Monthly Notices of the Royal Astronomical Society: LaTeX 2ε style guide for authors

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ABSTRACT

This guide is for authors who are preparing papers for *Monthly Notices of the Royal Astronomical Society* using the LaTeX 2ε document preparation system and the `mn2e` class file.

Key words: LaTeX 2ε – class files: `mn2e.cls` – sample text – user guide.

1 INTRODUCTION

The standard format for papers submitted to *Monthly Notices* is LaTeX 2ε. The layout design for *Monthly Notices* has been implemented as a LaTeX 2ε class file. The `mn2e` class file is based on the `mn` style file, which in turn is based on `article` style as discussed in the LaTeX manual (**?**). Commands that differ from the standard LaTeX interface, or that are provided in addition to the standard interface, are explained in this guide. This guide is not a substitute for the LaTeX manual itself. We also refer authors to **?** and **?**. Authors planning to submit their papers in LaTeX are advised to use `mn2e.cls` as early as possible in the creation of their files.

1.1 The mn2e document class

The use of LaTeX document classes allows a simple change of class to transform the appearance of your document. The `mn2e` class file preserves the standard LaTeX interface such that any document that can be produced using the standard LaTeX `article` class can also be produced with the `mn2e` class file. However, the measure (or width of text) is narrower than the default for `article`, and even narrower than for the `A4` style, therefore line breaks will change and long equations may need re-setting.

When your article is printed in the journal, it is typeset in 9/11 pt Times Roman. As most authors do not have this font, it is likely that the make-up will change with the change of font. For this reason, we ask you to ignore details such as slightly long lines, page stretching, or figures falling out of synchronization, because these details can be dealt with at a later stage.

1.2 General style issues

For general style issues, authors are referred to the 'Instructions for Authors' on the journal web page.[1] Authors who are interested in the details of style are referred to **?** and **?**. The language of the journal is British English and spelling should conform to this.

Use should be made of symbolic references (`\ref`) in order to protect against late changes of order, etc.

1.3 Submission of LaTeX 2ε articles to the journal

Authors should refer to the journal web page for instructions on how to submit a new manuscript for refereeing, and on how to supply the files for an accepted paper to Blackwell Publishing. Abbreviated instructions are also available on the inside back cover of the journal. Note that the standard procedure is to supply a PDF file at submission stage and TeX/LaTeX file(s) of the text plus EPS files of the figures at acceptance stage. If for some reason you cannot do this, please notify the RAS as soon as possible.

The correct *Monthly Notices* House Style should be used – again, details are given in the Instructions for Authors on the journal web page[1] and in the Style Guide published in the 1993 January 1 issue (MNRAS, 260, 1). Ensure that any author-defined macros are gathered together in the file, just before the `\begin{document}` command.

2 USING THE MN2E CLASS FILE

If the file `mn2e.cls` is not already in the appropriate system directory for LaTeX files, either arrange for it to be put there

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† Production Editor.

[1] http://www.blackwell-science.com/mnr/

or copy it to your working directory. The `mn2e` document class is implemented as a complete class, *not* a document style option. In order to use the MN document class, replace `article` by `mn2e` in the `\documentclass` command at the beginning of your document:

```
\documentclass{article}
```

is replaced by

```
\documentclass{mn2e}
```

In general, the following standard document style options should *not* be used with the `mn2e` class file:

(i) `10pt`, `11pt`, `12pt` – unavailable;

(ii) `twoside` (no associated style file) – `twoside` is the default;

(iii) `fleqn`, `leqno`, `titlepage` – should not be used (`fleqn` is already incorporated into the MN style);

(iv) `twocolumn` – is not necessary as it is the default style.

The `mn2e` class file has been designed to operate with the standard version of `lfonts.tex` that is distributed as part of LaTeX. If you have access to the source file for this guide, `mn2eguide.tex`, and to the specimen article, `mn2esample.tex`, attempt to typeset both of these. If you find font problems you might investigate whether a non-standard version of `lfonts.tex` has been installed in your system.

Authors using LaTeX wishing to create PDF files with smooth fonts are advised to read Adobe FaxYI Document Number 131303 by Kendall Whitehouse. Type 1 PostScript versions of the Computer Modern fonts are now freely available and are normally installed with new TeX/LaTeX software. Information is available from Y&Y.[2] Alternatively, you may wish to use Times font when creating your PDF file, e.g.

```
\documentclass[useAMS]{mn2e}
\usepackage{times}
```

2.1   Additional document style options

The following additional style options are available with the `mn2e` class file:

`onecolumn` – to be used *only* when two-column output is unable to accommodate long equations;

`landscape` – for producing wide figures and tables which need to be included in landscape format (i.e. sideways) rather than portrait (i.e. upright). This option is described below.

`doublespacing` – this will double-space your article by setting `\baselinestretch` to 2.

`referee` – 12/20pt text size, single column, measure 16.45 cm, left margin 2.75 cm on A4 page.

`galley` – no running heads, no attempt to align the bottom of columns.

`useAMS` – this enables the production of upright Greek characters π, μ and ∂.

