

Scientific Publishing

What are the steps involved in publishing a paper in a scientific journal?

The Scientific Publishing Process

- Select the most appropriate journal
- Determine formatting and material required for submission
- After submission, paper is assigned to an associate editor, who select 2-4 reviewers
- Then you wait.....
- After reviews are returned, associate editor issues a decision: Accept, Revise, or Reject
- Revise is most common: Make revisions and submit a letter documenting how the changes made address the comments of the reviewers
- Hopefully your paper is then accepted!

How to Think About Peer Review



Nature of Peer Review

- Reviews of your manuscripts can often be harsh, and are often difficult to read even when written thoughtfully
- Comments fall into 3 categories:
 - **Valid**: Learn from these, fix before resubmitting
 - **Wrong, but useful**: Reviewer misunderstood part of document; you must explain better
 - **A**hole/"Reviewer #2"**: Review comment with no basis in reality; find way to address without being dismissive or showing anger

Are all articles accessible?

What do you know about different
limitations on access?

Transition to Open Access Publishing

- We are currently living through the transition to Open Access publishing
- Subscription model dates to before the internet, when papers were published in print journals, obtained in hard copy format
- Transition to online publishing changed subscription model to a paywall
- Open access (OA) is online with no paywall

Why is money involved in publishing scientific results?

- Publishing has costs:
 - Online system for reviewing manuscript
 - Online system for displaying and searching articles
 - Legal matters (some debatable)
 - Staff costs
 - Use of revenue as profits or society support

Open Access Publishing

- OA models cover costs in different ways
 - **Gold OA:** Author (or their institution) pays an Article Processing Fee (APC) of \$2000-\$4000, article is then free to read by the world
 - **Green OA:** Author deposits a copy of the article, sometimes without journal format, in a government repository, free to read by world
 - Green OA often requires a 12-24 month embargo period
 - **Diamond OA (“Free OA”):** Published article is free to read by world at no cost to author; Publishing costs paid in some other way, often covered by a scientific society or institution

Preprinting

- One way around paywalled articles is to create a preprint: A publicly-shared copy of your work, often around the time that you submit to a journal
- Check with journal about their view of preprinting before you submit
- The community-preferred preprint server in Earth Science is EarthArXiv (<https://eartharxiv.org/>)



Wait there is preprinting? Why bother publishing?

- Good question!
- **Preprints are not peer-reviewed**
- Peer review has many benefits:
 - Identifies potential flaws or errors
 - Ensures results are placed in context of existing literature: Science builds off prior findings
 - Screens for data fabrication and falsification
- Peer review can also enable gate keeping or suppresses new ideas if not carefully guided
- Employers, journals, funding agencies expect that your work be published in a peer-reviewed journal

What do you know about publishing metrics
or statistics? IF? h-index?

Journal Impact Factors

- IFs are numerical measures of the average number of citation per article in a journal
 - Used as a proxy for the relative importance of the journal in a given field
- Calculated by ISI as follows (for 2020 IF):
 - Determine number of articles in 2018 and 2019
 - Determine how many times these were cited in 2020
 - $IF = \# \text{ of citations} / \# \text{ of articles}$

See: <https://jcr.clarivate.com/jcr/home>

Example Impact Factors

Journal	2020 Impact Factors
Geology	5.339
Nature Geosciences	16.908
Earth and Planetary Sciences Letters	5.255
Geophysical Research Letters	4.720
Geochimica et Cosmochimica Acta	5.010
Contributions to Mineralogy and Petrology	4.076
Journal of Geophysical Research: Planets	3.755
Journal of Geophysical Research: Solid Earth	3.848
Journal of Geophysical Research: Atmospheres	4.261
Annual Review of Earth and Planetary Sciences	12.810
ELEMENTS	3.671
Science	47.728
Nature	49.962
Earth Sciences History (?)	0.233

Criticisms of Impact Factors

- Provide no information on the quality of individual articles in the journal
- Not comparable among fields of different sizes
- Editors can skew by requiring citation of articles in manuscripts submitted to journal
- Institutional or national policies can lead to excessive, improper citation that boosts IFs

Individual Publishing Statistic

- Institutions and departments at times use publishing statistics to assess individual scientists:
 - Number of papers published
 - Papers per year
 - Total number of citation
 - Citations per year
 - h-index
 - i10-index
- There are positive and negative aspects of these statistics: ***Can you think of any?***

