

Astronomy & Astrophysics - Author's guide

A&A Editorial Office

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1. General remarks

Astronomy & Astrophysics publishes new results of astronomical and astrophysical research. Details about the current A&A editorial policy can be found in the editorial published in A&A 420(3), E1-E14 (2004).

Manuscripts submitted for publication to A&A should not be submitted to any other refereed journal, but can be sent to preprint servers such as astro-ph. By submitting a manuscript to A&A, the corresponding author explicitly states that the work is original and that all co-authors have read the manuscript and agree with its contents. A&A Editors expect to be informed when a submitted manuscript has previously been rejected by another Journal.

1.1. Ethical issues: the A&A policy concerning plagiarism and improper attribution

Plagiarism is the severest ethical problem encountered by A&A Editors. It is defined as the act of reproducing text or other content from works written by others without giving proper credit to the source of that content. Note that citing a text literally is not the only condition for determining plagiarism, which also includes any paraphrased text that discusses an already published idea without citing its original source.

Plagiarism is a major ethical breach and may also constitute a legal breach of copyright if the reproduced material has already been published. This is particularly true when authors cite text from their own previously published works. A&A Editors refer to this as "self-plagiarism".

Authors who wish to quote directly from other published work must cite the original reference and include any cited text in quotation marks. Figures may only be reproduced with permission and must be cited in the figure caption. Because A&A focuses on publishing original research results, authors are discouraged from using direct quotations of previously published papers and figures. A citation and brief discussion of previous results in the context of the submitted paper is usually more relevant than direct quotation.

Papers published in A&A should cite previously published papers that are directly relevant to the results being presented. Improper attribution – i.e., the deliberate refusal to cite prior, corroborating, or contradicting results – represents an ethical breach comparable to plagiarism.

Plagiarism, self-plagiarism, and improper attribution can result in the summary rejection of a manuscript submitted to A&A. In the severest cases of plagiarism, offending authors can be banned from publishing in A&A for a determinate period of time. In such cases, the Editor in Chief can also inform the Editors in Chief of the other professional astronomy journals of the author's ethical misconduct.

1.2. Manuscript categories

There are different kinds of manuscripts published in A&A, all of them must be written in English and formatted in LaTeX2e using the current A&A macro package¹. Submissions and manuscript follow-up are made via the A&A on-line manuscript management system (See Sect. 4).

Letters to the Editor

A&A Letters are short manuscripts on a significant result or idea. They are limited to 3000 words (four or five pages) but can have unlimited supporting material as appendices. They are free for all researchers across the world: they have both no page charges for publication and immediate open-access status. They are treated on a fast-track: a referee's report is expected about ten days after submission, and authors are expected to react to referee reports in a similar time.

Regular papers

Regular papers submitted to A&A should present new astronomical results or ideas of sufficient interest to the community as concisely as possible.

Other submissions

Errata concerning published A&A papers must be sent directly to the editorial office for consideration by the Editor in Chief.

Comments are usually not published by A&A, except in exceptional cases. Three conditions are necessary for a comment to be considered for publication (a) it refers to a paper published by A&A, (b) it does unambiguously solve the problem or question it raises, and (c) its publication will be useful to the community. Comments should also be sent directly to the editorial office.

1.3. About the language

Most papers in A&A have been written by non-native English speakers. Those authors with a limited experience of English are strongly recommended to find help in writing their papers, preferably from a native-speaking colleague. It is the policy of A&A to hold the authors responsible for a correct formulation of their text. A&A offers help, but only after the scientific content of a manuscript has been judged to be sufficient for publication, so it should be understandable before it goes to a referee. If necessary the Editor will send back poorly written submissions to the author with a request for an initial revision of the language by a native English speaker.

1.4. Structure of a paper

Most scientific papers have the same structure:

- Introduction
- Observations or calculations or mathematical derivations
- Results
- Discussion
- Conclusions

This is a well-tried format; authors should have good reasons for deviating from it. The goal of a scientific paper is not to impress the readers by poetic language but to transfer facts and new insights as lucidly as possible.

Instructions to download and install the A&A macro package are available at ftp://ftp.edpsciences.org/pub/aa/readme.html

The first page of a manuscript contains: A title, the authors' names, the addresses of authors' institution, an abstract and six keywords at most.

All this information is also entered in the manuscript management system at submission time. Authors are asked at the same time to suggest the section of the Journal in which the paper will appear.

1.5. The A&A sections

The current A&A sections are as follows.

- 1. Letters*
- 2. Astrophysical processes
- 3. Cosmology (including clusters of galaxies)
- 4. Extragalactic astronomy
- 5. Galactic structure, stellar clusters and populations
- 6. Interstellar and circumstellar matter
- 7. Stellar structure and evolution
- 8. Stellar atmospheres
- 9. The Sun
- 10. Planets and planetary systems
- 11. Celestial mechanics and astrometry
- 12. Atomic, molecular, and nuclear data*
- 13. Astronomical instrumentation*
- 14. Catalogs and data*
- 15. Numerical methods and codes*

* Free access at no cost

Sections 12–15 of A&A have topics of potential use by a wide range of astronomers. Thanks to the generosity of our publisher, who provides free access to these sections and to A&A Letters, these important parts of our Journal are freely available to the worldwide community of astronomers.

Note concerning papers submitted for Section 13

Recognizing the importance of state-of-the-art instrumentation, the A&A Board of Directors has decided to develop the corresponding journal section, thus aiming at making A&A a reference journal also for astronomers whose main interest is instrumentation. We therefore introduce hereby the new editorial policy concerning these papers. In Sect. 13, we will publish papers that describe:

- new concepts and ideas that might lead to actual future instruments,
- crucial instrumental developments in ongoing ground-based or space projects,
- studies that are essential to the preparation of large instrumental projects,
- ground-breaking data processing and mining methods, provided these works report a significant advance on current capabilities and are of interest to a sizable fraction of the community.

Compared to our previous editorial policy for Section 13, the main change is that we no longer request that papers describing instruments and related studies also present astronomical results.

Details on this new policy can be found in the editorial published in A&A 459, E3 (2006).

2. Paper organization: general guidelines

Here, we give some general guidelines concerning the style of the most important elements of a paper. More details and instructions for the LATEX implementation of these elements are given in the following section, and stylistic considerations are reviewed in Sect. C.

2.1. The title

Make the title short and communicative; do not use acronyms, except those that are in general use; avoid acronyms known only to those deeply specialized.

2.2. The abstract

The abstract should be short but informative. Sometimes this is difficult to achieve as these two criteria contradict each other to some extent. The abstract should give in a few lines the essence of the results. A good abstract eliminates to a large extent the need for the section with conclusions at the end of the paper.

A&A encourages the use of structured abstracts (see the editorial published in A&A 441, E3-E6). Just like a traditional abstract, a structured abstract summarizes the content of the paper, but it does make the structure of the article explicit and visible. For doing so, the structured abstract uses headings that define several short paragraphs. Three paragraphs, entitled respectively "Aims", "Methods", and "Results", are mandatory. When appropriate, the structured abstract may use an introductory paragraph entitled "Context", and a final paragraph entitled "Conclusions".

The objectives of the paper are defined in "Aims", the methods of the investigation are outlined in "Methods", and the results are summarized in "Results". The heading "Context" is used when needed to give background information on the research conducted in the paper, and "Conclusions" can be used to explicit the general conclusions that can be drawn from the paper.

Note that the use of structured abstracts in A&A articles and Letters is not mandatory. Authors who prefer the traditional form are invited to implicitly follow the logical structure indicated above.

2.3. The introduction

The introduction should state clearly why the study was started and place the research in a broad context e.g. by referring to previous work of relevance. The introduction should not contain the conclusions. Some authors tend to expand an introduction into a review paper by itself; this should be avoided; it is better to refer to papers in the well-established review journals. At the end of the introduction the outline of the paper may be described.

2.4. Tables and figures

All tables and figures must be mentioned explicitly by number in the body of the article and appear in correct numerical order in the body of the text.

2.4.1. Table title style

Every table should have a concise title; more extensive descriptions or additional information should be incorporated in a note to the table. Each column, including the first, must have a heading. Column headings should label the entries concisely (one or two words); the first letter of each word is capitalized. Units of measurement should be given in parentheses immediately below the column headings, not listed with the data in the body of the table. To indicate the omission of an entry, ellipsis dots (...) are used.

2.4.2. References in tables

References cited in a table should be numbered, either in the order in which they are listed in the column or following an alphabetical ordering of the references. The reference should list the number, with the full citation by name(s) and year in a note below the table. Alphanumeric abbreviations (e.g., DS86) may be used in place of numbers if these are used elsewhere in the text. The note to the table should then read, e.g., "References. (1) Dupont and Smith 1986; (2) Rees 1998." All references cited in tables must also have a complete entry in the reference list.

2.4.3. Figure legend style

Figure legends should concisely label and explain figures and parts of figures. The first sentence of each figure legend should be a descriptive phrase, omitting the initial article (the, a, an). In multipart figures, the legends should distinguish (a), (b), (c), etc., components of the figure. Note that if parts are identified in the legend as (a), (b), (c), particularly for single figures composed of multiple panels, these letters should be clearly labeled in the figure itself. Otherwise panels should be referred to by position (top right, top left, middle, bottom, etc.). All lines (solid, dashed, dot-dashed, dash-dotted, etc.) and symbols (filled or open circles, squares, triangles, crosses, arrows, etc.) should be explained in the legend. Graphics should not be used in figure legends.

