DOCUMENT PREPARATION FOR ASL PUBLICATIONS

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The JOURNAL and the BULLETIN OF SYMBOLIC LOGIC and the proceedings of conferences in the series **Notes in Logic** (LNL) are typeset with a version of $\mathcal{AMS}$-LaTeX, the typesetting system used for publications of the American Mathematical Society. This means that all commands of the familiar `article` "documentclass" of LaTeX2ε and essentially[1] all commands of the $\mathcal{AMS}$-LaTeX documentclass `amsart` are recognized by the documentclass `asl`, and so manuscripts prepared for those versions of TeX can be processed by the ASL Typesetting Office practically as-they-are.[2] This brief guide is aimed at those authors who are reasonably proficient in LaTeX2ε and would like to exercise better control of the final look of their papers by making the necessary changes themselves. It also offers a brief description of the `amsart` commands most useful for logic, as well as some additional commands available under `asl`.

For authors of papers which involve little or no mathematics, it should be pointed out that LaTeX is an extremely easy system with which to prepare documents which consist mostly of text: a brief perusal of Chapters 1 and 2 of the LaTeX book[3] and Section 1 and Subsection 2.3 of this guide should suffice.

To use the documentclass `asl`, put the file `asl.cls` where your TeX looks for inputs, or in the directory in which you are working; and if you plan to use `bibtex`, you should also put `asl.bst` where `bibtex` looks for `.bst` files, or in your working directory.

§1. The preamble.

Each article for publication by the ASL must start with the text in Section 5, which can be copied from the source file for this guide and used as a template. Here are some comments on this material:

1.1. Options.

At least one option is required for each manuscript, `jsl`, `bsl` or `conference`, specifying the venue of publication. In addition, one may add any number of `amsart` or `asl` options, which include the following:

- `reqno`; this places the equation numbers on the right, the default being `leqno` which puts them on the left.

This document and all that is needed to prepare documents for ASL publications are posted in the ASL Typesetting Office Website, `http://www.math.ucla.edu/~asl/asltex`. August 20, 2000.

[1] This is made precise in Section 4.

[2] The two main guides for $\mathcal{AMS}$-LaTeX are `amsldoc` and `amsthdoc`. They are both posted on the ASL Typesetting Office site, and it is highly recommended that the second one of these be read along with this document; it is very brief, and very useful.

[3] ***LaTeX***, by Leslie Lamport, Addison-Wesley, 1994.

- `fleqn`; places the displays at a fixed distance from the left margin, the default setting them centered. It can be combined with either the default `leqno` or `reqno` (not recommended).
- `endnotes`, `mixednotes`; these change footnotes to "endnotes" or allow both, see Subsection 2.3.
- `bibalpha`, `bibay1`, `bibay2`; different styles for the Bibliography and citations, explained in Section 3.

The `jsl`, `bsl` and `conference` options set the appropriate logo and Copyright information, they set a few additional publication-specific defaults, and (more significantly) they set the size of type—10pt for the JOURNAL and the LNL and 11pt for the BULLETIN. Manuscripts compiled with one of these options will give only an approximation of the final look of the published paper, because ASL publications are printed using proprietary Monotype Times Roman fonts rather than the usual Computer Modern fonts of LaTeX2ε; it is a fairly good approximation, however, especially for formulas and displays, and so it can be very useful to the author.

Do not worry when the typeset version declares that your paper will appear in Volume 0, of Year 0, etc., these default values are re-set (along with the fonts) at the time of production.

1.2. Other packages. After the `documentclass` command, several "packages" may be loaded, for drawings, diagrams, etc. For example, this document includes in its preamble the command

```
\usepackage{rotate}
```

which loads `rotate.sty`, needed for the "game quantifier" ⅁. All packages which are compatible with `article` or `amsart` are also compatible with `asl`—and please let us know of any exceptions you discover.

1.3. The title. No commands defined in the paper should be used in the entries to `\title` — if you need some special symbols in them, you should enter them using standard, LaTeX2ε or `asl` commands. The optional short title (within brackets) is used for the page-top-headings, and it is only needed if the title of the paper is long or contains line-breaking commands \\; do not include any \\ in the short title.

