

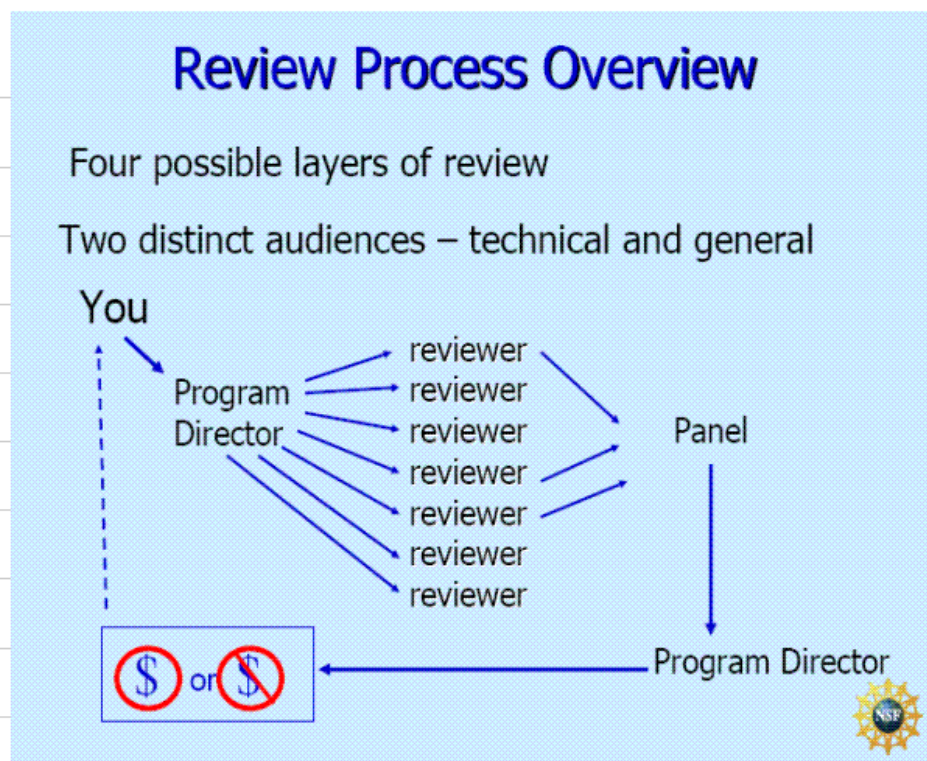
Tips for writing a research proposal

Rejoice, this is your chance to

- really understand what your project is about (bigger picture)
- brainstorm some new ideas
- find a peer that you can discuss your project with
- get your advisor/mentor/... to know about your project
- get excited about your project
- brag!

... so take your time and enjoy it.

from www.wvu.edu/depts/rsp/insideview.pd



General characteristics of people making decisions on your proposal

Program director

Generalist in your field
Busy
 Looks at all proposals
 Runs merit review
Helpful, can be cranky
 Wears reading glasses
 Counsels PIs

Reviewer

Technical expert in the field
Very busy
 Reads one proposal in detail
Wants to be doing anything else
 Often helpful, can be grumpy
 Has eyestrain

Panelist

Broad Expertise
Very, very busy
 Has glasses & eyestrain

Reads many proposals (~50)
 Compares and ranks proposals
Just wants to be done



from <http://www.mm.cs.sunysb.edu/300/lectures/proposal.pdf>

All proposals should answer the following questions in one form or another.

- * What is the problem being addressed? (What is the goal of the research being proposed?)
- * Why is the problem important and interesting?
- * What will you DO to address the problem? (If you complete the plan, will that bring us closer to an answer to the problem?)
- * Do you have the resources necessary to complete the research? (knowledge, good idea, experience / previous work, collaborators,...)

