

Scholarly Metrics

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Lichtenberger Engineering Library

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Learning Objectives



Be able to interpret some standard citation metrics with caution and know where to find them



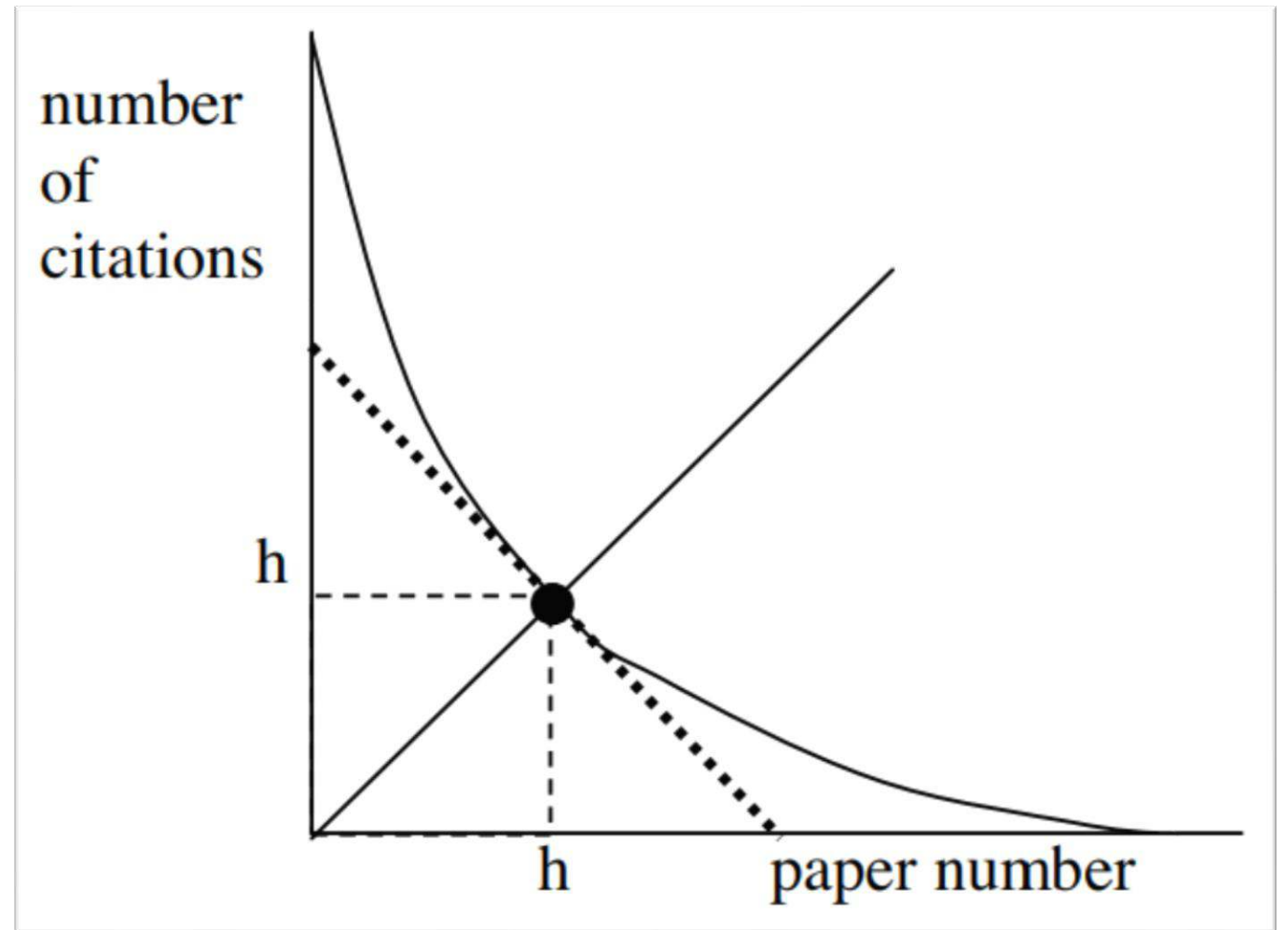
Explore three major sources of citation data including Web of Science (JCR), Scopus and Google Scholar



Identify best practices on broadening your scholarly impact

h-index

- J. E. Hirsch, 2005
- # of papers (h) published that have each been cited at least h times.
- Can be applied to any level of aggregation such as author, institution and journal, etc.



h-index (Cont'd)

An author has 8 papers that have been cited 34, 29, 20, 15, 7, 6, 5 and 4 times.
What is the author's h-index?

