What are Referee Reports?

How <u>should</u> they work?

Robert Whitney
LPMMC, UGA & CNRS, Grenoble

Masterclass Open Science, Grenoble – 3 June 2024

Typical numbers of referee reports

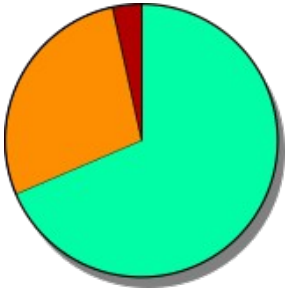
Typical (48 years old) **theoretical physicist**:

- **I've received 100-200 referee reports on my papers**
  (i.e. published about 50 papers)

My statistics up to summer 2022

- **I've written 252 referee reports (about 10 per year)**

1st report: 180
2nd report: 63
3rd report: 9



Authors are/were allowed up to three rounds

Time per report written: 1-2 days (i.e. bit less than 1 month each year)

Examples of Referee Reports

Let's look at Referee Reports on my 2013 manuscript
whose main message was:

> We know the laws of thermodynamics give Carnot bounds on efficiency (of heat-engine, refrigerator, etc).
> **However, quantum mechanics gives stricter bounds.**

Submitted June 2013,
and published as:

Robert S. Whitney, *Most efficient quantum thermoelectric at finite power output*
Phys. Rev. Lett. 112, 130601 (April 2014)

Report of Referee A:

In this paper, the author studies the maximum efficiency for a given power output by analyzing models described by the Landauer-Buttiker theory. [2 more sentences]

The analysis presented in this paper is sound, ... The paper is also well-written. However, I hesitate to recommend the paper to be published in PRL. The reason is the following:

Let us recall that the Carnot efficiency is important because it is universal. [1 more sentence] Such universality lacks in the result of the paper. [3 more sentences]
From these points, I do not think that this paper is successfully answer the question what is the equivalent of Carnot efficiencies for irreversible systems with finite power output,

Report of Referee A:

Referee's summary of manuscript

In this paper, the author studies the maximum efficiency for a given power output by analyzing models described by the Landauer-Buttiker theory. [2 more sentences]

Referee's RECOMMENDATION (postive/negative/...)

The analysis presented in this paper is sound, ... The paper is also well-written. However, I hesitate to recommend the paper to be published in PRL. The reason is the following:

with one/two sentence justification

Detailed Explanation of recommendation

Let us recall that the Carnot efficiency is important because it is universal. [1 more sentence] Such universality lacks in the result of the paper. [3 more sentences] From these points, I do not think that this paper is successfully answer the question what is the equivalent of Carnot efficiencies for irreversible systems with finite power output,

Optional :

(a) Other comments

Report of Referee B:

The author addresses theoretically the question of the maximum thermoelectric efficiency possible at given power output.

While I am not in a position to check all derivations, it is clear that the work is done at a high level. The results are of interest and can stimulate further discussions. The issue of the maximum efficiency of thermoelectric devices has practical implications. I recommend publication.

Report of Referee B:

Referee's summary of manuscript

The author addresses theoretically the question of the maximum thermoelectric efficiency possible at given power output.

Referee's RECOMMENDATION (postive/negative/...)

with one/two sentence justification

While I am not in a position to check all derivations, it is clear that the work is done at a high level. The results are of interest and can stimulate further discussions. The issue of the maximum efficiency of thermoelectric devices has practical implications. I recommend publication.

Detailed Explanation of recommendation

WOULD LONGER REPORT WOULD BE **BETTER FOR AUTHORS?**

Optional :

(a) Other comments

Report of Referee C:

Referee's summary of manuscript

The manuscript by Whitney proposed conditions that a quantum system driven far from equilibrium (by finite temperature or bias voltage) should to satisfy in order to generate maximum efficiency at finite power output. For conventional bulk thermoelectric materials which operate in the linear response regime, the optimization of the figure of merit ZT can be achieved by generating sharp features in the density of states (or transmission function for meso and nanoscale systems), as discussed in a landmark paper Ref. 10 on "The best thermoelectric". The present paper (with paraphrased title of Ref. 10) could have similar impact on the very recently emerged field of nonlinear thermoelectricity.