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[2] http://www.yandy.com/resources.htm

`usedcolumn` – this uses the package file `dcolumn.sty` to define two new types of column alignment for use in tables.

`usenatbib` – this uses Patrick Daly's `natbib.sty` package for cross-referencing.

`usegraphicx` – this enables the use of the `graphicx` package for inclusion of figures. Note that the standard LaTeX graphics package `graphicx.sty` is required in order to use the `usegraphicx` option.

Please place any additional command definitions at the very start of the LaTeX file, before the `\begin{document}`. Author-defined macros should be kept to a minimum. Please do not customize the MNRAS macros or class file, or redefine macros that are already in the class file, and please do not include additional definitions unless they are actually used in the paper.

2.2   Landscape pages

If a table or illustration is too wide to fit the standard measure, it must be turned, with its caption, through 90 degrees anticlockwise. Landscape illustrations and/or tables cannot be produced directly using the `mn2e` class file because TeX itself cannot turn the page, and not all device drivers provide such a facility. The following procedure can be used to produce such pages.

(i) Use the `table*` or `figure*` environments in your document to create the space for your table or figure on the appropriate page of your document. Include an empty caption in this environment to ensure the correct numbering of subsequent tables and figures. For instance, the following code prints a page with the running head, a message half way down and the figure number towards the bottom. If you are including a plate, the running headline is different, and you need to key in the three lines that are marked with `% **`, with an appropriate headline.

```
% ** \clearpage
% ** \thispagestyle{plate}
% ** \plate{Opposite p.~812, MNRAS, {\bf 261}}
\begin{figure*}
 \vbox to220mm{\vfil Landscape figure to go here.
 \caption{}
\vfil}
\label{landfig}
\end{figure*}
```

(ii) Create a separate document with the `mn2e` document class but also with the `landscape` document style option, and include the `\pagestyle` command, as follows:

```
\documentclass[landscape]{mn2e}
\pagestyle{empty}
```

(iii) Include your complete tables and illustrations (or space for these) with captions using the `table*` and `figure*` environments.

(iv) Before each float environment, use the `\setcounter` command to ensure the correct numbering of the caption. For example,

```
\setcounter{table}{0}
\begin{table*}
 \begin{minipage}{115mm}
```

```
\caption{The Largest Optical Telescopes.}
\label{tab1}
\begin{tabular}{@{}lllllcll}
  :
\end{tabular}
\end{minipage}
\end{table*}
```

The corresponding example for a figure would be:

```
\clearpage
\setcounter{figure}{12}
\begin{figure*}
 \vspace{144mm}
 \caption{Chart for a cold plasma.}
 \label{fig13}
\end{figure*}
```

3 ADDITIONAL FACILITIES

In addition to all the standard LaTeX design elements, the `mn2e` class file includes the following features.

(i) Extended commands for specifying a short version of the title and author(s) for the running headlines.

(ii) A `keywords` environment and a `\nokeywords` command.

(iii) Use of the `description` environment for unnumbered lists.

(iv) A `\contcaption` command to produce captions for continued figures or tables.

In general, once you have used the additional `mn2e.cls` facilities in your document, do not process it with a standard LaTeX class file.

3.1 Titles and author's name

In the MN style, the title of the article and the author's name (or authors' names) are used both at the beginning of the article for the main title and throughout the article as running headlines at the top of every page. The title is used on odd-numbered pages (rectos) and the author's name appears on even-numbered pages (versos). Although the main heading can run to several lines of text, the running headline must be a single line ($\leqslant 45$ characters). Moreover, new line commands (e.g. `\\`) are not acceptable in a running headline. To enable you to specify an alternative short title and an alternative short author's name, the standard `\title` and `\author` commands have been extended to take an optional argument to be used as the running headline. The running headlines for this guide were produced using the following code:

```
\title[Monthly Notices: \LaTeXe\ guide for authors]
  {Monthly Notices of the Royal Astronomical
  Society: \\ \LaTeXe\ style guide for authors}
```

and

```
\author[A. Woollatt et al.]
  {A.~Woollatt,$^1$\thanks{Affiliated to ICRA.}
  M.~Reed,$^1$ R.~Mulvey,$^1$ K.~Matthews,$^1$
  D.~Starling,$^1$ Y.~Yu,$^1$
```

```
\newauthor % starts a new line in the
           % author environment
A.~Richardson,$^1$
P.~Smith,$^2$\thanks{Production Editor.}
N. Thompson$^2$\footnotemark[2]
and G. Hutton$^2$\footnotemark[2] \\
$^1$Cambridge University Press, Shaftesbury
    Road, Cambridge CB2 2BS\\
$^2$Blackwell Publishing,
    23 Ainslie Place, Edinburgh EH3 6AJ}
```

The `\thanks` note produces a footnote to the title or author. The footnote can be repeated using the `\footnotemark[]` command.

