

L^AT_EX Class for the *Association for Computing Machinery**

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Abstract

This package provides a class for typesetting publications of the Association for Computing Machinery.

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1 Introduction

The Association for Computing Machinery¹ is the world's largest educational and scientific computing society, which delivers resources that advance computing as a science and a profession. It was one of the early adopters of \TeX for its typesetting.

It provided several different classes for a number of journals and conference proceedings. Unfortunately during the years since these classes were written, the code was patched many times, and supporting different versions of the classes became difficult.

This package provides the uniform interface for all ACM publications. It is intended to replace all the different classes and packages and provide an up-to-date \LaTeX package.

This package uses only free \TeX packages and fonts included in \TeX Live, Mik \TeX and other popular \TeX distributions. It is intended to be published in these distributions itself, which minimizes users' efforts in the installation and support of this package.

I am grateful to Michael D. Adams, Leif Andersen, Dirk Beyer, Joachim Breitner, Benjamin Byholm, Michael Ekstrand, Matthew Fluet, Paolo G. Giarrusso, Ben Greenman, Jamie Davis, LianTze Lim, Ben Liblit, Kai Mindermann, Frank Mittelbach, Serguei Mokhov, Ross Moore, John Owens, Joel Nider, Tobias Pape, Mathias Rav, Andreas Reichinger, Matteo Riondato, Craig Rodkin, Bernard Rous, David Shamma, Stephen Spencer, Daniel Thomas, Zack Weinberg, John Wickerson and many others for their invaluable help.

The development version of the package is available at <https://github.com/borisveytsman/acmart>.

2 User's guide

This class uses many commands and customizatón options, so it might appear intimidating for a casual user. Do not panic! Many of these commands and options can be safely left with their default values or the values recommended by your conference or journal editors. If you have problems or questions, do not hesitate to ask me directly or the community at <https://github.com/borisveytsman/acmart>, <https://tex.stackexchange.com> or the closest \TeX Users Group. The world-wide \TeX Users Group is at <https://tug.org/>; please consider joining us if you use \TeX regularly.

2.1 Installation

Most probably, you already have this package installed in your favorite \TeX distribution; if not, you may want to upgrade. You may need to upgrade it anyway since this package uses a number of relatively recent packages, especially the ones related to fonts.

The latest released version of this package can be found on CTAN: <https://www.ctan.org/pkg/acmart>. The development version can be found on GitHub: <https://github.com/borisveytsman/acmart>. At this address you can file a bug report—or even contribute your own enhancement by making a pull request.

¹<http://www.acm.org/>

Please note that the version on Github is a development (or experimental) version: please download it for testing new features. The production version is the one on CTAN and ACM sites.

Most users should not attempt to install this package themselves but should rather rely on their \TeX distributions to provide it. If you decide to install the package yourself, follow the standard rules:

1. Run `latex acmart.ins`. This will produce the file `acmart.cls`
2. Put the files `acmart.cls` and `ACM-Reference-Format.bst` in places where \TeX can find them (see [1] or the documentation for your \TeX system).
3. Update the database of file names. Again, see [1] or the documentation for your \TeX system for the system-specific details.
4. The file `acmart.pdf` provides the documentation for the package. (This is probably the file you are 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.

This class uses a number of other packages. They are included in all major \TeX distributions (\TeX Live, Mac \TeX , Mik \TeX) of 2015 and later, so you probably have them installed. Just in case here is the list of these packages:

- *amscs*, <http://www.ctan.org/pkg/amscs>
- *amsfonts*, <http://www.ctan.org/pkg/amsfonts>
- *amsmath*, <http://www.ctan.org/pkg/amsmath>
- *binhex*, <http://www.ctan.org/pkg/binhex>
- *caption*, <http://www.ctan.org/pkg/caption>
- *comment*, <http://www.ctan.org/pkg/comment>
- *cm-super*, <http://www.ctan.org/pkg/cm-super>
- *cmap*, <http://www.ctan.org/pkg/cmap>
- *draftwatermark*, <http://www.ctan.org/pkg/draftwatermark>
- *environ*, <http://www.ctan.org/pkg/environ>
- *etoolbox*, <http://www.ctan.org/pkg/etoolbox>
- *fancyhdr*, <http://www.ctan.org/pkg/fancyhdr>
- *float*, <http://www.ctan.org/pkg/float>
- *fontaxes*, <http://www.ctan.org/pkg/fontaxes>
- *geometry*, <http://www.ctan.org/pkg/geometry>

- *graphics*, <http://www.ctan.org/pkg/graphics>
- *hyperref*, <http://www.ctan.org/pkg/hyperref>
- *ifluatex*, <http://www.ctan.org/pkg/ifluatex>
- *ifxetex*, <http://www.ctan.org/pkg/ifxetex>
- *inconsolata*, <http://www.ctan.org/pkg/inconsolata>
- *libertine*, <http://www.ctan.org/pkg/libertine>
- *manyfoot*, <http://www.ctan.org/pkg/manyfoot>
- *microtype*, <http://www.ctan.org/pkg/microtype>
- *mmap*, <http://www.ctan.org/pkg/mmap>
- *ms*, <http://www.ctan.org/pkg/ms>
- *mweights*, <http://www.ctan.org/pkg/mweights>
- *natbib*, <http://www.ctan.org/pkg/natbib>
- *nccfoots*, <http://www.ctan.org/pkg/nccfoots>
- *newtx*, <http://www.ctan.org/pkg/newtx>
- *oberdiek*, <http://www.ctan.org/pkg/oberdiek>
- *pdftex-def*, <http://www.ctan.org/pkg/pdftex-def>
- *refcount*, <http://www.ctan.org/pkg/refcount>
- *setspace*, <http://www.ctan.org/pkg/setspace>
- *textcase*, <http://www.ctan.org/pkg/textcase>
- *totpages*, <http://www.ctan.org/pkg/totpages>
- *trimspaces*, <http://www.ctan.org/pkg/trimspaces>
- *upquote*, <http://www.ctan.org/pkg/upquote>
- *url*, <http://www.ctan.org/pkg/url>
- *xcolor*, <http://www.ctan.org/pkg/xcolor>
- *xkeyval*, <http://www.ctan.org/pkg/xkeyval>
- *xstring*, <http://www.ctan.org/pkg/xstring>

2.2 Invocation and options

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

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

There are several options corresponding to the type of the document and its general appearance. They are described below. Generally speaking, the options have key=value forms, for example,

```
\documentclass[format=acmsmall, screen=true, review=false]{acmart}
```

The option `format` describes the format of the output. There are several possible values for this option, for example,

```
\documentclass[format=acmtog]{acmart}
```

Actually the words `format=` can be omitted, e.g.,

```
\documentclass[acmtog, review=false]{acmart}
```

The possible formats are listed in Table 1. Note that formats starting with `acm` are intended for journals and transactions, while formats starting with `sig` are intended for proceedings published as books.

Note that sometimes conference proceedings are published as a special issue (or issues) of an ACM journal. In this case, you should use the journal format for a conference paper. Please contact your conference committee if in doubt.

There are several Boolean options that can take `true` or `false` values. They are listed in Table 2. The words `=true` can be omitted when setting a Boolean option, so instead of `screen=true` one can write just `screen`, for example,

```
\documentclass[acmsmall, screen, review]{acmart}
```

The option `review` is useful when combined with the `manuscript` format option. It provides a version suitable for reviewers and copy editors.

The default for the option `screen` depends on the publication. At present it is `false` for all publications *but* PACM, since PACM is now electronic-only. Thus PACM titles (see Table 5) set this option to `true`. In the future this option may involve additional features suitable for on-screen versions of articles.

The option `natbib` is used when the corresponding BibTeX style is based on `natbib`. In most cases you do not need to set it. See Section 2.10.

The option `anonymous` is used for anonymous review processes and causes all author information to be obscured.

The option `timestamp` is used to include a time stamp in the footer of each page. When preparing a document, this can help avoid confusing different revisions. The footer also includes the page range of the document. This helps detect missing pages in hard copies.

Table 1: The possible values for the format option

Value	Meaning
<code>manuscript</code>	A manuscript. This is the default.
<code>acmsmall</code>	Small single-column format. Used for CIE, CSUR, DTRAP, JACM, JDIQ, JEA, JERIC, JETC, PACMCGIT, PACMHCI, PACMPL, TAAS, TACCESS, TACO, TALG, TALLIP (formerly TALIP), TCPS, TDSCI, TEAC, TECS, THRI, TIIS, TIOT, TISSEC, TIST, TKDD, TMIS, TOCE, TOCHI, TOCL, TOCS, TOCT, TODAES, TODS, TOIS, TOIT, TOMACS, TOMM (formerly TOMCCAP), TOMPECS, TOMS, TOPC, TOPLAS, TOPS, TOS, TOSEM, TOSN, TRET, TSAS, TSC, TSLP and TWEB, including special issues.
<code>acmlarge</code>	Large single-column format. Used for IMWUT, JOCCH, POMACS and TAP, including special issues.
<code>acmtog</code>	Large double-column format. Used for TOG, including annual conference Technical Papers.
<code>sigconf</code>	Proceedings format for most ACM conferences (with the exceptions listed below) and all ICPS volumes.
<code>sigplan</code>	Proceedings format for SIGPLAN conferences.
<code>sigchi</code>	Proceedings format for SIGCHI conferences.
<code>sigchi-a</code>	Format for SIGCHI extended abstracts.

The option `authordraft` is intended for author’s drafts that are not intended for distribution. It typesets a copyright block to give the author an idea of its size and the overall size of the paper but overprints it with the phrase “Unpublished working draft. Not for distribution.”, which is also used as a watermark. This option sets `timestamp` and `review` to true, but these can be overridden by setting these options to false *after* setting `authordraft` to true.

2.3 Top matter

A number of commands set up *top matter* or (in computer science jargon) *metadata* for an article. They establish the publication name, article title, authors, DOI and other data. Some of these commands, like `\title` and `\author`, should be put by the authors. Others, like `\acmVolume` and `\acmDOI`—by the editors. Below we describe these commands and mention who should issue them. These macros should be used *before* the `\maketitle` command. Note that in previous versions of ACM classes some of these commands should be used before `\maketitle`, and some after it. Now they all must be used before `\maketitle`.

This class internally loads the `amsart` class, so many top-matter commands are inherited from `amsart` [2].

`\acmJournal` The macro `\acmJournal{<shortName>}` sets the name of the journal or transaction for journals and transactions. The argument is the short name of the publication *in uppercase*, for example,

Table 2: Boolean options

Option	Default	Meaning
review	false	A review version: lines are numbered and hyperlinks are colored
screen	see text	A screen version: hyperlinks are colored
natbib	true	Whether to use the natbib package (see Section 2.10)
anonymous	false	Whether to make author(s) anonymous
authorversion	false	Whether to generate a special version for the authors' personal use or posting (see Section 2.3)
timestamp	false	Whether to put a time stamp in the footer of each page
authordraft	false	Whether author's-draft mode is enabled
acmthm	true	Whether to define theorem-like environments, see Section 2.6

`\acmJournal{TOMS}`

The currently recognized journals are listed in Table 5. Note that conference proceedings published in *book* form do not set this macro.

It is expected that this command is inserted by the author of the manuscript when she decides to which journal to submit the manuscript.

`\acmConference` The macro `\acmConference[⟨short name⟩]{⟨name⟩}{⟨date⟩}{⟨venue⟩}` is used for conference proceedings published in the book form. The arguments are the following:

short name: the abbreviated name of the conference (optional).

name: the name of the conference.

date: the date(s) of the conference.

venue: the place of the conference.

Examples:

```
\acmConference[TD'15]{Technical Data Conference}{November
12--16}{Dallas, TX, USA}
\acmConference[SA'15 Art Papers]{November 02--06, 2015}{Kobe, Japan}
```

`\acmBooktitle` By default we assume that conference proceedings are published in the book named *Proceedings of CONFERENCE*, where CONFERENCE is the name of the conference inferred from the command `\acmConference` above. However, sometimes the book title is different. The command `\acmBooktitle` can be used to set this title, for example,

```
\acmBooktitle{Companion to the first International Conference on the
Art, Science and Engineering of Programming (Programming '17)}
```


`\editor` In most cases, conference proceedings are edited. You can use the command `\editor{<editor>}` to set the editor of the volume. This command can be repeated, for example,

```
\editor{Jennifer B. Sartor}
\editor{Theo D'Hondt}
\editor{Wolfgang De Meuter}
```

`\title` The command `\title`, as in the `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.

It is expected that this command is inserted by the author of the manuscript.

`\subtitle` Besides title, ACM classes allow a subtitle, set with the `\subtitle{<subtitle>}` macro.

The commands for specifying authors are highly structured. The reason is they serve double duty: the authors' information is typeset in the manuscript *and* is used by the metadata extraction tools for indexing and cataloguing. Therefore it is very important to follow the guidelines exactly.

`\author` The basic commands are `\author`, `\orcid` (for the researchers registered with ORCID, <http://www.orcid.org/>), `\affiliation` and `\email`. In the simplest case, you enter them in this order:

```
\author{...}
\orcid{...}
\affiliation{...}
\email{...}
```

Do *not* use the \TeX `\and` macro! Each author deserves his or her own `\author` command.

Note that some formats do not typeset e-mails or ORCID identifiers. Do not worry: the metadata tools will get them.

Sometimes an author has several affiliations. In this case, the `\affiliation` command should be repeated:

```
\author{...}
\orcid{...}
\affiliation{...}
\affiliation{...}
\email{...}
```

Similarly you can repeat the `\email` command.

You may have several authors with the same affiliation, different affiliations, or overlapping affiliations (author A_1 is affiliated with institutions I_1 and I_2 , while author A_2 is

affiliated with I_2 only, author A_3 is affiliated with I_1 and I_3 , etc.). The recommended solution is to put the `\affiliation` commands after each author, possibly repeating them:

```
\author{...}
\orcid{...}
\affiliation{...}
\affiliation{...}
\email{...}
\author{...}
\orcid{...}
\affiliation{...}
\email{...}
\author{...}
\orcid{...}
\affiliation{...}
\affiliation{...}
\email{...}
```

In some cases, when several authors share the same affiliation, you can try to save space using the format

```
\author{...}
\email{...}
\author{...}
\email{...}
\affiliation{...}
```

However, this format is not generally recommended.

`\additionalaffiliation` In some cases, too many affiliations can take too much space. The command `\additionalaffiliation{<affiliation>}` creates a footnote after an author’s name with the words “Also with {<affiliation>}”. You should use this command only as a last resort. An example of usage is:

```
\author{G. Tobin}
\author{Ben Trovato}
\additionalaffiliation{%
  \institution{The Th{\o}rv{\a}ld Group}
  \streetaddress{1 Th{\o}rv{\a}ld Circle}
  \city{Hekla}
  \country{Iceland}}
\affiliation{%
  \institution{Institute for Clarity in Documentation}
  \streetaddress{P.O. Box 1212}
  \city{Dublin}
  \state{Ohio}
  \postcode{43017-6221}}
```

Here Trovato and Tobin share their affiliation with the Institute for Clarity in Documentation, but only Ben Trovato is affiliated with The Thørväld Group.

<code>\position</code> <code>\institution</code> <code>\department</code> <code>\streetaddress</code> <code>\city</code> <code>\state</code> <code>\postcode</code> <code>\country</code>	<p>The <code>\affiliation</code> and <code>\additionalaffiliation</code> commands are further structured to interact with the metadata extraction tools. Inside these commands you should use the <code>\position</code>, <code>\institution</code>, <code>\department</code>, <code>\city</code>, <code>\streetaddress</code>, <code>\state</code>, <code>\postcode</code> and <code>\country</code> macros to indicate the corresponding parts of the affiliation. Note that in some cases (for example, journals) these parts are not printed in the resulting copy, but they <i>are</i> necessary since they are used by the XML metadata extraction programs. Do <i>not</i> put commas or <code>\\</code> between the elements of <code>\affiliation</code>. They will be provided automatically.</p>
--	--

An example of the author block:

```

\author{A. U. Thor}
\orcid{1234-4564-1234-4565}
\affiliation{%
  \institution{University of New South Wales}
  \department{School of Biomedical Engineering}
  \streetaddress{Samuels Building (F25), Kensington Campus}
  \city{Sidney}
  \state{NSW}
  \postcode{2052}
  \country{Australia}}
\email{author@nsw.au.edu}
\author{A. N. Other}
\affiliation{%
  \institution{University of New South Wales}
  \city{Sidney}
  \state{NSW}
  \country{Australia}}
\author{C. O. Respondent}
\orcid{1234-4565-4564-1234}
\affiliation{%
  \institution{University of Pennsylvania}
  \city{Philadelphia}
  \state{PA}
  \country{USA}}
\affiliation{%
  \institution{University of New South Wales}
  \city{Sidney}
  \state{NSW}
  \country{Australia}}

```

Note that the old ACM conference formats did not allow more than six authors and required some effort from authors to achieve alignment. The new format is much better in this.

Sometimes an author works in several departments within the same insitution. There could be two situations: the departments are independent, or one department is within another. In the first case, just repeat the command `\department` several times. To handle

the second case the command has an optional numerical parameter. The departments with higher numbers are higher in the organizational chart. Compare

```
\affiliation{%
  \department[0]{Department of Lunar Studies} % 0 is the default
  \department[1]{John Doe Institute} % higher than 0
  \institution{University of San Serriffe}
  \country{San Serriffe}}
```

and

```
\affiliation{%
  \department{Department of Lunar Studies} % Not in the John Doe Institute!
  \department{John Doe Institute}
  \institution{University of San Serriffe}
  \country{San Serriffe}}
```

The command `\affiliation` formats its output according to American conventions. This might be wrong for some cases. Consider, for example, a German address. In Germany, the postcode is put before the city and is not separated by a comma. We can handle this order using

```
\affiliation{%
  \institution{Fluginstitut}
  \streetaddress{Sonnenallee 17}
  \postcode{123456}
  \city{Helm}
  \country{Germany}}
```

However, the comma after the postcode is unfortunate: the address will be typeset (in some formats) as

```
Fluginstitut
Sonnenallee 17
123456, Helm, Germany
```

To overcome this problem, the command `\affiliation` has an optional parameter `obey punctuation`, which can be `false` (the default) or `true`. If this parameter is `true`, `\affiliation` obeys the author's command. Thus

```
\affiliation[obey punctuation=true]{%
  \institution{Fluginstitut}\\
  \streetaddress{Sonnenallee 17}\\
  \postcode{123456}
  \city{Helm},
  \country{Germany}}
```

will be typeset as

Fluginstitut
Sonentallee 17
123456 Helm, Germany

Note that you should *not* use this option for journals.

It is expected that these commands are inserted by the author of the manuscript.