Contrary to a popular practice, *only proper names are set in uppercase* in ASL publications: so don't enter

```
\title{A New Counterexample to G\"odel's Theorem}
```

but write instead

```
\title{A new counterexample to G\"odel's Theorem}
```

Incidentally, the same practice is followed in the titles of chapters, sections and subsections in ASL publications: only proper names should be entered in upper case.

1.4. The keywords and subjclass entries ($\mathcal{AMS}$-style) are optional.

1.5. Authors' names. Each author should have two entries of his or her name, in the form

```
\author{John J. John}
\revauthor{John, John J.}
```

The "reversed author" command is used to produce and alphabetize Tables of Contents and Indices, and it should be entered exactly as the author writes his/her name last-name-first, which sometimes requires a period at the end, e.g., after a middle initial, the appellation "Jr.", etc. Use

`\author{\Mac Lane, Saunders}` to enter MacLane, and
`\author{\Mc Lane, James}` to enter McLane,

but (preferably) the usual "`MacLane`" and "`McLane`" in the `\revauthor` field.

For entering footnotes to authors' names see Subsection 1.7 below.

1.6. Address, email, etc. Each author should have exactly one entry of the form

`\address{...}` or `\twoaddress{...}{...}{.}`

and any number of optional entries of the form

```
\curraddr{...}
\genaddr{...}{...}
\email{...}
\urladdr{...}
\thanks{...}
```

The lines of the address are separated by `\\`, and the country of the address must be included and put on the last line, not on a line by itself.

The `\twoaddress` command is useful for authors with two affiliations; the third entry must be *the number of lines* (1 plus the number of occurrences of `\\`) *in the first address*.[4] The address for this guide was entered in the form

```
\twoaddress{Department of Mathematics\\
University of California\\
Los Angeles, CA 90095-1555, USA}
{Department of Mathematics\\
University of Athens\\
Panepistimioupolis, Zografou, 15784 Greece}
{3}
```

From the optional commands,

```
\curraddr{Department of Mathematics\\
University of California\\
Los Angeles, California, 90095-1555, USA}
```

will produce at the end of the article (right after the address) the entry

[4] If you have three or more affiliations, just enter them separately and they will be hand-set by the ASL typesetters (and, perhaps, you should re-think your situation).

Current address: Department of Mathematics, University of California, Los Angeles, California, 90095-1555, USA.

The command `\genaddr` takes two arguments and adds an additional address with the heading specified by the first argument, e.g.,

```
\genaddr{Correspondence address}
{John J. John\\
 c/o Joe's Happy Hour Place\\
 43 6th Ave.\\
 New York, NY 08890, USA}
```

will produce at the end of the article the entry

Correspondence address: John J. John, c/o Joe's Happy Hour Place, 43 6th Ave., New York, NY 08890, USA.

In the self-explanatory `\email` and `\urladdr` commands, the symbol ~ should be entered as `\urltilde` or `\textasciitilde`.

These "address commands" are all printed at the end of the article *in the order in which they occur in the preamble*; this means that all the address commands of the first author must be entered before the first address command of the next author, etc., so that it is clear which address goes with whom.

1.7. Thankses. The "thankses" appear as numberless footnotes, on the first page, in the order in which they occur in the preamble.

If you need a footnote accompanying the name of an author, you must do it manually, as follows:

```
\author[John J. John]{John J. John$^\dag$}

\revauthor{John, John J.}

\thanks{$^\dag$John J. John appreciates the help of his
mother ...}
```

Notice that the † is not entered in the optional so-called "shortauthor" entry `[John J. John]` (which is used for the page-top headings) or in the `\revauthor` command.

1.8. Theorem environments. The `\newtheorem` commands are needed because the stylefile does not have any theorem environments built in. The default style is "plain" which sets the text of theorems in italics, and it can be changed by the `\theoremstyle` command. The most common theoremstyle (other than plain) is `definition`, which sets theorems in Roman; for more details see `amsthdoc`.

1.9. Authors' macros. If there are many macros, put them in another file, e.g., `john.mac`, and put here `\input{john.mac}`.

1.10. The abstract. The abstract (which is optional) should be entered *before* the `\maketitle` command. This is a feature of `amsart`, its main difference in form from `article`; it helps with the layout of the first page of the article.

