

L^AT_EX Class for The *Annals of Mathematics**

Boris Veytsman[†]

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Abstract

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

Contents

1	Introduction	3
2	User's Guide	3
2.1	Installation	3
2.2	Invocation	4
2.3	Top Matter	5
2.3.1	Commands for Authors	5
2.3.2	Commands for Editors	6
2.4	Additional Macros	8
2.5	Theorems	10
2.6	Illustrations	10
2.7	Funding	10
2.8	Bibliography	11
2.9	Papers in languages other than English	12
3	Implementation	13
3.1	Identification	13
3.2	Options	13
3.3	Loading Class and Packages	14
3.4	Internationalization	15
3.5	Fonts	15
3.6	Page Dimensions and Paragraphing	16
3.7	Headers	17
3.8	Top Matter Macros	18
3.9	Typesetting Top Matter	24
3.10	Typesetting End Matter	27
3.11	Sectioning	28
3.12	Figures and Tables	29
3.13	Theorems	29

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[†]borisv@lk.net, boris@varphi.com

3.14 Bibliography Macros	30
3.15 Additional Macros	31
3.16 End of Class	32

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. `yhmth` 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.

The class should work with the Babel [10] package. At present, English, French and German languages are fully supported. See also Section 2.9.

options The options `draft` and `final` work in the same way as for `amsart` and standard `draft` \LaTeX . If the option `draft` is chosen, the overfull lines are marked by black 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.

option Starting from version 1.9 (2011) the formatting of DOI numbers changed according to the new recommendations from CrossRef. The option `olddoi` switches on the “old” formatting. It is used for compatibility reasons.

option Starting from version 1.5 (2016) the formatting of DOI numbers changed again according to CrossRef recommendations. The option `doi2016` switches to the version existed between 2011 and 2016.

option Since June 2017 keywords and AMS Mathematical Subjects classification numbers are printed on the title page. The option `oldkeywords` suppresses this.

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

`10pt` Normally the scheme for MSC numbers is not printed. If the option `printscheme` is chosen, however, it is printed explicitly.

`11pt`

`12pt`

option
`printscheme`

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 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` [11] (and different from the standard \LaTeX). For each author a separate command `\author` should be used, followed by `\address` and (optionally) `\curraddr`, `\email`, `\urladdr` and `\orcid`. 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.

`\fulladdress` Another command which does not affect the typesetting is `\fulladdress`. It is used to store the full mailing address of the author for the online version of the journal and various databases.

`\contrib` Sometimes there are contributors to a paper, who are not full authors: the person may write an appendix or other part of the paper. You can use the command `\contrib[{role}]{{name}}` for indicating these persons. Note that [*role*] argument has a special meaning, indicating that the role of this person is the same as for the previous contributor, for example,

```
\contrib[with Appendix~A by]{A. U. Thor}  
\givenname{Alexandra}\surname{Thor}  
\contrib{A. N. Other}
```

```
\givenname{Antony N.}\surname{Other}
\contrib[with Appendix~B by]{Y. Etanother}
\givenname{Yakov}\surname{Etanother}
```

In this example Appendix A is written by A. U. Thor and A. N. Another, and Appendix B is written by Y. Etanother. Commands `\orcid`, `\email`, `\address`, `\fulladdress`, `\givenname` and `\surname` can be used for contributors in the same way they are used for authors.

`\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^AT_EX), `aomart` allows `\thanks` only *outside* of commands `\title` and `\author`.

`\copyrightnote` Normally each paper is copyrighted by Department of Mathematics, Princeton University. This is reflected in the footnote on the first page of the article. However, by arrangement with the editors, certain papers may have different copyright. The command `\copyrightnote{\copyright statement}`, if issued, changes the footnote to the corresponding text, for example:

```
\copyrightnote{\textcopyright~2012 by the authors. This paper may
be reproduced, in its entirety, for noncommercial purposes.}
```

Note that if you issue this command, you should explicitly include both the copyright sign and the year unless the paper does not have a copyright, for example:

```
\copyrightnote{This paper is in the public domain}
```

`abstract (env.)` 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`.

A paper may have several abstracts in different languages. This situation is discussed in Section 2.9.

`\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.

`\keyword` The command `\keyword` adds a keyword to the list of keywords. This command may be repeated, for example

```
\keyword{Embedding theorem}
\keyword{Relatively hyperbolic group}
```

`\subject` The command `\subject` has three parameters: whether the subject is primary or secondary, the classification scheme and the subject itself, for example

```

\subject{primary}{msc2000}{20E45}
\subject{secondary}{msc2000}{20F65}

```

`\formatdate` The macro `\formatdate` is used to format the dates in the commands. Its argument is the date in the format `YYYY-MM-DD`, for example

```

\formatdate{2010-08-13}

```

`\received` The commands `\received`, `\revised`, `\accepted`, `\published`, `\publishedonline` accept as a parameter a date in the form `\formatdate{(YYYY-MM-DD)}`, for example

```

\published
\publishedonline
\received{\formatdate{2004-12-24}}
\revised{\formatdate{2006-04-12}}
\accepted{\formatdate{2007-10-02}}

```

`\proposed` The macros `\proposed`, `\seconded`, `\corresponding`, `\editor`, `\version` are used to set the corresponding metadata for the editorial process, for example

```

\corresponding
\editor
\version
\proposed{E. D. Itor}
\seconded{A. S. Sociate}
\corresponding{A. U. Thor}
\version{2.1}

```

`\volumenumber` The macros `\volumenumber`, `\issuenumber`, `\publicationyear`, `\papernumber`, `\startpage`, `\endpage` set up the corresponding data for the paper, for example:

```

\publicationyear
\papernumber
\startpage
\endpage
\volumenumber{172}
\issuenumber{1}
\publicationyear{2010}
\papernumber{1}
\startpage{1}
\endpage{39}

```

Note that if the argument of `\endpage` is empty, L^AT_EX tries to calculate the last page number as best as it can.

`\copyrightyear` In the standard copyright statement the copyright year is assumed to be the same as the `\publicationyear`. However, for special cases one can set the copyright year explicitly, for example,

```

\publicationyear{2012}
\copyrightyear{2011}

```

Note that if you use your own copyright statement instead of the canned one (with the command `\copyrightnote`), you need to put there the copyright year explicitly instead of using this command.

`\doinumber` The macros `\doinumber`, `\mrnumber` and `\zblnumber` set the information

```

\mrnumber
\zblnumber
\arxivnumber

```

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

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/>) and arXiv (<https://www.arxiv.org/>). The use of these macros should be obvious:

```
\doinumber{10.1215/S0012-7094-92-06520-3}
\mrnumber{1154181}
\zblnumber{0774.14039}
\arxivnumber{1234.567890}
```

Note the difference between these commands and the bibliography commands discussed in Section 2.8. Commands in this Section set up the data for the *current article*. Commands in Section 2.8 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` (*env.*) The 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 margins in the manuscript mode, for example,

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

`\fullref` A set of macros is used to make more convenient clickable references in the on-
`\pfullref`
`\bfullref`
`\eqfullref`
`\fullpageref`

line versions of papers. The package `hyperref` [4] makes clickable reference numbers in the phrases like

```
...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 similar command `\fullpageref` is used to make the word “page” clickable, for example,

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

By default the command adds the word “page” to the text. You can override this choice using the optional parameter, e.g.

```
\fullpageref[The page]{eq:alpha} starts the discussion of...
```

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}`”, “word~`\ref{reference}`” and “word~`\pageref{reference}`” to “`\fullref{word}{reference}`”, and similarly for parenthesized references, `\eqref` commands, and page references. 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 [12] 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 [13] for a comprehensive discussion of L^AT_EX graphics possibilities).

2.7 Funding

`\funding` There is a special command for showing the support for the paper, `\funding[(text)]{(sponsor)}{(grantid)}`. Normally it prints the name of the sponsor and in parentheses the id of the grant, if it is not empty. However, you can override this using the optional argument of the command. For example, the following text

```
AB is grateful to \funding{NASA}{123GH456}, while MJ was supported
by \funding{NIH}{}. Both authors acknowledge \funding[the generous
help of other agencies]{Department of Defense}{Special project
grant}.
```

will expand to

```
% AB is grateful to NASA (123GH456), while MJ was supported
by NIH. Both authors acknowledge the generous
help of other agencies.
```

The command will save the information about the grants in the form suitable for automatic processing.

2.8 Bibliography

The authors are encouraged to use Bib_TE_X 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.

sortyear: Some entries do not have a year set up (e.g. some `unpublished` entries. If you have several entries from the same author, some with a year, and some without, you may want to put them in a certain order. The field `sortyear` overrides `year` for the sorting purposes.

titlenote: this field is like `note`, but is typeset immediately after a title. It should be used for additional information, for example,

```
@Book{Knuth94:TheTeXbook,
  author = {Knuth, Donald Ervin},
  title = {The \TeX book},
  publisher = {Addison-Wesley Publishing Company},
  year = 1994,
  series = {Computers \& Typesetting A},
  address = {Reading, MA},
  titlenote = {with illustrations by Duane Bibby}
}
```

totalpages: some articles (especially published in an electronic format) do not have start and end page numbers; instead you may put the total number of pages. If both `pages` and `totalpages` are present, `pages` take precedence.

`\doi` There are several databases routinely used in the science and mathematics communities. 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_TE_X, these commands are automatically used for the corresponding fields in your database entries.

2.9 Papers in languages other than English

The recommended way to typeset papers in languages other than English is the *babel* package [10]. For example, to typeset a paper in French (with an English abstract, see below), one puts in the preamble

```
\usepackage[utf8]{inputenc}
\usepackage[english,frenchb]{babel}
```

Such papers often contain several abstracts: for example, in the language the paper is written *and* in English. Accordingly, *aomart* allows several abstracts. Each abstract must be put inside a group with the corresponding language selected using `\selectlanguage` command, for example

```
{\selectlanguage{french}%
  \begin{abstract}
    French abstract
  \end{abstract}}

{\selectlanguage{english}%
  \begin{abstract}
    English abstract
  \end{abstract}}
```

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 [2025/01/07 v1.30 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\@om@size@warning#1{%
25   \ClassWarning{aomart}{Size-changing option #1 will not be
26     honored}}%
27 \DeclareOption{8pt}{\@om@size@warning{\CurrentOption}}%
28 \DeclareOption{9pt}{\@om@size@warning{\CurrentOption}}%
29 \DeclareOption{10pt}{\@om@size@warning{\CurrentOption}}%
30 \DeclareOption{11pt}{\@om@size@warning{\CurrentOption}}%
31 \DeclareOption{12pt}{\@om@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}
```

`\if@aom@olddoi` DOI processing is different in the “old” and new mode.

```
38 \newif\if@aom@olddoi
39 \@aom@olddoifalse
40 \DeclareOption{olddoi}{\@aom@olddoittrue}
```

`\if@aom@doiMMXVI` DOI processing is different in the 2016 and new mode

```
41 \newif\if@aom@doiMMXVI
42 \@aom@doiMMXVIfalse
43 \DeclareOption{doi2016}{\@aom@doiMMXVItrue}
```

`\if@aom@oldkeywords` Keywords processing is different in the “old” and new mode.

```
44 \newif\if@aom@oldkeywords
45 \@aom@oldkeywordsfalse
46 \DeclareOption{oldkeywords}{\@aom@oldkeywordstrue}
```

`\if@aom@printscheme`

```
47 \newif\if@aom@printscheme
48 \@aom@printschemefalse
49 \DeclareOption{printscheme}{\@aom@printschemetrue}
```

All other options are passed to amsart:

```
50 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{amsart}}
```

Now we read the configuration file

```
51 \InputIfFileExists{aomart.cfg}{%
52   \ClassInfo{aomart}{%
53     Loading configuration file aomart.cfg}{%
54   \ClassInfo{aomart}{%
55     Configuration file aomart.cfg is not found}}
```

And process the options:

```
56 \ProcessOptions\relax
```

3.3 Loading Class and Packages

`\@makefnmark@kernel` AMS redefines `\@makefnmark`. Here we return to the kernel version

```
57 \let\@makefnmark@kernel\@makefnmark
```

We start with the base class

```
58 \LoadClass[11pt]{amsart}
```

`\@makefnmar` Restoring the kernel version

```
59 \let\@makefnmark\@makefnmark@kernel
```

`\@citex` We redefine this macro early in case some package wants to patch it. Basically house style for repeated citations is not [1, 2, 3], but [1], [2], [3]:

```
60 \def\@citex[#1]#2{\leavevmode
61   \let\@citea\@empty
62   \@cite{\@for\@citeb:=#2\do
63     {\@citea\def\@citea{, []}%
64     \edef\@citeb{\expandafter\@firstofone\@citeb\@empty}}%
65   \if@files\immediate\write\@auxout{\string\citation{\@citeb}}\fi
66   \ifundefined{b@\@citeb}{\hbox{\reset@font\bfseries ?}}%
```

```

67 \G@refundefinedtrue
68 \@latex@warning
69 {Citation ‘\@citeb’ on page \thepage \space undefined}}%
70 {\@cite@ofmt{\csname b@\@citeb\endcsname}}}{#1}}

```

A bunch of packages:

```

71 \RequirePackage{fancyhdr, lastpage, ifpdf, graphicx}
72 \RequirePackage[breaklinks,colorlinks]{hyperref}
73 \if@aom@screen@mode
74 \hypersetup{linkcolor=blue,citecolor=blue,
75 urlcolor=blue}%
76 \else\if@aom@manuscript@mode
77 \hypersetup{linkcolor=blue,citecolor=blue,
78 urlcolor=blue}%
79 \else
80 \hypersetup{linkcolor=black,citecolor=black,
81 urlcolor=black}%
82 \fi\fi
83 \urlstyle{rm}

```

Amsart has `\collect@body` macro. However, we want the `\long` version, so we use `environ`

```

84 \RequirePackage{environ}

```

3.4 Internationalization

There are some papers published in languages other than English. The Babel is expected to be used for them. Here we add some macros extending captions for these languages.

First, let us define English defaults:

```

\@aom@by This is just “By” in English:
85 \def\@aom@by{By}

```

```

\@aom@and This is “and” in English:
86 \def\@aom@and{and}

```

Now we can define internationalization:

```

87 \AtBeginDocument{\@ifpackageloaded{babel}{%
88 \addto\captionsofrench{\def\@aom@by{Par}\def\@aom@and{et}}%
89 \addto\captionsofgerman{\def\@aom@by{Von}\def\@aom@and{und}}%
90 \addto\captionsofenglish{\def\@aom@by{By}\def\@aom@and{and}}}{}}

```

3.5 Fonts

We use `yhmath` for large symbols:

```

91 \RequirePackage{yhmath}

```

Since version 1.2 `ymath` no longer makes its large symbols default. We override this

```

92 \DeclareSymbolFont{largesymbols}{OMX}{yhext}{m}{n}

```

`\widehat` The way `\widehat` and `\widetilde` are implemented in `ymath` is buggy, see `\widetilde` https://www.reddit.com/r/LaTeX/comments/2j7mtn/usepackageamsmath_vs_usepackageyhmath_and_the/. We use AMS definitions instead

```

93 \xdef\widehat#1{\noexpand\@mathmeasure\z@\textstyle{#1}%
94 \noexpand\ifdim\noexpand\wd\z@>\tw@ em%
95 \mathaccent"0\hexnumber@\symAMSb 5B{#1}%
96 \noexpand\else\mathaccent"0362{#1}\noexpand\fi}
97 \xdef\widetilde#1{\noexpand\@mathmeasure\z@\textstyle{#1}%
98 \noexpand\ifdim\noexpand\wd\z@>\tw@ em%
99 \mathaccent"0\hexnumber@\symAMSb 5D{#1}%
100 \noexpand\else\mathaccent"0365{#1}\noexpand\fi}

```

We need `cmtiup` package, but we may find out it is not installed.

```

101 \IfFileExists{cmtiup.sty}{%
102 \RequirePackage{cmtiup}}{%
103 \ClassWarning{aomart}{The package mdputu is not found.\MessageBreak
104 You need this package to get italics with upright digits!}}

```

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

```

105 \def\specialdigits{}%
106 \let\sisshape=\itshape
107 \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`.

```

108 \def\@typesizes{%
109 \or{\@vipt}{9}\or{\@viipt}{9}\or{\@viipt}{9}\or{\@ixpt}{12}%
110 \or{\@xpt}{13}%
111 \or{\@xipt}{14}% normalsize
112 \or{\@xiipt}{15}\or{13}{17}\or{\@xviipt}{20}%
113 \or{19}{23.2}\or{22}{27.8}}%
114 \normalsize \linespacing=\baselineskip

```

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

```

115 \let\widebar\overline

```

3.6 Page Dimensions and Paragraphing

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

```

\textheight 116 \setlength{\textwidth}{31pc}
117 \setlength{\textheight}{48pc}

```

`\evensidemargin` The margins:

```

\oddsidemargin 118 \oddsidemargin=.65in
119 \evensidemargin=.65in

```

`\footins` Some skips from `aomamlt2e`:

```

\topskip 120 \setlength{\topskip}{12pt}
\abovedisplayskip 121 \setlength{\abovedisplayskip}{6.95pt plus3.5pt minus 3pt}
\belowdisplayskip

```



```

122 \setlength{\belowdisplayskip}{6.95pt plus4.5pt minus 3pt}
123 \setlength{\skip\footins}{20pt}
124 \setlength{\dimen\footins}{3in}

\footskip Some space for footnotes:
125 \setlength\footskip{30pt}

\parskip Paragraph shape:
\parindent 126 \setlength{\parindent}{22pt}
127 \setlength{\parskip}{\z@}

\widowpenalty We suppress widows and clubs:
\clubpenalty 128 \widowpenalty=10000
129 \clubpenalty=10000

```

AMS defines the margins for lists `\AtBeginDocument`. Our lists are tighter

```

130 \AtBeginDocument{%
131   \labelsep=5pt\relax
132   \settowidth\leftmargini{\labelenumi\hskip\labelsep}%
133   \leftmargin=\leftmargini
134   \labelwidth=\leftmargini \advance\labelwidth-\labelsep
135   \listi}

```

3.7 Headers

```

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

\headheight Slightly increasing head height
137 \setlength{\headheight}{18.0pt}

\headrulewidth We do not want decorative rules in the journal:
\footrulewidth 138 \renewcommand{\headrulewidth}{0pt}
139 \renewcommand{\footrulewidth}{0pt}

\@aom@linecount This is the box displayed in the manuscript mode
140 \if@aom@manuscript@mode
141   \newsavebox{\@aom@linecount}
142   \savebox{\@aom@linecount}[4em][t]{\parbox[t]{4em}{%
143     \@tempcnta\@ne\relax
144     \loop{\underline{\scriptsize\the\@tempcnta}}\@
145     \advance\@tempcnta by \@ne\ifnum\@tempcnta<43\repeat}}
146 \fi

```

It is easy to set up headers with fancyhdr:

```

147 \pagestyle{fancy}
148 \fancyhead{}
149 \fancyfoot{}
150 \fancyhead[CO]{\scriptsize\shorttitle}
151 \fancyhead[RO,LE]{\footnotesize\thepage}
152 \if@aom@manuscript@mode
153   \fancyhead[LE]{\footnotesize\thepage\begin{picture}(0,0)%
154     \put(-26,-25){\usebox{\@aom@linecount}}%

```

```

155 \end{picture}}
156 \fancyhead[L0]{\begin{picture}(0,0)%
157 \put(-21,-25){\usebox{\@aom@linecount}}%
158 \end{picture}}
159 \fancyfoot[C]{\scriptsize Proof: page numbers may be temporary}
160 \fi
161 \fancyhead[CE]{\scriptsize\MakeUppercase\shortauthors}

```

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

```

162 \fancypagestyle{firstpage}{%
163 \fancyhf{}%
164 \if@aom@manuscript@mode
165 \thead{\begin{picture}(0,0)%
166 \put(-21,-25){\usebox{\@aom@linecount}}%
167 \end{picture}}
168 \fi
169 \thead{\scriptsize%
170 \href{\@annalsurl}{Annals of Mathematics} \textbf{\currentvolume}
171 (\currentyear),

```

We always print the starting page. However, we print the last page only if it does not coincide with the first page. There are two cases here: first, the last page may still be `\pageref{LastPage}`. In this case we need to extract the numerical value of the counter—note that `hyperref` is in action! Second, we could redefine the last page, and it is no longer `\pageref{LastPage}`. In this case we need to compare the value with the first page.

```

172 \start@page%
173 \def\tempa{\pageref{LastPage}}%
174 \edef\tempb{\start@page}%
175 \ifx\tempa\end@page
176 \edef\tempa{\HyPsd@@\pageref{LastPage}}%
177 \else
178 \edef\tempa{\end@page}%
179 \fi
180 \ifx\tempa\tempb\else--\end@page\fi\
181 \ifx\@doinumber\@empty\else
182 \edef\@doinumber{\@doinumber}%
183 \expandafter\doi\expandafter{\@doinumber}\fi}%
184 \cfoot{\footnotesize\thepage}}%

```

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

```

185 \def\annalsurl#1{\gdef\@annalsurl{#1}}
186 \annalsurl{http://annals.math.princeton.edu/about}

```

3.8 Top Matter Macros

We make these macros allowed only in the preamble:

```

187 \@onlypreamble{\title}
188 \@onlypreamble{\author}
189 \@onlypreamble{\contrib}
190 \@onlypreamble{\email}
191 \@onlypreamble{\address}
192 \@onlypreamble{\curraddr}

```

```

193 \@onlypreamble{\urladdr}
194 \@onlypreamble{\orcid}
195 \@onlypreamble{\givenname}
196 \@onlypreamble{\fulladdress}
197 \@onlypreamble{\surname}
198 \@onlypreamble{\thanks}
199 \@onlypreamble{\keyword}
200 \@onlypreamble{\subject}
201 \@onlypreamble{\received}
202 \@onlypreamble{\revised}
203 \@onlypreamble{\accepted}
204 \@onlypreamble{\published}
205 \@onlypreamble{\publishedonline}
206 \@onlypreamble{\proposed}
207 \@onlypreamble{\seconded}
208 \@onlypreamble{\corresponding}
209 \@onlypreamble{\editor}
210 \@onlypreamble{\version}
211 \@onlypreamble{\volumenumber}
212 \@onlypreamble{\issuenummer}
213 \@onlypreamble{\publicationyear}
214 \@onlypreamble{\copyrightnote}
215 \@onlypreamble{\copyrightyear}
216 \@onlypreamble{\papernumber}
217 \@onlypreamble{\startpage}
218 \@onlypreamble{\endpage}
219 \@onlypreamble{\doinumber}
220 \@onlypreamble{\mrnumber}
221 \@onlypreamble{\zblnumber}
222 \@onlypreamble{\arxivnumber}

```

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

```

\fulladdress We store the information to output it later in the rpi file
\givenname 223 \def\@names{}
\surname 224 \def\givenname#1{\g@addto@macro\@names{givenname=#1;}}
225 \def\surname#1{\g@addto@macro\@names{surname=#1;}}
226 \def\fulladdress#1{\g@addto@macro\@names{fulladdress=#1;}}

\author We add mangling of \@names to the amsart macro
227 \renewcommand{\author}[2] [] {%
228 \ifx\@empty\authors
229 \gdef\authors{#2}%
230 \g@addto@macro\@names{author=#2;}%
231 \else
232 \g@addto@macro\authors{\and#2}%
233 \g@addto@macro\@names{\and author=#2;}%
234 \fi
235 \gdef\@om@current@orcid@target{\authors}%
236 \@ifnotempty{#1}{%
237 \ifx\@empty\shortauthors
238 \gdef\shortauthors{#1}%
239 \else
240 \g@addto@macro\shortauthors{\and#1}%

```

```

241     \fi
242   }%
243   \g@addto@macro\addresses{\author{#2}}%
244 }
245 \edef\author{\@nx\@dblarg
246   \xp\@nx\csname\string\author\endcsname}

\@currentcontribution The current contribution
247 \def\@currentcontribution{}

\@currentcontributors The current contributors with the same contribution
248 \def\@currentcontributors{}

\contributors All contributors to the paper
249 \def\contributors{}

\if@startcontribgroup A switch whether the new group is started
250 \newif\if@startcontribgroup
251 \@startcontribgroupfalse

\@processcurrentcontribgroup Add current contributors to \contributors
252 \def\@processcurrentcontribgroup{%
253   \ifx\@currentcontributors\@empty\else
254     \def\@and{\upshape \@aom@and}%
255     \author@andify\@currentcontributors
256     \ifx\contributors\@empty\else
257       \g@addto@macro\contributors{\and}%
258     \fi
259     \expandafter\g@addto@macro\expandafter\contributors
260     \expandafter{\@currentcontribution}%
261     \g@addto@macro\contributors{\space}%
262     \expandafter\g@addto@macro\expandafter\contributors
263     \expandafter{\@currentcontributors}%
264   \fi
265 }

\contrib The processing of contributors. Contributors are separated into groups with the
same contribution. Within the group one can omit the contribution.
266 \renewcommand{\contrib}[2][]{%
267   \def\@tempa{#1}%
268   \gdef\@aom@current@orcid@target{\@currentcontributors}%
269   \@startcontribgrouptrue
270   \ifx\@tempa\@empty\relax
271     \ifx\@currentcontribution\@empty\relax
272       \ClassError{aomart}{You must define contribution for
273         contributors}{The first \contrib command must have the
274         optional argument indicating the contribution}%
275     \else
276       \@startcontribgroupfalse
277     \fi
278   \fi
279   \ifx\@currentcontribution\@tempa\relax
280     \@startcontribgroupfalse

```

```

281 \fi
282 \ifstartcontribgroup
283   \@processcurrentcontribgroup
284   \gdef\@currentcontribution{#1}%
285   \gdef\@currentcontributors{#2}%
286 \else
287   \g@addto@macro\@currentcontributors{\and#2}%
288 \fi
289 \g@addto@macro\@names{\and contributor=#2;}%
290 \g@addto@macro\@names{role=}%
291 \expandafter\g@addto@macro\expandafter%
292 \@names\expandafter{\@currentcontribution}%
293 \g@addto@macro\@names{;}%
294 \g@addto@macro\addresses{\author{#2}}%
295 }

```

`\email` We change amsart macro to output metadata

```

296 \renewcommand{\email}[2] [] {%
297   \g@addto@macro\addresses{\email{#1}{#2}}%
298   \g@addto@macro\@names{email=#2;}%
299 }

```

`\urladdr` We change amsart macro to output metadata

```

300 \renewcommand{\urladdr}[2] [] {%
301   \g@addto@macro\addresses{\urladdr{#1}{#2}}%
302   \g@addto@macro\@names{urladdr=#2;}%
303 }

```

`\aom@current@orcid@target` Each new orcid can be added either to the authors or to the contributors. This macro defines where it goes

```

304 \def\aom@current@orcid@target{\authors}

```

`\orcid` Orcid also outputs metadata

```

305 \newcommand{\orcid}[1] {%
306   \g@addto@macro\addresses{\orcid{#1}}%
307   \g@addto@macro\@names{orcid=#1;}%
308   \expandafter\g@addto@macro\aom@current@orcid@target{\aom@orcidlink{#1}}%
309 }

```

`\aom@orcidlink` The package orcidlink [14] requires TikZ, so here we reproduce its functionality using our own version of orcid logo. Note that the original logo is licensed under CC0, see https://orcid.figshare.com/articles/figure/ORCID_id_icon_graphics/5008697

```

310 \newcommand\aom@orcidlink[1]{\kern0.2ex\href{https://orcid.org/#1}{\includegraphics[height=2ex]{orcidlogo.pdf}}

```

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

```

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

```

`\subject` Subjects.

```

313 \let\@primarysubjects\@empty
314 \let\@secondarysubjects\@empty

```

```

315 \let\@primaryscheme\@empty
316 \let\@secondaryscheme\@empty
317 \def\subject#1#2#3{%
318   \expandafter\ifx\csname @#1subjects\endcsname\@empty\relax
319     \expandafter\gdef\csname @#1subjects\endcsname{#3}%
320   \else
321     \expandafter\g@addto@macro\csname @#1subjects\endcsname{, #3}%
322   \fi
323   \if@aom@printscheme
324     \expandafter\g@addto@macro\csname @#1subjects\endcsname{%
325     ~(#2)}%
326   \fi}

```

`\formatdate` This just sends the date to the special macro `\@formatdate`

```
327 \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.

```

328 \def\@formatdate#1-#2-#3\@endformatdate{%
329   \@tempcnta=#3\relax
330   \ifcase#2\or
331     January\or February\or March\or April\or May\or June\or
332     July\or August\or September\or October\or November\or December\fi
333   \space\the\@tempcnta,\space#1}

```

`\received` The following macros add stuff to the footnotes material:

```

\revised 334 \def\received#1{\def\@received{#1}}
\accepted 335 \let\@received\@empty
\published 336 \def\revised#1{\def\@revised{#1}}
\publishedonline 337 \let\@revised\@empty
338 \def\accepted#1{\def\@accepted{#1}}
339 \let\@accepted\@empty
340 \def\published#1{\def\@published{#1}}
341 \let\@published\@empty
342 \def\publishedonline#1{\def\@publishedonline{#1}}
343 \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

```
344 \def\volumenumber#1{\def\currentvolume{#1}}
```

`\issuenumber` This sets the issue of the paper:

```
345 \def\issuenumber#1{\def\currentissue{#1}}
```

`\publicationyear` This sets the year of the paper

```
346 \def\publicationyear#1{\def\currentyear{#1}}
```

`\papernumber` This is absent from the `\issueinfo`.

```

347 \def\papernumber#1{\def\currentpaper{#1}}
348 \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...

```
349 \def\startpage#1{\pagenumbering{arabic}\setcounter{page}{#1}%
350 \def\start@page{#1}%
351 \ifnum\c@page<\z@ \pagenumbering{roman}\setcounter{page}{-#1}%
352 \def\start@page{\romannumeral#1}%
353 \fi}
```

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

```
354 \def\endpage#1{\def\@tempa{#1}%
355 \ifx\@tempa\@empty\def\end@page{\pageref{LastPage}}%
356 \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.

```
357 \def\pagespan#1#2{\startpage{#1}\endpage{#2}}
358 \pagespan{1}{}
```

`\g@addto@abstract` Syntactic sugar around `\g@addto@macro`

```
359 \def\g@addto@abstract#1{\g@addto@macro{\@aom@abstract}{#1}}
```

`\@getabstract` `Amsart` typesets the abstract in a box. We preserve this peculiarity, but we need to put abstract in a macro to output in the rpi file.

```
360 \long\def\@aom@abstract{}
361 \long\def\@getabstract#1{%
362 \bgroup
363 \ifx\languagename\undefined
364 \def\languagename{english}%
365 \fi
366 \g@addto@abstract{<begin abstract }%
367 \expandafter\g@addto@abstract\expandafter{\languagename>%
368 \g@addto@macro\@aom@abstract{#1}%
369 \g@addto@abstract{<end abstract }%
370 \expandafter\g@addto@abstract\expandafter{\languagename>%
371 \egroup
372 \ifx\maketitle\relax
373 \ClassWarning{aomart}{Abstract should precede
374 \protect\maketitle\space in AMS derived classes}%
375 \fi
376 \global\setbox\abstractbox=\vtop\bgroup%
377 \box\abstractbox
378 \vglue1pc%
379 {\centering\normalfont\normalsize\bfseries\abstractname\par\vglue1pc}%
380 \list{}{\labelwidth\z@%
381 \leftmargin3pc \rightmargin\leftmargin%
382 \listparindent\normalparindent \itemindent\normalparindent%
383 \parsep\z@ \@plus\p@%
384 \let\fullwidthdisplay\relax%
385 }%
386 \item[]\normalfont\Small#1
387 \endlist\egroup}
```

```

abstract This puts abstract in a box and in a macro. Wasteful, but backward compatible
388 \renewenvironment{abstract}{\Collect@Body\@getabstract}{%
389 \ifx\@setabstract\relax\@setabstracta\fi}

\proposed We do not typeset the name of the proposer
390 \let\proposed\@gobble

\seconded Or the seconder
391 \let\seconded\@gobble

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

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

\doinumber Now databases' numbers of the article:
\mrnumber 394 \def\doinumber#1{\gdef\@doinumber{#1}}
\zblnumber 395 \doinumber{10.4007/annals.\currentyear.\currentvolume.\currentissue.\currentpaper}
\arxivnumber 396 \def\mrnumber#1{\gdef\@mrnumber{#1}}
397 \mrnumber{}
398 \def\zblnumber#1{\gdef\@zblnumber{#1}}
399 \zblnumber{}
400 \def\arxivnumber#1{\gdef\@arxivnumber{#1}}
401 \arxivnumber{}

\copyrightyear This is the copyright year in case it does not coincide with the publication year:
402 \def\copyrightyear#1{\def\@copyrightyear{#1}}
403 \copyrightyear{}

\copyrightnote This is the copyrightnote. The default has some trickery with the year:
404 \def\copyrightnote#1{\def\@copyrightnote{#1}}
405 \copyrightnote{\textcopyright~%
406 \ifx\@empty\@copyrightyear\currentyear\else\@copyrightyear\fi~%
407 Department of Mathematics, Princeton University}

```

3.9 Typesetting Top Matter

```

\@mainrpi We write the information about the paper into file.rpi (the The stream for the rpi
file:
408 \newwrite\@mainrpi

\@om@write@paper@info This writes the information about the paper into the file jobname.rpi. Note that
hyperref makes our life a little bit more complex
409 \def\@om@write@paper@info{%
410 \bgroup
411 \if@filesw
412 \openout\@mainrpi\jobname.rpi%
413 \def\and{\string\and\space}%
414 \ifx\r@LastPage\@undefined
415 \edef\@tempa{\start@page}%
416 \else

```



```

417     \def\@tempc##1##2##3##4##5{##2}%
418     \edef\@tempa{\expandafter\@tempc\r@LastPage}%
419     \fi
420     \ifx\languagename\undefined
421       \def\languagename{english}%
422     \fi
423     \protected@write\@mainrpi{}%
424       {\@percentchar authors=\authors}%
425     \protected@write\@mainrpi{}%
426       {\@percentchar authors.information={\@names}}%
427     \protected@write\@mainrpi{}%
428       {\@percentchar title=\@title}%
429     \protected@write\@mainrpi{}%
430       {\@percentchar year=\currentyear}%
431     \protected@write\@mainrpi{}%
432       {\@percentchar volume=\currentvolume}%
433     \protected@write\@mainrpi{}%
434       {\@percentchar issue=\currentissue}%
435     \protected@write\@mainrpi{}%
436       {\@percentchar paper=\currentpaper}%
437     \protected@write\@mainrpi{}%
438       {\@percentchar startpage=\start@page}%
439     \protected@write\@mainrpi{}%
440       {\@percentchar endpage=\@tempa}%
441     \protected@write\@mainrpi{}%
442       {\@percentchar doi=\@doinumber}%
443     \ifx\@zblnumber\@empty\else
444     \protected@write\@mainrpi{}%
445       {\@percentchar zbl=\@zblnumber}%
446     \fi
447     \ifx\@mrnumber\@empty\else
448     \protected@write\@mainrpi{}%
449       {\@percentchar mr=\@mrnumber}%
450     \fi
451     \ifx\@arxivnumber\@empty\else
452     \protected@write\@mainrpi{}%
453       {\@percentchar arxiv=\@arxivnumber}%
454     \fi
455     \protected@write\@mainrpi{}%
456       {\@percentchar subjects=Primary \@primarysubjects; Secondary:
457         \@secondarysubjects}%
458     \protected@write\@mainrpi{}%
459       {\@percentchar keywords=\@keywords}%
460     \protected@write\@mainrpi{}%
461       {\@percentchar abstract=\@aom@abstract}%
462     \protected@write\@mainrpi{}%
463       {\@percentchar articlelanguage=\languagename}%
464     \AtEndDocument{\closeout\@mainrpi}%
465     \fi
466 \egroup}

```

\@maketitle@hook We add writing the information to the hook:

```

467 \def\@maketitle@hook{\aom@write@paper@info\global\let\@maketitle@hook\@empty}

```

`\@settitle` We do not uppercase title. Also, we use this occasion to set PDF information:

```
468 \def\@settitle{\begin{center}}%
469 \baselineskip20\p@\relax
470 \bfseries\LARGE
471 \@title
472 \ifpdf
473 \hypersetup{pdftitle=\@title}%
474 \fi
475 \end{center}}%
476 }
```

`\@setauthors` Now we typeset authors according to our specs. Again, we use this occasion to set some PDF information:

```
477 \def\@setauthors{%
478 \ifx\authors\@empty\relax\else
479 \begingroup
480 \def\thanks{\protect\thanks@warning}%
481 \trivlist
482 \centering\footnotesize \@topsep30\p@\relax
483 \advance\@topsep by -\baselineskip
484 \item\relax
485 \def\@and{\upshape \@aom@and}}%
486 \author@andify\authors
487 \ifpdf
488 \bgroup
489 \def\@aom@orcidlink##1{%
490 \xdef\@tempa{\authors}}%
491 \egroup
492 \hypersetup{pdfauthor=\@tempa}%
493 \fi
494 \def\{\protect\linebreak}%
495 \small \@aom@by} \scshape\authors%
496 \@processcurrentcontribgroup
497 \ifx\@empty\contribs
498 \else
499 ,\penalty-3 \space \@setcontribs
500 \fi
501 \endtrivlist
502 \endgroup
503 \fi}
```

`\@setcontribs` Contributors are set up in the same way as authors:

```
504 \def\@setcontribs{%
505 \def\@and{\upshape \@aom@and}}%
506 \author@andify\contribs
507 \contribs
508 }
```

`\@adminfootnotes` We do not typeset keywords, so we change the definition:

```
509 \def\@adminfootnotes{%
510 \let\@makefnmark\relax \let\@thefnmark\relax
511 \ifx\@empty\@date\else \@footnotetext{\@setdate}\fi
512 \ifx\@empty\@subjclass\else \@footnotetext{\@setsubjclass}\fi
```

```

513 \ifx\@empty\@keywords\else\@setkeywords\fi
514 \ifx\@empty\@primarysubjects
515     \ifx\@empty\@secondarysubjects
516     \else\@setsubjects\fi
517 \else\@setsubjects\fi
518 \ifx\@empty\thankses\else \@footnotetext{%
519     \def\par{\let\par\@par}\@setthanks}%
520 \fi
521 \ifx\@empty\@copyrightnote\else \@footnotetext{%
522     \def\par{\let\par\@par}\@copyrightnote\@addpunct.}%
523 \fi
524 }

```

\@setkeywords Typesetting keywords

```

525 \def\@setkeywords{%
526     \ifpdf
527     \hypersetup{pdfkeywords=\@keywords}%
528     \fi
529     \if@aom@oldkeywords\else
530     \@footnotetext{Keywords: \@keywords}%
531     \fi
532 }

```

\@setsubjects Setting subjects

```

533 \def\@setsubjects{%
534     \let\@subjects\@empty
535     \ifx\@primarysubjects\@empty\else
536     \edef\@subjects{Primary:~\@primarysubjects}%
537     \fi
538     \ifx\@secondarysubjects\@empty\else
539     \ifx\@primarysubjects\@empty
540     \edef\@subjects{Secondary:~\@secondarysubjects}%
541     \else
542     \edef\@subjects{\@subjects; Secondary:~\@secondarysubjects}%
543     \fi
544     \fi
545     \ifpdf
546     \hypersetup{pdfsubject=\@subjects}%
547     \fi
548     \if@aom@oldkeywords\else
549     \@footnotetext{AMS Classification:~\@subjects.}%
550     \fi
551 }

```

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

```

552 \def\@@and{\MakeLowercase{\@aom@and}}

```

3.10 Typesetting End Matter

End matter is typeset at the end of the paper.

\enddoc@text This is the main macro for typesetting endmatter.

```

553 \def\enddoc@text{%
554   \ifx\@empty\@translators \else\@settranslators\fi
555   \ifx\@empty\@received \else\@setreceived\fi
556   \ifx\@empty\@revised \else\@setrevised\fi
557   \ifx\@empty\@addresses \else\@setaddresses\fi}

\@setreceived A bunch of macros for setting centered dates
\@setrevised 558 \def\@setreceived{\centering(Received: \@received)\par}}
\@setaccepted 559 \def\@setrevised{\centering(Revised: \@revised)\par}}
\@setpublished 560 \def\@setaccepted{\centering(Accepted: \@accepted)\par}}
\@setpublishedonline 561 \def\@setpublished{\centering(Published: \@published)\par}}
562 \def\@setpublishedonline{\centering(Published online: \@publishedonline)\par}}

\emailaddrname We do not want the word “address” here:
563 \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
564 \def\@setaddresses{\par
565   \nobreak \begingroup
566   \footnotesize
567   \def\author##1{\nobreak\addvspace\bigskipamount{\scshape##1\par}}%
568   \def\{\unskip, \ignorespaces}%
569   \interlinepenalty\@M
570   \def\address##1##2{\begingroup
571     \par
572     \@ifnotempty{##1}{(\ignorespaces##1\unskip) }%
573     {\ignorespaces##2}\par\endgroup}%
574   \def\curraddr##1##2{\begingroup
575     \@ifnotempty{##2}{\nobreak\indent\curraddrname
576       \@ifnotempty{##1}{, \ignorespaces\scshape##1\unskip}\hskip0.2em:\space
577       ##2\par}\endgroup}%
578   \def\email##1##2{\begingroup
579     \@ifnotempty{##2}{\nobreak\indent\emailaddrname
580       \@ifnotempty{##1}{, \ignorespaces##1\unskip}\hskip0.2em:\space
581       \href{mailto:##2}{\nolinkurl{##2}}\par}\endgroup}%
582   \def\urladdr##1##2{\begingroup
583     \@ifnotempty{##2}{\nobreak\indent
584       \@ifnotempty{##1}{, \ignorespaces##1\unskip}%
585       \url{##2}\par}\endgroup}%
586   \def\orcid##1{\begingroup
587     \@ifnotempty{##1}{\nobreak\indent
588       \url{https://orcid.org/##1}\par}\endgroup}%
589   \addresses
590   \endgroup
591 }

```

3.11 Sectioning

```

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

```

```

\section We want our sections to be centered and bold:

```

```

593 \def\section{\@startsection{section}{1}%
594 \z@{.7\linespacing\@plus\linespacing}{.5\linespacing}%
595 {\normalfont\bfseries\centering}}

```

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

```

596 \def\subsection{\@startsection{subsection}{2}%
597 {\parindent}{.5\linespacing}{-.5em}%
598 {\normalfont\itshape}}

```

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

```

599 \def\oldsubsections{%
600 \gdef\subsection{\@startsection{subsection}{2}%
601 {\parindent}{.5\linespacing\@plus.7\linespacing}{-.5em}%
602 {\normalfont\itshape}}

```

`\subsubsection` Subsubsections are formatted exactly like subsections:

```

603 \def\subsubsection{\@startsection{subsubsection}{3}%
604 {\parindent}{.5\linespacing}{-.5em}%
605 {\normalfont\itshape}}

```

`\Hy@AlphNoErr` The newer (circa 2012) hyperref defines this command. However, older versions do not. Here we provide it:

```

606 \providecommand\Hy@AlphNoErr[1]{%
607 \ifnum\value{#1}>26 %
608   Alph\number\value{#1}%
609 \else
610   \ifnum\value{#1}<1 %
611     Alph\number\value{#1}%
612   \else
613     \Alph{#1}%
614   \fi
615 \fi
616 }%

```

`\appendix` We redefine appendix to ensure the letter in section number is always upright:

```

617 \def\appendix{\par\c@section\z@ \c@subsection\z@
618 \gdef\theHsection{\Hy@AlphNoErr{section}}}%
619 \let\sectionname\appendixname
620 \def\thesection{{\upshape\@Alph\c@section}}

```

3.12 Figures and Tables

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

```

621 \def\@captionheadfont{\normalfont}

```

3.13 Theorems

Here we redefine three main style of `amst`. 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.

```

622 \newtheoremstyle{plain}{0.5\linespacing}{0.5\linespacing}{\sishape}%
623   {\parindent}{\scshape}{.}{0.5em}%
624   {\thmname{#1}\thmnumber{ #2}\thmnote{\normalfont} (#3)}

```

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

```

625 \newtheoremstyle{definition}{0.5\linespacing}{0.5\linespacing}%
626   {\upshape}{\parindent}%
627   {\sishape}{.}{0.5em}%
628   {\thmname{#1}\thmnumber{ #2}\thmnote{\normalfont} (#3)}

```

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

```

629 \newtheoremstyle{remark}{0.5\linespacing}{0.5\linespacing}%
630   {\upshape}{\parindent}%
631   {\sishape}{.}{0.5em}%
632   {\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.

```

633 \renewcommand{\newtheorem}{\@ifstar{\@aom@newthm@star}{\@aom@newthm}}
634 \def\@aom@newthm@star{\@ifnextchar[{\@aom@newthm@star@}{\@aom@newthm@star@[]}}
635 \def\@aom@newthm{\@ifnextchar[{\@aom@newthm@}{\@aom@newthm@[]}}
636 \def\@aom@newthm@star@[#1]{\@xnthm *}
637 \def\@aom@newthm@[#1]{\@xnthm \relax}

```

`proof` We want our proofs to be indented:

```

638 \renewenvironment{proof}[1][\proofname]{\par
639   \pushQED{\qed}%
640   \normalfont \topsep6\p@\@plus6\p@\relax
641   \trivlist
642   \item[\hskip\labelsep\hskip\parindent
643     \itshape
644     #1\@addpunct{.}]\ignorespaces
645 }{\%
646   \popQED\endtrivlist\@endpefalse
647 }

```

3.14 Bibliography Macros

`\repeatedauthors` When the authors are repeated, we used change them to `\bysame`; we no more do this:

```

648 \def\repeatedauthors#1{\ClassWarning{aomart}{The command is obsolete}#1}

```

```

\bysame We no longer use \bysame
649 \let\bysame@@orig=\bysame
650 \def\bysame{\ClassWarning{aomart}{We no longer omit
651   repeated authors}\bysame@@orig}

\doi Typesetting doi...
652 \def\doi#1{%
653   \if@aom@doiMMXVI
654     \url{http://dx.doi.org/#1}%
655   \else
656     \if@aom@olddoi
657       \href{http://dx.doi.org/#1}{doi: \path{#1}}%
658     \else
659       \url{https://doi.org/#1}%
660     \fi
661   \fi}

\mr Typesetting urls
\zbl 662 \def\mr#1{\href{http://www.ams.org/mathscinet-getitem?mr=#1}{MR~\path{#1}}}
\arxiv 663 \def\zbl#1{\href{http://www.zentralblatt-math.org/zmath/en/search/?q=an:#1}{Zbl~\path{#1}}}
\jfm 664 \def\arxiv#1{\href{http://www.arxiv.org/abs/#1}{arXiv~\path{#1}}}
665 \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
666 \renewcommand{\bibliofont}{\small}

```

3.15 Additional Macros

```

\EditorialComment This macro is noop in normal mode, but is a tiny marginpar in the manuscript
mode
667 \def\EditorialComment#1{\if@aom@manuscript@mode\bgroup
668   \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.
669 \def\@fullref#1#2#3#4{\hyperref[#3]{#1~#2\ref*{#3}#4}}

\fullref A reference without parentheses:
670 \newcommand{\fullref}[2]{\@fullref{#1}{-}{#2}{-}}

\pfullref A reference with parentheses:
671 \newcommand{\pfullref}[2]{\@fullref{#1}{(}{#2}{)}}

\bfullref A reference with brackets:
672 \newcommand{\bfullref}[2]{\@fullref{#1}{[}{#2}{]}}

\eqfullref Here we do not use the standard common \@fullref because we want \eqref to
work...
673 \newcommand{\eqfullref}[2]{\hyperref[#2]{#1~\textup{\tagform@{\ref*{#2}}}}}

```

`\fullpageref` A wide link for page reference. Note that the word “page” can be omitted
674 `\newcommand{\fullpageref}[2][page]{\hyperref[#2]{#1~\pageref*{#2}}}`

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

```
675 \def\eqnarray{%
676   \stepcounter{equation}%
677   \def\@currentlabel{\p@equation\theequation}%
678   \global\@eqnswtrue
679   \m@th
680   \global\@eqcnt\z@
681   \tabskip\@centering
682   \let\\\@eqncr
683   $$\arraycolsep1\p@
684   \everycr{}\halign to\displaywidth\bgroup
685     \hskip\@centering$\displaystyle\tabskip\z@skip{##}$\@eqnse1
686     &\global\@eqcnt\@ne\hskip \tw@\arraycolsep \hfil{##}$\hfil
687     &\global\@eqcnt\tw@ \hskip \tw@\arraycolsep
688     $\displaystyle{##}$\hfil\tabskip\@centering
689     &\global\@eqcnt\thr@@ \hb@xt@\z@\bgroup\hss##\egroup
690     \tabskip\z@skip
691   \cr
692 }
```

`\funding` The macro to print grants. It adds to the `rpi` file the information about grants

```
693 \newcommand\funding[3][]{%
694   \protected@write\@mainrpi{%
695     {\@percentchar sponsor=#2, grantid=#3}%
696     \def\@tempa{#1}\relax%
697     \ifx\@tempa\@empty\relax
698       \def\@tempb{#3}%
699       #2%
700       \ifx\@tempb\@empty\relax\else\ (grant~#3)\fi
701     \else
702       #1
703     \fi}
```

3.16 End of Class

```
704 </class>
```


References

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Change History

v0.10	General: Bibliography styles update	2	Made remark theorem style identical to definition theorem style	30
	Documentation update	2	Made Roman font the default URL font	15
	Screen mode triggers special URL settings	15	<code>\@fullref</code> : Added macro	31
	<code>\ifaom@screen@mode</code> : Added screen mode	13	<code>\@setaddresses</code> : Deleted the word URL	28
	<code>\jfm</code> : Added macro	31	E-mail is now in Roman font	28
v0.2	General: First fully functional version	2	<code>\@setpublishedonline</code> : Decreased font	28
v0.3	General: Added DOI number in headers	18	<code>\@typesizes</code> : Corrected typo in the definition of Small	16
	Added package <code>mdputu</code>	16	Increased LARGE from 16 pt to 17 pt	16
	Documentation update	2	<code>\bfullref</code> : Added macro	31
	<code>\arxiv</code> : Added macro	31	<code>\emailaddrname</code> : Changed macro	28
	<code>\corresponding</code> : Added macro	24	<code>\eqfullref</code> : Added macro	31
	<code>\doinumber</code> : Added macro	24	<code>\fullref</code> : Added macro	31
	<code>\EditorialComment</code> : Added macro	31	<code>\pfullref</code> : Added macro	31
	<code>\ifaom@manuscript@mode</code> : Added manuscript mode	13	<code>proof</code> : Redefined macro	30
	<code>\mr</code> : Added macro	31	<code>\subsection</code> : Redefined macro	29
	<code>\mrnumber</code> : Added macro	24	v0.6	
	<code>\newtheorem</code> : Redefined macro	30	General: Changes to bst files	2
	<code>\proposed</code> : Added macro	24	Fullref.pl is much less aggressive now	2
	<code>\seconded</code> : Added macro	24	<code>\@setauthors</code> : 'By' and 'and' are in Roman font now	26
	<code>\version</code> : Added macro	24	<code>\belowdisplayskip</code> : Changed belowdisplayskip	16
	<code>\zbl</code> : Added macro	31	<code>\bibliofont</code> : Changed default	31
	<code>\zblnumber</code> : Added macro	24	<code>\zbl</code> : Changed capitalization	31
v0.4	General: Changed definition theorem style	30	v0.7	
	Changed plain theorem style	30	General: Bibliography styles changed	2
	Deleted <code>lineno</code> package dependence	15	v0.8	
	Deleted remark theorem style	30	General: Added <code>yhmath</code>	15
	Documentation update	2	Bibliography styles update	2
	Switched to upright digits in italics everywhere	16	Changed authors in header	17
	Used line numbers for headings	17	Documentation update	2
	<code>\@aom@linecount</code> : Added macro	17	Switched to <code>cmtiup</code>	16
	<code>\enddoc@text</code> : Deleted many dates.	27	<code>\specialdigits</code> : Redefined to <code>noop</code>	16
v0.5	General: Added extra footer in manuscript mode	17	v0.9	
	Corrected the byg with math in headers	17	General: Bibliography styles update	2
			Changed font for the folio on the first page	18
			Documentation update	2
			<code>\@and</code> : Redefined macro	27

\@setaddresses: Deleted spurious space in urladdress	28	\@om@write@paper@info: Added macro	24
\@setpublishedonline: Increased font	28	v1.14a \annalsurl: New url	18
abstract: Added parindent for the first par	24	v1.15 \doi: Doi according to the new Crossref recommendations . . .	31
\eqnarray: Redefined standard macro	32	\if@aom@doiMMXVI: Added another options	14
v1.0		v1.16	
General: Top matter macros are now only in preamble	2	General: We require environ package	15
\doinumber: Added default	24	\@om@write@paper@info: Added names, abstract, subjects, keywords, zblnumber,	24
\papernumber: Added macro	22	Corrected the endpage bug	24
v1.1		\arxivnumber: Added macro	24
General: In manuscript mode the links are always blue	15	\author: Redefined amsart definition	19
v1.10		abstract: Redefined using environ	24
\@and: Added internationalization	27	\email: Redefined amsart definition	21
\@aom@and: Added macro	15	\fulladdress: Redefined	19
\@aom@by: Added macro	15	\givenname: Redefined	19
\@setauthors: Internationalization	26	\surname: Redefined	19
\doi: Introduced the logic for old doi formatting	31	\urladdr: Redefined amsart definition	21
\if@aom@olddoi: Added old DOI processing	14	v1.17	
v1.11		General: Added new field totalpages to the bibliography . .	2
General: Added \fulladdress	2	v1.17a	
Added new commands for copyright statement	2	General: Bug fixed in aomplain.bst	2
Bibliography change: titlenote, deleted bysame	2	v1.18	
Deleted \repeatedauthors from the documentation	2	General: New option oldkeywords and printing keywords and subjects by default	2
\@adminfootnotes: Added copyright statement	26	\@setaddresses: Added orcid	28
\@setaddresses: Changed email handling	28	\@setkeywords: Now we print keywords	27
\bysame: Made the macro obsolete	31	\@setsubjects: Now we print subjects	27
\copyrightnote: Added macro	24	\if@aom@oldkeywords: Added keywords processing	14
\copyrightyear: Added macro	24	\orcid: Added macro	21
\fulladdress: Added macro	19	\subject: Drop scheme and primary/secondary	21
\repeatedauthors: Now this command is obsolete	30	v1.19	
v1.12		General: Bibliography changes	2
\appendix: Added hyperref definition	29	v1.2	
v1.13		General: Bibliography styles update	2
\Hy@AlphNoErr: Added macro for older installations	29	\@setaddresses: Changed font for current address	28
v1.14			
\@mainrpi: Added macro	24		
\@maketitle@hook: Added macro	25		

<code>\arxiv</code> : Now we properly treat numbers with underscores ...	31	<code>\if@startcontribgroup</code> : Introduced macro	20
<code>\doi</code> : Now we properly treat numbers with underscores ...	31	v1.27	
<code>\jfm</code> : Now we properly treat numbers with underscores ...	31	<code>\aom@write@paper@info</code> : Keep the .rpi file open till the end of document	24
<code>\mr</code> : Now we properly treat numbers with underscores ...	31	<code>\funding</code> : Added macro	32
<code>\oldsubsections</code> : Introduced macro	29	v1.28	
<code>\subsection</code> : Decreased vertical spacing	29	<code>\@setauthors</code> : Added treatment of orcid	26
<code>\zbl</code> : Now we properly treat numbers with underscores ...	31	<code>\aom@current@orcid@target</code> : Added macro	21
v1.20		<code>\aom@orcidlink</code> : Added macro ..	21
<code>\@adminfootnotes</code> : Make primary and secondary subjects separated	26	<code>\contrib</code> : Added typesetting orcid	20
<code>\@setsubjects</code> : Make primary and secondary subjects separated ..	27	<code>\orcid</code> : Added typesetting orcid ..	21
<code>\aom@write@paper@info</code> : Make primary and secondary subjects separated	24	v1.29	
<code>\subject</code> : Make primary and secondary subjects separated ..	21	<code>\@setaddresses</code> : Reformatted ..	28
v1.21		v1.3	
<code>\@getabstract</code> : Added multilanguage abstracts	23	General: Corrected bug with doinumber	18
<code>\aom@write@paper@info</code> : Added main language	24	v1.30	
<code>\g@addto@abstract</code> : Added macro	23	<code>\@citex</code> : Redefined mactoc	14
v1.22		<code>\@makefnmar</code> : Use kernel version of footnote marks	14
General: In screen mode we no longer crop pages	15	<code>\@makefnmark@kernel</code> : Use kernel version of footnote marks ...	14
v1.23		v1.4	
General: Made ymath large symbols default	15	General: Deleted noamsfonts option	14
<code>\widetilde</code> : We are taking wide hat and wide tilde from amsfonts	16	<code>\subsection</code> : Deleted stretch in vertical spacing	29
v1.24		<code>\subsubsection</code> : Introduced the macro	29
<code>\if@aom@printscheme</code> : Added optional printing of scheme ..	14	v1.5	
<code>\subject</code> : Added scheme	21	General: Added noopsort to the styles, corrected typo	2
v1.25		Added sortyear to the styles ...	2
<code>\fullpageref</code> : Added macro ...	32	<code>\arxiv</code> : Typo corrected	31
v1.26		v1.6	
<code>\@currentcontribution</code> : Introduced macro	20	General: Bibliography change: aomalpha now respects key field in the bib file	2
<code>\@currentcontributors</code> : Introduced macro	20	<code>\appendix</code> : Redefined the macro ..	29
<code>\@processcurrentcontribgroup</code> : Introduced macro	20	v1.7	
<code>\contrib</code> : Redefined amsart macro	20	General: Suppressed page number in the header for one-page articles	18
<code>\contribs</code> : Introduced macro ...	20	v1.9	
		<code>\doi</code> : Changed doi look	31
		v2.28	
		<code>\headheight</code> : Increased	17
		v2.30	
		General: Changed the margins for enumerate	17

