# Peer-reviewing scientific papers Why and how

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# Outline

- 1. What is peer review
- 2. Why review?
  - benefits to science
  - benefits to the reviewer
- 3. When to review?
- 4. **How** to review?
- 5. Ethics
- 6. Becoming a reviewer
- 7. Resources



## **Topic: Peer review**

- The evaluation of a proposed paper, presentation, book ... by the author's peers
  - "peer" 同等地位的人, someone of equal rank/status, in this case scientific knowledge/competence
- Purpose: ensure that only sound science is published → the scientific record is clear and correct → does not mislead other researchers
- Reviewers are selected and soliticed by the journal editors they make the final decision







# **Types of review**

- **public**: both author and reviewer names are public
  - the review is **on-line** with the draft of the paper, the review(s), the author's response(s), and the final paper
- **open**: both author and reviewer names are known to each other
- **single-blind**: authors are known to the reviewers, but not vice-versa
  - The reviewer can choose to reveal his/her identity in the comments
- **double-blind**: no one's name is known
  - often it is easy to guess some of the authors, from the papers they cite (their own previous work)



## **Public review – flow**

Interactive Public Peer Review<sup>TM</sup>



source: https://www.soil-journal.net/peer\_review/interactive\_review\_process.html



#### **Public review – example**



source: https://www.soil-discuss.net/soil-2018-30/#discussion



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## Advantages of public review

- The process is **transparent** so there is less chance of bias or favouritism
- Authors are likely more careful to "get it right the first time"
- Reviewers are more likely to be thorough and constructive

But ... most reviews are still private

• Only the authors, reviewers, and editors see these



#### **Topic: Why review? - 1**

- 1. **Do your part** for the overall success of the scientific enterprise
  - The "scientific mansion" 大厦 is built up from many small bricks 小块, each paper is one of these bricks
  - Dutch 成语 *idereen hun steentje bijdragen* = every person adds his or her little stone to the building



#### Why review? - 2

- 2. Keep up to date with the latest developments: you see this new work before it is published; it can stimulate your own research
- 3. The review forces you to look at the related literature and perhaps learn some new techniques



## Why review? - 3

- 4. You can receive **recognition** from the journal and **include in your CV/list of publications**
- 5. It is a step towards becoming an editorial board member or (associate) editor
  - $\rightarrow$  professional recognition



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# Recognition

- Individual publishers/journals, e.g., Elsevier
- Community of publishers/journals, e.g., Publon











#### https://publons.com/home/





#### PROFILE IL STATISTICS

#### Samuel Kilonzo Mutiga

Postdoc - Plant Pathology, University of Arkansas - Fayetteville - Present Visiting Scientist - Plant Pathology, BecA-ILRI Hub, Kenya Complete PhD in 2014 - Plant Pathology and Plant-Microbe Biology, Cornell University

#### BIO

My research interests are in plant diseases caused by fungal pathogens. I am interested understanding the genetic basis for disease resistance of crop plants to fungal pathogens, identification of resistance mechanisms, and deployment of the resistance using plant breeding methods. Because resistance to plant pathogens is not always complete (qualitative), and could be conferred by multiple genes of small effect and modulated by environment (quantitative), I have an interest in utilizing both qualitative and quantitative epidemiological tools to dissect other factors that could be associated the trait. My previous research experience includes use of survey tools, field experiments, and molecular approaches in dissection of environmental and genetic factors for aflatoxin and fumonisin accumulation in maize. I am currently involved in a rice research project which focuses on identification of durable resistance to rice blast disease in Africa. In the current research effort, I have been involved in genotyping and pathotyping of a diverse collection of isolates of Magnaporthe oryzae from Africa using rice differential lines carrying varying blast resistance genes that were developed by the International Rice Research Institute (IRRI). My ultimate goal is to be a key player in tackling food insecurity in sub-Saharan Africa through identification and deployment of disease resistance in crop plants to reduce yield losses, and to contribute to capacity building through mentorship of new scientists.