`\thanks` Like `amsart` (and unlike standard \LaTeX), we allow `\thanks` only *outside* of the commands `\title` and `\author`. This command is obsolete and should *not* be used in most cases. Do not list your acknowledgments or grant sponsors here. Put this information in the `acks` environment (see Section 2.9).

`\authorsaddresses` In some formats, addresses are printed as a footnote on the first page. By default \LaTeX typesets them itself using the information you give it. However, you can override its choice using the command `\authorsaddresses{<contact addresses>}`, for example,

```
\authorsaddresses{%
  Authors' addresses: G.~Zhou, Computer Science Department, College of
  William and Mary, 104 Jameson Rd, Williamsburg, PA 23185, US;
  V.~B'~eranger, Inria Paris-Rocquencourt, Rocquencourt, France;
  A.~Patel, Rajiv Gandhi University, Rono-Hills, Doimukh, Arunachal
  Pradesh, India; H.~Chan, Tsinghua University, 30 Shuangqing Rd,
  Haidian Qu, Beijing Shi, China; T.~Yan, Eaton Innovation Center,
  Prague, Czech Republic; T.~He, C.~Huang, J.~A.~Stankovic University
  of Virginia, School of Engineering Charlottesville, VA 22903, USA;
  T. F. Abdelzaher, (Current address) NASA Ames Research Center,
  Moffett Field, California 94035.}
```

You can *suppress* printing authors' addresses by setting them to an empty string:

`\authorsaddresses{}`.

`\titlenote` While the command `\thanks` generates a note without a footnote mark, sometimes
`\subtitlenote` the authors might need notes more tightly connected to the title, subtitle or author. The
`\authornote` commands `\titlenote`, `\subtitlenote` and `\authornote` that follow the corresponding commands (`\title`, `\subtitle` and `\author`) generate such notes. For example,

```
\title{This is a title}
\titlenote{This is a titlenote}
\author{A. U. Thor}
\authornote{This is an authornote}
```

Please never use a `\footnote` inside an `\author` or `\title` command since this confuses the metadata extraction software. (Actually these commands now produce errors.)

`\authornotemark` Sometimes one may need to have the same footnote connected to several authors. The command `\authornotemark[<number>]` adds just the footnote mark, for example,

```
\author{A. U. Thor}
\authornote{Both authors contributed equally to the paper}
```

```
...
\author{A. N. Other}
\authornotemark[1]
```

The correct numbering of these marks is the responsibility of the user.

The macros `\acmVolume`, `\acmNumber`, `\acmArticle`, `\acmYear` and `\acmMonth` are inserted by the editor and set the journal volume, issue, article number, year and month correspondingly. The arguments of all these commands, including `\acmMonth`, is numerical. For example,

```
\acmVolume{9}
\acmNumber{4}
\acmArticle{39}
\acmYear{2010}
\acmMonth{3}
```

Note that `\acmArticle` is used not only for journals but also for some conference proceedings.

The articles in the same issue of a journal have a *sequence number*. It is used to vertically position the black blob on the first page of some formats. By default it is the same as the article number, but the command `\acmArticleSeq{<n>}` can be used to change it:

```
\acmArticle{39} % The sequence number will be 39 by default
\acmArticleSeq{5} % We redefine it to 5
```

Setting this number to zero suppresses the blob.

If your paper got a Submission ID from the Conference Management System, put it here:

```
\acmSubmissionID{123-A56-BU3}
```

The macro `\acmPrice{<price>}` sets the price for the article, for example,

```
\acmPrice{25.00}
```

Note that you do not need to put the dollar sign here, just the amount. By default the price is \$15.00, unless the copyright is set to `usgov`, `rightsretained`, `iw3c2w3`, or `iw3c2w3g`, when it is suppressed. Note that to override the defaults you need to set the price *after* the `\setcopyright` command. Also, the command `\acmPrice{}` suppresses the printing of the price.

Book-like volumes have ISBN numbers attached to them. The macro `\acmISBN{<ISBN>}` sets it. Normally it is set by the typesetter, for example,

```
\acmISBN{978-1-4503-3916-2}
```

	Setting it to the empty string, as <code>\acmISBN{}</code> , suppresses printing the ISBN.
<code>\acmDOI</code>	<p>The macro <code>\acmDOI{<DOI>}</code> sets the DOI of the article, for example,</p> <pre>\acmDOI{10.1145/9999997.9999999}</pre>
	It is normally set by the typesetter. Setting it to the empty string, as <code>\acmDOI{}</code> , suppresses the DOI.
<code>\acmBadgeR</code> <code>\acmBadgeL</code>	<p>Some conference articles get special distinctions, for example, the artifact evaluation for PPOPP 2016 (see http://ctuning.org/ae/ppopp2016.html). These articles display special badges supplied by the conference organizers. This class provides commands to add these badges: <code>\acmBadgeR[<url>]{<graphics>}</code> and <code>\acmBadgeL[<url>]{<graphics>}</code>. The first command puts the badge to the right of the title, and the second one—to the left. The exception is the <code>sigchi-a</code> mode for SIGCHI extended abstracts, which puts the badges on the left margin. The arguments have the following meaning: <code>[<url>]</code>, if provided, sets the link to the badge authority in the screen version, while <code>{<graphics>}</code> sets the graphics file with the badge image. The file must be a cropped square, which is scaled to a standard size in the output. For example, if the badge image is <code>ae-logo.pdf</code>, the command is</p> <pre>\acmBadgeR[http://ctuning.org/ae/ppopp2016.html]{ae-logo}</pre>
<code>\startPage</code>	The macro <code>\startPage{<page>}</code> sets the first page of the article in a journal or book. It is used by the typesetter.
<code>\terms</code> <code>\keywords</code>	<p>The command <code>\keywords{<keyword, keyword,...>}</code> sets keywords for the article. They must be separated by commas, for example,</p> <pre>\keywords{wireless sensor networks, media access control, multi-channel, radio interference, time synchronization}</pre>
<code>CCSXML</code> <code>\ccsdesc</code>	<p>ACM publications are classified according to the ACM Computing Classification Scheme (CCS). CCS codes are used both in the typeset version of the publications <i>and</i> in the metadata in various databases. Therefore you need to provide both \TeX commands and XML metadata with the paper.</p> <p>The tool at http://dl.acm.org/ccs.cfm can be used to generate CCS codes. After you select the topics, click on “Generate CCS codes” to get results like the following:</p> <pre>\begin{CCSXML} <ccs2012> <concept> <concept_id>10010520.10010553.10010562</concept_id> <concept_desc>Computer systems organization~Embedded systems</concept_desc> <concept_significance>500</concept_significance> </concept> <concept> <concept_id>10010520.10010575.10010755</concept_id> <concept_desc>Computer systems organization~Redundancy</concept_desc> <concept_significance>300</concept_significance></pre>

```

</concept>
<concept>
  <concept_id>10010520.10010553.10010554</concept_id>
  <concept_desc>Computer systems organization~Robotics</concept_desc>
  <concept_significance>100</concept_significance>
</concept>
<concept>
  <concept_id>10003033.10003083.10003095</concept_id>
  <concept_desc>Networks~Network reliability</concept_desc>
  <concept_significance>100</concept_significance>
</concept>
</ccs2012>
\end{CCSXML}

\ccsdesc[500]{Computer systems organization~Embedded systems}
\ccsdesc[300]{Computer systems organization~Redundancy}
\ccsdesc{Computer systems organization~Robotics}
\ccsdesc[100]{Networks~Network reliability}

```

You just need to copy this code and paste it in your paper anywhere before `\maketitle`.

`\setcopyright` There are several possibilities for the copyright of the papers published by the ACM: the authors may transfer the rights to the ACM, license them to the ACM, some or all authors might be employees of the US or Canadian governments, etc. Accordingly the command `\setcopyright{...}` is introduced. Its argument is the copyright status of the paper, for example, `\setcopyright{acmcopyright}`. The possible values for this command are listed in Table 3.

The ACM submission software should generate the right command for you to paste into your file.

`\copyrightyear` Each copyright statement must have the year of copyright. By default it is the same as `\acmYear`, but you can override this using the macro `\copyrightyear`, e.g.,

```

\acmYear{2016}
\copyrightyear{2015}

```

There is a special case for a personal copy that the authors may be allowed to generate for their use or a posting on a personal site (check the instructions for the specific journal or conference for the details). The document option `authorversion=true` produces a special form of the copyright statement for this case. Note that you still need the `\setcopyright` command and (optionally) `\copyrightyear` command to tell \TeX about the copyright owner and year. Also, you should be aware that due to the different sizes of the permission blocks for the printed version and authors' version, the page breaks might be different between them.

`abstract` The environment `abstract` must *precede* the `\maketitle` command. Again, this is different from the standard \LaTeX .

`teaserfigure` A special kind of figure is used for many two-column conference proceedings.

Table 3: Parameters for the `\setcopyright` command

Parameter	Meaning
<code>none</code>	The copyright and permission information is not typeset. (This is the option for some ACM conferences.)
<code>acmcopyright</code>	The authors transfer the copyright to the ACM (the “traditional” choice).
<code>acmlicensed</code>	The authors retain the copyright but license the publication rights to ACM.
<code>rightsretained</code>	The authors retain the copyright and publication rights to themselves or somebody else.
<code>usgov</code>	All the authors are employees of the US government.
<code>usgovmixed</code>	Some authors are employees of the US government.
<code>cagov</code>	All the authors are employees of the Canadian government.
<code>cagovmixed</code>	Some authors are employees of the Canadian government.
<code>licensedusgovmixed</code>	Some authors are employees of the US government, and the publication rights are licensed to ACM.
<code>licensedcagov</code>	All the authors are employees of the Canadian government, and the publication rights are licensed to ACM.
<code>licensedcagovmixed</code>	Some authors are employees of the Canadian government, and the publication rights are licensed to ACM.
<code>othergov</code>	Authors are employees of a government other than the US or Canada.
<code>licensedothergov</code>	Authors are employees of a government other than the US or Canada, and the publication rights are licensed to ACM.
<code>iw3c2w3</code>	Special statement for conferences organized by IW3C2.
<code>iw3c2w3g</code>	Special statement for conferences organized by IW3C2, when some authors are approved Google employees.

Table 4: Settings for the `\settopmatter` command

Parameter	Values	Meaning
<code>printccs</code>	true/false	Whether to print CCS categories
<code>printacmref</code>	true/false	Whether to print the ACM bibliographic entry
<code>printfolios</code>	true/false	Whether to print page numbers (folios)
<code>authorsperrow</code>	numeric	Number of authors per row for the title page in conference proceedings formats

This figure is placed just after the authors but before the main text. The environment `teaserfigure` is used for these figures. This environment must be used *before* `\maketitle`, for example,

```
\begin{teaserfigure}
  \includegraphics[width=\textwidth]{sampleteaser}
  \caption{This is a teaser}
  \label{fig:teaser}
\end{teaserfigure}
```

`\settopmatter` Some information in the top matter is printed for certain journals or proceedings and suppressed for others. You can override these defaults using the command `\settopmatter{<settings>}`. The settings and their meanings are listed in Table 4. For example,

```
\settopmatter{printacmref=false, printccs=true, printfolios=true}
```

The parameter `authorsperrow` requires some explanation. In conference proceedings authors' information is typeset in boxes, several boxes per row (see `sample-sigconf.pdf`, `sample-sigplan.pdf`, etc.). The number of boxes per row is determined automatically. If you want to override this, you can do it using this parameter, for example,

```
\settopmatter{authorsperrow=4}
```

However, in most cases you should *not* do this and should use the default settings. Setting `authorsperrow` to 0 will revert it to the default settings.

`\received` The command `\received[<stage>]{<date>}` sets the history of the publication. The `[<stage>]` argument is optional; the default is Received for the first date and revised for the subsequent ones. For example,

```
\received{February 2007}
\received[revised]{March 2009}
\received[accepted]{June 2009}
```

`\maketitle` The macro `\maketitle` must be the last command in the top-matter group. That is

it must follow the commands defined in this section.

`\shortauthors` *After* the command `\maketitle`, the macro `\shortauthors` stores the names of the authors for the running head. You can redefine it if the list of author’s name is too long, e.g.,

```
\maketitle
\renewcommand{\shortauthors}{Zhou et al.}
```

2.4 Algorithms

There are now several good packages for typesetting algorithms [3, 4, 5], and the authors are free to choose their favorite one.

2.5 Figures and tables

The new ACM styles use the standard \LaTeX interface for figures and tables. There are some important items to be aware of, however.

1. The captions for figures must be entered *after* the figure bodies and for tables *before* the table bodies.
2. The ACM uses the standard types for figures and tables and adds several new ones. In total there are the following types:

figure, table: a standard figure or table taking a full text width in one-column formats and one column width in two-column formats.

figure*, table* in two-column formats, a special figure or table taking a full text width.

teaserfigure: a special figure before `\maketitle`.

sidebar, marginfigure, margintable: in the sigchi-a format, special sidebars, tables and figures in the margin.

3. Accordingly, when scaling images, one should use the following sizes:
 - (a) For `teaserfigure`, `figure` in one-column mode or `figure*` in two-column mode, use `\textwidth`. In one-column mode, you can also use `\columnwidth`, which coincides with `\textwidth` in this case.
 - (b) For `figure` in two-column mode, use `\columnwidth`.
 - (c) For `marginfigure`, use `\marginparwidth`.
 - (d) For `figure*` in SIGCHI extended abstracts, use `\fulltextwidth`.

It is strongly recommended to use the package `booktabs` [6] and follow its main principles of typography with respect to tables:

1. Never, ever use vertical rules.
2. Never use double rules.

It is also a good idea not to overuse horizontal rules.

For table *footnotes* you have several options described in the TeX FAQ [1]. The simplest one is to use a `\minipage` environment:

```
\begin{table}
\caption{Simulation Configuration}
\label{tab:conf}
\begin{minipage}{\columnwidth}
\begin{center}
\begin{tabular}{ll}
\toprule
TERRAIN\footnote{This is a table footnote. This is a
table footnote. This is a table footnote.} &
(200\,m$\times$200\,m) Square\\
Node Number & 289\\
Node Placement & Uniform\\
Application & Many-to-Many/Gossip CBR Streams\\
Payload Size & 32 bytes\\
Routing Layer & GF\\
MAC Layer & CSMA/MMSN\\
Radio Layer & RADIO-ACCNOISE\\
Radio Bandwidth & 250Kbps\\
Radio Range & 20m--45m\\
\bottomrule
\end{tabular}
\end{center}
\bigskip
\footnotesize\emph{Source:} This is a table
sourcenote. This is a table sourcenote. This is a table
sourcenote.

\emph{Note:} This is a table footnote.
\end{minipage}
\end{table}
```

sidebar
marginfigure
margintable

SIGCHI extended abstracts use margin space extensively. This package provides three environments for this with optional captions:

sidebar: textual information in the margin

marginfigure: a figure in the margin

margintable: a table in the margin

Tables and figures (including margin tables and margin figures) are by default centered. However, in some cases (for example, when you use several subimages per figure) you may need to override this. A good way to do so is to put the contents into a `\minipage` of the width `\columnwidth`.

2.6 Theorems

The ACM classes define two theorem styles and several pre-defined theorem environments:

acmplain: this is the style used for theorem, conjecture, proposition, lemma and corollary, and

acmdefinition: this is the style used for example and definition.

These environments are defined by default. In the unusual circumstance that a user does not wish to have these environments defined, the option `acmthm=false` in the preamble will suppress them.

2.7 Online-only and offline-only material

`printonly` Some supplementary material in ACM publications is put online but not in the printed
`screenonly` version. The text inside the environment `screenonly` will be typeset only when the option `screen` (see Section 2.2) is set to true. Conversely, the text inside the environment `printonly` is typeset only when this option is set to false. For example,

```
\section{Supplementary materials}

\begin{printonly}
  Supplementary materials are available in the online version of this paper.
\end{printonly}

\begin{screenonly}
  (The actual supplementary materials.)
\end{screenonly}
```

We use the `comment` package for typesetting this code, so `\begin` and `\end` should start on a line of their own with no leading or trailing spaces.

2.8 Note about anonymous mode

`anonsuppress` When the option `anonymous` is selected, \TeX suppresses author information (including the number of authors) for a blind review. However, sometimes the information identifying the authors may be present in the body of the paper. For example,

```
\begin{anonsuppress}
  This is the continuation of the previous work by the author
  \cite{prev1, prev2}.
\end{anonsuppress}
```

As for the `printonly` and `screenonly` environments, `\begin{anonsuppress}` and `\end{anonsuppress}` should start on a line of their own with no leading or trailing spaces.

2.9 Acknowledgments

The traditional “Acknowledgments” section is conventionally used to thank persons and granting agencies for their help and support. However, there are several important considerations about this section.

First, in anonymous mode this section must be omitted: it gives too much information to reviewers. Second, data about grants is extracted and stored separately by the postprocessing software. ACM classes provide facilities for both these tasks.

`acks` The environment `acks` starts an unnumbered section “Acknowledgments” unless the anonymous mode is chosen. Put all thanks inside this environment.

As for the `printonly` and `screenonly` environments, `\begin{acks}` and `\end{acks}` should start on a line of their own with no leading or trailing spaces.

`\grantsponsor` All financial support *must* be listed using the commands `\grantsponsor` and
`\grantnum` `\grantnum`. These commands tell the postprocessing software about the granting organization and grant. The format of these commands is the following:

```
\grantsponsor{<sponsorID>}{<name>}{<url>}  
\grantnum[<url>]{<sponsorID>}{<number>}.
```

Here `{<sponsorID>}` is the unique ID used to match grants to sponsors, `{<name>}` is the name of the sponsor, `{<url>}` is its URL, and `{<number>}` is the grant number. The `{<sponsorID>}` of the `\grantnum` command must correspond to the `{<sponsorID>}` of a `\grantsponsor` command. Some awards have their own web pages, which you can include using the optional argument of the `\grantnum` command.

At present `{<sponsorID>}` is chosen by the authors and can be an arbitrary key in the same way the label of a `\cite` is arbitrarily chosen. There might be a change to this policy if the ACM decides to create a global database of sponsoring organizations.

Example:

```
\begin{acks}  
The authors would like to thank Dr. Yuhua Li for providing the  
matlab code of the \textit{BEPS} method.  
  
The authors would also like to thank the anonymous referees for  
their valuable comments and helpful suggestions. This work is  
supported by the \grantsponsor{GS501100001809}{National Natural  
Science Foundation of  
China}{https://doi.org/10.13039/501100001809} under Grant  
No.: ~\grantnum{GS501100001809}{61273304}  
and ~\grantnum[http://www.nnsf.cn/youngscientists]{GS501100001809}{Young  
Scientists' Support Program}.  
\end{acks}
```

2.10 Bibliography

The ACM uses the `natbib` package for formatting references and the `BibTeX` style file `ACM-Reference-Format.bst` for `BibTeX` processing. You can disable loading of `natbib` using the option `natbib=false` in `\documentclass`. However, it is not recommended,

as well as the use of Bib_T_EX styles other than ACM-Reference-Format.bst, and may delay the processing of the manuscript.

