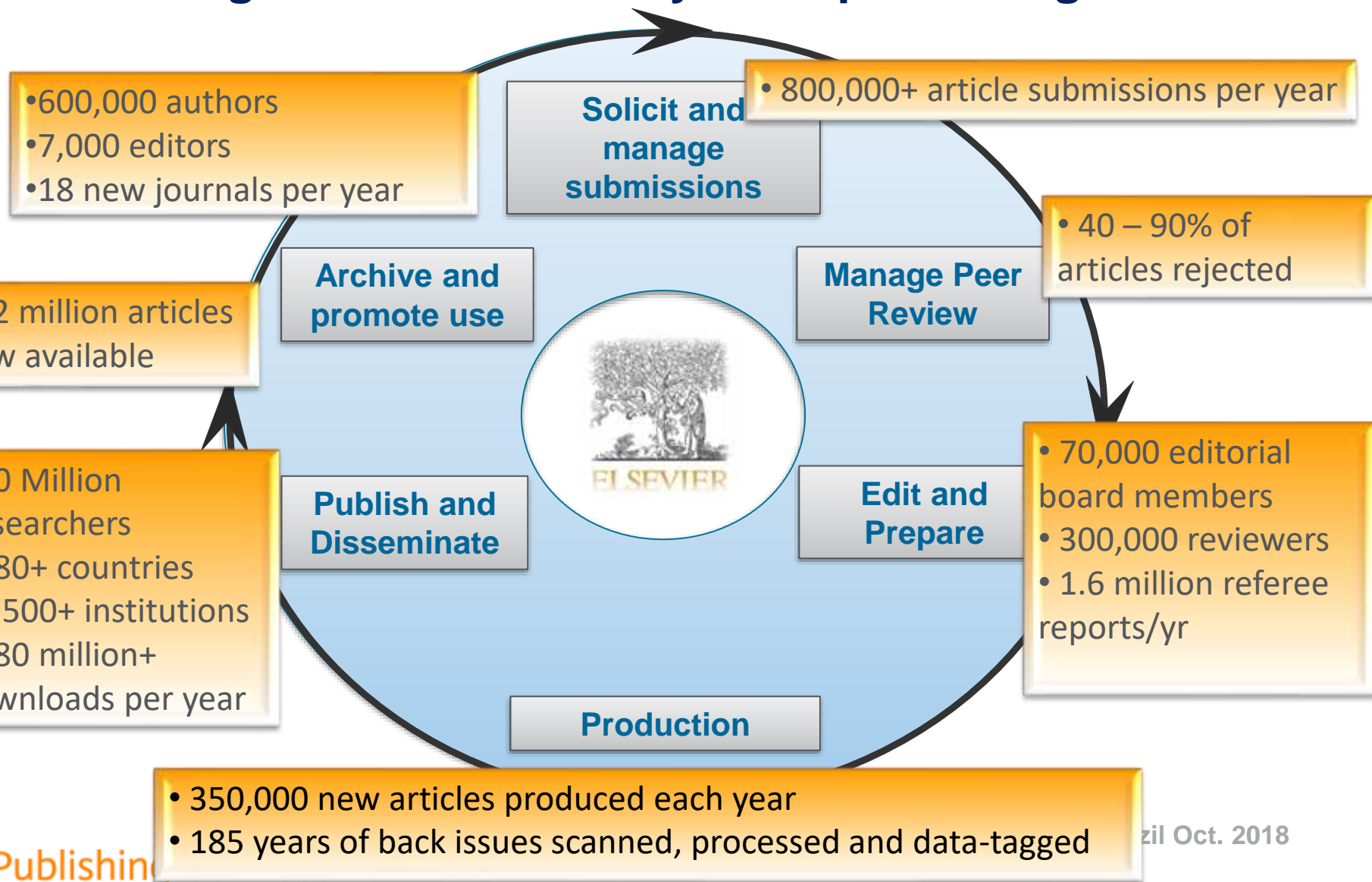
What data is being used and what data could be used: bibliometrics

All ***stakeholders*** in the publishing process make decisions based on data

- Authors decide what journal to publish in
- Readers decide what authors or journals to keep track of
- Reviewers decide what to review for
- Libraries decide what journals to subscribe to
- Funding agencies decide what journals are important
- Universities often decide about the career of a scientist based on numbers



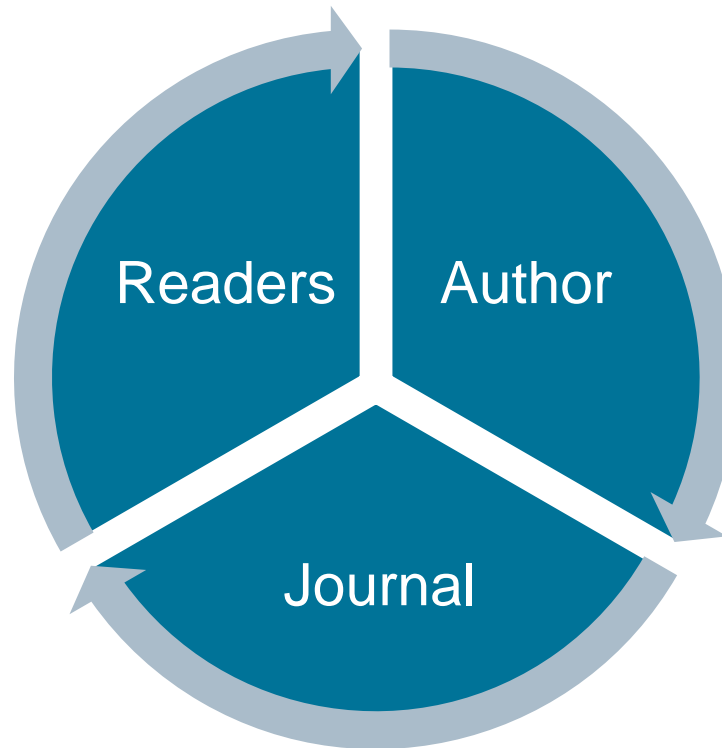
Publishing in the 21st century – the publishing circle