The scientific discussion of the table or figure contents should appear in the main body of the article, not in the table title or figure legend.

2.5. Multimedia

A&A can also publish multimedia and 3D models embedded within HTML and PDF versions of articles. (see also http://www.aanda.org/author-information/latex-issues/multi-media).

2.5.1. Movies

When you submit your video files, please make certain their size is appropriate: as small as possible (and not larger than 10 Mb) but still big enough for all the important scientific information and details to be clearly visible. We will not resize videos, so authors are expected to submit their video files in the size and format in which they wish them to appear.

We accept .mov, .avi, .mpg, and .mp4 files. Please note that we cannot accept movie files that require the reader to download particular codecs; files must be playable on standard media players such as QuickTime, Windows Media Player, or VLC.

2.5.2. 3D models

When you submit your 3D model files, please make certain their size is appropriate: as small as possible but still big enough for all the important scientific information and details to be clearly visible. We will not resize your files, so authors are expected to submit their video files in the size and format they wish them to appear.

U3D or PRC files may be embedded directly into the PDF with the "media9" package

See, for example, figure 15 in the PDF file of the following article:

http://www.aanda.org/articles/aa/abs/2014/01/aa22032-13/aa22032-13.html.

The size of the whole PDF document should not exceed 50 Mb, and the same requirements as for videos apply.

At the present time, the technical tools for automatically standardizing the process of including a 3D object in an HTML format do not exist. To overcome this technical limitation, A&A will accept links to 3D models on your site or on any specialised site such as Sketchfab. In this case, links should be included in your article as footnotes at the appropriate places.

2.6. Appendices

In principle, all information that is not crucial for understanding the paper can be published in appendices, following the Editor-in-Chief's decision. For instance, such material can be observation logs, tables of properties that are also reproduced in figures, long mathematical derivations, redundant figures when only one example is needed to understand the discussion, etc. Movies can also be published.

The appendices are included after the reference list.

3. TEX file preparation

As the articles for the A&A will be available online in different formats – one of these is full-text-searchable hyper-text – we strongly suggest you strictly obey the LATEX conventions.

The A&A document class was derived from the LaTeX $2_{\mathcal{E}}$ article.cls based on TeX version 3.141 and LaTeX $2_{\mathcal{E}}$. You may use it with the LaTeX engine or the pdfLaTeX engine. Be sure that the LaTeX version is at least the 2007 version. Hence formulas and text are typed using the standard LaTeX $2_{\mathcal{E}}$ commands. The standard sectioning commands are also kept. Using aa.cls with other versions or implementations may cause difficulties. If this is the case, please contact us and we will try to help you.

Please refrain from using any self-made definitions since these will get lost during further conversion of your text. If you use typing abbreviations, "search and replace" them before submitting your article to the publisher.

3.1. The preamble of your T_FX file

3.1.1. Loading the class: various A&A layouts

\documentclass[referee]{aa}

\documentclass[longauth]{aa}

\documentclass[onecolumn]{aa}

\documentclass[bibyear]{aa}

Both for refereeing purposes and, after acceptance, for language editing purposes, the authors are requested to send their article in "Referee format", i.e. with a special double-line spacing layout. To set this class option, please include the referee option. This special layout also provides a list of all astronomical objects indexed with the \object command (see Sect. 3.8).

In articles that are the result of consortia, the number of authors and the list of affiliations are very long. With the longauth option, all the institutes are set below the references.

Some papers contain a lot of large mathematical formulae which are sometimes not easily readable and cannot be written in a 2-column format. In this case, the authors can submit their articles using the option onecolumn. After the submission, the editors will confirm if the article will actually be displayed in 1 column, right across the page.

If you don't use structured references (according to the author-year natbib style), add this option.

3.1.2. TX fonts

A&A uses the Postscript TX Times-fonts. The TX fonts consist of virtual text roman fonts using Adobe Times with some modified and additional text symbols. The TX fonts are distributed under the GNU public license and are available in the distributions of LATEX since December 2000.

\documentclass{aa}
\usepackage[varg]{txfonts}
...
\begin{document}

As the use of the TX fonts results in a slightly different page make-up from CM fonts, we encourage you to use TX fonts, following this example.

3.2. The manuscript header

3.2.1. Title

Make the title short and communicative; do not use acronyms, except those that are in general use; avoid acronyms known only to those deeply specialized. The main title and the subtitle should not be capitalized, except for the first letter and any other words that are always capitalized. Math variables and symbols should be typeset as in the text.

In the manuscript TeX file, please code the title and subtitle of your article as follows.

\title{<your title>}
\subtitle{<your subtitle>}

If a long \title or \subtitle needs to split across two or more lines, please insert linebreaks (\\).

3.2.2. Authors and addresses

For every manuscript, all authors and all addresses should be listed. Addresses should contain e-mail addresses where possible. A number should precede each address and the authors' names should be marked with the appropriate numerical superscript(s). Unless the authors request otherwise, the e-mail addresses will be included in the affiliation to facilitate information exchange between readers and authors.

Names of authors The preferred form for each name is: initial(s) of the forename(s) followed by the family name.

\author{<first author's name>
\and <second author's name> }
\and <third author's name>... }

If there is more than one author, the order is optional. The names should be separated by \and. If the authors have different affiliations, each name has to be followed by \inst{<number>}. Numbers referring to different addresses should be attached to each author, pointing to the corresponding institute.

A&A offers authors the possibility of being identified with non-Roman alphabets, such as Chinese, Japanese, Cyrillic characters (see specific instructions here).

Addresses

```
\institute{<name of the first
institute>
\and <name of the second
institute> ...}
```

If there is more than one address, the entries are numbered automatically with \and, in the order in which you type them. Please make sure that the numbers match those placed next to the authors' names.

The authors' institutes can also be given using labels, so that there is no need to rewrite the full institutes list if the order of the authors changes during the evaluation process. An example is given below:

\author{V.~Arsenijevic\inst{\ref{inst1}}\and S.~Fabbro\inst{\ref{inst2}}\and

```
A.~M.~Mour\~ao\inst{\ref{inst3}}\and A.~J.~Rica da Silva\inst{\ref{inst1}}}
\institute{Multidisciplinar de Astrof\'{\i}sica, IST, Avenida Rovisco Pais, 1049
Lisbon, Portugal\email{arsenije@ist.utl.pt}\label{inst1}
\and
Multidisciplinar de Astrof\'{\i}sica, IST, Avenida Rovisco Pais, 1049
Lisbon, Portugal\email{arsenije@ist.utl.pt}\label{inst2}
\and
Multidisciplinar de Astrof\'{\i}sica, IST, Avenida Rovisco Pais, 1049
Lisbon, Portugal\email{arsenije@ist.utl.pt}\label{inst3}
\label{inst3}
```

In the case of large collaborations involving several tens of authors, a special formatting of the authors' list is requested in order to save space. With the longauth option, all the institutes are set below the references (see section 3.1.1).

3.2.3. Footnote to the title block

```
...\thanks{<text of footnote>}
```

If footnotes to the title, subtitle, author's names or institute addresses are needed, please use thanks immediately after the word where the footnote indicator should be placed.

These footnotes are marked by asterisks (*). If you need more than one consecutive footnote, use \fnmsep to typeset the comma separating the asterisks (see an example in the file aa.dem available in the macro package).

3.2.4. Dates of receipt and acceptance

Enter the receipt and acceptance dates as follows:

The date is in format "day month year" (e.g. 1 January 2005).

The proper receipt and acceptance dates of your manuscript will be set by the editors and inserted by the publisher.

3.2.5. Abstract

A new concept "Structured Abstract" is implemented with the version 6.0 of the A&A macro package. Just like a traditional abstract, a structured abstract summarizes the content of the paper, but it does make the structure of the article explicit and visible. For doing so, the structured abstract uses headings that define several short paragraphs. Three paragraphs, entitled respectively Aims, Methods, and Results, are mandatory. When appropriate, the structured abstract may use an introductory paragraph entitled Context, and a final paragraph entitled Conclusions. More details about the structured format can be found in the Editorial (A&A 441, E3).

Proceed as follows:

\abstract {}{}{}{}{}

The second, third and fourth arguments have to be completed. The first one and the last one might be left empty.

For example:

```
\abstract {} {Text of aims} {Text of methods} {Text of results} {}
```

The abstract should accurately summarize the paper's content, be limited to 300 words, and be self-contained (no references, no abbreviations or acronyms except for the truly obvious and familiar ones). A counter of words has been added with an error message for an abstract exceeding 300 words. Citations in an abstract display an error message. Please note that abstract is a command with 5 arguments, and not an environment.

Remark: Authors who prefer to keep an unstructured format can do so using the command \abstract{...}, which will make the abstract a single paragraph without headings.

3.2.6. Key words

A maximum of 6 key words should be listed after the abstract. These must be selected from a list that is published each year in the first issue in January and is also available in Appendix A or on the A&A web site. This list is common to the major astronomical and astrophysical journals.