§2. The main part of the article. If you are not familiar with `amsart` and don't feel like learning it just now, read this guide and the 4-page `amsthdoc` and type your article using your new knowledge and the usual `article` commands—`equation`, `array`, `eqnarray`, etc. You won't really need to learn the more esoteric `amsart` commands, unless your paper involves many, complex mathematical formulas and displays (especially multiple subscripts and superscripts) and you want to get it all right by yourself.

2.1. Formatting commands. These are instructions like `\newpage`, `\linebreak`, `\allowdisplaybreaks`, `\parindent=2em`, `\widowpenalty=0`, etc., and the first rule is *don't use any*; they will all be deleted before the final version of the article is prepared—and then some of them may be re-introduced by the ASL typesetters, as they are needed.

2.2. Space commands. These are things like `\vspace`, `\hspace`, `\quad`, `~~`, etc., and the second rule is *don't use any vertical space commands*—well, except perhaps for an occasional `\smallskip` or `\medskip`; *use horizontal space commands sparingly*; and *never—ever—insert space within formulas* to enlarge the natural space that TEX and the stylefile introduces. For example, authors are often tempted to enter

`a~=~b` which prints as $a \ = \ b$
rather than `a = b` which prints as $a = b$

and the first of these does not look good to the trained eye. If you want to get the correct spacing around new function or binary relation symbols, don't enter it by hand, but use the command

```
\DeclareMathOperator{\height}{ht}
```

which introduces the combination 'ht' as the name of an operator or relation and lets LATEX2ε worry about spacing; with this command in effect,

`\height(a,b)` will print in math mode as $\operatorname{ht}(a, b)$
and
`a \height b` will print in math mode as $a \operatorname{ht} b$.

This is especially useful for binary relations, while a one-time use of a function can be entered as `\textup{ht}(a,b)` which yields $\textup{ht}(a, b)$. For one-time uses of single binary relation *symbols* (not words), you can use also use

`x \mathbin{\natural} y` which yields $x \mathbin{\natural} y$.

ASL publications have a very "tight" layout which is not compatible with much white space, and all space commands are removed by our typesetters before the final, production version of the article is developed. Remember that what may look crowded in a preprint might look just right in ASL publications.

2.3. Footnotes and endnotes. Footnotes are entered with the `footnote` command, attached to the footnoted word with no intervening space; for example[5] the line which produced the footnote on this page was entered as follows:

```
for example\footnote{Sample footnote.} the line which produced
```

The option `endnotes` changes footnotes to endnotes, printed when the command `\theendnotes` is encountered, typically at the end of the article just before the bibliography. In more detail: the first time when `\theendnotes` is encountered, all the endnotes entered from the beginning of the article are printed, and each subsequent occurrence of the command causes the printing of all the endnotes entered since the previous occurrence. If you want the numbering of endnotes to start over, enter `\startoverendnotes` just after the `\theendnotes`. (This option treats the command `\endnote{...}` as synonymous to `\footnote{...}`.)

The option `mixednotes` makes it possible to enter both footnotes and endnotes: `\footnote{...}` produces a footnote, while `\endnote{...}` produces an endnote, handled exactly as in the `endnotes` option. In this option the footnotes are numbered using symbols like †, ‡, etc., and there should not be more than nine of them in any given page.

When no option is specified, `\endnote{...}` produces a footnote, just like `\footnote{..}`. Similarly, all other commands of the `endnote` package behave like their footnote equivalents, or do nothing if there is no such equivalent. This means that the following experimentation is possible: produce the document as if the `mixednotes` option is going to be used (thus using both `\footnote` and `\endnote`), then try it with either option or with no option at all to see which looks best.

2.4. Common errors and bad practices. Four of these are worth pointing out here, because they occur very frequently and require a great deal of effort to correct.

(1) *Don't use math mode to simulate italics*:

`$George$`	prints as	$George$, while
`\textit{George}`	prints as	*George*

which is better spaced. This is often committed when operators and binary relations with long names are defined in math mode, which should be done using the `\DeclareMathOperator` and `\textup` commands as explained in Subsection 2.2. To switch between *text* fonts (in either text or math mode) use the commands

`\textit{George}`	prints as	*George*
`\textup{George}`	prints as	George
`\textbf{George}`	prints as	**George**
`\textsc{George}`	prints as	GEORGE

[5]Sample footnote.