3.2 Key words and abstracts

At the beginning of your article, the title should be generated in the usual way using the `\maketitle` command. Immediately following the title you should include an abstract followed by a list of key words. The abstract should be enclosed within an `abstract` environment, followed immediately by the key words enclosed in a `keywords` environment. For example, the titles for this guide were produced by the following source:

```
\maketitle
\begin{abstract}
 This guide is for authors who are preparing
 papers for \textit{Monthly Notices of the
 Royal Astronomical Society} using the \LaTeXe\
 document preparation system and the {\tt mn2e}
 class file.
\end{abstract}
\begin{keywords}
 \LaTeXe\ -- class files: \verb"mn2e.cls"\ --
 sample text -- user guide.
\end{keywords}

\section{Introduction}
  :
```

The heading 'Key words' is included automatically and the key words are followed by vertical space. If, for any reason, there are no key words, you should insert the `\nokeywords` command immediately after the end of the `abstract` environment. This ensures that the vertical space after the abstract and/or title is correct and that any `thanks` acknowledgments are correctly included at the bottom of the first column. For example,

```
\maketitle
\begin{abstract}
  :
\end{abstract}
\nokeywords

\section{Introduction}
  :
```

The key words list is common to MNRAS, ApJ and A&A, and is available from the journal web page.[1]

3.3   Lists

The `mn2e` class file provides numbered lists using the `enumerate` environment and unnumbered lists using the `description` environment with an empty label. Bulleted lists are not part of the journal style and the `itemize` environment should not be used.

The enumerated list numbers each list item with roman numerals:

(i) first item
(ii) second item
(iii) third item

Alternative numbering styles can be achieved by inserting a redefinition of the number labelling command after the `\begin{enumerate}`. For example, the list

(1) first item
(2) second item
(3) etc...

was produced by:

```
\begin{enumerate}
 \renewcommand{\theenumi}{(\arabic{enumi})}
  \item first item
        :
\end{enumerate}
```

Unnumbered lists are provided using the `description` environment. For example,

First unnumbered item which has no label and is indented from the left margin.
Second unnumbered item.
Third unnumbered item.

was produced by:

```
\begin{description}
 \item First unnumbered item...
 \item Second unnumbered item.
 \item Third unnumbered item.
\end{description}
```

3.4   Captions for continued figures and tables

The `\contcaption` command may be used to produce a caption with the same number as the previous caption (for the corresponding type of float). For instance, if a very large table does not fit on one page, it must be split into two floats; the second float should use the `\contcaption` command:

```
\begin{table}
 \contcaption{}
  \begin{tabular}{@{}lccll}
  :
  \end{tabular}
\end{table}
```

4   SOME GUIDELINES FOR USING STANDARD FACILITIES

The following notes may help you achieve the best effects with the `mn2e` class file.

Figure 1. An example figure.

4.1   Sections

LaTeX 2_ε provides four levels of section headings and they are all defined in the `mn2e` class file:

```
\section
\subsection
\subsubsection
\paragraph
```

Section numbers are given for section, subsection, subsubsection and paragraph headings. Section headings are automatically converted to upper case; if you need any other style, see the example in Section **??**.

4.2   Illustrations (or figures)

The `mn2e` class file will cope with most positioning of your illustrations and you should not normally use the optional positional qualifiers on the `figure` environment that would override these decisions. See the instructions for authors on the journal web page for details regarding submission of artwork. Figure captions should be *below* the figure itself, therefore the `\caption` command should appear after the figure or space left for an illustration. For example, Fig. **??** is produced using the following commands:

```
\begin{figure}
%\includegraphics[width=84mm]{fig1.ps}
  %% to include a figure, or
 \vspace{3.5cm}
  %% to leave a blank space
 \caption{An example figure.}
 \label{sample-figure}
\end{figure}
```

4.3   Tables

The `mn2e` class file will cope with most positioning of your tables and you should not normally use the optional positional qualifiers on the `table` environment which would override these decisions. Table captions should be at the top, therefore the `\caption` command should appear *above* the body of the table.

The `tabular` environment can be used to produce tables with single horizontal rules, which are allowed, if desired, at the head and foot and under the header only. This environment has been modified for the `mn2e` class in the following ways:

(i) additional vertical space is inserted on either side of a rule;

Table 1. Radio-band beaming model parameters for FSRQs and BL Lacs.

Class	γ_1	γ_2	$\langle\gamma\rangle$	G	f	θ_c
BL Lacs	5	36	7	−4.0	1.0×10^{-2}	10°
FSRQs	5	40	11	−2.3	0.5×10^{-2}	14°

G is the slope of the Lorentz factor distribution, i.e. $n(\gamma) \propto \gamma^G$, extending between γ_1 and γ_2, with mean value $\langle\gamma\rangle$, f is the ratio between the intrinsic jet luminosity and the extended, unbeamed luminosity, while θ_c is the critical angle separating the beamed class from the parent population.

(ii) vertical lines are not produced.