Jeff Catalano: Ph.D. 2004, Professor since 2007

Publications

97

Total

From 1900 to 2021

Citing Articles

3,125 Analyze

Total

3,051 Analyze

Without self-citations

Times Cited

4,396

Total

4,115

Without self-citations

45.32

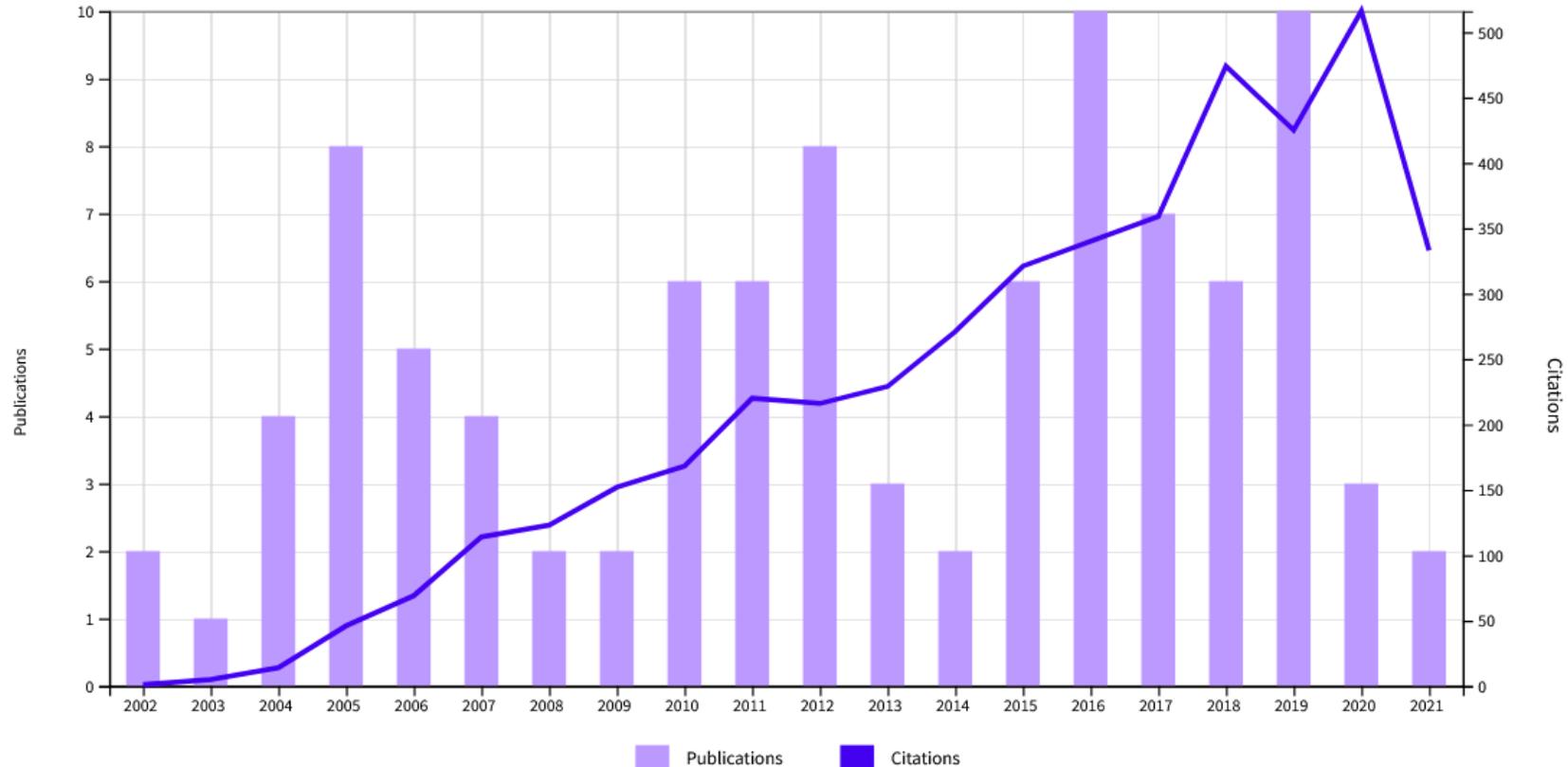
Average per item

43

H-Index

Times Cited and Publications Over time

DOWNLOAD



97 Publications		Citations: highest first		< 1 of 2 >		Citations						
						< Back			Forward >		Average per year	Total
						2017	2018	2019	2020	2021		
Total		359	474	425	516	333	219.8	4,396				
1	<p>Structure and reactivity of the hydrated hematite (0001) surface</p> <p>Trainor, TP; Chaka, AM; (...); Brown, GE Dec 10 2004 SURFACE SCIENCE 573 (2) , pp.204-224</p>	15	20	14	16	6	13.28	239				
2	<p>Uranyl adsorption onto montmorillonite: Evaluation of binding sites and carbonate complexation</p> <p>Catalano, JG and Brown, GE Jun 15 2005 GEOCHIMICA ET COSMOCHIMICA ACTA 69 (12) , pp.2995-3005</p>	17	15	19	15	7	11.82	201				
3	<p>Simultaneous inner- and outer-sphere arsenate adsorption on corundum and hematite</p> <p>Catalano, JG; Park, C; (...); Zhang, Z Apr 15 2008 GEOCHIMICA ET COSMOCHIMICA ACTA 72 (8) , pp.1986-2004</p>	9	11	9	20	16	14.07	197				
4	<p>Adsorption of Uranium(VI) to Manganese Oxides: X-ray Absorption Spectroscopy and Surface Complexation Modeling</p> <p>Wang, ZM; Lee, SW; (...); Giammar, DE Jan 15 2013 ENVIRONMENTAL SCIENCE & TECHNOLOGY 47 (2) , pp.850-858</p>	13	15	23	23	15	15.33	138				
5	<p>Ancient Aqueous Environments at Endeavour Crater, Mars</p> <p>Arvidson, RE; Squyres, SW; (...); Wolff, MJ Jan 24 2014 SCIENCE 343 (6169)</p>	20	23	13	10	10	16.63	133				
6	<p>Nanoscale Size Effects on Uranium(VI) Adsorption to Hematite</p> <p>Zeng, H; Singh, A; (...); Giammar, DE Mar 1 2009 ENVIRONMENTAL SCIENCE & TECHNOLOGY 43 (5) , pp.1373-1378</p>	10	20	10	13	3	9.15	119				
7	<p>Molecular beam epitaxial growth and properties of CoFe2O4 on MgO(001)</p> <p>Chambers, SA; Farrow, RFC; (...); Brown, GE Apr 2002 JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS 246 (1-2) , pp.124-139</p>	8	6	2	8	3	5.8	116				
8	<p>Fluorescence spectroscopy of U(VI)-silicates and U(VI)-contaminated Hanford sediment</p> <p>Wang, ZM; Zachara, JM; (...); Catalano, JG Mar 15 2005 GEOCHIMICA ET COSMOCHIMICA ACTA 69 (6) , pp.1391-1403</p>	6	11	6	5	3	5.94	101				
9	<p>Changes in uranium speciation through a depth sequence of contaminated Hanford sediments</p> <p>Catalano, JG; McKinley, JP; (...); Brown, GE Apr 15 2005 ENVIRONMENTAL SCIENCE & TECHNOLOGY 49 (4) , pp.2517-2524</p>	6	6	2	4	4	5.75	92				