In your T_FX file, the key words should read as follows:

```
\keywords{<keyword 1 - keyword 2 - keyword 3>}}
```

3.2.7. Formatting the header and the running title

Having entered the commands described above to set the title block of the article, please format the complete heading of your article by typing:

\maketitle

If you leave it out, the work done so far will produce no text. The command \maketitle will automatically generate the running title, derivating it from the author and title inputs. If the title is too long for the space available, you will be asked to supply a shorter version. In this case, enter before \maketitle:

\titlerunning{<short title>}
\authorrunning{<name(s) of
author(s)}</pre>

If there are two authors, both names, separated by an ampersand (&, coded as \&), should be given; if there are more than two authors, the name of the first plus "et al." should be given. The title should be shortened to a maximum of about 60 characters, spaces ignored, following the wording of the original title as closely as possible. If a paper has a numbered subtitle, the main title (length permitting) should be given, followed by the roman numeral of the subtitle.

The Editors reserve the right to modify the running head suggested by the authors, should this be necessary.

The required style is illustrated below (the colon will be inserted by the macro):

- N. Copernicus: How active is NGC 4258?
- E. Hertzsprung & E.P. Hubble: Optical spectroscopy of WR stars in M33 and M31. II
- A.S. Eddington et al.: Infrared lines as probes of solar magnetic features. IV
- C. Barbieri et al.: (RN) First HST/FOC images of the low mass companion of the astronomic binary Gliese 623

Appendix B provides an example of a manuscript header coded with LATEX.

3.3. The main text

Manuscripts should be divided into numbered sections and subsections, starting with "1. Introduction". Subsections should be numbered 2.1, 2.2, 3.1, etc. All sections must have a short descriptive title. In the TeX file, the sections appear as follows.

\section{Title}
\subsection{Title}
\subsubsection{Title}
\paragraph{Title}

3.3.1. Cross-referencing

Please always give a \label where possible (figures, tables, section) and use \ref for cross-referencing. Such cross-references will be converted to HTML hyper-links. The \cite- and \bibitem-mechanism for bibliographic references as well as the \object command is also mandatory.

3.3.2. Acknowledgements

A special section for acknowledgements may be included before the References list. It will appear as follows:

\begin{acknowledgements} ... \end{acknowledgements}

3.3.3. Some aspects of typographic style within the text

The following expressions should always be abbreviated unless they appear at the beginning of a sentence (i.e. Sect., Sects., Fig., Figs., Col., Cols.). Table is never abbreviated.

Abbreviations of concepts, methods, instruments, observatories, etc may be used throughout the text, but the full wording followed by the abbreviation in parentheses should be given once in the Abstract (if appropriate) and/or once when first mentioned in the main text (usually in the Introduction).

Examples: ...very long baseline interferometry (VLBI)...; ... Westerbork Radio Telescope (WRT)...

3.4. Figures

Figures submitted to the Journal must be of the highest quality to ensure accuracy and clarity in the final published copy. You can supply graphics in eps, pdf, jpg, and tiff formats, or as native Photoshop/Illustrator files. We recommend that you refrain from using conversion tools that might decrease the quality of the figures.

We urge the author to limit the empty space in and around figures. Artwork should be in sharp focus, with clean, clear numbers and letters and with sharp black lines. Thin lines should be avoided, particularly in figures requiring considerable reduction. Authors should check whether laser-printed originals of these figures are acceptable (especially for grayscale).

The author is warned that changes in the size and arrangement of figures can made by the publisher at the production stage. Because of the bulk of the Journal, the production office will reduce most figures to fit a one-column format (88 mm). If necessary, figures may extend across the entire page width (max. 180 mm). Intermediate widths with a side caption are also possible (max. 120 mm). The illustrations should be placed at the top of the column and flush-left according to layout conventions.

If lettered parts of a figure (e.g., 1a, 1b, 1c, etc.) are referred to in the figure legend, each part of the figure should be labeled with the appropriate letter within the image area. Symbols should be explained in the caption and not in the figure. Please use lower case for any words in figures to comply with the A& A style.

See appendix B.3 for examples of how figures should be coded in the TEX file.

3.4.1. About figures format

Depending of your preferred LaTeX engine (LaTeX or pdfLaTeX), figures should be sent as encapsulated PostScript files or in any other format as PDF, JPG, TIF, BMP, and GIF (compatible with pdfLaTeX). All graphics are either vector graphics or bitmap graphics. Vector figures are graphics consisting of individual, scalable objects such as lines, curves, and shapes with editable attributes, therefore you can resize a vector without loss of quality. The bitmap figures are graphics composed of dots called pixels. Because bitmaps have a fixed resolution, enlarging or reducing them produce jagged and distorted images because extra pixels are added or supressed. Some software packages leave a considerable margin around the figures. You may have to adjust the BoundingBox for EPS figures by hand with the help of ghostview, for example. The figure can also be automatically changed with the psfixbb command, which you will find in almost any LaTeX distribution. For other formats as PDF, JPG, and bitmap formats, crop out any extra spaces around the figures and also check very carefully that the resolution is at least 250/300 dpi and not 92 dpi, as in standard screen JPG files. The easiest way to include your figures is by using the graphicx package, which comes along with the standard LaTeX2e distribution. See the document by Keith Reckdahl "Using Imported Graphics in LaTeX2e", which explains how to use imported graphics in LaTeX2e documents. The

Part I, Background Information provides historical information and describes basic LaTeX2e terminology and graphic formats.

3.5. Tables

Tables should be prepared using the table environment, following the examples given below.

Tables should be self-explanatory. The table headings should contain the essential information needed to understand the data presented. Details should not clutter the header and are better presented as explanatory footnotes. Dates in tables should be given in the IAU abridged format, i.e., 2012-Jul-13, or 2012-07-13. Large tables containing primary data can be archived at the CDS. For details about archival at the CDS, please refer to Sect. 3.5.1

Table columns should be set flush left. Vertical lines are normally not necessary and should be inserted only in exceptional cases for the sake of clarity. The height of each table, including the caption, usually must not exceed 23.5 cm, and the caption should always be placed above the table.

Detailed examples of TEX code for tables are provided in the appendix: see appendix B.3.2 for simple A&A tables and appendix B.3.3 for tables longer than one page.

See section 2.4 for details about table caption style.

A&A LaTeX macro package provides some special commands to format notes in the tables, see appendix B.3.4.

3.5.1. Publishing data at the CDS

By contract with the Journal, the CDS archives the primary data that are published in A&A and puts them at the disposal of the global community. The data are also linked to the general purpose data-mining tools developed at the CDS. These archived data can be primary observational material, catalogs, theoretical tables of lasting values, etc.

The CDS requires the data tables to be in ascii format. Each table is accompanied by a readme.txt file that describes the table's content. The readme file format defines a standard that is used by all major astronomy journals. Again by contract with the Journal, the CDS provides help to A&A authors for preparing the files. Primary data can also be archived at the CDS as graphics files in FITS format. This is of particular interest for spectrograms.

Tables made available in electronic form at the CDS should be prepared according to the conventions explained below and should be sent to the CDS upon acceptance of the paper, preferably using the submission form proposed on the CDS web site. Alternatively, the tabular material can be sent by e-mail to cats@cdsarc.u-strasbg.fr, or by ftp to cdsarc.u-strasbg.fr.

The electronic versions of the tables are systematically checked for consistency at the CDS, and the author may have to communicate with the CDS about missing descriptions or detected inconsistencies.

Preparation of the electronic tables

Tables to be published in electronic form at the CDS should preferably be prepared as plain ASCII files, one file per table; the description of all table layouts and contents should be gathered into a file named ReadMe, a template of which can be copied from ftp://cdsarc.u-strasbg.fr/pub/J/A+A/ReadMe.txt. In addition to the description of the tabular material, the role of the ReadMe file is to supply a minimum number of details about the context and the history of the data.

Detailed instructions for the preparation and the submission of the tabular data can be found at http://cdsweb.u-strasbg.fr/submit/; specific questions can be addressed to cats@simbad.u-strasbg.fr.

Reference to the material published electronically should appear in the text, including a description of the column headings of tabular material. The following text is an example of such a description:

"Table 1, available at the CDS, contains the following information. Column 1 lists the name of the source, Column 2 gives the bolometric luminosity...".

Alternatively, an excerpt from the table (a few lines) can be inserted in the article.

Retrieving electronic tables

For all papers, including old papers that do not have an electronic version, the online tables can be obtained from the CDS:

- by ftp:

```
ftp cdsarc.u-strasbg.fr (or 130.79.128.5) username: anonymous
password: (type your electronic address) cd pub/A+A/<volume>/<page>
mget * (to get all files)
```

- by web access from:

```
http://cdsweb.u-strasbg.fr/A+A.htx
http://cdsweb.u-strasbg.fr/A+AS.htx
```

3.6. References

3.6.1. The reference list

The reference list should contain all the references cited in the text, ordered alphabetically by surname (with initials following). If there are several references to the same first author, they should be entered according to the following scheme:

- 1. One author: chronologically
- 2. Author, one co-author: alphabetically by co-author, then chronologically
- 3. Author, two or more co-authors: chronologically.

Please note that for papers that have more than five authors, only the first three should be given, followed by "et al."