Commands to redefine quantities such as \arraystretch should be omitted in general. For example, Table **??** is produced using the following commands. Note that \rmn will produce a roman character in math mode. There are also \bld and \itl, which produce bold face and text italic in math mode.

```
\begin{table}
 \caption{Radio-band beaming model parameters
          for FSRQs and BL Lacs.}
 \label{symbols}
 \begin{tabular}{@{}lcccccc}
  \hline
  Class & $\gamma _1$ & $\gamma _2$
        & $\langle \gamma \rangle$
        & $G$ & $f$ & $\theta _{\rmn{c}}$ \\
  \hline
  BL Lacs &5 & 36 & 7 & $-4.0$
        & $1.0\times 10^{-2}$ & 10$\degr$ \\
  FSRQs & 5 & 40 & 11 & $-2.3$
        & $0.5\times 10^{-2}$ & 14$\degr$ \\
  \hline
 \end{tabular}

 \medskip
 {\em G} is the slope of the Lorentz factor
   :
 class from the parent population.
\end{table}
```

If you have a table that is to extend over two columns, you need to use **table*** in a minipage environment, i.e. you can say

```
\begin{table*}
\begin{minipage}{126mm}
 \caption{Caption which will wrap round to the
          width of the minipage environment.}
 \begin{tabular}{%
      :
 \end{tabular}
\end{minipage}
\end{table*}
```

The width of the minipage should more or less be the width of your table, so you can only guess on a value on the first pass. The value will have to be adjusted when your article is typeset in Times, so do not worry about making it the exact size.

4.4 Running headlines

As described above, the title of the article and the author's name (or authors' names) are used as running headlines at the top of every page. The headline on left-hand pages can list up to three names; for more than three use et al. The \pagestyle and \thispagestyle commands should *not* be used. Similarly, the commands \markright and \markboth should not be necessary.

4.5 Typesetting mathematics

4.5.1 Displayed mathematics

The mn2e class file will set displayed mathematics flush with the left margin, provided that you use the LaTeX2ε standard of open and closed square brackets as delimiters. The equation

$$\sum_{i=1}^{p} \lambda_i = \text{trace}(\mathbf{S})$$

was typeset using the mn2e class file with the commands

```
\[
 \sum_{i=1}^p \lambda_i = \rmn{trace}(\mathbfss{S})
\]
```

Note the difference between the positioning of this equation and of the following centred equation,

$$\alpha_{j+1} > \bar{\alpha} + ks_\alpha$$

which was wrongly typeset using double dollars as follows:

```
$$ \alpha_{j+1} > \bar{\alpha}+ks_{\alpha} $$
```

Please do not use double dollars.

4.5.2 Bold math italic / bold symbols

To get bold math italic you should use \bmath, e.g.

```
\[
  d(\bmath{s_{t_u}}) = \langle [RM(\bmath{X_y}
  + \bmath{s_t}) - RM(\bmath{x_y})]^2 \rangle
\]
```

to produce:

$$d(\boldsymbol{s_{t_u}}) = \langle [RM(\boldsymbol{X_y} + \boldsymbol{s_t}) - RM(\boldsymbol{x_y})]^2 \rangle$$

Working this way, scriptstyle and scriptscriptstyle sizes will take care of themselves.

4.5.3 Bold Greek

Bold lowercase Greek characters can now be obtained by prefixing the normal (unbold) symbol name with a 'b', e.g. \bgamma gives $\boldsymbol{\gamma}$. This rule does not apply to bold \eta, as this would lead to a name clash with \beta. Instead use \boldeta for bold eta. Note that there is no \omicron (so there is no \bomicron), just use 'o' in math mode for omicron (o) and '\bmath{o}' for bold omicron ($\boldsymbol{o}$). '\bmath{}' can also be used for other Greek characters.

For bold uppercase Greek, prefix the unbold character name with \mathbf, e.g. \mathbf\Gamma gives $\boldsymbol{\Gamma}$. Upper and lowercase Greek characters are available in all typesizes.

You can then use these definitions in math mode, as you would normal Greek characters:

```
\[
  \balpha_{\bmu} = \mathbf{\Theta} \alpha.
\]
```

will produce

$$\boldsymbol{\alpha_\mu} = \boldsymbol{\Theta}\alpha.$$

4.5.4   Upright Greek characters

You can obtain upright Greek characters if you have access to the American Maths Society Euler fonts (version 2.0), but you may not have these. In this case, you will have to use the normal math italic symbols and the typesetter will substitute the corresponding upright characters. You will make this easier if you can use the macros `\upi`, `\umu` and `\upartial` etc. in your text to indicate the need for upright characters, together with the `useAMS` global option: (`\documentclass[useAMS]{mn2e}`). Characters π, μ and ∂ will appear upright only on systems that have the Euler roman fonts (`eurm`xx); characters $\leqslant$ and $\geqslant$ appear slanted only on systems that have the AMS series A fonts (`msam`xx). On systems that do not have these fonts, the standard forms of the characters appear in the printout; however, they should be correct in the final typeset paper if the correct LaTeX commands have been used.

4.5.5   Special symbols

The macros for the special symbols in Tables **??** and **??** have been taken from the Springer Verlag 'Astronomy and Astrophysics' design, with their permission. They are directly compatible and use the same macro names. These symbols will work in all text sizes, but are only guaranteed to work in text and displaystyles. Some of the symbols will not get any smaller when they are used in sub- or superscripts, and will therefore be displayed at the wrong size. Do not worry about this as the typesetter will be able to sort this out. Authors should take particular note of the symbols `\la`, `\ga`, `\fdg` and `\sun`.