The three central actors of (scientific) publishing

Putting numbers on these actors

Average time spent
downloads
Areas of interest
Personal subscription



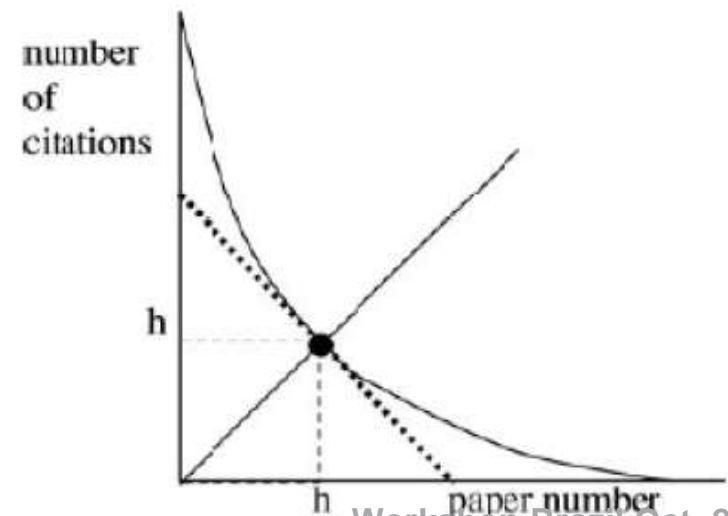
published papers
of citations
h-index
high impact papers
papers in high impact journals

published papers (size)
Acceptance rate
Impact factor
Eigenfactor



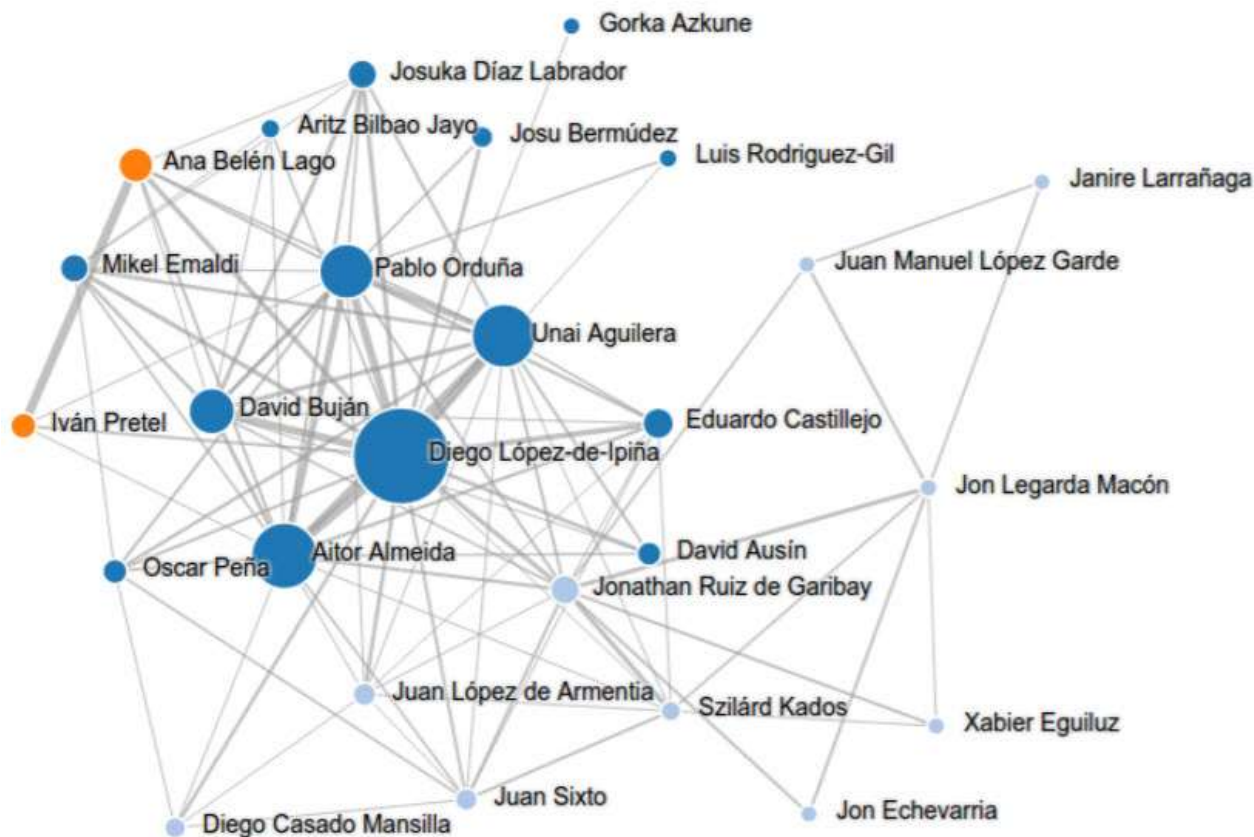
h-index

- Proposed by physicist Jorge Hirsch in 2005
- Rates individual scientist based on career publications
- Incorporates both quantity (no. publications) and quality (no. citations)
- A scientist has index h if h papers have at least h citations each





