

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

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Abstract

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

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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 $\text{\LaTeX}$ 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 $\text{\LaTeX}$ 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 $\text{\LaTeX}$ packages:

1. Run `latex` on `aomart.ins`. This will produce the file `aomart.cls`.
2. Put the file `aomart.cls` to the place where $\text{\LaTeX}$ can find them (see [2] or the documentation for your $\text{\TeX}$ system).
3. Update the database of file names. Again, see [2] or the documentation for your $\text{\TeX}$ 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 $\text{\LaTeX}$ 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 uprgiht 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 `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 manuscript The option `manuscript` is intended to facilitate the communications between 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 screen The option `screen` is intended for the onscreen version of the article. If this option is selected, the links are blue colored, and the margins are reduced.

option olddoi 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 doi2016 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 oldkeywords 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`, ..., `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 L^AT_EX). 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`
`\revised` accept as a parameter a date in the form `\formatdate{YYYY-MM-DD}`, for
`\accepted` 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
`\seconded` 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`,
`\issuenumber` `\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`

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.

The class has a system of editorial comments and highlighting for communication between copy editors, production editors, journal editors and authors. All these comments are visible only in the `manuscript` mode. In production environment they are not displayed.

The important feature of these commands is the notion of **audience**. Each comment or highlighting has an audience in mind, which is the optional argument of the comments and highlights. One can selectively enable the comments for the given audience. There is a special audience called `default`, which is enabled, well, by default. All other audiences must be enabled explicitly.

`\EditorialComment` The macro `\EditorialComment[audience]{comments}[vertical offset]` typesets the comments on the margins in the `manuscript` mode for the selected audience, for example,

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

```
Erd"os proved the following
theorem~\cite{Erd01}.\EditorialComment[Editor]{Please check the
citation}
```

The style does not check whether comments overlap, so sometimes you need to manually shift a comment up or down. The second optional argument will do it, for example

```
Erd"os proved the following
theorem~\cite{Erd01}.\EditorialComment[Editor]{Please check the
citation}[-5pt]
```

`\Highlight` The macro `\Highlight[audience]{text}` highlights the **text** for the selected **audience**. The highlighting is done using the color selected for the given audience, for example

```
This is described by the following
```


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

```
theorem\Highlight{:}\EditorialComment{Added ‘:’}
```

```
This is described by the following
theorem\Highlight[Editor]{:}\EditorialComment[Editor]{Do we need
‘:’ here?}
```

`\ECSelect` The audiences to be displayed are selected by the command `\ECSelect[⟨color⟩]{⟨audience⟩}` audiences, for example,

```
\ECSelect{Editor}
\ECSelect[teal]{Author}
```

The default color is black, and the audience “default” is selected by default.

`\HSelect` The command `\Hselect[⟨color⟩]{⟨audience⟩}` selects the audience for which the highlight is intended. The optional argument “color” is used for highlighting, for example,

```
\HSelect[green]{Editor}
```

The default color is red, and the audience “default” is selected by default.

2.4 Additional Macros

`eqnarray` (*env.*) 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 avilable, 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`, `\widetriangle`, `\widering`, `\widebar`. See Table 1 for the example of the usage.

`\wideparen` A set of macros is used to make more convenient clickable references in the on-line versions of papers. The package `hyperref` [4] makes clickable reference numbers in the phrases like

```
\fullref
\pfullref ...in theorem~\ref{thm:Noeter}...
\bfullref ...see equation~\eqref{eq:alpha}...
\eqfullref
\fullpageref
```

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 and color

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).

`\includecolorgraphics` The printed edition of the journal cannot use color illustrations. The online version can, although we recommend against the reliance of color since it might not be accessible for people with color perception problems. If you want to use color illustrations for the online version, you need to prepare two versions, a color one, and a BW (or grayscale one) with *identical sizes and contents*. The command `\includecolorgraphics[<options>]{<color-file>}{<bw-file>}` can be used to select the proper illustration: in the screen mode the color one is chosen, and otherwise the bw one is chosen.

`\IfColorTF` Sometimes graphics is created inside `.tex` file with packages like `tikz`. The command `\IfColorTF{<color-version>}{<bw-version>}` can be used in this case. It has two arguments, the first one is used for the color version of the output, and the second one is used for the BW version. It is up to the author that both version produce the same output with the changes in the color only.

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 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.

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. For books, dissertations, manuals and reports this field stores the total pages in the item, for example,

```
@Book{Arnold89:MathMethodsMechanics,
  author = {Arnold, V. I.},
  title = {Mathematical Methods of Classical Mechanics},
  publisher = {Springer},
  year = 1989,
  volume = 60,
  series = {Graduate Texts in Mathematics},
  address = {New York},
  edition = {Second},
  totalpages = {xvi+516}
}
```

`\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` BibTeX, 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,french]{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 [2026/08/12 v1.38 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], and [3].