#### RESEARCH FIELDS

PLANT BIOLOGY

#### EDITORIAL BOARD MEMBERSHIPS

Samuel is not currently contributing as an editor for any journal or publisher.

# HAS REVIEWED FOR Image: State of Stat

#### https://publons.com/author/1170953/samuel-kilonzo-mutiga#profile



### **Topic: When to review?**

When you are invited to review ....

- **Read the abstract**: the topic should be **within your area(s) of expertise** 
  - you must be qualified to understand the paper
  - you must be familiar with the relevant literature, so you can see if the authors ignore or mis-represent previous work
- Check if you have any **conflict of interest** 
  - each publisher has a clear definition
    - \* Examples: in the same work group, have published with (one or more of) the authors (if known) . . .
  - Are prejudiced for or against the author(s) and do not feel you can give an unbiased review
  - if in doubt ask the editor they will advise if you should continue or withdraw



- A proper review takes half a day to a week
  - depending on the complexity of the paper and your familiarity with the work
- For each paper you **submit**, you should be willing to **review** two.
- Limit to the time allocated to the activity by your group leader typically one per month.



## **Topic: How to review?**

- Different journals have different requirements
- Instructions are always are supplied with the review request
- These typically point to a web page with detailed instructions
- Structure the review according to instructions





 $\mathsf{Q}$  search  $\beth$  cart  $\equiv$  menu

Home > Reviewers > How to review

#### How to conduct a review

• 1- Before you begin

Before you accept or decline an invitation to review, consider the following questions:

- Does the article match your area of expertise? Only accept if you feel you can provide a high-quality review.
- Do you have a potential  $\downarrow$  conflict of interest ? Disclose this to the editor when you respond.
- Do you have time? Reviewing can be a lot of work before you commit, make sure you can meet the deadline.
- Do you need to find out more about reviewing and the peer review process? If so, check out the free tutorials on the Elsevier Researcher Academy a

Respond to the invitation as soon as you can (even if it is to decline) – a delay in your decision slows down the review process and means more waiting for the author. If you do decline the invitation, it would be helpful if you could provide suggestions for alternative reviewers.



Confidential material

#### source: https://www.elsevier.com/reviewers/how-to-review



## **Check: methods**

Before going into detail of the review, make sure the methods were proper – if not, the whole paper (or the part of it with certain methods) is invalid and the authors should correct that first.

#### • Unsound methodology

- Example: improper pre-processing of soil samples prior to particle-size analysis by laser diffraction → "no" clay fraction → incorrect equations to predict soil hydrologic properties
- Discredited method
  - Example: Ordinary Least Squares linear regression with spatially-correlated residuals
- Missing processes known to be influential on the area of reported research



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## **Check: data sources**

- Properly **documented**?
- **Appropriate** to the research question?



#### Literature search

- The paper will cite some **literature** is it **relevant** and **up-to-date**?
  - If not, authors should do a proper literature search and re-submit
- Search for papers by the same authors (if known) and on the same topic is this paper new information?



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# Author search

Select a database	Web of Science Core C	ollection	•		
Basic Search C	Cited Reference Search	Advanced Search	+ More		
Bonfante, A*				Author	<ul><li>Search</li><li>+ Add row</li></ul>
Timespan					