Especially useful is the `\textup{..}` command, which can be used to introduce small phrases in straight-up text (Roman) within a slanted environment, e.g., within the statement of a theorem.

For the commands needed to switch fonts in formulas, see Subsection 2.11.

(2) *Don't precede or follow displays by blank lines*, unless, of course a display ends a paragraph.

(3) *Do not overuse list environments*. There is a natural tendency to take too seriously the LaTeX "philosophy" of *logical design* and introduce lists within lists within lists, reflecting the logical structure of the statement of a theorem or a proof; in the end the article looks like a `lisp` program, and this does not help understanding. The rules are:

- Do not use a list environment (`enumerate`, `itemize`, etc.) if individual items will be more than two or three lines long.
- Do not use a nesting of lists of depth more than 2 (list within list).
- Do not nest lists at all if the items of the inner list are more than one line long.

Every rule has exceptions, of course, and perhaps you want part of your paper to look like a program, but multiply nested lists will normally be re-set by the ASL typesetters to lessen the amount of white space on the page.

(4) *Format your* `.tex`*-file so that it can be easily read by others*; while the published article should not look like a program, the `.tex`-file, really *is* a program, which will be debugged by the ASL typesetters, and you should try to make their job easier. Two simple rules:

- Don't `\input{mymacros}` if `mymacros.tex` has 2000 commands, only five of them needed for this paper; prune the macro files you submit.
- Format displays so they look like displays.

For example, don't bury the line

```
... from which it follows that \[f(x)=0,\] and so ...
```

in the middle of a long paragraph, type instead

```
... from which it follows
  \[
   f(x)=0,
  \]
  and so ...
```

which makes it easier to identify it as a display in the source file.

2.5. Theorems, lemmas, and the like. For introducing theorem environments, please see `amsthdoc` which describes succinctly the many possibilities offered by `amsthm`, whose commands are all available under `asl`. The only command described there which you should not use is `\swapnumbers`, which does not fit in well with `asl`.

Theorems are normally set in italics, but tradition (and taste) demands that parentheses, brackets, punctuation symbols and numerals in them are set straight-up. This is a painful problem when the Computer Modern fonts are used: because if you type

```
(2) ... and so (by Rice's Theorem) $p\sqsubseteq q$;
```

within a theorem environment, you will get the ugly-looking

(2) ... and so (by Rice's Theorem) $p \sqsubseteq q$*;*

and, to correct this, you would need to type the cumbersome

```
\textup{(2)}... and so \textup{(}by Rice's
 Theorem\textup{)} $p\sqsubseteq q$\textup{;}
```

There is no need for this when preparing articles for ASL publications, because theorems are automatically set in a special font which uses italics for text but straight-up type for delimiters, punctuation symbols and numerals: so the first entry above (in a theorem environment) will produce the output

(2) *... and so* (*by Rice's Theorem*) $p \sqsubseteq q$;

in the font in which this document is typeset. So, if you can stand the ugly, leaning parentheses in your preprints, you can omit all the extra `\textup` commands in typing theorems.

2.6. Proofs. For proofs, use the `proof` environment described in `amsthdoc`. Briefly: proofs are entered in the form

```
\begin{proof}
 The argument is by induction ...
 ...
 completing the argument.
\end{proof}
```

which will produce the output

PROOF. The argument is by induction ... ... completing the argument. ⊣

You can change the name "proof" with an optional argument:

```
\begin{proof}[Proof of John's Theorem]
 The argument is by induction ...
 ...
 which completes the argument.
\end{proof}
```

will produce the output

PROOF OF JOHN'S THEOREM. The argument is by induction ... ... which completes the argument. ⊣

Finally, for those who like to start a proof with its name, `asl` provides the `proofplain` environment: entering

```
\begin{proofplain} is by induction on
 ...
```

```
  completing the argument.
\end{proofplain}
```

will produce the output

PROOF is by induction on ... completing the argument. $\dashv$

You can change the end-of-proof symbol ‘ $\dashv$ ’ customarily used in ASL publications by entering (in the preamble or, locally, within a specific proof) the command

```
\renewcommand{\qedsymbol}{...}
```

but, please, don’t choose something ugly and gloomy like ■. You can also have the “blank” end-of-proof symbol by typing (globally or locally, within a proof) `\noqed`, but even in this case, it is good to encase your proofs in the `\begin{proof}` ... `\end{proof}` environment, to insure good spacing.