The A&A format for references is as follows:

- Bohr, N., Einstein, A., & Fermi, E. 1992, MNRAS, 301, 257 (BEF)
- Curie, M., & Curie, P. 1991, A&A, 248, 612
- de Gaulle, C. 1996, Solar Phys. (Oxford Univ. Press, Oxford)
- Heisenberg, W., & West, C. N. 1993, Australian J. Phys., 537, 36 (Paper III)
- Laurel, S., & Hardy, O. 1994, Active Galactic Nuclei, in The Evolution and Distribution of Galaxies, ed. W. Churchill, F. D. Roosevelt, & J. Stalin (Wiley, New York), 210

To set the reference list in the proper A&A format, we encourage you to use BibTeX and the natbib package instead of the standard thebibliography environment.

How to use BibTEX for A&A

For extensive description of the general use of BiBTeX, please see for example The LATeX Companion p.757 (Franck Mittelbach and Michel Goosens, second edition).

To use BibTEX, you must:

- 1. Create a database (.bib) file that describes the articles or books you want to reference. The NASA Astrophysics Data System (ADS) provides automatic tools for retrieving a .bib file including entries for a selection of articles. An example of a typical .bib file is also provided in the A&A LATEX macro package.
- 2. Specify the style and location of the bibliography in your TEX document. The A&A package includes a style file aa.bst that will format your reference list in the proper A&A format. Before running BibTEX you must ensure that the requested files (i.e. bib, bst and sty files) are in the same directory as your TEX files.
- 3. Run BibTeX then run LATeX. Remember you must run LATeX twice to update the citations.

In the T_FX file, the references list is enclosed as follows:

```
\documentclass{aa}
...
\bibpunct{(){)}{;}{a}{}{,} % to follow the A&A style
...
% for the bibliography, at the end
\bibliographystyle{aa} % style aa.bst
\bibliography{Yourfile} % your references Yourfile.bib
\end{document}
```

3.6.2. Citations in the text

References are normally cited in the text by placing the name(s) and the year in parentheses, without any comma between them. If there are two authors for one citation, both names should be given, separated by an ampersand (&). If there are more than two authors, only the first name should be given, followed by "et al.". Commas should be used only to separate two or more years linked with one author (author group). If two or more citations are made in one set of parentheses, they should be separated by a semi-colon. If more than one citation for a particular author (author group) is made for the same year, "a", "b", "c", etc. should be added to the year. If citations are made within the normal running text, only the year(s) should be placed in parentheses. The following examples illustrate the required style:

```
(Copernicus 1986)
(Copernicus & Galilei 1988)
(Hubble et al. 1985; Newton et al. 1987; Ptolemaus & Copernicus 1988a, 1988b, 1992)
Recently Galilei et al. (1991, 1992) showed that . . .
```

Authors' initials are permitted only in exceptional cases, for example, to distinguish between two authors with the same surname. Each literature citation made in the text should have a corresponding entry in the *References* at the end of the paper. For frequently cited papers, an abbreviated form of citation is recommended, e.g., Paper I, Paper II (if appropriate) or by the initial letters of the authors' surnames.

The Natbib package provides citation commands that automatically format the citations in the proper format. The command \citet is to be used for textual citations, while the command \citep is to be used for parenthetical citations. Some examples are given below.

```
      \citet{jon90}
      ⇒ Jones et al. (1990)

      \citep{jon90}
      ⇒ (Jones et al. 1990)

      \citep[see][]{jon90}
      ⇒ (see Jones et al. 1990)

      \citep[see][chap.~2]{jon90}
      ⇒ (see Jones et al. 1990, chap. 2)
```

Multiple citations can be made as usual, by including more than one citation key in the \cite command argument.

```
\citet{jon90, jam91} ⇒ Jones et al. (1990); James et al. (1991)
\citep{jon90, jam91} ⇒ (Jones et al., 1990; James et al. 1991)
\citep{jon90, jon91} ⇒ (Jones et al. 1990, 1991)
\citep{jon90a, jon90b} ⇒ (Jones et al. 1990a,b)
```

3.7. Appendices

The appendices are included after the reference list.

In the LATEX file, appendix sections should appear as follows:

\begin{appendix}
\section{Title of the first
appendix}
...

...
\section{Title of the second
\end{appendix}

Put all the appendix sections into a single environment appendix. Then all sections that follow will be numbered with capital letters.

3.8. Astronomical objects: linking to databases

SIMBAD, the astronomical database, and ALADIN, the interactive deep sky mapping facility at the CDS Strasbourg, create anchors for astronomical objects cited in A&A. Object names that are tagged with the \object macro and verified will appear linked to the object information. As the one better placed to start the process and in order to help in the indexing, you should surround any astronomical object in your text, as well as in small tables with the command:

\object{<objectname>}

This command simply prints out its argument and adds the thus-marked element to the list of hyper-linked astronomical objects, so it should be repeated for each object.

In the referee version of your article, the list of your objects will automatically appear at the end (after the references). LATEX will write an auxiliary file with the extension obj to prepare that list.

\listofobjects

For the final (two-column) version you could use this command directly before the end of your document to get the list of known objects printed.

Astronomical designations (also called Object Identifiers) are often confusing. We encourage you to test the stellar objects (in the *.tex file or in the *.obj file), using the sites and easy tools available at the CDS.

TeX files: http://vizier.u-strasbg.fr/viz-bin/Object Obj files: http://vizier.u-strasbg.fr/viz-bin/Sesame

The Object Identifiers have been also collected and published by Lortet and collaborators in Dictionaries of Nomenclature of Celestial Objects outside the solar system (1994A&AS..107..193L). The information service available at http://vizier.u-strasbg.fr/cgi-bin/Dic is the electronic look-up version of the Dictionary, which is updated on a regular basis; it provides full references and usages about for 13211 different acronyms.

Links to object databases (Simbad or Ned, with the directive) should be viewed as a means of referencing the most important astronomical objects studied in the article. The number of such links should therefore not exceed some 10-20 occurrences to remain pertinent. In particular, using the object directive in the tabular material should be avoided, which includes not tagging each and every occurrence of all the object names in the text of the article.

4. How to submit a manuscript

Any submission of Letters or regular articles should be made via the web site devoted to the authors: https://mms-aanda.obspm.fr/. Errata should be sent as a PDF file by e-mail to the A&A Editorial Office (aanda.paris@obspm.fr).

The Editor-in-Chief is:

Thierry FORVEILLE A&A Editorial Office Observatoire de Paris 61 avenue de l'Observatoire 75014 Paris - France Tel. (33) (0)1 43 29 05 41 Fax (33) (0)1 43 29 05 57 e-mail: aanda.paris@obspm.fr

ftp: aanda.obspm.fr

The Letters Editor-in-Chief is:

João ALVES University of Vienna Department of Astrophysics Türkenschanzstraße 17 1180 Vienna - Austria

e-mail: aanda.paris@obspm.fr

The submission process consists of two steps:

1. Register your new submission on the A&A Manuscript Management System (MMS) at the following address

https://mms-aanda.obspm.fr/

2. Upload your manuscript directly to the MMS or to the A&A FTP site.

1. Registering your manuscript on the MMS

In order to register your new submission, you need to enter your author identifier. This is a unique and confidential number that is attributed to you upon your first submission to A&A. If you have submitted a paper to A&A before, you already have an author identifier. If you publish regularly with us, it is a good idea to note your author number for future reference.

If you are a new A&A author, you will be asked to fill out a registration form and an identifier will be attributed to you.

If you have forgotten your author identifier, go to https://mms-aanda.obspm.fr/.Click on Submit a paper (on the left side of the page) and follow the link for retrieving your number. You will be asked to enter your e-mail address and your identifier will be mailed to the given address if MMS finds a correspondence between the e-mail address you entered and an A&A author.

If you have recently changed your e-mail address, do NOT fill out a new registration form, but instead contact the Editorial Office at aanda paris@obspm.fr and your author identifier will be communicated to you.

2. Uploading your manuscript file

You will first need to prepare your manuscript as a single PDF (preferred) or PostScript file.

- Your manuscript file size is less than or equal to 50 Mbytes. Upload your file directly to the MMS at address https://mms-aanda.obspm.fr/.
- Your manuscript file size is larger than 50 Mbytes. You must upload your file to our FTP site at ftp mms-aanda.obspm.fr

A typical sequence of commands for sending your file is as follows:

ftp mms-aanda.obspm.fr login: anonymous password: your e-mail address cd incoming mkdir your name cd your name bin put your_file.pdf bye

This is a typical sequence of commands for sending your file. When loading a PDF file, always use the BINARY option otherwise we will not be able to read your file.

Note that the incoming folder is not read-enabled for obvious security reasons; therefore, you will not be able to check that your file has been transferred.

There have been rare reports of access problems to the server that are apparently attributed to some combinations of FTP clients and operating systems. In case of a problem, you might want to try using a different computer or FTP client to load your paper before contacting us.

5. The acceptance stage

5.1. Acceptance proposal from the Associate Editor and official acceptance by the Chief Editor

The Associate Editor in charge of a given paper proposes the paper's acceptance to the Editor-in-Chief, who then sends the author -sometimes with a delay of more than one week- the formal acceptance letter.

There are several reasons to this double acceptance process. First, the Editor-in-Chief needs to the make sure that the peer-review process is consistent, i.e., that the Associate Editors all have comparable acceptance criteria. The second reason is that formal acceptance requires several decisions from the Editor-in-Chief. The section of publication and keywords must be chosen and/or corrected; likewise, one must decide what level of language editing is needed, whether part of article should be published as an Appendix, and whether the paper is subject to page charges.

