

Referees, who are generally unpaid volunteers, play an essential role in the scientific enterprise. It is part of every scientist's obligation to the community to serve as a referee if requested, to the extent that his or her expertise allows.

Today we'll look at the various duties and responsibilities of referees and how to write referee reports.

The terms "referee" and "reviewer" are used interchangeably in US English to mean an expert who provides an objective opinion about the scientific and technical merit of a paper, nomination, or application.

Training by George Miley and useful discussions with David Hertzog and Lance Cooper are gratefully acknowledged.

An excellent resource for novice referees is "Introduction to refereeing," IOP Publishing, http://download.iop.org/lat/supportMaterials/introduction_to_refereeing_english.pdf.

What does a referee do for science?



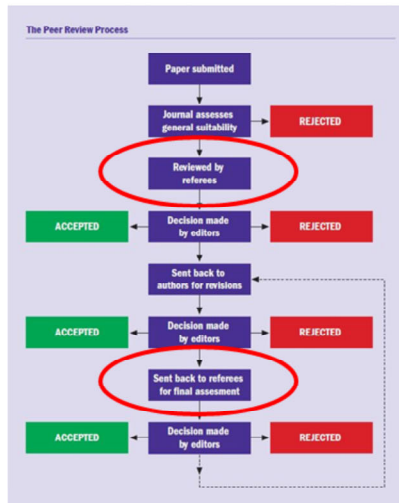
**Safeguards the integrity
of the archival literature**

**Ensures \$\$ invested in
research are spent wisely**

**Ensures that people are
rewarded on the merits
of their work**

Today we're going to focus specifically on reviewing scientific articles. But referees also evaluate proposals for funding agencies and nominations for prizes and awards. They evaluate the suitability of candidates for jobs and for promotion and tenure.

Referees evaluate scientific articles before they are published



Ensures only credible, high-quality research is published

Improves the quality of published papers

Ensures papers are published in appropriate journals

IOP Publishing
<http://images.iop.org/referees/>

Journal editors generally have established criteria for the suitability of publications in their journals.

These criteria vary from journal to journal and generally depend on the nature of the journal's readership.

The job of the referee is to provide an objective, expert opinion on whether the submitted paper satisfies the stated criteria of the journal. The reviewer must thus understand not only the scientific methods and results presented in the paper, he or she must also understand the aims, scope, and general readership of the journal.

Most journals will provide very specific instructions to referees about the criteria that are to be applied when evaluating a manuscript for publication.

You should have three objectives in refereeing a paper



- 1. “Protecting the cathedral by testing the brick”**
- 2. Helping the authors produce a better paper (clearer, more persuasive, more concise, more complete)**
- 3. Maintaining your objectivity and professional ethics**

Questions to ask yourself before you agree to be a referee

Do I have the necessary expertise?

Do I have a conflict of interest?

**Can I be objective and offer constructive
criticism?**

Can I refrain from taking advantage?

**Can I provide a timely review? (Can I meet the
journal's deadline?)**

Can I preserve the anonymity of review?

To provide an adequate review, you must be sufficiently familiar with the research topic to adequately assess the originality of the research, the quality of the work, the validity of the conclusions, and the significance and impact of the work being presented. If you do not have the necessary expertise, you should immediately notify the editor that you cannot review the paper because it is outside your area. You *can* suggest the names of other scientists who might be better suited to review, but you **may not** forward the manuscript to someone else to review.

If you have a prior relationship with one of the authors or if you are in direct competition with one of them, you should immediately tell the editor that you have a conflict of interest, disclose the nature of the conflict, and let the editor decide if you should review.

If you have pre-existing opinions about an author that would affect your objectivity—either positively or negatively—you should recuse yourself from review.

One benefit to referees for performing this service is they learn about innovative new work before it is published. However, it is a breach of ethics to use information obtained in the review process for your own personal benefit.

Can you realistically do an adequate review in the time the editor has suggested? If you cannot, either ask the editor if you can have more time or decline the review. It is not fair to the authors either to take an unreasonable amount of time to do the review or to provide a hasty, superficial, ill-considered review.