For proofs which end with a displayed equation, see Subsection 2.10 below.

2.7. Diagrams, formal proofs and graphics. These should always be encased in a `figure` or `table` environment, with the location set to [tb] (top-bottom), captioned and cited in the text; *do not* use the location [h] (here), except for very small figures which will not take up more vertical space than about 10 lines of text. LaTeX2ε places floats at the end of an article, after the BIBLIOGRAPHY, and this is not allowed in the ASL journals; this means that if your attempt to control the placement of your figure is too strict and it ends up as a float, the figure will need to be re-positioned.

There are many good packages for entering diagrams, including `xy-pic` which works well with `asl` and produces excellent output—although it is a little hard to debug, and so the author (rather than the ASL typesetter) has a greater responsibility to “do it right”.

For formal proofs, we recommend `bussproofs.sty`, which is simple to use (and to debug) and produces very good output.[6] There are, however, many other excellent packages which some authors may prefer.

For figures and drawings, keep in mind that ASL publications are printed on a high-resolution, 1200 DPI imagesetter; this means that drawings which look fine when printed on a 300 DPI laserprinter may end up looking terrible when published. The main lesson from this are that *you should try to avoid submitting bitmaps*, unless you can produce them at 1200 DPI, and *you should not use very thin lines*, because they will become invisible at high resolution.

If you know some program which suffices for your needs and produces LaTeX2ε output (like `xy-pic.sty`, `bussproofs.sty` or LaTeX2ε’s `picture` environment), use it; these have the great advantage that they use the default fonts of the documents for symbols, and so they fit in well with the rest of the article. Second best is to submit your drawings in *encapsulated Postscript* (EPS) files, which are called by your document using the `epsfig.sty` package, especially if you avoid

[6] `bussproofs.sty` is posted on `http://www.math.ucla.edu/~asl/asltex` along with this guide.

using bitmapped fonts in the drawings and (if you can) set the resolution of your Postscript-generating program to 1200 DPI; this produces very good results, and it allows shading, which often livens up a drawing.

2.8. Other environments. There is nothing wrong with introducing your own environments, but, in practice, there is little need for many of them and you should not be carried away. In particular, the `\newtheorem*`, `\section*` and `\subsection*` commands can often be used to introduce easily environments with good spacing. For example, entering

```
\subsection*{Acknowledgement} The author is grateful to
his brother-in-law who actually proved the main
theorem of this paper.
```

will produce the output

Acknowledgement. The author is grateful to his brother-in-law who actually proved the main theorem of this paper.

In a similar way, Remarks, Notes, Asides, etc. can be entered as theorem environments with no numbering, or a different numbering than the theorems of the article.

2.9. Displayed equations and formulas. One advantage of `amsart` is that it allows for many more forms of displaying and aligning formulas and equations than LaTeX2ε's plain `equation` and `eqnarray`, which (when carefully used) can produce much finer results than the `article` environments. The following two are the simplest and the most useful.

First, for definitions *by cases*, enter

```
f(x) =
     \begin{cases}
     g(x) &\text{if } R(x) \\
     h(x) &\text{otherwise.}
     \end{cases}
```

which in math mode will produce the output

$$f(x) = \begin{cases} g(x) & \text{if } R(x) \\ h(x) & \text{otherwise.} \end{cases}$$