`\citestyle` If you use natbib, you can select one of two predefined citation styles using the command `\citestyle`: the author-year format `acmauthoryear` or the numeric format `acmnumeric`. For example,

```
\citestyle{acmauthoryear}
```

Note that numeric citations are the default mode for most formats.

`\setcitestyle` You can further customize natbib using the `\setcitestyle` command, for example,

```
\setcitestyle{numbers,sort&compress}
```

One of the more common versions is

```
\setcitestyle{nosort}
```

It is useful if you do not like the way natbib sorts citation lists.

If you use natbib, then commands like `\cite` and `\citeauthor` are automatically supported. The command `\shortcite` is the same as `\cite` in numerical mode and cites the year in author-date mode.

Note that before version 1.48 the command `\citeyear` put the year in parentheses. In version 1.48 and later it produces just the year; the command `\citeyearpar` can be used to emulate its old behavior.

There are several customized Bib_T_EX entry types and fields in the ACM style file ACM-Reference-Format.bst that you may want to be aware of.

The style supports the fields `doi` and `url`, for example,

```
doi = "10.1145/1188913.1188915",
url = "http://ccrma.stanford.edu/~jos/bayes/bayes.pdf",
```

The style supports the arXiv-recommended fields `eprint` and (optionally) `primaryclass`, for example,

```
eprint = "960935712",
primaryclass = "cs",
```

See the examples at <http://arxiv.org/hypertex/bibstyles/>.

There are the special entry types online and game for Web pages and games, for example,

```
@online{Thornburg01,
author = "Harry Thornburg",
year = "2001",
title = "Introduction to Bayesian Statistics",
url = "http://ccrma.stanford.edu/~jos/bayes/bayes.html",
```

```

month =      mar,
lastaccessed = "March 2, 2005",
}

```

For these entry types you can use the `lastaccessed` field to add the access date for the URL.

There are two ways to enter video or audio sources in the bibliography corresponding to two different possibilities. For standalone sources available online, you can use an online entry and set its `howpublished` field. For example,

```

@online{Obama08,
author =      "Barack Obama",
year   =      "2008",
title  =      "A more perfect union",
howpublished = "Video",
day    =      "5",
url    =      "http://video.google.com/videoplay?docid=6528042696351994555",
month  =      mar,
lastaccessed = "March 21, 2008",
}

```

For sources available as attachments to conference proceedings and similar documents, you can use the usual `inproceedings` entry type and set its `howpublished` field:

```

@Inproceedings{Novak03,
author =      "Dave Novak",
title  =      "Solder man",
booktitle =   "ACM SIGGRAPH 2003 Video Review on Animation theater Program",
year   =      "2003",
publisher =   "ACM Press",
address =     "New York, NY",
pages  =      "4",
month  =      "March 21, 2008",
doi    =      "10.9999/woot07-S422",
howpublished = "Video",
}

```

Sometimes you need to cite a complete issue of a journal. The `periodical` entry type is intended for this:

```

@periodical{JCohen96,
key =        "Cohen",
editor =     "Jacques Cohen",
title =      "Special issue: Digital Libraries",
journal =    "Communications of the {ACM}",
volume =     "39",
number =     "11",
month =      nov,
}

```



```

year =      "1996",
}

```

If you do not know the year of publication, the style will add “[n. d.]” (for “no date”) to the entry.

If you do not know the author (this is often the case for online entries), use the key field to add a key for sorting and citations, for example,

```

@online{TUGInstmem,
key =      {TUG},
year =      2017,
title =      "Institutional members of the {\TeX} Users Group",
url =      "http://wwtug.org/instmem.html",
lastaccessed = "May 27, 2017",
}

```

2.11 Colors

While printed ACM publications are usually black and white, screen mode allows the use of colors. The ACM classes pre-define several colors according to [7]: ACMBLue, ACMYellow, ACMOrange, ACMRed, ACMLightBlue, ACMGreen, ACMPurple and ACMDarkBlue. You can use them in color assignments.

The ACM provides the following recommendation on color use.

The most accessible approach would be to ensure that your article is still readable when printed in greyscale. The most notable reasons for this are:

1. The most common type of inherited Color Vision Deficiency (CVD) is red-green (in which similar-brightness colors that differ only in their amounts of red or green are often confused), and it affects up to 8% of males and 0.5% of females of Northern European descent.
2. The most common type of acquired Color Vision Deficiency (CVD) is blue-yellow (including mild cases for many older adults).
3. Most printing is in black and white.
4. Situational impairments (e.g., bright sunlight shining on a mobile screen) tend to reduce the entire color gamut, reducing color discriminability.

Note: It is *not* safe to encode information using only variations in color (i.e., only differences in hue and/or saturation) as there is bound to be someone affected!

To ensure that you are using the most accessible colors, the ACM recommends that you choose sets of colors to help ensure suitable variations in when printed in greyscale by using either of the following tools:

1. ColourBrewer: <http://colorbrewer2.org/>
2. ACE: The Accessible Colour Evaluator: <http://daprlab.com/ace/> for designing WCAG 2.0 compliant palettes.

2.12 Other notable packages and typographic remarks

Several other packages are recommended for specialized tasks.

The package `subcaption` [8] is recommended for complex figures with several subplots or subfigures that require separate subcaptioning. The packages `nomencl` [9] and `glossaries` [10] can be used for the automatic creation of the lists of symbols and concepts used.

By default `acmart` prevents all widows and orphans (i.e., lonely lines at the beginning or end of the page) and hyphenation at the end of the page. This is done by the rather strict settings

```
\widowpenalty=10000
\clubpenalty=10000
\brokenpenalty=10000
```

However, this may lead to frustrating results when the authors must obey a page limit. Setting these penalties to smaller values may help if you absolutely need to.

Another problem might be the too strict line breaking rules. Again, a strategically placed `\sloppy` command or putting the problematic paragraph inside `sloppypar` environment might help—but beware, the results might be, well, sloppy.

Note that the uppercasing in section titles is done using the `textcase` package [11], so the command `\NoCaseChange` inside the title may help to prevent extraneous uppercasing.

2.13 A note for wizards: `acmart-preload-hook.tex`

Sometimes you need to change the behavior of `acmart`. The usual way to do this is to redefine commands in the preamble. However, these definitions are executed *after* `acmart` is loaded and certain decisions are made. This presents a number of problems.

For example, one may want to use the `titletoc` package with `acmart`. This package should be loaded before `hyperref`. However, since `acmart` loads `hyperref` itself, the line `\usepackage{titletoc}` in the preamble will lead to grief (see <http://tex.stackexchange.com/questions/357265/using-titletoc-with-acm-acmart-style>).

Another example is passing options to a package. Suppose you want to use the `dvipsnames` option of the `xcolor` package. Normally you cannot do this because `acmart` loads this package itself without options.

The file `acmart-preload-hook.tex` can be used to solve these problems. If this file exists, it will be processed before any other package. You can use this file to load packages or pass options to them. For example, if you put in this file

```
\let\LoadClassOrig\LoadClass
\renewcommand\LoadClass[2][\LoadClassOrig]{#1}{#2}%
\usepackage{titletoc}
```

then `titletoc` will be loaded before `hyperref`. If you put in this file

```
\PassOptionsToPackage{dvipsnames}{xcolor}
```

you will pass dvipsnames to xcolor.

Important note. This hook makes it too easy to create a manuscript that is not acceptable by the ACM. It is even easier to create a file that cannot be compiled. So please do not use it *unless you know what you are doing*. And if you use it, *do not ask for support*. If you decide to use this hook, you are on your own.

2.14 Currently supported publications

Table 5: ACM publications and arguments of the \acmJournal command

Abbreviation	Publication
CIE	ACM Computers in Entertainment
CSUR	ACM Computing Surveys
DTRAP	Digital Threats: Research and Practice
IMWUT	PACM on Interactive, Mobile, Wearable and Ubiquitous Technologies
JACM	Journal of the ACM
JDIQ	ACM Journal of Data and Information Quality
JEA	ACM Journal of Experimental Algorithmics
JERIC	ACM Journal of Educational Resources in Computing
JETC	ACM Journal on Emerging Technologies in Computing Systems
JOCCH	ACM Journal on Computing and Cultural Heritage
PACMCGIT	Proceedings of the ACM on Computer Graphics and Interactive Techniques
PACMHCI	PACM on Human-Computer Interaction
PACMPL	PACM on Programming Languages
POMACS	PACM on Measurement and Analysis of Computing Systems
TAAS	ACM Transactions on Autonomous and Adaptive Systems
TACCESS	ACM Transactions on Accessible Computing
TACO	ACM Transactions on Architecture and Code Optimization
TALG	ACM Transactions on Algorithms
TALLIP	ACM Transactions on Asian and Low-Resource Language Information Processing
TAP	ACM Transactions on Applied Perception
TCPS	ACM Transactions on Cyber-Physical Systems
TDSCI	ACM Transactions on Data Science
TEAC	ACM Transactions on Economics and Computation
TECS	ACM Transactions on Embedded Computing Systems
THRI	ACM Transactions on Human-Robot Interaction
TIIS	ACM Transactions on Interactive Intelligent Systems
TIOT	ACM Transactions on Internet of Things
TISSEC	ACM Transactions on Information and System Security
TIST	ACM Transactions on Intelligent Systems and Technology
TKDD	ACM Transactions on Knowledge Discovery from Data
TMIS	ACM Transactions on Management Information Systems

Table 5: ACM publications and arguments of the \acmJournal command (continued)

Abbreviation	Publication
TOCE	ACM Transactions on Computing Education
TOCHI	ACM Transactions on Computer-Human Interaction
TOCL	ACM Transactions on Computational Logic
TOCS	ACM Transactions on Computer Systems
TOCT	ACM Transactions on Computation Theory
TODAES	ACM Transactions on Design Automation of Electronic Systems
TODS	ACM Transactions on Database Systems
TOG	ACM Transactions on Graphics
TOIS	ACM Transactions on Information Systems
TOIT	ACM Transactions on Internet Technology
TOMACS	ACM Transactions on Modeling and Computer Simulation
TOMM	ACM Transactions on Multimedia Computing, Communications and Applications
TOMPECS	ACM Transactions on Modeling and Performance Evaluation of Computing Systems
TOMS	ACM Transactions on Mathematical Software
TOPC	ACM Transactions on Parallel Computing
TOPLAS	ACM Transactions on Programming Languages and Systems
TOPS	ACM Transactions on Privacy and Security
TOS	ACM Transactions on Storage
TOSEM	ACM Transactions on Software Engineering and Methodology
TOSN	ACM Transactions on Sensor Networks
TRETS	ACM Transactions on Reconfigurable Technology and Systems
TSAS	ACM Transactions on Spatial Algorithms and Systems
TSC	ACM Transactions on Social Computing
TSLP	ACM Transactions on Speech and Language Processing
TWEB	ACM Transactions on the Web

3 Implementation

3.1 Identification

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

```
1 <class>\NeedsTeXFormat{LaTeX2e}
2 <*gobble>
3 \ProvidesFile{acmart.dtx}
4 </gobble>
5 <class>\ProvidesClass{acmart}
6 [2018/04/14 v1.53 Typesetting articles for the Association for
7 Computing Machinery]
```

And the driver code:

```
8 <*gobble>
9 \documentclass{ltxdoc}
10 \usepackage{array,booktabs,amsmath,graphicx,fancyvrb,tabularx, longtable}
11 \usepackage[tt=false, type1=true]{libertine}
12 \usepackage[varqu]{zi4}
13 \usepackage[libertine]{newtxmath}
14 \usepackage[tableposition=top]{caption}
15 \usepackage{hypdoc}
16 \PageIndex
17 \CodelineIndex
18 \RecordChanges
19 \EnableCrossrefs
20 \begin{document}
21   \DocInput{acmart.dtx}
22 \end{document}
23 </gobble>
24 <*class>
25 \def\@classname{acmart}
```

3.2 Preload hook

We preload acmart-preload-hook:

```
26 \InputIfFileExists{acmart-preload-hook.tex}{%
27   \ClassWarning{\@classname}{%
28     I am loading acmart-preload-hook.tex. You are fully responsible
29     for any problems from now on.}}{}
```

3.3 Options

We need xkeyval since some of our options may have values:

```
30 \RequirePackage{xkeyval}
```

We use xstring to check whether user input is integer

```
31 \RequirePackage{xstring}
```

format The possible formats

```

32 \define@choicekey*+{acmart.cls}{format}[\ACM@format\ACM@format@nr]{%
33 manuscript, acmsmall, acmlarge, acmtog, sigconf, siggraph,
34 sigplan, sigchi, sigchi-a}[manuscript]{}{%
35 \ClassError{\@classname}{The option format must be manuscript,
36 acmsmall, acmlarge, acmtog, sigconf, siggraph,
37 sigplan, sigchi or sigchi-a}}
38 \def\@DeclareACMFormat#1{\DeclareOptionX{#1}{\setkeys{acmart.cls}{format=#1}}}
39 \@DeclareACMFormat{manuscript}
40 \@DeclareACMFormat{acmsmall}
41 \@DeclareACMFormat{acmlarge}
42 \@DeclareACMFormat{acmtog}
43 \@DeclareACMFormat{sigconf}
44 \@DeclareACMFormat{siggraph}
45 \@DeclareACMFormat{sigplan}
46 \@DeclareACMFormat{sigchi}
47 \@DeclareACMFormat{sigchi-a}
48 \ExecuteOptionsX{format}

```

\if@ACM@screen Whether we use screen mode

```

49 \define@boolkey+{acmart.cls}[\ACM@]{screen}[true]{%
50 \if@ACM@screen
51 \PackageInfo{\@classname}{Using screen mode}%
52 \else
53 \PackageInfo{\@classname}{Not using screen mode}%
54 \fi}{\PackageError{\@classname}{The option screen can be either true or
55 false}}
56 \ExecuteOptionsX{screen=false}

```

\if@ACM@acmthm Whether we define theorem-like environments.

```

57 \define@boolkey+{acmart.cls}[\ACM@]{acmthm}[true]{%
58 \if@ACM@acmthm
59 \PackageInfo{\@classname}{Requiring acmthm}%
60 \else
61 \PackageInfo{\@classname}{Suppressing acmthm}%
62 \fi}{\PackageError{\@classname}{The option acmthm can be either true or
63 false}}
64 \ExecuteOptionsX{acmthm=true}

```

\if@ACM@review Whether we use review mode

```

65 \define@boolkey+{acmart.cls}[\ACM@]{review}[true]{%
66 \if@ACM@review
67 \PackageInfo{\@classname}{Using review mode}%
68 \AtBeginDocument{\ACM@printfoliostrue}%
69 \else
70 \PackageInfo{\@classname}{Not using review mode}%
71 \fi}{\PackageError{\@classname}{The option review can be either true or
72 false}}
73 \ExecuteOptionsX{review=false}

```

`\if@ACM@authorversion` Whether we use author's-version mode

```

74 \define@boolkey+{acmart.cls}[@ACM@]{authorversion}[true]{%
75   \if@ACM@authorversion
76     \PackageInfo{\@classname}{Using authorversion mode}%
77   \else
78     \PackageInfo{\@classname}{Not using authorversion mode}%
79   \fi}{\PackageError{\@classname}{The option authorversion can be either true or
80     false}}
81 \ExecuteOptionsX{authorversion=false}

```

`\if@ACM@natbib@override` This macro is no longer used.

`\if@ACM@natbib` Whether we use natbib mode

```

82 \define@boolkey+{acmart.cls}[@ACM@]{natbib}[true]{%
83   \if@ACM@natbib
84     \PackageInfo{\@classname}{Explicitly selecting natbib mode}%
85   \else
86     \PackageInfo{\@classname}{Explicitly deselecting natbib mode}%
87   \fi}{\PackageError{\@classname}{The option natbib can be either true or
88     false}}
89 \ExecuteOptionsX{natbib=true}

```

`\if@ACM@anonymous` Whether we use anonymous mode

```

90 \define@boolkey+{acmart.cls}[@ACM@]{anonymous}[true]{%
91   \if@ACM@anonymous
92     \PackageInfo{\@classname}{Using anonymous mode}%
93   \else
94     \PackageInfo{\@classname}{Not using anonymous mode}%
95   \fi}{\PackageError{\@classname}{The option anonymous can be either true or
96     false}}
97 \ExecuteOptionsX{anonymous=false}

```

`\if@ACM@timestamp` Whether we use timestamp mode

```

98 \define@boolkey+{acmart.cls}[@ACM@]{timestamp}[true]{%
99   \if@ACM@timestamp
100     \PackageInfo{\@classname}{Using timestamp mode}%
101   \else
102     \PackageInfo{\@classname}{Not using timestamp mode}%
103   \fi}{\PackageError{\@classname}{The option timestamp can be either true or
104     false}}
105 \ExecuteOptionsX{timestamp=false}

```

`\if@ACM@authordraft` Whether we use author-draft mode

```

106 \define@boolkey+{acmart.cls}[@ACM@]{authordraft}[true]{%
107   \if@ACM@authordraft
108     \PackageInfo{\@classname}{Using authordraft mode}%
109     \@ACM@timestamptrue
110     \@ACM@reviewtrue
111   \else

```

```

112 \PackageInfo{\@classname}{Not using authordraft mode}%
113 \fi}{\PackageError{\@classname}{The option authordraft can be either true or
114     false}}
115 \ExecuteOptionsX{authordraft=false}

```

\ACM@fontsize The font size to pass to the base class

```

116 \def\ACM@fontsize{}
117 \DeclareOptionX{9pt}{\edef\ACM@fontsize{\CurrentOption}}
118 \DeclareOptionX{10pt}{\edef\ACM@fontsize{\CurrentOption}}
119 \DeclareOptionX{11pt}{\edef\ACM@fontsize{\CurrentOption}}
120 \DeclareOptionX{12pt}{\edef\ACM@fontsize{\CurrentOption}}

121 \DeclareOptionX{draft}{\PassOptionsToClass{\CurrentOption}{amsart}}
122 \DeclareOptionX{*}{\PassOptionsToClass{\CurrentOption}{amsart}}
123 \ProcessOptionsX
124 \ClassInfo{\@classname}{Using format \ACM@format, number \ACM@format@nr}

```

3.4 Setting switches

\if@ACM@manuscript Whether we use manuscript mode

```

125 \newif\if@ACM@manuscript

```

\if@ACM@journal There are two kinds of publications: journals and books

```

126 \newif\if@ACM@journal

