

## ASTR 121 – Spring 2016

### Scientific Writing

#### What is Scientific Writing?

An integral part of the scientific process is the communication of results; writing and publishing journal articles allows scientists to share information, contribute to a larger body of knowledge, and provide a basis for further research. For these reasons, it is crucial to be able to effectively communicate scientific knowledge. Throughout this course, we will practice scientific writing skills by both reading and writing scientific reports.

#### Structure of a Scientific Paper

Though the structure of a paper can vary between disciplines, there are some elements that are almost always present in one form or another. These sections build a logical argument, starting with a question, leading the reader through the process, and ending with a justified answer.

**Abstract** – An abstract is essentially a condensed version of a paper; someone should be able to read a paper's abstract and get the main ideas, including the question, the method, the results, and its implications. An abstract mimics the structure of the rest of the paper, but with one or two sentences for each section, rather than an extended explanation.

**Introduction** – This section gives the motivation for a research question, as well as any necessary background. Here, one introduces a problem, describes the current state of knowledge, and connects it to what is done in the paper.

**Methodology** – This section varies greatly from field to field. Basically, it describes what was done in the paper. As a few examples, this could take the form of an experimental setup, observation information, a description of a simulation, or theoretical equations

**Results** – This is where findings are reported. Whatever the result of the method described in the previous section, it is given here.

**Discussion** – This section synthesizes the results into information to answer the research question. However, the discussion does not only include the answer to the question; it also discusses sources of uncertainty, limitations to an experiment, possible improvements, and implications the result may have.

**Conclusion** – No new information is introduced in the conclusion; it is simply the restatement of the main points to tie up the paper. In many ways, it reflects the abstract.

**References** – As with any kind of writing, it's important to cite any sources used in your research. Citation styles vary between fields.

**Appendices** – This is where excess information is included: data, diagrams, or equations might all be placed in the appendix rather than the body of the paper.