Second, the `multline` environment takes care of one-line displays that are too long to fit in one line: entering

```
\begin{multline*}
\sigma_q X_q.\bigvee_{S\subseteq \Sigma\setminus \{p\}}
\Biggl[ \Biggl(
 \bigvee_{D\in Y_q^S} (\alpha^{-p}_S\wedge \neg p\wedge
\beta_{q,D})\vee ( \alpha^{-p}_S\wedge p\wedge
\beta_{q,D} ) \Biggr)
\\
\vee   \bigvee_{D\in Z_q^S}
```

```
(\alpha_S^p\wedge \beta_{q,D})\Biggr],
\end{multline*}
```

will produce the output

$$\sigma_q X_q.\bigvee_{S\subseteq\Sigma\setminus\{p\}}\Biggl[\biggl(\bigvee_{D\in Y_q^S}(\alpha_S^{-p}\wedge\neg p\wedge\beta_{q,D})\vee(\alpha_S^{-p}\wedge p\wedge\beta_{q,D})\biggr) \\ \vee\bigvee_{D\in Z_q^S}(\alpha_S^p\wedge\beta_{q,D})\Biggr],$$

with the break in the line exactly where the author indicated it should go with the `\\` command and well-chosen margins.

All display environments[7] of `asl` support the `\tag` command which allows the author to replace the equation number by any tag; for example, in the case of a single equation, entering

```
\begin{equation}
A = B   \tag{$\ast$}
        \label{george}
\end{equation}
```

will print

$$A = B \tag{$\ast$}$$

This will not advance the equation counter, and references to this equation can be made as usual with `\eqref{george}`.

2.10. The enhanced `eqnarray` environment. The familiar `eqnarray` environment of LaTeX2ε and its starred version `eqnarray*` have been extended in `asl` to allow for two, useful refinements and a variation.

First, you can have a third column: entering

```
\begin{eqnarray}
A &=& B   &\text{by equation~\eqref{george}} \\
C &=& D
\end{eqnarray}
```

will produce the output

$$\begin{aligned} A &= B \qquad \text{by equation } (\ast) \qquad (1)\\ C &= D \qquad (2)\end{aligned}$$

assuming that the equation labeled `george` is, indeed, the equation tagged $(\ast)$. This is useful for commented computations and also works with `eqnarray*`.

Second, `eqnarray` and `eqnarray*` support the `\tag` command described in the preceding section, albeit with one restriction: if you assign both a tag and a label to an equation, *issue the tag command first and the label command after it*, as

[7] Actually, the `tag` command does not work right in the `align` environment when both the `reqno` and `fleqn` options are in effect—an ugly combination which you don't really want to use.

illustrated in the example above; if you enter these commands in the wrong order, `asl` will stop and warn you of the error.

Finally, the variant environment `endproofeqnarray` makes it possible to end a proof with a displayed equation and still have ‘ $\dashv$ ’ placed correctly; entering

```
\begin{proof} \dots and, finally, we compute:
\begin{endproofeqnarray}
f(x) &=& g(x) &\text{(by \eqref{george})} \\
     &=& h(x) &\text{obviously.}
\end{endproofeqnarray}
\end{proof}
```

produces the output:

PROOF. ... and, finally, we compute:

$$f(x) = g(x) \qquad \text{(by } (*)) \tag{3}$$

$$= h(x) \qquad \text{obviously.} \qquad \dashv \tag{4}$$

This also works with `endproofeqnarray*` (which does not number the equations).

To end a proof with a single (for example, unnumbered) equation, enter

```
\begin{proof} ... and finally
\begin{endproofeqnarray*}
&   a=b   &
\end{endproofeqnarray*}
\end{proof}
```

which is rendered as

PROOF. ... and finally

$$a = b \qquad \dashv$$

(You can omit the `&` symbols in the case of a single equation, when alignment is not needed, but surrounding the equation with them gives a more accurate centering of the display.)

2.11. Math symbols. To switch fonts in letters which occur within formulas, use the `\math..{...}` command, which is analogous to the `\text..{...}` command:

`\mathrm{R}`	prints as	R
`\mathit{R}`	prints as	R (not useful, just type `R`)
`\mathbf{R}`	prints as	$\boldsymbol{R}$
`\mathbb{R}`	prints as	$\mathbb{R}$, and
`\mathcal{R}`	prints as	$\mathcal{R}$ or $\mathscr{R}$,

depending on the publication.[8] The `\mathbf..{...}` command works only with

[8]With the Monotype fonts, in all publications, `\oldcal{R}` = $\mathcal{R}$ and `\truescript{R}` = $\mathscr{R}$; with CMR fonts, `\truescript{R}` = `\oldcal{R}` = `\mathcal{R}` = $\mathcal{R}$.

