

# L<sup>A</sup>T<sub>E</sub>X Class for The *Annals of Mathematics*\*

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## Abstract

This package provides a class for typesetting articles for The *Annals of Mathematics*

## Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
<b>2</b>	<b>User's Guide</b>	<b>3</b>
2.1	Installation . . . . .	3
2.2	Invocation . . . . .	4
2.3	Top Matter . . . . .	4
2.3.1	Commands for Authors . . . . .	5
2.3.2	Commands for Editors . . . . .	6
2.4	Additional Macros . . . . .	7
2.5	Theorems . . . . .	9
2.6	Illustrations . . . . .	9
2.7	Bibliography . . . . .	9
<b>3</b>	<b>Implementation</b>	<b>11</b>
3.1	Identification . . . . .	11
3.2	Options . . . . .	11
3.3	Loading Class and Packages . . . . .	12
3.4	Fonts . . . . .	12
3.5	Page Dimensions and Paragraphing . . . . .	13
3.6	Headers . . . . .	14
3.7	Top Matter Macros . . . . .	15
3.8	Typesetting Top Matter . . . . .	18
3.9	Typesetting End Matter . . . . .	19
3.10	Sectioning . . . . .	20
3.11	Figures and Tables . . . . .	21

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3.12 Theorems . . . . .	21
3.13 Bibliography Macros . . . . .	22
3.14 Additional Macros . . . . .	22
3.15 End of Class . . . . .	23

# 1 Introduction

The *Annals of Mathematics* is published bimonthly with the cooperation of Princeton University and the Institute for Advanced Study. Founded in 1884 by Ormond Stone of the University of Virginia, the journal was transferred in 1899 to Harvard University, and in 1911 to Princeton University. Since 1933, the Annals has been edited jointly by Princeton University and the Institute for Advanced Study (see <http://annals.princeton.edu/annals/about/journal/about.html>).

This class presents a complete redesign of the journal style—with new fonts and new interface.

An author well acquainted with AMS $\LaTeX$  should find this package easy to use and configurable. The User Manual below illustrates the basic use of the class and discusses the differences with `amsart`. For an in-depth tutorial of AMS $\LaTeX$  I could recommend the excellent book [1].

## 2 User's Guide

### 2.1 Installation

The installation of the class follows the usual practice [2] for  $\LaTeX$  packages:

1. Run `latex` on `aomart.ins`. This will produce the file `aomart.cls`.
2. Put the file `aomart.cls` to the place where  $\LaTeX$  can find them (see [2] or the documentation for your  $\TeX$  system).
3. Update the database of file names. Again, see [2] or the documentation for your  $\TeX$  system for the system-specific details.
4. The file `aomart.pdf` provides the documentation for the package (this is the file you are probably reading now).

As an alternative to items 2 and 3 you can just put the files in the working directory where your `.tex` file is.

The class uses some other  $\LaTeX$  classes or packages. Most probably, they are already installed on your system. If not (or if their versions are very old), you need to download and install them. Here is the list:

1. `amsart` class and related packages [3],
2. Package `hyperref` [4],
3. `ifpdf` package [5],
4. `fancyhdr` package [6],
5. `cmtiup` package [7] for “special italics” with upright digits and punctuation. Note that since many distributions do not include this package, you may need to install it yourself. Just download the file <http://mirrors.ctan.org/fonts/cm/cmtiup.zip>, unzip it in your `TEXMF` directory and rebuild the file names database with the command like `mktexlsr`,

6. yhmath package [8].

## 2.2 Invocation

To use the class, put in the preamble of your document

```
\documentclass[<options>]{aomart}
```

The class internally loads `amsart`, so all facilities of `amsart` [1, 9] can be used in the source.

*options*      The options `draft` and `final` work in the same way as for `amsart` and standard  
*draft*      L<sup>A</sup>T<sub>E</sub>X. If the option `draft` is chosen, the overfull lines are marked by black  
*final*      boxes on the margins *and* the `\includegraphics` prints blank placeholders for the  
images. The option `final` (default) switches off the marking of overfull lines and  
restores the behavior of `\includegraphics`. To switch on just the overfull marks,  
without changing the behavior of `\includegraphics`, one can either explicitly  
pass the option `final` to `graphics` package:

```
\documentclass[draft]{aomart}  
\usepackage[final]{graphics}
```

or add in the beginning of the document

```
\overfullrule=5pt
```

*option*      The option `manuscript` is intended to facilitate the communications between  
*manuscript* the editor and the author. It enables two things:

1. Numbering of lines in the manuscript is switched off in the normal mode, but is on in the manuscript mode.
2. Command `\EditorialComment` is no-op in normal mode, but produces marginal commentaries in the manuscript
3. Hyperlinks are black in normal mode, but blue in manuscript mode.

*option*      The option `screen` is intended for the onscreen version of the article. If this  
*screen* option is selected, the links are blue colored, and the margins are reduced.

*options*      The size-changing options of `amsart` class (`8pt`, `9pt`, ..., `12pt`) have no effect  
*8pt*      other than producing a warning in the log since the journal is designed for only  
*9pt*      one type size (roughly corresponding to `11pt` of `amsart`).  
*10pt*  
*11pt*  
*12pt*

## 2.3 Top Matter

There are two kinds of top matter commands: the ones used primarily for authors and the ones used primarily for editors. We describe them separately.

The macros described below must be issued in the preamble of the document, i.e. before `\begin{document}`. They produce fatal error otherwise. This behavior is required by the way non- $\TeX$  scripts process the files to produce metadata.

The only exception is `abstract`, which should be placed between after `\begin{document}`.

### 2.3.1 Commands for Authors

`\title` The command `\title`, as in `amsart` class, has two arguments: one optional, and one mandatory:

`\title[<ShortTitle>]{<FullTitle>}`

The mandatory argument is the full title of the article. The optional argument, if present, defines the shorter version of the title for running heads. If the optional argument is absent, the full title is used instead.

The optional argument should be used in two cases: when the full title is too long to fit in the running head, *and* when the author wants to add a footnote or linebreaks to the title.

`\author` The interface for specifying the authors and their affiliations is close to the one of `amsart` [10] (and different from the standard L<sup>A</sup>T<sub>E</sub>X). For each author a separate command `\author` should be used, followed by `\address` and (optionally) `\curraddr`, `\email` and `\urladdr`. Note that the house style of the *Annals of Mathematics* requires writing `\address` in the form *Institution, City, State* (or *Institution, City, Country* for non-US locations). Like the newer versions of `amsart`, `aomart` does *not* require the doubling of the @ symbols in the e-mail addresses. The macro `\author` has two arguments, similarly to `\title`:

`\author[<AbbrevName>]{<FullName>}`

The optional argument defines the shorter form of the author’s name to be included in the running head.

`\givenname` The papers published in the *Annals of Mathematics* are included in various databases. For the indexing purposes it is important to correctly separate the authors’ names into “First Name/Surname” parts. This operation is not easy for the computers. Therefore we decided that the authors should know best how to deal with their names. The macros `\givenname` and `\surname` are used to indicate how to split the name into the parts.

`\shortauthors` In some cases the authors list may be too long for the running head, even if the abbreviated forms are used for each author. In this case it is possible to change the running head by a *redefinition* of the command `\shortauthors`. This redefinition must be done after all `\author` commands, but before `\maketitle`:

`\renewcommand{\shortauthors}{A.~Smith et al}`

`\thanks` Like `amsart` (and unlike standard L<sup>A</sup>T<sub>E</sub>X), `aomart` allows `\thanks` only *outside* of commands `\title` and `\author`.

`abstract` The abstract of the paper must be put between `\begin{abstract}` and `\end{abstract}`. Unlike the situation in `amsart` class, abstract may be put *after* `\maketitle`.

`\maketitle` The macro `\maketitle` typesets the top matter. All top matter information should be specified before this command.

### 2.3.2 Commands for Editors

The commands described in this section should be used by the editors to insert the information about the published paper. They must be put before the `\maketitle` command.