```

\if@ACM@sigchiamode The formatting of SIGCHI extended abstracts is quite unusual. We have a special switch for them.

```

127 \newif\if@ACM@sigchiamode

```

Setting up switches

```

128 \ifnum\ACM@format@nr=5\relax % siggraph
129 \ClassWarning{\@classname}{The format siggraph is now obsolete.
130     I am switching to sigconf.}
131 \setkeys{acmart.cls}{format=sigconf}
132 \fi
133 \ifnum\ACM@format@nr=0\relax
134 \@ACM@manuscripttrue
135 \else
136 \@ACM@manuscriptfalse
137 \fi
138 \@ACM@sigchiamodefalse
139 \ifcase\ACM@format@nr
140 \relax % manuscript
141 \@ACM@journaltrue
142 \or % acmsmall
143 \@ACM@journaltrue
144 \or % acmlarge
145 \@ACM@journaltrue

```



```

146 \or % acmtog
147   \@ACM@journaltrue
148 \or % sigconf
149   \@ACM@journalfalse
150 \or % siggraph
151   \@ACM@journalfalse
152 \or % sigplan
153   \@ACM@journalfalse
154 \or % sigchi
155   \@ACM@journalfalse
156 \or % sigchi-a
157   \@ACM@journalfalse
158   \@ACM@sigchiamodetrue
159 \fi

```

3.5 Loading the base class and package

At this point we either have \ACM@fontsize or use defaults

```

160 \ifx\ACM@fontsize\@empty
161   \ifcase\ACM@format@nr
162     \relax % manuscript
163     \def\ACM@fontsize{9pt}%
164   \or % acmsmall
165     \def\ACM@fontsize{10pt}%
166   \or % acmlarge
167     \def\ACM@fontsize{10pt}%
168   \or % acmtog
169     \def\ACM@fontsize{9pt}%
170   \or % sigconf
171     \def\ACM@fontsize{9pt}%
172   \or % siggraph
173     \def\ACM@fontsize{9pt}%
174   \or % sigplan
175     \def\ACM@fontsize{10pt}%
176   \or % sigchi
177     \def\ACM@fontsize{10pt}%
178   \or % sigchi-a
179     \def\ACM@fontsize{10pt}%
180   \fi
181 \fi
182 \ClassInfo{\@classname}{Using fontsize \ACM@fontsize}
183 \LoadClass[\ACM@fontsize, reqno]{amsart}
184 \RequirePackage{microtype}

```

We need etoolbox for delayed code

```
185 \RequirePackage{etoolbox}
```

We need totpages to calculate the number of pages and refcount to use that number

```
186 \RequirePackage{refcount}
```

```
187 \RequirePackage{totpages}
```

The `\collect@body` macro in `amsmath` is defined using `\def`. We load `environ` to access the `\long` version of this command

```
188 \RequirePackage{environ}
```

We use `setspace` for double spacing

```
189 \if@ACM@manuscript
```

```
190 \RequirePackage{setspace}
```

```
191 \onehalfspacing
```

```
192 \fi
```

We need `textcase` for better upcasing

```
193 \RequirePackage{textcase}
```

3.6 Citations

We patch `\setcitestyle` to allow, for example, `\setcitestyle{sort}` and `\setcitestyle{nosort}`. We patch `\citestyle` to warn about undefined citation styles.

```
194 \if@ACM@natbib
```

```
195 \RequirePackage{natbib}
```

```
196 \renewcommand{\bibsection}{%
```

```
197 \section*{\refname}%
```

```
198 \phantomsection\addcontentsline{toc}{section}{\refname}%
```

```
199 }
```

```
200 \renewcommand{\bibfont}{\bibliofont}
```

```
201 \renewcommand{\setcitestyle}[1]{
```

```
202 \@for\@tempa:=#1\do
```

```
203 {\def\@tempb{round}\ifx\@tempa\@tempb
```

```
204 \renewcommand\NAT@open{(\renewcommand\NAT@close{)}\fi
```

```
205 \def\@tempb{square}\ifx\@tempa\@tempb
```

```
206 \renewcommand\NAT@open{[\renewcommand\NAT@close{]}\fi
```

```
207 \def\@tempb{angle}\ifx\@tempa\@tempb
```

```
208 \renewcommand\NAT@open{$<\renewcommand\NAT@close{$>}\fi
```

```
209 \def\@tempb{curly}\ifx\@tempa\@tempb
```

```
210 \renewcommand\NAT@open{\{\renewcommand\NAT@close{\}}\fi
```

```
211 \def\@tempb{semicolon}\ifx\@tempa\@tempb
```

```
212 \renewcommand\NAT@sep{;}\fi
```

```
213 \def\@tempb{colon}\ifx\@tempa\@tempb
```

```
214 \renewcommand\NAT@sep{:}\fi
```

```
215 \def\@tempb{comma}\ifx\@tempa\@tempb
```

```
216 \renewcommand\NAT@sep{,}\fi
```

```
217 \def\@tempb{authoryear}\ifx\@tempa\@tempb
```

```
218 \NAT@numbersfalse\fi
```

```
219 \def\@tempb{numbers}\ifx\@tempa\@tempb
```

```
220 \NAT@numberstrue\NAT@superfalse\fi
```

```
221 \def\@tempb{super}\ifx\@tempa\@tempb
```

```
222 \NAT@numberstrue\NAT@supertrue\fi
```

```
223 \def\@tempb{nobibstyle}\ifx\@tempa\@tempb
```

```
224 \let\bibstyle=\@gobble\fi
```

```

225 \def\@tempb{bibstyle}\ifx\@tempa\@tempb
226 \let\bibstyle=\@citestyle\fi
227 \def\@tempb{sort}\ifx\@tempa\@tempb
228 \def\NAT@sort{\@ne}\fi
229 \def\@tempb{nosort}\ifx\@tempa\@tempb
230 \def\NAT@sort{\@z}\fi
231 \def\@tempb{compress}\ifx\@tempa\@tempb
232 \def\NAT@cmprs{\@ne}\fi
233 \def\@tempb{nocompress}\ifx\@tempa\@tempb
234 \def\NAT@cmprs{\@z}\fi
235 \def\@tempb{sort&compress}\ifx\@tempa\@tempb
236 \def\NAT@sort{\@ne}\def\NAT@cmprs{\@ne}\fi
237 \def\@tempb{mcite}\ifx\@tempa\@tempb
238 \let\NAT@merge\@ne\fi
239 \def\@tempb{merge}\ifx\@tempa\@tempb
240 \ifnum{\NAT@merge<\tw@}{\let\NAT@merge\tw@}\fi
241 \def\@tempb{elide}\ifx\@tempa\@tempb
242 \ifnum{\NAT@merge<\thr@@}{\let\NAT@merge\thr@@}\fi
243 \def\@tempb{longnamesfirst}\ifx\@tempa\@tempb
244 \NAT@longnamestrue\fi
245 \def\@tempb{nonamebreak}\ifx\@tempa\@tempb
246 \def\NAT@nmfmt#1{\mbox{\NAT@up#1}}\fi
247 \expandafter\NAT@find@eq\@tempa=\relax\@nil
248 \if\@tempc\relax\else
249 \expandafter\NAT@rem@eq\@tempc
250 \def\@tempb{open}\ifx\@tempa\@tempb
251 \xdef\NAT@open{\@tempc}\fi
252 \def\@tempb{close}\ifx\@tempa\@tempb
253 \xdef\NAT@close{\@tempc}\fi
254 \def\@tempb{aysep}\ifx\@tempa\@tempb
255 \xdef\NAT@aysep{\@tempc}\fi
256 \def\@tempb{yysep}\ifx\@tempa\@tempb
257 \xdef\NAT@yrsep{\@tempc}\fi
258 \def\@tempb{notesep}\ifx\@tempa\@tempb
259 \xdef\NAT@cmt{\@tempc}\fi
260 \def\@tempb{citesep}\ifx\@tempa\@tempb
261 \xdef\NAT@sep{\@tempc}\fi
262 \fi
263 }%
264 \NAT@@setcites
265 }
266 \renewcommand\citestyle[1]{%
267 \ifcsname bibstyle@#1\endcsname%
268 \csname bibstyle@#1\endcsname\let\bibstyle\@gobble%
269 \else%
270 \latex@error{Undefined ‘#1’ citestyle}%
271 \fi
272 }%
273 \fi

```

`\bibstyle@acmauthoryear` The default author-year format:

```

274 \newcommand{\bibstyle@acmauthoryear}{%
275   \setcitestyle{%
276     authoryear,%
277     open={},close={},citesep={;},%
278     aysep={},yysep={},,%
279     notesep={, }}}
```

`\bibstyle@acmnumeric` The default numeric format:

```

280 \newcommand{\bibstyle@acmnumeric}{%
281   \setcitestyle{%
282     numbers,sort&compress,%
283     open={},close={},citesep={},,%
284     notesep={, }}}
```

The default is numeric:

```

285 \if@ACM@natbib
286 \citestyle{acmnumeric}
287 \fi
```

`\@startsection` Before we call `hyperref`, we redefine `\startsection` commands to their \LaTeX defaults since the `amsart` ones are too AMS-specific. We need to do this early since we want `hyperref` to have a chance to redefine them again:

```

288 \def\@startsection#1#2#3#4#5#6{%
289   \if@noskipsec \leavevmode \fi
290   \par
291   \@tempskipa #4\relax
292   \@afterindenttrue
293   \ifdim \@tempskipa <\z@
294     \@tempskipa -\@tempskipa \@afterindentfalse
295   \fi
296   \if@nobreak
297     \everypar{%
298       \else
299       \addpenalty\@secpenalty\addvspace\@tempskipa
300     \fi
301     \@ifstar
302       {\@ssect{#3}{#4}{#5}{#6}}%
303       {\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}
304 \def\@sect#1#2#3#4#5#6[#7]#8{%
305   \edef\@toclevel{\ifnum#2=\@m 0\else\number#2\fi}%
306   \ifnum #2>\c@secnumdepth
307     \let\@svsec\@empty
308   \else
309     \refstepcounter{#1}%
310     \protected@edef\@svsec{\@secntformat{#1}\relax}%
311   \fi
312   \@tempskipa #5\relax
313   \ifdim \@tempskipa>\z@
```

```

314 \begingroup
315   #6{%
316     \@hangfrom{\hskip #3\relax\@svsec}%
317     \interlinepenalty \@M #8\@par}%
318 \endgroup
319 \csname #1mark\endcsname{#7}%
320 \ifnum #2>\c@secnumdepth \else
321   \@tochangmeasure{\csname the#1\endcsname}%
322 \fi
323 \addcontentsline{toc}{#1}{%
324   \ifnum #2>\c@secnumdepth \else
325     \protect\numberline{\csname the#1\endcsname}%
326   \fi
327   #7}%
328 \else
329   \def\@svsechd{%
330     #6{\hskip #3\relax
331       \@svsec #8}%
332     \csname #1mark\endcsname{#7}%
333     \ifnum #2>\c@secnumdepth \else
334       \@tochangmeasure{\csname the#1\endcsname\space}%
335     \fi
336     \addcontentsline{toc}{#1}{%
337       \ifnum #2>\c@secnumdepth \else
338         \protect\numberline{\csname the#1\endcsname}%
339       \fi
340       #7}}%
341 \fi
342 \@xsect{#5}}
343 \def\@xsect#1{%
344   \@tempskipa #1\relax
345   \ifdim \@tempskipa>\z@
346     \par \nobreak
347     \vskip \@tempskipa
348     \@afterheading
349   \else
350     \@nobreakfalse
351     \global\@noskipsectrue
352     \everypar{%
353       \if@noskipsec
354         \global\@noskipsecfalse
355         {\setbox\z@\lastbox}%
356         \clubpenalty\@M
357         \begingroup \@svsechd \endgroup
358         \unskip
359         \@tempskipa #1\relax
360         \hskip -\@tempskipa
361       \else
362         \clubpenalty \@clubpenalty
363         \everypar{}%

```

```

364     \fi}%
365 \fi
366 \ignorespaces}
367 \def\@seccntformat#1{\csname the#1\endcsname\quad}
368 \def\@ssect#1#2#3#4#5{%
369   \@tempskipa #3\relax
370   \ifdim \@tempskipa>\z@
371     \begingroup
372       #4{%
373         \@hangfrom{\hskip #1}%
374         \interlinepenalty \@M #5\@par}%
375     \endgroup
376   \else
377     \def\@svsechd{#4{\hskip #1\relax #5}}%
378   \fi
379   \@xsect{#3}}

```

\@startsection The amsart package redefines \@startsection. Here we redefine it again to make the table of contents work.

```

380 \def\@starttoc#1#2{\begingroup\makeatletter
381   \setTrue{#1}%
382   \par\removelastskip\vskip\z@skip
383   \@startsection{section}\@M\z@{\linespacing\@plus\linespacing}%
384     {.5\linespacing}{centering\contentsnamefont}{#2}%
385   \input{\jobname.#1}%
386   \if@filesn
387     \exp\newwrite\csname tf#1\endcsname
388     \immediate\exp\openout\csname tf#1\endcsname \jobname.#1\relax
389   \fi
390   \global\@nbreakfalse \endgroup
391   \addvspace{32\p@\@plus14\p@}%
392 }

```

\l@section Section spacing is more generous than for amsart

```

393 \def\l@section{\@toctline{1}{0pt}{1pc}{2pc}{}}

```

\l@subsection The spacing in amsart is too large

```

394 \def\l@subsection{\@toctline{2}{0pt}{1pc}{3pc}{}}

```

\l@subsubsection The spacing in amsart is too large

```

395 \def\l@subsubsection{\@toctline{2}{0pt}{1pc}{5pc}{}}

```

And hyperref

```

396 \let\@footnotemark@nolink\@footnotemark
397 \let\@footnotetext@nolink\@footnotetext
398 \RequirePackage[bookmarksnumbered,unicode]{hyperref}
399 \pdfstringdefDisableCommands{%
400   \def\unskip{}%
401   \def\textbullet{- }%

```

```

402 \def\textrightarrow{ -> }%
403 \def\footnotemark{ }%
404 }
405 \urlstyle{rm}
406 \ifcase\ACM@format@nr
407 \relax % manuscript
408 \or % acmsmall
409 \or % acmlarge
410 \or % acmtog
411 \or % sigconf
412 \or % siggraph
413 \or % sigplan
414 \urlstyle{sf}
415 \or % sigchi
416 \or % sigchi-a
417 \urlstyle{sf}
418 \fi
419 \AtEndPreamble{%
420 \if@ACM@screen
421 \hypersetup{colorlinks,
422 linkcolor=ACMRed,
423 citecolor=ACMPurple,
424 urlcolor=ACMDarkBlue,
425 filecolor=ACMDarkBlue}
426 \else
427 \hypersetup{hidelinks}
428 \fi}

Bibliography mangling.
429 \if@ACM@natbib
430 \let\cite\cite
431 \let\cite\citep
432 \let\citeANP\citeauthor
433 \let\citeNN\citeyearpar
434 \let\citeyearNP\citeyear
435 \let\citeNP\citealt
436 \DeclareRobustCommand\citeA
437 {\begingroup\NAT@swafalse
438 \let\NAT@ctype\@ne\NAT@partrue\NAT@fullfalse\NAT@open\NAT@citetp}%
439 \providecommand\newblock{}%
440 \else
441 \AtBeginDocument{%
442 \let\shortcite\cite%
443 \providecommand\citename[1]{#1}}
444 \fi
445 \newcommand\shortcite[2][]{%
446 \ifNAT@numbers\cite[#1]{#2}\else\citeyearpar[#1]{#2}\fi}

```

`\bibliographystyle` The `amsart` package redefines `\bibliographystyle` since it prefers the AMS bibliography style. We turn it back to the \LaTeX definition:

```

447 \def\bibliographystyle#1{%
448   \ifx\@begindocumenthook\@undefined\else
449     \expandafter\AtBeginDocument
450   \fi
451   {\if@filesw
452     \immediate\write\@auxout{\string\bibstyle{#1}}%
453   \fi}}

```

Graphics and color.

```

454 \RequirePackage{graphicx}
455 \RequirePackage[prologue]{xcolor}

```

We define ACM colors according to [7]:

```

456 \definecolor[named]{ACMBlue}{cmyk}{1,0.1,0,0.1}
457 \definecolor[named]{ACMYellow}{cmyk}{0,0.16,1,0}
458 \definecolor[named]{ACMOrange}{cmyk}{0,0.42,1,0.01}
459 \definecolor[named]{ACMRed}{cmyk}{0,0.90,0.86,0}
460 \definecolor[named]{ACMLightBlue}{cmyk}{0.49,0.01,0,0}
461 \definecolor[named]{ACMGreen}{cmyk}{0.20,0,1,0.19}
462 \definecolor[named]{ACMPurple}{cmyk}{0.55,1,0,0.15}
463 \definecolor[named]{ACMDarkBlue}{cmyk}{1,0.58,0,0.21}

```

Author-draft mode

```

464 \if@ACM@authordraft
465   \RequirePackage{draftwatermark}
466   \SetWatermarkFontSize{0.5in}
467   \SetWatermarkColor[gray]{.9}
468   \SetWatermarkText{\parbox{12em}{\centering
469     Unpublished working draft.\
470     Not for distribution.}}
471 \fi

```

3.7 Paper size and paragraphing

We use geometry for dimensions. Note that the present margins do not depend on the font size option—we might need to change this. See <https://github.com/borisveytsman/acmart/issues/5#issuecomment-272881329>.

```

472 \RequirePackage{geometry}
473 \ifcase\ACM@format@nr
474 \relax % manuscript
475   \geometry{letterpaper,head=13pt,
476     marginparwidth=6pc,heightrounded}%
477 \or % acmsmall
478   \geometry{twoside=true,
479     includeheadfoot, head=13pt, foot=2pc,
480     paperwidth=6.75in, paperheight=10in,
481     top=58pt, bottom=44pt, inner=46pt, outer=46pt,
482     marginparwidth=2pc,heightrounded
483   }%
484 \or % acmlarge