letters (not symbols), while the `\boldsymbol{...}` command will give a boldface version of every symbol which exists in the current font:

`\boldsymbol{\Sigma}` is rendered as $\boldsymbol{\Sigma}$

To cope with the unfortunate notation in Descriptive Set Theory where the difficult to see distinction between boldface and lightface Greek letters is essential, you may want to use the `\tboldsymbol{...}` command which proclaims explicitly the boldness:

`\tboldsymbol{\Sigma}` is rendered as $\underset{\sim}{\boldsymbol{\Sigma}}$

The files `aslsyms.tex` and `aslsyms.ps` in the ASL Typesetting Office site give a complete list of all symbols which can be used with `asl`, including the LaTeX symbols, the symbols from the AMS fonts, arithmetic subtraction $x \dot{-} y$ and the "correct" game quantifier $(\Game\alpha)$. We welcome suggestions and contributions of additional symbols useful for papers in logic.

§**3. Bibliography.** A basic characteristic of the style for bibliographies in ASL publications is that *complete names of journals are entered*, i.e., we do not write *Bull. Am. Math. Soc.* but, in full, *Bulletin of the American Mathematical Society*. The file `journals.lst` posted on the ASL Typesetting site lists the full names of most journals cited by our authors, and it is extremely helpful to the ASL Typesetting Office if complete names of the books and journals in the bibliography are sent in by the author.

If you know how to use `bibtex`, please submit a `.bib` file with your article, otherwise one will be made up by our typesetters. The remainder of this section is aimed at those who know how to use `bibtex`, as described in Appendix B of the LaTeX book.

ASL publications use only one stylefile for bibliographies, `asl.bst`, invoked by putting at the end of the paper

```
\bibliographystyle{asl}
\bibliography{jones}
```

If you want to use bibtex with some other bibliography style (like `plain` or `amsalpha`, or if you want to hand-set your bibliography bibtex-style, you must invoke the option `otherbib` otherwise compilation will stop and you will get a warning message the first time the command `\bibitem` is encountered.

On the other hand, there is no reason to use a style other than `asl`, because it is a so-called "generic" stylefile, which allows the construction of several distinct "looks" for the bibliography and the citations to it, invoked by options. Here are brief examples of how items are listed in the bibliography under the standard options:

The default – no option:

[11] BELA BOLLOBÁS, ***Graph theory, an introduction course***, Springer-Verlag, 1979.

`bibalpha` option: uses the main "key" in the `.bib` file to both list and cite the item:

[Bol79] BELA BOLLOBÁS, ***Graph theory, an introduction course***, Springer-Verlag, 1979.

`bibay1` option: one of two "author-year" styles available:

[1979] BELA BOLLOBÁS, ***Graph theory, an introduction course***, Springer-Verlag, 1979.

`bibay2` option: the second "author-year" style:

BELA BOLLOBÁS [1979], ***Graph theory, an introduction course***, Springer-Verlag.

Citations (by the `\cite{key}` command) are set using the labels in the bibliography, i.e., for the different styles,

[11], [Bol79], [Bollobás, 1979], or Bollobás [1979].

In the two "author-year" styles, use `\fullcite{key}` to produce a citation with the full name of the author, like

[Bela Bollobás, 1979], or Bela Bollobás [1979].

With any style, use `\citeauth{key}` to produce only the author name (e.g., Bollobás), and `\citeyear{key}` to produce only the year label (e.g., [1979]).

As with footnotes and endnotes, the ASL typesetters will be happy to customize the look of your bibliography and citations; `asl.bst` is very flexible and allows many possibilities.

§**4. Technicalities and credits.** The file `asl.cls` has been constructed by combining all the packages required of a basic $\mathcal{AMS}$-LaTeX installation, and then redefining some of the basic commands and adding some additional code; the option `endnotes` is a version of John Lavagnino's endnotes.sty, customized to fit the style of ASL publications by Christos Kapoutsis, who also wrote the bibtex file `asl.bst`. We want to give here full credit and grateful thanks to all the AMS programmers and John Lavagnino, whose work we have so blatantly plagiarized, in the cause of practicality and ease-of-use for the writers of papers in logic.

