Your research footprint:

tracking and enhancing scholarly impact

Presenters: Marié Roux and Pieter du Plessis

Authors: Lucia Schoombee (April 2014) and Marié Theron (March 2015)

Biblioteek- en Inligtingsdiens

Library and Information Service

UNIVERSITEIT STELLENBOSCH UNIVERSITY

Outline

- Introduction
- Citations analysis
- H-, g- and m-indices
- Data sources (Scopus, WOS, Google Scholar & others)
- Webometrics & Altmetrics
- Increasing your footprint (a few tips)
- Final remarks

Outcomes

- Create citation reports in Scopus & WOS
- Calculate h-index, m-index and g-index
- Find and understand Journal Impact Factors
- Create a profile in Google Scholar Citations
- Be aware of various altmetrics and webometrics
- Be aware of a few ways to enhance your footprint

Introduction

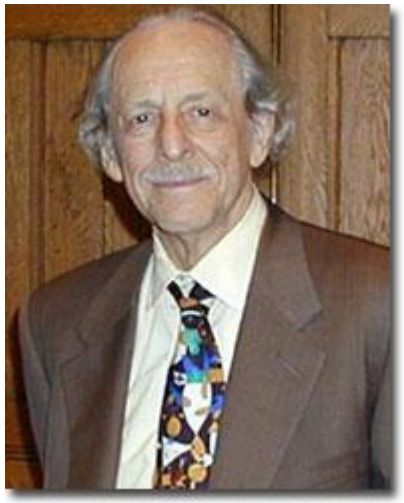
Prof Dermott Diamond, National Centre for Sensor Research, Dublin City University talks about Bibliometrics for the individual

What is citation analysis?

Citation analysis is a way of measuring the impact of an author, an article or a publication, by counting the number of times that author, article or publication has been cited by other works

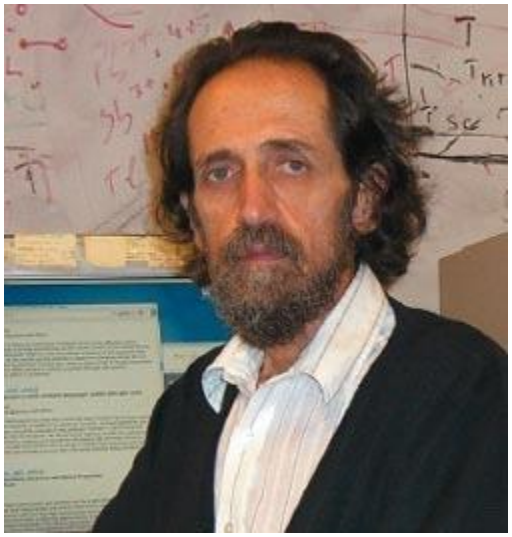
Citation indexes

- Citation information is found in citation indexes
- A citation index is a bibliographic index which does not only include a specific publication but also the references that were made to that publication
- The most prominent citation indexes are Scopus, Web of Science and Google Scholar



Dr Eugene Garfield, founder of citation indexing

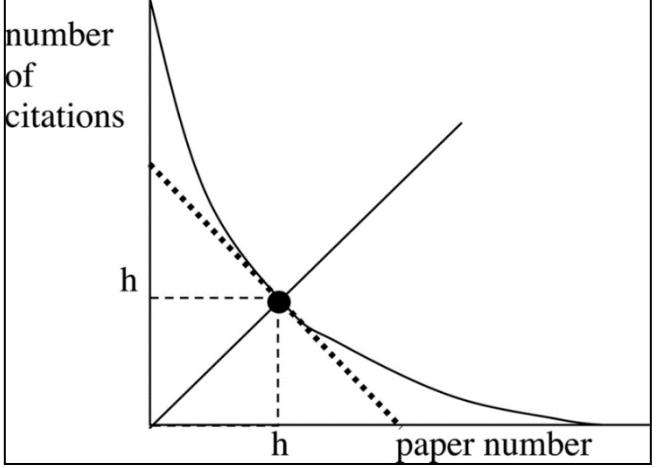
h-index



Prof Jorge Hirsch
invented h-index in 2005

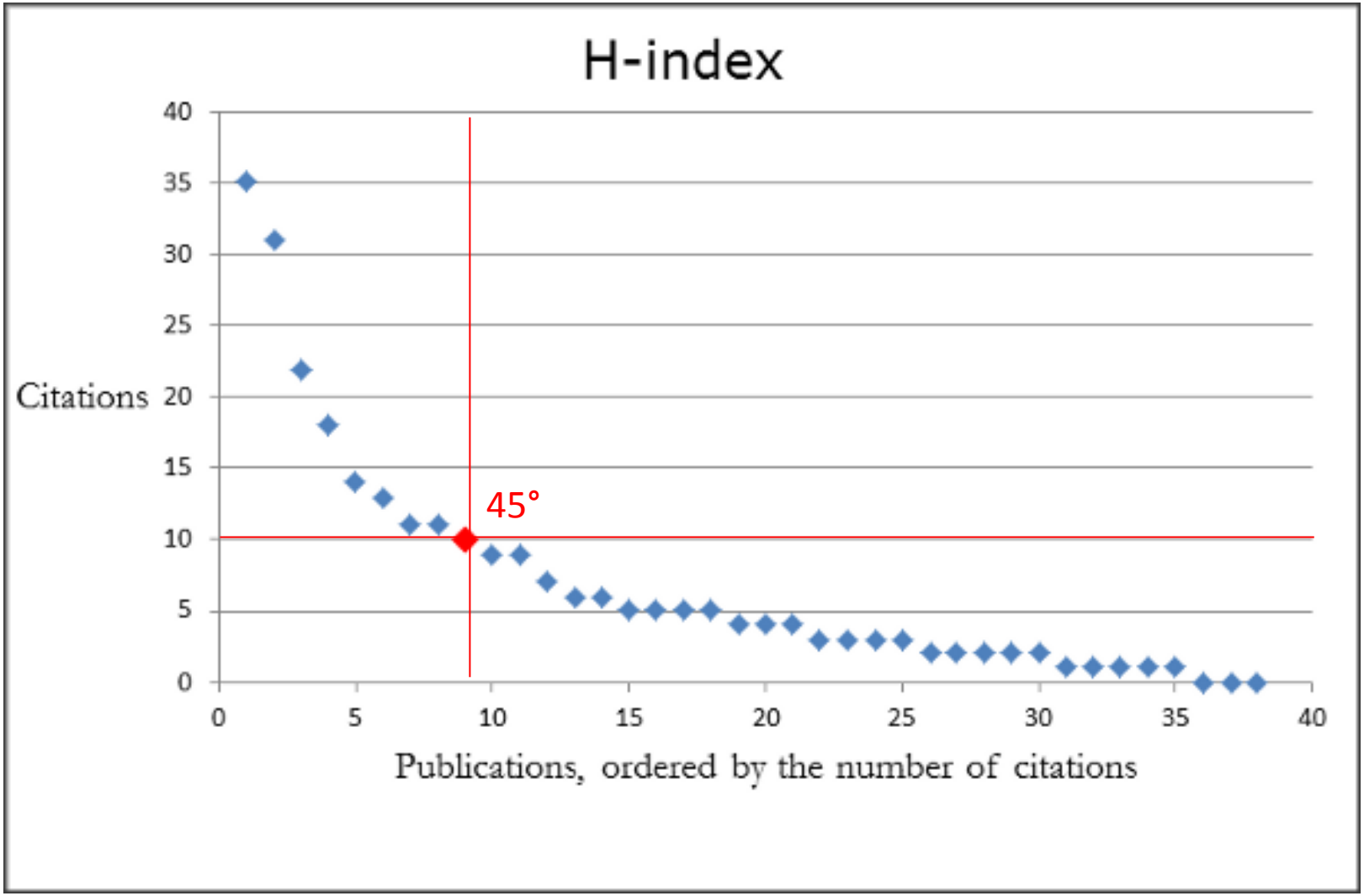
- Developed by Prof Jorge Hirsch in 2005
- The h-index is an equation based on the number of publications and the number of citations per publication
- *h*-index is now recognized as an industry standard that gives information about the performance of researchers and research areas that is very useful in some situations

h-index formula



- *A scientist has an h*-index of 9 if his top 9 most-cited publications have each received at least 9 citations; it is 13 if an entity's top 13 most-cited publications have each received at least 13 citations; and so on

[A scientist has index h *if* h *of his/her* N_p *papers have at least* h *citations each, and the other (*N_p – h*) papers have no more than* h *citations each]*


H-index
Citations
40
35
30
25
20
15
10
5
0
45°
0
5
10
15
20
25
30
35
40
Publications, ordered by the number of citations