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1.	The role of soil series in quantitative land evaluation when expressing effects of climate change and crop breeding on future land use (vol 259, pg 187, 2015) By: Bonfante, A.; Bouma, J. GEODERMA Volume: 281 Pages: 133-133 Published: NOV 1 2016 Get it! Cornell	Times Cited: 0 (from Web of Science Core Collection) Usage Count 💙
2.	The role of soil series in quantitative land evaluation when expressing effects of climate change and crop breeding on future land use	Times Cited: 14 (from Web of Science Core Collection)
	By: Bonfante, Antonello; Bouma, Johan GEODERMA Volume: 259 Pages: 187-195 Published: DEC 2015	Usage Count 🛩
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3.	The LIFE plus SOILCONSWEB project: A web based spatial decision support system embedding DSM engines	<b>Times Cited: 0</b> (from Web of Science Core Collection)
	By: Langella, G.; Basile, A.; Bonfante, A.; et al. Conference: 5th Global Workshop on Digital Soil Mapping Location: Sydney, AUSTRALIA Date: APR 10-13, 2012 Sponsor(s): Univ Sydney; Soil Sci Australia; State Govt Victoria, Dept Primary Ind; Australian Collaborat Land Evaluat Program; NSW Govt, Off Environm & Heritage; CSIRO DIGITAL SOIL ASSESSMENTS AND BEYOND Pages: 277-280 Published: 2012 Get it! Cornell View Abstract ▼	Usage Count 🛩
4.	A physically oriented approach to analysis and mapping of terroirs By: Bonfante, A.; Basile, A.; Langella, G.; et al. GEODERMA Volume: 167-68 Pages: 103-117 Published: NOV 2011	Times Cited: 15 (from Web of Science Core Collection)
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5.	Use of Physically Based Models to Evaluate USDA Soil Moisture Classes By: Bonfante, Antonello; Basile, Angelo; Manna, Piero; et al. SOIL SCIENCE SOCIETY OF AMERICA JOURNAL Volume: 75 Issue: 1 Pages: 181-191 Published: JAN 2011	Times Cited: 5 (from Web of Science Core Collection)
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6.	Comparative Land Evaluation approaches: An itinerary from FAO framework to simulation modelling By: Manna, P.; Basile, A.; Bonfante, A.; et al. GEODERMA Volume: 150 Issue: 3-4 Pages: 367-378 Published: MAY 15 2009	Times Cited: 21 (from Web of Science Core Collection)
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# Title/topic search

Select a database	Web of Science Core C	Collection	•				
Basic Search	Cited Reference Search	Advanced Search	+ More				
soil AND (quality	y OR health) NOT (air or	rhuman)		8	Title	+ Add row	Search

#### Timespan

Last 5 years 🔹



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Results: 1,640 (from Web of Science Core Collection)	Sort by: Date Times Cited Usage Count Relevance More
You searched for: TITLE: (soil AND ( uality OR health) NOT (air or human) More	
🌲 Create Alert	1. Effects of vegetation restoration on soil quality in degraded karst landscapes of southwest China
Refine Results	By: Zhang, Yaohua; Xu, Xianli; Li, Zhenwei; et al. SCIENCE OF THE TOTAL ENVIRONMENT Volume: 650 Pages: 2657-2665 Part: 2 Published: FEB 10 2019 Get it! Cornell Full Text from Publisher View Abstract
Search within results for C	By: Xue, Rui; Wang, Chong; Liu, Mengli; et al.
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<ul> <li>Open Access (406)</li> <li>Associated Data (11)</li> </ul>	3.       Soil health assessment: A critical review of current methodologies and a proposed new approach         By: Rinot, Oshri; Levy, Guy J.; Steinberger, Yosef; et al.         SCIENCE OF THE TOTAL ENVIRONMENT Volume: 648 Pages: 1484-1491 Published: JAN 15 2019
Ref Publication Years	Get it! Cornell Full Text from Publisher View Abstract
2019 (5) 2018 (332) 2017 (355) 2016 (344) 2015 (318)	4.       Soil quality assessment in Yellow River Delta: Establishing a minimum data set and fuzzy logic model         By: Wu, Chunsheng; Liu, Gaohuan; Huang, Chong; et al.         GEODERMA Volume: 334 Pages: 82-89 Published: JAN 15 2019         Get it! Cornell       Full Text from Publisher         View Abstract