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	
<code>\@and</code>	254, 485, 505, <u>552</u>
<code>\@Alph</code>	..... 620
<code>\@M</code>	..... 569
<code>\@accepted</code>	338, 339, 560
<code>\@addpunct</code>	... 522, 644
<code>\@adminfootnotes</code>	.. <u>509</u>
<code>\@annalsurl</code>	... 170, 185
<code>\@aom@abstract</code>	.... .. 359, 360, 368, 461
<code>\@aom@and</code>	..... .. 86, 88, 89, 90, 254, 485, 505, 552
<code>\@aom@by</code>	..... .. 85, 88, 89, 90, 495
<code>\@aom@doiMMXVifalse</code>	42
<code>\@aom@doiMMXVitrue</code>	.. 43
<code>\@aom@linecount</code>	... .. <u>140</u> , 154, 157, 166
<code>\@aom@manuscript@modefalse</code>	..... 33
<code>\@aom@manuscript@modetrue</code>	..... 34
<code>\@aom@newthm</code>	.. 633, 635
<code>\@aom@newthm@</code>	.. 635, 637
<code>\@aom@newthm@star</code>	..... 633, 634
<code>\@aom@newthm@star@</code>	..... 634, 636
<code>\@aom@olddoifalse</code>	.. 39
<code>\@aom@olddoittrue</code>	.. 40
<code>\@aom@oldkeywordsfalse</code>	..... 45
<code>\@aom@oldkeywordstrue</code>	..... 46
<code>\@aom@printschemefalse</code>	..... 48
<code>\@aom@printschemetrue</code>	..... 49
<code>\@aom@screen@modefalse</code>	..... 36
<code>\@aom@screen@modetrue</code>	..... 37
<code>\@arxivnumber</code>	.... .... 400, 451, 453
<code>\@auxout</code>	..... 65
<code>\@captionheadfont</code>	.. <u>621</u>
<code>\@centering</code>	681, 685, 688
<code>\@cite</code>	..... 62
<code>\@cite@ofmt</code>	..... 70
<code>\@citea</code>	..... 61, 63
<code>\@citeb</code>	..... 62, 64, 65, 66, 69, 70
<code>\@citex</code>	..... <u>60</u>
<code>\@copyrightnote</code>	... .... 404, 521, 522
<code>\@copyrightyear</code>	402, 406
<code>\@currentcontribution</code>	.... <u>247</u> , 260, 271, 279, 284, 292
<code>\@currentcontributors</code>	.. <u>248</u> , 253, 255, 263, 268, 285, 287
<code>\@currentlabel</code>	.... 677
<code>\@date</code>	..... 511
<code>\@dblarg</code>	..... 245
<code>\@doinumber</code>	... 181, 182, 183, 394, 442
<code>\@empty</code>	.... 61, 64, 181, 228, 237, 253, 256, 270, 271, 311, 313, 314, 315, 316, 318, 335, 337, 339, 341, 343, 355, 406, 443, 447, 451, 467, 478, 497, 511, 512, 513, 514, 515, 518, 521, 534, 535, 538, 539, 554, 555, 556, 557, 697, 700
<code>\@endformatdate</code>	327, 328
<code>\@endpefalse</code>	..... 646
<code>\@eqcnt</code>	680, 686, 687, 689
<code>\@eqncr</code>	..... 682
<code>\@eqnset</code>	..... 685
<code>\@eqnswtrue</code>	..... 678
<code>\@firstofone</code>	..... 64
<code>\@footnotetext</code>	.... .... 511, 512, 518, 521, 530, 549
<code>\@for</code>	..... 62
<code>\@formatdate</code>	.. 327, <u>328</u>
<code>\@fullref</code>	..... .. <u>669</u> , 670, 671, 672
<code>\@getabstract</code>	.. <u>360</u> , 388
<code>\@gobble</code>	..... .. 390, 391, 392, 393
<code>\@ifnextchar</code>	.. 634, 635
<code>\@ifnotempty</code>	236, 572, 575, 576, 579, 580, 583, 584, 587
<code>\@ifpackageloaded</code>	.. 87
<code>\@ifstar</code>	..... 633
<code>\@ifundefined</code>	..... 66
<code>\@ixpt</code>	..... 109
<code>\@keywords</code>	311, 312, 459, 513, 527, 530
<code>\@latex@warning</code>	... 68
<code>\@listi</code>	..... 135
<code>\@mainrpi</code>	.. <u>408</u> , 412, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 444, 448, 452, 455, 458, 460, 462, 464, 694
<code>\@makefnmar</code>	..... <u>59</u>
<code>\@makefnmark</code>	57, 59, 510
<code>\@makefnmark@kernel</code>	..... <u>57</u> , 59
<code>\@maketitle@hook</code>	.. <u>467</u>
<code>\@mathmeasure</code>	... 93, 97
<code>\@mrnumber</code>	396, 447, 449
<code>\@names</code>	..... 223, 224, 225, 226, 230, 233, 289, 290, 292, 293, 298, 302, 307, 426
<code>\@ne</code>	..... 143, 145, 686
<code>\@nx</code>	..... 245, 246
<code>\@onlypreamble</code>	.... .... 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212,

213, 214, 215,	\@subjclass	512	\aom@current@orcid@target	. 235, 268, <u>304</u> , 308
216, 217, 218,	\@subjects	534, 536,	\aom@orcidlink . . . .	. . . . 308, <u>310</u> , 489
219, 220, 221, 222	\@tempa	267, 270,	\aom@size@warning 24,	27, 28, 29, 30, 31
\@par	519, 522	279, 354, 355,	\aom@write@paper@info	. . . . . <u>409</u> , 467
\@percentchar . . . .	. . . . .	415, 418, 440,	\appendix	<u>617</u>
.	424, 426,	490, 492, 696, 697	\appendixname	619
428, 430, 432,	\@tempb	698, 700	\arraycolsep . . . . .	. . . . . 683, 686, 687
434, 436, 438,	\@tempc	417, 418	\arxiv	<u>11</u> , <u>662</u>
440, 442, 445,	\@tempcnta	143,	\arxivnumber 7, 222, <u>394</u>	
449, 453, 456,	144, 145, 329, 333	\@thefnmark	\AtBeginDocument 87, 130	
459, 461, 463, 695	\@title	428, 471, 473	\AtEndDocument	464
\@plus 383, 594, 601, 640	\@topsep	482, 483	\author	5,
\@primaryscheme . . .	315	\@translators	188, 227, 294, 567	
\@primarysubjects .	. . . . .	554	\author@andify . . . .	. . . . 255, 486, 506
.	313, 456,	\@typesizes	\authors 228, 229, 232,	235, 304, 424,
514, 535, 536, 539	\@processcurrentcontribgroup	108	478, 486, 490, 495	
\@published 340, 341, 561	. . . . .	414	B	
\@publishedonline .	. . . . .	252, 283, 496	\baselineskip . . . . .	. . . . . 114, 469, 483
.	342, 343, 562	\@viipt	\begin	19,
\@received . . . . .	. 334, 335, 555, 558	109	153, 156, 165, 468	
. . . . .	. 336, 337, 556, 559	\@viipt . . . . .	\begingroup . . . . .	. 479, 565, 570,
\@secondaryschme . .	316	109	574, 578, 582, 586	
\@secondarysubjects	. . . . .	112	\belowdisplayskip . <u>120</u>	
.	314, 457,	\@xiipt	\bfseries	66,
515, 538, 540, 542	\@setabstract	111	379, 470, 592, 595	
\@setabstract	389	\@xnthm	\bfullref	8, <u>672</u>
\@setabstracta	389	\@xp	\bgroup 362, 376, 410,	488, 667, 684, 689
\@setaccepted	<u>558</u>	\@xpt	\bibliofont	<u>666</u>
\@setaddresses 557, <u>564</u>	\@setaddresses	112	\bigskipamount	567
\@setauthors	477	\@zblnumber 398, 443, 445	\box	377
\@setcontribs . 499, <u>504</u>	\@setdate	144, 180, 494, 568, 682	\bysame	<u>649</u>
\@setdate	511	_	\bysame@@orig . 649, 651	
\@setkeywords . 513, <u>525</u>	\@setpublished	700	C	
\@setpublishedonline	. . . . .	10pt (option)	\c@page	351
.	<u>558</u>	11pt (option)	\c@section	617, 620
\@setreceived . 555, <u>558</u>	\@setrevised . . 556, <u>558</u>	12pt (option)	\c@subsection	617
\@setrevised . . 556, <u>558</u>	\@setsubjclass	8pt (option)	\captionenglish . . .	90
\@setsubjclass	512	9pt (option)	\captionfrench	88
\@setsubjects . . . . .	. . . . .		\captionsgerman . . .	89
.	516, 517, <u>533</u>	A	\centering	379,
\@setthanks	519	\abovedisplayskip . <u>120</u>	482, 558, 559,	560, 561, 562, 595
\@settitle	<u>468</u>	\abstract		
\@settranslators . .	554	388		
\@startcontribgroupfalse	. . . . .	abstract (env.)		
.	251, 276, 280	6		
\@startcontribgrouptrue	. . . . .	\abstractbox . . . . .	
.	269	376, 377		
\@startsection . . . .	. 593, 596, 600, 603	\abstractname		
.		379		
		\accepted		
		7, 203, <u>334</u>		
		\address		
		5, 191, 570		
		\addresses		
		. 243, 294, 297,		
		301, 306, 557, 589		
		\addto		
		88, 89, 90		
		\addvspace		
		567		
		\advance		
		134, 145, 483		
		\Alph		
		613		
		\and		
		232, 233, 240,		
		257, 287, 289, 413		
		\annalsurl		
		<u>185</u>		