h-index: # of articles published that have been cited the same # of times

97 Publications		Citations						
		Citations: highest first < <u>1</u> of 2 >					Average per year	Total
		< Back				Forward >		
2017	2018	2019	2020	2021				
40	Effect of co-solutes on the products and solubility of uranium(VI) precipitated with phosphate Mehta, VS ; Maillot, F ; (...); Giammar, DE Jan 22 2014 CHEMICAL GEOLOGY 364 , pp.66-75	5	5	4	12	3	5.5	44
41	Distribution and speciation of trace elements in iron and manganese oxide cave deposits Friedrich, AJ and Catalano, JG Aug 15 2012 GEOCHIMICA ET COSMOCHIMICA ACTA 91 , pp.240-253	7	4	9	2	2	4.4	44
42	Speciation of Selenium, Arsenic, and Zinc in Class C Fly Ash Luo, Y ; Giammar, DE ; (...); Catalano, JG Jul 2011 ENERGY & FUELS 25 (7) , pp.2980-2987	6	4	6	9	2	4	44
43	On the use of CCD area detectors for high-resolution specular X-ray reflectivity Fenter, P ; Catalano, JG ; (...); Zhang, Z Jul 2006 JOURNAL OF SYNCHROTRON RADIATION 13 , pp.293-303	1	2	0	1	0	2.69	43
44	Enthalpies of formation of U-, Th-, Ce-brannerite: implications for plutonium immobilization Helean, KB ; Navrotsky, A ; (...); Catalano, JG Aug 1 2003 JOURNAL OF NUCLEAR MATERIALS 320 (3) , pp.231-244	5	1	3	5	2	2.26	43
45	Inhibition of Trace Element Release During Fe(II)-Activated Recrystallization of Al-, Cr-, and Sn-Substituted Goethite and Hematite Friedrich, AJ ; Scherer, MM ; (...); Catalano, JG Sep 18 2012 ENVIRONMENTAL SCIENCE & TECHNOLOGY 46 (18) , pp.10031-10039	7	5	5	2	4	4.1	41
46	Fe(II)-Mediated Reduction and Repartitioning of Structurally Incorporated Cu, Co, and Mn in Iron Oxides Friedrich, AJ and Catalano, JG Oct 16 2012 ENVIRONMENTAL SCIENCE & TECHNOLOGY 46 (20) , pp.11070-11077	8	5	4	3	7	3.9	39
47	Structural response of phyllo-manganates to wet aging and aqueous Mn(II) Hinkle, MAG ; Flynn, ED and Catalano, JG Nov 2016 GEOCHIMICA ET COSMOCHIMICA ACTA 192 , pp.220-234	4	8	10	6	8	6	36

Goals for Publishing

- Publications are the currency of science
 - To be pursue a research-focused career, you must publish! Finding a job, being promoted, and obtaining funding all depend on your ability to publish
 - Sharing your results is your responsibility as a scientist
- Publishing goals:
 - 3 or more Ph.D. thesis papers, ideally out within 1 year of graduation
 - 1 first author paper per year as a postdoc
 - 3 papers per 3-year grant
 - ~3 papers per year for tenure at a research university