<code>\keyword</code>	<p>The command <code>\keyword</code> adds a keyword to the list of keywords. This command may be repeated, for example</p> <pre> \keyword{Embedding theorem} \keyword{Relatively hyperbolic group} </pre>
<code>\subject</code>	<p>The command <code>\subject</code> has three parameters: whether the subject is primary or secondary, the classification scheme and the subject itself, for example</p> <pre> \subject{primary}{msc2000}{20E45} \subject{secondary}{msc2000}{20F65} </pre>
<code>\formatdate</code>	<p>The macro <code>\formatdate</code> is used to format the dates in the commands. Its argument is the date in the format <code>YYYY-MM-DD</code>, for example</p> <pre> \formatdate{2010-08-13} </pre>
<code>\received</code> <code>\revised</code> <code>\accepted</code> <code>\published</code> <code>\publishedonline</code>	<p>The commands <code>\received</code>, <code>\revised</code>, <code>\accepted</code>, <code>\published</code>, <code>\publishedonline</code> accept as a parameter a date in the form <code>\formatdate{\YYYY-MM-DD}</code>, for example</p> <pre> \received{\formatdate{2004-12-24}} \revised{\formatdate{2006-04-12}} \accepted{\formatdate{2007-10-02}} </pre>
<code>\proposed</code> <code>\seconded</code> <code>\corresponding</code> <code>\editor</code> <code>\version</code>	<p>The macros <code>\proposed</code>, <code>\seconded</code>, <code>\corresponding</code>, <code>\editor</code>, <code>\version</code> are used to set the corresponding metadata for the editorial process, for example</p> <pre> \proposed{E. D. Itor} \seconded{A. S. Sociate} \corresponding{A. U. Thor} \version{2.1} </pre>
<code>\volumenumber</code> <code>\issuenummer</code> <code>\publicationyear</code> <code>\papernumber</code> <code>\startpage</code> <code>\endpage</code>	<p>The macros <code>\volumenumber</code>, <code>\issuenummer</code>, <code>\publicationyear</code>, <code>\papernumber</code>, <code>\startpage</code>, <code>\endpage</code> set up the corresponding data for the paper, for example:</p> <pre> \volumenumber{172} \issuenummer{1} \publicationyear{2010} \papernumber{1} \startpage{1} \endpage{39} </pre>

Code	Example
<code>\widetilde{AB}</code>	$\widetilde{AB}$
<code>\widehat{AB}</code>	$\widehat{AB}$
<code>\widetriangle{AB}</code>	$\widetriangle{AB}$
<code>\wideparen{AB}</code>	$\wideparen{AB}$
<code>\widering{AB}</code>	$\widering{AB}$
<code>\widebar{AB}</code>	$\widebar{AB}$

Table 1: Wide Mathematical Accents

Note that if the argument of `\endpage` is empty, L<sup>A</sup>T<sub>E</sub>X tries to calculate the last page number as best as it can.

`\doinumber`      The macros `\doinumber`, `\mrnumber` and `\zblnumber` set the information about paper in four major reference databases: DOI (<http://www.doi.org/>), MathSciNet (<http://www.ams.org/mathscinet/>), Zentralblatt MATH (<http://www.zentralblatt-math.org/zmath/>). The use of these macros should be obvious:

```
\doinumber{10.1215/S0012-7094-92-06520-3}
\mrnumber{1154181}
\zblnumber{0774.14039}
```

Note the difference between these commands and the bibliography commands discussed in Section 2.7. Commands in this Section set up the data for the *current article*. Commands in Section 2.7 set up the data for the articles in the bibliography list.

Normally you should *not* use `\doinumber` command, since the class will construct the standard DOI for the paper from the volume, issue and paper information. Use it *only* if the result is by any reason wrong.

`\oldsubsections`      Starting with version 1.2 we decreased the vertical spacing before `\subsection`. The command `\oldsubsections` restores the “old” values.

## 2.4 Additional Macros

`\eqnarray`      Thee class `aomart` loads the class `amsart`. Therefore all familiar `amsmath` commands [9] are available. In particular, there are many commands for writing multiline equations (`split`, `align`, `gather`, `multline`, ...). The environments `\eqnarray` and `\eqnarray*`, while still available, are *not* recommended and should be avoided if possible.

`\widetilde`      A number of “wide” mathematical accents is available due to the (internally loaded) package `yhmath` [8]: `\widetilde`, `\widehat`, `\widetriangle`, `\wideparen`, `\widering`, `\widebar`. See Table 1 for the example of the usage.

`\wideparen`      The macro `\EditorialComment[⟨comments⟩]` typesets the comments on the

`\widering`  
`\widebar`

`\EditorialComment`

margins in the `manuscript` mode, for example,

```
Erd\os proved the following theorem.\EditorialComment{A citation is
needed}
```

```
\fullref      A set of macros is used to make more convenient clickable references in the on-
\pfullref     line versions of papers. The package hyperref [4] makes clickable reference numbers
\bfullref     in the phrases like
\eqfullref     ...in theorem~\ref{thm:Noeter}...
               ...see equation~\eqref{eq:alpha}...
```

However, it is more convenient for the readers if both the number *and* the word “theorem” or “equation” were clickable. The macros `\*fullref` solve this problem. Each macro has two arguments: the word and the reference, for example

```
...in \fullref{theorem}{thm:Noeter}...
```

The command `\pfullref` typesets the reference in parentheses. The command `\bfullref` typesets it in brackets, and the command `\eqfullref` uses the `\eqref` command, for example,

```
...see \eqfullref{equation}{eq:alpha}...
```

The Perl script `fullref.pl` can be used to convert change all references to the `\fullref` commands. It works in the following way:

```
perl fullref.pl original.pl > result.pl
```

The script converts all instances of combinations “word `\ref{reference}`” and “word~`\ref{reference}`” to “`\fullref{word}{reference}`”, and similarly for parenthesized references or `\eqref` commands. To prevent the converting, just put `\ref{reference}` or `\eqref{reference}` inside braces. The “word” here must not start with a backslash (i.e. must not be a macro itself). This prevents disastrous results for phrases like “see~`\ref{a}`, `\ref{b}`”.

The distribution includes two sample files, `aomsample.tex` and `aomsample1.tex`, the latter being obtained from the former by the script `fullref.pl`.

Note that `\autoref` command of `hyperref` provides for another mechanism that achieves the same goal. Unlike `\fullref` command, the command `\autoref` tries to figure out the name of the reference from the context. See the manual [4] for more information.



## 2.5 Theorems

`\newtheorem` You can use the commands of `amsthm` package [11] like `\newtheorem{lem}{Lemma}` for numbered theorems, or `\newtheorem*{KL}{Klein's Lemma}` for unnumbered theorems, or tune the numbering using the optional arguments of these commands.

To provide backward compatibility with some other classes used internally by the *Annals of Mathematics*, the class provides yet another optional argument for the command `\newtheorem`, allowing constructions like `\newtheorem[it]{lem}{Lemma}`. This optional parameter is not used in our typesetting.

The class provides two theorem styles:

**plain:** This is the default theorem style. It is used for Theorem, Lemma, Proposition, Conjecture, Corollary and Claim.

**definition:** This style is used for Definition, Remark, Notation, Condition, Example etc.

Note that AMS classes define the third theorem style, **remark**. In our class remarks are typeset in the **definition** style. To make the authors' lives easier we define the theorem style **remark**, which is identical to the theorem style **definition**.

## 2.6 Illustrations

The authors can use the `graphics`, `graphicx`, `PSTricks`, `pgf/tikz`, `Metapost` or other tools to include illustrations (see [12] for a comprehensive discussion of  $\text{\LaTeX}$  graphics possibilities).