Advantages of h-index

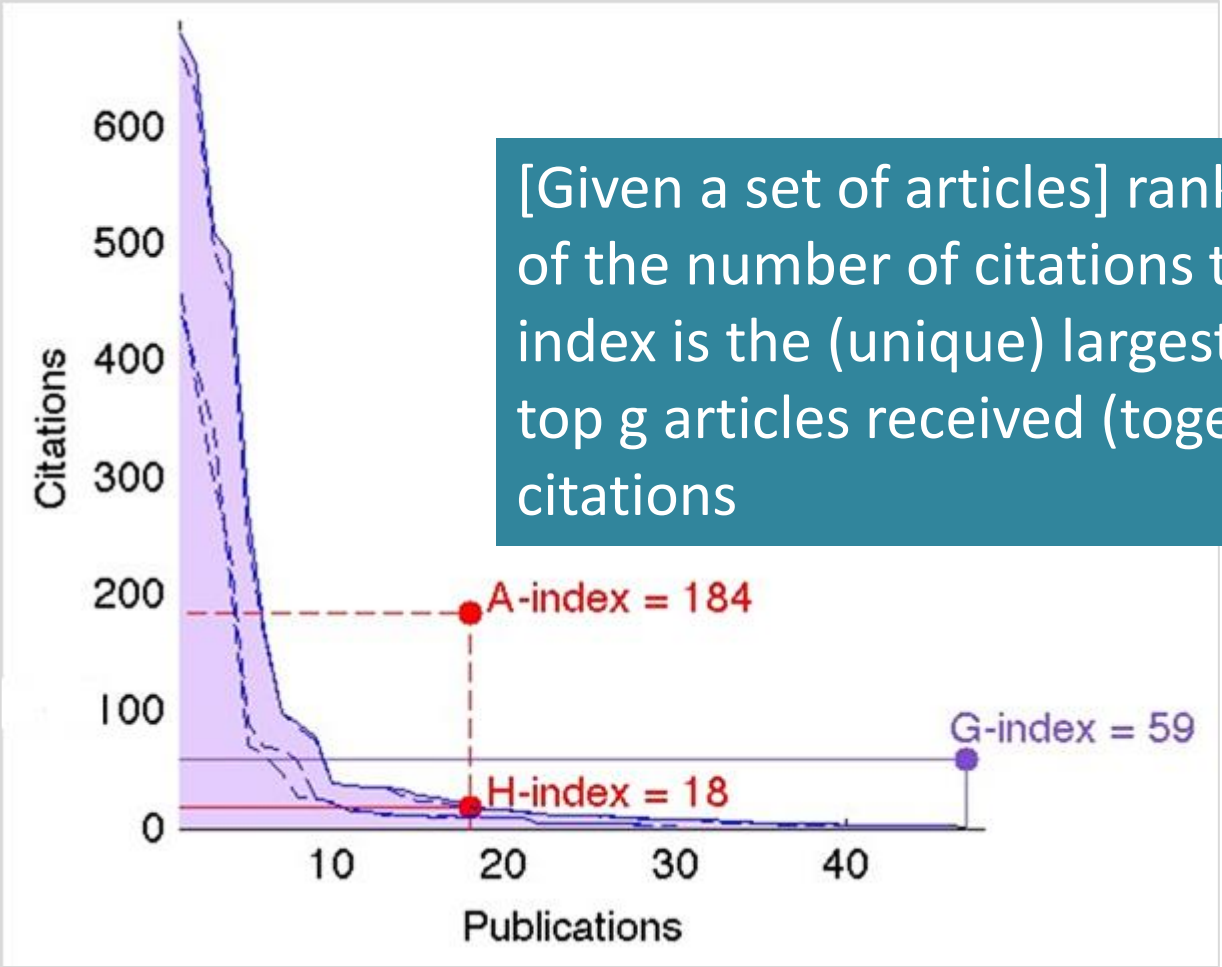
- Combines quantity (number of publications) and impact (number of citations)
- Better than other single-number criteria such as

  Impact factor, total number of documents, total number of citations, citation per paper rate and number of highly cited papers
- Objective measure of performance
- Insensitive to low-cited papers
- Easy to obtain
- Easy to understand

Limitations of h-index

- Publication and citation patterns vary between disciplines
- Not time sensitive
- Highly cited papers are not reflected in the h-index
- Easy to obtain, risk of indiscriminate use and over-reliance
- May change behaviour of scientists (self-citations)
- There are also technical limitations:
  - Difficulty to obtain the complete output of scientists
  - Deciding whether self-citations should be removed or not

g-index



[Given a set of articles] ranked in decreasing order of the number of citations that they received, the g-index is the (unique) largest number such that the top g articles received (together) at least g2 citations

Source: https://who.rocq.inria.fr/Jean-Charles.Gilbert/publications/indices.jpg

g-index calculation

Table 1. Example of calculation of h- and g-index

Rank doc	No. citations	h-index	$Rank^2$	Sum citations	g-index
1	15		1	15	
2	10		4	25	
3	7		9	32	
4	4	X	16	36	
5	0		25	36	
6	*0*		*36*	*36*	X
7	*0*		*49*	*36*	

Method/calculation: Rank by decreasing order the citations of all the documents of the unit. The position where the square of the rank position is equal to the accumulated number of citations corresponds to the g-index

Source: Costas, R., & Bordons, M. (2008). Is g-index better than h-index? An exploratory study at the individual level. Scientometrics, 77(2), 267-288.

m-index

- The h-index depends on the duration of each scientist's career because the pool of publications and citations increases over time.
- In order to compare scientists at different stages of their career, Hirsch presented the "m parameter", which is the result of dividing h by the scientific age of a scientist (number of years since the author's first publication)
- The *m*-index is defined as *h*/*n*, where *n* is the number of years since the first published paper of the scientist

Comparing h-, g- and m-indices

	Brown	Smith	Jones	White	Ray
h-index	27	40	39	24	**45**
g-index	41	**80**	69	34	63
m-index	1,688	2,222	2,167	1,33	**2,5**

The main citation analysis tools

- Scopus
- Web of Science
- Google Scholar

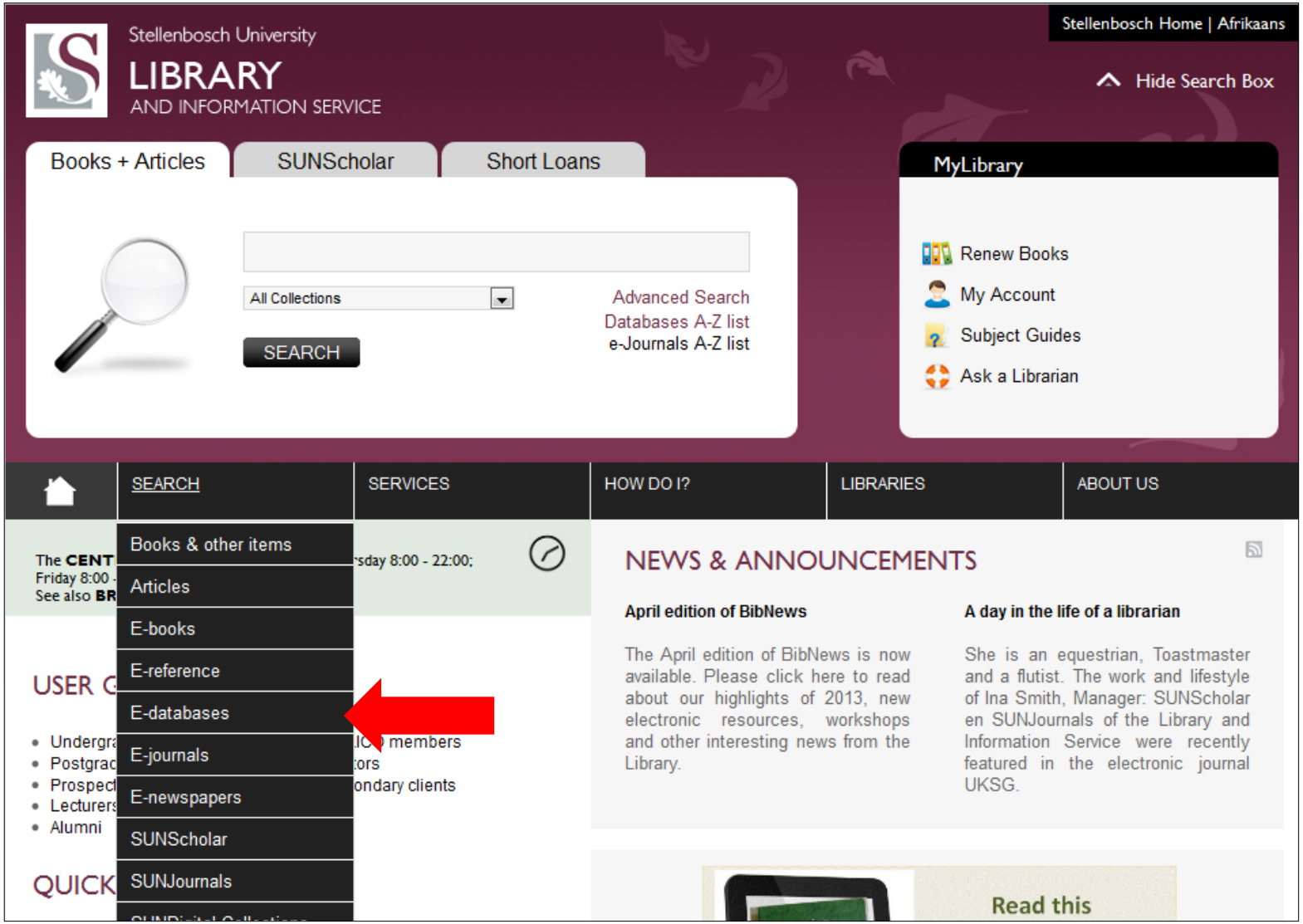
Other citation sources

- HighwirePress Journals
- ScienceDirect
- SpringerLink
- Wiley Online Library
- SciFinder Scholar for chemistry and MathSciNet for mathematics
- Free tool: CiteSeer (**citeseer**.ist.psu.edu/)
- For a comprensive overview see: **Brown, J. D.** (2014). Citation Searching for Tenure & Promotion: An Overview of Issues and Tools. Reference Services Review, 42(1), 6-6.