4.6   Bibliography

References to published literature should be quoted in text by author and date: e.g. Draine (1978) or (Begelman, Blandford & Rees 1984). Where more than one reference is cited having the same author(s) and date, the letters a,b,c, ... should follow the date; e.g. Smith (1988a), Smith (1988b), etc. When a three-author paper is cited, you should list all three authors at the first citation, and thereafter use 'et al.'.

4.6.1   Use of `natbib`

If the `usenatbib` global option is specified, Patrick Daly's `natbib.sty` package will be used for for cross-referencing. If the `usenatbib` option is specified, citations in the text should be in one of the following forms (or one of the additional forms documented within `natbib.sty` itself).

- `\citet{`*key*`}` produces text citations, e.g. Jones et al. (1990),
- `\citep{`*key*`}` produces citations in parentheses, e.g. (Jones et al. 1990),
- `\citealt{`*key*`}` produces citations with no parentheses, e.g. Jones et al. 1990.

For three-author papers, a full author list can be forced by putting a * just before the {. To add notes within the citation, use the form `\citep[`*pre_reference_text*`][`*post_reference_text*`]{`*key*`}` (note that either of *pre_reference_text* and *post_reference_text* can be blank).

Items in the reference list must be of the form `\bibitem[\protect\citeauthoryear{`*author_names*`}{`*year*`}]{`*key*`}` Text of reference ... for one-, two- and multi-author papers, or `\bibitem[\protect\citeauthoryear{`*three_author_names*`}{`*first_author_etal*`}{`*year*`}]{`*key*`}` Text of reference ... for three-author papers.

Note that Patrick Daly's package `natbib.sty` is required in order to use the `usenatbib` option.

We recommend that authors use `natbib.sty` as their standard cross-referencing package, because of the flexibility in citation style that it provides.

4.6.2   The list of references

The following listing shows some references prepared in the style of the journal; the code produces the references at the end of this guide. The following rules apply for the ordering of your references:

(i) if an author has written several papers, some with other authors, the rule is that the single-author papers precede the two-author papers, which, in turn, precede the multi-author papers;

(ii) within the two-author paper citations, the order is determined by the second author's surname, regardless of date;

(iii) within the multi-author paper citations, the order is chronological, regardless of authors' surnames.

```
\begin{thebibliography}{}
  \bibitem[\protect\citeauthoryear{Butcher}{1992}]{bu}
    Butcher J., 1992, Copy-editing: The Cambridge
    Handbook, 3rd edn. Cambridge Univ. Press,
    Cambridge
  \bibitem[\protect\citeauthoryear{The Chicago Manual}%
    {1982}]{ch} The Chicago Manual of Style, 1982.
    Univ. Chicago Press, Chicago
  \bibitem[\protect\citeauthoryear{Blanco}{1991}]{bl}
    Blanco P., 1991, PhD thesis, Edinburgh
    University
  \bibitem[\protect\citeauthoryear{Brown \& Jones}%
    {1989}]{bj} Brown A. B., Jones C. D., 1989,
    in Robinson E. F., Smith G. H., eds,
    Proc. IAU Symp. 345, Black Dwarfs.
    Kluwer, Dordrecht, p. 210
  \bibitem[\protect\citeauthoryear{Edelson}{1987}]{ed}
    Edelson R. A., 1987, ApJ, 313, 651
  \bibitem[\protect\citeauthoryear{Knuth}{1998}]{kn}
    Knuth D. E., 1998, The \TeX book. Addison-Wesley,
```

Table 2. Special symbols which can only be used in math mode.

Input	Explanation	Output	Input	Explanation	Output
\la	less or approx	$\lesssim$	\ga	greater or approx	$\gtrsim$
\getsto	gets over to	$\leftrightarrows$	\cor	corresponds to	$\stackrel{\wedge}{=}$
\lid	less or equal	$\leqq$	\gid	greater or equal	$\geqq$
\sol	similar over less	$\lesssim$	\sog	similar over greater	$\gtrsim$
\lse	less over simeq	$\lessapprox$	\gse	greater over simeq	$\gtrapprox$
\grole	greater over less	$\gtrless$	\leogr	less over greater	$\lessgtr$
\loa	less over approx	$\lessapprox$	\goa	greater over approx	$\gtrapprox$

Table 3. Special symbols which do not have to be used in math mode.

