The Scientific Review

- Scientific journal article
  - What is published
  - Where it is published
  - Completed work
- Abstracts for conference oral and poster presentations
  - Least rigorous
- Grants/funding applications
  - Examples: NIH, NSF, DOD
  - Proposed work
- Public policy
Objectives and Significance

- Provide useful feedback
  - Opinions on what is good
  - Suggestions for improvement
    - Both science and writing
- Ensure that the science presented is credible and believable
  - Check integrity of work
  - Determine value of results
- The reviewer has a powerful voice
Who are Reviewers

- Typically scientific review is conducted anonymously
- For a journal
  - “Peers” selected by editors
  - Experts in fields relevant to work
- For a grant
  - Example: NIH study section
  - Experts in fields relevant to work
Elements of a Review

- **Summary**
  - Indicates whether it has been read and comprehended
  - Lends greater credibility to the review

- **Specific critiques**
  - Listed in organized fashion (by section and chronologically)

- **Final assessment**
  - Yes or no to publishing (in that specific journal)
  - Conditional (with significant changes)
General Questions to Ask

- What work has been done?
- Is the work novel?
- How significant is it?
- What impact will it have?

- Should the paper be published?
- How can the paper be improved?
Abstract

- Does it meet the word limit?
- Is it efficient and concise?
- Are methods mentioned or referred to?
- Does it fairly summarize all of the contents?
  - No omitted points
- Is there a conclusion? Is it accurate?

- Review both before and after reading full paper
Introduction

- What is main idea being communicated?
- What fields does this research relate to?
  - Proper target audience?
- Are the cited references relevant?
  - Check some references yourself
- Is direction of paper clear?
  - Point to conclusions
Materials and Methods

- Are all materials referenced properly?
- Are all necessary protocols described?
  - Sufficient level of detail
  - Novel procedures should be very detailed
  - Common or referenced procedures should be briefly described
- Is order of experiments organized?
- Can this work be repeated if necessary?

- Considered the most important part of paper to review
Results

- Presented in a logical order?
- Same order as methods?
  - Methods described for all of the results
- Is the data clearly referenced in the text?
- Is contradictory data noted and explained?
- Are controls or other crucial experiments missing?
Discussion and Conclusion

- Are the results interpreted?
- Have the stated objectives been reached?
- Does the work reach a conclusion?
- Are speculative statements or thoughts included? Are they reasonable?
- Is it stimulating?
- Does it produce new ideas?
Figures and Tables

- Are they neat and clear?
  - Labels, legends, titles, etc.
- Do they accurately support the results?
- Is each one essential?
- Are others needed?
Literature Cited

- Are citations accurate?
- Are references the most pertinent?
  - Suggest others that may be better
- Is each reference essential?
- Are additional references needed?
  - Complete accounting of previous work
How to Voice Criticism

- Be specific
  - Mention figures, highlight sentences
- Be constructive
  - Suggest improvements or pose alternatives
- Use tact
  - Even if anonymous, the author may be able to determine identity of reviewer