## 2.7 Bibliography

The authors are encouraged to use `BibTeX` for uniform style of bibliography. The distribution includes the BST files `aomplain.bst` and `aomalpha.bst`. These files have several additional non-standard fields:

**mrnumber:** MathSciNet number for the article.

**zblnumber:** Zentralblatt number for the article.

**doi:** DOI number for the article.

**jfmnumber:** JFM number for the article.

**arxiv:** ArXiv reference for the ArXiv manuscript.

**url:** If the reference is available online, the corresponding url.

**venue:** (for `conference` entries) the place where the conference took place.

`\repeatedauthors` If you do not use Bib<sub>T</sub>E<sub>X</sub> and produce your bibliography manually, you may want to have repeated authors to be suppressed in the bibliography list, like it is done in the example. The command `\repeatedauthors` should be used in this case, for example:

```
\bibitem{fre:cichon}
D.~H. Fremlin, \emph{Cichon's diagram}, presented at the
S{\`e}minaire Initiation {\`a} l'Analyse, G. Choquet, M. Rogalski,
J. Saint Raymond, at the Universit{\'e} Pierre et Marie Curie,
Paris, 23e ann{\'e}e., 1983/194.

\bibitem{fre:riesz}
\repeatedauthors{D.~H. Fremlin}, \emph{Topological {R}iesz spaces
and measure theory}, Cambridge University Press, 2008.
```

`\doi` There are several databases routinely used in the science and mathematics com-  
`\mr` munities. Among them are DOI, MathSciNet, Zentralblatt, Jahrbuch Database,  
`\zbl` ArXiv. Many bibliographies include references to these databases. The commands  
`\jfm` `\doi`, `\mr`, `\zbl`, `\jfm`, `\arxiv` are used to typeset these references. If you use  
`\arxiv` Bib<sub>T</sub>E<sub>X</sub>, these commands are automatically used for the corresponding fields in  
your database entries.

## 3 Implementation

### 3.1 Identification

We start with the declaration who we are. Most `.dtx` files put driver code in a separate driver file `.drv`. We roll this code into the main file, and use the pseudo-guard `<gobble>` for it.

```
1 <class>\NeedsTeXFormat{LaTeX2e}
2 <*gobble>
3 \ProvidesFile{aomart.dtx}
4 </gobble>
5 <class>\ProvidesClass{aomart}
6 [2011/01/07 v1.3 Typesetting articles for the Annals of Mathematics]
```

And the driver code:

```
7 <*gobble>
8 \documentclass{ltxdoc}
9 \usepackage{array,booktabs,amsmath,graphics}
10 \let\widebar\overline
11 \usepackage{url}
12 \usepackage{amsfonts,yhmath}
13 \usepackage[breaklinks,colorlinks,linkcolor=black,citecolor=black,
14             pagecolor=black,urlcolor=black,hyperindex=false]{hyperref}
15 \PageIndex
16 \CodelineIndex
17 \RecordChanges
18 \EnableCrossrefs
19 \begin{document}
20   \DocInput{aomart.dtx}
21 \end{document}
22 </gobble>
23 <*class>
```

### 3.2 Options

The size-changing options produce a warning:

```
24 \long\def\aom@size@warning#1{%
25   \ClassWarning{aomart}{Size-changing option #1 will not be
26     honored}}%
27 \DeclareOption{8pt}{\aom@size@warning{\CurrentOption}}%
28 \DeclareOption{9pt}{\aom@size@warning{\CurrentOption}}%
29 \DeclareOption{10pt}{\aom@size@warning{\CurrentOption}}%
30 \DeclareOption{11pt}{\aom@size@warning{\CurrentOption}}%
31 \DeclareOption{12pt}{\aom@size@warning{\CurrentOption}}%
```

`\if@aom@manuscript@mode` Check whether we are in the manuscript mode

```
32 \newif\if@aom@manuscript@mode
33 \@aom@manuscript@modefalse
34 \DeclareOption{manuscript}{\@aom@manuscript@modetrue}
```

```

\if@aom@screen@mode Check whether we are in the screen mode
35 \newif\if@aom@screen@mode
36 \@aom@screen@modefalse
37 \DeclareOption{screen}{\@aom@screen@modetrue}

All other options are passed to amsart:
38 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{amsart}}

Now we read the configuration file
39 \InputIfFileExists{aomart.cfg}{%
40   \ClassInfo{aomart}{%
41     Loading configuration file aomart.cfg}{%
42     \ClassInfo{aomart}{%
43       Configuration file aomart.cfg is not found}}
And process the options:
44 \ProcessOptions\relax

```

### 3.3 Loading Class and Packages

We start with the base class

```

45 \LoadClass[11pt,noamsfonts]{amsart}

A bunch of packages:
46 \RequirePackage{fancyhdr, lastpage, ifpdf}
47 \RequirePackage[breaklinks,colorlinks]{hyperref}
48 \if@aom@screen@mode
49 \hypersetup{linkcolor=blue,citecolor=blue,
50   urlcolor=blue, pdfpagescrop={110 705 500 80}}%
51 \else\if@aom@manuscript@mode
52 \hypersetup{linkcolor=blue,citecolor=blue,
53   urlcolor=blue}%
54 \else
55 \hypersetup{linkcolor=black,citecolor=black,
56   urlcolor=black}%
57 \fi\fi
58 \urlstyle{rm}

```

### 3.4 Fonts

We use yhmath for wide symbols:

```

59 \RequirePackage{yhmath}

We need cmtiup package, but we may find out it is not installed.
60 \IfFileExists{cmtiup.sty}{%
61   \RequirePackage{cmtiup}}{%
62   \ClassWarning{aomart}{The package mdputu is not found.\MessageBreak
63     You need this package to get italics with upright digits!}}

```

`\specialdigits` A legacy macro. We do not need it anymore.

```
64 \def\specialdigits{%
65 \let\sisshape=\itshape
66 \let\textsi=\textit
```

The `amsart` class defines several options for different font sizes (10pt, 11pt, etc). We have just one design size for the articles.

`\@typesizes` The font information in `amsart` is stored in `\@typesizes` macro. It has 11 type-sizes: 5 below and 5 above `\normalsize`.

```
67 \def\@typesizes{%
68 \or{\@vipt}{9}\or{\@vipt}{9}\or{\@viipt}{9}\or{\@ixpt}{12}%
69 \or{\@xpt}{13}%
70 \or{\@xipt}{14}% normalsize
71 \or{\@xiipt}{15}\or{13}{17}\or{\@xvipt}{20}%
72 \or{19}{23.2}\or{22}{27.8}}%
73 \normalsize \linespacing=\baselineskip
```

`\widebar` The functionality of `\widebar` coincides with that of `amsmath \overline`:

```
74 \let\widebar\overline
```

### 3.5 Page Dimensions and Paragraphing

`\textwidth` These are from the old `aomamlt2e`:

```
\textheight 75 \setlength{\textwidth}{31pc}
76 \setlength{\textheight}{48pc}
```

`\evensidemargin` The margins:

```
\oddsidemargin 77 \oddsidemargin=.65in
78 \evensidemargin=.65in
```

`\footins` Some skips from `aomamlt2e`:

```
\topskip 79 \setlength{\topskip}{12pt}
\abovedisplayskip 80 \setlength{\abovedisplayskip}{6.95pt plus3.5pt minus 3pt}
\belowdisplayskip 81 \setlength{\belowdisplayskip}{6.95pt plus4.5pt minus 3pt}
82 \setlength{\skip\footins}{20pt}
83 \setlength{\dimen\footins}{3in}
```

`\footskip` Some space for footnotes:

```
84 \setlength\footskip{30pt}
```

`\parskip` Paragraph shape:

```
\parindent 85 \setlength{\parindent}{22pt}
86 \setlength{\parskip}{\z@}
```

`\widowpenalty` We suppress widows and clubs:

```
\clubpenalty 87 \widowpenalty=10000
88 \clubpenalty=10000
```

### 3.6 Headers

`\headsep` Separation between the header and the body  
89 `\setlength{\headsep}{14pt}`

`\headrulewidth` We do not want decorative rules in the journal:  
`\footrulewidth` 90 `\renewcommand{\headrulewidth}{0pt}`  
91 `\renewcommand{\footrulewidth}{0pt}`

`\@aom@linecount` This is the box displayed in the manuscript mode  
92 `\if@aom@manuscript@mode`  
93 `\newsavebox{\@aom@linecount}`  
94 `\savebox{\@aom@linecount}[4em][t]{\parbox[t]{4em}{%`  
95 `\@tempcnta\@ne\relax`  
96 `\loop{\underline{\scriptsize\the\@tempcnta}}\%`  
97 `\advance\@tempcnta by \@ne\ifnum\@tempcnta<43\repeat}}`  
98 `\fi`

It is easy to set up headers with `fancyhdr`:

99 `\pagestyle{fancy}`  
100 `\fancyhead{}`  
101 `\fancyfoot{}`  
102 `\fancyhead[CO]{\scriptsize\shorttitle}`  
103 `\fancyhead[RO,LE]{\footnotesize\thepage}`  
104 `\if@aom@manuscript@mode`  
105 `\fancyhead[LE]{\footnotesize\thepage\begin{picture}(0,0)%`  
106 `\put(-26,-25){\usebox{\@aom@linecount}}}%`  
107 `\end{picture}}`  
108 `\fancyhead[LO]{\begin{picture}(0,0)%`  
109 `\put(-21,-25){\usebox{\@aom@linecount}}}%`  
110 `\end{picture}}`  
111 `\fancyfoot[C]{\scriptsize Proof: page numbers may be temporary}`  
112 `\fi`  
113 `\fancyhead[CE]{\scriptsize\MakeUppercase\shortauthors}`

The first page has the special headers. The style `firstpage` is invoked by `amsart`; here we just redefine it.