Input	Explanation	Output	Input	Explanation	Output
\sun	sun symbol	$\odot$	\degr	degree	$^{\circ}$
\diameter	diameter	$\oslash$	\sq	square	$\square$
\fd	fraction of day	$\overset{\text{d}}{.}$	\fh	fraction of hour	$\overset{\text{h}}{.}$
\fm	fraction of minute	$\overset{\text{m}}{.}$	\fs	fraction of second	$\overset{\text{s}}{.}$
\fdg	fraction of degree	$\overset{\circ}{.}$	\fp	fraction of period	$\overset{\text{p}}{.}$
\farcs	fraction of arcsecond	$''.$	\farcm	fraction of arcmin	$'.$
\arcsec	arcsecond	$''$	\arcmin	arcminute	$'$

```
  Reading, MA
\bibitem[\protect\citeauthoryear{Kopka \& Daly}%
  {1999}]{kd} Kopka H., Daly P. W., 1999, A Guide
  to \LaTeX, 3rd edn. Addison-Wesley, Harlow
\bibitem[\protect\citeauthoryear{Lamport}{1986}]{la}
  Lamport L., 1986, \LaTeX: A Document
  Preparation System. Addison--Wesley, New York
\bibitem[\protect\citeauthoryear{Mirabel \& Sanders}%
  {1989}]{ms} Mirabel I. F., Sanders D. B., 1989,
  ApJ, 340, L53
\bibitem[\protect\citeauthoryear{Misner et al.}%
  {1973}]{mtw} Misner C. W., Thorne K. S.,
  Wheeler J. A., 1973, Gravitation.
  Freeman, San Francisco
\bibitem[\protect\citeauthoryear{Sopp \& Alexander}%
  {1991}]{sa} Sopp H. M., Alexander P., 1991,
  MNRAS, 251, 112
\bibitem[\protect\citeauthoryear{Stella \& Campana}%
  {1991}]{sc} Stella L., Campana S., 1991, in
  Treves A., Perola G. C., Stella L., eds,
  Iron Line Diagnostic in X-ray Sources.
  Springer--Verlag, Berlin, p. 230
\end{thebibliography}
```

Each entry takes the form

```
\bibitem[\protect\citeauthoryear{Author(s)}%
  {Date}]{tag} Bibliography entry
```

where `Author(s)` should be the author names as they are cited in the text, `Date` is the date to be cited in the text, and `tag` is the tag that is to be used as an argument for the vatious `\cite` commands. `Bibliography entry` should be the material that is to appear in the bibliography, suitably formatted.

Please, wherever possible, supply the formatted .bbl file of your reference list rather than the 'raw' .bib file(s).

4.7 Appendices

The appendices in this guide were generated by typing:

```
\appendix
\section{For authors}
     :
\section{For editors}
```

You only need to type `\appendix` once. Thereafter, every `\section` command will generate a new appendix which will be numbered A, B, etc. Figures and tables that appear in the Appendices should be called Fig. A1, Table A1, etc.

5 EXAMPLE OF SECTION HEADING WITH SMALL CAPS, lowercase, *ITALIC*, AND BOLD GREEK SUCH AS μ^{κ}

There are at least two ways of achieving this section head. The first involves the use of `\boldmath`. You could say:

```
\section[]{Example of section heading with\\*
  S{\sevensize\bf MALL} C{\sevensize\bf APS},
  \lowercase{lowercase}, \textbfit{italic},
  and bold\\* Greek such as
  \mbox{\boldmath{$\mu^{\kappa}$}}}
```

Many implementations of LATEX do not support `\boldmath` at 9pt, so you may need to use the bold Greek characters as described in Section **??**, and typeset the section head as follows:

```
\section[]{Example of section heading with\\*
  S{\sevensize\bf MALL} C{\sevensize\bf APS},
  \lowercase{lowercase}, \textbfit{italic},
  and bold\\* Greek such as
  $\bmu^{\bkappa}$}
```

Was produced with:

```
\section[]{Example of section heading with\\*
  S{\sevensize MALL} C{\sevensize APS},
  \lowercase{lowercase}, \textbfit{italic},
  and bold\\* Greek such as
  $\bmu^{\bkappa}$}
```

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APPENDIX A: FOR AUTHORS

Table **??** is a list of design macros which are unique to the Monthly Notices class and style files. The list displays each macro's name and description.

For detailed guidelines on style, authors are referred to the journal web page. Adherence to correct style from the start will obviously save time and effort later on, in terms of fewer proof corrections. The notes given on the journal web page relate to common style errors found in Monthly Notices manuscripts, and are *not* intended to be exhaustive. Please see the editorials in issues 257/2 and 260/1, as well as any recent issue of the journal, for more details.

APPENDIX B: FOR EDITORS

The additional features shown in Table **??** may be used for production purposes. The most commonly used of these is \bsp, which produces the 'This paper . . .' statement. This should be placed at the end of the document.

APPENDIX C: TROUBLESHOOTING

Authors may from time to time encounter problems with the preparation of their papers in TEX/LaTeX. The appropriate action to take will depend on the nature of the problem – the following is intended to act as a guide.

(i) If a problem is with TEX/LaTeX itself, rather than with the actual macros, please refer to the appropriate handbooks for initial advice (**??**). If the solution cannot be found after discussion with colleagues, and you suspect that the problem lies with the macros, then please contact the RAS Journal Production team at Blackwell Publishing, 23 Ainslie Place, Edinburgh EH3 6AJ, UK [Tel: +44 (0)131 226 7232; Fax: +44 (0)131 226 3803]. The Blackwell Publishing office may also be reached using the journal e-mail address (mnr@blacksci.co.uk). Please provide precise details of the problem (what you were trying to do – ideally, include examples of source code as well – and what exactly happened; what error message was received).

