

# A L<sup>A</sup>T<sub>E</sub>X CLASS FILE FOR ESA PROCEEDINGS

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## ABSTRACT

Talks presented at an ESA sponsored conference are published by the ESA Publications Division by means of author-produced camera-ready copy. The format is pre-determined. This L<sup>A</sup>T<sub>E</sub>X class allows authors to produce this format with a straight-forward L<sup>A</sup>T<sub>E</sub>X file. The only non-standard features are the `\keywords` command and the method for entering author and affiliation names. B<sub>I</sub>B<sub>T</sub>E<sub>X</sub> support is provided as a bibliography style file for the publicly available package `natbib`.

Key words: L<sup>A</sup>T<sub>E</sub>X; ESA; macros.

## 1. INTRODUCTION

This is a L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> class based on the standard `article` class for generating camera-ready copy of conference proceedings for publication by the European Space Agency.

It conforms to the specifications for ESA conference proceedings:

- 23.5 cm high and 17 cm wide;
- if two columns, they have 1 cm between them;
- 10 pt font on 11 pt, Times Roman preferred;
- all titles in upper case

Compatibility with standard L<sup>A</sup>T<sub>E</sub>X is maintained as much as possible in order to simplify the transfer of text from or to another format. The only additional features are the `\keyword` command and the entry of authors and affiliations.

It replaces the L<sup>A</sup>T<sub>E</sub>X 2.09 style file that has been previously provided by the ESA.

For an excellent manual on using L<sup>A</sup>T<sub>E</sub>X, see Kopka & Daly, *A Guide to L<sup>A</sup>T<sub>E</sub>X*, 3rd ed., 1999, Addison Wesley Longman.

## 2. INVOKING THE CLASS

The class file is invoked with the `\documentclass` command, as

```
\documentclass[a4paper,twocolumn]{esapub}
```

where the option `a4paper` may be replaced by `letterpaper` (the default) for American installations. The text will be centered on the specified paper type. The `twocolumn` option is given if the publication is to be in two columns per page.

### 2.1. Other Packages

There are other (nearly) standard packages that may be included with the `\usepackage` command:

- `times` to use TimesRoman instead of Computer Modern (T<sub>E</sub>X) fonts ,
- `graphicx` or `epsfig` for importing figures (see Section 6.1),
- `natbib` to use author–year citations with B<sub>I</sub>B<sub>T</sub>E<sub>X</sub> (see Section 5.2).

The author may have his or her own extra packages, such as `amsmath` for advanced mathematical formatting.

## 3. NON-STANDARD FEATURES

A list of key words is to be printed below the abstract. They are entered *anywhere before the abstract environment* with the `\keywords` command.

```
\keywords{space; plasmas; electrons}
\begin{abstract}
. . .
\end{abstract}
```

Each author name should be entered with an `\author` command. Give the affiliation with the `\affil` command after all authors of the same affiliation. They will then be listed with a common footnote number.

```
\author{Donald P. Duck}
\author{Mickey C. Mouse}
\affil{Disney Studios, CA USA}
\author{Bugs G. Bunny}
\affil{Warner Bros. Studios}
```

produces

Donald P. Duck<sup>1</sup>, Mickey C. Mouse<sup>1</sup>, Bugs G. Bunny<sup>2</sup>  
<sup>1</sup>Disney Studios, CA USA  
<sup>2</sup>Warner Bros. Studios

For more control over the footnote numbers, one can give them explicitly as optional arguments to `\author` and `\affil`:

```
\author[*]{Donald P. Duck}
\author[\dag]{Bugs G. Bunny}
\author[*]{Mickey C. Mouse}
\affil[*]{Disney Studios, CA USA}
\affil[\dag]{Warner Bros. Studios}
```

to obtain

Donald P. Duck<sup>\*</sup>, Bugs G. Bunny<sup>†</sup>, Mickey C. Mouse<sup>\*</sup>  
<sup>\*</sup>Disney Studios, CA USA  
<sup>†</sup>Warner Bros. Studios