Note that the official date of acceptance of the paper is the day when the paper is accepted by the Associate Editor in charge of the scientific peer-review process. Time spent after this decision to improve the manuscript and to make the final publishing decisions is editing time for which the author should not be penalized since the scientific content of the paper has already been deemed publishable.

The editorial decisions at acceptance time are the following. The first two, choice of section of publication and of keywords, should be self-explanatory. Since the author can enter these data in MMS using pull-down menus at the time the submission is sent to the Journal, the Editors should not even have to deal with them. In practice, however, many authors still do not indicate the Journal's section for which the paper is submitted, and the keywords must still be modified in many cases. Contributors are therefore encouraged to pay attention to these important details to save time between acceptance and publication.

5.2. Language editing

Papers are sent to language editors after acceptance, at the recommendation of either the referee or one of the Journal's editors. It is also important to know that, unlike at some journals, not all papers are looked at by a language editor, which can explain some differences in usage between the articles actually published, as well as some minor differences between suggestions made by each of the language editors.

Additional information are available in the A&A English guide or on the A&A web site.

6. The production stage

6.1. Sending your files to the publisher

After the paper has been accepted and **on the request of the Editor-in-Chief**, you should send your paper files to the publisher. You need to prepare:

- The final manuscript *.tex file by removing the referee option.
- The figure files.
- Any additional stylefiles needed.
- The PDF of the final version.

You will receive by e-mail your access codes, which allow you to send these files to the publisher by uploading them at the production online system SAGA http://saga.edpsciences.org/?lang=en. Once you are connected, you should follow the instructions given.

Tables made available in electronic form at the CDS should be prepared according to the conventions indicated above and detailed at http://cdsweb.u-strasbg.fr/submit/; they should be sent to the CDS upon acceptance of the paper, preferably using the submission form proposed on the CDS web site. Alternatively the tabular material can be sent by e-mail to cats@cdsarc.u-strasbg.fr, or by ftp to cdsarc.u-strasbg.fr.

The electronic versions of the tables are systematically checked for their consistency at the CDS, and the author may have to communicate with the CDS about missing descriptions or detected inconsistencies.

6.2. PDF files of forthcoming papers

A&A now gives online access to unedited preprint versions of accepted papers several weeks ahead of publication, with the authors' consent. This service is free of charge for authors.

The authors' permission is requested by MMS at the time of submission. This version does not take into account corrections made during copy-editing and production processes.

Online access to PDF versions of forthcoming papers is granted to all A&A subscribers.

6.3. Page proofs

For all papers, except Letters, page proofs will be sent to the authors by e-mail (PDF file). Please note that corrections should be restricted to typographical errors; fees for extensive additional changes will be charged to the author. Where absolutely essential, the addition of a "Note added in proof" will be considered and, if accepted, will appear at the end of the paper, following the reference list.

6.4. Electronic offprints

The corresponding authors will receive the PDF file of their article at no charge as soon as it is published.

Appendix A: Key words

The list is common to the major astronomical and astrophysical journals. In order to ease the search, the keywords are subdivided into broad categories.

The parts of the keywords in italics are for reference only and should be omitted when the key

are entered on the manuscript.

General

Editorials notices

Errata, addenda Extraterrestrial intelligence History and philosophy of astronomy Miscellaneous Obituaries, biographies Publications, bibliography Sociology of Astronomy Standards

Physical data and processes

Asteroseismology Astrobiology Astrochemistry Acceleration of particles Accretion, accretion disks Astroparticle physics Atomic data Atomic processes Black hole physics Conduction Convection Dense matter Diffusion

Elementary particles

Dynamo

Equation of state Gravitation

Gravitational lensing: weak Gravitational lensing: micro Gravitational waves Hydrodynamics Instabilities Line: formation Line: identification Line: profiles Magnetic fields Magnetic reconnection Magnetohydrodynamics (MHD)

Gravitational lensing: strong

Masers Molecular data Molecular processes Neutrinos

Nuclear reactions, nucleosynthesis, abundances

Opacity Plasmas Polarization

Radiation mechanisms: general Radiation mechanisms: non-thermal Radiation mechanisms: thermal Radiative transfer

Relativistic processes Scattering Shock waves Turbulence Waves

Astronomical instrumentation, methods and techniques

Atmospheric effects Balloons Instrumentation: adaptive optics Instrumentation: detectors Instrumentation: high angular resolution Instrumentation: interferometers Instrumentation: miscellaneous Instrumentation: photometers Instrumentation: polarimeters Instrumentation: spectrographs

Light pollution Methods: analytical Methods: data analysis Methods: laboratory

Methods: miscellaneous Methods: numerical Methods: observational Methods: statistical Site testing Space vehicles

Space vehicles: instruments Techniques: high angular resolution Techniques: image processing Techniques: imaging spectroscopy Techniques: interferometric Techniques: miscellaneous Techniques: photometric Techniques: polarimetric Techniques: radar astronomy Techniques: radial velocities Techniques: spectroscopic Telescopes

Astronomical databases

Astronomical databases: miscellaneous Atlases

Catalogs Surveys

Virtual observatory tools

Astrometry and celestial mechanics

Astrometry Celestial mechanics **Eclipses** Ephemerides Occultations Parallaxes Proper motions Reference systems Time

The Sun

Sun: abundances Sun: activity

Sun: atmosphere
Sun: chromosphere
Sun: corona
Sun: coronal mass ejections (CMEs)
Sun: dynamo
Sun: evolution
Sun: faculae, plages
Sun: filaments, prominences
Sun: flares
Sun: fundamental parameters
Sun: general
Sun: granulation
Sun: helioseismology
Sun: heliosphere
Sun: infrared

Sun: interior
Sun: magnetic topology
Sun: oscillations
Sun: particle emission
Sun: photosphere
Sun: radio radiation
Sun: rotation

(Sun:) solar-terrestrial relations

(Sun:) solar wind (Sun:) sunspots Sun: surface magnetism Sun: transition region Sun: UV radiation Sun: X-rays, gamma rays

Planetary systems

Comets: general Comets: individual: ... Earth

Interplanetary medium Kuiper belt: general

Kuiper belt objects: individual: ... Meteorites, meteors, meteoroids Minor planets, asteroids: general Minor planets, asteroids: individual: ...

Moon Oort Cloud

Planets and satellites: atmospheres Planets and satellites: aurorae Planets and satellites: composition Planets and satellites: detection

Planets and satellites: dynamical evolution and

stability

Planets and satellites: formation

Planets and satellites: fundamental parameters

Planets and satellites: general Planets and satellites: individual: ... Planets and satellites: interiors Planets and satellites: magnetic fields Planets and satellites: physical evolution

Planets and satellites: rings Planets and satellites: surfaces Planets and satellites: tectonics Protoplanetary disks

Planet-disk interactions Planet-star interactions Zodiacal dust

Stars

Stars: abundances Stars: activity

Stars: AGB and post-AGB

Stars: atmospheres

(Stars:) binaries (including multiple): close

(Stars:) binaries: eclipsing (Stars:) binaries: general (Stars:) binaries: spectroscopic (Stars:) binaries: symbiotic

(Stars:) binaries: visual (Stars:) blue stragglers (Stars:) brown dwarfs

Stars: carbon

Stars: chemically peculiar Stars: chromospheres (Stars:) circumstellar matter

Stars: coronae Stars: distances Stars: dwarf novae Stars: early-type Stars: emission-line, Be Stars: evolution Stars: flare Stars: formation

Stars: fundamental parameters Stars: general (*Stars*:) Gamma-ray burst: general (*Stars*:) Gamma-ray burst: individual:

(Stars:) Hertzsprung-Russell and C-M diagrams

Stars: horizontal-branch Stars: imaging Stars: individual: ... Stars: interiors

Stars: kinematics and dynamics

Stars: late-type Stars: low-mass

Stars: luminosity function, mass function

Stars: magnetars Stars: magnetic field Stars: massive Stars: mass-loss Stars: neutron

(Stars:) novae, cataclysmic variables Stars: oscillations (including pulsations)

Stars: oscillations (including pulsations) Stars: peculiar (except chemically peculiar) (Stars): planetary systems

(Stars): planetary systems
Stars: Population II
Stars: Population III
Stars: pre-main sequence
Stars: protostars
(Stars:) pulsars: general
(Stars:) pulsars: individual ...

Stars: rotation
Stars: solar-type
(Stars:) starspots
Stars: statistics
(Stars:) subdwarfs
(Stars:) supernovae: general
(Stars:) supernovae: individue
Stars: variebles: Cepheide

(Stars:) supernovae: individual: ... Stars: variables: Cepheids Stars: variables: delta Scuti Stars: variables: general Stars: variables: RR Lyrae

Stars: variables: S Doradus Stars: variables: T Tauri, Herbig Ae/Be

(Stars:) white dwarfs Stars: winds, outflows Stars: Wolf-Rayet

Interstellar medium (ISM), nebulae

ISM: abundances
ISM: atoms
ISM: bubbles
ISM: clouds
(ISM:) cosmic rays
(ISM:) dust, extinction
(ISM:) evolution
ISM: general
(ISM:) HII regions
(ISM:) Herbig-Haro objects
ISM: individual objects: ...
(except planetary nebulae)
ISM: jets and outflows

ISM: jets and outflows
ISM: kinematics and dynamics
ISM: lines and bands
ISM: magnetic fields
ISM: molecules

(ISM:) planetary nebulae: general (ISM:) planetary nebulae: individual: ... (ISM:) photon-dominated region (PDR)

ISM: supernova remnants

The Galaxy

Galaxy: abundances Galaxy: bulge Galaxy: center Galaxy: disk Galaxy: evolution Galaxy: formation

Galaxy: fundamental parameters

Galaxy: general

(Galaxy:) globular clusters: general (Galaxy:) globular clusters: individual: ...