```



```

485 \geometry{twoside=true, head=13pt, foot=2pc,
486   paperwidth=8.5in, paperheight=11in,
487   includeheadfoot,
488   top=78pt, bottom=114pt, inner=81pt, outer=81pt,
489   marginparwidth=4pc,heightrounded
490   }%
491 \or % acmtog
492 \geometry{twoside=true, head=13pt, foot=2pc,
493   paperwidth=8.5in, paperheight=11in,
494   includeheadfoot, columnsep=24pt,
495   top=52pt, bottom=75pt, inner=52pt, outer=52pt,
496   marginparwidth=2pc,heightrounded
497   }%
498 \or % sigconf
499 \geometry{twoside=true, head=13pt,
500   paperwidth=8.5in, paperheight=11in,
501   includeheadfoot, columnsep=2pc,
502   top=57pt, bottom=73pt, inner=54pt, outer=54pt,
503   marginparwidth=2pc,heightrounded
504   }%
505 \or % siggraph
506 \geometry{twoside=true, head=13pt,
507   paperwidth=8.5in, paperheight=11in,
508   includeheadfoot, columnsep=2pc,
509   top=57pt, bottom=73pt, inner=54pt, outer=54pt,
510   marginparwidth=2pc,heightrounded
511   }%
512 \or % sigplan
513 \geometry{twoside=true, head=13pt,
514   paperwidth=8.5in, paperheight=11in,
515   includeheadfoot=false, columnsep=2pc,
516   top=1in, bottom=1in, inner=0.75in, outer=0.75in,
517   marginparwidth=2pc,heightrounded
518   }%
519 \or % sigchi
520 \geometry{twoside=true, head=13pt,
521   paperwidth=8.5in, paperheight=11in,
522   includeheadfoot, columnsep=2pc,
523   top=66pt, bottom=73pt, inner=54pt, outer=54pt,
524   marginparwidth=2pc,heightrounded
525   }%
526 \or % sigchi-a
527 \geometry{twoside=false, head=13pt,
528   paperwidth=11in, paperheight=8.5in,
529   includeheadfoot, marginparsep=72pt,
530   marginparwidth=170pt, columnsep=20pt,
531   top=72pt, bottom=72pt, left=314pt, right=72pt
532   }%
533 \@mparswitchfalse
534 \reversemarginpar

```

```

535 \fi

\parindent Paragraphing
\parskip
536 \setlength\parindent{10\p@}
537 \setlength\parskip{\z@}
538 \ifcase\ACM@format@nr
539 \relax % manuscript
540 \or % acmsmall
541 \or % acmlarge
542 \or % acmtog
543 \setlength\parindent{9\p@}%
544 \or % sigconf
545 \or % siggraph
546 \or % sigplan
547 \or % sigchi
548 \or % sigchi-a
549 \fi

\normalparindent The amsart package defines the \normalparindent length and initializes it to 12pt (the
value of \parindent in amsart). It is later used to set the \listparindent length in
the quotation environment and the \parindent length in the \@footnotetext com-
mand. We set \normalparindent to the value of \parindent as selected by acmart for
consistent paragraph indents.
550 \setlength\normalparindent{\parindent}

Footnotes require some consideration. We have several layers of footnotes: front-
matter footnotes, “regular” footnotes and the special insert for the bibstrip. In the old
ACM classes, the bibstrip was a \@float. The problem with floats is that they tend to,
well, float—and we want the guarantee they stay.
We use manyfoot for layered footnotes instead.

\copyrightpermissionfootnoterule This is the footnote rule that separates the bibstrip from the rest of the paper. It is a full
width rule.
551 \def\copyrightpermissionfootnoterule{\kern-3\p@
552 \hrule \@width \columnwidth \kern 2.6\p@}

553 \RequirePackage{manyfoot}
554 \SelectFootnoteRule[2]{copyrightpermission}
555 \DeclareNewFootnote{authorsaddresses}
556 \SelectFootnoteRule[2]{copyrightpermission}
557 \DeclareNewFootnote{copyrightpermission}

\footnoterule Tschichold’s rules:
558 \def\footnoterule{\kern-3\p@
559 \hrule \@width 4pc \kern 2.6\p@}

\endminipage We do not use footnote rules in minipages
560 \def\endminipage{%
561 \par

```

```

562 \unskip
563 \ifvoid\@mpfootins\else
564 \vskip\skip\@mpfootins
565 \normalcolor
566 \unvbox\@mpfootins
567 \fi
568 \@minipagefalse
569 \color@endgroup
570 \egroup
571 \expandafter\@iiiparbox\@mpargs{\unvbox\@tempboxa}}

\@makefnmark We do not use indentation for footnotes
572 \def\@makefnmark{\noindent\@makefnmark}

\@footnotetext In sigchi-a mode our footnotes are in the margin!
573 \if@ACM@sigchiamode
574 \long\def\@footnotetext#1{\marginpar{%
575 \reset@font\small
576 \interlinepenalty\interfootnotelinepenalty
577 \protected@edef\@currentlabel{%
578 \csname p@footnote\endcsname\@thefnmark
579 }%
580 \color@begingroup
581 \makefnmark{%
582 \rule{z@footnotesep}{\ignorespaces#1}\@finalstrut\strutbox}%
583 \color@endgroup}}%
584 \fi

\@mpfootnotetext We want the footnotes in minipages centered:
585 \long\def\@mpfootnotetext#1{%
586 \global\setbox\@mpfootins\vbox{%
587 \unvbox\@mpfootins
588 \reset@font\footnotesize
589 \hsize\columnwidth
590 \@parboxrestore
591 \protected@edef\@currentlabel
592 {\csname p@mpfootnote\endcsname\@thefnmark}%
593 \color@begingroup\centering
594 \makefnmark{%
595 \rule{z@footnotesep}{\ignorespaces#1}\@finalstrut\strutbox}%
596 \color@endgroup}}

\@makefnmark AMS classes use a buggy definition of \makefnmark. We revert to the standard one.
597 \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}

\@textbottom Add some stretch according to David Carlisle's advice at http://tex.stackexchange.com/a/62318/5522
598 \def\@textbottom{\vskip \z@ \@plus 1pt}
599 \let\@texttop\relax

```

3.8 Fonts

Somehow PDF_TEX and Xe_TEX require different incantations to make a PDF compliant with the current Acrobat bugs. Xpdf is much better.

The code below is by Ross Moore.

```
600 \RequirePackage{iftex}
601 \ifPDFTeX
602 \input{glyphtounicode}
603 \pdfglyphtounicode{f_f}{FB00}
604 \pdfglyphtounicode{f_f_i}{FB03}
605 \pdfglyphtounicode{f_f_l}{FB04}
606 \pdfglyphtounicode{f_i}{FB01}
607 \pdfglyphtounicode{t_t}{00740074}
608 \pdfglyphtounicode{f_t}{00660074}
609 \pdfglyphtounicode{T_h}{00540068}
610 \pdfgentounicode=1
611 \fi
612 \RequirePackage{cmap}

\if@ACM@newfonts Whether we load the new fonts
613 \newif\if@ACM@newfonts
614 \@ACM@newfontstrue
615 \IfFileExists{libertine.sty}{\ClassWarning{\@classname}{You do not
616   have the libertine package installed. Please upgrade your
617   TeX}\@ACM@newfontsfalse}
618 \IfFileExists{zi4.sty}{\ClassWarning{\@classname}{You do not
619   have the zi4 package installed. Please upgrade your
620   TeX}\@ACM@newfontsfalse}
621 \IfFileExists{newtxmath.sty}{\ClassWarning{\@classname}{You do not
622   have the newtxmath package installed. Please upgrade your
623   TeX}\@ACM@newfontsfalse}

We use Libertine throughout.
624 \if@ACM@newfonts
625 \ifxetex
626   \RequirePackage[tt=false]{libertine}
627 \else
628   \RequirePackage[tt=false, type1=true]{libertine}
629 \fi
630 \RequirePackage[varqu]{zi4}
631 \RequirePackage[libertine]{newtxmath}
632 \ifxetex\else
633   \RequirePackage[T1]{fontenc}
634 \fi
635 \fi

\liningnums Libertine defines \liningnums, which makes fontspec unhappy. While we do not use
fontspec, some users do.
636 \let\liningnums\@undefined
```

```

637 \AtEndPreamble{%
638   \DeclareTextFontCommand{\liningnums}{\libertineLF}}

```

The SIGCHI extended abstracts are sans serif:

```

639 \if@ACM@sigchiamode
640   \renewcommand{\familydefault}{\sfdefault}
641 \fi

```

3.9 Floats

We use the caption package

```

642 \RequirePackage{caption, float}
643 \captionsetup[table]{position=top}
644 \if@ACM@journal
645   \captionsetup{labelfont={sf, small},
646     textfont={sf, small}, margin=\z@}
647   \captionsetup[figure]{name={Fig.}}
648 \else
649   \captionsetup{labelfont={bf},
650     textfont={bf}, labelsep=colon, margin=\z@}
651   \ifcase\ACM@format@nr
652     \relax % manuscript
653     \or % acmsmall
654     \or % acmlarge
655     \or % acmtog
656     \or % sigconf
657     \or % siggraph
658     \captionsetup{textfont={it}}
659     \or % sigplan
660     \captionsetup{labelfont={bf},
661       textfont={normalfont}, labelsep=period, margin=\z@}
662     \or % sigchi
663     \captionsetup[figure]{labelfont={bf, small},
664       textfont={bf, small}}
665     \or % sigchi-a
666     \captionsetup[figure]{labelfont={bf, small},
667       textfont={bf, small}}
668   \fi
669 \fi

```

sidebar The sidebar environment:

```

670 \newfloat{sidebar}{}{sbar}
671 \floatname{sidebar}{Sidebar}
672 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}

```

\@sidebar The processing of the saved text

```

673 \long\def\@sidebar#1{\bgroup\captionsetup{type=sidebar}%
674   \marginpar{\small#1}\egroup}

```

`marginfigure` The `marginfigure` environment:

```
675 \newenvironment{marginfigure}{\Collect@Body\@marginfigure}{}
```

`\@marginfigure` The processing of the saved text

```
676 \long\def\@marginfigure#1{\bgroup\captionsetup{type=figure}%
677   \marginpar{\centering\small#1}\egroup}
```

`marginable` The `marginable` environment:

```
678 \newenvironment{marginable}{\Collect@Body\@marginable}{}
```

`\@marginable` The processing of the saved text

```
679 \long\def\@marginable#1{\bgroup\captionsetup{type=table}%
680   \marginpar{\centering\small#1}\egroup}
```

SIGCHI extended abstracts provide an interesting possibility to push into the margin. Here we use `figure*` and `table*` for this.

`\fulltextwidth` We define the width of the boxes as

```
681 \newdimen\fulltextwidth
682 \fulltextwidth=\dimexpr(\textwidth+\marginparwidth+\marginparsep)
```

`\@dblfloat` We redefine the double-float command. First, we make the size bigger. Second, our default position is going to be `tp` (to give marginalia a chance)

```
683 \if@ACM@sigchiamode
684 \def\@dblfloat{\bgroup\columnwidth=\fulltextwidth
685   \let\@endfloatbox\@endwidefloatbox
686   \def\@fpsadddefault{\def\@fps{tp}}}%
687 \@float}
688 \fi
```

`\end@dblfloat` And the end. Just adding a `\bgroup`.

```
689 \if@ACM@sigchiamode
690 \def\end@dblfloat{%
691   \end@float\egroup}
692 \fi
```

`\@endwidefloatbox` This is the end of a wide box—we basically move everything to the left

```
693 \def\@endwidefloatbox{%
694   \par\vskip\z@skip
695   \@minipagefalse
696   \outer@nobreak
697   \egroup
698   \color@endbox
699   \global\setbox\@currbox=\vbox{\moveleft
700     \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
701   \wd\@currbox=\textwidth
702 }
```

3.10 Lists

```
703 \ifcase\ACM@format@nr
704 \relax % manuscript
705 \or % acmsmall
706 \or % acmlarge
707 \or % acmtog
708 \or % sigconf
709 \or % siggraph
710 \or % sigplan
711 \def\labelenumi{\theenumi.}
712 \def\labelenumii{\theenumii.}
713 \def\labelenumiii{\theenumiii.}
714 \def\labelenumiv{\theenumiv.}
715 \or % sigchi
716 \or % sigchi-a
717 \fi
```

The AMS uses generous margins for lists. Note that `amsart` defines `\leftmargin` values for list levels at the beginning of the document, so we must redefine them in the same manner. Also, note that `amsart` redefines the `enumerate` and `itemize` environments with a `\makelabel` command that uses `\llap`, so the `\labelwidth` value is (effectively) irrelevant; nonetheless, we follow `amsart` and set `\labelwidth` to `\leftmargin` minus `\labelsep`.

```
718 \newdimen\@ACM@labelwidth
719 \AtBeginDocument{%
720   \setlength\labelsep{4pt}
721   \setlength{\@ACM@labelwidth}{6.5pt}
722
723   %% First-level list: when beginning after the first line of an
724   %% indented paragraph or ending before an indented paragraph, labels
725   %% should not hang to the left of the preceding/following text.
726   \setlength\leftmargini{\z@}
727   \addtolength\leftmargini{\parindent}
728   \addtolength\leftmargini{2\labelsep}
729   \addtolength\leftmargini{\@ACM@labelwidth}
730
731   %% Second-level and higher lists.
732   \setlength\leftmarginii{\z@}
733   \addtolength\leftmarginii{0.5\labelsep}
734   \addtolength\leftmarginii{\@ACM@labelwidth}
735   \setlength\leftmarginiii{\leftmarginii}
736   \setlength\leftmarginiv{\leftmarginiii}
737   \setlength\leftmarginv{\leftmarginiv}
738   \setlength\leftmarginvi{\leftmarginv}
739   \@listi}
740 \newskip\listisep
741 \listisep\smallskipamount
742 \def\@listI{\leftmargin\leftmargini
743   \labelwidth\leftmargini \advance\labelwidth-\labelsep
```

```

744 \listparindent\z@
745 \topsep\listisep}
746 \let\@listi\@listI
747 \def\@listii{\leftmargin\leftmarginii
748 \labelwidth\leftmarginii \advance\labelwidth-\labelsep
749 \topsep\z@skip}
750 \def\@listiii{\leftmargin\leftmarginiii
751 \labelwidth\leftmarginiii \advance\labelwidth-\labelsep}
752 \def\@listiv{\leftmargin\leftmarginiv
753 \labelwidth\leftmarginiv \advance\labelwidth-\labelsep}
754 \def\@listv{\leftmargin\leftmarginv
755 \labelwidth\leftmarginv \advance\labelwidth-\labelsep}
756 \def\@listvi{\leftmargin\leftmarginvi
757 \labelwidth\leftmarginvi \advance\labelwidth-\labelsep}

\descriptionlabel We do not use a colon by default like amsart does:
758 \renewcommand{\descriptionlabel}[1]{\upshape\bfseries #1}

\description Make the description environment indentation consistent with that of the itemize
and enumerate environments.
759 \renewenvironment{description}{\list{}{%
760 \labelwidth\@ACM\labelwidth
761 \let\makelabel\descriptionlabel}%
762 }{
763 \endlist
764 }
765 \let\enddescription=\endlist % for efficiency

```

3.11 Top-matter data

We use the xkeyval interface to define journal titles and the relevant information

```

766 \define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
767 CIE,%
768 CSUR,%
769 DTRAP,%
770 IMWUT,%
771 JACM,%
772 JDIQ,%
773 JEA,%
774 JERIC,%
775 JETC,%
776 JOCCH,%
777 PACMCGIT,%
778 PACMHCI,%
779 PACMPL,%
780 POMACS,%
781 TAAS,%
782 TACCESS,%
783 TACO,%

```



```

784 TALG,%
785 TALLIP,%
786 TAP,%
787 TCPS,%
788 TDSCI,%
789 TEAC,%
790 TECS,%
791 THRI,%
792 TIIS,%
793 TIOT,%
794 TISSEC,%
795 TIST,%
796 TKDD,%
797 TMIS,%
798 TOCE,%
799 TOCHI,%
800 TOCL,%
801 TOCS,%
802 TOCT,%
803 TODAES,%
804 TODS,%
805 TOG,%
806 TOIS,%
807 TOIT,%
808 TOMACS,%
809 TOMM,%
810 TOMPECS,%
811 TOMS,%
812 TOPC,%
813 TOPS,%
814 TOPLAS,%
815 TOS,%
816 TOSEM,%
817 TOSN,%
818 TRETs,%
819 TSAS,%
820 TSC,%
821 TSLP,%
822 TWEB%
823 }{%
824 \ifcase\@journalCode@nr
825 \relax % CIE
826 \def\@journalName{ACM Computers in Entertainment}%
827 \def\@journalNameShort{ACM Comput. Entertain.}%
828 \def\@permissionCodeOne{1544-3574}%
829 \or % CSUR
830 \def\@journalName{ACM Computing Surveys}%
831 \def\@journalNameShort{ACM Comput. Surv.}%
832 \def\@permissionCodeOne{0360-0300}%
833 \or % DTRAP

```

```

834 \def\@journalName{Digital Threats: Research and Practice}%
835 \def\@journalNameShort{Digit. Threat. Res. Pract.}%
836 \def\@permissionCodeOne{2576-5337}%
837 \or % IMWUT
838 \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
839   Wearable and Ubiquitous Technologies}%
840 \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
841 \def\@permissionCodeOne{2474-9567}%
842 \@ACM@screentrue
843 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
844 \or % JACM
845 \def\@journalName{Journal of the ACM}%
846 \def\@journalNameShort{J. ACM}%
847 \def\@permissionCodeOne{0004-5411}%
848 \or % JDIQ
849 \def\@journalName{ACM Journal of Data and Information Quality}%
850 \def\@journalNameShort{ACM J. Data Inform. Quality}%
851 \def\@permissionCodeOne{1936-1955}%
852 \or % JEA
853 \def\@journalName{ACM Journal of Experimental Algorithmics}%
854 \def\@journalNameShort{ACM J. Exp. Algor.}%
855 \def\@permissionCodeOne{1084-6654}%
856 \or % JERIC
857 \def\@journalName{ACM Journal of Educational Resources in Computing}%
858 \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
859 \def\@permissionCodeOne{1073-0516}%
860 \or % JETC
861 \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
862 \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
863 \def\@permissionCodeOne{1550-4832}%
864 \or % JOCCH
865 \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
866 \def\@journalNameShort{ACM J. Comput. Cult. Herit.}%
867 \or % PACMCGIT
868 \def\@journalName{Proceedings of the ACM on Computer Graphics and Interactive Techniques}%
869 \def\@journalNameShort{Proc. ACM Comput. Graph. Interact. Tech.}%
870 \def\@permissionCodeOne{2577-6193}%
871 \@ACM@screentrue
872 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
873 \or % PACMHCI
874 \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
875 \def\@journalNameShort{Proc. ACM Hum.-Comput. Interact.}%
876 \def\@permissionCodeOne{2573-0142}%
877 \@ACM@screentrue
878 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
879 \or % PACMPL
880 \def\@journalName{Proceedings of the ACM on Programming Languages}%
881 \def\@journalNameShort{Proc. ACM Program. Lang.}%
882 \def\@permissionCodeOne{2475-1421}%
883 \@ACM@screentrue

```

```

884 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
885 \or % POMACS
886 \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
887 \def\@journalNameShort{Proc. ACM Meas. Anal. Comput. Syst.}%
888 \def\@permissionCodeOne{2476-1249}%
889 \@ACM@screentruer
890 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
891 \or % TAAS
892 \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
893 \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
894 \def\@permissionCodeOne{1556-4665}%
895 \or % TACCESS
896 \def\@journalName{ACM Transactions on Accessible Computing}%
897 \def\@journalNameShort{ACM Trans. Access. Comput.}%
898 \def\@permissionCodeOne{1936-7228}%
899 \or % TACO
900 \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
901 \def\@journalNameShort{ACM Trans. Arch. Code Optim.}%
902 \or % TALG
903 \def\@journalName{ACM Transactions on Algorithms}%
904 \def\@journalNameShort{ACM Trans. Algor.}%
905 \def\@permissionCodeOne{1549-6325}%
906 \or % TALLIP
907 \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
908 \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
909 \def\@permissionCodeOne{2375-4699}%
910 \or % TAP
911 \def\@journalName{ACM Transactions on Applied Perception}%
912 \or % TCPS
913 \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
914 \or % TDSCI
915 \def\@journalName{ACM Transactions on Data Science}%
916 \def\@journalNameShort{ACM Trans. Data Sci.}%
917 \def\@permissionCodeOne{2577-3224}%
918 \or % TEAC
919 \def\@journalName{ACM Transactions on Economics and Computation}%
920 \or % TECS
921 \def\@journalName{ACM Transactions on Embedded Computing Systems}%
922 \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
923 \def\@permissionCodeOne{1539-9087}%
924 \or % THRI
925 \def\@journalName{ACM Transactions on Human-Robot Interaction}%
926 \def\@journalNameShort{ACM Trans. Hum.-Robot Interact.}%
927 \def\@permissionCodeOne{2573-9522}%
928 \or % TIIS
929 \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
930 \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
931 \def\@permissionCodeOne{2160-6455}%
932 \or % TIOT
933 \def\@journalName{ACM Transactions on Internet of Things}%

```

```

934 \def\@journalNameShort{ACM Trans. Internet Things}%
935 \def\@permissionCodeOne{2577-6207}%
936 \or % TISSEC
937 \def\@journalName{ACM Transactions on Information and System Security}%
938 \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
939 \def\@permissionCodeOne{1094-9224}%
940 \or % TIST
941 \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
942 \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
943 \def\@permissionCodeOne{2157-6904}%
944 \or % TKDD
945 \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
946 \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
947 \def\@permissionCodeOne{1556-4681}%
948 \or % TMIS
949 \def\@journalName{ACM Transactions on Management Information Systems}%
950 \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
951 \def\@permissionCodeOne{2158-656X}%
952 \or % TOCE
953 \def\@journalName{ACM Transactions on Computing Education}%
954 \def\@journalNameShort{ACM Trans. Comput. Educ.}%
955 \def\@permissionCodeOne{1946-6226}%
956 \or % TOCHI
957 \def\@journalName{ACM Transactions on Computer-Human Interaction}%
958 \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
959 \def\@permissionCodeOne{1073-0516}%
960 \or % TOCL
961 \def\@journalName{ACM Transactions on Computational Logic}%
962 \def\@journalNameShort{ACM Trans. Comput. Logic}%
963 \def\@permissionCodeOne{1529-3785}%
964 \or % TOCS
965 \def\@journalName{ACM Transactions on Computer Systems}%
966 \def\@journalNameShort{ACM Trans. Comput. Syst.}%
967 \def\@permissionCodeOne{0734-2071}%
968 \or % TOCT
969 \def\@journalName{ACM Transactions on Computation Theory}%
970 \def\@journalNameShort{ACM Trans. Comput. Theory}%
971 \def\@permissionCodeOne{1942-3454}%
972 \or % TODAES
973 \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
974 \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
975 \def\@permissionCodeOne{1084-4309}%
976 \or % TODS
977 \def\@journalName{ACM Transactions on Database Systems}%
978 \def\@journalNameShort{ACM Trans. Datab. Syst.}%
979 \def\@permissionCodeOne{0362-5915}%
980 \or % TOG
981 \def\@journalName{ACM Transactions on Graphics}%
982 \def\@journalNameShort{ACM Trans. Graph.}%
983 \def\@permissionCodeOne{0730-0301}

```

```

984 \or % TOIS
985 \def\@journalName{ACM Transactions on Information Systems}%
986 \def\@permissionCodeOne{1046-8188}%
987 \or % TOIT
988 \def\@journalName{ACM Transactions on Internet Technology}%
989 \def\@journalNameShort{ACM Trans. Internet Technol.}%
990 \def\@permissionCodeOne{1533-5399}%
991 \or % TOMACS
992 \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
993 \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
994 \or % TOMM
995 \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
996 \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
997 \def\@permissionCodeOne{1551-6857}%
998 \def\@permissionCodeTwo{0100}%
999 \or % TOMPECS
1000 \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
1001 \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
1002 \def\@permissionCodeOne{2376-3639}%
1003 \or % TOMS
1004 \def\@journalName{ACM Transactions on Mathematical Software}%
1005 \def\@journalNameShort{ACM Trans. Math. Softw.}%
1006 \def\@permissionCodeOne{0098-3500}%
1007 \or % TOPC
1008 \def\@journalName{ACM Transactions on Parallel Computing}%
1009 \def\@journalNameShort{ACM Trans. Parallel Comput.}%
1010 \def\@permissionCodeOne{1539-9087}%
1011 \or % TOPS
1012 \def\@journalName{ACM Transactions on Privacy and Security}%
1013 \def\@journalNameShort{ACM Trans. Priv. Sec.}%
1014 \def\@permissionCodeOne{2471-2566}%
1015 \or % TOPLAS
1016 \def\@journalName{ACM Transactions on Programming Languages and Systems}%
1017 \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
1018 \def\@permissionCodeOne{0164-0925}%
1019 \or % TOS
1020 \def\@journalName{ACM Transactions on Storage}%
1021 \def\@journalNameShort{ACM Trans. Storage}%
1022 \def\@permissionCodeOne{1553-3077}%
1023 \or % TOSEM
1024 \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
1025 \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
1026 \def\@permissionCodeOne{1049-331X}%
1027 \or % TOSN
1028 \def\@journalName{ACM Transactions on Sensor Networks}%
1029 \def\@journalNameShort{ACM Trans. Sensor Netw.}%
1030 \def\@permissionCodeOne{1550-4859}%
1031 \or % TRET
1032 \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
1033 \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%

```

```

1034 \def\@permissionCodeOne{1936-7406}%
1035 \or % TSAS
1036 \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
1037 \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
1038 \def\@permissionCodeOne{2374-0353}%
1039 \or % TSC
1040 \def\@journalName{ACM Transactions on Social Computing}%
1041 \def\@journalNameShort{ACM Trans. Soc. Comput.}%
1042 \def\@permissionCodeOne{2469-7818}%
1043 \or % TSLP
1044 \def\@journalName{ACM Transactions on Speech and Language Processing}%
1045 \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
1046 \def\@permissionCodeOne{1550-4875}%
1047 \or % TWEB
1048 \def\@journalName{ACM Transactions on the Web}%
1049 \def\@journalNameShort{ACM Trans. Web}%
1050 \def\@permissionCodeOne{1559-1131}%
1051 \fi
1052 \ClassInfo{\@classname}{Using journal code \@journalCode}%
1053 }{%
1054 \ClassError{\@classname}{Incorrect journal #1}%
1055 }%

\acmJournal And the syntactic sugar around it
1056 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}}

The defaults:
1057 \def\@journalCode@nr{0}
1058 \def\@journalName{}%
1059 \def\@journalNameShort{\@journalName}%
1060 \def\@permissionCodeOne{XXXX-XXXX}%
1061 \def\@permissionCodeTwo{}%

\acmConference This is the conference command
1062 \newcommand\acmConference[4][{}]{%
1063 \gdef\acmConference@shortname{#1}%
1064 \gdef\acmConference@name{#2}%
1065 \gdef\acmConference@date{#3}%
1066 \gdef\acmConference@venue{#4}%
1067 \ifx\acmConference@shortname\@empty
1068 \gdef\acmConference@shortname{#2}%
1069 \fi}
1070 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
1071 DC, USA}

\acmBooktitle The book title of the conference:
\@acmBooktitle
1072 \def\acmBooktitle#1{\gdef\@acmBooktitle{#1}}
1073 \acmBooktitle{Proceedings of \acmConference@name
1074 \ifx\acmConference@name\acmConference@shortname\else
1075 \ (\acmConference@shortname)\fi}

```

<code>\@editorsAbbrev</code>	How to abbreviate editors 1076 <code>\def\@editorsAbbrev{(Ed.)}</code>
<code>\@acmEditors</code>	The list of editors 1077 <code>\def\@acmEditors{}</code>
<code>\editor</code>	Add a new editor to the list 1078 <code>\def\editor#1{\ifx\@acmEditors\empty</code> 1079 <code>\gdef\@acmEditors{#1}%</code> 1080 <code>\else</code> 1081 <code>\gdef\@editorsAbbrev{(Eds.)}%</code> 1082 <code>\g@addto@macro\@acmEditors{\and#1}%</code> 1083 <code>\fi}</code>
<code>\subtitle</code>	The subtitle macro 1084 <code>\def\subtitle#1{\def\@subtitle{#1}}</code> 1085 <code>\subtitle{}</code>
<code>\num@authorgroups</code>	The total number of “groups”. Each group is several authors with the same affiliations(s) 1086 <code>\newcount\num@authorgroups</code> 1087 <code>\num@authorgroups=0\relax</code>
<code>\num@authors</code>	The total number of authors 1088 <code>\newcount\num@authors</code> 1089 <code>\num@authors=0\relax</code>
<code>\if@insideauthorgroup</code>	Whether we are continuing an author group 1090 <code>\newif\if@insideauthorgroup</code> 1091 <code>\@insideauthorgroupfalse</code>
<code>\author</code>	Adding an author to the list of authors and addresses 1092 <code>\renewcommand\author[2][{}%</code> 1093 <code>\global\advance\num@authors by 1\relax</code> 1094 <code>\if@insideauthorgroup\else</code> 1095 <code>\global\advance\num@authorgroups by 1\relax</code> 1096 <code>\global\@insideauthorgrouptrue</code> 1097 <code>\fi</code> 1098 <code>\ifx\addresses\empty</code> 1099 <code>\if@ACM@anonymous</code> 1100 <code>\gdef\addresses{\@author{Anonymous Author(s)}}%</code> 1101 <code>\gdef\authors{Anonymous Author(s)}%</code> 1102 <code>\else</code> 1103 <code>\gdef\addresses{\@author{#2}}%</code> 1104 <code>\gdef\authors{#2}%</code> 1105 <code>\fi</code> 1106 <code>\else</code> 1107 <code>\if@ACM@anonymous\else</code> 1108 <code>\g@addto@macro\addresses{\and\@author{#2}}%</code>

```

1109     \g@addto@macro\authors{\and#2}%
1110   \fi
1111 \fi
1112 \if@ACM@anonymous
1113   \ifx\shortauthors\@empty
1114     \gdef\shortauthors{Anon.}%
1115   \fi
1116 \else
1117   \def\@tempa{#1}%
1118   \ifx\@tempa\@empty
1119     \ifx\shortauthors\@empty
1120       \gdef\shortauthors{#2}%
1121     \else
1122       \g@addto@macro\shortauthors{\and#2}%
1123     \fi
1124   \else
1125     \ifx\shortauthors\@empty
1126       \gdef\shortauthors{#1}%
1127     \else
1128       \g@addto@macro\shortauthors{\and#1}%
1129     \fi
1130   \fi
1131 \fi}

```

`\affiliation` The macro `\affiliation` mimics `\address` from `amsart`. Note that it has an optional argument, which we use differently from `amsart`.

```

1132 \newcommand{\affiliation}[2][{}]{%
1133   \global\@insideauthorgroupfalse
1134   \if@ACM@anonymous\else
1135     \g@addto@macro\addresses{\affiliation{#1}{#2}}%
1136   \fi}

```

`@ACM@affiliation@obeypunctuation` Whether to use the author's punctuation (false by default, which adds American-style address punctuation)

```

1137 \define@boolkey+{@ACM@affiliation@}[@ACM@affiliation@]{obeypunctuation}%
1138 [true]{}{\ClassError{\@classname}{The option obeypunctuation can be either true or false}}

```

`\additionalaffiliation` Additional affiliations go to footnotes

```

1139 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}

```

`@additionalaffiliation` Process `\additionalaffiliation` inside `\authornote`

```

1140 \def\@additionalaffiliation#1{\bgroup
1141   \def\position##1{\ignorespaces}%
1142   \def\institution##1{##1\ignorespaces}%
1143   \def\department{\@ifnextchar[{\@department}{\@department[]}}%
1144   \def\@department[##1]##2{\unskip, ##2\ignorespaces}%
1145   \let\streetaddress\position
1146   \let\city\position
1147   \let\state\position

```



```

1148 \let\postcode\position
1149 \let\country\position
1150 Also with #1\unskip.\egroup}

\email The macro \email mimics \email from amsart. Again, it has an optional argument that
we do not currently need but keep for possible future use.
1151 \renewcommand{\email}[2][{}]{%
1152 \if@ACM@anonymous\else
1153 \g@addto@macro\addresses{\email{#1}{#2}}%
1154 \fi}

\orcid Right now we do not typeset ORCIDs
1155 \def\orcid#1{\unskip\ignorespaces}

\authorsaddresses Setting up authors' addresses
1156 \def\authorsaddresses#1{\def\@authorsaddresses{#1}}
1157 \authorsaddresses{\mkauthorsaddresses}

\@titlenotes The title notes
1158 \def\@titlenotes{}

\titlenote Adding a note to the title
1159 \def\titlenote#1{%
1160 \g@addto@macro\@title{\footnotemark}%
1161 \if@ACM@anonymous
1162 \g@addto@macro\@titlenotes{%
1163 \stepcounter{footnote}\footnotetext{Title note}}%
1164 \else
1165 \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
1166 \fi}

\@subtitlenotes The subtitle notes
1167 \def\@subtitlenotes{}

\subtitlenote Adding a note to the subtitle
1168 \def\subtitlenote#1{%
1169 \g@addto@macro\@subtitle{\footnotemark}%
1170 \if@ACM@anonymous
1171 \g@addto@macro\@subtitlenotes{%
1172 \stepcounter{footnote}\footnotetext{Subtitle note}}%
1173 \else
1174 \g@addto@macro\@subtitlenotes{%
1175 \stepcounter{footnote}\footnotetext{#1}}%
1176 \fi}

\@authornotes The author notes
1177 \def\@authornotes{}

```

`\authornote` Adding a note to the author

```

1178 \def\authornote#1{%
1179   \if@ACM@anonymous\else
1180     \g@addto@macro\addresses{\@authornotemark}%
1181     \g@addto@macro\authornotes{%
1182       \stepcounter{footnote}\footnotetext{#1}}%
1183   \fi}

```

`\authornotemark` Adding a footnote mark to the authors

```

1184 \newcommand\authornotemark[1][\relax]{%
1185   \ifx#1\relax\relax\relax
1186     \g@addto@macro\addresses{\@authornotemark}%
1187   \else
1188     \g@addto@macro\addresses{\@authornotemark{#1}}%
1189   \fi}

```

`\acmVolume` The current volume

```

1190 \def\acmVolume#1{\def\@acmVolume{#1}}
1191 \acmVolume{1}

```

`\acmNumber` The current number

```

1192 \def\acmNumber#1{\def\@acmNumber{#1}}
1193 \acmNumber{1}

```

`\acmArticle` The current article

```

1194 \def\acmArticle#1{\def\@acmArticle{#1}}
1195 \acmArticle{}

```

`\acmArticleSeq` The sequence number

```

1196 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
1197 \acmArticleSeq{\@acmArticle}

```

`\acmYear` The current year

```

1198 \def\acmYear#1{\def\@acmYear{#1}}
1199 \acmYear{\the\year}

```

`\acmMonth` The current month

```

1200 \def\acmMonth#1{\def\@acmMonth{#1}}
1201 \acmMonth{\the\month}

```

`\@acmPubDate` The publication date

```

1202 \def\@acmPubDate{\ifcase\@acmMonth\or
1203   January\or February\or March\or April\or May\or June\or
1204   July\or August\or September\or October\or November\or
1205   December\fi~\@acmYear}

```

`\acmPrice` The price

```

1206 \def\acmPrice#1{\def\@acmPrice{#1}}
1207 \acmPrice{15.00}

```

<code>\acmSubmissionID</code>	<p>The submission ID</p> <pre>1208 \def\acmSubmissionID#1{\def\@acmSubmissionID{#1}} 1209 \acmSubmissionID{}</pre>
<code>\acmISBN</code>	<p>The book ISBN</p> <pre>1210 \def\acmISBN#1{\def\@acmISBN{#1}} 1211 \acmISBN{978-x-xxxx-xxxx-x/YY/MM}</pre>
<code>\acmDOI</code>	<p>The paper DOI</p> <pre>1212 \def\acmDOI#1{\def\@acmDOI{#1}} 1213 \acmDOI{10.1145/nnnnnnn.nnnnnnn}</pre>
<code>\if@ACM@badge</code>	<p>Whether to print a badge. Note that either a left or right badge triggers it:</p> <pre>1214 \newif\if@ACM@badge 1215 \@ACM@badgefalse</pre>
<code>\@ACM@badge@width</code>	<p>The width of the badge</p> <pre>1216 \newlength\@ACM@badge@width 1217 \setlength\@ACM@badge@width{5pc}</pre>
<code>\@ACM@title@width</code>	<p>The width of the badge</p> <pre>1218 \newlength\@ACM@title@width</pre>
<code>\@ACM@badge@skip</code>	<p>The space between the badge and the title</p> <pre>1219 \newlength\@ACM@badge@skip 1220 \setlength\@ACM@badge@skip{1pc}</pre>
<code>\acmBadgeR</code>	<p>Setting the right badge</p> <pre>1221 \newcommand\acmBadgeR[2][\@ACM@badgetrue 1222 \def\@acmBadgeR@url{#1}% 1223 \def\@acmBadgeR@image{#2}} 1224 \def\@acmBadgeR@url{} 1225 \def\@acmBadgeR@image{}</pre>
<code>\acmBadgeL</code>	<p>Setting the left badge</p> <pre>1226 \newcommand\acmBadgeL[2][\@ACM@badgetrue 1227 \def\@acmBadgeL@url{#1}% 1228 \def\@acmBadgeL@image{#2}} 1229 \def\@acmBadgeL@url{} 1230 \def\@acmBadgeL@image{}</pre>
<code>\startPage</code>	<p>The start page of the paper</p> <pre>1231 \def\startPage#1{\def\@startPage{#1}} 1232 \startPage{}</pre>
<code>\terms</code>	<p>Terms are obsolete. We use CCS now.</p> <pre>1233 \def\terms#1{\ClassWarning{\@classname}{The command \string\terms{} is 1234 obsolete. I am going to ignore it}}</pre>