One advantage of this (initially suspect) *mix-em-all-up* approach to tex-programming is that the typical user, who has LaTeX2ε (but not necessarily $\mathcal{AMS}$-LaTeX) installed, needs only four files: `asl.cls`, `asl.bst`, `amsthdoc` and this document.

Another important reason for the route we have adopted is the desire to freeze a specific version of $\mathcal{AMS}$-LaTeX, known to be compatible with the changes and additions specific to ASL publications. Here is a list of the $\mathcal{AMS}$-LaTeX packages whose code has been folded in `asl.cls`:

- `amsart.cls`, Version 1.2q, 1996/11/05: This is the main stylefile for $\mathcal{AMS}$-LaTeX.
- `amsmath.sty`, Version 1.2c, 1996/11/01: Defines extra environments for multline displayed equations, as well as a number of other enhancements for math.

- `amsthm`, Version 1.2d, 1996/10/29. Provides a `proof` environment and extensions for the `newtheorem` command.
- `amstext`, Version 1.2b, 1996/10/28. Provides a `text` command for typesetting a fragment of text inside a display.
- `amsbsy`, Version 1.2b, 1996/10/29. Defines `boldsymbol` and `pmb` 'poor man's bold' commands.
- `amsopn`, Version 1.2b, 1996/10/28. Provides `DeclareMathOperator` for defining new 'operator names' like `sin` and `lim`.

An attempt to load one of these packages (in any version) gives an error, and a warning that the package will not be loaded.

In addition, `asl.cls` loads the file `latexsym.sty`, and it also loads `amssymb.sty` and `amsfonts.sty` if `amssymb.sty` is available; if it is not, then a warning is given, but compilation does not stop unless the file requests some symbol from AMS fonts, in which case TeX complains of an "unknown command".

It follows from its construction that `asl.cls` will recognize all commands which are defined in the 1996 version of AMS-LaTeX detailed above. New commands are sure to be introduced in later versions of these packages, and these will be unknown to `asl.cls`. We welcome suggestions for useful enrichments of the class `asl`, but it is the policy of the ASL Typesetting Office that (aside from the inevitable bug-fixing) future versions of `asl.cls` will be *conservative extensions* of this one, in the technical sense of logic: on files which do not use any of the new commands, the later versions of `asl.cls` should produce *exactly the same* output as this version.

§5. Preamble sample.

```
%%%%%%%%%%%%%%%% file john.tex February 15, 2000
\documentclass[options]{asl}

\usepackage{...}          % optional
\usepackage{...}

\title[Proper inner submodels of $L$]
{The continuum hypothesis fails\\
on all proper inner submodels of $L$}

\keywords{This is not required.}
\subjclass{This is not required.}

\author{John J. John}
\revauthor{John, John J.}

\address{Department of Mathematics\\
University of the Atlantic\\
Atlantic City, NJ 03395, USA}

\email{jjj@math.uoa.edu}

\thanks{During the preparation of this paper John J. John was
supported by his mother.}

\author{Mary Katherine Smith}
\revauthor{Smith, Mary Katherine}

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\thanks{During the preparation of this paper Mary Smith
was supported by a Grant from the National Logic Foundation.}

\thanks{The authors deplore the referee's comments
and did not follow any of his suggestions.}
```

```
%------------------------------- New theorems

% These will be typeset in italics
\newtheorem{Theorem}{Theorem}[section]
\newtheorem{Proposition}[Theorem]{Proposition}
\newtheorem{Lemma}[Theorem]{Lemma}

% These will be typeset in Roman
\theoremstyle{definition}
\newtheorem{Definition}[Theorem]{Definition}
\newtheorem{Fact}[Theorem]{Fact}
\newtheorem{Conjecture}[Theorem]{Conjecture}

%------------------------------- macros, if any

% These can be listed here, if not too many
% or put in a macro file, to be \inputed here.

%-------------------------------

\begin{document}

\begin{abstract}
In this paper we consider the class of proper inner submodels
of $L$, and we show that none of them satisfies
the Continuum Hypothesis.
\end{abstract}

\maketitle
```

Here starts the proper article, either with the command `\section{...}` or with plain text.

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