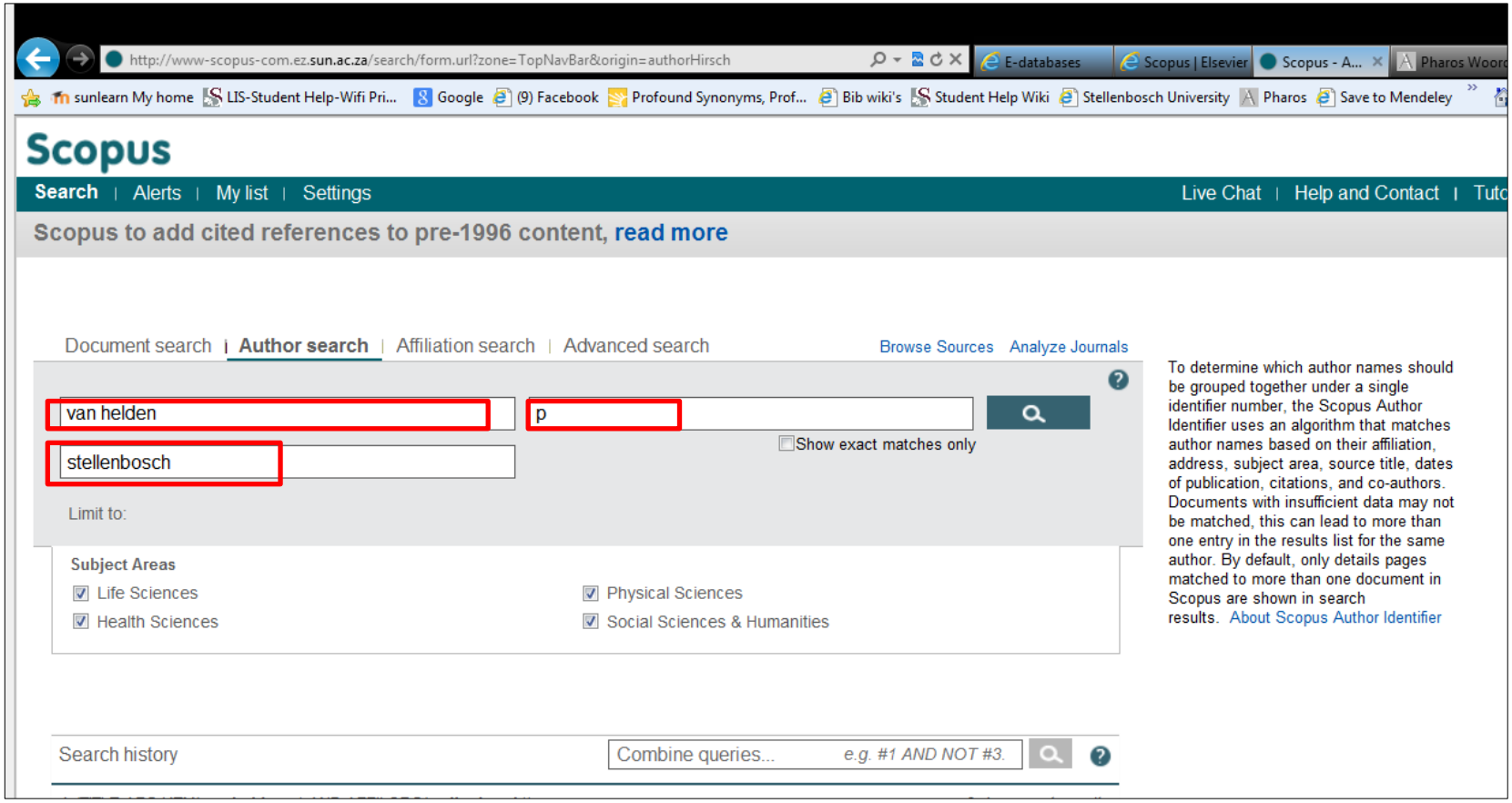
Scopus

- Established 2004 by Elsevier
- 50 million records | 21,000 titles | 5,000 publishers
- Citations from 1996
- Updated daily
- Special features:
  - content from from Europe, Latin America and the Asia Pacific region
  - conference papers, Web pages, patents, articles in press, book series, institutional repositories

Library website > E-databases



Scopus Author search



Scopus Author Identifier

http://www-scopus-com.ez.sun.ac.za/results/authorNamesList.url?sort=count-f&src=al&st1=van+helden&st2=p&

Scopus

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To display profile matches with one document at the top of your list, sort your results list by "Document count (ascending)".

Author last name **"van helden"** , Author first name **"p"** , Affiliation **"stellenbosch"** Edit

4 of 4 author results Hide Profile Matches with One Document | About Scopus Author Identifier

Sort on: Document Count ↓ Author (A-Z)

Show exact matches only

Refine

Limit to Exclude

Source Title

- Molecular Microbiology (2)
- Plos One (2)
- Transboundary and Emerging Diseases (2)
- American Journal of Human Genetics (1)
- American Journal of Respiratory and Critical Care Medicine (1)

Affiliation

- Universiteit Stellenbosch (3)
- Arkansas Department of Health (1)
- Barts and The London Queen

Show documents | View citation overview | Request to merge authors

Van Helden, Paul David Van Helden, Paul D. van Helden, Paul Van Helden, Paul D.	384	Medicine ; Biochemistry, Genetics and Molecular Biology ; Immunology and Microbiology; ...	Universiteit Stellenbosch	Stellenbosch	South Africa
Van Helden, Paul van Helden, Paul	3	Medicine ; Agricultural and Biological Sciences ; Biochemistry, Genetics and Molecular Biology; ...	Universiteit Stellenbosch	Stellenbosch	South Africa
Van Helden, P. van Helden, P.	1	Veterinary ; Immunology and Microbiology	Division of Molecular Biology and Human Genetics DST/NRF Centre of Excellence for Biomedical Tuberculosis Research/MRC Centre for Molecular and Cellular Biology Faculty of Health Sciences Stellenbosch University Tygerberg		South Africa
Van Helden, P. V.	1	Biochemistry, Genetics and Molecular Biology ; Immunology and Microbiology	Universiteit Stellenbosch	Stellenbosch	South Africa

120%

Scopus Citation Overview

http://www-scopus-com.ez.sun.ac.za/cto2/main.url?ctoId=CTODS_492760282&authors=55931032000&authors=700

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Citation overview

Citations received since 1996

Authors : Van Helden, Paul; Van Helden, Paul David

Export | Print

Overview options Hide

Exclude from citation overview: Self citations of selected authors | Self citations of all authors | Citations from books

Sort documents Year descending

Date range 2012 to 2014

Update Overview

387 Cited Documents	Citations <2012	2012	2013	2014	Subtotal	>2014	Total
Total	6314	1182	1144	187	2513	0	8827
1 2014 Mutation rate and the emergence ...					0		0
2 2014 Mycobacterium bovis BCG infectio...					0		0
3 2014 Associations between human leuko...					0		0
4 2014 Evaluation of the AID TB resista...					0		0
5 2013 Prevalence and risk factors for ...					0		0
6 2013 A panel of ancestry informative ...					0		0
7 2013 The role of glutamine oxoglutara...					0		0