Mapping collaborations and relations

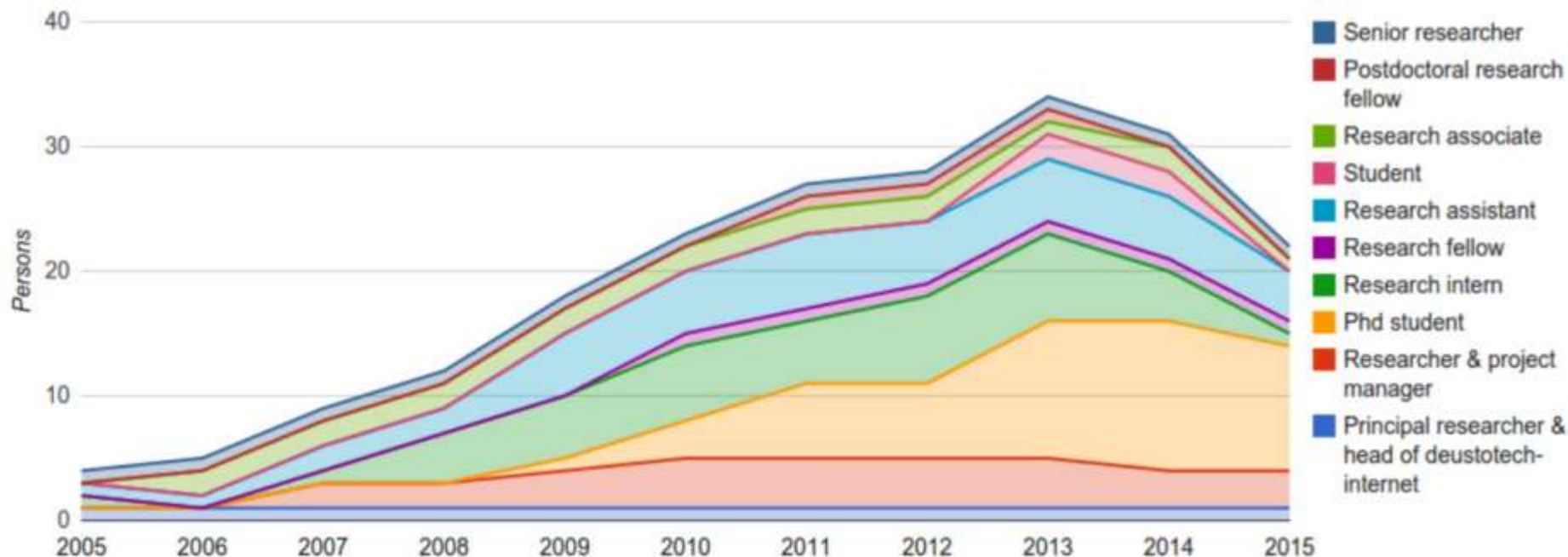


Pena *et al.*
DOI 10.1007/978-
3-319-24129-6_25
ISSN 1865-0929

(Conference paper)



Looking at the group



Pena *et al.*

DOI 10.1007/978-3-319-24129-6_25

ISSN 1865-0929

Publishing Connect

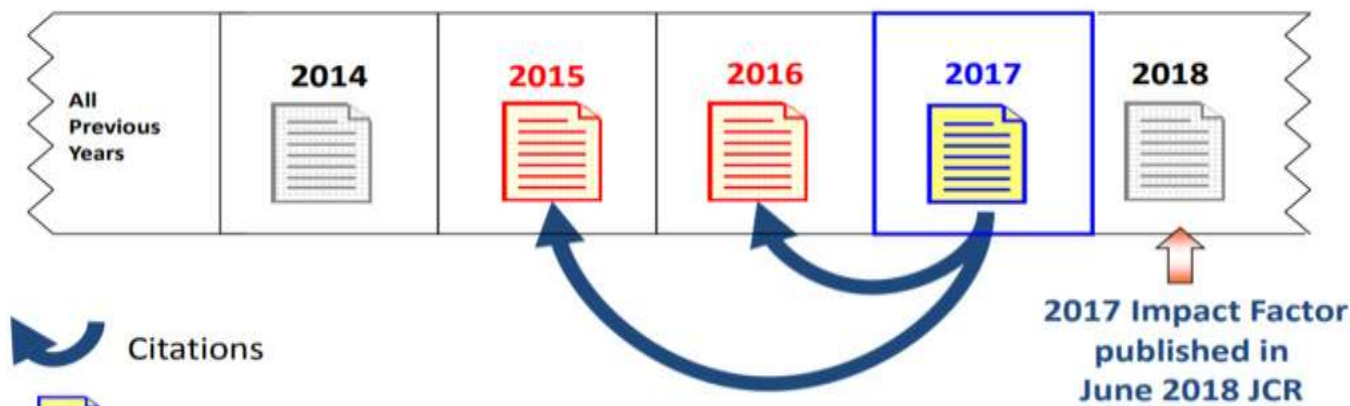
Workshop Brazil Oct. 2018



(Journal) Impact factor

The impact factor of a journal for year x , is the ratio between the sum of references in year x to papers in the journal in year $x-1$ and $x-2$ divided by the number of publications in year $x-1$ and $x-2$ (all based on Web of Science data – ca. 11000 journals) - “Clarivate Analytics Journal Citation Reports”

$$IF_x = \frac{Citations_{x-2} + Citations_{x-1}}{Publications_{x-2} + Publications_{x-1}}$$