It is an absolute obligation of a referee to preserve the anonymity of review. Under **no** circumstances should a referee contact the authors or disclose that he was a referee. If you have a question for the authors, send it to them via the editor.

Reviewing vs. reading a paper

As a reader, you are more likely to presume the details presented in the paper are true and correct (experts have already signed off on it)

As a referee, you have an obligation to carefully evaluate

- 1. the “truth” of what is being presented**
- 2. the originality and significance of the work**
- 3. the suitability of the methods used**
- 4. the validity of the conclusions drawn**
- 5. the “independence” of the article**

Referees must be more skeptical than readers. The referee is the first defense against the proliferation of bad science and the wasting of people’s time and funders’ resources.

Questions to ask yourself as you're reading the paper—on the science

Is the hypothesis being tested clearly stated and well motivated?

Is the work original? Is adequate referencing provided to prior work?

Were appropriate methods and techniques employed to obtain the results? Is sufficient detail provided?

Are there obvious errors or omissions?

Do the authors' arguments logically support their conclusions?

Is it clear what problem the authors were trying to solve and why it is important?

Has the work already been done by somebody else? Has it been published elsewhere? Is it sufficiently new and different from the authors' previous papers?

Have the authors adequately referenced previous work to provide a background and context for the work they are reporting?

Have the authors provided meaningful results and adequate evidence for their conclusions? Are there any unsupported claims?

Is the work correct? Are there errors or gaps in the data? Have the authors made unwarranted assumptions? Have any treatments or selection data been fully disclosed? Have inappropriate methods been used? Are known sources of error addressed and accounted for?

Are the mathematics and statistics correct? (Yes, re-derive the equations.)

**Questions to ask yourself as you're
reading the paper—on the science**

Is the work being reported important?

Is it interesting?

**How relevant is the work to other researchers
in your field? in other fields?**

Do the results reported significantly advance the field? Do the authors explain the significance of their work? Is it clear what they've contributed?

Is the work being reported of interest to the journal's readership? Would it be more appropriately published in a different journal?

Should the editor get an opinion from an expert in another field?

Questions to ask yourself as you're reading—on the paper itself

Does the title reflect the contents?

Is the abstract adequate?

Are the figures and tables clear and informative?

Are additional figures or tables needed?

Is there any superfluous material that should be removed or moved to an appendix or supplement?

Is the conclusions section adequate?

Is the ms. free of typos and grammatical errors?

Is the English understandable? Are conventional standards of nomenclature and notation observed?

While it is helpful to mark obvious spelling and grammatical errors for the authors, your job is to be a referee and assess the quality of the research, not to be a copy editor and correct every comma. However, do point out language that is imprecise, ambiguous, or misleading.

If the English is so poor that you cannot understand what the authors are trying to convey, you are not obliged to struggle to parse or “translate” every sentence. Simply return the ms. to the editor with the notation that you are unable to review it because the English is sufficiently incomprehensible that you cannot evaluate the paper.

Essentials of a good referee report

- 1. Summarizes the main points**
- 2. Provides an evaluation on each criterion identified by the journal**
- 3. Gives a specific recommendation for or against publication**
- 4. Lists specific mandatory and suggested changes to the paper**
- 5. Highlights both the paper's strengths and weaknesses**
- 6. Provides examples and gives reasons**

Begin your review with a summary of the most important points in the paper to 1) show that you've actually read the paper, and 2) help the editors understand it.

Next, go down the list of review criteria provided by the journal and address each point; state how well the paper meets each criterion.

At some point in the review, explicitly state your recommendation for or against publication. Put the recommendation at the beginning or the end of the report and highlight it so the editor can see it immediately. Common recommendations are:

- Accept paper for publication as written.
- Publish after the authors have considered optional suggestions (and provide the editor with those suggestions).
- Publish after the authors have made mandatory corrections (and specify what those corrections are).
- Reject the paper.