<u>Paper #</u>	<u># of Citations</u>	
1	34	
2	29	
3	20	
4	15	
5	7	
6	6	= h-index
7	5	
8	4	

Example from
<https://subjectguides.uwaterloo.ca/calculate-academic-footprint/YourHIndex>

h-index Issues

- Is not influenced by citation counts of papers that have been cited at least h times
- Distinctive. Its value can only increase, never decrease, over time.
- Advantage senior researchers but disadvantage early-career researchers

	John's h-index = 10	Sara's h-index = 5
<u>Paper #</u>	<u># of Citations</u>	<u># of Citations</u>
1	34	62
2	28	50
3	25	40
4	23	32
5	20	5
6	17	4
7	16	3
8	14	2
9	13	1
10	10	1

Finding Your h-index in Web of Science

Search Tools ▾ Searches and alerts ▾ Search History Marked List

[← Back to search](#)

Ratner, Albert ✔ *Claimed by the author* BETA

University of Iowa
Dept Mech Engr
IOWA CITY, IA, USA

Alternative names: Ratner, Albert Ratner, A. Ratner, A

Organization: University of Iowa

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Citation Network i

H-index **9**

Sum of Times Cited **323**

Citing Articles **253**

49 publications from Web of Science Core Collection View as a set of results to export, analyze, and link to full text

Sorted by Date: newest first ◀ 1 of 1 ▶

<p>Experimental study on applying biomass-derived syngas in a microturbine Pedroso Correa, Paulo Sergio, Jr. ; Zhang, Jianan ; Silva Lora, Electro Eduardo ...More</p> <p>APPLIED THERMAL ENGINEERING Volume 146 Page 328-337 Published 2019</p>	<p>TIMES CITED 3</p>
<p>The effect of acetylene black on droplet combustion and flame regime of petrodiesel and soy biodiesel Singh, Gurjap ; Esmaeilpour, Mehdi ; Ratner, Albert</p> <p>FUEL</p>	<p>TIMES CITED 2</p>

Finding Your h-index in Scopus

Author details

Ratner, Albert

[View potential author matches](#)

Author ID: 35579345900 ⓘ

 <http://orcid.org/0000-0002-9281-3185>



Affiliation(s): ⓘ

University of Iowa, Iowa City, United States [View more](#) ▾

Other name formats: [Ratner, A.](#)

Subject area:

[Engineering](#) [Energy](#) [Chemical Engineering](#) [Chemistry](#) [Environmental Science](#) [Agricultural and Biological Sciences](#)
[Physics and Astronomy](#) [Earth and Planetary Sciences](#) [Medicine](#) [Materials Science](#) [Mathematics](#) [Computer Science](#)

 Print  Email

Profile actions

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 [Connect to ORCID](#) ⓘ

 Alerts

[Set citation alert](#)

[Set document alert](#)



[Albert Ratner](#) ↗

69 Documents

[View Mendeley profile](#) ↗

Documents by author

69

[Analyze author output](#)

Total citations

439 by 354 documents

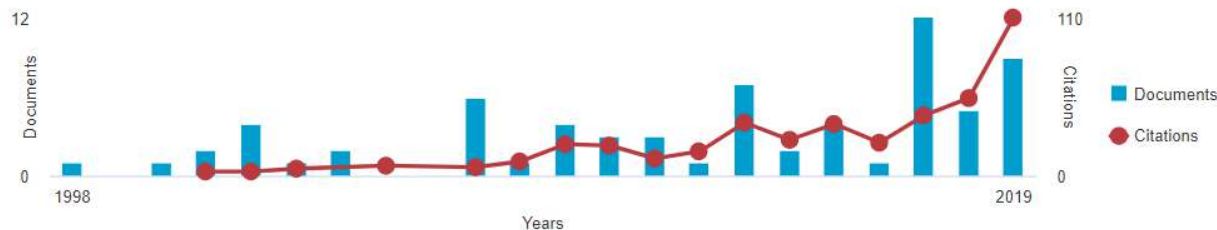
[View citation overview](#)

h-index: ⓘ

11

[View *h*-graph](#)

Document and citation trends:





Albert Ratner

Associate Professor, [University of Iowa](#)
 Verified email at uiowa.edu - [Homepage](#)

Combustion Instability and High Speed and La Biomass Gasification and C... Droplet Behavior in Alternat...

