The Publication Process
Process

- Do scientific study. Take very, very careful notes
- Write paper to report the results of the study
  - Allow input from all those who assisted with the study
  - Ensure that the final paper meets with approval from all authors
- Submit paper to scientific journal
  - Paper will be sent for refereeing by the journal editor
- Respond to referee report
  - Take all comments seriously. If you do not implement suggestions, provide detailed, sincere explanation of why.
- Resubmit paper to journal
- Upon acceptance, pay page charges
- Publication of paper by journal
Paper Sections

- Title, Authors, Abstract, Keywords
- Introduction/Background
- Data Selection and preparation
- Analysis methods and result
- Discussion of results
- Conclusion
- Acknowledgements
- References
Introduction

- Paper writing starts at the conception of a new project
  - What work has been done previously that you can base your study on?
  - What science questions are being asked in your study?
  - Why are the answers important?

- The answers to these questions will go in the Introduction of the paper
  - When you start your project, make notes where you can find and use them later

- Be sure to keep track of who helps you with the concept and design of your project.
  - May wish to recognize them in Acknowledgements
Data Selection

- What data are you using and why?
  - Describe the data sets used in the analysis
  - If some data has been removed, explain why

- How did you adjust the data to ready it for analysis?
  - Scaling, period folding, power spectrum, etc.
  - This is everything you do prior to modeling/fitting your data
Analysis

• Describe in detail how you generate results from the data set
  • Modeling, fitting, etc.

• Summary of Results
  • Tables, plots, etc
  • This is where the quantitative results from your analysis get reported
  • Remember “just the facts” – speculation about what the results mean is in the next section
Discussion

- Explain what the results you have obtained mean for the science area you are investigating

- Try to answer the questions you posed in the introduction
  - If unable to answer (ambiguous results), describe what else needs to be done to address the question

- This section is usually longer than you anticipate, because you need to address multiple angles for looking at your results
Conclusion / Acknowledgements

- Short description of what you discovered in the study.

- For short papers with a simple result, Discussion and Conclusion may be combined

- Acknowledgements
  - Thanks for those who assisted in developing project but did not join paper as authors
  - Thanks to funding agencies (specify grant numbers)
Title, Authors, Abstract, Keywords

- Do once the paper is essentially complete.
- **Title** should be unambiguous and descriptive.
- **Author list** should recognize everyone who contributed materially to the study.
  - Even if they only took data for you!
- **Abstract** should be brief but clear description of what you did and what you discovered.
- **Keywords** should reflect search terms that are appropriate for your analysis.
  - Keyword options are often journal-specific.
References

- All statements of fact must have references
  - Reference should be to the first time the fact was reported
  - If multiple independent reports, provide multiple references
  - Goal is to be complete, but not excessive
- Reference formatting usually journal-specific
“Journal Specific”

- How to keep track of a variety of journal-specific formatting needs?
  - LaTeX!!
    - Style files provided by the various journals will do the formatting for you
    - Need to include the style file in your build directory

- How to handle long lists of references?
  - BibTeX!!
    - Reference handling/formatting
    - Put ADS bibliographic entries in .bib file
    - BibTeX selects those cited in the paper and formats the References section
Include entry in paper with `\cite{2010ApJ...708L.100A}`
Different Citation Formats

- LaTeX provides for different formats for references
- Smith et al, 2010 have shown that...
  - \cite{Smith2010} have shown that...
- So and so was demonstrated (Smith et al. 2010).
  - So and so was demonstrated \citep{Smith2010}.
- Yadda is known (see, e.g., Smith et al. 2010).
  - Yadda is known \citep[see, e.g.,][]{}{Smith2010}.
- ... has been seen repeatedly (Smith et al. 2010; Jones 2011).
  - ... has been seen repeatedly \citep{Smith2010,Jones2011}.  

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Internal references

- Figures and tables must be numbered in the order they are discussed in the text
- You don’t want to have to re-number all your tables, figures, etc. when you add something mid-writing
  - Use `\label{label_name}` in the figure or table definition
  - Then reference that label in the text
    - `\ref{label_name}`
  - LaTeX will take care of numbering the items properly
Compiling

- When you have a bibliography file and internal references, you need to run several commands to get all the pieces where they belong:
  - \texttt{latex ms.tex}
  - \texttt{latex ms.tex}
  - \texttt{bibtex ms.tex}
  - \texttt{latex ms.tex}
  - \texttt{latex ms.tex}
  - Sometimes one more \texttt{latex ms.tex}

- The multiple runs allow LaTeX to cross reference the tables, figures and citations.
Complex Papers

- Some papers can wind up with many tables, figures, sections, subsections, etc.
  - Best to start with good practices to keep structure simple and consistent

- LaTeX allows for directory structures and multiple source files

- Typical structure:
  - Top directory: ms.tex, authors.tex, ms.bib, etc.
  - Subdirectories: figures, tables

- Sample paper template, with ApJ style file and sample figures, available at class web
Refereeing

- All reputable scientific journals use peer-review

- Your paper **will be reviewed** by another expert in your field.
  - Be sure you and all co-authors are happy with it before you submit!
  - Referee report usually within 6 weeks

- Questions on referee report **must be answered**
  - Otherwise, editor will not publish the paper

- Once you publish, you will start getting requests to be a referee
Page Charges

• Journals charge to publish
  • Charges cover personnel, editing, publication, overhead, etc.
  • Subscriptions not nearly enough

• Cost is base+per page amount

• Additional charges:
  • Color figures (cost is per page with color figures)
  • Supplemental material (online tables, etc.)
  • Other?

• Page charges are typically paid by your grant
Press Embargos

- Some journals have automatic press embargoes
  - No talking about results to reporters or in public until paper is published (online)
  - E.g., Nature and Science

- If your result is very scientifically interesting, you may plan press events even if not in high-visibility journal
  - If so, press embargo is a good idea
  - Builds interest in your result
  - Stops unexpected early reporting

- If no press embargo, you have the option to post pre-print to arXiv.org
  - Best to wait for journal acceptance
Publication

- Once paper is published:
  - Update arXiv with final version of the paper
  - Update your CV
  - Include in your bibliography file
  - Send copies to all your friends/family
    - See if they can spot the verbs!