Workshop Brazil Oct. 2018

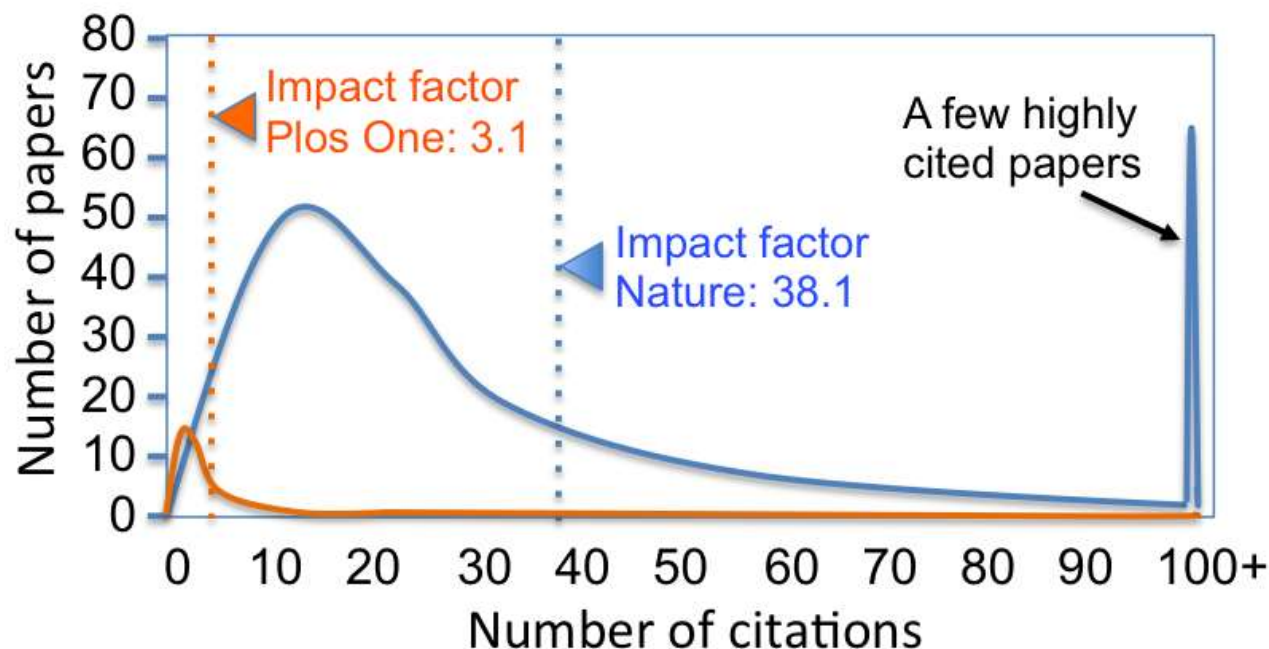


(Journal) Impact factor

.... *Please note:*

- JIF can only be calculated after completing a minimum of 3 years of publication. New journals have NO IF
- JIF is a quotient factor only and is not a quality factor.
- JIF is not related to quality of content and quality of peer review.
- Review Journals which publishes more review articles will get highest impact factors.
- JIF is very discipline dependent.
- JIF is dependent on the database use (WOS)
- JIF may be independent of the real 'impact' of the work among investigators and scientific communities.
- Self-citations and purposeful addition of the same journal article with the favorable editorial policies may cause the journals or publishers to be not considered for the evaluation of the impact factor.

Few articles with many citations determine IF



Journal impact factors are influenced heavily by a small number of highly cited papers. In general, most papers published in 2013–14 received many fewer citations than indicated by the impact factor. Two journals (Nature [blue], PLOS One [orange]) are shown to represent a highly cited and less cited journal, respectively. Note that the high citation impact of Nature is derived from relatively few highly cited papers. Modified after Callaway 2016



Other bibliometric measures

Cited half-life: the median age of the articles that were cited in Journal Citation Reports each year. E.g., if Cited half-life time for a journal in 2017 is 5, it means that half of the articles cited in 2017 were from before 2012 and the other half from 2012-17

CiteScore based on citation counts in a given year (e.g. 2015) to documents published in **three** previous calendar years (e.g. 2012 – 14), divided by the number of documents in these **three** previous years (e.g. 2012 – 14) using Scopus (ca. 36000 journal of which 23000 are still active

Accept rate ratio between number of accepted articles and received articles



Other bibliometric measures

More elaborate bibliometrics

Eigenfactor® score is a rating of the total importance of a specific journal. Journals are rated according to the number of incoming citations, with citations from highly ranked journals weighted to make a larger contribution to the **Eigenfactor**® than those from poorly ranked journals. As a measure of importance, the **Eigenfactor**® score scales with the total impact of a journal. Journals generating higher impact to the field tend to have larger **Eigenfactor**® scores.