(ii) Problems with page make-up, particularly in the two-column mode (e.g. large spaces between paragraphs, or under headings or figures; uneven columns; figures/tables appearing out of order). Please do *not* attempt to remedy these yourself using 'hard' page make-up commands – the typesetters will sort out such problems during the typesetting process. (You may, if you wish, draw attention to particular problems when submitting the final version of your paper.)

(iii) If a required font is not available at your site, allow TEX to substitute the font and report the problem on your FTP submission form.

(iv) If you choose to use \boldmath, you may find that boldmath has not been defined locally for use with a particular size of font. If this is the case, you will get a message that reads something like:

```
LaTeX Warning: No \boldmath typeface in this size,
using \unboldmath on input line 44.
```

If you get this message, you are advised to use the alternative described in this guide for attaining bold face math italic characters, i.e. \bmath{...}.

C1   Fixes for coding problems

The new versions of the class file and macros have been designed to minimize the need for user-defined macros to create special symbols. Authors are urged, wherever possible, to use the following coding rather than create their own. This will minimize the danger of author-defined macros being accidentally 'overridden' when the paper is typeset in 9/11 pt Times Roman (see Section **??**, 'Typesetting mathematics', in the LaTeX author guide).

(i) Fonts in sections and paper titles. The following are examples of styles that sometimes prove difficult to code.

Paper titles

> # A survey of *IRAS* galaxies at $\delta > 50°$

is produced by:

```
\title[A survey of {\rm IRAS} galaxies at
      $\delta > 50\degr$]
  {A survey of \textit{IRAS} galaxies at
   $\bmath{\delta > 50\degr}$}
```

Table A1. Authors' notes.

`\title[optional short title]{long title}`	short title used in running head
`\author[optional short author(s)]{long author(s)}`	short author(s) used in running head
`\newauthor`	starts a new line in the author environment
`\begin{abstract}...\end{abstract}`	for abstract on titlepage
`\begin{keywords}...\end{keywords}`	for keywords on titlepage
`\nokeywords`	if there are no keywords on titlepage
`\begin{figure*}...\end{figure*}`	for a double spanning figure in two-column mode
`\begin{table*}...\end{table*}`	for a double spanning table in two-column mode
`\plate{Opposite p.~812, MNRAS, {\bf 261}}`	used with `\thispagestyle{plate}` for plate pages
`\contcaption{}`	for continuation figure and table captions
`\bmath{math text}`	Bold math italic / symbols.
`\textbfit{text}, \mathbfit{text}`	Bold text italic (defined in the preamble of `mnsample.tex`).
`\textbfss{text}, \mathbfss{text}`	Bold text sans serif (defined in the preamble of `mnsample.tex`).

Table B1. Editors' notes.

`\pagerange{000--000}`	for catchline, note use of en-rule
`\pagerange{L00--L00}`	for letters option, used in catchline
`\volume{000}`	volume number, for catchline
`\pubyear{0000}`	publication year, for catchline
`\journal`	replace the whole catchline at one go
`[doublespacing]`	documentstyle option for doublespacing
`[galley]`	documentstyle option for running to galley
`[landscape]`	documentstyle option for landscape illustrations
`[letters]`	documentstyle option, for short communications (adds L to folios)
`[onecolumn]`	documentstyle option for one-column
`[referee]`	documentstyle option for 12/20pt, single col, 39pc measure
`\bsp`	typesets the final phrase 'This paper has been typeset from a TeX/LaTeX file prepared by the author.'

Observations of compact H II regions

is produced by:

```
\title[Observations of compact H\,{\normalsize
       \it II} regions]
  {Observations of compact H\,{\Large\bf II}
  regions}
```

Section headings

1   THE *IRAS* DATA FOR $\delta > 50°$

is produced by:

```
\section[]{The \textit{IRAS} data for
  $\bmath{\delta > 50\degr}$
```

2   H II GALAXIES AT $z > 1.6$

is produced by:

```
\section[]{H\,{\sevensize\bf II} galaxies at
  $\bmath{\lowercase{z} > 1.6}$}
```

Subsection headings

2.1   The *IRAS* data for $\delta > 50°$: galaxies at $z > 1.5$

is produced by:

```
\subsection[]{The \textit{IRAS} data for
  $\bmath{\delta > 50\degr}$: galaxies
  at $\bmath{z > 1.5}$}
```

2.2   Observations of compact H II regions

is produced by:

```
\subsection[]{Observations of compact
  H\,{\sevensize\bf II} regions}
```

2.2.1   A survey of radio galaxies for $\delta > 50°$

is produced by:

```
\subsubsection[]{A survey of radio galaxies for
  $\delta > 50\degr$}
```

2.2.2   Determination of $T_{\rm eff}$ in compact H II regions

is produced by:

```
\subsubsection[]{Determination of $T_{\rm eff}$ in
  compact H\,{\sevensize\it II} regions}
```

(ii) Small capitals and other unusual fonts in table and figure captions:

Figure 1. Profiles of the Hα and N III lines observed.

is produced by:

```
\caption{Profiles of the H$\alpha$ and
  N\,{\sc iii} lines observed.}
```

(iii) Multiple author lists (to get the correct vertical spacing and wraparound on the title page of a multiple-author paper).

