

4.2 Refereeing

4.2.1 Peer Review

What is Peer Review

- ▶ No scientific or engineering journal in the world with any standing in the respective community would ever publish something send to one of the editors without subjecting the article in question to "peer review". A peer, in the meaning implied in this context, is "one that is of equal standing with another"; in short another scientist with comparable knowledge in the field as the most senior author.
 - Usually, at least two "peers" are asked to act as **referees**. They have to read through the article, answer various questions on some (nowadays mostly Internet based) questionnaire, give a recommendation as to be or not to be (for the paper; in the Journal), and justify all of this by more or less detailed comments to the manuscript.
 - Many journals enable two kinds of comments: One goes anonymously to the authors, another one may go to the editor only,.
- ▶ Reviews are always anonymous. This is a matter of debate on occasion, but this principle has been **staunchly** upheld by all and sundry so far.
 - Authors may object to the judgement of the reviewers. If they present good reasons, the editor may consult a third referee; otherwise he (or she) may tell the authors to go suck eggs (if in slightly friendlier words)

Peer Review for Scientific Articles

- ▶ Obviously, peer review is a good and fair thing, and totally indispensable if some kind of quality is to be maintained in the scientific community and their journals.
- ▶ So consider the following pieces of information:
 - Our newest noble prize winner, **Peter Grünberg** from Jülich, send his first discovery of the giant magneto-resistance effect that ultimately gained him the Nobel prize (after several other major prizes) to [Phys Rev. Lett.](#), where the referees promptly rejected it.
 - **V. Lehmann** and **U. Gösele**, to take a less **august** example somewhat closer to home, send their discovery of the quantum wire nature of so-called macroporous **Si** to [Appl. Phys. Lett.](#) where it was promptly rejected. After the authors protested it was finally published (somewhat later than a similar paper of **Canham**, who discovered the same thing (and somewhat more) independently at about the same time). The two papers together started the whole field of "porous semiconductors" with its own international conference and so on.
 - Jan Hendrik **Schön** published from **1998** to **2001** about **one** paper every **8** days, and a total of **17** articles in the absolute top journals "**Nature**" and **Science**. All his articles were peer reviewed and accepted (both journals accept less than **10** % of what they get), and all his findings were **fakes** and, in retrospect, would have been easy to catch.
- ▶ What do we learn from this? Simple: Despite all the shortcomings of the peer review process, there is no alternative (as with democracy).
 - It's not perfect, it's not even good sometimes, but how else could you go about maintaining quality and integrity in science and engineering? More referees just would mean more work for all, and probably not even change very much.
 - You simply must accept that peer review is not perfect and that one of your top papers might be rejected for no good reason. But then, a not-so-good one might make it - on the long run it cancels out to some extent.
- ▶ On order to give you some ideas how reviewing is done - here is typical a list of what a reviewer should watch out for (taken from a Journal that shall go unnamed):
- ▶ the link provides some examples (with some blackening on occasion to maintain anonymity).
 - "The Journal aims to publish HIGH quality papers reporting NEW developments in XXXXXXX. Currently less than **40%** of submissions to the Journal are accepted for publication. In scrutinizing the manuscript, in particular please consider:
 - (a) if the subject matter is appropriate for the Journal;
 - (b) if the quality of the presentation is adequate;
 - (c) if the work contains new and original contributions;
 - (d) any apparent lack of clarity;
 - (e) any apparent errors of fact or logic;
 - (f) if appropriate reference to previous work is given;
 - (g) if the conclusions are sound and justified;
 - (h) if the abstract is informative;
 - (i) if the title reflects the contents adequately;
 - (j) if there is any material which might be omitted."

▶ The links provides some examples (with some blackening on occasion to maintain anonymity):

- [Short and positive](#)
- [Short and negative](#)
- [Long and negative](#)

▶ You might have to referee the papers of your peers in this seminar. The way you do this is by using this [template](#).

Peer Review for Project Proposals

▶ While it is unpleasant if some of your peers rejects that Noble-prize winning paper you send to some journal, it really hurts if some **proposal** you wrote gets rejected after peer review.

▶ A proposal is a (usually largish) stack of paper that you (or a group) send to some agency like the "Deutsche Forschungsgemeinschaft" (**DFG**), and in which you propose to do some probably Noble-prize winning research - provided that you are given some **money**.

- "Ohne Moos nix los" (Money makes the world go round). Research and development is expensive, and somewhere the money must come from. Without proposals resulting in **grants**, you won't go far in the scientific and engineering world.
- As a Professor, you send your proposal to the various agencies (**EU**, federal, state, independent, ...) that fund more basic research, as a scientist or engineer with some responsibility in a company, you send it to your Bosses. The procedures might be quite different, the philosophy is not.
- You either are in position where somebody tells you what to do - than you don't have to worry about writing proposals - or you are the one who tells others what to do - then you better get the necessary funding first. You almost never get it because of your winning personality; you get it because your proposals - written or verbal - to your peers or Bosses - get approval.
- The basic idea is simple and can be expressed in one word: **Competition!** And it is a good idea as experimentally proved if you look at societies with no competition.

▶ What are the odds for us Professors to get a proposal granted. Rough numbers for success with the three main funding agencies are: **DFG: 30 %- 40 %**, **VW Stifitung 15 %**, **EU < 10 %**.

- So you better be i) good, and ii) not given to screaming fits and shooting people if disappointed.

▶ Graduates of Materials Science in Kiel are expected to belong into the proposal write category some **10** years after graduation. So you still have time, but paper and proposal writing with the necessary peer reviews will likely catch up with you.

- Just a hint: One big help for your career to become a major proposal writer, is to help your boss with whatever he or she has to write while you still are in the lower ranks. All Bosses **hate** writing all this crap all day and **love** underlings who deliver perfect papers, report, parts of proposals and so on.
- Get used it it now! It's "**Publish or Perish**" out there!