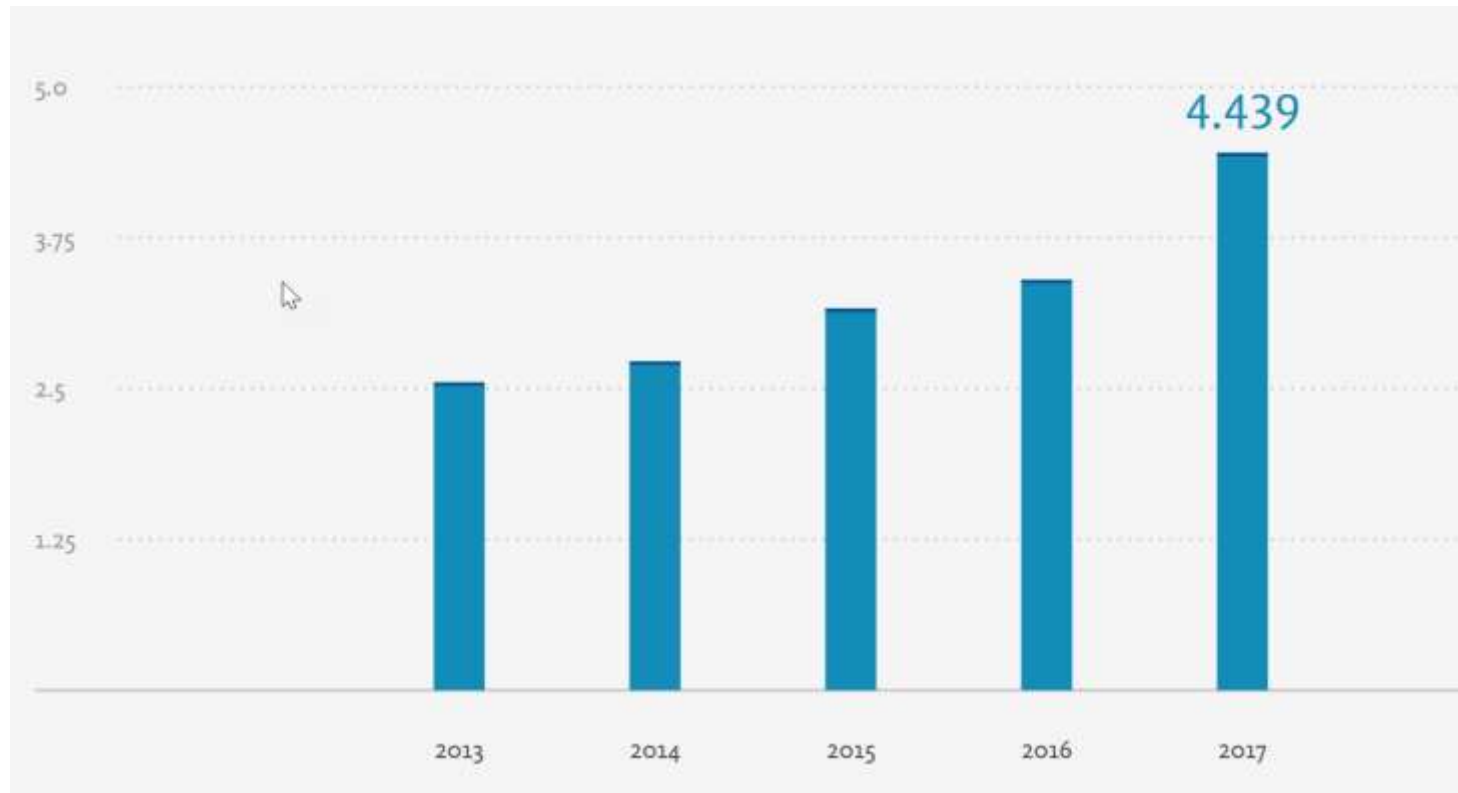
Article Influence is calculated by dividing the **Eigenfactor**® score by the percentage of all articles recorded in the Journal Citation Reports that were published in a specific journal. The **Article Influence** score measures the average influence per article of the papers in a journal.