`\keywords` Keywords are mostly obsolete. We use CCS now. Still it makes sense to keep them for compatibility.

```

1235 \def\keywords#1{\def\@keywords{#1}}
1236 \keywords{}
```

`abstract` The `amsart` package puts `abstract` in a box. Since we do not know whether we will use two-column mode, we prefer to save the text

```

1237 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}
```

`\@saveabstract` And saving the abstract

```

1238 \long\def\@saveabstract#1{\long\gdef\@abstract{#1}}
1239 \@saveabstract{}
```

`\@empty` The long version of `\@empty` (to compare with `\@abstract`)

```

1240 \long\def\@empty{}
```

`\if@ACM@printccs` Whether to print CCS

```

1241 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
1242   \if@ACM@printccs
1243     \ClassInfo{\@classname}{Printing CCS}%
1244   \else
1245     \ClassInfo{\@classname}{Suppressing CCS}%
1246   \fi}{\ClassError{\@classname}{The option printccs can be either true or false}}
```

`\if@ACM@printacmref` Whether to print the ACM bibstrip

```

1247 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
1248   \if@ACM@printacmref
1249     \ClassInfo{\@classname}{Printing bibformat}%
1250   \else
1251     \ClassInfo{\@classname}{Suppressing bibformat}%
1252   \fi}{\ClassError{\@classname}{The option printacmref can be either true or false}}
```

`\if@ACM@printfolios` Whether to print folios

```

1253 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
1254   \if@ACM@printfolios
1255     \ClassInfo{\@classname}{Printing folios}%
1256   \else
1257     \ClassInfo{\@classname}{Suppressing folios}%
1258   \fi}{\ClassError{\@classname}{The option printfolios can be either true or false}}
```

`\@ACM@authorssperrow` The number of authors per row. 0 means use the default algorithm.

```

1259 \define@cmdkey{@ACM@topmatter@}[@ACM@]{authorssperrow}[0]{%
1260   \IfInteger{#1}{\ClassInfo{\@classname}{Setting authorssperrow to
1261     #1}}{\ClassWarning{\@classname}{The parameter authorssperrow must be
1262     numerical. Ignoring the input #1}}\gdef\@ACM@authorssperrow{0}}
```

`\settopmatter` The usual syntactic sugar

```

1263 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}
```

Now the settings

```
1264 \settopmatter{printccs=true, printacmref=true}
1265 \if@ACM@manuscript
1266   \settopmatter{printfolios=true}
1267 \else
1268   \if@ACM@journal
1269     \settopmatter{printfolios=true}
1270   \else
1271     \settopmatter{printfolios=false}
1272   \fi
1273 \fi
1274 \settopmatter{authorsperrow=0}
```

\@received The container for the paper history

```
1275 \def\@received{}
```

\received The \received command

```
1276 \newcommand\received[2][\def\@tempa{#1}%
1277   \ifx\@tempa\@empty
1278     \ifx\@received\@empty
1279       \gdef\@received{Received #2}%
1280     \else
1281       \g@addto@macro{\@received}{; revised #2}%
1282     \fi
1283   \else
1284     \ifx\@received\@empty
1285       \gdef\@received{#1 #2}%
1286     \else
1287       \g@addto@macro{\@received}{; #1 #2}%
1288     \fi
1289 \fi}
1290 \AtEndDocument{%
1291   \ifx\@received\@empty\else
1292     \par\bigskip\noindent\small\normalfont\@received\par
1293   \fi}
```

3.12 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```
1294 \RequirePackage{comment}
1295 \excludecomment{CCSXML}
```

\@concepts This is the storage macro for concepts

```
1296 \let\@concepts\@empty
```

\ccsdesc The first argument is the significance, the second is the concept(s)

```
1297 \newcommand\ccsdesc[2][100]{%
1298   \ccsdesc@parse#1~#2~~\ccsdesc@parse@end}
```

`\ccsdesc@parse` The parser of the expression Significance~General~Specific (we need `textcomp` for `\textrightarrow`). Note that Specific can be empty!

```

1299 \RequirePackage{textcomp}
1300 \def\ccsdesc@parse#1~#2~#3~{%
1301   \expandafter\ifx\csname CCS@General@#2\endcsname\relax
1302     \expandafter\gdef\csname CCS@General@#2\endcsname{\textbullet\
1303       \textbf{#2}}}%
1304   \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{; }%
1305   \expandafter\gdef\csname CCS@Specific@#2\endcsname{}%
1306   \g@addto@macro{\@concepts}{\csname CCS@General@#2\endcsname
1307     \csname CCS@Punctuation@#2\endcsname
1308     \csname CCS@Specific@#2\endcsname}%
1309   \fi
1310   \ifx#3\relax\relax\else
1311     \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{
1312       \textrightarrow }%
1313     \expandafter\g@addto@macro\expandafter{\csname CCS@Specific@#2\endcsname}{%
1314       \ifnum#1>499\textbf{#3}; \else
1315       \ifnum#1>299\textit{#3}; \else
1316       #3; \fi\fi}%
1317   \fi
1318 \ccsdesc@parse@finish}

```

`\ccdesc@parse@finish` Gobble everything to `\ccsdesc@parse@end`

```

1319 \def\ccsdesc@parse@finish#1\ccsdesc@parse@end{}

```

3.13 Copyright system

This is from `acmcopyright.sty`

`\if@printcopyright` Whether to print a copyright symbol

```

1320 \newif\if@printcopyright
1321 \@printcopyrighttrue

```

`\if@printpermission` Whether to print the permission block

```

1322 \newif\if@printpermission
1323 \@printpermissiontrue

```

`\if@acmowned` Whether the ACM owns the rights to the paper

```

1324 \newif\if@acmowned
1325 \@acmownedtrue

```

Keys:

```

1326 \define@choicekey*{ACM@}{acmcopyrightmode}[%
1327   \acm@copyrightinput\acm@copyrightmode]{none,%
1328   acmcopyright,acmlicensed,rightsretained,%
1329   usgov,usgovmixed,cagov,cagovmixed,licensedusgovmixed,%
1330   licensedcagov,licensedcagovmixed,othergov,licensedothergov,%

```

```

1331     iw3c2w3,iw3c2w3g){%
1332 \@printpermissiontrue
1333 \@printcopyrighttrue
1334 \@acmownedtrue
1335 \ifnum\acm@copyrightmode=0\relax % none
1336 \@printpermissionfalse
1337 \@printcopyrightfalse
1338 \@acmownedfalse
1339 \fi
1340 \ifnum\acm@copyrightmode=2\relax % acmlicensed
1341 \@acmownedfalse
1342 \fi
1343 \ifnum\acm@copyrightmode=3\relax % rightsretained
1344 \@acmownedfalse
1345 \AtBeginDocument{\acmPrice{}}%
1346 \fi
1347 \ifnum\acm@copyrightmode=4\relax % usgov
1348 \@printpermissiontrue
1349 \@printcopyrightfalse
1350 \@acmownedfalse
1351 \AtBeginDocument{\acmPrice{}}%
1352 \fi
1353 \ifnum\acm@copyrightmode=6\relax % cagov
1354 \@acmownedfalse
1355 \fi
1356 \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1357 \@acmownedfalse
1358 \fi
1359 \ifnum\acm@copyrightmode=9\relax % licensedcagov
1360 \@acmownedfalse
1361 \fi
1362 \ifnum\acm@copyrightmode=10\relax % licensedcagovmixed
1363 \@acmownedfalse
1364 \fi
1365 \ifnum\acm@copyrightmode=11\relax % othergov
1366 \@acmownedtrue
1367 \fi
1368 \ifnum\acm@copyrightmode=12\relax % licensedothergov
1369 \@acmownedfalse
1370 \fi
1371 \ifnum\acm@copyrightmode=13\relax % iw3c2w3
1372 \@acmownedfalse
1373 \AtBeginDocument{\acmPrice{}}%
1374 \fi
1375 \ifnum\acm@copyrightmode=14\relax % iw3c2w3g
1376 \@acmownedfalse
1377 \AtBeginDocument{\acmPrice{}}%
1378 \fi}

```

`\setcopyright` This is the syntactic sugar around setting keys.

```
1379 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
1380 \setcopyright{acmcopyright}
```

`\@copyrightowner` Here is the owner of the copyright

```
1381 \def\@copyrightowner{%
1382   \ifcase\acm@copyrightmode\relax % none
1383   \or % acmcopyright
1384     Association for Computing Machinery.
1385   \or % acmlicensed
1386     Copyright held by the owner/author(s). Publication rights licensed to
1387     ACM\@.
1388   \or % rightsretained
1389     Copyright held by the owner/author(s).
1390   \or % usgov
1391   \or % usgovmixed
1392     Association for Computing Machinery.
1393   \or % cagov
1394     Crown in Right of Canada.
1395   \or %cagovmixed
1396     Association for Computing Machinery.
1397   \or %licensedusgovmixed
1398     Copyright held by the owner/author(s). Publication rights licensed to
1399     ACM\@.
1400   \or % licensedcagov
1401     Crown in Right of Canada. Publication rights licensed to
1402     ACM\@.
1403   \or %licensedcagovmixed
1404     Copyright held by the owner/author(s). Publication rights licensed to
1405     ACM\@.
1406   \or % othergov
1407     Association for Computing Machinery.
1408   \or % licensedothergov
1409     Copyright held by the owner/author(s). Publication rights licensed to
1410     ACM\@.
1411   \or % ic2w3www
1412     IW3C2 (International World Wide Web Conference Committee), published
1413     under Creative Commons CC-BY~4.0 License.
1414   \or % ic2w3wwwgoogle
1415     IW3C2 (International World Wide Web Conference Committee), published
1416     under Creative Commons CC-BY-NC-ND~4.0 License.
1417   \fi}
```

`\@formatdoi` Print a clickable DOI

```
1418 \def\@formatdoi#1{\url{https://doi.org/#1}}
```

`\@copyrightpermission` The canned permission block.

```
1419 \def\@copyrightpermission{%
1420   \ifcase\acm@copyrightmode\relax % none
```


1421 \or % acmcopyright
 1422 Permission to make digital or hard copies of all or part of this
 1423 work for personal or classroom use is granted without fee provided
 1424 that copies are not made or distributed for profit or commercial
 1425 advantage and that copies bear this notice and the full citation on
 1426 the first page. Copyrights for components of this work owned by
 1427 others than ACM must be honored. Abstracting with credit is
 1428 permitted. To copy otherwise, or republish, to post on servers or to
 1429 redistribute to lists, requires prior specific permission
 1430 and\hspace*{.5pt}/or a fee. Request permissions from
 1431 permissions@acm.org.
 1432 \or % acmlicensed
 1433 Permission to make digital or hard copies of all or part of this
 1434 work for personal or classroom use is granted without fee provided
 1435 that copies are not made or distributed for profit or commercial
 1436 advantage and that copies bear this notice and the full citation on
 1437 the first page. Copyrights for components of this work owned by
 1438 others than the author(s) must be honored. Abstracting with credit
 1439 is permitted. To copy otherwise, or republish, to post on servers
 1440 or to redistribute to lists, requires prior specific permission
 1441 and\hspace*{.5pt}/or a fee. Request permissions from
 1442 permissions@acm.org.
 1443 \or % rightsretained
 1444 Permission to make digital or hard copies of part or all of this work
 1445 for personal or classroom use is granted without fee provided that
 1446 copies are not made or distributed for profit or commercial advantage
 1447 and that copies bear this notice and the full citation on the first
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1539 disseminate the work on their personal and corporate Web sites with
1540 the appropriate attribution.
1541 \fi}

\copyrightyear By default, the copyright year is the same as \acmYear, but one can override this:
1542 \def\copyrightyear#1{\def\@copyrightyear{#1}}
1543 \copyrightyear{\@acmYear}

\@teaserfigures The teaser figures container
1544 \def\@teaserfigures{}

teaserfigure The teaser figure
1545 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}

\@saveteaser Saving the teaser
1546 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}}

\thanks We redefine amsart \thanks so the anonymous key works
1547 \renewcommand{\thanks}[1]{%
1548   \@ifnotempty{#1}{%
1549     \if@ACM@anonymous
1550       \g@addto@macro\thankses{\thanks{A note}}}%
1551   \else
1552     \g@addto@macro\thankses{\thanks{#1}}}%
1553   \fi}}

```

3.14 Typesetting top matter

```

\mktitle@bx Some of our formats use a two-column design. Some use a one-column design. In all
cases we use a wide title. Thus we typeset the top matter in a special box to be used in
the construction \@twocolumn[<box>].
1554 \newbox\mktitle@bx

```

`\maketitle` The (in)famous `\maketitle`. Note that in `sigchi-a` mode, authors are *not* in the title box.

Another note: there is a subtle difference between author notes, title notes and thanks. The latter two refer to the paper itself and therefore belong to the copyright/permission block. By the way, this was the default behavior of the old ACM classes.

```

1555 \def\maketitle{%
1556   \if@ACM@anonymous
1557     % Anonymize omission of \author-s
1558     \ifnum\num@authorgroups=0\author{}\fi
1559   \fi
1560   \begingroup
1561   \let\@footnotemark\@footnotemark@nolink
1562   \let\@footnotetext\@footnotetext@nolink
1563   \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1564   \global\@topnum\z@ % this prevents floats from falling
1565                       % at the top of page 1
1566   \global\@botnum\z@ % we do not want them to be on the bottom either
1567   \hsize=\textwidth
1568   \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1569   \@mktitle\if@ACM@sigchiamode\else\@mkauthors\fi\@mkteasers
1570   \@printtopmatter
1571   \if@ACM@sigchiamode\@mkauthors\fi
1572   \setcounter{footnote}{0}%
1573   \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1574   \@titlenotes
1575   \@subtitlenotes
1576   \@authornotes
1577   \let\@makefnmark\relax
1578   \let\@thefnmark\relax
1579   \let\@makefntext\noindent
1580   \ifx\@empty\thankses\else
1581     \footnotetextauthorsaddresses{%
1582       \def\par{\let\par\@par}\parindent\z@\@setthanks}%
1583   \fi
1584   \ifx\@empty\@authorsaddresses\else
1585     \if@ACM@anonymous\else
1586       \if@ACM@journal
1587         \footnotetextauthorsaddresses{%
1588           \def\par{\let\par\@par}\parindent\z@\@setauthorsaddresses}%
1589       \fi
1590     \fi
1591   \fi
1592   \footnotetextcopyrightpermission{%
1593     \if@ACM@authordraft
1594       \raisebox{-2ex}[\z@][\z@]{\makebox[0pt][l]{\large\bfseries
1595         Unpublished working draft. Not for distribution.}}%
1596       \color[gray]{0.9}%
1597     \fi
1598     \parindent\z@\parskip0.1\baselineskip

```

```

1599 \if@ACM@authorversion\else
1600   \if@printpermission\@copyrightpermission\par\fi
1601 \fi
1602 \if@ACM@manuscript\else
1603   \if@ACM@journal\else % Print the conference information
1604     {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
1605   \fi
1606 \fi
1607 \if@printcopyright
1608   \copyright\ \@copyrightyear\ \@copyrightowner\
1609 \else
1610   \@copyrightyear.\
1611 \fi
1612 \if@ACM@manuscript
1613   Manuscript submitted to ACM\
1614 \else
1615   \if@ACM@authorversion
1616     This is the author's version of the work. It is posted here for
1617     your personal use. Not for redistribution. The definitive Version
1618     of Record was published in
1619     \if@ACM@journal
1620       \emph{\@journalName}%
1621     \else
1622       \emph{\@acmBooktitle}%
1623     \fi
1624     \ifx\@acmDOI\@empty
1625       .
1626     \else
1627       , \@formatdoi{\@acmDOI}.
1628     \fi\
1629   \else
1630     \if@ACM@journal
1631       \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1632       \ifx\@acmPrice\@empty\else\ $\@acmPrice\fi\
1633       \@formatdoi{\@acmDOI}%
1634     \else % Conference
1635       \ifx\@acmISBN\@empty\else ACM~ISBN~\@acmISBN
1636       \ifx\@acmPrice\@empty.\else\dots$\@acmPrice\fi\\\fi
1637       \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi%
1638     \fi
1639   \fi
1640 \fi}
1641 \endgroup
1642 \setcounter{footnote}{0}%
1643 \mkabstract
1644 \if@ACM@printccs
1645   \ifx\@concepts\@empty\else\bgroup
1646     {\@specialsection{CCS Concepts}%
1647     \@concepts\par}\egroup
1648 \fi

```

```

1649 \fi
1650 \ifx\@keywords\@empty\else\bgroup
1651   {\if@ACM@journal
1652     \@specialsection{Additional Key Words and Phrases}%
1653   \else
1654     \@specialsection{Keywords}%
1655   \fi
1656   \@keywords}\par\egroup
1657 \fi
1658 \andify\authors
1659 \andify\shortauthors
1660 \global\let\authors=\authors
1661 \global\let\shortauthors=\shortauthors
1662 \if@ACM@printacmref
1663   \@mkbibcitation
1664 \fi
1665 \hypersetup{%
1666   pdflang={English},
1667   pdfdisplaydoctitle,
1668   pdfauthor={\authors},
1669   pdftitle={\@title},
1670   pdfsubject={\@concepts},
1671   pdfkeywords={\@keywords},
1672   pdfcreator={LaTeX with acmart
1673     \csname ver@acmart.cls\endcsname\space
1674     and hyperref
1675     \csname ver@hyperref.sty\endcsname}}%
1676 \@printendtopmatter
1677 \@afterindentfalse
1678 \@afterheading
1679 }

```

`\@specialsection` This macro starts sections for proceedings and uses `\small` for journals

```

1680 \def\@specialsection#1{%
1681   \ifcase\ACM@format@nr
1682   \relax % manuscript
1683     \par\medskip\small\noindent#1: %
1684   \or % acmsmall
1685     \par\medskip\small\noindent#1: %
1686   \or % acmlarge
1687     \par\medskip\small\noindent#1: %
1688   \or % acmtog
1689     \par\medskip\small\noindent#1: %
1690   \or % sigconf
1691     \section*{#1}%
1692   \or % siggraph
1693     \section*{#1}%
1694   \or % sigplan
1695     \paragraph*{#1}%
1696   \or % sigchi