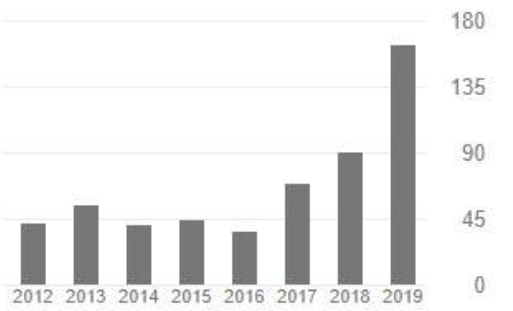
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TITLE	CITED BY	YEAR
Experimental investigation of water emulsion fuel stability G Singh, E Lopes, N Hentges, A Ratner arXiv preprint arXiv:1911.05106		2019
Effect of polymeric additives on ignition, combustion and flame characteristics and soot deposits of crude oil droplets G Singh, M Esmailpour, A Ratner arXiv preprint arXiv:1911.00392		2019
Rotary valve G Singh, A Ratner US PatentApp. 16/312,689		2019

Cited by [VIEW ALL](#)

	All	Since 2014
Citations	676	449
h-index	13	12
i10-index	17	14



Finding h-index in Google Scholar

- i10-index: # of papers with at least 10 citations. Simple and straightforward to calculate. Only used in Google Scholar
- Why an individual's h-index is different in Web of Science (9), Scopus (11) and Google Scholar (13)?

Categories ▾

English ▾

	Publication	<u>h5-index</u>	<u>h5-median</u>
1.	Nature	<u>368</u>	546
2.	The New England Journal of Medicine	<u>352</u>	603
3.	Science	<u>338</u>	511
4.	The Lancet	<u>282</u>	464
5.	Chemical Reviews	<u>266</u>	443
6.	Nature Communications	<u>260</u>	345
7.	Advanced Materials	<u>252</u>	342

h5-index
h5-median

- h5-index: # of papers (h) published in the report year and the preceding four years that have been cited at least h times.
- h5-median: median # of citations in the report year and the preceding four years to those papers that have each been cited at least h time.

Journal Impact Factor

- Average # of times the papers published in a journal over a **two-year** period (the two years prior to the report year) were cited during the report year.
- e.g., IEEE Access

Journal Impact Factor Calculation

$$\text{2018 Journal Impact Factor} = \frac{12,838}{3,133} = 4.098$$

How is Journal Impact Factor Calculated?

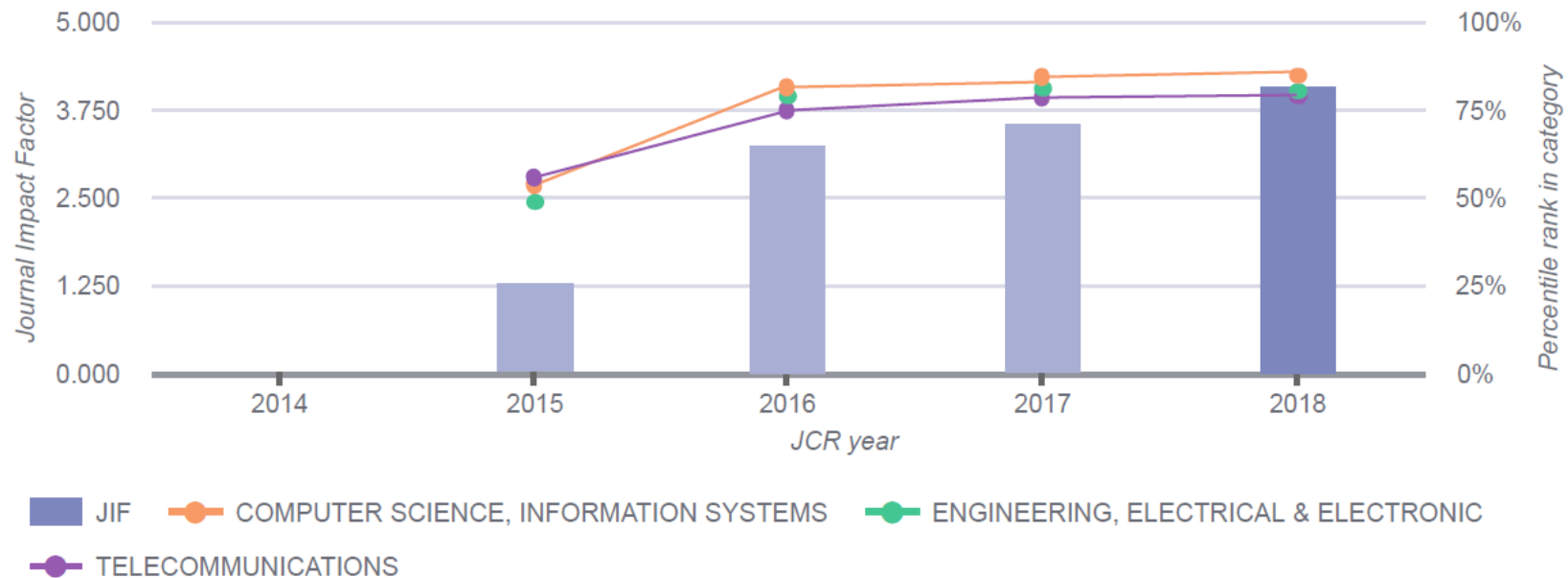
$$\text{JIF} = \frac{\text{Citations in 2018 to items published in 2016 (4,529) + 2017 (8,309)}{12,838}{\text{Number of citable items in 2016 (808) + 2017 (2,325)}{3,133}}$$