114 `\fancypagestyle{firstpage}{%`  
115 `\fancyhf{}%`  
116 `\if@aom@manuscript@mode`  
117 `\lhead{\begin{picture}(0,0)%`  
118 `\put(-21,-25){\usebox{\@aom@linecount}}}%`  
119 `\end{picture}}`  
120 `\fi`  
121 `\chead{\scriptsize%`  
122 `\href{\@annalsurl}{Annals of Mathematics} \textbf{\currentvolume}`  
123 `(\currentyear),`  
124 `\start@page--\end@page\%`  
125 `\ifx\@doinumber\@empty\else`  
126 `\edef\@doinumber{\@doinumber}%`

```

127 \expandafter\doi\expandafter{\@doinumber}\fi}%
128 \cfoot{\footnotesize\thepage}}%

```

`\annalsurl` The command to set up the URL of the journal

```

129 \def\annalsurl#1{\gdef\@annalsurl{#1}}
130 \annalsurl{http://annals.math.princeton.edu/annals/about/cover/cover.html}

```

### 3.7 Top Matter Macros

We make these macros allowed only in the preamble:

```

131 \@onlypreamble{\title}
132 \@onlypreamble{\author}
133 \@onlypreamble{\email}
134 \@onlypreamble{\address}
135 \@onlypreamble{\curraddr}
136 \@onlypreamble{\urladdr}
137 \@onlypreamble{\givenname}
138 \@onlypreamble{\surname}
139 \@onlypreamble{\thanks}
140 \@onlypreamble{\keyword}
141 \@onlypreamble{\subject}
142 \@onlypreamble{\received}
143 \@onlypreamble{\revised}
144 \@onlypreamble{\accepted}
145 \@onlypreamble{\published}
146 \@onlypreamble{\publishedonline}
147 \@onlypreamble{\proposed}
148 \@onlypreamble{\seconded}
149 \@onlypreamble{\corresponding}
150 \@onlypreamble{\editor}
151 \@onlypreamble{\version}
152 \@onlypreamble{\volumenumber}
153 \@onlypreamble{\issuenumber}
154 \@onlypreamble{\publicationyear}
155 \@onlypreamble{\papernumber}
156 \@onlypreamble{\startpage}
157 \@onlypreamble{\endpage}
158 \@onlypreamble{\doinumber}
159 \@onlypreamble{\mrnumber}
160 \@onlypreamble{\zblnumber}

```

Most top matter macros are defined in `amsart`. Here we just add some new macros and redefine some.

`\givenname` These commands at present do nothing: they are for machine indexing only.

```

\surname 161 \let\givenname=\@gobble
          162 \let\surname=\@gobble

```

`\keyword` Actually `amsart` has `\keywords` macro. It redefines `\@keywords`. Our macro adds to the stack instead.

```

163 \def\keyword#1{\ifx\@keywords\@empty\gdef\@keywords{#1}\else
164 \g@addto@macro\@keywords{, #1}\fi}

\subject We do not typeset subject, but use it for PDF info.
165 \let\@subjects\@empty
166 \def\subject#1#2#3{\ifx\@subjects\@empty\gdef\@subjects{#1:#2:#3}\else
167 \g@addto@macro\@subjects{, #1:#2:#3}\fi}

\formatdate This just sends the date to the special macro \@formatdate
168 \def\formatdate#1{\@formatdate#1\@endformatdate}

\@formatdate This macro takes date in the form YYYY-MM-DD and properly formats it. Note
how we delete the leading zero in dates like April 02.
169 \def\@formatdate#1-#2-#3\@endformatdate{%
170 \@tempcnta=#3\relax
171 \ifcase#2\or
172 January\or February\or March\or April\or May\or June\or
173 July\or August\or September\or October\or November\or December\fi
174 \space\the\@tempcnta,\space#1}

\received The following macros add stuff to the footnotes material:
\revised 175 \def\received#1{\def\@received{#1}}
\accepted 176 \let\@received\@empty
\published 177 \def\revised#1{\def\@revised{#1}}
\publishedonline 178 \let\@revised\@empty
179 \def\accepted#1{\def\@accepted{#1}}
180 \let\@accepted\@empty
181 \def\published#1{\def\@published{#1}}
182 \let\@published\@empty
183 \def\publishedonline#1{\def\@publishedonline{#1}}
184 \let\@publishedonline\@empty

The next macros mimic the functionality of amsart \issueinfo command.
Note that \issueinfo still works.

\volumenumber This sets the volume of the paper
185 \def\volumenumber#1{\def\currentvolume{#1}}

\issuenumber This sets the issue of the paper:
186 \def\issuenumber#1{\def\currentissue{#1}}

\publicationyear This sets the year of the paper
187 \def\publicationyear#1{\def\currentyear{#1}}

\papernumber This is absent from the \issueinfo.
188 \def\papernumber#1{\def\currentpaper{#1}}
189 \papernumber{0000}

```



`\startpage` This defines the starting page of the paper. We have some nice features to set up roman page numbers for editorial stuff—probably not needed for this journal at this time...

```
190 \def\startpage#1{\pagenumbering{arabic}\setcounter{page}{#1}%
191 \def\start@page{#1}%
192 \ifnum\c@page<\z@ \pagenumbering{roman}\setcounter{page}{-#1}%
193 \def\start@page{\romannumeral#1}%
194 \fi}
```

`\endpage` This macro again has a twist in it: if the argument is not set, it calculates the last page number itself.

```
195 \def\endpage#1{\def\@tempa{#1}%
196 \ifx\@tempa\empty\def\end@page{\pageref{LastPage}}%
197 \else\def\end@page{#1}\fi}
```

`\pagespan` This macro is different from the one provided by `amsart` because we want to have the option of automatic calculation of the last page number.

```
198 \def\pagespan#1#2{\startpage{#1}\endpage{#2}}
199 \pagespan{1}{}
```

`abstract` We slightly redefine `abstract` comparing to `amsart` conventions:

```
200 \renewenvironment{abstract}{%
201 \ifx\maketitle\relax
202 \ClassWarning{aomart}{Abstract should precede
203 \protect\maketitle\space in AMS derived classes}%
204 \fi
205 \global\setbox\abstractbox=\vtop\bgroup%
206 \vglue1pc%
207 {\centering\normalfont\normalsize\bfseries\abstractname\par\vglue1pc}%
208 \list{}{\labelwidth\z@%
209 \leftmargin3pc \rightmargin\leftmargin%
210 \listparindent\normalparindent \itemindent\normalparindent%
211 \parsep\z@ \@plus\p@%
212 \let\fullwidthdisplay\relax%
213 }%
214 \item[]\normalfont\Small%
215 }{%
216 \endlist\egroup%
217 \ifx\@setabstract\relax\@setabstracta\fi%
218 }
219
```

`\proposed` We do not typeset the name of the proposer

```
220 \let\proposed\@gobble
```

`\seconded` Or the seconder

```
221 \let\seconded\@gobble
```

```

\corresponding This is the corresponding author—again not typeset
222 \let\corresponding@gobble

\version We do not typeset the current version of the manuscript either...
223 \let\version@gobble

\doinumber Now databases' numbers of the article:
\mrnumber 224 \def\doinumber#1{\gdef\@doinumber{#1}}
\zblnumber 225 \doinumber{10.4007/annals.\currentyear.\currentvolume.\currentissue.\currentpaper}
226 \def\mrnumber#1{\gdef\@mrnumber{#1}}
227 \mrnumber{}
228 \def\zblnumber#1{\gdef\@zblnumber{#1}}
229 \zblnumber{}