Referee's RECOMMENDATION (postive/negative/...)

However, in the present form the manuscript is very difficult to read, so the author should make effort to make it more suitable for PRL audiences:

with one/two sentence justification

Detailed Explanation of recommendation

1. Besides recent wave of papers on nonlinear thermoelectricity, the author should have cited earlier i
solated studies such as PHYSICALREVIEW B 82, 045412 (2010) or Molecular Physics Vol. 10 2–4,
2008, 397–404.

2. Both of papers I mentioned in 1. clearly discuss regimes in which n iciency,
which is a prime motivation to explore this new topic. This ty from
the present manuscript (it does appear in some othe
arXiv:1208.6130v3).

3. The manuscript contains
substantial effort to track diff
some of them into the display

4. The abstract advertises how
calculated." However,one finds s".
on this should be added into the

5. Any nonlinearity will eventually
Physics Vol. 106, Nos. 2–4, 2008,
manuscript. The scattering formalis
unlike some other recent closely rela
115404 (2013)], not even dephasing

6. Since the aim of the present manusc discussion of what kind of
transmission function optimizes ZT of li it easier to understand the novelty
of the top-hat function proposed by the a studies.

Six detailed criticisms of
- presentation,
- formulas,
- citations, etc.

Each in 1-2 ***brutal*** sentences

This referee really tried to understand everything

Optional :

(a) Other comments

Types of criticisms I have received ... or given to others

Physics:

- Made a methodological mistake
- The results in the paper do not prove the claims that the paper makes
- Contradiction of known laws (law of thermodynamics)
- Not understood the problem
- Not understood the literature
- Results already well-known

Presentation:

- Not cited the correct literature
- Difficult to understand
- confusing/non-standard notation
- poor English

Scope:

- Not of sufficient interest for journal
- Not experimentally realizable (i.e. send to theoretical physics journal)
- Others have done it better

Comparison with FICTION writers:

Advice about choosing a good editor for your fiction

from kindlepreneur.com/book-editors/#h-what-to-look-for-in-an-editor

Prices ~1000€ plus 1€ per 300 words

Comparison with FICTION writers:

Advice about choosing a good editor for your fiction

from kindlepreneur.com/book-editors/#h-what-to-look-for-in-an-editor

Prices ~1000€ plus 1€ per 300 words

- A copy editor? → grammar and spelling mistakes?
- someone who proposes clear, and creative sentences?
- someone to look at the overall structure or plot?
- someone to knows your style of fiction (science fiction/...)

Comparison with FICTION writers:

Advice about choosing a good editor for your fiction

from kindlepreneur.com/book-editors/#h-what-to-look-for-in-an-editor

Prices ~1000€ plus 1€ per 300 words

- A copy editor? → grammar and spelling mistakes?
- someone who proposes clear, and creative sentences?
- someone to look at the overall structure or plot?
- someone to knows your style of fiction (science fiction/...)

MY ADVICE:

1) Referee reports are brutally focused on the negative

2) **It's not personal!**

4) It often takes **calm thought**
to understand a referee's point

... remember that there is no rush to reply

MY ADVICE:

1) Referee reports are brutally focused on the negative

2) **It's not personal!**

4) It often takes **calm thought**
to understand a referee's point

90% of referee's job:

giving free advice to make your paper better

... remember that there is no rush to reply

PSYCHOLOGY of ACCEPTING CRITICISM

google says:

1) Avoid immediately reacting.

2) Remind yourself that constructive criticism helps you improve.

3) Listen to understand—not to respond.

*4) Feedback is on your work, **NOT on YOU**.*

5) Thank the person giving you feedback.

6) Ask questions, but don't challenge the feedback.

NOBODY FINDS THIS EASY !!!

PSYCHOLOGY of ACCEPTING CRITICISM

google says:

1) Avoid immediately reacting.

2) Remind yourself that constructive criticism helps you improve.

3) Listen to understand—not to respond.

*4) Feedback is on your work, **NOT on YOU**.*

5) Thank the person giving you feedback.

6) Ask questions, but don't challenge the feedback.

NOBODY FINDS THIS EASY !!!