Finding Journal Impact Factor in Web of Science

2018 Journal Impact Factor & percentile rank in category for: IEEE Access

4.098

2018 Journal Impact Factor



CiteScore

- Like *Impact Factor*, but based on three years' data
- Average # of times the papers published in a journal over a **three-year** period (the three years prior to the report year) were cited during the report year.
- e.g., IEEE Access



$$4.96 = \frac{\text{Citation Count 2018}}{\text{Documents 2015 - 2017}} = \frac{19,331 \text{ Citations}}{3,899 \text{ Documents}}$$

Finding CiteScore in Scopus



Scopus

Search

Sources

Lists

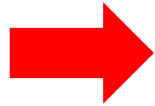
SciVal ↗



Create account

Sign in

Sources



Title



Enter title

IEEE ACCESS

Find sources

Title: IEEE Access x

Filter refine list

Apply

Clear filters

Display options

Display only Open Access journals

Counts for previous 3 years

No minimum selected

1 result

[Download Scopus Source List](#)

[Learn more about Scopus Source List](#)

All v

[Export to Excel](#)

[Save to source list](#)

View metrics for year:

2018



	Source title ↓	CiteScore ↓	Highest percentile ↓	Citations 2018 ↓	Documents 2015-17 ↓	% Cited ↓
<input type="checkbox"/> 1	IEEE Access Open Access Entitled Full Text(opens in a new window)	4.96	96% 9/275 General Engineering	19,331	3,899	84

Putting Citations in Context



Fields/Disciplines: Citation rates vary by discipline.



Time: Citations grow over time at different rates



Document Types: Articles, Reviews, Conference Papers etc.

Source Normalized Impact Per Paper (SNIP)

- Developed by Henk Moed in 2009 and revised in 2012
- Impact Per Paper (IPP): calculated as the # of citations given in the present year to publications in the past **three years** divided by the total # of publications in the past **three years**. (Similar to *CiteScore*)
- Normalized in order to correct for differences in citation practices between subject fields

$$SNIP = \frac{\text{Impact Per Paper (IPP)}}{\text{Relative Database Citation Potential (RDCP)}}$$

SNIP (Cont'd)

$$\mathbf{RDCP(Relative Database Citation Potential)} = \frac{\text{Database Citation Potential (DCP)}}{\text{Median DCP}}$$

- Database Citation Potential (DCP): average # of citations to the publications in the subject field of the journal, counting three proceeding years.
- Example: If a journal published 10 papers in 2008-2010 and these papers were cited 120 times in 2011, DCP is 6 and median DCP is 3, what is the journal's SNIP?

$$RDCP = \frac{DCP}{\text{Median DCP}} = \frac{6}{3} = 2$$

$$SNIP = \frac{\text{Impact Per Paper (IPP)}}{\text{Relative Database Citation Potential (RDCP)}} = \frac{120/10}{2} = 6$$

Finding SNIP in Scopus

Sources

Title [Find sources](#)

Title: [Journal Of Informetrics](#) x [Environmental Science & Technology](#) x [Annals Of Applied Statistics](#) x

Filter refine list

[Apply](#) [Clear filters](#)

Display options

Display only Open Access journals

Counts for previous 3 years

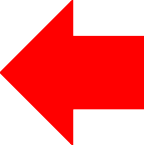
No minimum selected

3 results [Download Scopus Source List](#) [Learn more about Scopus Source List](#)

All [Export to Excel](#) [Save to source list](#) View metrics for year: 2018

	Source title ↓	Documents 2015-17 ↓	% Cited ↓	SNIP ↓	SJR ↓	Publisher ↓
<input type="checkbox"/> 1	Environmental Science & Technology Entitled Full Text (opens in a new window)	4,953	92	1.959	2.514	American Chemical Society
<input type="checkbox"/> 2	Journal of Informetrics Entitled Full Text (opens in a new window)	294	77	1.815	1.952	Elsevier
<input type="checkbox"/> 3	Annals of Applied Statistics Entitled Full Text (opens in a new window)	299	62	1.407	2.249	Institute of Mathematical Statistics

Click on the source title to compare journals



Comparing Journals in Scopus



Source details

[Feedback >](#) [Compare sources >](#)

Environmental Science & Technology

Scopus coverage years: 1958, from 1967 to Present

Publisher: American Chemical Society

ISSN: 0013-936X E-ISSN: 1520-5851

Subject area: [Chemistry: General Chemistry](#) [Environmental Science: Environmental Chemistry](#)

[View all documents >](#)

[Set document alert](#)

[Save to source list](#)

[Entitled Full Text \(opens in a new window\)](#) [Journal Homepage](#)

CiteScore 2018

7.38



[Add CiteScore to your site](#)

SJR 2018

2.514



SNIP 2018

1.959



Comparing Journals in Scopus (Cont'd)

Compare sources

[About compare sources calculations](#)

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[Export](#) [Print](#) [Email](#)

Select up to 10 sources to compare

Selected sources: Annals of Applied Statistics Journal of Informetrics Environmental Science & Technology
[Remove all selections](#)

[Chart](#) [Table](#)

Search by title, publisher, ISSN, and/or subject area

Source title

Enter title *
annals of applied statistics

E.g., Cell, cancer

limit to

All subject areas

[Search](#)

1 Search results

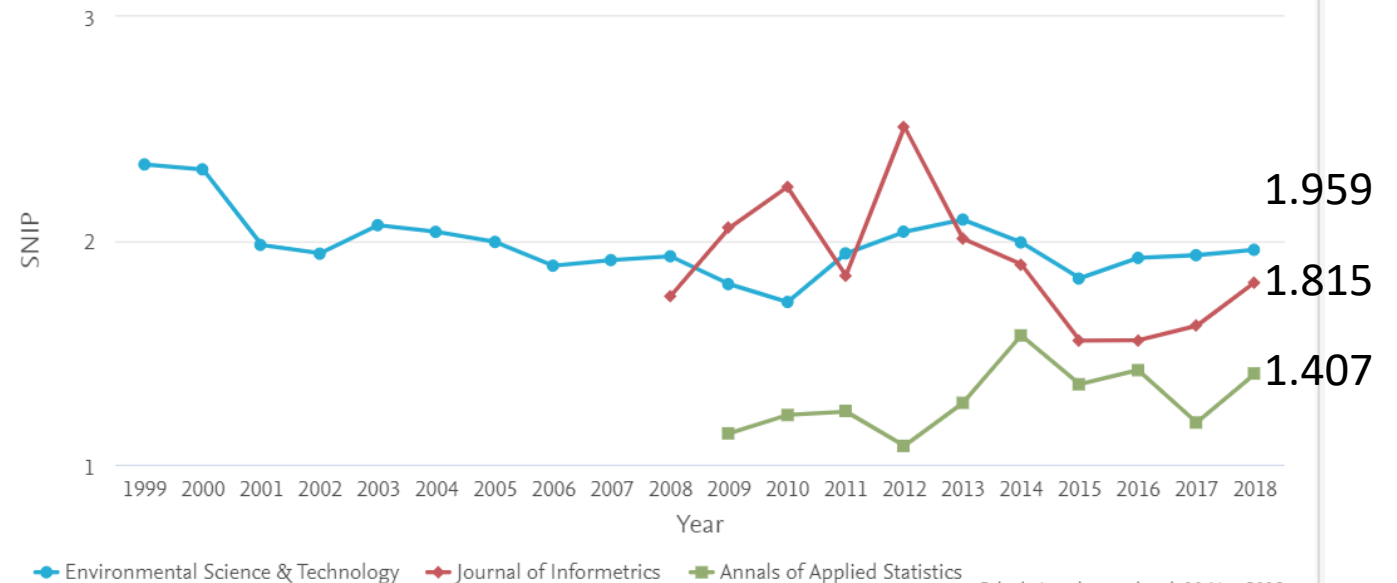
CiteScore

Source

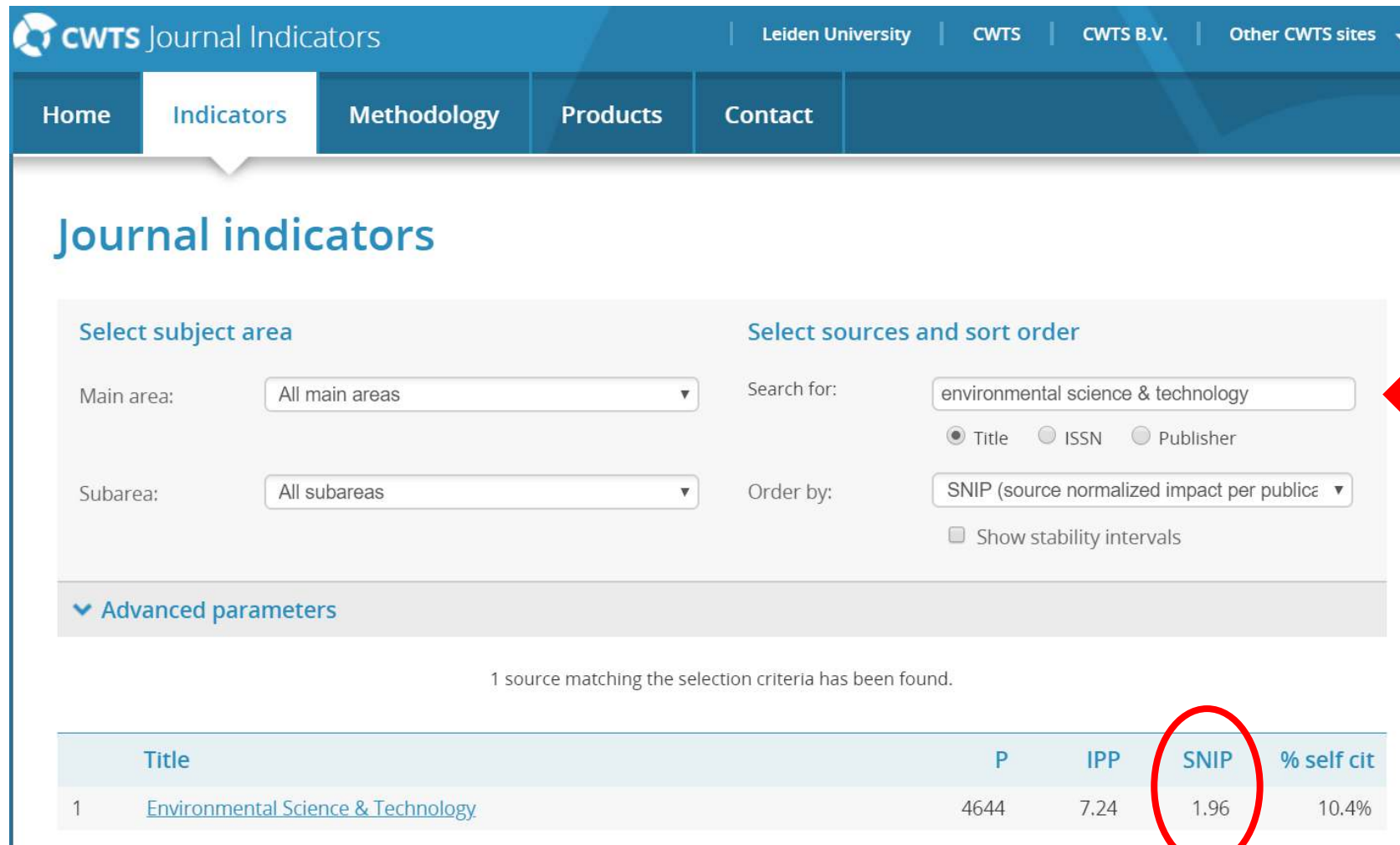
CiteScore

Annals of Applied Statistics 2.19

Source normalized impact per paper by year



Finding SNIP in CWTS Journal Indicators



The screenshot shows the CWTS Journal Indicators website interface. The top navigation bar includes 'Home', 'Indicators', 'Methodology', 'Products', and 'Contact'. The main content area is titled 'Journal indicators' and contains search filters for 'Select subject area' and 'Select sources and sort order'. A red arrow points to the search input field containing 'environmental science & technology'. Below the filters, a message states '1 source matching the selection criteria has been found.' A table displays the search results, with the 'SNIP' column value '1.96' circled in red.

Select subject area

Main area: All main areas

Subarea: All subareas

Select sources and sort order

Search for: environmental science & technology

Title ISSN Publisher

Order by: SNIP (source normalized impact per publica

Show stability intervals

▼ Advanced parameters

1 source matching the selection criteria has been found.

	Title	P	IPP	SNIP	% self cit
1	Environmental Science & Technology	4644	7.24	1.96	10.4%

Category Normalized Citation Impact (CNCI)

- *CNCI* is the citation impact (citations per paper) normalized for subject area, year of publication and document type.

$$CNCI = \frac{\text{Actual Citations}}{\text{Category Expected Citations}}$$

- Example: A Plant Sciences paper published in 2014 has been cited 46 times. Is that good, bad or average performance? (hint: an expected citation rate for the paper is 2.32)

$$CNCI = \frac{46}{2.32} = 19.82$$

Category Normalized Citation Impact (CNCI)

- When a paper belongs to multiple subject categories, the *CNCI* value is calculated with harmonic mean of all **Category Expected Citations** this paper belongs to.
- When calculating a set of papers (the collected works of an individual, institution or country/region), the *CNCI* value is the average of all the papers in the set.

Finding CNCI in InCites

- InCites Benchmarking & Analytics is a citation-based evaluation tool.
- Registration and sign in are required.
- If you are already registered for *Web of Science*, *ResearcherID* or *EndNote*, use the same username and password.

Sign In

Email Address

Password

Sign In

InCites

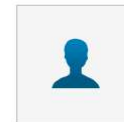
Analysis ▾ Reports ▾ My Organization

 New in InCites

 My Folders

Explore InCites Data

Create dynamic tables and graphs based on your needs.



Researchers



Organizations



Locations



Research Areas



Journals, Books,
Conference
Proceedings



Funding Agencies

Finding Your CNCI

By Attributes

- Person Name or ID
 - Name Unique ID
 - Name
 - X Carmichael, Gregory R.
 - X Carmichael, Greg
 - X Carmichael, Greg R.
 - X Carmichael, Gregory
- Affiliated Organization
- Location



Documents: 100

Bar Graph Times Cited

Dataset: InCites Dataset

Entity Type: Researchers

Time Period: Min: 1980 Max: 2019

Filters: Clear Filters

By Attributes: Person Name or ID (Name selected)

Name	Rank	Affiliation	Web of Science Documents	% Docs Cited	Times Cited	Category Normalized Citation Impact
Baseline for All Items	n/a	n/a	100	81%	2,563	1.68
Carmichael, Greg	1	University of Iowa	5	80%	78	1.54
Carmichael, Greg R.	2	University of Iowa	3	100%	28	0.47
Carmichael, Gregory	3	University of Iowa	8	100%	359	5.02
Carmichael, Gregory R.	4	n/a	19	89.47%	749	1.06
Carmichael, Gregory R.	4	University of Iowa	65	75.38%	1,349	1.51

Update Results

How U.S. News Calculated the Best Global Universities Rankings?

Education > Best Global Universities > Rankings

Best Global Universities Rankings



These institutions from the U.S. and more than 80 other countries have been ranked based on 13 indicators that measure their academic research performance and their global and regional reputations. Students can use these rankings to explore the higher education options that exist beyond their own countries' borders and to compare key aspects of schools' research missions. These are the world's top 1,500 universities.

[See the methodology »](#)



RANKING INDICATOR	WEIGHT
Global research reputation	12.5%
Regional research reputation	12.5%
Publications	10%
Books	2.5%
Conferences	2.5%
Normalized citation impact	10%
Total citations	7.5%
Number of publications that are among the 10% most cited	12.5%
Percentage of total publications that are among the 10% most cited	10%
International collaboration – relative to country	5%
International collaboration	5%
Number of highly cited papers that are among the top 1% most cited in their respective field	5%
Percentage of total publications that are among the top 1% most highly cited papers	5%

Known Issues with Using CNCI

- A single highly cited paper may inflate the *CNCI* values given a small set of papers.
- Very highly cited papers can have an unduly large influence on the *CNCI* value given a large sets of papers (e.g., collected works of an institution).
- If the baseline values for current year is very low, the *CNCI* values for current year can fluctuate more than expected.
- Other indicators
 - % Documents in Top 1%
 - % Documents in Top 10%
 - Average Percentile

Source from <http://help.prod-incites.com/inCites2Live/indicatorsGroup/aboutHandbook/usingCitationIndicatorsWisely/normalizedCitationImpact.html>

Putting It Together...

Normalization assumes that the various fields simply differ in their average citation impact or in the rate at which citations accrue, not in author's reasons for citing or in the inherent meaning of a citation.

Normalization is intended to control for differences in citation rates among fields. But do these field-normalization citation metrics really eliminate disciplinary differences in impact?

Consider complementary citation impact indicators such as average percentile, % documents in top 1% and % documents in top 10% when comparing the relative influence of journals within their disciplines

Why an individual's h-index is different in Web of Science, Scopus and Google Scholar?

Google Scholar



Albert Ratner

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Combustion Instability Biomass Gasification and C... Droplet Behavior in Alternat... and High Speed and La

TITLE	CITED BY	YEAR
Experimental investigation of water emulsion fuel stability G Singh, E Lopes, N Hentges, A Ratner arXiv preprint arXiv:1911.05106		2019
Effect of polymeric additives on ignition, combustion and flame characteristics and soot deposits of crude oil droplets G Singh, M Esmailpour, A Ratner arXiv preprint arXiv:1911.00392		2019
Rotary valve G Singh, A Ratner US Patent App. 16/312,689		2019

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Ratner, Albert

✔ Claimed by the author BETA

University of Iowa
Dept Mech Engr
IOWA CITY, IA, USA

Alternative names: Ratner, Albert Ratner, A. Ratner, A.

Organization: University of Iowa

49 publications from Web of Science Core Collection View as a set of results to export, analyze, and link to full text

Sorted by Date: newest first ◀ 1 of 1 ▶

Experimental study on applying biomass-derived syngas in a microturbine Pedroso Correa, Paulo Sergio, Jr.; Zhang, Jianan; Silva Lora, Electro Eduardo ... More	TIMES CITED 3
APPLIED THERMAL ENGINEERING Volume 146 Page 328-337 Published 2019	
The effect of acetylene black on droplet combustion and flame regime of petrodiesel and soy biodiesel Singh, Gurjap; Esmailpour, Mehdi; Ratner, Albert	TIMES CITED 2

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Sum of Times Cited
323

Citing Articles
253

Author details

Ratner, Albert

View potential author matches

Author ID: 35579345900

<http://orcid.org/0000-0002-9281-3185>

Affiliation(s):

University of Iowa, Iowa City, United States View more ▾

Other name formats: Ratner, A.

Subject areas: Engineering Energy Chemical Engineering Chemistry Environmental Science Agricultural and Biological Sciences Physics and Astronomy Earth and Planetary Sciences Medicine Materials Science Mathematics Computer Science

Documents by author

69

Analyze author output

Total citations

439 by 354 documents

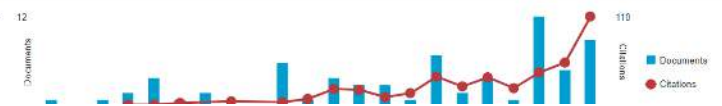
View citation overview

h-index

11

View h-graph

Document and citation trends:



Profile actions

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- [Alerts](#)
 - [Set citation alert](#)
 - [Set document alert](#)

AR Albert Ratner ✕
69 Documents
[View Mendely profile](#)

Coverage of Data Sources

Web of Science: more complete coverage of the natural and social sciences than the humanities. 13,100 journals in Core Collection (20,556 if include *Emerging Sources Citation Index*). Conference proceedings and book data are also available.

Scopus: 22,800 journals along with selected book series and conference proceedings. Natural and social sciences are represented well but is weaker in its coverage of arts and humanities.

Google Scholar: the broadest coverage. Data for approximately 87% of all the English-language scholarly documents available on the web: journal articles, preprints, conference papers, theses, research reports, and other items.

Broadening Your Scholarly Impact

Researcher Profiles

- Author disambiguation: ORCID, ResearcherID, Scopus Author ID
- University author profile page
- Author profiles: Web of Science, Scopus, Google Scholar
- Researcher Communities: Academia, ResearchGate
- Personal sites and social media: LinkedIn, blog

Altmetrics Tools

- Altmetrics
- PlumX
- ImpactStory

References

- Walters, W. (2017). Citation-based journal rankings: Key questions, metrics, and data sources. *IEEE Access*, 5, 22036-22053.
- Journal Impact Factor. Understanding Journal Citation Reports Metrics. <https://clarivate.libguides.com/jcr/basics>
- CiteScore. <https://journalmetrics.scopus.com/index.php/Faqs>
- How are CiteScore metrics used in Scopus? https://service.elsevier.com/app/answers/detail/a_id/14880/supporthub/scopus/
- How is SNIP (Source Normalized Impact per Paper) used in Scopus? https://service.elsevier.com/app/answers/detail/a_id/14884/supporthub/scopus/related/1/

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- SNIP - CWTS Journal Indicators.
<https://www.journalindicators.com/methodology>
- Category Normalized Citation Impact (CNCI).
http://clarivate.libguides.com/incites_ba/understanding-indicators
- Eigenfactor (EF), EF_n, Article Influence Score (AI).
<http://www.eigenfactor.org/about.php>
- SCImago Journal rank (SJR). <https://www.scimagojr.com/>
- Relative Citation Ratio (RCR). <https://nexus.od.nih.gov/all/2016/09/08/nih-rcr/>
- iCite <https://icite.od.nih.gov>