If you make suggestions for how the paper could be improved, be sure to tell the editor whether the suggested changes are optional or mandatory.

If you want to re-review any revisions to the ms. before it is published, so state in your report.

Criteria for PRL reviews

REFeree RESPONSE FORM
(Please include this form with your full report)

Referee Please Note: **This form is not a substitute for a full report**

This form is to assist the Editors and is not a substitute for your written report. It may be useful, however, as an outline for your report, which should explain why the paper does, or does not, meet our criteria.

1. Importance → I. Letters published in PRL must meet a high standard of importance and interest.

a) Please judge the importance of the paper to its specific field.

not important very important

2. Broad interest → b) Please judge the broad interest of the paper, apart from its importance to its specific field, to a wide spectrum of physicists.

not interesting very interesting

3. Validity → c) Please judge the validity of the paper.

probably not valid probably valid

II. A Letter should have an introduction and conclusion that explains, in terms accessible to a broad audience, the physics context of the work: why it is important and what has been accomplished.

4. Accessibility → Please judge the introduction and conclusion.

not accessible very accessible

III. Recommendation:

NOTE: IF YOU ARE RECOMMENDING PUBLICATION IN PRL, PLEASE PROVIDE, IN YOUR REPORT, A SEPARATE STATEMENT AS TO WHY THIS PAPER IS APPROPRIATE SPECIFICALLY FOR PRL.

a) The paper should be published in PRL as it is.

b) The paper should be published in PRL after minor revisions are made, without further review.

c) The paper with revisions and further review, might be publishable in PRL.

d) The paper with extensive revisions, and further review could possibly be published in PRL.

e) The paper should not be published in PRL.

IV. Would you be willing to review the paper again? yes no

If not could you suggest alternative referees?

Phys. Rev. Lett. provides very specific criteria for referees to consider.

Note that returning the form is not sufficient. A full narrative report is also required.

Validity—Is the work scientifically sound? If not, do you believe the paper can be revised to correct the scientific defects you find? Are the arguments made to draw the conclusions logically constructed and well-founded?

Importance—Does the manuscript report substantial research? Is the conclusion very important to the field to which it pertains? Is the research at the forefront of a rapidly changing field? Will the work have a significant impact on future research?

Broad interest—Papers are of broad interest if they report a substantial advance in a subfield of physics or if they have significant implications across subfield boundaries. Is the paper of broad interest?

Accessibility—Is the paper written so that it is understandable by the broad PRL audience? Is there an introduction which indicates, to the interested non-specialist reader, the basic physics issues addressed, and the primary achievements? Are assumptions clearly presented? Is unnecessary jargon avoided? Do the title and abstract stand alone? Are tables and figures, if any, well used and effectively presented?

Here are further details of the *PRL* criteria for publication.

“Review unto others...”*

Do not personally criticize the authors; focus on improving the paper, not straightening out the researchers

Do not make statements or claims without providing explanations and evidence

Strive for the highest standards of objectivity and honesty

Do not use information obtained through review for personal benefit

*Professor Lance Cooper’s “Golden Rule for Referees”

Your report should be written constructively, in a collegial tone, to benefit the understanding of both the authors and the editors.

In a positive, respectful, constructive way, point out experimental problems, flaws in the authors’ arguments, or alternative interpretations not proposed by the authors.

Provide appropriate references if inadequate credit is given to previous work.

Excellent resource for novice referees: “Introduction to refereeing,” IOP Publishing, http://download.iop.org/lat/supportMaterials/introduction_to_refereeing_english.pdf

Your assignment:

**Prepare a referee report for the two articles
that have been assigned to you.**

Address your comments to the *editor*

Use the PRL criteria for evaluating the paper

Back up your criticisms with examples

**Make specific suggestions for how the paper
could be improved**

**Make a specific recommendation for or
against publication and give your reasons**

Submit your report by Oct 16



cmelliot@illinois.edu

<http://physics.illinois.edu/people/Celia/>

NOTES: