Reading and Presenting Papers

(These instructions are modified from something that Dr. Wendy Panero uses in her graduate classes. I think they are excellent. Thanks Wendy!)

When you are reading the papers pay attention to the following:

**Context and motivation:**
- What is the main argument of the paper and why is it significant? Why did the authors write the paper or do the work in the first place? Why would anyone want to read it?

**Experimental process:**
- What did they do?
  - Field work:
    - Where?
    - Why did they select the site?
    - What observations/samples were collected?
  - Experiments
    - How was it set up?
    - Sample?
    - Conditions?
    - Evaluated?
  - Modeling
    - What type of calculations?
    - Validation?
    - Scale/resolution/convergence

**Data and analysis:**
- What’s the evidence?
- How are the data presented and why?
- Are the tools or instruments appropriate?
- Is the data analysis adequate?
- What are the assumptions and what are the fundamentals that allow you to make these assumptions?

**Scientific Assessment:**
- What constitutes evidence?
- Are the results consistent with what we know already? Is there something inconsistent with this work?
- If the result is an "outlier", is it important? Is it a new discovery or that someone has screwed up or it’s a glitch?
- Are there alternative hypotheses that could come from the data?
  - Is this possible, probable, or excluded (expected, permissive, doubtful, or excluded).
Questions:
- If there are aspects of the paper that you do not understand and you are leading the discussion, seek answers to your questions before you get to class.
- If there are aspects of the paper that you do not understand send your questions to the discussion leader ahead of time (at least a day ahead).

Leading the Discussion:
- Integrate any questions submitted by the class into your summary of the paper
- Focus your effort on explaining difficult to understand concepts rather than all concepts.
- Structure your presentation
  - Introduce the topic and background.
  - Summarize (briefly) experimental technique and results
  - Explain what is illustrated in major figures
  - Summarize conclusions and any other claims made by the authors
  - Discuss conclusions and claims
- Topics to discuss:
  - Highlight strengths and weaknesses of the paper
  - Highlight context and implications of the paper.
  - How well established are these ideas?
  - What is the impact of this work?
  - How should this area of the science proceed?
  - How would further results of this work affect other fields?
  - How does this week’s reading relate to previous material from this course?
- Synthesis: (If presenting more than one paper)
  - How do the papers relate to each other?
  - How do their approaches differ? Are they addressing the same issue?
  - How do the results compare? How do they differ?