<http://www.eigenfactor.org>



Bibliometric data

Development of a journal





Bibliometric data

Development of a journal

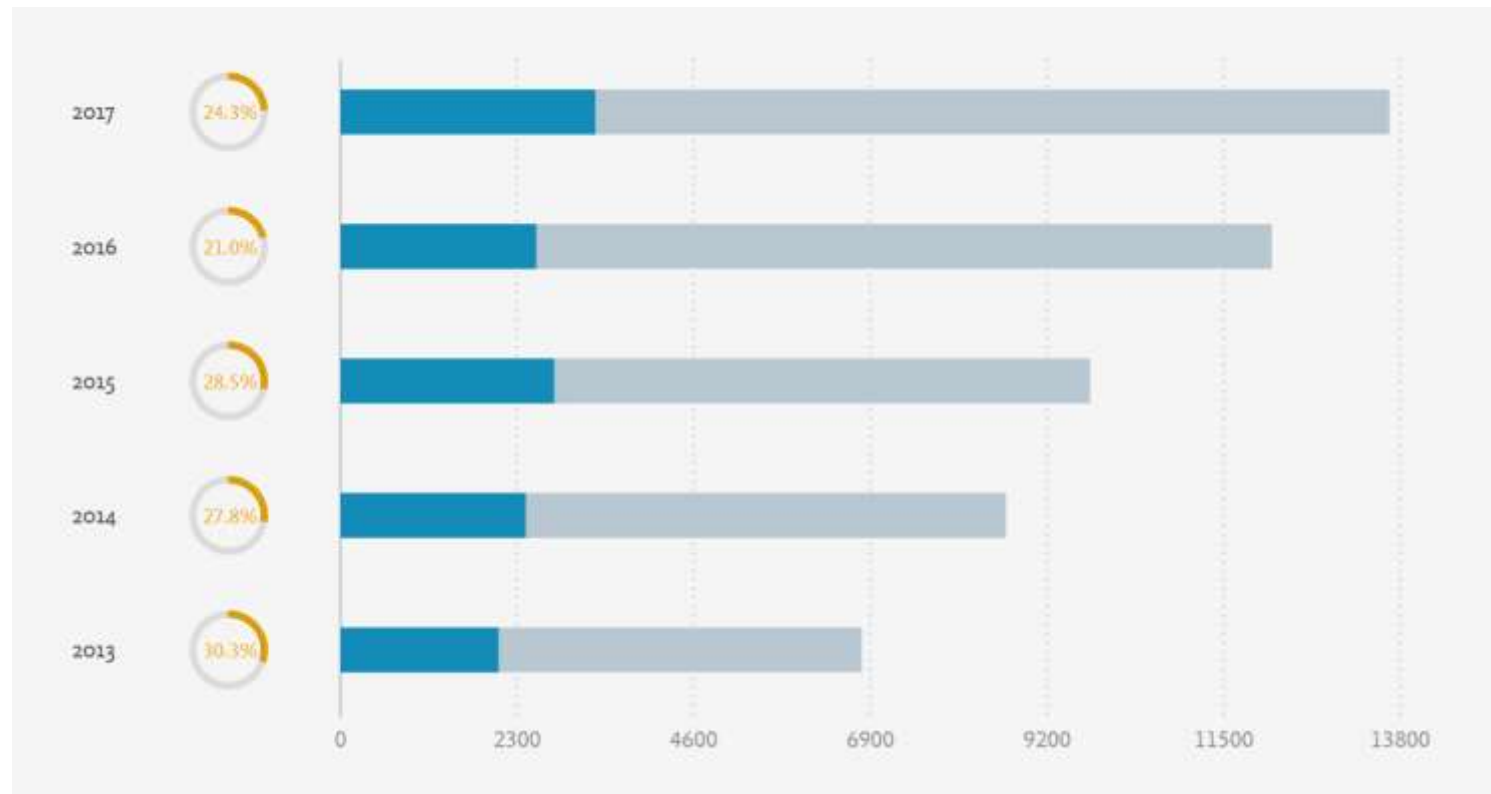
Article Influence & Eigenfactor





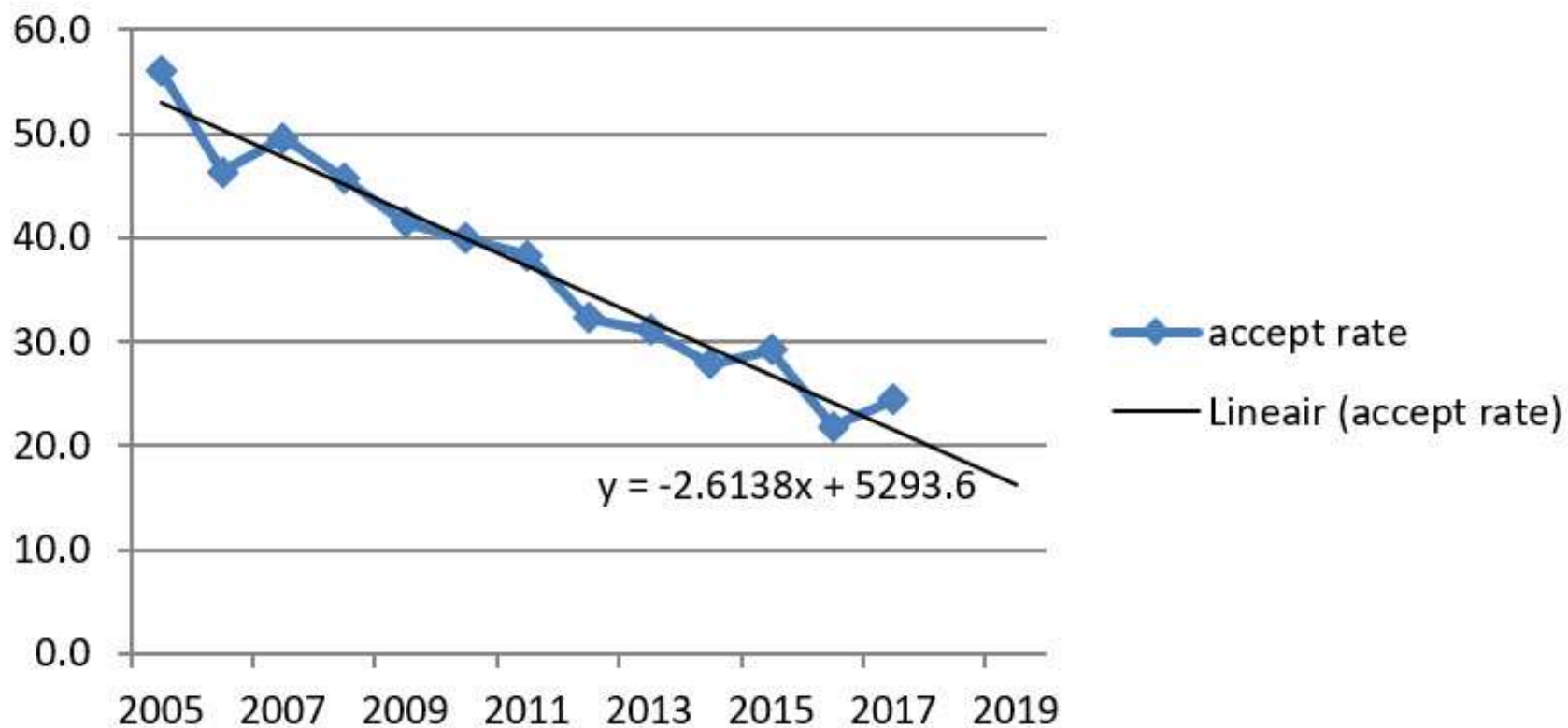
Bibliometric data

Development of a journal