```

### 3.8 Typesetting Top Matter

```

\@settitle We do not uppercase title. Also, we use this occasion to set PDF information:
230 \def\@settitle{\begin{center}%
231   \baselineskip20\p@\relax
232   \bfseries\LARGE
233   \@title
234   \ifpdf
235     \hypersetup{pdftitle=\@title}%
236   \fi
237   \end{center}%
238 }

\@setauthors Now we typeset authors according to our specs. Again, we use this occasion to
set some PDF information:
239 \def\@setauthors{%
240   \ifx\authors\@empty\relax\else
241     \begingroup
242     \def\thanks{\protect\thanks@warning}%
243     \trivlist
244     \centering\footnotesize \@topsep30\p@\relax
245     \advance\@topsep by -\baselineskip
246     \item\relax
247     \def\@and{{\upshape and}}
248     \author@andify\authors
249     \ifpdf
250       \hypersetup{pdfauthor=\authors}%
251     \fi
252     \def\{\{\protect\linebreak\}%
253     \small By \scshape\authors%
254     \ifx\@empty\contribs
255     \else
256       ,\penalty-3 \space \@setcontribs
257       \@closetocontribs
258     \fi

```

```

259     \endtrivlist
260     \endgroup
261     \fi}

\@setcontribs Contributors are set up in the same way as authors:
262 \def\@setcontribs{%
263     \xcontribs
264     {\scshape \xcontribs}%
265 }

\@adminfootnotes We do not typeset keywords, so we change the definition:
266 \def\@adminfootnotes{%
267     \let\@makefnmark\relax \let\@thefnmark\relax
268     \ifx\@empty\@date\else \@footnotetext{\@setdate}\fi
269     \ifx\@empty\@subjclass\else \@footnotetext{\@setsubjclass}\fi
270     \ifx\@empty\@keywords\else\@setkeywords\fi
271     \ifx\@empty\@subjects\else\@setsubjects\fi
272     \ifx\@empty\thankses\else \@footnotetext{%
273         \def\par{\let\par\@par}\@setthanks}%
274     \fi
275 }

\@setkeywords We do not typeset keywords, but use them for the PDF information
276 \def\@setkeywords{%
277     \ifpdf
278         \hypersetup{pdfkeywords=\@keywords}%
279     \fi
280 }

\@setsubjects We do not typeset subjects, but use them for the PDF information
281 \def\@setsubjects{%
282     \ifpdf
283         \hypersetup{pdfsubject=\@subjects}%
284     \fi
285 }

\@@and We want “and” in the footers to be lowercase. Since there is some uppercase
involved, we protect it:
286 \def\@@and{\MakeLowercase{and}}

```

### 3.9 Typesetting End Matter

End matter is typeset at the end of the paper.

```

\enddoc@text This is the main macro for typesetting endmatter.
287 \def\enddoc@text{%
288     \ifx\@empty\@translators \else\@settranslators\fi
289     \ifx\@empty\@received \else\@setreceived\fi
290     \ifx\@empty\@revised \else\@setrevised\fi
291     \ifx\@empty\addresses \else\@setaddresses\fi

```

```

\@setreceived A bunch of macros for setting centered dates
\@setrevised 292 \def\@setreceived{\centering(Received: \@received)\par}}
\@setaccepted 293 \def\@setrevised{\centering(Revised: \@revised)\par}}
\@setpublished 294 \def\@setaccepted{\centering(Accepted: \@accepted)\par}}
\@setpublishedonline 295 \def\@setpublished{\centering(Published: \@published)\par}}
296 \def\@setpublishedonline{\centering(Published online: \@publishedonline)\par}}

\emailaddrname We do not want the word “address” here:
297 \def\emailaddrname{\itshape E-mail}}

\@setaddresses The difference between our definition and the one in amsart is that we want the
e-mail and URL to be clickable
298 \def\@setaddresses{\par
299 \nobreak \begingroup
300 \footnotesize
301 \def\author##1{\nobreak\addvspace\bigskipamount}%
302 \def\{\unskip, \ignorespaces}%
303 \interlinepenalty\@M
304 \def\address##1##2{\begingroup
305 \par\addvspace\bigskipamount\indent
306 \@ifnotempty{##1}{(\ignorespaces##1\unskip) }%
307 {\scshape\ignorespaces##2}\par\endgroup}%
308 \def\curraddr##1##2{\begingroup
309 \@ifnotempty{##2}{\nobreak\indent\curraddrname
310 \@ifnotempty{##1}{, \ignorespaces\scshape##1\unskip}\hskip0.2em:\space
311 \scshape##2\par}\endgroup}%
312 \def\email##1##2{\begingroup
313 \@ifnotempty{##2}{\nobreak\indent\emailaddrname
314 \@ifnotempty{##1}{, \ignorespaces##1\unskip}\hskip0.2em:\space
315 \href{mailto:##2}{\rmfamily##2}\par}\endgroup}%
316 \def\urladdr##1##2{\begingroup
317 \@ifnotempty{##2}{\nobreak\indent
318 \@ifnotempty{##1}{, \ignorespaces##1\unskip}%
319 \url{##2}\par}\endgroup}%
320 \addresses
321 \endgroup
322 }

```

### 3.10 Sectioning

```

\contentsnamefont This is the font for the word “Contents”:
223 \renewcommand\contentsnamefont{\bfseries}

\section We want our sections to be centered and bold:
224 \def\section{\@startsection{section}{1}%
225 \z@{.7\linespacing\@plus\linespacing}{.5\linespacing}%
226 {\normalfont\bfseries\centering}}

```

`\subsection` We want our sections to be indented and italic:

```
327 \def\subsection{\@startsection{subsection}{2}%
328   {\parindent}{.5\linespacing\@plus.3\linespacing}{-.5em}%
329   {\normalfont\itshape}}
```

`\oldsubsections` This macro restores the values for `\subsection` spacing prior to v1.1.

```
330 \def\oldsubsections{%
331   \gdef\subsection{\@startsection{subsection}{2}%
332     {\parindent}{.5\linespacing\@plus.7\linespacing}{-.5em}%
333     {\normalfont\itshape}}
```

### 3.11 Figures and Tables

`\@captionheadfont` This is the font for the words “Figure” or “Table” in captions. Unlike `amsmath` with is small caps, we want just plain Roman font:

```
334 \def\@captionheadfont{\normalfont}
```

### 3.12 Theorems

Here we redefine three main style of `amsart`. Here are the arguments of `\newtheoremstyle` from [3]:

```

#1
\newtheoremstyle{NAME}%
#2 #3 #4
{ABOVESPACE}{BELOWSPACE}{BODYFONT}%
#5 #6 #7 #8
{INDENT}{HEADFONT}{HEADPUNCT}{HEADSPACE}%
#9
{CUSTOM-HEAD-SPEC}
```

In the `plain` style the name (“theorem”) is in small caps, the number is in normal font, the optional note is also in normal font, and the text is italics.

```
335 \newtheoremstyle{plain}{0.5\linespacing}{0.5\linespacing}{\sishape}%
336   {\parindent}{\scshape}{.}{0.5em}%
337   {\thmname{#1}\thmnumber{ #2}\thmnote{\normalfont{ } (#3)}}
```

In the `definition` style the name is italics, and the body font is upright:

```
338 \newtheoremstyle{definition}{0.5\linespacing}{0.5\linespacing}%
339   {\upshape}{\parindent}%
340   {\sishape}{.}{0.5em}%
341   {\thmname{#1}\thmnumber{ #2}\thmnote{\normalfont{ } (#3)}}
```

In our class there is no difference between `remark` and `definition` theorem styles:

```
342 \newtheoremstyle{remark}{0.5\linespacing}{0.5\linespacing}%
343   {\upshape}{\parindent}%
344   {\sishape}{.}{0.5em}%
345   {\thmname{#1}\thmnumber{ #2}\thmnote{\normalfont{ } (#3)}}
```

`\newtheorem` For compatibility reasons we need to accept `\newtheorem` with optional first argument—and silently drop it. The problem is, there is `\newtheorem*`, so we need to check which one we deal with... The command `\@xnthm` here is from `amsthm`; it does the real work with the real parameters.

```

346 \renewcommand{\newtheorem}{\@ifstar{\@aom@newthm@star}{\@aom@newthm}}
347 \def\@aom@newthm@star{\@ifnextchar[{\@aom@newthm@star@}{\@aom@newthm@star@[]}}
348 \def\@aom@newthm{\@ifnextchar[{\@aom@newthm@}{\@aom@newthm@[]}}
349 \def\@aom@newthm@star@[#1]{\@xnthm *}
350 \def\@aom@newthm@[#1]{\@xnthm \relax}

```

`proof` We want our proofs to be indented:

```

351 \renewenvironment{proof}[1][\proofname]{\par
352   \pushQED{\qed}%
353   \normalfont \topsep6\p@\@plus6\p@\relax
354   \trivlist
355     \item[\hskip\labelsep\hskip\parindent
356       \itshape
357       #1\@addpunct{.}]\ignorespaces
358 }{\%
359   \popQED\endtrivlist\@endpfalse
360 }

```

### 3.13 Bibliography Macros

`\repeatedauthors` When the authors are repeated, we change them to `\bysame`:

```

361 \def\repeatedauthors#1{\bysame}

```

`\doi` Typesetting doi...

```

362 \def\doi#1{\href{http://dx.doi.org/#1}{doi: \path{#1}}}

```

`\mr` Typesetting urls

```

\zbl 363 \def\mr#1{\href{http://www.ams.org/mathscinet-getitem?mr=#1}{MR~\path{#1}}}
\arxiv 364 \def\zbl#1{\href{http://www.zentralblatt-math.org/zmath/en/search/?q=an:#1}{Zbl~\path{#1}}}
\jfm 365 \def\arxiv#1{\href{http://www.arxiv.org/abs/#1}{arXiv~\path{#1}}}
366 \def\jfm#1{\href{http://www.emis.de/cgi-bin/JFM-item?#1}{JFM~\path{#1}}}

```

`\bibliofont` We make this `\small` rather than `\Small` in `amsart`

```

367 \renewcommand{\bibliofont}{\small}

```

### 3.14 Additional Macros

`\EditorialComment` This macro is noop in normal mode, but is a tiny marginpar in the manuscript mode

```

368 \def\EditorialComment#1{\if@aom@manuscript@mode\bgroup
369   \marginparwidth=75pt\marginpar{\scriptsize\raggedright#1}\egroup\fi}

```

`\@fullref` This macro creates a wide link for the reference. It has four parameters: the word (theorem, equation, ...), the “pre” punctuation, the reference and the “post” punctuation.

```
370 \def\@fullref#1#2#3#4{\hyperref[#3]{#1~#2\ref*{#3}#4}}
```

`\fullref` A reference without parentheses:

```
371 \newcommand{\fullref}[2]{\@fullref{#1}{}{#2}{}}
```

`\pfullref` A reference with parentheses:

```
372 \newcommand{\pfullref}[2]{\@fullref{#1}{()}{#2}{}}
```

`\bfullref` A reference with brackets:

```
373 \newcommand{\bfullref}[2]{\@fullref{#1}{}{#2}{[]}}
```

`\eqfullref` Here we do not use the standard common `\@fullref` because we want `\eqref` to work...

```
374 \newcommand{\eqfullref}[2]{\hyperref[#2]{#1~\textup{\tagform@{\ref*{#2}}}}}
```

`\eqnarray` While we do *not* recommend the use of `eqnarray`, we still would like to correct the ugly spacing around it...

```
375 \def\eqnarray{%
376   \stepcounter{equation}%
377   \def\@currentlabel{\p@equation\theequation}%
378   \global\@eqnswtrue
379   \m@th
380   \global\@eqcnt\z@
381   \tabskip\@centering
382   \let\\\@eqnocr
383   $$\arraycolsep1\p@
384   \everycr{}\halign to\displaywidth\bgroup
385     \hskip\@centering$\displaystyle\tabskip\z@skip{##}$\@eqnse1
386     &\global\@eqcnt\@ne\hskip \tw@arraycolsep \hfil${##}$\hfil
387     &\global\@eqcnt\tw@ \hskip \tw@arraycolsep
388     $\displaystyle{##}$\hfil\tabskip\@centering
389     &\global\@eqcnt\thr@@ \hb@xt@\z@\bgroup\hss##\egroup
390     \tabskip\z@skip
391   \cr
392 }
```

### 3.15 End of Class

```
393 \end{class}
```

## References

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## Change History

v0.10	General: Bibliography styles update . . . . . 2	\@setaddresses: Deleted the word URL . . . . . 20
	Documentation update . . . . . 2	E-mail is now in Roman font . 20
	Screen mode triggers special URL settings . . . . . 12	\@setpublishedonline: Decreased font . . . . . 20
	\if@aom@screen@mode: Added screen mode . . . . . 12	\@typesizes: Corrected typo in the definition of Small . . . . . 13
	\jfm: Added macro . . . . . 22	Increased LARGE from 16 pt to 17 pt . . . . . 13
v0.2	General: First fully functional version . . . . . 2	General: Added extra footer in manuscript mode . . . . . 14
v0.3	General: Added DOI number in headers . . . . . 14	Corrected the byg with math in headers . . . . . 14
	Added package mdputu . . . . . 12	Made remark theorem style identical to definition theorem style 21
	Documentation update . . . . . 2	Made Roman font the default URL font . . . . . 12
	\arxiv: Added macro . . . . . 22	\bfullref: Added macro . . . . . 23
	\corresponding: Added macro . . 18	\emailaddrname: Changed macro 20
	\doinumber: Added macro . . . . . 18	\eqfullref: Added macro . . . . . 23
	\EditorialComment: Added macro 22	\fullref: Added macro . . . . . 23
	\if@aom@manuscript@mode: Added manuscript mode . . . . . 11	\pfullref: Added macro . . . . . 23
	\mr: Added macro . . . . . 22	proof: Redefined macro . . . . . 22
	\mrnumber: Added macro . . . . . 18	\subsection: Redefined macro . . 21
	\newtheorem: Redefined macro . . 22	v0.6
	\proposed: Added macro . . . . . 17	\@setauthors: 'By' and 'and' are in Roman font now . . . . . 18
	\seconded: Added macro . . . . . 17	General: Changes to bst files . . . . 2
	\version: Added macro . . . . . 18	Fullref.pl is much less aggressive now . . . . . 2
	\zbl: Added macro . . . . . 22	\belowdisplayskip: Changed belowdisplayskip . . . . . 13
	\zblnumber: Added macro . . . . . 18	\bibliofont: Changed default . . 22
v0.4	\@aom@linecount: Added macro . 14	\zbl: Changed capitalization . . . 22
	General: Changed definition theorem style . . . . . 21	v0.7
	Changed plain theorem style . . 21	General: Bibliography styles changed . . . . . 2
	Deleted lineno package dependence . . . . . 12	v0.8
	Deleted remark theorem style . 21	General: Added yhmth . . . . . 12
	Documentation update . . . . . 2	Bibliography styles update . . . . 2
	Switched to upright digits in italics everywhere . . . . . 12	Changed authors in header . . . 14
	Used line numbers for headings 14	Documentation update . . . . . 2
	\enddoc@text: Deleted many dates. . . . . 19	Switched to cmtiup . . . . . 12
v0.5	\@fullref: Added macro . . . . . 23	\specialdigits: Redefined to noop . . . . . 13
		v0.9
		\@and: Redefined macro . . . . . 19