## 4. STRUCTURE OF THE DOCUMENT

Except for the above features, the `esapub` class is identical to the standard `article` class, as far as input is concerned. The document should be organized as usual.

```
\documentclass[a4paper,twocolumn]{esapub}
% Any extra packages
\usepackage{times,natbib,graphicx,...}
% Title and authors
\title{Title text}
\author{First Author}...
\affil{First affiliation}
...
% Start of body
\begin{document}
\maketitle
% Keywords and abstract
\keywords{keyword1; keyword2;...}
\begin{abstract}
Text of abstract
\end{abstract}
```

```
% Main text
\section{Heading}
Text
\subsection{Sub-heading}
Text
\section*{Acknowledgments}
Acknowledgment text
% Bibliography (Section 5.2)
\bibliographystyle{aa}
\bibliography{database name}
% Termination
\end{document}
```

## 5. BIBLIOGRAPHIC REFERENCES

Citations to bibliographic references are to be of the author–year style. This may be done manually or with the help of `natbib` package and `LATEX` with the supplied `aa.bst` bibliographic style file.

### 5.1. Manual Citations

The citations are either parenthetical [3] or in-text as shown by Allen [1] and elaborated on by Nobody et al. [2].

The list of references is placed at the end of the article, as

```
\begin{thebibliography}{}
\bibitem{}
Allen C., 1973, Astrophysical Quantities,
Athlone Press
\bibitem{}
Nobody B., Somebody G., Who M.E., et al.,
1997, ApJ 331, 902
\bibitem{}
Smith A., Jones B., 1996, A&A 555, 999
\end{thebibliography}
```

Note the empty braces after `\bibitem` and after `\begin{thebibliography}`

The format of the reference list is that used by *Astronomy and Astrophysics* and other astronomy journals.

### 5.2. References with `natbib`

The `natbib` package is a powerful tool for extending the citation and bibliography features of standard `LATEX`. It is included in most modern installations these days.<sup>1</sup>

<sup>1</sup>Otherwise it may be obtained from <ftp://ctan.tug.org/tex-archive/macros/latex/contrib/supported/natbib> or from the other CTAN servers or from almost any CD-ROM distribution of `TEX/LATEX`.

*Figure 1. Sample figure showing how an encapsulated PostScript graphic may be included. This example is for a double column figure, which does cause more placement problems than single column ones.*

With `natbib`, in-text citations are generated with `\citet{allen73}` to yield “Allen [1]” while parenthetical ones are made with `\citep{smith96}` for [3]. There are many other possibilities, such as `\citeauthor` for the authors without year. See the `natbib` documentation.

With `natbib` the bibliography must be entered differently, at least the `\bibitem` entries.

```
\bibitem[Allen(1973)]{allen73}
. . .
\bibitem[Nobody et~al.(1997)]{nobody97}
. . .
\bibitem[Smith \& Jones(1996)]{smith96}
. . .
```

The text in square brackets contains the author and year information, with the year part in parentheses, no space before, which is used by the `\citet` and `\citep` commands.

Rather than trying to make up the `thebibliography` environment manually with all its intricate details, one can let `BIBTEX` do it, if the references are already in an appropriate database file. For this purpose, a bibliographic style file `aa.bst` is provided with `esapub.cls`, designed to produce output formatted for *Astronomy and Astrophysics* and the `natbib` package. In this case, one replaces the `thebibliography` environment with

```
\bibliographystyle{aa}
\bibliography{bib file names}
```

One processes the  $\LaTeX$  file once, then `BIBTEX`, and then the  $\LaTeX$  file at least twice. This need only be repeated if the citations have added or deleted in the text.

## 6. FIGURES AND TABLES

Figures and tables are inserted with the normal  $\LaTeX$  environments `figure` and `table`. They are numbered

*Figure 2. Sample figure showing how an encapsulated PostScript graphic may be included. This example is for a single column figure.*

automatically and one refers to the numbers with the `\label` and `\ref` system.