Galaxy: halo

(Galaxy:) local insterstellar matter Galaxy: kinematics and dynamics

Galaxy: nucleus

(Galaxy:) open clusters and associations: gen-

eral

(Galaxy:) open clusters and associations: indi-

vidual: ...

(Galaxy:) solar neighborhood Galaxy: stellar content Galaxy: structure

Galaxies

Galaxies: abundances Galaxies: active

(Galaxies:) BL Lacertae objects: general (Galaxies:) BL Lacertae objects: individual: ...

Galaxies: bulges Galaxies: clusters: general Galaxies: clusters: individual: ... Galaxies: clusters: intracluster medium

Galaxies: distances and redshifts Galaxies: dwarf

Galaxies: elliptical and lenticular, cD

Galaxies: evolution Galaxies: formation

Galaxies: fundamental parameters Galaxies: general Galaxies: groups: general

Galaxies: groups: individual: ...
Galaxies: halos
Galaxies: high-redshift
Galaxies: individual: ...
Galaxies: interactions
(Galaxies:) intergalactic medium

Galaxies: irregular Galaxies: ISM Galaxies: jets

Galaxies: jets Galaxies: kinematics and dynamics

(Galaxies:) Local Group

Galaxies: luminosity function, mass function

(Galaxies:) Magellanic Clouds Galaxies: magnetic fields Galaxies: nuclei Galaxies: peculiar Galaxies: photometry

(Galaxies:) quasars: absorption lines (Galaxies:) quasars: emission lines (Galaxies:) quasars: general (Galaxies:) quasars: individual: ... Galaxies: Seyfert

Galaxies: Seyfert Galaxies: spiral Galaxies: starburst

Galaxies: star clusters: general Galaxies: star clusters: individual: ...

Galaxies: star formation Galaxies: statistics Galaxies: stellar content Galaxies: structure

Cosmology

(Cosmology:) cosmic background radiation (Cosmology:) cosmological parameters Cosmology: miscellaneous

(Cosmology:) large-scale structure of Universe

(Cosmology:) dark ages, reionization, first stars

(Cosmology:) primordial nucleosynthesis

Cosmology: observations

(Cosmology:) dark energy (Cosmology:) diffuse radiation (Cosmology:) distance scale

(Cosmology:) early Universe

(Cosmology:) inflation

Cosmology: theory (Cosmology:) dark matter Resolved and unresolved sources

as a function of wavelength Gamma rays: diffuse background

Gamma rays: galaxies Gamma rays: galaxies: clusters

Gamma rays: general Gamma rays: ISM Gamma rays: stars

Infrared: diffuse background

Infrared: galaxies Infrared: general Infrared: ISM

Infrared: planetary systems Infrared: stars

Radio continuum: galaxies Radio continuum: general Radio continuum: ISM

Radio continuum: planetary systems

Radio continuum: stars Radio lines: galaxies Radio lines: general

Radio lines: ISM

Radio lines: planetary systems

Radio lines: stars

Submillimeter: diffuse background

Submillimeter: galaxies Submillimeter: general Submillimeter: ISM

Submillimeter: planetary systems

Submillimeter: stars Ultraviolet: galaxies
Ultraviolet: general
Ultraviolet: ISM
Ultraviolet: planetary systems
Ultraviolet: stars

X-rays: binaries X-rays: bursts X-rays: diffuse background X-rays: galaxies X-rays: galaxies: clusters X-rays: general X-rays: individuals: ...

X-rays: ISM X-rays: stars

Appendix B: How to prepare your TEX file: examples

B.1. Example of a manuscript header with structured abstract

```
\documentclass{aa}
\usepackage[varg]{txfonts}
\begin{document}
\title{Optimality relationships for $p$-cyclic SOR p
  \thanks{Research supported in part by the US Air Force
    under grant no. AFOSR-88-0285 and
    the National Science Foundation under grant
    no. DMS-85-21154}\fnmsep
  \thanks{This is a second footnote}\\
  resulting in asymptotically faster convergence\\
  for the same amount of work per iteration}
\subtitle{II. An example text with infinitesimal
  scientific value\\
  whose title and subtitle may also be split}
\author{Daniel J. Pierce\inst{1}
  \and Apostolos Hadjidimios\inst{2}
  \thanks{\emph{Present address:}
    Department of Computer Science, Purdue University,
    West Lafayette, IN 47907, USA}
     \and Robert J. Plemmons\inst{3}}
\institute{Boeing Computer Service, P.O. Box 24346,
  MS 7L-21, Seattle, WA 98124-0346, USA
  \and Department of Mathematics, University of Ioannina,
  GR-45 1210, Ioannina, Greece
  \and Department of Computer Science and Mathematics,
 North Carolina State University, Raleigh, NC 27695-8205, USA}
\date{Received 2 November 1992 / Accepted 7 January 1993}
\abstract {} {We look for characteristics typical of water-megamaser galaxies
in SO 103-G035, TXS 2226-184, and IC 1481.} {We obtained long-slit optical
emission-line spectra.} {We present rotation curves, line ratios, electron
densities, temperatures. IC 1481 reveals a spectrum suggestive of a vigorous
starburst in the central kiloparsec 108 years ago.} {We do not find any hints
for outflows nor special features which could give clues to the unknown
megamaser excitation mechanism.}
\keywords{interstellar medium: jets and outflows --
  interstellar medium: molecules -- stars: pre-main-sequence}}
\maketitle
```

B.2. Example of a manuscript header with traditional abstract

```
\documentclass{aa}
\usepackage[varg]{txfonts}
\begin{document}
title{Optimality relationships for $p$-cyclic SOR p
  \thanks{Research supported in part by the US Air Force
   under grant no. AFOSR-88-0285 and
    the National Science Foundation under grant
   no. DMS-85-21154}\fnmsep
  \thanks{This is a second footnote}\\
  resulting in asymptotically faster convergence\\
  for the same amount of work per iteration}
\subtitle{II. An example text with infinitesimal
  scientific value\\
  whose title and subtitle may also be split}
\author{Daniel J. Pierce\inst{1}
  \and Apostolos Hadjidimios\inst{2}
  \thanks{\emph{Present address:}
   Department of Computer Science, Purdue University,
   West Lafayette, IN 47907, USA}
\and Robert J. Plemmons\inst{3}}
\institute{Boeing Computer Service, P.O. Box 24346,
  MS 7L-21, Seattle, WA 98124-0346, USA
  \and Department of Mathematics, University of Ioannina,
 GR-45 1210, Ioannina, Greece
  \and Department of Computer Science and Mathematics.
North Carolina State University, Raleigh, NC 27695-8205, USA}
\date{Received 2 November 1992 / Accepted 7 January 1993}
\abstract{We look for characteristics typical of water-megamaser galaxies in SO
103-G035, TXS 2226-184, and IC 1481. We obtained long-slit optical
emission-line spectra. We present rotation curves, line ratios, electron
densities, temperatures. IC 1481 reveals a spectrum suggestive of a vigorous
starburst in the central kiloparsec 108 years ago. We do not find any hints for
outflows nor special features which could give clues to the unknown megamaser
excitation mechanism.}
\keywords{interstellar medium: jets and outflows --
  interstellar medium: molecules -- stars: pre-main-sequence}}
\maketitle
```

B.3. Examples of tables and figures

B.3.1. Figures

Include the package in the preamble of your document as follows:

```
\usepackage{graphicx}
```

To fill the whole column width, the figure has to be resized with the resizebox command.

```
\begin{figure}
  \resizebox{\hsize}{!}{\includegraphics{<yourfilename.eps>}}
  \caption{<Your caption text...>.}
  \label{<Your label>}
\end{figure}

For a two-column-wide plot, substitute figure by figure*.

\begin{figure*}
\centering
  \includegraphics[width=17cm]{<yourfilename.eps>}
  \caption{<Your caption text...>.}
  \label{<Your label>}
\end{figure*}
```

A&A also uses a third width, 12 cm; that is, with the figure caption at its lower right-hand side. To achieve this format, use

```
\begin{figure*}
\sidecaption
\includegraphics[width=12cm]{<yourfilename.eps>}
\caption{<Your caption text...>.}
\label{<Your label>}
\end{figure*}
```

B.3.2. Simple tables

Simple tables must be prepared as in the example below.

Table B.1. Nonlinear Model Results

HJD	Е	Method#2	Method#3
1	50	-837	970
2	47	877	230
3	31	25	415
4	35	144	2356
5	45	300	556

The corresponding TEX code is as follows

```
\begin{table}
\caption{Nonlinear Model Results}
                                              % title of Table
\label{table:1} % is used to refer this table in the text
\centering
                                    % used for centering table
\begin{tabular}{c c c c}
                                % centered columns (4 columns)
                             % inserts double horizontal lines
\hline\hline
HJD & $E$ & Method\#2 & Method\#3 \\
                                       % table heading
                              % inserts single horizontal line
   1 & 50 & $-837$ & 970 \\
                                 % inserting body of the table
   2 & 47 & 877
                  & 230 \\
   3 & 31 & 25
                   & 415 \\
```

To produce two columns width tables, use the table* environment.