422, 446, 450,	<code>\headrulewidth</code> 138	<code>\indent</code> 575, 579, 583, 587
454, 465, 474,	<code>\headsep</code> 136	<code>\InputIfFileExists</code> . 51
493, 500, 503,	<code>\hexnumber@</code> 95, 99	<code>\interlinepenalty</code> . 569
511, 512, 513,	<code>\hfil</code> 686, 688	<code>\issuenum</code> 7, 212, 345
516, 517, 520,	<code>\href</code> 170,	<code>\item</code> 386, 484, 642
523, 528, 531,	310, 581, 657,	<code>\itemindent</code> 382
537, 543, 544,	662, 663, 664, 665	<code>\itshape</code> .. 106, 563,
547, 550, 554,	<code>\hskip</code> 132, 576, 580,	598, 602, 605, 643
555, 556, 557,	642, 685, 686, 687	
614, 615, 660,	<code>\hss</code> 689	J
661, 668, 700, 703	<code>\Hy@AlphNoErr</code> . 606 , 618	<code>\jfm</code> 11, 662
<code>final</code> (option) 4	<code>\hyperref</code> . 669, 673 , 674	<code>\jobname</code> 412
<code>\footins</code> 120	<code>\hypersetup</code> 74, 77, 80,	K
<code>\footnotesize</code> . 151,	473, 492, 527, 546	<code>\kern</code> 310
153, 184, 482, 566	<code>\HyPsd@@@pageref</code> .. 176	<code>\keyword</code> ... 6, 199, 311
<code>\footrulewidth</code> 138		
<code>\footskip</code> 125	I	L
<code>\formatdate</code> 7, 327	<code>\if@aom@doiMMXVI</code> 41 , 653	<code>\labelenumi</code> 132
<code>\fulladdress</code> 5, 196, 223	<code>\if@aom@manuscript@mode</code>	<code>\labelsep</code>
<code>\fullpageref</code> 8, 674	. . . . . 32 , 76,	. 131, 132, 134, 642
<code>\fullref</code> 8, 670	140, 152, 164, 667	<code>\labelwidth</code> ... 134, 380
<code>\fullwidthdisplay</code> . 384	<code>\if@aom@olddoi</code> . 38 , 656	<code>\language</code>
<code>\funding</code> 10, 693	<code>\if@aom@oldkeywords</code>	. 363, 364, 367,
	. . . . . 44 , 529, 548	370, 420, 421, 463
G	<code>\if@aom@printscheme</code>	<code>\LARGE</code> 470
<code>\g@addto@abstract</code> .	. . . . . 47 , 323	<code>\leavevmode</code> 60
. 359 ,	<code>\if@aom@screen@mode</code>	<code>\leftmargin</code> ... 133, 381
366, 367, 369, 370	. . . . . 35 , 73	<code>\leftmargini</code>
<code>\g@addto@macro</code>	<code>\if@filesw</code> 65, 411	. . . . . 132, 133, 134
. 224, 225,	<code>\if@startcontribgroup</code>	<code>\let</code> .. 10, 57, 59, 61,
226, 230, 232,	. . . . . 250 , 282	106, 107, 115,
233, 240, 243,	<code>\ifcase</code> 330	313, 314, 315,
257, 259, 261,	<code>\ifdim</code> 94, 98	316, 335, 337,
262, 287, 289,	<code>\IfFileExists</code> 101	339, 341, 343,
290, 291, 293,	<code>\ifnum</code> 145, 351, 607, 610	384, 390, 391,
294, 297, 298,	<code>\ifpdf</code> 472, 487, 526, 545	392, 393, 467,
301, 302, 306,	<code>\ifx</code> .. 175, 180, 181,	510, 519, 522,
307, 308, 312,	228, 237, 253,	534, 619, 649, 682
321, 324, 359, 368	256, 270, 271,	<code>\thead</code> 165
<code>\G@refundefinedtrue</code> 67	279, 311, 318,	<code>\linebreak</code> 494
<code>\gdef</code> 185, 229,	355, 363, 372,	<code>\linespacing</code> .. 114,
235, 238, 268,	389, 406, 414,	594, 597, 601,
284, 285, 311,	420, 443, 447,	604, 622, 625, 629
319, 394, 396,	451, 478, 497,	<code>\list</code> 380
398, 400, 600, 618	511, 512, 513,	<code>\listparindent</code> 382
<code>\givenname</code> . 5, 195, 223	514, 515, 518,	<code>\LoadClass</code> 58
<code>\global</code> 376, 467, 678,	521, 535, 538,	<code>\long</code> 24, 360, 361
680, 686, 687, 689	539, 554, 555,	<code>\loop</code> 144
	556, 557, 697, 700	
H	<code>\ignorespaces</code>	M
<code>\halign</code> 684	. 568, 572, 573,	<code>\m@th</code> 679
<code>\hb@xt@</code> 689	576, 580, 584, 644	<code>\MakeLowercase</code> 552
<code>\hbox</code> 66	<code>\immediate</code> 65	<code>\maketitle</code> . 6, 372, 374
<code>\headheight</code> 137	<code>\includegraphics</code> .. 310	<code>\MakeUppercase</code> 161

<code>\skip</code>	123	<code>\textstyle</code>	93, 97	<code>\usebox</code> ...	154, 157, 166	
<code>\Small</code>	386	<code>\textup</code>	673	<code>\usepackage</code>	9, 11, 12, 13	
<code>\small</code>	495, 666	<code>\textwidth</code>	<u>116</u>	V		
<code>\space</code>	69, 261, 333, 374, 413, 499, 576, 580	<code>\thanks</code>	6, 198, 480	<code>\value</code>	607, 608, 610, 611	
<code>\specialdigits</code>	<u>105</u>	<code>\thanks@warning</code> ...	480	<code>\version</code> ...	7, 210, <u>393</u>	
<code>\start@page</code>	172, 174, 350, 352, 415, 438	<code>\thankses</code>	518	<code>\vglue</code>	378, 379	
<code>\startpage</code>		<code>\the</code>	144, 333	<code>\volumenumber</code>	7, 211, <u>344</u>	
..	7, 217, <u>349</u> , 357	<code>\theequation</code>	677	<code>\vtop</code>	376	
<code>\stepcounter</code>	676	<code>\theHsection</code>	618	W		
<code>\string</code> ...	65, 246, 413	<code>\thepage</code>	69, 151, 153, 184	<code>\wd</code>	94, 98	
<code>\subject</code> ...	7, 200, <u>313</u>	<code>\thesection</code>	620	<code>\widebar</code>	8, 10, <u>115</u>	
<code>\subsection</code> ...	<u>596</u> , 600	<code>\thmname</code> ..	624, 628, 632	<code>\widehat</code>	8, <u>93</u>	
<code>\subsubsection</code>	<u>603</u>	<code>\thmnote</code> ..	624, 628, 632	<code>\wideparen</code>	8	
<code>\surname</code> ...	5, 197, <u>223</u>	<code>\thmnumber</code>	624, 628, 632	<code>\widering</code>	8	
<code>\symAMSb</code>	95, 99	<code>\thr@@</code>	689	<code>\widetilde</code>	8, <u>93</u>	
T			<code>\title</code>	5, 187	<code>\widetriangle</code>	8
<code>\tabskip</code>		<code>\topsep</code>	640	<code>\widowpenalty</code>	<u>128</u>	
..	681, 685, 688, 690	<code>\topskip</code>	<u>120</u>	<code>\write</code>	65	
<code>\tagform@</code>	673	<code>\trivlist</code>	481, 641	X		
<code>\tempa</code>	173, 175, 176, 178, 180	<code>\tw@</code>	94, 98, 686, 687	<code>\xdef</code>	93, 97, 490	
<code>\tempb</code>	174, 180	U				
<code>\textbf</code>	170	<code>\undefined</code> ...	363, 420	Z		
<code>\textcopyright</code>	405	<code>\underline</code>	144	<code>\z@</code>	93, 94, 97, 98, 127, 351, 380, 383, 594, 617, 680, 689	
<code>\textheight</code>	<u>116</u>	<code>\unskip</code>	568, 572, 576, 580, 584	<code>\z@skip</code>	685, 690	
<code>\textit</code>	107	<code>\upshape</code> ..	254, 485, 505, 620, 626, 630	<code>\zbl</code>	<u>11</u> , <u>662</u>	
<code>\textsi</code>	107	<code>\url</code> ..	585, 588, 654, 659	<code>\zblnumber</code> .	7, 221, <u>394</u>	
		<code>\urladdr</code>	5, 193, <u>300</u> , 582			
		<code>\urlstyle</code>	83			