<code>\@setaddresses</code> : Deleted spurious space in urladdress . . . . .	20	v1.2	<code>\@setaddresses</code> : Changed font for current address . . . . .	20
<code>\@setpublishedonline</code> : Increased font . . . . .	20	General: Bibliography styles up- date . . . . .	2	
General: Bibliography styles up- date . . . . .	2	<code>\arxiv</code> : Now we properly treat numbers with underscores . . .	22	
Changed font for the folio on the first page . . . . .	14	<code>\doi</code> : Now we properly treat num- bers with underscores . . . . .	22	
Documentation update . . . . .	2	<code>\jfm</code> : Now we properly treat num- bers with underscores . . . . .	22	
<code>abstract</code> : Added parindent for the first par . . . . .	17	<code>\mr</code> : Now we properly treat num- bers with underscores . . . . .	22	
<code>\eqnarray</code> : Redefined standard macro . . . . .	23	<code>\oldsubsections</code> : Introduced macro . . . . .	21	
v1.0		<code>\subsection</code> : Decreased vertical spacing . . . . .	21	
General: Top matter macros are now only in preamble . . . . .	2	<code>\zbl</code> : Now we properly treat num- bers with underscores . . . . .	22	
<code>\doinumber</code> : Added default . . . .	18			
<code>\papernumber</code> : Added macro . . .	16	v1.3	General: Corrected bug with doinumber . . . . .	14
v1.1				
General: In manuscript mode the links are always blue . . . . .	12			

# Index

Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

Symbols		
\@and . . . . .	247, <u>286</u>	\@fullref . 370, 371–373
\@M . . . . .	303	\@gobble . . . . .
\@accepted 179, 180, 294		. 161, 162, 220–223
\@addpunct . . . . .	357	\@ifnextchar . . 347, 348
\@adminfootnotes . .	<u>266</u>	\@ifnotempty . . . . .
\@annalsurl . . . . .	122, 129	. 306, 309, 310,
\@aom@linecount . . .		313, 314, 317, 318
. <u>92</u> , 106, 109, 118		\@ifstar . . . . . 346
\@aom@manuscript@modelfalse		\@ixpt . . . . . 68
. . . . . 33		\@keywords . . . . .
\@aom@manuscript@modetrue		. 163, 164, 270, 278
. . . . . 34		\@makefnmark . . . . . 267
\@aom@newthm . . . . .	346, 348	\@mrnumber . . . . . 226
\@aom@newthm@ . . . . .	348, 350	\@one . . . . . 95, 97, 386
\@aom@newthm@star . .		\@onlypreamble 131–160
. . . . . 346, 347		\@par . . . . . 273
\@aom@newthm@star@ . .		\@plus . . . . . 211,
. . . . . 347, 349		325, 328, 332, 353
\@aom@screen@modelfalse		\@published 181, 182, 295
. . . . . 36		\@publishedonline . . . . .
\@aom@screen@modetrue		. . . . 183, 184, 296
. . . . . 37		\@received . . . . .
\@captionheadfont . <u>334</u>		. 175, 176, 289, 292
\@centering 381, 385, 388		\@revised . . . . .
\@closetocontribs . 257		. 177, 178, 290, 293
\@currentlabel . . . . 377		\@setabstract . . . . . 217
\@date . . . . . 268		\@setabstracta . . . . 217
\@doinumber 125–127, 224		\@setaccepted . . . . <u>292</u>
\@empty 125, 163, 165,		\@setaddresses 291, <u>298</u>
166, 176, 178,		\@setauthors . . . . . <u>239</u>
180, 182, 184,		\@setcontribs . 256, <u>262</u>
196, 240, 254,		\@setdate . . . . . 268
268–272, 288–291		\@setkeywords . 270, <u>276</u>
\@endformatdate 168, 169		\@setpublished . . . . <u>292</u>
\@endpfalse . . . . . 359		\@setpublishedonline
\@eqcnt 380, 386, 387, 389		. . . . . <u>292</u>
\@eqncr . . . . . 382		\@setreceived . 289, <u>292</u>
\@eqnsel . . . . . 385		\@setrevised . . 290, <u>292</u>
\@eqnswtrue . . . . . 378		\@setsubjclass . . . . 269
\@footnotetext . . . .		\@setsubjects . 271, <u>281</u>
. . . . 268, 269, 272		\@setthanks . . . . . 273
\@formatdate . . 168, <u>169</u>		\@settitle . . . . . <u>230</u>
		\@settranslators . . 288
		\@startsection . . . .
		. . . . 324, 327, 331
		\@subjclass . . . . . 269
		\@subjects . . . . .
		. 165–167, 271, 283
		\@tempa . . . . . 195, 196
		\@tempcnta . . . . .
		. . . 95–97, 170, 174
		\@thefnmark . . . . . 267
		\@title . . . . . 233, 235
		\@topsep . . . . . 244, 245
		\@translators . . . . . 288
		\@typesizes . . . . . <u>67</u>
		\@viipt . . . . . 68
		\@vipt . . . . . 68
		\@vipt . . . . . 68
		\@xcontribs . . . . . 263
		\@xipt . . . . . 71
		\@xipt . . . . . 70
		\@xnthm . . . . . 349, 350
		\@xppt . . . . . 69
		\@xvipt . . . . . 71
		\@zblnumber . . . . . 228
		\\ 96, 124, 252, 302, 382
		10pt (option) . . . . . 4
		11pt (option) . . . . . 4
		12pt (option) . . . . . 4
		8pt (option) . . . . . 4
		9pt (option) . . . . . 4
		<b>A</b>
		\abovedisplayskip . <u>79</u>
		\abstract . . . . . <u>200</u>
		abstract (environ-
		ment) . . . . . 5
		\abstractbox . . . . . 205
		\abstractname . . . . . 207
		\accepted . . . . . 6, 144, <u>175</u>
		\address . . . . . 5, 134, 304
		\addresses . . . . . 291, 320
		\addvspace . . . . . 301, 305
		\advance . . . . . 97, 245
		\annalsurl . . . . . <u>129</u>