Save list | Delete

h index = 45

Author *h* index

View h-Graph

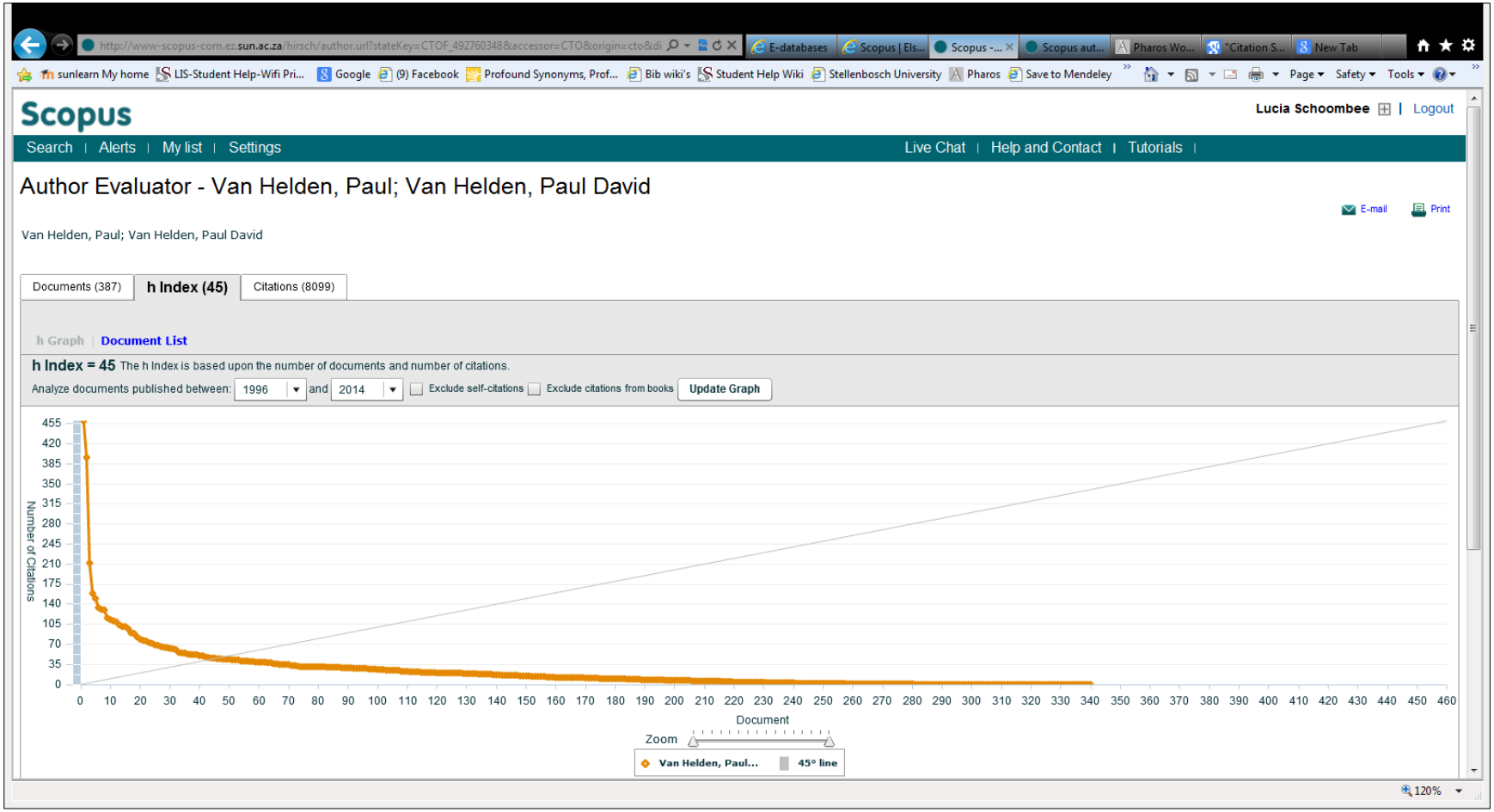
Of the 340 documents considered for the *h* index, 45 have been cited at least 45 times.

Note: The *h* index considers Scopus documents published after 1995.