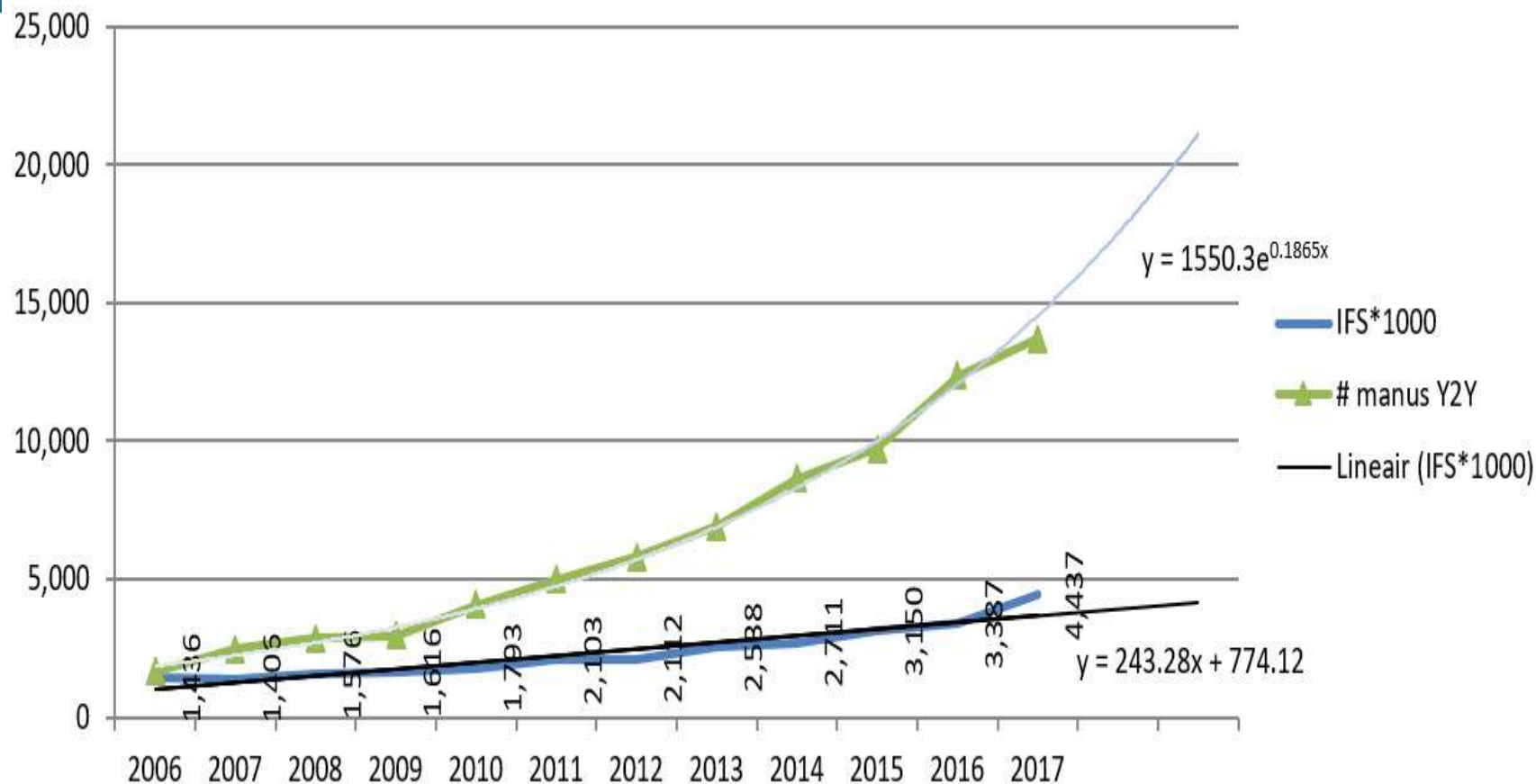




Is Applied Surface Science !! accept rate



Applied Surface Science





Applied Surface Science

Country	Total # submissions	Accept rate
Argentina	39	43.6
Brazil	189	24.9
Chile	17	23.5
Colombia	20	30.0
Mexico	75	24.3
China	7193	24.2
India	1256	19.7
Overall	13705	24.6