<code>\headsep</code> . . . . .	89	178, 180, 182,	8pt . . . . .	4
<code>\hfil</code> . . . . .	386, 388	184, 212, 220–	9pt . . . . .	4
<code>\href</code> . . . . .	122, 315, 362–366	223, 267, 273, 382	draft . . . . .	4
<code>\hskip</code> . . . . .	310,	<code>\lhead</code> . . . . .	final . . . . .	4
314, 355, 385–387	<code>\linebreak</code> . . . . .	252	manuscript . . . . .	4
<code>\hss</code> . . . . .	389	<code>\linespacing</code> . . . . .	screen . . . . .	4
<code>\hyperref</code> . . . . .	370, 374	.. 73, 325, 328,	<code>\or</code> . . . . .	68–72, 171–173
<code>\hypersetup</code> 49, 52, 55,	332, 335, 338, 342	<code>\list</code> . . . . .	<code>\overline</code> . . . . .	10, 74
235, 250, 278, 283	<code>\listparindent</code> . . . . .	208		
	<code>\LoadClass</code> . . . . .	45		
<b>I</b>	<code>\long</code> . . . . .	24	<b>P</b>	
<code>\if@aom@manuscript@mode</code>	<code>\loop</code> . . . . .	96	<code>\p@</code> 211, 231, 244, 353, 383	
. . . . .			<code>\p@equation</code> . . . . .	377
32,			<code>\PageIndex</code> . . . . .	15
51, 92, 104, 116, 368			<code>\pagenumbering</code> 190, 192	
<code>\if@aom@screen@mode</code>	<b>M</b>		<code>\pageref</code> . . . . .	196
. . . . .	<code>\m@th</code> . . . . .	379	<code>\pagespan</code> . . . . .	198
35, 48	<code>\MakeLowercase</code> . . . . .	286	<code>\pagestyle</code> . . . . .	99
<code>\ifcase</code> . . . . .	<code>\maketitle</code> . . . . .	5, 201, 203	<code>\papernumber</code> 6, 155, 188	
<code>\IfFileExists</code> . . . . .	<code>\MakeUppercase</code> . . . . .	113	<code>\par</code> 207, 273, 292–296,	
<code>\ifnum</code> . . . . .	manuscript (option) ..	4	298, 305, 307,	
<code>\ifpdf</code> 234, 249, 277, 282	<code>\marginpar</code> . . . . .	369	311, 315, 319, 351	
<code>\ifx</code> . . . . .	<code>\marginparwidth</code> . . . . .	369	<code>\parbox</code> . . . . .	94
125, 163,	<code>\MessageBreak</code> . . . . .	62	<code>\parindent</code> . . . . .	
166, 196, 201,	<code>\mr</code> . . . . .	10, 363	.. 85, 328, 332,	
217, 240, 254,	<code>\mrnumber</code> ..	7, 159, 224	336, 339, 343, 355	
268–272, 288–291			<code>\parsep</code> . . . . .	211
<code>\ignorespaces</code> . . . . .			<code>\parskip</code> . . . . .	85
. . . . .	<b>N</b>		<code>\PassOptionsToClass</code> 38	
302, 306, 307,	<code>\NeedsTeXFormat</code> . . . . .	1	<code>\path</code> . . . . .	362–366
310, 314, 318, 357	<code>\newcommand</code> . . . . .	371–374	<code>\penalty</code> . . . . .	256
<code>\indent</code> 305, 309, 313, 317	<code>\newif</code> . . . . .	32, 35	<code>\pfullref</code> . . . . .	8, 372
<code>\InputIfFileExists</code> . . . . .	<code>\newsavebox</code> . . . . .	93	<code>\popQED</code> . . . . .	359
<code>\interlinepenalty</code> . . . . .	<code>\newtheorem</code> . . . . .	9, 346	<code>\ProcessOptions</code> . . . . .	44
<code>\issuenumber</code> 6, 153, 186	<code>\newtheoremstyle</code> . . . . .	335, 338, 342	<code>\proof</code> . . . . .	351
<code>\item</code> . . . . .	<code>\nobreak</code> . . . . .	299,	<code>\proofname</code> . . . . .	351
214, 246, 355	301, 309, 313, 317		<code>\proposed</code> ..	6, 147, 220
<code>\itemindent</code> . . . . .	<code>\normalfont</code> . . . . .		<code>\protect</code> ..	203, 242, 252
<code>\itshape</code> . . . . .	. . . . .		<code>\ProvidesClass</code> . . . . .	5
65,	207, 214, 326,		<code>\ProvidesFile</code> . . . . .	3
297, 329, 333, 356	329, 333, 334,		<code>\publicationyear</code> ..	
	337, 341, 345, 353		. . . . .	6, 154, 187
<b>J</b>	<code>\normalparindent</code> ..	210	<code>\published</code> . . . . .	6, 145, 175
<code>\jfm</code> . . . . .	<code>\normalsize</code> . . . . .	73, 207	<code>\publishedonline</code> ..	
			. . . . .	6, 146, 175
<b>K</b>			<code>\pushQED</code> . . . . .	352
<code>\keyword</code> . . . . .	<b>O</b>		<code>\put</code> . . . . .	106, 109, 118
6, 140, 163	<code>\oddsidemargin</code> . . . . .	77		
	<code>\oldsubsections</code> . . . . .	7, 330	<b>Q</b>	
<b>L</b>	options:		<code>\qed</code> . . . . .	352
<code>\labelsep</code> . . . . .	10pt . . . . .	4		
<code>\labelwidth</code> . . . . .	11pt . . . . .	4		
<code>\LARGE</code> . . . . .	12pt . . . . .	4		
<code>\leftmargin</code> . . . . .				
209				
<code>\let</code> . . . . .				
10,				
65, 66, 74, 161,				
162, 165, 176,				

<b>R</b>		
<code>\raggedright</code> . . . . .	369	
<code>\received</code> . . . . .	6, 142, <u>175</u>	
<code>\RecordChanges</code> . . . . .	17	
<code>\ref</code> . . . . .	370, 374	
<code>\relax</code> . . . . .	44, 95, 170, 201, 212, 217, 231, 240, 244, 246, 267, 350, 353	
<code>\renewcommand</code> . . . . .	90, 91, 323, 346, 367	
<code>\renewenvironment</code> . . . . .	200, 351	
<code>\repeat</code> . . . . .	97	
<code>\repeatedauthors</code> . . . . .	10, <u>361</u>	
<code>\RequirePackage</code> . . . . .	46, 47, 59, 61	
<code>\revised</code> . . . . .	6, 143, <u>175</u>	
<code>\rightmargin</code> . . . . .	209	
<code>\rmfamily</code> . . . . .	315	
<code>\romannumeral</code> . . . . .	193	
<b>S</b>		
<code>\savebox</code> . . . . .	94	
<code>screen</code> (option) . . . . .	4	
<code>\scriptsize</code> . . . . .	96, 102, 111, 113, 121, 369	
<code>\scshape</code> . . . . .	253, 264, 307, 310, 311, 336	
<code>\seconded</code> . . . . .	6, 148, <u>221</u>	
<code>\section</code> . . . . .	<u>324</u>	
<code>\setbox</code> . . . . .	205	
<code>\setcounter</code> . . . . .	190, 192	
<code>\setlength</code> . . . . .	75, 76, 79–86, 89	
<code>\shortauthors</code> . . . . .	5, 113	
<code>\shorttitle</code> . . . . .	102	
<code>\sishape</code> . . . . .	65, 335, 340, 344	
<code>\skip</code> . . . . .	82	
<code>\Small</code> . . . . .	214	
<code>\small</code> . . . . .	253, 367	
<code>\space</code> . . . . .	174, 203, 256, 310, 314	
<code>\specialdigits</code> . . . . .	64	
<code>\start@page</code> . . . . .	124, 191, 193	
<code>\startpage</code> . . . . .	6, 156, <u>190</u> , 198	
<code>\stepcounter</code> . . . . .	376	
<code>\subject</code> . . . . .	6, 141, <u>165</u>	
<code>\subsection</code> . . . . .	<u>327</u> , 331	
<code>\surname</code> . . . . .	5, 138, <u>161</u>	
<b>T</b>		
<code>\tabskip</code> . . . . .	381, 385, 388, 390	
<code>\tagform@</code> . . . . .	374	
<code>\textbf</code> . . . . .	122	
<code>\textheight</code> . . . . .	<u>75</u>	
<code>\textit</code> . . . . .	66	
<code>\textsi</code> . . . . .	66	
<code>\textup</code> . . . . .	374	
<code>\textwidth</code> . . . . .	<u>75</u>	
<code>\thanks</code> . . . . .	5, 139, 242	
<code>\thanks@warning</code> . . . . .	242	
<code>\thankses</code> . . . . .	272	
<code>\the</code> . . . . .	96, 174	
<code>\theequation</code> . . . . .	377	
<code>\thepage</code> . . . . .	103, 105, 128	
<code>\thmname</code> . . . . .	337, 341, 345	
<code>\thmnote</code> . . . . .	337, 341, 345	
<code>\thmnumber</code> . . . . .	337, 341, 345	
<code>\thr@@</code> . . . . .	389	
<code>\title</code> . . . . .	5, 131	
<code>\topsep</code> . . . . .	353	
<code>\topskip</code> . . . . .	<u>79</u>	
<code>\trivlist</code> . . . . .	243, 354	
<code>\tw@</code> . . . . .	386, 387	
<b>U</b>		
<code>\underline</code> . . . . .	96	
<code>\unskip</code> . . . . .	302, 306, 310, 314, 318	
<code>\upshape</code> . . . . .	247, 339, 343	
<code>\url</code> . . . . .	319	
<code>\urladdr</code> . . . . .	5, 136, 316	
<code>\urlstyle</code> . . . . .	58	
<code>\usebox</code> . . . . .	106, 109, 118	
<code>\usepackage</code> . . . . .	9, 11–13	
<b>V</b>		
<code>\version</code> . . . . .	6, 151, <u>223</u>	
<code>\vglue</code> . . . . .	206, 207	
<code>\volumenumber</code> . . . . .	6, 152, <u>185</u>	
<code>\vtop</code> . . . . .	205	
<b>W</b>		
<code>\widebar</code> . . . . .	7, 10, <u>74</u>	
<code>\widehat</code> . . . . .	7	
<code>\wideparen</code> . . . . .	7	
<code>\widening</code> . . . . .	7	
<code>\widetilde</code> . . . . .	7	
<code>\widetriangle</code> . . . . .	7	
<code>\widowpenalty</code> . . . . .	<u>87</u>	
<b>X</b>		
<code>\xcontribs</code> . . . . .	264	
<b>Z</b>		
<code>\z@</code> . . . . .	86, 192, 208, 211, 325, 380, 389	
<code>\z@skip</code> . . . . .	385, 390	
<code>\zbl</code> . . . . .	10, <u>363</u>	
<code>\zblnumber</code> . . . . .	7, 160, <u>224</u>	