# Keeping up-to-date with search alerts

#### Web of Science

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	Name: Baveye, Philippe Description: love him or hate him, always interesting Query: AUTHOR: (Baveye, P*) Open	Web of Science Core Collection		ON Created: 2014-10-14 Last Run: 2017-06-08 Expires: 2019-03-07 Renew	E-mail Address: dgr2@cornell.edu Type: Author, Title, Source, plus Abstract Format: Plain Text Frequency: Weekly
	Name: Bouma, J Description: Query: AUTHOR: (bouma, j) Open	Web of Science Core Collection		ON Created: 2018-06-04 Last Run: 2018-06-04 Expires: 2019-03-07 Renew	E-mail Address: dgr2@cornell.edu Type: Author, Title, Source Format: HTML Frequency: Weekly
	Name: Land evaluation Description: Query: Topic=("land evaluation" or "land suitability") Open	Web of Science Core Collection		ON Created: 2013-02-18 Last Run: 2018-05-23 Expires: 2019-03-07 Renew	E-mail Address: dgr2@cornell.edu Type: Author, Title, Source, plus Abstract Format: Field Tagged Frequency: Weekly
	Name: Soil Health Description: Query: TITLE: ("soil health") Open	Web of Science Core Collection		ON Created: 2018-08-16 Last Run: 2018-08-16 Expires: 2019-03-07 Renew	E-mail Address: dgr2@cornell.edu Type: Author, Title, Source, plus Abstract Format: HTML Frequency: Weekly
	Name: Soil colour Description: Query: #3 OR #2 Open	Web of Science Core Collection	2	ON Created: 2018-10-24 Last Run: 2018-10-24 Expires: 2019-04-10	E-mail Address: dgr2@cornell.edu Type: Author, Title, Source Format: HTML Frequency: Weekly



## Keeping up-to-date with content alerts

ScienceDirect Message Center <sciencedirect@notification.elsevier.com>

🛅 ToC 🛛 21 September 2018 at 13:24

Geoderma : Volume 337

To: Rossiter, D G <david.rossiter@wur.nl>

#### Alert: Geoderma

New articles available on ScienceDirect

#### Geoderma

Volume 337, Pages 1, 1 March 2019

Seasonality, altitude and human activities control soil quality in a national park surrounded by an urban area Pages 1-10 Available Online 2018-09-10 Valeria Memoli, Anna De Marco, Francesco Esposito, Speranza Claudia Panico, Rossella Barile, Giulia Maisto

Advantages of fuzzy k-means over k-means clustering in the classification of diffuse reflectance soil spectra: A case study with West African soils Pages 11-21 Available Online 2018-09-10 Jannis Heil, Volker Häring, Bernd Marschner, Britta Stumpe

#### Land-use type affects nitrate production and consumption pathways in subtropical acidic soils

Pages 22-31 Available Online 2018-09-10 Yushu Zhang, Xiangzhou Zheng, Xiangyun Ren, Jinbo Zhang, Tom Misselbrook, Laura Cardenas, Alison Carswell, Christoph Müller, Hong Ding

Graphical abstract



Prediction of soil organic carbon stock by laboratory spectral data and airborne hyperspectral images Pages 32-41 Available Online 2018-09-11 Long Guo, Haitao Zhang, Tiezhu Shi, Yiyun Chen, Qinghu Jiang, M. Linderman



#### Write your own summary

- In your own words, summarize the objectives and main findings/innovations of the paper
- *Not* the authors's Abstract
- This shows the editor and reviewer that you understand the main idea of the paper.
- Example:

"This paper simulates the situation where more or less experienced observers identify the soil series at a point location, from simple to more complete field observations and knowledge (via the SSURGO geographic databse) of the map unit and its context at that location. The field observation is simulated by a NCSS-Soil Characterization Database profile, taken as what would be observed, and its characteristics are taken as observed at the various levels of observation detail. The series is identified from a set of series in the observation's map unit (its components) and its neighbours (their components) by taxonomic distances, comparing three methods of considering depths and three levels of property information."



#### **Review items - for detailed comments**

Each journal or publisher has their own suggested list, here is an **example** from SOIL

- (1) relevance and scientific merit
- 1. Does the paper address relevant scientific questions within the scope of the journal?

"SOIL publishes scientific research that contributes to understanding the soil system and its interaction with humans and the entire Earth system. The scope of the journal includes all topics that fall within the study of soil science as a discipline, with an emphasis on studies that integrate soil science with other sciences (hydrology, agronomy, socio-economics, health sciences, atmospheric sciences, etc.)."