The future for bibliometric measures

- More complex multiparameter measures
- Bibliometric measure “vectors”
- Discipline normalized bibliometric parameters
- Institution subscriptions for insights of own and other scientists

Workshop Brazil Oct. 2018

Resources for the (young) scientist

<https://researcheracademy.elsevier.com/>

The screenshot shows the Researcher Academy website. At the top, the Elsevier logo is on the left, and navigation links for 'Learn', 'Career path', 'Blog', and user icons are on the right. The main header features the text 'Unlock your research potential' followed by a description of the platform's offerings and a 'Start learning' button. Below this is a horizontal timeline with five stages: Research Preparation, Writing for Research, Publication Process, Navigating Peer Review, and Communicating Your Research. The 'Latest' section at the bottom displays three featured resources: 'Writing Skills' (a video on turning a thesis into an article), 'Ensuring Visibility' (a video on conference skills), and 'Fundamentals of Publishing' (a video on ORCID ID).

Researcher Academy

Learn Career path Blog

Unlock your research potential

Navigate your research journey with Researcher Academy. Free e-learning modules developed by global experts. Career guidance and advice. Research news on our blog.

Start learning >

RESEARCH PREPARATION

WRITING FOR RESEARCH

PUBLICATION PROCESS

NAVIGATING PEER REVIEW

COMMUNICATING YOUR RESEARCH

Latest

WRITING SKILLS
How to turn your thesis into an article
1 h

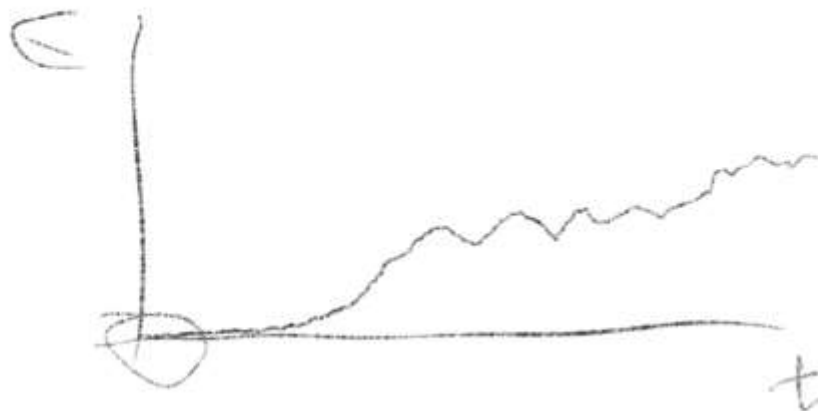
ENSURING VISIBILITY
Conference skills for researchers
30 m

FUNDAMENTALS OF PUBLISHING
10 reasons to get – and use – an ORCID ID
15 m

New bibliometric measure from Sao Paulo

$$E(R_{ess}) = \sum W_j R_{essj}$$

GUIHERME D. ARAUJO



It took a lot of concentration



New bibliometric measure from Natal

$$S = \frac{\sum_i n_i I_i \times 0.2}{\sum_i n_i}$$



João
Santos

Also in Natal it required concentration



Advertisement.....

The poster is for the 3rd International Conference on Applied Surface Science (ICASS). It features a dark red background with a large white 'ICASS' logo at the top left. To the right of the logo, the dates '17-20 June 2019' and the location 'Pisa Congress Palace, Pisa, Italy' are written in white. Below the logo, the full name of the conference is written in white. A paragraph of text in white describes the conference's focus on current research in surface science. To the right of this text is the Elsevier logo, which includes a tree and the word 'ELSEVIER'. Below the text, a list of conference topics is provided in white. At the bottom left, a yellow circular badge contains the text 'SUBMIT YOUR ABSTRACT BY 18 January 2019'. At the bottom right, a photograph of the Pisa Congress Palace and the Leaning Tower of Pisa is shown. Overlaid on the bottom right of the poster is the text 'SUBMIT YOUR ABSTRACT ONLINE: elsevier.com/icass-conference' in white.

ICASS

17-20 June 2019
Pisa Congress Palace, Pisa, Italy

3RD INTERNATIONAL CONFERENCE ON APPLIED SURFACE SCIENCE

We are delighted to announce the **3rd International Conference on Applied Surface Science (ICASS)**, which will be held at the Pisa Congress Palace, Pisa, Italy on 17-20 June 2019.

ICASS will report on and discuss current research on the role and use of surfaces in chemical and physical processes, related to catalysis, electrochemistry, energy, new functional materials, nanotechnology and characterization techniques/methods. Do not miss this opportunity to hear and discuss about recent scientific developments in applied surface science and submit your abstract soon.

ORGANISED BY

ELSEVIER

CONFERENCE TOPICS

- Surface science of catalysis, electrocatalysis and photocatalysis
- Surface engineering and functionalization
- Functional surfaces and coatings
- Surface science applied to energy conversion and storage
- Surface nanotechnology and devices
- Biointerfaces
- Electrochemistry at surfaces and interfaces
- Advances in surface characterization tools
- Environmentally-friendly materials
- Semiconductors – surface and interface
- 2D layered materials and assembling

**SUBMIT YOUR ABSTRACT BY
18 January
2019**

**SUBMIT YOUR ABSTRACT ONLINE:
elsevier.com/icass-conference**

Thank you

THERE IS
NO RIGHT WAY
TO DO
A WRONG THING.