If a horizontal line is required in the table, the $\cline{n-m}$ command is used to draw a horizontal line from the left side of the column n to the right side of the column m.

The \multicolumn{num}{col}{text} command is used to combine the following num columns into a single column with their total width:

The output is:

HJD		Method	
11312	50	-837	970
2	47	877	230
3	31	25	415
<i>3</i>	35	144	2356
5	35 45	300	556
	43	300	550

Some examples of a table with footnotes or a rotated table in landscape are given in the aa.dem file.

B.3.3. Large tables (longer than one page)

To place the large tables automatically at the end of your article, use these commands:

```
\longtab{
\begin{longtable}{lllrrr}
\caption{\label{kstars} Sample stars with absolute magnitude}\\
\hline\hline
Catalogue& $M_{V}$ & Spectral & Distance & Mode & Count Rate \\
\hline
\endfirsthead
\caption{continued.}\\
\hline\hline
Catalogue& $M_{V}$ & Spectral & Distance & Mode & Count Rate \\
\hline
\endhead
\hline
\endfoot
%%
Gl 33
        & 6.37 & K2 V & 7.46 & S & 0.043170\\
Gl 66AB & 6.26 & K2 V & 8.15 & S & 0.260478\\
Gl 68
        & 5.87 & K1 V & 7.47 & P & 0.026610\\
                              & H & 0.008686\\
               &
                       &
Gl 86 \footnote{Source not included in the HRI catalog. See Sect.~5.4.2 for
details.}
         & 5.92 & K0 V & 10.91& S & 0.058230\\
\end{longtable}
```

B.3.4. Notes to tables

New commands allow you to format the table notes in the proper A&A layout, as illustrated in the examples given below.

SN name	Epoch	Bands	References		
51 manie	(with respect to B maximum)	Danas	References		
1981B	0	UBV	1		
1986G	-3, -1, 0, 1, 2	BV	2		
1989B	-5, -1, 0, 3, 5	UBVRI	3, 4		
1990N	2, 7	UBVRI	5		
1991M	3	VRI	6		
SNe 91bg-like					
1991bg	1, 2	BVRI	7		
1999by	-5, -4, -3, 3, 4, 5	UBVRI	8		
SNe 91T-like					
1991T	-3, 0	UBVRI	9, 10		
2000cx	-3, -2, 0, 1, 5	UBVRI	11		

Table B.2. List of nearby SNe used in this work.

References. (1) Branch et al. (1983); (2) Philipps et al. (1987); (3) Barbon et al. (1990); (4) Wells et al. (1994); (5) Mazzali et al. (1993); (6) Gomez et lopez (1998); (7) Kirshner et al. (1993); (8) Patat et al. (1996); (9) Salvo et al. (2001); (10) Branch et al. (2003); (11) Jha et al. (1999).

- **References below the table:** They are introduced in the TEX file using the command \tablebib, as in the example below.

The corresponding T_FX code is the following:

```
\begin{table*}
\caption ...
\begin{tabular}
... Content of the table
...
\hline
\end{tabular}
\tablebib{
(1) ~\citet{branch83}; (2) \citet{phillips87}; (3) \citet{barbon90}; (4) \citet{wells94};
(5) \citet{mazzali93}; (6) \citet{gomez98}; (7) \citet{kirshner93}; (8) \citet{patat96};
(9) \citet{salvo01}; (10) \citet{branch03}; (11) \citet{jha99}.
}
\end{table*}
```

Notes below the table: Notes can refer to special portions of the table and be introduced with superscripts. In this case, the author should use the command \tablefootmark and \tablefoottext. Notes can also include general remarks on the whole table. In this case, the note is not preceded with a superscript and is introduced with the command \tablefoot. A detailed example is given below, followed by the related TFX code.

```
\begin{table}
\caption{\label{t7}Spectral types and photometry for stars in the
  region.}
\centering
\begin{tabular}{lccc}
\hline\hline
Star&Spectral type&RA(J2000)&Dec(J2000)\\
\hline
69
             &B1\,V
                        &09 15 54.046 & $-$50 00 26.67\\
             &B0.7\,V
                        &*09 15 54.570& $-$50 00 03.90\\
49
LS~1267~(86) &08\,V
                        &09 15 52.787&11.07\tablefootmark{a}\\
24.6
             &7.58\tablefootmark{1}&1.37\tablefootmark{a}
                                                             &0.20\tablefootmark{a}\\
\hline
LS~1262
                        &09 15 05.17&11.17\tablefootmark{b}\\
             &B0\,V
```

Table B.3. Spectral types and photometry for stars in the region.

Star	Spectral type	RA(J2000)	Dec(J2000)
69	B1 V	09 15 54.046	-50 00 26.67
49	B0.7 V	*09 15 54.570	$-50\ 00\ 03.90$
LS 1267 (86)	O8 V	09 15 52.787	11.07^{a}
24.6	7.58^{a}	1.37^{a}	0.20^{a}
LS 1262	B0 V	09 15 05.17	11.17^{b}
MO 2-119	B0.5 V	09 15 33.7	11.74^{c}
LS 1269	O8.5 V	09 15 56.60	10.85^{d}

Notes. The top panel shows likely members of Pismis 11. The second panel contains likely members of Alicante 5. The bottom panel displays stars outside the clusters.

(a) Photometry for MF13, LS 1267 and HD 80077 from Dupont et al. (b) Photometry for LS 1262, LS 1269 from Durand et al. (c) Photometry for MO2-119 from Mathieu et al.

```
MO 2-119 &B0.5\,V &09 15 33.7 &11.74\tablefootmark{c}\\
LS~1269 &O8.5\,V &09 15 56.60&10.85\tablefootmark{d}\\
\hline
\end{tabular}
\tablefoot{
The top panel shows likely members of Pismis~11. The second panel contains likely members of Alicante~5. The bottom panel displays stars outside the clusters.\\
\tablefoottext{a}{Photometry for MF13, LS~1267 and HD~80077 from Dupont et al.}
\tablefoottext{b}{Photometry for LS~1262, LS~1269 from Durand et al.}
\tablefoottext{c}{Photometry for MO2-119 from Mathieu et al.}
}
\end{table}
```

Some other examples of large, online tables are also given in the aa.dem file.

Appendix C: Typography: General typing rules

C.1. Fine tuning of the text

The following should be used to improve the readability of the text:

- \, a thin space, e.g. between thousands in numbers with more than 4 digits; a line division will not be made following this space,
- -- en-dash; two hyphens, without a space at either end,
- Please note: in TeX, --- gives an em-dash "—"; we do not use this, but rather the shorter en-dash *with* spaces, i.e. space, two hyphens, for an endash, space, to give an "em-dash".
- hyphen; no space at either end,
- \$-\$ minus, in the text only,
- fixed space, e.g. between parts of names.

Their use is best explained in the following example. Sample input:

```
20\,000 km, 1\,000\,000 s, HD 174\,638 1950--1985, p.~11--21 this -- written on a computer -- is now printed signal-to-noise ratio, early-type, metal-poor, non-relativistic -30\%K, -5\^{\circ}C Dr.~h.c.~Rockefeller-Smith and Prof.~Dr.~Mallory
```

Sample output:

 $20\,000$ km, $1\,000\,000$ s, NGC $468\,324\,1950-1985$, p. 11-21 this – written on a computer – is now printed signal-to-noise ratio, early-type, metal-poor, non-relativistic -30 K, -5 °C Dr. h.c. Rockefeller-Smith and Prof. Dr. Mallory

C.2. Units, symbols, and nomenclature

Authors can considerably help the publisher by observing the following rules:

- a) The text should make clear distinctions between physical variables, mathematical symbols, units of measurement, abbreviations, chemical formulae, etc.
- b) Italics and boldface should be used appropriately to identify physical or mathematical variables. In general, variables are set in regular italics, vectors in boldface italics. Physical constants such as the speed of light, the Boltzmann constant, the Hubble constant and the solar mass are also set in regular italics.
- c) Italics should never be used for units of measurement e.g. km, erg cm⁻², s⁻¹ or for chemical formulae unless, of course, these items fall within a passage that is entirely in italics.
- d) As far as possible, italics should be avoided for the following: mathematical signs such as "d" (total differential), "e" (base of natural logarithm), "i" (imaginary unit), "pi" (3.14159...), and abbreviations used as subscripts or superscripts to variables, but serving merely as labels, e.g. $Q_{\rm d}$ (d = dust), $m_{\rm e}$ (e = electron). However, in conformity with the rest of the text, italics should be used if the subscripts or superscripts are variables themselves.
- e) For common units of measurement (SI and non-SI), standard abbreviations should be used. Unusual units may, at the authors' discretion, be written in full, at least at the first mention. Some traditional, non-SI units persist in astronomy literature. Some are acceptable (e.g. erg, angström/Å) but others are obsolescent and should be avoided (e.g. micron/ μ). Compound units in which the meaning "per" is implied can be written using either a slash or a negative index: A&A prefers the latter style, e.g. km s⁻¹ instead of km/s.
- f) For the correct naming of astronomical objects outside the solar system, it is suggested that authors refer to the recommendations on nomenclature given by the International Astronomical Union at http://cdsweb.u-strasbg.fr/Dic/how.htx

C.3. Special typefaces

Emphasize: (\emph{Emphasize}) should be used for emphasis in the text.