- 2. Does the paper present **novel** concepts, ideas, tools, or data?
- 3. Does the paper address soils within a **multidisciplinary context**?
- 4. Is the paper of **broad international interest**?



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#### (2) scientific approach

- 1. Are **clear objectives and/or hypotheses** put forward?
- 2. Are the **scientific methods** valid and clear outlined to be reproduced?
- 3. Are **analyses and assumptions** valid?
- 4. Are the presented **results sufficient to support the interpretations** and associated discussion?
- 5. Is the **discussion relevant** and backed up?
- 6. Are accurate conclusions reached based on the presented results and discussion?



#### (3) structure

- 1. Does the title clearly reflect the contents of the paper and is it informative?
- 2. Does the **abstract** provide a concise and complete summary, including quantitative results?
- 3. Is the overall presentation **well structured**, **concise** and to the point?
- 4. Is the **language** fluent, precise, and grammatically correct?
- 5. Are the **figures and tables** useful and all necessary?
- 6. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used according to the **author guidelines**?
- 7. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated?



#### (4) ethics/relation to previous work

- 1. Do the authors give **proper credit** to related and relevant work and clearly indicate their own original contribution?
- 2. Has this same work, or most of it, been **published before**?
- 3. Are the number and quality of **references** appropriate?



# **Example review (part)**

SOIL Discuss., https://doi.org/10.5194/soil-2018-30-RC1, 2018 © Author(s) 2018. This work is distributed under the Creative Commons Attribution 4.0 License.

SOIL	Open Ac	<b>E</b> GU
Discussions	cess	

#### SOILD

Interactive comment

Interactive comment on "Refining physical aspects of soil quality and soil health when exploring the effects of soil degradation and climate change on biomass production: an Italian case study" by Antonello Bonfante et al.

#### D. Rossiter (Referee)

david.rossiter@wur.nl

Received and published: 24 September 2018

Review of soil-2018-30 D G Rossiter ISRIC-World Soil Information/Cornell University/Nanjing Normal University

(1) General comments

This paper is a welcome step towards quantifying the concept of "soil health" and towards relating it to the concept of soil phenoforms (management-induced semipermanent changes in soil properties within one soil genoform). It also presents a

C1





convincing argument to use simulation for the future (obviously). The technical aspects are sound, in particular a good choice of soil-plant-atmosphere model and associated pedotransfer functions and a good choice of quantitative phenoform indicators. Less convincing are the future scenarios, although that is entirely because of the uncertainty in the RCP 8.5- IPCC scenario – a reasonable choice since this is what is presented to policy makers. The clear message is that biomass yield, as affected by changes in soil physical properties, can be a quantitative indicator of soil physical "health".

The paper mentions an "logical and interconnected sequence considering pedological, physical, chemical and biological aspects" to holistically evaluate soil health; however the paper does not give any details of how such a sequence would work, nor indeed why a sequential approach (and in the order given, at that) would be desireable. This is outside the scope of the paper (as indicated by its title) but if it is included in the discussion it could be expanded somewhat.

(2) Specific comments

L30 likely under the scenarios; see also comment below on L309

L57 fixed values as expressed by laboratory measurements of the pressure head

L91 Unfortunately, the "soil series" is not used everywhere, explain that the lowest level of other classifications are essentially the same concept. However this level is recognized as necessary for communication with stakeholders, see for example: Lepsch, I. F. (2013). Status of soil surveys and demand for soil series descriptions in Brazil. Soil Horizons, 54(2), 0. https://doi.org/10.2136/sh2013-54-2-gc

L182: Is Yw always lower than Yp? Perhaps if averaged over a number of years – there are always unfavourable years.

L200 These are the phenoforms! emphasize

L255, Figure 1: terminology "environmental systems" seems over-ambitious for what are "landform classes" or similar. Is this the standard terminology used in Italian soil



Interactive comment





#### The recommendation

Usually there are three choices; in all cases **explain your reasoning**.