<div style="border:1px solid">

The variation in the strength of low-*l* solar p modes: 1981–2

Y. Elsworth, R. Howe, G.R. Isaac, C. P. McLeod, B. A. Miller, R. New, C. C. Speake and S. J. Wheeler

</div>

is produced by:

```
\title[The variation in the strength of low-$l$
  solar p modes: 1981--2]%
  {The variation in the strength of
  low-$\bmath{l}$ solar
  p modes: 1981--2}
```

```
\author[Y. Elsworth et al.]
  {Y. Elsworth, R. Howe, G.R. Isaac, \newauthor
  C.~P. McLeod, B.~A. Miller, R. New, \newauthor
  C.~C. Speake and S.~J. Wheeler}
```

(iv) Ionized species (as used in the examples above). The correct style calls for the use of small capitals and a thin space after the symbol for the element: e.g. for H II, use the code `\mbox{H\,{\sc ii}}`. The use of the `\mbox` will stop the H and the II being separated.

(v) Lower case greek pi (π), mu (μ) and partial (∂). In certain circumstances, the *Monthly Notices* style calls for these to be roman [when pi is used to denote the constant 3.1415..., mu is used to denote 'micro' in a unit (e.g. μm, μJy), and partial is a differential symbol]. See Section **??** for instructions.

(vi) Decimal degrees, arcmin, arcsec, hours, minutes and seconds. The symbol needs to be placed vertically above the decimal point. For example, the sentence

 The observations were made along position angle 120°.5, starting from the central coordinates RA(1950) = $19^{\rm h}$ $22^{\rm m}$ $18^{\rm s}$2, Dec. (1950) = 45° 18′ 36″4

uses the following coding:

```
The observations were made along position angle
120\fdg 5, starting from the central coordinates
$\rmn{RA}(1950)=19^{\rmn{h}} 22^{\rmn{m}} 18\fs2$,
$\rmn{Dec.}~(1950)=45\degr 18\arcmin 36\farcs 4$
```

(vii) The correct coding for the prime symbol ′ is `\arcmin`, and that for ″ is `\arcsec`; see the two tables on special symbols. Note that these symbols should *only* be used for coordinates. The words 'arcmin' and 'arcsec' should be used for units (e.g. '4.5-arscec resolution').

(viii) N-rules, hyphens and minus signs (see the instructions for authors on the journal web page for correct usage). To create the correct symbols in the sentence

 The high-resolution observations were made along a line at an angle of $-15°$ (east from north) from the axis of the jet, which runs north–south

you would use the following code:

```
The high-resolution observations were made along
```

```
a line at an angle of $-15\degr$ (east from north)
from the axis of the jet, which runs north--south
```

(ix) Vectors and matrices should be bold italic and bold sans serif respectively. To create the correct fonts for the vector x and the matrix **P**, you should use `$\bmath{x}$` and `\textbfss{P}` respectively; `\mathbfss` is for use in math mode. Bold face text italic can be obtained by using `\textbfit{..}` and `\mathbfit{..}` for math mode.

(x) Bold italic superscripts and subscripts. To get these to come out in the correct font and the right size, you need to use `\bmath`. You can create the output k_x by typing `$\bmath{k_x}$`. Try to avoid using LaTeX commands to determine script sizes that are already defined in the style file. For example, macros such as

```
\newcommand{\th}{^\mbox{\tiny th}}
```

are generating extra work;

```
\newcommand{\th}{^{th}}
```

will do, and will get the size of the superscript right whether in main text, tables or captions (the use of `\tiny` over-rides the style file). Also, the `\mbox` is not necessary, as TeX will not split a superscript/subscript from its variable at a line break.

(xi) Calligraphic letters (uppercase only). Normal uppercase calligraphic can be produced with `\mathcal` as normal (in math mode). Bold calligraphic can be produced with `\bmath`. e.g. `$\bmath{\mathcal A}$` gives $\mathcal{A}$.

(xii) Automatic scaling of brackets. The codes `\left` and `\right` should be used to scale brackets automatically to fit the equation being set. For example, to get

$$v = x \left(\frac{N+2}{N} \right)$$

use the code

```
\[
  v = x \left( \frac{N+2}{N} \right)
\]
```

(xiii) Roman font in equations. It is often necessary to make some symbols roman in an equation (e.g. units, subscripts). For example, to get the following output:

$$\sigma \simeq (r/13\ h^{-1}\ {\rm Mpc})^{-0.9}, \qquad \omega = \frac{N-N_{\rm s}}{N_{\rm R}},$$

you should use:

```
\[
  \sigma \simeq (r/13~h^{-1}~\rmn{Mpc})^{-0.9},
  \qquad \omega=\frac{N-N_{\rmn{s}}}{N_{\rmn{R}}},
\]
```

(xiv) Continuation figure and table captions. See Section **??**.

C2   Springer-Verlag macro names

These have been incorporated from the Astronomy & Astrophysics LaTeX style file, to aid in the creation of various commonly used astronomical symbols. Please see Section **??** for details.