### 6.1. Figures

The `figure` environment is used to enter a single column figure such as Figure 2, while `figure*` is for double column figures (Figure 1).

```
\begin{figure}
\centering
\includegraphics[width=0.8\linewidth]{sample.eps}
\caption{Sample figure showing how an encapsulated
PostScript graphic may be included. This example
is for a single column figure.\label{fig:single}}
\end{figure}
```

One can then refer to this figure with `Figure~\ref{fig:single}`, producing “Figure 2”.

The `\includegraphics` command is made available with the `graphicx` package and allows the importation of graphic files. For PostScript output (with the `dvips` program) these graphics must adhere to the *encapsulated* PostScript standard.

Many users are familiar with the `\epsfig` available

Table 1. A sample table illustrating usage of the  $\LaTeX$  table environment.

First column	Col. 2	Col. 3	V mag
row 1	11.0	25.0	12
row 2	11.0	25.0	12
row 3	11.0	25.0	12
row 4	11.0	25.0	12
row 5	11.0	25.0	12

with the `epsfig` package. With this the syntax is slightly different:

```
\epsfig{file=sample.eps,width=0.8\linewidth}
```

(In fact, the `epsfig` package uses the `graphicx` package so in the end they do exactly the same thing.)

The same syntax can also be used with `pdf $\TeX$` , a variant on the  $\TeX$  program producing PDF output directly. In this case, the figures must be in PDF, PNG, or JPEG format. It is not necessary to include the extension in the file name (`file=sample` suffices), something that makes the  $\LaTeX$  text more general for both normal  $\TeX$  and `pdf $\TeX$` . (It may however be necessary to add the option `[pdftex]` when loading the graphics packages.)

## 6.2. Tables

Tables are placed and numbered and referred to with the `table` and `table*` environments. The contents of the table are normally entered with the `tabular` or `tabbing` environments. The `\caption` now comes at the top of the table, before the table contents.

## 7. EQUATIONS

Formulae which appear in the running text should be enclosed in  $\$$  signs. For example, to produce the equation  $a^2 + b^2 = c^2$  within a paragraph type `\$a^2 + b^2 = c^2\$`. Displayed formulae are produced using the `\begin{equation}` and `\end{equation}` commands (see Equation 1). This produces equations which are automatically numbered sequentially throughout your paper. Equations which should appear together can be formatted using `\begin{eqnarray}` and `\end{eqnarray}` as for Equations 2 and 3:

$$\Delta \hat{a}_i = \sum_j \frac{\partial f_i}{\partial a_j} \Delta a_j \quad (1)$$

$$\alpha = \alpha_0 + (T - T_0) \mu_{\alpha*0} \sec \delta_0 \quad (2)$$

$$\delta = \delta_0 + (T - T_0) \mu_{\delta 0} \quad (3)$$

When in math mode (i.e. within the `equation` or `eqnarray` environment) all letters appear in italics. However, the preferred notation is for subscripts, superscripts<sup>2</sup> and text within the equation to be typeset as roman. To achieve this use the `\mbox{...}` command. Thus, `\$T_{\mbox{eff}}=5.8\times 10^3\$` produces  $T_{\text{eff}} = 5.8 \times 10^3$  K. Note that units should be tied to the numerical value using `\sim` and should always be in roman font (the default outside of math mode).

## 8. FINAL MANUSCRIPTS

### 8.1. Preparation of Final Manuscripts

There is an upper limit of eight pages for an Invited paper, six pages for Contributed papers and four pages for Poster papers.

You should use the standard  $\LaTeX$  command, in conjunction with the style file provided, `esapub.sty`, to produce the final output. If using `dvips` places the final PostScript file lower on the page than appears to be reasonable, try using the qualifier `'-t a4'` with `dvips`.

### 8.2. Submission of Final Manuscripts

Please refer to the conference guidelines for submission instructions.

## ACKNOWLEDGMENTS

The section containing acknowledgments should use the `\section*` form, as shown, to prevent it from being numbered.

## REFERENCES

- [1] Allen C., 1973, *Astrophysical Quantities*, Athlone Press
- [2] Nobody B., Somebody G., Who M.E., et al., 1997, *ApJ* 331, 902
- [3] Smith A., Jones B., 1996, *A&A* 555, 999

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<sup>2</sup>Except when the superscript or subscript are variables.