Vectors: \vec{Symbol}, vectors may only appear in math mode.

Examples:

Input: \$\vec{A} \times \vec{B} \cdot \vec{C}\$

Output: $\mathbf{A} \times \mathbf{B} \cdot \mathbf{C}$

Input: $\vec{A}/$ \rm T} \otimes \vec{B} \otimes \vec{\hat D}\$

Output: $A^{\mathrm{T}} \otimes B \otimes \hat{D}$

Tensors \tens{Symbol}], tensors may only appear in math mode.

Example:

Input: \tens{ABC}
Output: ABC

Ions \ion{<element symbol>}{<degree of ionization>}, the degree of ionization in the \ion command has to be given as lower case roman numerals (e.g. \ion{H}{ii} which yields H II).

Examples:

Input: \ion{H}{II}

Output: H II

Input: \element[][13]{C}

Output: ¹³C

Elements \element[<electrical charge>][<number of nucleons>] [<number of protons>]
[<number of neutrons>]{<element symbol>}

Note, that if you want to have for example ¹³C, the last two optional arguments may be omitted: \element[][13]{C}.

C.4. Signs and characters

You may need to use special signs. The available ones are listed in different books (ETEX User's Guide & Reference Manual, The ETEX Companion, etc.). We have created further common astronomy symbols:

In	Explanation	Out	In	Explanation	Out
\sun	sun symbol	0	\fs	fraction of second	s .
\degr	degree	0	\fdg	fraction of degree	•
\diameter	diameter	\emptyset	\fp	fraction of period	P
\farcs	fraction of arcsecond	"		-	
\fd	fraction of day	d	\farcm	fraction of arcmin	<i>'</i> .
\arcsec	arcsecond	"	\fh	fraction of hour	h •
\arcmin	arcminute	,	\fm	fraction of minute	m •

In	Out	In	Out
∖la	≲	\ga	≳
\cor	≘	\sol	$\tilde{<}$
\sog	~ ≥	\lse	~ ~< <u>%</u>
\gse	≥	\grole	
\leogr	≶	\loa	≨
\goa	≳	\getsto	N V≋↓↑∧∥
\lid	N≅ VII	\gid	\geq

C.5. Mathematical formulae

All equations that you are referring to with \ref must have the corresponding \label – please use this mechanism only. Punctuate a displayed equation in the same way as ordinary text.

\left(\left[
\right) \right]

Note that the sizes of the parentheses or other delimiter symbols used in equations should ideally match the height of the formulas being enclosed. This is automatically taken care of by these ETFX commands.

Italic and roman type in the math mode

In math mode LaTeX treats all letters as though they were mathematical or physical variables; hence they are typeset in italics. However, any textual elements within formulas should be set in roman. Roman should also be used for subscripts and superscripts *in formulas* where these are merely labels and not in themselves variables, e.g.

<pre>\$T_\mathrm{eff} =</pre>		
5\times 10^{9}\ \mathrm{K}\$	produces	$T_{\rm eff} = 5 \times 10^9 \text{ K}$
<pre>\$T_\mathrm{K}\$</pre>	produces	$T_{\rm K}$ (K = Kelvin)
<pre>\$m_\mathrm{e}\$</pre>	produces	$m_{\rm e}$ (e = electron)

However, do not use roman if the subscripts or superscripts represent variables, e.g. $\sum_{i=1}^{n} a_i$.

Please ensure that *physical units* (e.g. pc, erg s⁻¹ K, cm⁻³, W m⁻² Hz⁻¹, m kg s⁻² A⁻²) and *abbreviations* such as Ord, Var, GL, SL, sgn, const. are always set in roman type with an appropriate inter-word spacing. To

ensure this, use the \mbox command: \mbox{Hz}. On p. 44 of the \mathbb{ET_EX User's Guide & Reference Manual (2nd ed.) by Leslie Lamport, you will find the names of common mathematical functions, such as log, sin, exp, max, and sup. These should be coded as \log, \sin, \exp, \max, \sup and will then automatically appear in roman.

In order to distinguish "d" used as the "differential sign" and "e" used as the "exponential function" from normal variables, set these letters in roman.

Chemical symbols and formulas should be set in roman, e.g. Fe not Fe, H_2O not H_2O , $H\alpha$ not $H\alpha$.

Appendix D: Simplified abbreviations of frequently used journals

Astronomical Journal (the)

ARA&A Annual Review of Astronomy and Astrophysics

AZh Astronomiceskij Zhurnal Astronomy and Astrophysics A&A (Letters indicated by number)

Astronomy and Astrophysics Review (the)

A&AR A&AS Astronomy and Astrophysics Supplement Series Acta Astron. Acta Astronomica

Acta Astronomica Sinica Acta Astron. Sin. Astrofizica

Astrophysical Journal (the) ApJ (Letters indicated by number)

ApJS Astrophysical Journal Supplement Series (the)

Ap&SS Astrophysics and Space Science

Ark. Astron. Arkiv for Astronomi Astronomische Nachrichten Astron. Nachr. Aust. J. Phys. Australian Journal of Physics Aust. J. Phys. Australian Journal of Physics Astrophys. Suppl. Astrophysics Supplement

Bulletin of the American Astronomical Society BAAS

Bull. astr. Inst. Czechosl. Bulletin of the Astronomical Institutes of Czechoslovakia

Comptes Rendus de l'Académie des Science C. R. Acad. Sci. Paris

Chin. Astron. Chinese Astronomy

IAU Circ. International Astronomical Union, Circular

Icarus

Ir. Astron. J. Irish Astronomical Journal

J. R. Astron. Soc. Can. Journal of the Royal Astronomical Society of

JA&A Journal of Astronomy and Astrophysics **MNRAS** Monthly Notices of the Royal Astronomical

Society

Mem. R. Astron. Soc. Memoirs of the Royal Astronomical Society Mem. Soc. Astron. Ital. Memorie della Societa Astronomica Italiana Mitt. Astron. Ges. Mitteilungen der Astronomischen Gesellschaft Monthly Notes of the Astronomical Society Mon. Notes

Astron. Soc. S. Afr. of Southern Africa Nature Nat

Observatory Observatory (the)

Publications of the Astronomical Society **PASJ**

of Japan

PASP Publications of the Astronomical Society

of the Pacific

PASPC Ditto, Conference Proceedings Philosophical Transactions of the Phil. Trans. R. Soc. London, Royal Society of London, Series A

Proc. Astron. Soc. Aust. Proceedings of the Astronomical Society

of Australia

QJRAS Quarterly Journal of the Royal

Astronomical Society

Rev. Mex. Astron. Astrofis. Revista Mexicana de Astronomia

v Astrofisica

Ric. Astron. Specola Vaticana Ricerche Astronomiche. Specola Vaticana

Science Sci

Sci. Am. Scientific American Sky Telesc. Sky and Telescope Space Sci. Rev. Space Science Reviews SvA Soviet Astronomy

There are commands for many of the most frequently-referenced journals so that authors may use the markup rather than having to look up a particular journal's abbreviation.

\actaa Acta Astronomica \aj Astronomical Journal

\araa Annual Review of Astron and Astrophys

\apj Astrophysical Journal \apj1 Astrophysical Journal, Letters \apjs Astrophysical Journal, Supplement

\ao Applied Optics \aplett Astrophysics Letters

\apspr Astrophysics Space Physics Research \apss Astrophysics and Space Science \aap Astronomy and Astrophysics

\aapr Astronomy and Astrophysics Reviews \aaps Astronomy and Astrophysics, Supplement

\azh Astronomicheskii Zhurnal \baas Bulletin of the AAS

\bac Bulletin of the Astronomical Institutes of Czechoslovakia \bain Bulletin Astronomical Institute of the Netherlands

\caa Chinese Astronomy and Astrophysics

\cjaa Chinese Journal of Astronomy and Astrophysics

\fcp Fundamental Cosmic Physics \gca Geochimica Cosmochimica Acta \gr1 Geophysics Research Letters

\iaucirc IAU Cirulars \icarus Icarus

\jcap Journal of Cosmology and Astroparticle Physics

\jcp Journal of Chemical Physics \jgr Journal of Geophysics Research

\jqsrt Journal of Quantitiative Spectroscopy and Radiative Trasfer

\jrasc Journal of the RAS of Canada

\memras Memoirs of the RAS

\mnras Monthly Notices of the RAS \memsai Mem. Societa Astronomica Italiana

\na New Astronomy

\nat Nature

\nar New Astronomy Review \nphysa Nuclear Physics A

\pra Physical Review A: General Physics \prb Physical Review B: Solid State

\prc Physical Review C
\prd Physical Review D
\pre Physical Review E
\pr1 Physical Review Letters
\pasp Publications of the ASP
\pasj Publications of the ASJ
\pasa Publications of the ASA

\physrep Physics Reports \physscr Physica Scripta

\planss | Planetary Space Science | Proceedings of the SPIE | Quarterly Journal of the RAS

\rmxaa Revista Mexicana de Astronomia y Astrofisica

\skytel Sky and Telescope
\solphys Solar Physics
\sovast Soviet Astronomy
\ssr Space Science Reviews
\zap Zeitschrift fuer Astrophysik