Note that we do not want to use `\andify` since it requires fine control of expansion. Rather, we just count the number of commas. Below `\@tempcnta` is the total number of cites, and `\@tempcntb` is the current cite.

```
60 \def\@citex[#1]#2{\leavevmode
61   \@tempcnta=0
62   \for\@citeb:=#2\do{\advance\@tempcnta by 1}%
63   \@tempcntb=1
```

```

64 \let\@citea\@empty
65 \@cite{\@for\@citeb:=#2\do
66   {\@citea\def\@citea{, []}%
67     \advance\@tempcntb by 1
68     \ifnum\@tempcnta=\@tempcntb\relax
69       \ifnum\@tempcnta=2\relax
70         \def\@citea{ and~[]}%
71       \else
72         \def\@citea{, and~[]}%
73       \fi
74     \fi
75     \edef\@citeb{\expandafter\@firstofone\@citeb\@empty}%
76     \if@filesw\immediate\write\@auxout{\string\citation{\@citeb}}\fi
77     \ifundefined{b@\@citeb}{\hbox{\reset@font\bfseries ?}}%
78     \G@refundefinedtrue
79     \@latex@warning
80       {Citation ‘\@citeb’ on page \thepage \space undefined}}%
81     {\@cite\ofmt{\csname b@\@citeb\endcsname}}}{#1}}

```

A bunch of packages:

```

82 \RequirePackage{fancyhdr, lastpage, ifpdf, graphicx}
83 \RequirePackage{zref-savepos}
84 \RequirePackage[breaklinks,colorlinks]{hyperref}
85 \if@aom@screen@mode
86 \hypersetup{linkcolor=blue,citecolor=blue,
87   urlcolor=blue}%
88 \else\if@aom@manuscript@mode
89 \hypersetup{linkcolor=blue,citecolor=blue,
90   urlcolor=blue}%
91 \else
92 \hypersetup{linkcolor=black,citecolor=black,
93   urlcolor=black}%
94 \fi\fi
95 \urlstyle{rm}

```

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

```

96 \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:
97 \def\@aom@by{By}

```

```

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

```

Now we can define internationalization:


```

99 \AtBeginDocument{\ifpackageloaded{babel}{%
100 \addto\captionsfrench{\def\@aom@by{Par}\def\@aom@and{et}}%
101 \addto\captionsgerman{\def\@aom@by{Von}\def\@aom@and{und}}%
102 \addto\captionsenglish{\def\@aom@by{By}\def\@aom@and{and}}{}}

```

3.5 Fonts

We use yhmth for large symbols:

```
103 \RequirePackage{yhmth}
```

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

```
104 \DeclareSymbolFont{largesymbols}{OMX}{yhex}{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_usepackageymath_and_the/. We use AMS definitions instead

```

105 \xdef\widehat#1{\noexpand\@mathmeasure\z@\textstyle{#1}%
106 \noexpand\ifdim\noexpand\wd\z@>\tw@ em%
107 \mathaccent"0\hexnumber@\symAMSb 5B{#1}%
108 \noexpand\else\mathaccent"0362{#1}\noexpand\fi}
109 \xdef\widetilde#1{\noexpand\@mathmeasure\z@\textstyle{#1}%
110 \noexpand\ifdim\noexpand\wd\z@>\tw@ em%
111 \mathaccent"0\hexnumber@\symAMSb 5D{#1}%
112 \noexpand\else\mathaccent"0365{#1}\noexpand\fi}

```

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

```

113 \IfFileExists{cmtiup.sty}{%
114 \RequirePackage{cmtiup}}{%
115 \ClassWarning{aomart}{The package mdputu is not found.\MessageBreak
116 You need this package to get italics with upright digits!}}

```

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

```

117 \def\specialdigits{}%
118 \let\sisshape=\itshape
119 \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`.

```

120 \def\@typesizes{%
121 \or{\@vipt}{9}\or{\@vipt}{9}\or{\@viipt}{9}\or{\@ixpt}{12}%
122 \or{\@xpt}{13}%
123 \or{\@xipt}{14}% normalsize
124 \or{\@xiipt}{15}\or{13}{17}\or{\@xviipt}{20}%
125 \or{19}{23.2}\or{22}{27.8}}%
126 \normalsize \linespacing=\baselineskip

```

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

```
127 \let\widebar\overline
```

3.6 Page Dimensions and Paragraphing

```

\textwidth These are from the old aomamlt2e:
\textheight 128 \setlength{\textwidth}{31pc}
              129 \setlength{\textheight}{48pc}

\evensidemargin The margins:
\oddsidemargin 130 \oddsidemargin=.65in
              131 \evensidemargin=.65in

\footins Some skips from aomamlt2e:
\topskip 132 \setlength{\topskip}{12pt}
\abovedisplayskip 133 \setlength{\abovedisplayskip}{6.95pt plus3.5pt minus 3pt}
\belowdisplayskip 134 \setlength{\belowdisplayskip}{6.95pt plus4.5pt minus 3pt}
              135 \setlength{\skip\footins}{20pt}
              136 \setlength{\dimen\footins}{3in}

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

\parskip Paragraph shape:
\parindent 138 \setlength{\parindent}{22pt}
              139 \setlength{\parskip}{\z@}

\widowpenalty We suppress widows and clubs:
\clubpenalty 140 \widowpenalty=10000
              141 \clubpenalty=10000

AMS defines the margins for lists \AtBeginDocument. Our lists are tighter
142 \AtBeginDocument{%
143   \labelsep=5pt\relax
144   \settowidth\leftmargini{\labelenumi\hskip\labelsep}%
145   \leftmargin=\leftmargini
146   \labelwidth=\leftmargini \advance\labelwidth-\labelsep
147   \@listi}

\itemize
148 \renewenvironment{itemize}{%
149   \ifnum\@itemdepth>3 \toodeep
150   \else \advance\@itemdepth\@ne
151     \edef\@itemitem{labelitem\romannumeral\the\@itemdepth}%
152     \list{\csname\@itemitem\endcsname}%
153     {\settowidth\leftmargin{\labelitemi\hskip\labelsep}%
154       \def\makelabel##1{\hss\llap{\upshape##1}}}%
155   \fi
156 }{%
157   \endlist
158 }

```

3.7 Headers

`\headsep` Separation between the header and the body

```
159 \setlength{\headsep}{14pt}
```

`\headheight` Slightly increasing head height

```
160 \setlength{\headheight}{18.0pt}
```

`\headrulewidth` We do not want decorative rules in the journal:

```
\footrulewidth 161 \renewcommand{\headrulewidth}{0pt}
```

```
162 \renewcommand{\footrulewidth}{0pt}
```

`\@aom@linecount` This is the box displayed in the manuscript mode

```
163 \if@aom@manuscript@mode
164   \newsavebox{\@aom@linecount}
165   \savebox{\@aom@linecount}[4em][t]{\parbox[t]{4em}{%
166     \@tempcnta\@ne\relax
167     \loop{\underline{\scriptsize\the\@tempcnta}}\
168     \advance\@tempcnta by \@ne\ifnum\@tempcnta<43\repeat}}
169 \fi
```

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

```
170 \pagestyle{fancy}
171 \fancyhead{}
172 \fancyfoot{}
173 \fancyhead[CO]{\scriptsize\shorttitle}
174 \fancyhead[RO,LE]{\footnotesize\thepage}
175 \if@aom@manuscript@mode
176   \fancyhead[LE]{\footnotesize\thepage\begin{picture}(0,0)%
177     \put(-26,-25){\usebox{\@aom@linecount}}}%
178   \end{picture}}
179   \fancyhead[LO]{\begin{picture}(0,0)%
180     \put(-21,-25){\usebox{\@aom@linecount}}}%
181   \end{picture}}
182   \fancyfoot[C]{\scriptsize Proof: page numbers may be temporary}
183 \fi
184 \fancyhead[CE]{\scriptsize\MakeUppercase\shortauthors}
```

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

```
185 \fancypagestyle{firstpage}{%
186   \fancyhf{}%
187   \if@aom@manuscript@mode
188     \lhead{\begin{picture}(0,0)%
189       \put(-21,-25){\usebox{\@aom@linecount}}}%
190     \end{picture}}
191   \fi
192   \chead{\scriptsize%
193     \href{\@annalsurl}{Annals of Mathematics} \textbf{\currentvolume}
194     (\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.

```

195 \start@page%
196 \def\tempa{\pageref{LastPage}}%
197 \edef\tempb{\start@page}%
198 \ifx\tempa\end@page
199 \edef\tempa{\HyPsd@@\pageref{LastPage}}%
200 \else
201 \edef\tempa{\end@page}%
202 \fi
203 \ifx\tempa\tempb\else--\end@page\fi\
204 \ifx\@doinumber\@empty\else
205 \edef\@doinumber{\@doinumber}%
206 \expandafter\doi\expandafter{\@doinumber}\fi}%
207 \cfoot{\footnotesize\thepage}}%
```

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

```

208 \def\annalsurl#1{\gdef\@annalsurl{#1}}
209 \annalsurl{http://annals.math.princeton.edu/about}
```

3.8 Top Matter Macros

We make these macros allowed only in the preamble:

```

210 \@onlypreamble{\title}
211 \@onlypreamble{\author}
212 \@onlypreamble{\contrib}
213 \@onlypreamble{\email}
214 \@onlypreamble{\address}
215 \@onlypreamble{\curraddr}
216 \@onlypreamble{\urladdr}
217 \@onlypreamble{\orcid}
218 \@onlypreamble{\givenname}
219 \@onlypreamble{\fulladdress}
220 \@onlypreamble{\surname}
221 \@onlypreamble{\thanks}
222 \@onlypreamble{\keyword}
223 \@onlypreamble{\subject}
224 \@onlypreamble{\received}
225 \@onlypreamble{\revised}
226 \@onlypreamble{\accepted}
227 \@onlypreamble{\published}
228 \@onlypreamble{\publishedonline}
229 \@onlypreamble{\proposed}
230 \@onlypreamble{\seconded}
231 \@onlypreamble{\corresponding}
232 \@onlypreamble{\editor}
233 \@onlypreamble{\version}
234 \@onlypreamble{\volumenumber}
235 \@onlypreamble{\issuenummer}
236 \@onlypreamble{\publicationyear}
237 \@onlypreamble{\copyrightnote}
238 \@onlypreamble{\copyrighyear}
```

```

239 \@onlypreamble{\papernumber}
240 \@onlypreamble{\startpage}
241 \@onlypreamble{\endpage}
242 \@onlypreamble{\doinumber}
243 \@onlypreamble{\mrnumber}
244 \@onlypreamble{\zblnumber}
245 \@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 246 \def\@names{}
\surname 247 \def\givenname#1{\g@addto@macro\@names{givenname=#1;}}
248 \def\surname#1{\g@addto@macro\@names{surname=#1;}}
249 \def\fulladdress#1{\g@addto@macro\@names{fulladdress=#1;}}

```

`\author` We add mangling of `\@names` to the `amsart` macro

```

250 \renewcommand{\author}[2][]{%
251   \ifx\@empty\authors
252     \gdef\authors{#2}%
253     \g@addto@macro\@names{author=#2;}%
254   \else
255     \g@addto@macro\authors{\and#2}%
256     \g@addto@macro\@names{\and author=#2;}%
257   \fi
258   \gdef\@om@current@orcid@target{\authors}%
259   \@ifnotempty{#1}{%
260     \ifx\@empty\shortauthors
261       \gdef\shortauthors{#1}%
262     \else
263       \g@addto@macro\shortauthors{\and#1}%
264     \fi
265   }%
266   \g@addto@macro\addresses{\author{#2}}%
267 }
268 \edef\author{\@nx\@dblarg
269   \@xp\@nx\csname\string\author\endcsname}

```

`\@currentcontribution` The current contribution

```

270 \def\@currentcontribution{}

```

`\@currentcontributors` The current contributors with the same contribution

```

271 \def\@currentcontributors{}

```

`\contribs` All contributors to the paper

```

272 \def\contribs{}

```

`\if@startcontribgroup` A switch whether the new group is started

```

273 \newif\if@startcontribgroup
274 \@startcontribgroupfalse

```

`\@processcurrentcontribgroup` Add current contributors to `\contributors`

```

275 \def\@processcurrentcontribgroup{%
276   \ifx\@currentcontributors\@empty\else
277     \def\@and{\upshape \@aom@and}%
278     \author@andify\@currentcontributors
279     \ifx\contributors\@empty\else
280       \g@addto@macro\contributors{\and}%
281     \fi
282     \expandafter\g@addto@macro\expandafter\contributors
283     \expandafter{\@currentcontribution}%
284     \g@addto@macro\contributors{\space}%
285     \expandafter\g@addto@macro\expandafter\contributors
286     \expandafter{\@currentcontributors}%
287   \fi
288 }
```

`\contrib` The processing of contributors. Contributors are separated into groups with the same contribution. Within the group one can omit the contribution.

```

289 \renewcommand{\contrib}[2][]{%
290   \def\@tempa{#1}%
291   \gdef\@aom@current@orcid@target{\@currentcontributors}%
292   \@startcontribgrouptrue
293   \ifx\@tempa\@empty\relax
294     \ifx\@currentcontribution\@empty\relax
295       \ClassError{aomart}{You must define contribution for
296         contributors}{The first \contrib command must have the
297         optional argument indicating the contribution}%
298     \else
299       \@startcontribgroupfalse
300     \fi
301   \fi
302   \ifx\@currentcontribution\@tempa\relax
303     \@startcontribgroupfalse
304   \fi
305   \if@startcontribgroup
306     \@processcurrentcontribgroup
307     \gdef\@currentcontribution{#1}%
308     \gdef\@currentcontributors{#2}%
309   \else
310     \g@addto@macro\@currentcontributors{\and#2}%
311   \fi
312   \g@addto@macro\@names{\and contributor=#2;}%
313   \g@addto@macro\@names{role=}%
314   \expandafter\g@addto@macro\expandafter%
315   \@names\expandafter{\@currentcontribution}%
316   \g@addto@macro\@names{;}%
317   \g@addto@macro\addresses{\author{#2}}%
318 }
```

`\email` We change amsart macro to output metadata

```

319 \renewcommand{\email}[2][]{%
320   \g@addto@macro\addresses{\email{#1}{#2}}%
321   \g@addto@macro\@names{email=#2;}%
322 }
```

`\urladdr` We change amsart macro to output metadata

```
323 \renewcommand{\urladdr}[2][]{%  
324   \g@addto@macro\addresses{\urladdr{#1}{#2}}%  
325   \g@addto@macro\@names{\urladdr=#2;}%  
326 }
```

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

```
327 \def\aom@current@orcid@target{\authors}
```

`\orcid` Orcid also outputs metadata

```
328 \newcommand{\orcid}[1]{%  
329   \g@addto@macro\addresses{\orcid{#1}}%  
330   \g@addto@macro\@names{\orcid=#1;}%  
331   \expandafter\g@addto@macro\aom@current@orcid@target{\aom@orcidlink{#1}}%  
332 }
```

`\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

```
333 \newcommand\aom@orcidlink[1]{\kern0.2ex\href{https://orcid.org/#1}{\includecolorgraphics[height=1em]{orcidlogo.png}}}
```

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

```
334 \def\keyword#1{\ifx\@keywords\@empty\gdef\@keywords{#1}\else  
335   \g@addto@macro\@keywords{, #1}\fi}
```

`\subject` Subjects.

```
336 \let\@primarysubjects\@empty  
337 \let\@secondarysubjects\@empty  
338 \let\@primaryscheme\@empty  
339 \let\@secondaryscheme\@empty  
340 \def\subject#1#2#3{%  
341   \expandafter\ifx\csname @#1subjects\endcsname\@empty\relax  
342     \expandafter\gdef\csname @#1subjects\endcsname{#3}%  
343   \else  
344     \expandafter\g@addto@macro\csname @#1subjects\endcsname{, #3}%  
345   \fi  
346   \if@aom@printscheme  
347     \expandafter\g@addto@macro\csname @#1subjects\endcsname{%  
348       ~(#2)}%  
349   \fi}
```

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

```
350 \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.

```
351 \def\@formatdate#1-#2-#3\@endformatdate{%  
352   \@tempcnta=#3\relax  
353   \ifcase#2\or
```

```

354 January\or February\or March\or April\or May\or June\or
355 July\or August\or September\or October\or November\or December\fi
356 \space\the\@tempcnta,\space#1}

\received The following macros add stuff to the footnotes material:
\revised 357 \def\received#1{\def\@received{#1}}
\accepted 358 \let\@received\@empty
\published 359 \def\revised#1{\def\@revised{#1}}
\publishedonline 360 \let\@revised\@empty
361 \def\accepted#1{\def\@accepted{#1}}
362 \let\@accepted\@empty
363 \def\published#1{\def\@published{#1}}
364 \let\@published\@empty
365 \def\publishedonline#1{\def\@publishedonline{#1}}
366 \let\@publishedonline\@empty

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

\volume 367 \def\volume#1{\def\currentvolume{#1}}

\issue 368 \def\issue#1{\def\currentissue{#1}}

\publicationyear 369 \def\publicationyear#1{\def\currentyear{#1}}

\paper 370 \def\paper#1{\def\currentpaper{#1}}
371 \paper{0000}

\startpage 372 \def\startpage#1{\pagenumbering{arabic}\setcounter{page}{#1}%
373 \def\start@page{#1}%
374 \ifnum\c@page<\z@ \pagenumbering{roman}\setcounter{page}{-#1}%
375 \def\start@page{\romannumeral#1}%
376 \fi}

\endpage 377 \def\endpage#1{\def\@tempa{#1}%
378 \ifx\@tempa\@empty\def\end@page{\pageref{LastPage}}%
379 \else\def\end@page{#1}\fi}

\pagespan 380 \def\pagespan#1#2{\startpage{#1}\endpage{#2}}
381 \pagespan{1}{}

```



```

\g@addto@abstract Syntactic sugar around \g@addto@macro
382 \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.
383 \long\def\@aom@abstract{}
384 \long\def\@getabstract#1{%
385   \bgroup
386     \ifx\language\undefined
387       \def\language{english}%
388     \fi
389     \g@addto@abstract{<begin abstract }%
390     \expandafter\g@addto@abstract\expandafter{\language}%
391     \g@addto@macro\@aom@abstract{#1}%
392     \g@addto@abstract{<end abstract }%
393     \expandafter\g@addto@abstract\expandafter{\language}%
394   \egroup
395   \ifx\maketitle\relax
396     \ClassWarning{aomart}{Abstract should precede
397       \protect\maketitle\space in AMS derived classes}%
398   \fi
399   \global\setbox\abstractbox=\vtop\bgroup%
400   \box\abstractbox
401   \vglue1pc%
402   {\centering\normalfont\normalsize\bfseries\abstractname\par\vglue1pc}%
403   \list{}{\labelwidth\z@%
404     \leftmargin3pc \rightmargin\leftmargin%
405     \listparindent\normalparindent \itemindent\normalparindent%
406     \parsep\z@ \@plus\p@%
407     \let\fullwidthdisplay\relax%
408   }%
409   \item[]\normalfont\Small#1
410 \endlist\egroup}

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

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

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

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

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

\doinumber Now databases' numbers of the article:
\mrnumber 417 \def\doinumber#1{\gdef\@doinumber{#1}}
\zblnumber 418 \doinumber{10.4007/annals.\currentyear.\currentvolume.\currentissue.\currentpaper}
\arxivnumber

```

```

419 \def\mrnumber#1{\gdef\@mrnumber{#1}}
420 \mrnumber{}
421 \def\zblnumber#1{\gdef\@zblnumber{#1}}
422 \zblnumber{}
423 \def\arxivnumber#1{\gdef\@arxivnumber{#1}}
424 \arxivnumber{}

```

`\copyrightyear` This is the copyright year in case it does not coincide with the publication year:

```

425 \def\copyrightyear#1{\def\@copyrightyear{#1}}
426 \copyrightyear{}

```

`\copyrightnote` This is the copyrightnote. The default has some trickery with the year:

```

427 \def\copyrightnote#1{\def\@copyrightnote{#1}}
428 \copyrightnote{\textcopyright~%
429   \ifx\@empty\@copyrightyear\currentyear\else\@copyrightyear\fi~%
430   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:

```

431 \newwrite\@mainrpi

```

`\aom@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

```

432 \def\aom@write@paper@info{%
433   \bgroup
434   \if@filesw
435     \openout\@mainrpi\jobname.rpi%
436     \def\and{\string\and\space}%
437     \ifx\r@LastPage\@undefined
438       \edef\@tempa{\start@page}%
439     \else
440       \def\@tempc##1##2##3##4##5{##2}%
441       \edef\@tempa{\expandafter\@tempc\r@LastPage}%
442     \fi
443     \ifx\language\undefined
444       \def\language{english}%
445     \fi
446     \protected@write\@mainrpi{%
447       {\@percentchar authors=\authors}%
448     \protected@write\@mainrpi{%
449       {\@percentchar authors.information={\@names}}}%
450     \protected@write\@mainrpi{%
451       {\@percentchar title=\@title}%
452     \protected@write\@mainrpi{%
453       {\@percentchar year=\currentyear}%
454     \protected@write\@mainrpi{%
455       {\@percentchar volume=\currentvolume}%
456     \protected@write\@mainrpi{%
457       {\@percentchar issue=\currentissue}%
458     \protected@write\@mainrpi{%
459       {\@percentchar paper=\currentpaper}%

```

```

460 \protected@write\@mainrpi{%
461   {\@percentchar startpage=\start@page}%
462 \protected@write\@mainrpi{%
463   {\@percentchar endpage=\@tempa}%
464 \protected@write\@mainrpi{%
465   {\@percentchar doi=\@doinumber}%
466 \ifx\@zblnumber\@empty\else
467 \protected@write\@mainrpi{%
468   {\@percentchar zbl=\@zblnumber}%
469 \fi
470 \ifx\@mrnumber\@empty\else
471 \protected@write\@mainrpi{%
472   {\@percentchar mr=\@mrnumber}%
473 \fi
474 \ifx\@arxivnumber\@empty\else
475 \protected@write\@mainrpi{%
476   {\@percentchar arxiv=\@arxivnumber}%
477 \fi
478 \protected@write\@mainrpi{%
479   {\@percentchar subjects=Primary \@primarysubjects; Secondary:
480     \@secondarysubjects}%
481 \protected@write\@mainrpi{%
482   {\@percentchar keywords=\@keywords}%
483 \protected@write\@mainrpi{%
484   {\@percentchar abstract=\@aom@abstract}%
485 \protected@write\@mainrpi{%
486   {\@percentchar articlelanguage=\@language}%
487 \def\paperUrl{\https://annals.math.princeton.edu/\currentyear/\currentvolume-\currentissue/
488 \protected@write\@mainrpi{%
489   {\@percentchar paperUrl=\paperUrl}%
490 \AtEndDocument{\closeout\@mainrpi}%
491 \fi
492 \egroup}

```

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

```

493 \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:

```

494 \def\@settitle{\begin{center}%
495   \baselineskip20\p@\relax
496   \bfseries\LARGE
497   \@title
498   \ifpdf
499     \hypersetup{pdftitle=\@title}%
500   \fi
501 \end{center}}%
502 }

```

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

```

503 \def\@setauthors{%
504   \ifx\authors\@empty\relax\else
505     \begin{group}
506     \def\thanks{\protect\thanks@warning}%

```

```

507 \trivlist
508 \centering\footnotesize \@topsep30\p@\relax
509 \advance\@topsep by -\baselineskip
510 \item\relax
511 \def\@and{\upshape \@aom@and}}%
512 \author@andify\authors
513 \ifpdf
514 \bgroup
515 \def\@aom@orcidlink##1{%
516 \xdef\@tempa{\authors}%
517 \egroup
518 \hypersetup{pdfauthor=\@tempa}%
519 \fi
520 \def\{\{\protect\linebreak}%
521 \small \@aom@by\} \scshape\authors%
522 \@processcurrentcontribgroup
523 \ifx\@empty\contribs
524 \else
525 ,\penalty-3 \space \@setcontribs
526 \fi
527 \endtrivlist
528 \endgroup
529 \fi}

```

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

```

530 \def\@setcontribs{%
531 \def\@and{\upshape \@aom@and}}%
532 \author@andify\contribs
533 \contribs
534 }

```

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

```

535 \def\@adminfootnotes{%
536 \let\@makefnmark\relax \let\@thefnmark\relax
537 \ifx\@empty\@date\else \@footnotetext{\@setdate}\fi
538 \ifx\@empty\@subjclass\else \@footnotetext{\@setsubjclass}\fi
539 \ifx\@empty\@keywords\else \@setkeywords\fi
540 \ifx\@empty\@primarysubjects
541 \ifx\@empty\@secondarysubjects
542 \else \@setsubjects\fi
543 \else \@setsubjects\fi
544 \ifx\@empty\thankses\else \@footnotetext{%
545 \def\par{\let\par\@par}\@setthanks}%
546 \fi
547 \ifx\@empty\@copyrightnote\else \@footnotetext{%
548 \def\par{\let\par\@par}\@copyrightnote\@addpunct.}%
549 \fi
550 }

```

`\@setkeywords` Typesetting keywords

```

551 \def\@setkeywords{%
552 \ifpdf
553 \hypersetup{pdfkeywords=\@keywords}%
554 \fi

```

```

555 \if@aom@oldkeywords\else
556 \@footnotetext{Keywords: \@keywords}%
557 \fi
558 }

```

`\@setsubjects` Setting subjects

```

559 \def\@setsubjects{%
560 \let\@subjects\@empty
561 \ifx\@primarysubjects\@empty\else
562 \edef\@subjects{Primary:~\@primarysubjects}%
563 \fi
564 \ifx\@secondarysubjects\@empty\else
565 \ifx\@primarysubjects\@empty
566 \edef\@subjects{Secondary:~\@secondarysubjects}%
567 \else
568 \edef\@subjects{\@subjects; Secondary:~\@secondarysubjects}%
569 \fi
570 \fi
571 \ifpdf
572 \hypersetup{pdfsubject=\@subjects}%
573 \fi
574 \if@aom@oldkeywords\else
575 \@footnotetext{AMS Classification:~\@subjects.}%
576 \fi
577 }

```

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

```

578 \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.

```

579 \def\enddoc@text{%
580 \ifx\@empty\@translators \else\@settranslators\fi
581 \ifx\@empty\@received \else\@setreceived\fi
582 \ifx\@empty\@revised \else\@setrevised\fi
583 \ifx\@empty\@addresses \else\@setaddresses\fi}

```

`\@setreceived` A bunch of macros for setting centered dates

`\@setrevised` 584 `\def\@setreceived{\centering(Received: \@received)\par}}`

`\@setaccepted` 585 `\def\@setrevised{\centering(Revised: \@revised)\par}}`

`\@setpublished` 586 `\def\@setaccepted{\centering(Accepted: \@accepted)\par}}`

`\@setpublishedonline` 587 `\def\@setpublished{\centering(Published: \@published)\par}}`

588 `\def\@setpublishedonline{\centering(Published online: \@publishedonline)\par}}`

`\emailaddrname` We do not want the word “address” here:

```

589 \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

```

590 \def\@setaddresses{\par
591   \nobreak \begingroup
592   \footnotesize
593   \def\author##1{\goodbreak\addvspace\bigskipamount{\scshape##1\par\nobreak}}%
594   \def\{\{\unskip, \ignorespaces}%
595   \interlinepenalty\@M
596   \def\address##1##2{\begingroup\nobreak
597     \par\hangindent=22pt\hangafter=0\parindent=0pt
598     \@ifnotempty{##1}{(\ignorespaces##1\unskip) }%
599     {\ignorespaces##2}\par\endgroup}%
600   \def\curraddr##1##2{\begingroup
601     \@ifnotempty{##2}{\nobreak\par
602       \par\hangindent=22pt\hangafter=0\parindent=0pt\curraddrname
603       \@ifnotempty{##1}{, \ignorespaces\scshape##1\unskip}\hskip0.2em:\space
604       ##2\par}\endgroup}%
605   \def\email##1##2{\begingroup
606     \@ifnotempty{##2}{\nobreak
607       \par\hangindent=22pt\hangafter=0\parindent=0pt\emailaddrname
608       \@ifnotempty{##1}{, \ignorespaces##1\unskip}\hskip0.2em:\space
609       \href{mailto:##2}{\nolinkurl{##2}}\par\nobreak}\endgroup}%
610   \def\urladdr##1##2{\begingroup
611     \@ifnotempty{##2}{\nobreak
612       \par\hangindent=22pt\hangafter=0\parindent=0pt%
613       \@ifnotempty{##1}{, \ignorespaces##1\unskip}%
614       \url{##2}\par\nobreak}\endgroup}%
615   \def\orcid##1{\begingroup
616     \@ifnotempty{##1}{\nobreak
617       \par\hangindent=22pt\hangafter=0\parindent=0pt%
618       \url{https://orcid.org/##1}\par\nobreak}\endgroup}%
619   \addresses
620   \endgroup
621 }

```

3.11 Sectioning

`\contentsnamefont` This is the font for the word “Contents”:

```
622 \renewcommand\contentsnamefont{\bfseries}
```

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

```

623 \def\section{\@startsection{section}{1}%
624   \z@{.7\linespacing\@plus\linespacing}{.5\linespacing}%
625   {\normalfont\bfseries\centering}}

```

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

```

626 \def\subsection{\@startsection{subsection}{2}%
627   {\parindent}{.5\linespacing}{-.5em}%
628   {\normalfont\itshape}}

```

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

```

629 \def\oldsubsections{%
630   \gdef\subsection{\@startsection{subsection}{2}%
631     {\parindent}{.5\linespacing\@plus.7\linespacing}{-.5em}%
632     {\normalfont\itshape}}

```

`\subsubsection` Subsubsections are formatted exactly like subsections:

```
633 \def\subsubsection{\@startsection{subsubsection}{3}%
634   {\parindent}{.5\linespacing}{-.5em}%
635   {\normalfont\itshape}}
```

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

```
636 \providecommand\Hy@AlphNoErr[1]{%
637   \ifnum\value{#1}>26 %
638     Alph\number\value{#1}%
639   \else
640     \ifnum\value{#1}<1 %
641       Alph\number\value{#1}%
642     \else
643       \Alph{#1}%
644     \fi
645   \fi
646 }
```

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

```
647 \def\appendix{\par\c@section\z@ \c@subsection\z@
648   \gdef\theHsection{\Hy@AlphNoErr{section}}%
649   \let\sectionname\appendixname
650   \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 is small caps, we want just plain Roman font:

```
651 \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.

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

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

```
655 \newtheoremstyle{definition}{0.5\linespacing}{0.5\linespacing}%
656   {\upshape}{\parindent}%
657   {\sishape}{.}{0.5em}%
658   {\thmname{#1}\thmnumber{ #2}\thmnote{\normalfont{ } (#3)}}
```

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

```
659 \newtheoremstyle{remark}{0.5\linespacing}{0.5\linespacing}%
660   {\upshape}{\parindent}%
661   {\sishape}{.}{0.5em}%
662   {\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.

```
663 \renewcommand{\newtheorem}{\@ifstar{\@aom@newthm@star}{\@aom@newthm}}
664 \def\@aom@newthm@star{\@ifnextchar[{\@aom@newthm@star@}{\@aom@newthm@star@[]}}
665 \def\@aom@newthm{\@ifnextchar[{\@aom@newthm@}{\@aom@newthm@[]}}
666 \def\@aom@newthm@star@[#1]{\@xnthm *}
667 \def\@aom@newthm@[#1]{\@xnthm \relax}
```

`proof` We want our proofs to be indented:

```
668 \renewenvironment{proof}[1][\proofname]{\par
669   \pushQED{\qed}%
670   \normalfont \topsep6\p@\@plus6\p@\relax
671   \trivlist
672   \item[\hskip\labelsep\hskip\parindent
673     \itshape
674     #1\@addpunct{.}]\ignorespaces
675 }{%
676   \popQED\endtrivlist\@endpefalse
677 }
```

3.14 Bibliography Macros

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

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

`\bysame` We no longer use `\bysame`

```
679 \let\bysame@@orig=\bysame
680 \def\bysame{\ClassWarning{aomart}{We no longer omit
681   repeated authors}\bysame@@orig}
```

`\doi` Typesetting doi...

```
682 \def\doi#1{%
683   \if@aom@doiMMXVI
684     \url{http://dx.doi.org/#1}%
685   \else
686     \if@aom@olddoi
687       \href{http://dx.doi.org/#1}{doi: \path{#1}}%
```



```

688         \else
689             \url{https://doi.org/#1}%
690         \fi
691     \fi}

\mr Typesetting urls
\zbl 692 \def\mr#1{\href{http://www.ams.org/mathscinet-getitem?mr=#1}{MR~\path{#1}}}
\arxiv 693 \def\zbl#1{\href{http://www.zentralblatt-math.org/zmath/en/search/?q=an:#1}{Zbl~\path{#1}}}
\jfm 694 \def\arxiv#1{\href{http://www.arxiv.org/abs/#1}{arXiv~\path{#1}}}
695 \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
696 \renewcommand{\bibliofont}{\small}

```

3.15 Additional Macros

```

\c@aom@EC@counter The counter for editorial comments
697 \newcounter{aom@EC@counter}

\EditorialComment This macro is tiny marginpar in manuscript mode
698 \NewDocumentCommand\EditorialComment{0{default} +m 0{Opt}}{%
699     \if@aom@manuscript@mode\bgroup
700     \expandafter\ifx\csname EditorialComment@#1\endcsname\relax\else
701         \stepcounter{aom@EC@counter}%
702         \setlength\unitlength{1sp}%
703         \zsavapos{aom@EC@position\arabic{aom@EC@counter}}%
704         \begin{picture}(0,0)%
705             \put(\the\dimexpr
706                 -\zposx{aom@EC@position\arabic{aom@EC@counter}}sp + 15pt,#3){%
707                 \parbox{80pt}{\raggedright
708                     \normalfont\scriptsize\raggedright\expandafter\color\expandafter{%
709                         \csname EditorialComment@#1\endcsname}#2}}}%
710         \end{picture}%
711     \fi
712     \egroup
713 \fi}

\ECSelect

714 \newcommand\ECSelect[2][black]{\if@aom@manuscript@mode
715     \expandafter\gdef\csname
716         EditorialComment@#2\endcsname{#1}%
717     \fi}
718 \AtBeginDocument{\ECSelect{default}}

\Highlight

719 \newcommand\Highlight[2][default]{%
720     \expandafter\ifx\csname Highlight@#1\endcsname\relax
721     #2\else
722     \csname Highlight@#1\endcsname{#2}\fi}

\HSelect

723 \newcommand\HSelect[2][red]{\if@aom@manuscript@mode
724     \@for\TC@level:=#2\do{\expandafter

```

```

725 \gdef\csname Highlight@TC@level\endcsname##1{\bgroup
726 \Hy@colorlinksfalse
727 \def\Hy@colorlink####1{\begingroup}%
728 \def\Hy@endcolorlink{\endgroup}%
729 \color{#1}##1\egroup}}%
730 \fi}
731 \AtBeginDocument{\HSelect{default}}

```

\@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.

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

\fullref A reference without parentheses:

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

\pfullref A reference with parentheses:

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

\bfullref A reference with brackets:

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

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

```
736 \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

```
737 \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...

```

738 \def\eqnarray{%
739 \stepcounter{equation}%
740 \def\@currentlabel{\p@equation\theequation}%
741 \global\@eqnswtrue
742 \m@th
743 \global\@eqcnt\z@
744 \tabskip\@centering
745 \let\\\@eqnocr
746 $$\arraycolsep1\p@
747 \everycr{}\halign to\displaywidth\bgroup
748 \hskip\@centering$\displaystyle\tabskip\z@skip{##}$\@eqnse1
749 &\global\@eqcnt\@ne\hskip \tw@\arraycolsep \hfil$##$\hfil
750 &\global\@eqcnt\tw@ \hskip \tw@\arraycolsep
751 $\displaystyle{##}$\hfil\tabskip\@centering
752 &\global\@eqcnt\thr@@ \hb@xt@\z@\bgroup\hss##\egroup
753 \tabskip\z@skip
754 \cr
755 }

```

\includecolorgraphics Color graphics: select either the first or the second argument.

```

756 \newcommand\includecolorgraphics[3][ ]{\if@aom@screen@mode
757 \includegraphics[#1]{#2}\else
758 \includegraphics[#1]{#3}\fi}

```

```

\IfColorTF A slight generalization of the previous macro
759 \newcommand\IfColorTF[2]{\if@aom@screen@mode
760   #1\else
761   #2\fi}

@aom@sponsors The list of sponsors, separated by \and
762 \def@aom@sponsors{}
763 \AtEndDocument{%
764   \ifx@aom@sponsort\@empty\else
765     \protected@write\@mainrpi{}%
766     {\@percentchar grants=@aom@sponsors}%
767   \fi}

\funding The macro to print grants. It adds to the rpi file the information about grants
768 \newcommand\funding[3][]{%
769   \ifx@aom@sponsors\@empty
770     \gdef@aom@sponsors{sponsor=#2, grantid=#3}%
771   \else
772     \g@addto@macro{@aom@sponsors}{\protect\and sponsor=#2, grantid=#3}%
773   \fi
774   \def@tempa{#1}\relax%
775   \ifx@tempa\@empty\relax
776     \def@tempb{#3}%
777     #2%
778     \ifx@tempb\@empty\relax\else\ (grant~#3)\fi
779   \else
780     #1
781   \fi}

3.16 End of Class
782 \end{class}

```

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Change History

v0.10	General: Bibliography styles update 2 Documentation update 2 Screen mode triggers special URL settings 16 <code>\ifaom@screen@mode</code> : Added screen mode 14 <code>\jfm</code> : Added macro 33	Made remark theorem style identical to definition theorem style 32 Made Roman font the default URL font 16 <code>\@fullref</code> : Added macro 34 <code>\@setaddresses</code> : Deleted the word URL 29 E-mail is now in Roman font . . 29 <code>\@setpublishedonline</code> : Decreased font 29 <code>\@typesizes</code> : Corrected typo in the definition of Small 17 Increased LARGE from 16 pt to 17 pt 17 <code>\bfullref</code> : Added macro 34 <code>\emailaddrname</code> : Changed macro 29 <code>\eqfullref</code> : Added macro 34 <code>\fullref</code> : Added macro 34 <code>\pfullref</code> : Added macro 34 <code>proof</code> : Redefined macro 32 <code>\subsection</code> : Redefined macro . . 30
v0.2	General: First fully functional version 2	
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