Common Reasons for High Ratings

- "This proposal suggests a **clear, elegant, well-documented** approach to a problem that has plagued this field for decades."
- "The PI has a **beautiful plan**. **Undergraduates or new graduate** students can step right into this work, yet it solves a major problem and will be publishable in a first-rate journal."
- "This is certainly **adventurous**, and I frankly would have doubted it could be done. Yet the **PI has proven the method** in preliminary work *AND* had it accepted by a peer-reviewed journal!"
- "This **reads like a dream**. I have rarely seen a proposal, even from long-established investigators, that shows such **careful thought and meticulous presentation**."



Common Reasons for Low Ratings

- No well defined hypotheses or tests of same. **Lack of focus**. "Why all the rambling, this seems like a fishing expedition."
- Extraneous aspects or PIs. "What does that component/co-PI have to do with the central focus of the proposal?"
- **Important information** on experimental and sampling procedures is **omitted**. "I really can't tell what is going to be done and how."
- The work can certainly be carried out, but it **doesn't address any topic of broad current interest**. "I would probably not read a paper describing the results."
- Scope of the work is out of proportion to the budget and amount of time needed to do the work.



What makes a proposal competitive?

- Original ideas
- Succinct, focused project plan
- Cost effective
- Knowledge and experience in the discipline
- Experience in essential methodology
- Realistic amount of work
- Sufficient detail
- Strong rationale or evidence of potential effectiveness



Tips for Writing Competitive Proposals

- Discuss size and scope of intellectual payoff
- Use plain, simple English
- Let no question fester
- Do not include extra stuff
- Put specifics in the Methods section
- Use tables, figures, and flow charts to save words
- Make it visually appealing (i.e. do not make reviewers curse you for making their job harder)
- Include sufficient budget justification
- Think of your proposal as the 40th in a stack



from <http://www.cs.cmu.edu/~sfinger/advice/advice.html>

6. State your research objective clearly in your proposal: A good research proposal includes a clear statement of the research objective. Early in the proposal is better than later in the proposal. The first sentence of the proposal is a good place. ~~to get the attention of the reviewers~~

7. Frame your project around the work of others: Remember that research builds on the extant knowledge base, that is, upon the work of others. Be sure to frame your project appropriately, acknowledging the current limits of knowledge and making clear your contribution to the extension of these limits. Be sure that you include references to the extant work of others. ~~Propose that~~

9. Format and brevity are important: Do not feel that your proposal is rated based on its weight. Do not do your best to be as verbose as possible, to cover every conceivable detail, to use the smallest permissible fonts, and to get the absolute most out of each sheet of paper. Reviewers hate being challenged to read densely prepared text or to read obtusely prepared matter. Use 12 point fonts, use easily legible fonts, use generous margins. Take pity on the reviewers. Make your proposal a pleasant reading experience that puts important concepts up front and makes them clear. Use figures appropriately to make and clarify points, but not as filler. Remember, you are writing this proposal to the reviewers, not to yourself. ~~to get the attention of the reviewers~~

Intellectual Merit – 5 strands

- How important is the proposed activity to **advancing knowledge and understanding** within its own field or across different fields?
- How **well qualified** is the proposer to conduct the project?
- To what extent does the proposed activity explore **creative and original concepts**?
- How **well conceived and organized** is the proposed activity?
- (➤ Is there sufficient **access to necessary resources**)

...you should excel in all of these



NSF Broader Impacts activities – 5 strands

you should propose something that fits into at least 1 strand

- How well does the activity advance discovery and understanding while **promoting teaching, training and learning**?
- How well does the proposed activity **broaden the participation of underrepresented groups**?
- To what extent will it **enhance the infrastructure for research and education**, such as facilities, instrumentation, networks and partnerships?
- Will the results be **disseminated broadly to enhance scientific and technological understanding**?
- What may be the **benefits** of the proposed activity **to society**?

*e.g.
seminars/
working groups
advising
(under)graduates*

*(all publications will be
posted on arXiv)
general talks
scripts/
textbooks*

For an annotated example of good/bad practices in an NSF research proposal see

http://math.mit.edu/~katrin/papers/proposal_example.pdf