About h-Graph

120%

Scopus Author Evaluator



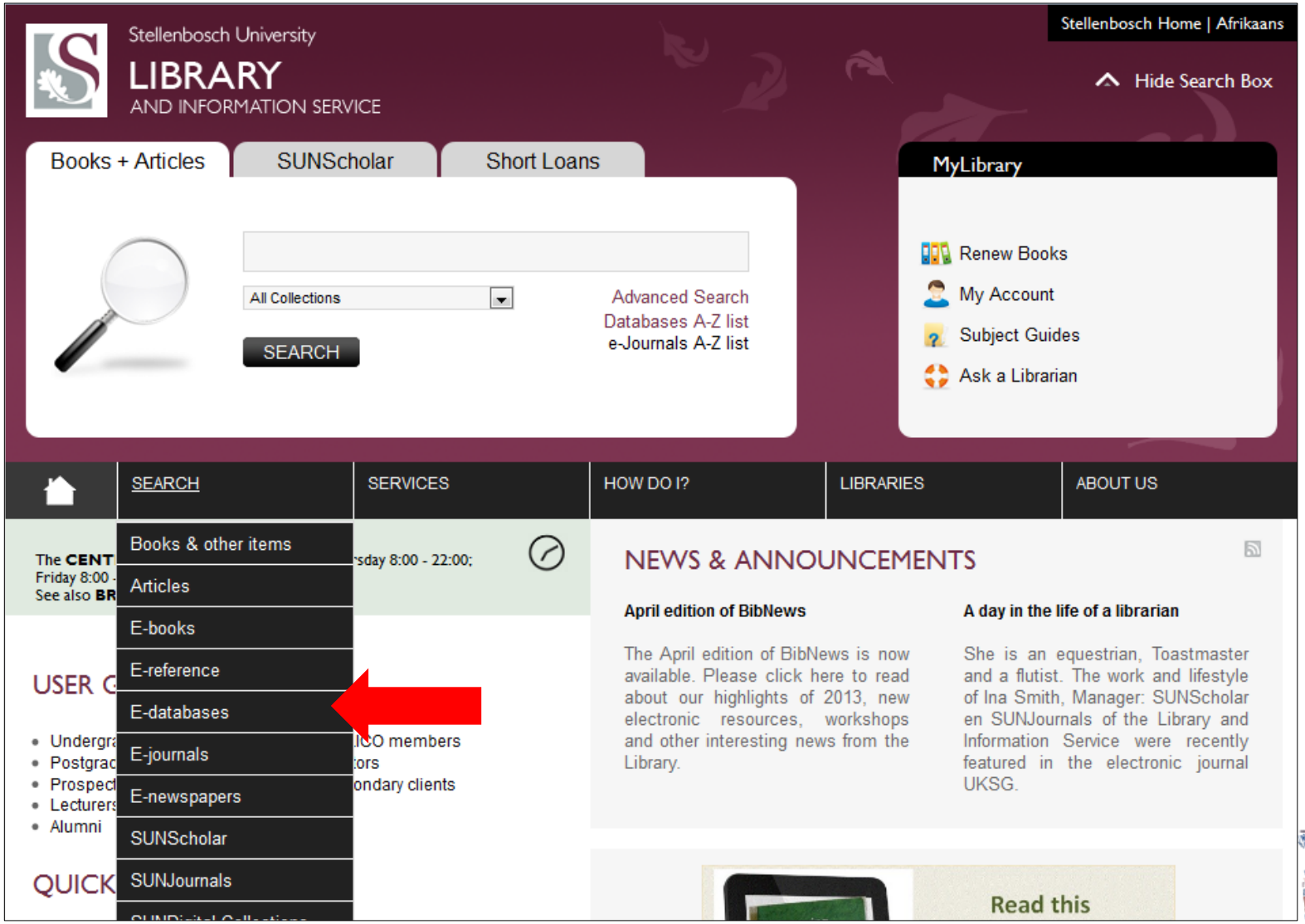
Scopus demonstration

http://library.sun.ac.za

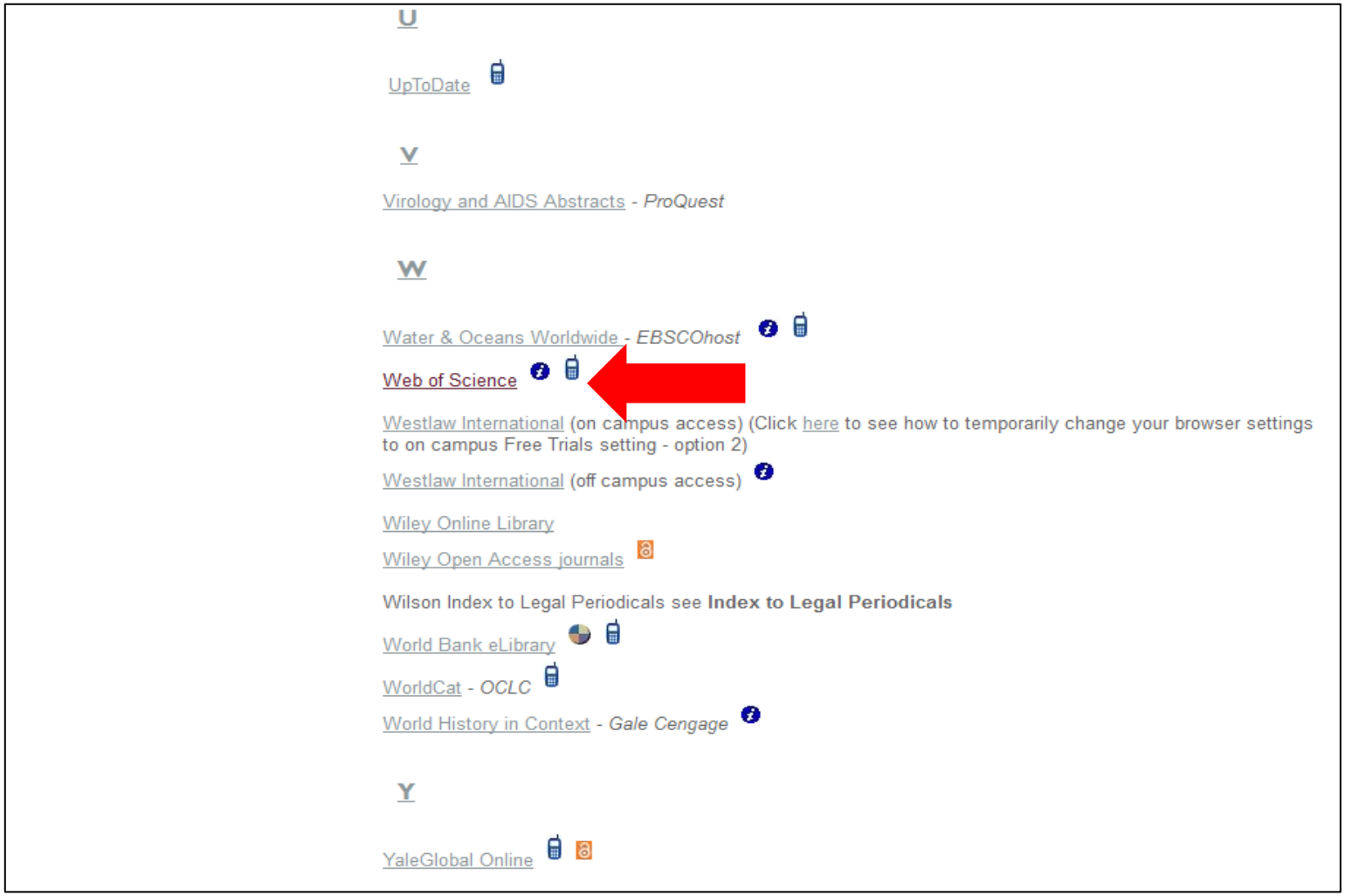
Web of Science

- Thomson Reuters, established in 1960
- Online access to the following databases:
  - Science Citation Index Expanded (1900-present)
  - Social Sciences Citation Index (1900-present)
  - Arts & Humanities Citation Index (1975-present)
  - Book Citation Index (2005-present)
  - Conference Proceedings Citation Index (1993-present)
- 12, 000 journals, incl. open access journals
- and 150,000 conference proceedings

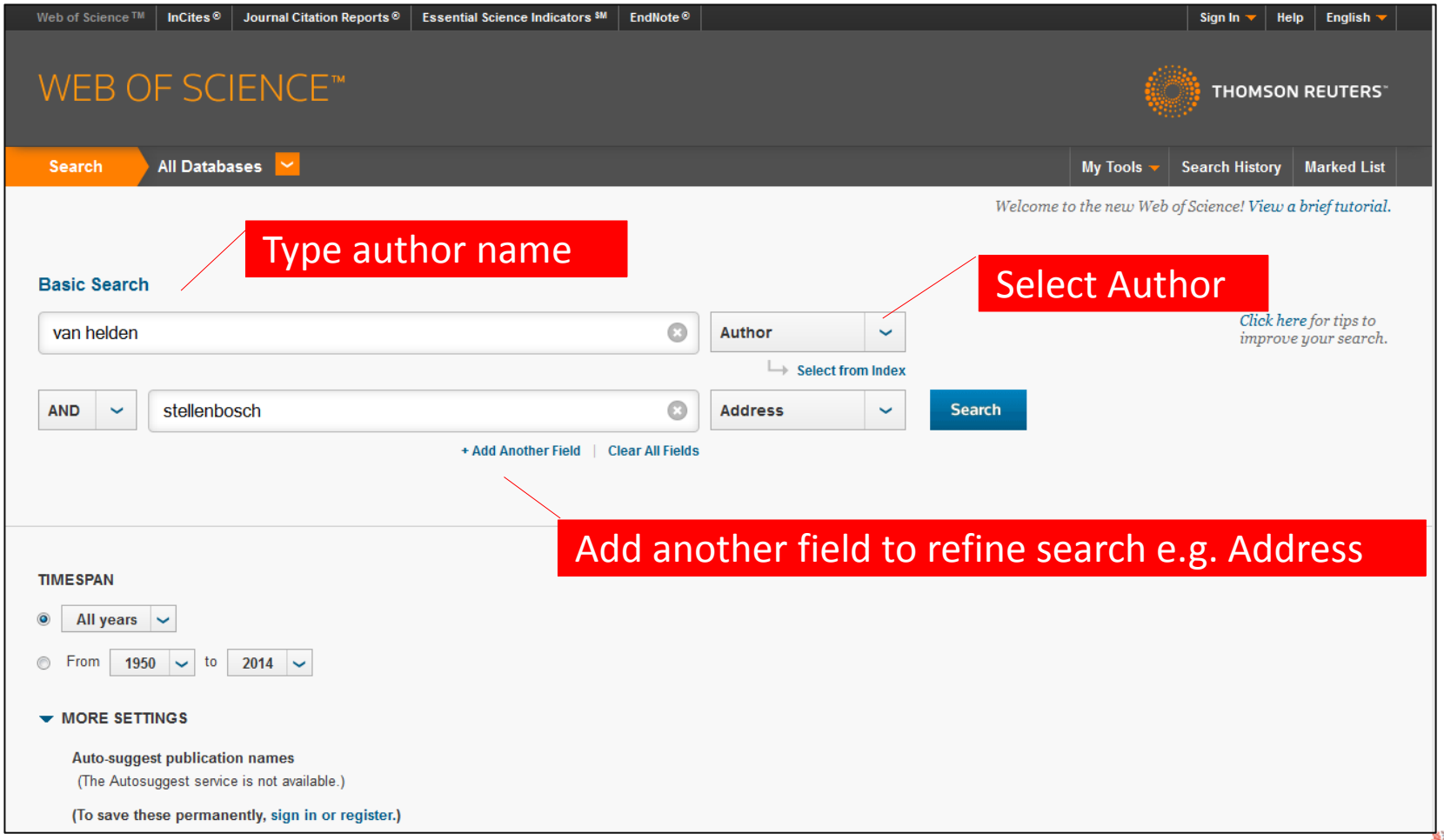
Library website > E-databases



Find Web of Science



Search for author



"Create Citation Report"

Web of Science™ | InCites® | Journal Citation Reports® | Essential Science Indicators SM | EndNote® | Sign In | Help | English

WEB OF SCIENCE™ THOMSON REUTERS™

Back to Search | My Tools | Search History | Marked List

Results: 360
(from All Databases)

You searched for:
AUTHOR: (van helden) *AND*
ADDRESS: (stellenbosch ...More

Refine Results

Search within results for...

Databases

Research Domains
- SCIENCE TECHNOLOGY
- SOCIAL SCIENCES
- ARTS HUMANITIES

Refine

Research Areas
- MICROBIOLOGY
- INFECTIOUS DISEASES
- GENETICS HEREDITY

Sort by: Publication Date -- newest to oldest

Page 1 of 36

Select Page | Save to EndNote online | Add to Marked List | Create Citation Report

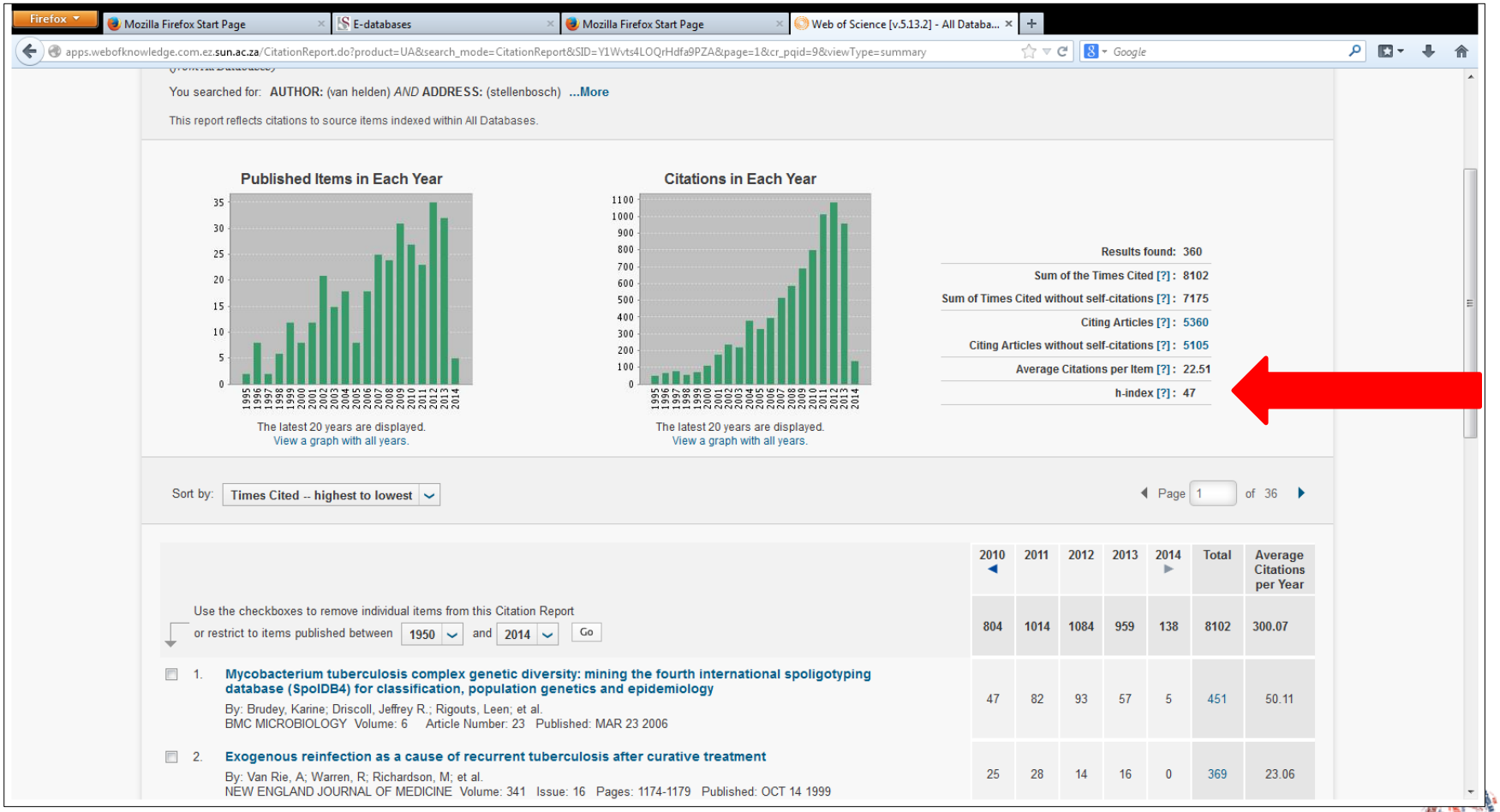
1. **Evaluation of the AID TB Resistance Line Probe Assay for Rapid Detection of Genetic Alterations Associated with Drug Resistance in Mycobacterium tuberculosis Strains**
By: Ritter, C.; Lucke, K.; Sirgel, F. A.; et al.
JOURNAL OF CLINICAL MICROBIOLOGY Volume: 52 Issue: 3 Pages: 940-946 Published: MAR 2014
S·F·X | View Abstract
Times Cite
(from Al

2. **Mutation rate and the emergence of drug resistance in Mycobacterium tuberculosis**
By: McGrath, M.; van Pittius, N. C. Gey; van Helden, P. D.; et al.
JOURNAL OF ANTIMICROBIAL CHEMOTHERAPY Volume: 69 Issue: 2 Pages: 292-302 Published: FEB 2014
S·F·X | View Abstract
Times Cite
(from All D s)

3. **Genome-wide association study of ancestry-specific TB risk in the South African Coloured population**
By: Chimusa, Emile R.; Zaitlen, Noah; Daya, Michelle; et al.
HUMAN MOLECULAR GENETICS Volume: 23 Issue: 3 Pages: 796-809 Published: FEB 1 2014
S·F·X | View Abstract
Times Cited: 0
(from All Databases)

4. **Mycobacterium bovis BCG infection severely delays Trichuris muris expulsion and co-infection suppresses immune responsiveness to both pathogens**
By: Nel, Hendrik J.; du Plessis, Nelita; Kleynhans, Leanie; et al.
BMC MICROBIOLOGY Volume: 14 Article Number: 9 Published: JAN 17 2014
S·F·X | Full Text from Publisher | View Abstract
Times Cited: 0
(from All Databases)

WOS – Citation Report



Google Scholar Citations

Google Scholar Citations

Johann Mouton

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Director of Centre for Research on Evaluation, Science and Technology (CREST), Stellenbosch University

The sociology and methodology of science, science policy and science studies, postgraduate studies and supervision, knowledge pr

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Title 1–20	Cited by	Year
How to succeed in your master's and doctoral studies: A South African guide and resource book J Mouton Van Schaik	2224	2001
Understanding social research J Mouton Van Schaik Publishers	1088	1996
Basic concepts in the methodology of the social sciences HC Marais Hsrc Press	779	1988
The practice of social science research E Babbie, J Mouton Belmont, CA: Wadsworth	176	2001
Basiese begrippe: metodologie van die geesteswetenskappe J Mouton, HC Marais, KP Prinsloo, NJ Rhoodie Raad vir Geesteswetenskaplike Navorsing	125	1990
Metodologie van die geesteswetenskappe: Basiese begrippe J Mouton, HC Marais HSRC Press	120	1988
The practice of social research J Mouton, E Babbie Cape Town: Wadsworth Publishing Company	89	2001
The nationwide audit of ECD provisioning in South Africa T Williams, ML Samuels, J Mouton, K Ratele, N Shabalala, T Shefer, ... Department of Education, Directorate	30	2001
Post-graduate studies in South Africa: Myths, misconceptions and challenges J Mouton South African Journal of Higher Education: Postgraduate Supervision 2007 ...	26	2007
Becoming appropriately modern: towards a genealogy of cultural studies in South Africa	26	1990

Google Scholar

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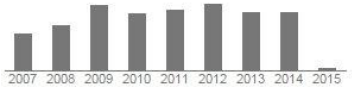
Citation indices	All	Since 2010
Citations	5283	2742
h-index	18	12
i10-index	33	16



Co-authors View all...

Nelius Boshoff

Google Scholar Limitations & Advantages

- Evasive about exactly which resources it indexes
- Update schedule unknown
- Definition of “scholarly” includes grey literature, including article preprints, conference proceedings, and other materials not peer-reviewed
- Duplication of documents
- BUT Google Scholar is “freely” available

Open Access - citation information

- Amazon
- arXiv e-Print Archive
- BioMed Central
- CiteSeerX (currently in beta)
- Cogprints--Cognitive Sciences E-Print
- Archive
- Google Books
- HighWire Press, Stanford University
- IDEAS (Internet Documents in Economics Access Service)
- PLoS (Public Library of Science)
- PROLA (Physical Review Online Archive)
- PubMed Central
- USPTO (US Patent & Trademark Office)

Source: Brown, J. D. (2014). Citation Searching for Tenure & Promotion: An Overview of Issues and Tools. Reference Services Review, 42(1), 6-6.

Journal Impact Factor

- Developed by ISI (now Thompson Reuters) in 1960's
- Most well-known journal metric, most notorious
- Represents the impact a journal has in relation to other journals in a specific field
- Measures the frequency with which the average article in a journal has been cited in particular year
- Despite criticism, widely used

JIF formula

- The calculation of the impact of a journal is based on the average number of times the articles of a journal is cited in a two year period

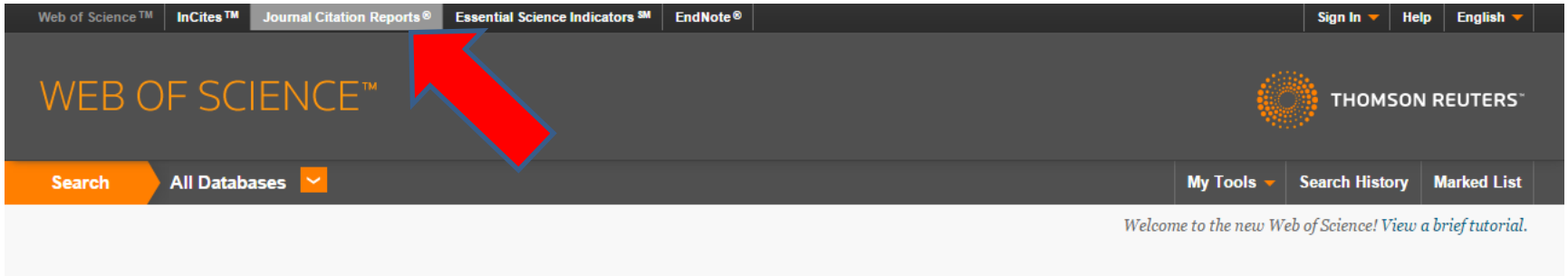
- E.g., the 2011 Impact factor for the journal *Cell* =

$$\frac{\text{Number of times cited during 2009 \& 2010}}{\text{Number of articles 2009 \& 2010}}$$

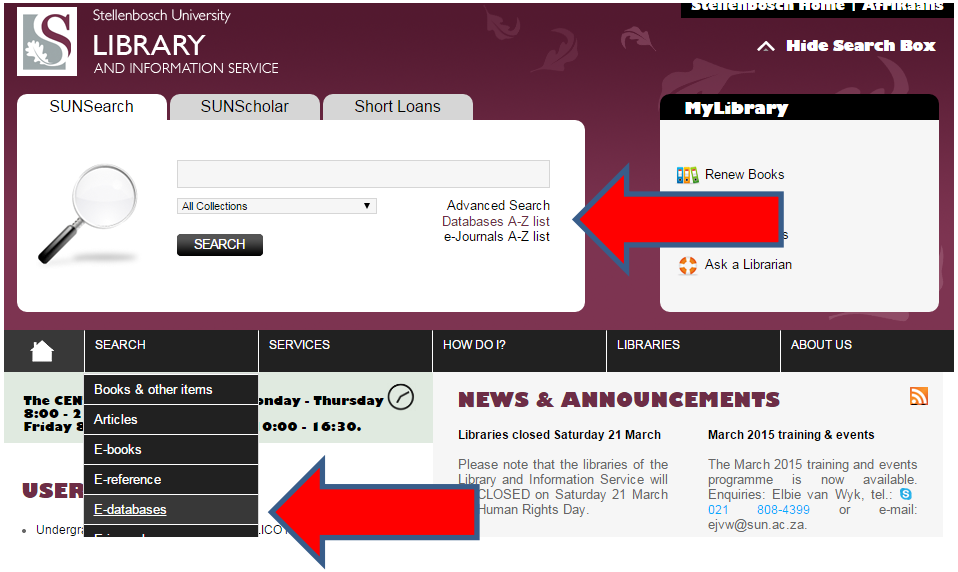
- **= 32.403**

Journal Citations Reports

1) Available from Web of Science



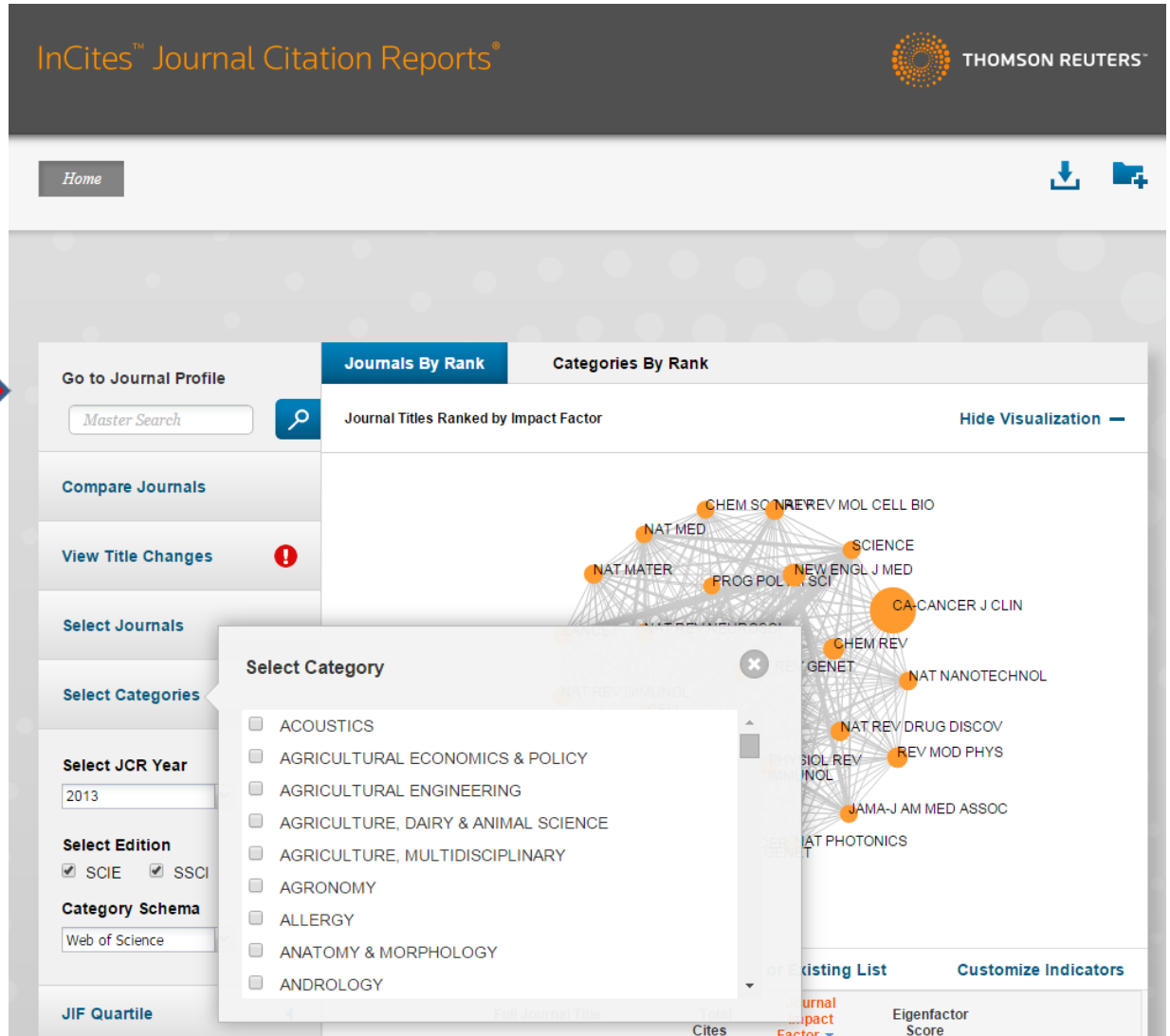
2) Or Library E-Databases: Journal Citation Reports



Journal Citation Reports

Search by individual journal title

Search by subject category



ENERGY

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ENGLAND

Go to Journal Table of Contents Go to Ulrich's

Titles
ISO: Energy
JCR Abbrev: ENERGY

Categories
THERMODYNAMICS - SCIE;
ENERGY & FUELS - SCIE;

Languages
ENGLISH

11 Issues/Year;

Key Indicators

Year	Total Cites Graph	Journal Impact Factor Graph	Impact Factor Without Journal Self Cites Graph	5 Year Impact Factor Graph	Immediacy Index Graph	Citable Items Graph	Cited Half-Life Graph	Citing Half-Life Graph	Eigenfactor Score Graph	Article Influence Score Graph
2013	17,799	4.159	2.576	4.465	0.645	831	3.7	5.5	0.03736	0.891
2012	13,276	3.651	2.174	4.107	0.693	775	4.1	5.4	0.02959	0.857
2011	9,844	3.487	1.967	3.858	0.675	721	4.5	5.9	0.02199	0.794
2010	7,147	3.597	2.277	3.681	0.499	613	4.8	6.4	0.01794	0.862
2009	4,765	2.952	2.390	2.699	0.403	243	5.0	6.3	0.01500	0.715
2008	3,053	1.712	1.530	1.739	0.335	164	5.0	6.4	0.01220	0.586
2007	2,358	1.172	1.006	1.398	0.213	235	6.3	6.9	0.00896	0.496

Individual journal impact history from Master Search

Go to Journal Profile

Master Search

Compare Journals

View Title Changes

Select Journals

Select Categories

Select JCR Year

2013

Select Edition

SCIE SSCI

Category Schema

Web of Science

JIF Quartile

Select Publisher

Select Country/Territory

Impact Factor Range

to

Clear Submit

Journals By Rank | Categories By Rank

Journal Titles Ranked by Impact Factor

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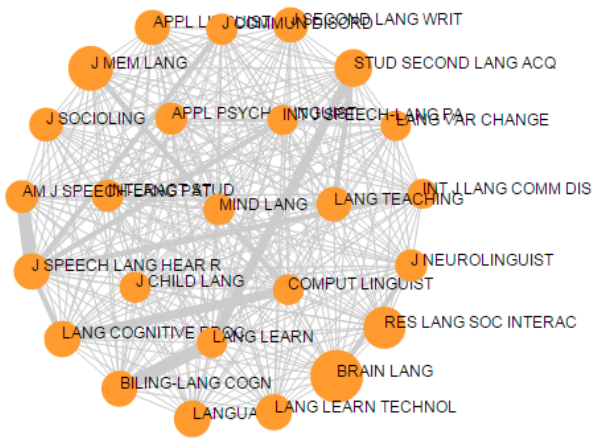


1 - 25 of 169

Compare Selected Journals | Add Journals to New or Existing List | Customize Indicators

		Full Journal Title	Total Cites	Journal Impact Factor	Eigenfactor Score
	1	BRAIN AND LANGUAGE	5,920	3.309	0.00855
	2	JOURNAL OF MEMORY AND LANGUAGE	6,845	2.647	0.01424
	3	RESEARCH ON LANGUAGE AND SOCIAL INTERACTION	665	2.421	0.00259
	4	STUDIES IN SECOND LANGUAGE ACQUISITION	1,337	2.051	0.00186
	5	LANGUAGE	2,276	1.974	0.00316
	6	LANGUAGE AND COGNITIVE PROCESSES	2,017	1.930	0.00519
	7	LANGUAGE LEARNING &	484	1.929	0.00109

Top journals in Linguistics from “Select categories”

Webometrics

- Two methods:
  - link analysis ("the quantitative study of hyperlinks between web pages"
  - Web citation analysis ("using the web to count how often journal articles are cited"
- Web Impact Factor:

  "number of pages linking to a site or area of the Internet divided by the number of pages in that site. A high value of WIFs indicates a site with high impact because there are relatively many pages linking to the site"

Altmetrics

- Variety of research outputs: datasets, software, posters, slides, videos, websites and articles
- Impact is measured by: number of tweets, bookmarks, Likes on Facebook, blog posts, media mentions, etc.
- Altmetrics tracks how many times the outputs have been viewed, downloaded, cited, reused/adapted, shared, bookmarked, or commented upon