- 1. Accept without revision
- 2. **Reject**, no possibility to improve enough to publish in this journal

#### 3. Revise:

- can be major, moderate or minor
- explain what revision is requested and why it is necessary
- tell to the editor whether you would be willing to review the revised article

Recall, the journal editor does not have to accept your suggestion.


#### **Do not ...**

- ... question the motives or ethics of the authors if there is suspicion of ethical problems (e.g., plagiarism) contact the editor
- ... attack the authors ("What kind of idiot would write such garbage?")
  - Express your opinion politely
    - \* "The main message of this paper is not clear to this reviewer"
    - \* "The authors use methods that have been superseded by more appropaite methods some time ago, for example ...."

# **Topic: Ethics in reviewing**

- Confidential material
- Conflict of interest
- Avoiding bias



# **Codes of conduct**



 $\mathbb{N}$ 180 团 Netherlands Code of Conduct for Research Integrity 2018

sources: https://publicationethics.org, https:

//www.nwo.nl/en/documents/nwo/policy/netherlands-code-of-conduct-for-research-integrity



## **Confidential material**

- The material you are reviewing is **unpublished**, which means it is still **private**
- Do not share with anyone if you think you need help from another specialist ask the editor for permission
- Do not contact the authors directly, all correspondence goes through the editor, so everything is documented
- Do not tell anyone you are reviewing the paper



# **Conflict of interest**

Do *not* . . .

- ... reject a paper because it conflicts with your **own views**, if otherwise the paper is sound
- ... reject a paper because you are working on the **same topic** and do not want other work published first
- ... suggest that the author include citations to your work unless for valid scientific reasons (i.e., it would add value to the paper)



# **Avoiding bias**

If the authors and their institutions are known (single-blind review) or can be inferred (double-blind review):

- Judge the work on its own merits, *not* on the reputation of the authors or institutions
  - *positive* ("Chinese Academy of Sciences") or *negative* ("Institution you have never heard of in a country you had to find on the map")
- Be especially aware not to judge on the basis of affiliation, country of origin, gender, apparent religious beliefs or political affiliation of authors
  - Military or (agro-)industry ...
  - Chinese names, obviously Muslim or Jewish names ...



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## **Topic: Becoming a Reviewer**

- You may beinvited on the recommendation of a paper's author
- You may be **invited** on the recommendation of another reviewer of the paper
- You may **volunteer**:
  - via the journal's home page
    - \* register as a potential reviewer and indicate your interests
  - via direct contact with an editor see the editorial board at the journal home page



## **Topic: Resources**

#### • publisher's web pages

- Elsevier "Researcher Academy"; Springer "How to peer review"
- a senior colleague
- a journal editor they are eager to get good reviewers and good reviews



# Understanding the peer review process



source: https://researcheracademy.elsevier.com/navigating-peer-review/becoming-peer-reviewer



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Search					Q			
Home	Subjects	Services	Products	Springer Shop	About us			

1. Author & reviewer tutorials

#### How to peer review

- » Overview
- » Evaluating manuscripts
- » After the review
- » Quiz
- » Further information

#### How to peer review

All researchers will encounter peer review in their careers; either as authors when they submit their work to a journal for publication or as a reviewer when they are asked to provide comments on a paper by a journal editor.

Although it is an important aspect of the scientific process, how to peer review is rarely taught in universities and can be a daunting task for those new to it. Compared with conducting research, teaching, and writing your own manuscripts, reviewing someone else's work may seem relatively easy. In fact, reviewing effectively is a special skill that takes time and effort to develop. This tutorial gives you an introduction to peer review and explains how you should go about reviewing a paper.

source: https://www.springer.com/gp/authors-editors/authorandreviewertutorials/howtopeerreview











WORK WITH YOUR MENTOR TO COMPLETE YOUR FIRST REAL REVIEWS

source: https://publons.com/academy/



#### End

Take-home messages:

- Peer review is a vital part of the scientific enterprise
- Peer review can stimulate your own research
- Peer review can make you **recognized in your scientific community**
- Journals are eager for good peer reviewers and have resources to help do a proper review

