

如何写好天文学论文

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摘 要

对如何撰写将要在国际上发表的天文学论文给出一些建议。讲述了论文的每一部分(题目、摘要、引言、主要内容、图表及参考文献等)如何可以写得简洁而又能清晰地表达出观点。这是作者根据在多年的编辑生涯中审阅了许多效果迥异的论文后的经验之谈。

关键词 天文学论文 — 简洁 — 清晰

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How to Write a Good Astronomical Paper

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Abstract

Some suggestions are given about writing an astronomical paper for an international audience. For each of the parts of a paper (title, abstract, introduction, main text, figures, references) we give ideas on how to write concisely but to be clear yet informative. These are based on my years of being an editor and reading both good and weak papers.

Key words astronomical paper—concise—clear

Start to write an astronomical paper only when you have some significantly new or useful results.

Having a paper published is a privilege and a large expense (roughly 1000 RMB per page) to others, so do not waste space.

If possible, you should select a short title because it will catch the eye easier.

On the other hand, the title should be informative and describe your main results, e.g. "The Space Motion of the Globular Cluster M13" rather than "Observations of the Globular Cluster M13".

The Abstract should give your main conclusions. Do not be afraid of giving your results in the Abstract because if they are interesting, the readers need to be convinced by your full evidence in the text before they will believe them.

In the Abstract avoid saying "... will be discussed". Such a statement usually means that no conclusions are reached and the paper may not be worth reading.

Select the key words only from the list supplied by the journal. The reason is as follows. The key words are often used to form a subject index. If you invent a new key word and it is used in the subject index, there may be other papers that should have been listed under it, and the reader will fail to find those.

The usual order of the parts of the text are (1) introduction, (2) description of the observations or methods, (3) results, (4) discussion, (5) conclusions and (6) acknowledgements. Those are followed by the references, tables, figure captions, and figures.

Unless the journal asks for a camera-ready text, do not try to simulate the arrangements of parts (e.g. location of tables and figures) because the journal will have to rearrange them anyway. Instead, indicate in the manuscript margins where each of the figures and tables are first mentioned.

The Introduction should help an average astronomer to understand your goals and how they fit into what is already known about the topic. It is not written for an expert (e.g. a specialist on Seyfert galaxies) or for a person who has not taken the first university course in astronomy. If you lose the reader with an obscure or unhelpful Introduction, he will stop reading.

Be concise. With our need to read many papers, we cannot afford to spend time on papers that are unnecessary long. On the other hand, be clear. Avoid long sentences and obscure words. Many readers do not have English as their primary language, so do not make reading your paper too hard for them.

Do not describe well-known techniques, but refer to some paper or book that has already been done.

Do not invent many new acronyms, especially if they are used only a few times in the text, because then it is hard to read. Define all except the best-known acronyms (e.g. AGN, NLTE, SN) by writing out the full words in parentheses the first times they are used in the text.

In referring to previous papers, we often refer to the first paper that invented a method or technique or obtained results in fairness to the originator, and a recent paper that has done it best. In a research paper it is not necessary to refer to all of the relevant papers – that is the role of a review paper.

The main text should proceed in a logical way that is easy to follow. If necessary, provide

an outline of how the text is arranged.

Journal editors do not like you to take extra space by presenting results in both tabular and graphical form, except perhaps for the final or most important results. Choose the form that describes the results best.

Figures should have four borders each and tick marks along all four so that readers can obtain numerical data from them more easily. Each coordinate should be labeled with a parameter (e.g. velocity, luminosity) and dimensions (e.g. $\text{km}\cdot\text{s}^{-1}$, mag.). The lettering should be large enough that when the figures are reduced to about 5-15 cm wide the lettering is easily read.

Plan the figures so that there is not a large amount of blank space. Do not put too much into a figure so that will be confusing after reduction to the printed page. The press will normally enlarge a figure so that the smallest details are resolved. If it is not necessary for the readers to resolve all the details (e.g. each of the observational points), tell the press that.

The figure captions should describe the contents of the figures, but they should not interpret the contents. The interpretation will be given in the text, and it would be redundant to have that in two places.

The content of the tables should be pertinent to the paper. Not every number that you derive needs to be in the final paper. Each journal has rules about the lines needed in tables. Often vertical lines (to separate columns) are not needed and are difficult to install, just as they are in a computer. Most journals use lowercase letters to call for footnotes because numbers can be confused with exponents.

In most astronomical journals the titles of journal papers are not published because they take up too much space. On the other hand, the titles give useful information about whether the paper is likely to be of interest, so some journals choose to take the extra space.

The format of references is logical but very detailed. Try to get the details right to avoid extra work by the copyeditor and yourself. Refer to recent journal issues for guidance with the details. The journal normally does not look up the references, so if you make mistakes with volume or page numbers, the mistakes will be printed and readers will be confused.

Writing a paper may seem like a chore (extra work), but we often find that we do not fully understand our results until we have to explain them to others (the readers). In writing those explanations we sometimes find that we have to change our conclusions. Therefore writing a paper is an important part in completing our research.