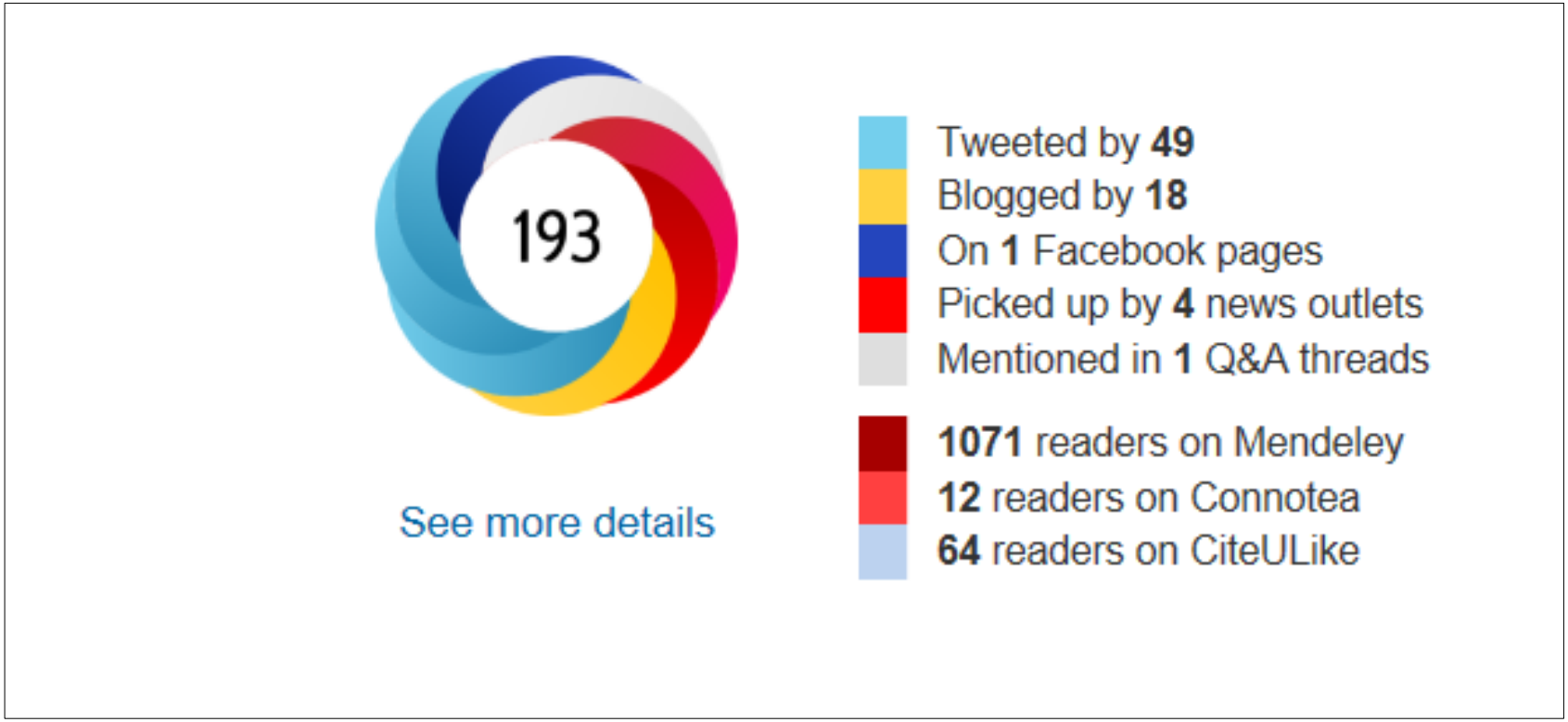
Altmetrics tools

- **Altmetric** collects and analyzes postings about articles and datasets
- **ImpactStory** aggregator of impacts for articles, datasets, blog posts, software, etc.
- **Topsy** an index of the public social web
- **Slideshare** offers views, downloads and other statistics for videos, presentations, slides and documents posted to its website
- **Plum Analytics** and **CitedIn**

Using Altmetric.com

- Go to http://www.altmetric.com/
- Librarians & researchers - Request a free trial account of the Explorer using the form at the bottom of the page
- http://www.altmetric.com/researchers.php
- Go to Product > Explorer and Sign in
- Pick an article by keyword, journal, etc.
- N.B. Altmetrics is an article-based metric
- Download the Altmetric bookmarklet
- http://www.altmetric.com/bookmarklet.php

Altmetric donut



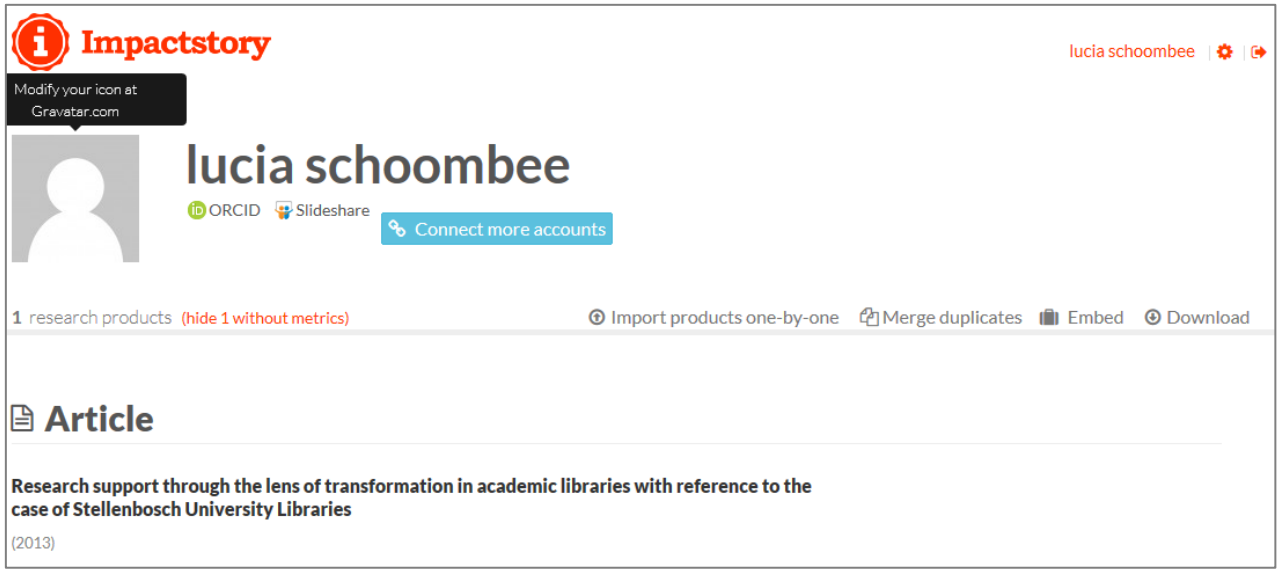
- Badge can be embedded
- Add “altmetric it” to browser favourites toolbar

Altmetrics in Scopus

- Appears in sidebar of Scopus articles
- But, only when there is data available for the article being viewed
- E.g. Priem, J., Groth, P., & Taraborelli, D. (2011). The altmetrics collection. PloS one, 7(11), e48753-e48753.

Impactstory

- Go to www.impactstory.org
- Create a profile
- Impactstory collects your products from slideshare, ORCID, Figshare, Githup



Strategies to improve impact (1)

- Library suggestions: ResearcherID, ORCiD, Open Access, JIF
- Ale Ebrahim, Nader, et al. "Effective strategies for increasing citation frequency." *International Education Studies* 6.11 (2013): 93-99
- Visibility is the key to higher citations
- This paper, by reviewing the relevant articles, extracted 33 different ways for increasing citation possibilities

Strategies to improve impact (2)

- Use a Unique Name Consistently or an unique author id (ResearcherID / ORCiD)
- Use a standardised institutional affiliation and address, using no abbreviations
- Assign keyword terms to the manuscript
- Publish in journal with high impact factor
- Self-archive articles
- Open Access (OA) increases citation rate
- Team-authored articles get cited more

Strategies to improve impact (3)

- Write review articles
- Contribute to Wikipedia
- Join academic social networking sites
- Share detailed research data
- Publish your work in a journal with the highest number of abstracting and indexing
- Create an online CV
- Make a podcast about your research

Limitations of citation analysis

- Papers are cited for a variety of reasons, some of which are not related to the value of the research
- Citation analysis relies heavily on journal content. However many subject areas prefer to publish books and are therefor not well represented in citation indexes.

Metrics - Not an end in itself

- Indicators should be a means to an end not an end in itself
- Triangulate – Metric plus peer-review / expert opinion
- Use indicators in combination (never rely on one indicator)
- avoid the perversion of the science process, use metrics responsibly
- Guard against “publication obesity”

Final comments

"Ultimately, the prime issue is surely to disseminate research knowledge, which has been funded by taxpayers, as effectively and openly as possible, rather than for that knowledge simply to be seen as a static and dormant symbol of research ranking, both individually and collectively."

Steele (2006)

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