```

```

1697 \section*{#1}%
1698 \or % sigchi-a
1699 \section*{#1}%
1700 \fi}

```

\@printtopmatter The printing of top matter starts a new page and uses the given title box. Note that for sigchi-a we print badges here rather than in \mkttitle since we want them in the margins.

```

1701 \def\@printtopmatter{%
1702 \ifx\@startPage\@empty
1703 \gdef\@startPage{1}%
1704 \else
1705 \setcounter{page}{\@startPage}%
1706 \fi
1707 \thispagestyle{firstpagestyle}%
1708 \noindent
1709 \ifcase\ACM@format@nr
1710 \relax % manuscript
1711 \box\mkttitle@bx\par
1712 \or % acmsmall
1713 \box\mkttitle@bx\par
1714 \or % acmlarge
1715 \box\mkttitle@bx\par
1716 \or % acmtog
1717 \twocolumn[\box\mkttitle@bx]%
1718 \or % sigconf
1719 \twocolumn[\box\mkttitle@bx]%
1720 \or % siggraph
1721 \twocolumn[\box\mkttitle@bx]%
1722 \or % sigplan
1723 \twocolumn[\box\mkttitle@bx]%
1724 \or % sigchi
1725 \twocolumn[\box\mkttitle@bx]%
1726 \or % sigchi-a
1727 \par\box\mkttitle@bx\par\bigskip
1728 \if@ACM@badge
1729 \marginpar{\noindent
1730 \ifx\@acmBadgeL@image\@empty\else
1731 \href{\@acmBadgeL@url}{%
1732 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
1733 \hskip\@ACM@badge@skip
1734 \fi
1735 \ifx\@acmBadgeR@image\@empty\else
1736 \href{\@acmBadgeR@url}{%
1737 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
1738 \fi}%
1739 \fi
1740 \fi
1741 }

```

`\@mktitle` The title of the article

```
1742 \def\@mktitle{%
1743   \ifcase\ACM@format@nr
1744   \relax % manuscript
1745   \@mktitle@i
1746   \or % acmsmall
1747   \@mktitle@i
1748   \or % acmlarge
1749   \@mktitle@i
1750   \or % acmtog
1751   \@mktitle@i
1752   \or % sigconf
1753   \@mktitle@iii
1754   \or % siggraph
1755   \@mktitle@iii
1756   \or % sigplan
1757   \@mktitle@iii
1758   \or % sigchi
1759   \@mktitle@iii
1760   \or % sigchi-a
1761   \@mktitle@iv
1762   \fi
1763 }
```

`\@titlefont` The font to typeset the title

```
1764 \def\@titlefont{%
1765   \ifcase\ACM@format@nr
1766   \relax % manuscript
1767   \LARGE\sffamily\bfseries
1768   \or % acmsmall
1769   \LARGE\sffamily\bfseries
1770   \or % acmlarge
1771   \LARGE\sffamily\bfseries
1772   \or % acmtog
1773   \Huge\sffamily
1774   \or % sigconf
1775   \Huge\sffamily\bfseries
1776   \or % siggraph
1777   \Huge\sffamily\bfseries
1778   \or % sigplan
1779   \Huge\bfseries
1780   \or % sigchi
1781   \Huge\sffamily\bfseries
1782   \or % sigchi-a
1783   \Huge\bfseries
1784   \fi}
```

`\@subtitlefont` The font to typeset the subtitle

```
1785 \def\@subtitlefont{\normalsize
```



```

1786 \ifcase\ACM@format@nr
1787 \relax % manuscript
1788 \mdseries
1789 \or % acmsmall
1790 \mdseries
1791 \or % acmlarge
1792 \mdseries
1793 \or % acmtog
1794 \LARGE
1795 \or % sigconf
1796 \LARGE\mdseries
1797 \or % siggraph
1798 \LARGE\mdseries
1799 \or % sigplan
1800 \LARGE\mdseries
1801 \or % sigchi
1802 \LARGE\mdseries
1803 \or % sigchi-a
1804 \mdseries
1805 \fi}

```

\mktitle@i The version of \mktitle for most journals

```

1806 \def\mktitle@i{\hsize=\textwidth
1807 \ACM@title@width=\hsize
1808 \ifx\acmBadgeL@image\empty\else
1809 \advance\ACM@title@width by -\ACM@badge@width
1810 \advance\ACM@title@width by -\ACM@badge@skip
1811 \fi
1812 \ifx\acmBadgeR@image\empty\else
1813 \advance\ACM@title@width by -\ACM@badge@width
1814 \advance\ACM@title@width by -\ACM@badge@skip
1815 \fi
1816 \setbox\mktitle@bx=\vbox{\noindent\@titlefont
1817 \ifx\acmBadgeL@image\empty\else
1818 \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\acmBadgeL@url}{%
1819 \includegraphics[width=\ACM@badge@width]{\acmBadgeL@image}}}%
1820 \hskip\ACM@badge@skip
1821 \fi
1822 \parbox[t]{\ACM@title@width}{\raggedright
1823 \@titlefont\noindent
1824 \@title
1825 \ifx\@subtitle\empty\else
1826 \par\noindent{\@subtitlefont\@subtitle}
1827 \fi}%
1828 \ifx\acmBadgeR@image\empty\else
1829 \hskip\ACM@badge@skip
1830 \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\acmBadgeR@url}{%
1831 \includegraphics[width=\ACM@badge@width]{\acmBadgeR@image}}}%
1832 \fi
1833 \par\bigskip}}%

```

`\@mkttitle@ii` The version of `\mkttitle` for TOG. Since v1.06, this is subsumed by the `\mkttitle@i` macro

`\@mkttitle@iii` The version of `\mkttitle` for SIG proceedings. Note that since the title is centered, we leave space for the left badge even if only the right badge is defined.

```

1834 \def\@mkttitle@iii{\hsize=\textwidth
1835   \setbox\mkttitle@bx=\vbox{\@titlefont\centering
1836     \@ACM@title@width=\hsize
1837     \if@ACM@badge
1838       \advance\@ACM@title@width by -2\@ACM@badge@width
1839       \advance\@ACM@title@width by -2\@ACM@badge@skip
1840       \parbox[b]{\@ACM@badge@width}{\strut
1841         \ifx\@acmBadgeL@image\@empty\else
1842           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1843             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1844         \fi}%
1845       \hskip\@ACM@badge@skip
1846     \fi
1847     \parbox[t]{\@ACM@title@width}{\centering\@titlefont
1848       \@title
1849       \ifx\@subtitle\@empty\else
1850         \par\noindent{\@subtitlefont\@subtitle}
1851       \fi
1852     }%
1853     \if@ACM@badge
1854       \hskip\@ACM@badge@skip
1855       \parbox[b]{\@ACM@badge@width}{\strut
1856         \ifx\@acmBadgeR@image\@empty\else
1857           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1858             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1859         \fi}%
1860       \fi
1861     \par\bigskip}}%
```

`\@mkttitle@iv` The version of `\@mkttitle` for sigchi-a

```

1862 \def\@mkttitle@iv{\hsize=\textwidth
1863   \setbox\mkttitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
1864     \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
1865     \noindent\@title
1866     \ifx\@subtitle\@empty\else
1867       \par\noindent\@subtitlefont\@subtitle
1868     \fi
1869     \par\bigskip}}%
```

`\@ACM@addtoaddress` This macro adds an item to the address using the following rules:

1. If we start a paragraph, add the item
2. Otherwise, add a comma and the item

3. However, the comma is deleted if it is at the end of a line. We use the magic `\cleaders` trick for this.

```

1870 \newbox\@ACM@commabox
1871 \def\@ACM@addtoaddress#1{%
1872   \ifvmode\else
1873     \if@ACM@affiliation@obeypunctuation\else
1874       \setbox\@ACM@commabox=\hbox{, }%
1875       \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
1876     \fi\fi
1877   #1}

```

`\institution` Theoretically we can define the macros for `\affiliation` inside the `\@mkauthors`-style commands. However, this would lead to a strange error if an author uses them outside `\affiliation`. Of course we can make them produce an error message, but...

`\position`

`\department`

`\streetaddress` 1878 \def\streetaddress#1{\unskip\ignorespaces}

`\city` 1879 \def\postcode#1{\unskip\ignorespaces}

`\state` 1880 \if@ACM@journal

`\postcode` 1881 \def\position#1{\unskip\ignorespaces}

`\country` 1882 \def\institution#1{\unskip~#1\ignorespaces}

1883 \def\city#1{\unskip\ignorespaces}

1884 \def\state#1{\unskip\ignorespaces}

1885 \newcommand\department[2][0]{\unskip\ignorespaces}

1886 \def\country#1{\if@ACM@affiliation@obeypunctuation\else, \fi#1\ignorespaces}

1887 \else

1888 \def\position#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%

1889 \def\institution#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%

1890 \newcommand\department[2][0]{\if@ACM@affiliation@obeypunctuation

1891 #2\else#2\par\fi}%

1892 % \def\streetaddress#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%

1893 \let\city\@ACM@addtoaddress

1894 \let\state\@ACM@addtoaddress

1895 % \def\postcode#1{\if@ACM@affiliation@obeypunctuation#1\else\unskip\space#1\fi}%

1896 \let\country\@ACM@addtoaddress

1897 \fi

`\@mkauthors` Typesetting the authors

```

1898 \def\@mkauthors{\begingroup
1899   \hsize=\textwidth
1900   \ifcase\ACM@format@nr
1901     \relax % manuscript
1902     \@mkauthors@i
1903   \or % acmsmall
1904     \@mkauthors@i
1905   \or % acmlarge
1906     \@mkauthors@i
1907   \or % acmtog
1908     \@mkauthors@i
1909   \or % sigconf
1910     \@mkauthors@iii

```

```

1911 \or % siggraph
1912     \mkauthors@iii
1913 \or % sigplan
1914     \mkauthors@iii
1915 \or % sigchi
1916     \mkauthors@iii
1917 \or % sigchi-a
1918     \mkauthors@iv
1919 \fi
1920 \endgroup
1921 }

```

\@authorfont Somehow different conferences use different fonts for author names. Why?

```

1922 \def\@authorfont{\Large\sffamily}

```

\@affiliationfont Font for affiliations

```

1923 \def\@affiliationfont{\normalsize\normalfont}

```

Adjusting fonts for different formats

```

1924 \ifcase\ACM@format@nr
1925 \relax % manuscript
1926 \or % acmsmall
1927     \def\@authorfont{\large\sffamily}
1928     \def\@affiliationfont{\small\normalfont}
1929 \or % acmlarge
1930 \or % acmtog
1931     \def\@authorfont{\LARGE\sffamily}
1932     \def\@affiliationfont{\large}
1933 \or % sigconf
1934     \def\@authorfont{\LARGE}
1935     \def\@affiliationfont{\large}
1936 \or % siggraph
1937     \def\@authorfont{\normalsize\normalfont}
1938     \def\@affiliationfont{\normalsize\normalfont}
1939 \or % sigplan
1940     \def\@authorfont{\Large\normalfont}
1941     \def\@affiliationfont{\normalsize\normalfont}
1942 \or % sigchi
1943     \def\@authorfont{\bfseries}
1944     \def\@affiliationfont{\mdseries}
1945 \or % sigchi-a
1946     \def\@authorfont{\bfseries}
1947     \def\@affiliationfont{\mdseries}
1948 \fi

```

\@typeset@author@line At this point we have \@currentauthors and \@currentaffiliations. We typeset them in the journal style

```

1949 \def\@typeset@author@line{%
1950     \andify\@currentauthors\par\noindent

```

```

1951 \@currentauthors\def\@currentauthors{%
1952 \ifx\@currentaffiliations\@empty\else
1953 \andify\@currentaffiliations
1954 \unskip, {\@currentaffiliations}\par
1955 \fi
1956 \def\@currentaffiliations{}}

```

`\@mkauthors@i` This version is used in most journal formats. Note that `\and` between authors with the same affiliation becomes `_and_`:

```

1957 \def\@mkauthors@i{%
1958 \def\@currentauthors{%
1959 \def\@currentaffiliations{%
1960 \global\let\and\@typeset@author@line
1961 \def\@author##1{%
1962 \ifx\@currentauthors\@empty
1963 \gdef\@currentauthors{\@authorfont\MakeTextUppercase{##1}}%
1964 \else
1965 \g@addto@macro{\@currentauthors}{\and\MakeTextUppercase{##1}}%
1966 \fi
1967 \gdef\and{}}%
1968 \def\email##1##2{%
1969 \def\affiliation##1##2{%
1970 \def\@tempa{##2}\ifx\@tempa\@empty\else
1971 \ifx\@currentaffiliations\@empty
1972 \gdef\@currentaffiliations{%
1973 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1974 \setkeys{@ACM@affiliation@}{##1}%
1975 \@affiliationfont##2}%
1976 \else
1977 \g@addto@macro{\@currentaffiliations}{\and
1978 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1979 \setkeys{@ACM@affiliation@}{##1}##2}%
1980 \fi
1981 \fi
1982 \global\let\and\@typeset@author@line}%
1983 \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
1984 \noindent\addresses\@typeset@author@line
1985 \par\medskip}%
1986 }

```

`\@mkauthors@ii` The `\@mkauthors@ii` command was the version used in `acmtog`. It is no longer necessary.

`\author@bx` The box to put an individual author in

```
1987 \newbox\author@bx
```

`\author@bx@wd` The width of the author box

```
1988 \newdimen\author@bx@wd
```

`\author@bx@sep` The separation between author boxes

```
1989 \newskip\author@bx@sep
1990 \author@bx@sep=1pc\relax
```

`\@typeset@author@bx` Typesetting the box with authors. Note that in sigchi-a the box is not centered.

```
1991 \def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd\def\and{\par}%
1992 \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
1993 \@authorfont\@currentauthors\par\@affiliationfont
1994 \@currentaffiliation}\egroup
1995 \box\author@bx\hspace{\author@bx@sep}%
1996 \gdef\@currentauthors{}}%
1997 \gdef\@currentaffiliation{}}
```

`\@mkauthors@iii` The sigconf version. Here we use a centered design with each author in a separate box.

```
1998 \def\@mkauthors@iii{%
```

First, we need to determine the design of the author strip. The boxes are separated by `\author@bx@sep` plus two `\author@bx@sep` margins. This means that each box must be of width $(\text{textwidth} - \text{author@bx@sep})/N - \text{author@bx@sep}$, where N is the number of boxes per row.

```
1999 \author@bx@wd=\textwidth\relax
2000 \advance\author@bx@wd by -\author@bx@sep\relax
2001 \ifnum\@ACM@authorsperrow>0\relax
2002 \divide\author@bx@wd by \@ACM@authorsperrow\relax
2003 \else
2004 \ifcase\num@authorgroups
2005 \relax % 0?
2006 \or % 1=one author per row
2007 \or % 2=two authors per row
2008 \divide\author@bx@wd by \num@authorgroups\relax
2009 \or % 3=three authors per row
2010 \divide\author@bx@wd by \num@authorgroups\relax
2011 \or % 4=two authors per row (!)
2012 \divide\author@bx@wd by 2\relax
2013 \else % three authors per row
2014 \divide\author@bx@wd by 3\relax
2015 \fi
2016 \fi
2017 \advance\author@bx@wd by -\author@bx@sep\relax
```

Now, parsing of `\addresses`:

```
2018 \gdef\@currentauthors{}}%
2019 \gdef\@currentaffiliation{}}%
2020 \def\@author##1{\ifx\@currentauthors\@empty
2021 \gdef\@currentauthors{\par##1}%
2022 \else
2023 \g@addto@macro\@currentauthors{\par##1}%
2024 \fi
2025 \gdef\and{}}%
2026 \def\email##1##2{\ifx\@currentaffiliation\@empty
```

```

2027 \gdef\@currentaffiliation{\nolinkurl{##2}}%
2028 \else
2029 \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
2030 \fi}%
2031 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2032 \gdef\@currentaffiliation{%
2033 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2034 \setkeys{@ACM@affiliation@}{##1}##2}%
2035 \else
2036 \g@addto@macro\@currentaffiliation{\par
2037 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2038 \setkeys{@ACM@affiliation@}{##1}##2}%
2039 \fi
2040 \global\let\and\@typeset@author@bx
2041 }%

```

Actual typesetting is done by the \and macro:

```

2042 \hsize=\textwidth
2043 \global\setbox\mktitle@bx=\vbox{\noindent
2044 \box\mktitle@bx\par\medskip\leavevmode
2045 \lineskip=1pc\relax\centering\hspace*{-1em}%
2046 \addresses\let\and\@typeset@author@bx\and\par\bigskip}}

```

\@mkauthors@iv The sigchi-a version. We put authors in the main text with no more than 2 authors per line, unless overridden.

```

2047 \def\@mkauthors@iv{%

```

First, we need to determine the design of the author strip. The boxes are separated by \author@bx@sep plus two \author@bx@sep margins. This means that each box must be of width $(\text{textwidth} - \text{author@bx@sep})/N - \text{author@bx@sep}$, where N is the number of boxes per row.

```

2048 \author@bx@wd=\columnwidth\relax
2049 \advance\author@bx@wd by -\author@bx@sep\relax
2050 \ifnum\@ACM@author@sprow>0\relax
2051 \divide\author@bx@wd by \@ACM@author@sprow\relax
2052 \else
2053 \ifcase\@num@author@groups
2054 \relax % 0?
2055 \or % 1=one author per row
2056 \else % 2=two authors per row
2057 \divide\author@bx@wd by 2\relax
2058 \fi
2059 \fi
2060 \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of \addresses:

```

2061 \gdef\@currentauthors{}%
2062 \gdef\@currentaffiliation{}%
2063 \def\@author##1{\ifx\@currentauthors\@empty
2064 \gdef\@currentauthors{\par##1}%

```

```

2065 \else
2066   \g@addto@macro\@currentauthors{\par##1}%
2067 \fi
2068 \gdef\and{}}%
2069 \def\email##1##2{\ifx\@currentaffiliation\@empty
2070   \gdef\@currentaffiliation{\nolinkurl{##2}}%
2071 \else
2072   \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
2073 \fi}%
2074 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2075   \gdef\@currentaffiliation{%
2076     \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2077     \setkeys{@ACM@affiliation@}{##1}##2}%
2078 \else
2079   \g@addto@macro\@currentaffiliation{\par
2080     \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2081     \setkeys{@ACM@affiliation@}{##1}##2}%
2082 \fi
2083 \global\let\and\@typeset@author@bx}%
2084 %

```

Actual typesetting is done by the \and macro

```

2085   \bgroup\hsize=\columnwidth
2086   \par\raggedright\leftskip=\z@
2087   \lineskip=1pc\noindent
2088   \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}

```

\@mkauthorsaddresses Typesetting authors' addresses in the footnote style

```

2089 \def\@mkauthorsaddresses{%
2090   \ifnum\num@authors>1\relax
2091   Authors' \else Author's \fi
2092   \ifnum\num@authorgroups>1\relax
2093   addresses: \else address: \fi
2094   \bgroup
2095   \def\streetaddress##1{\unskip\@addpunct, ##1}%
2096   \def\postcode##1{\unskip\@addpunct, ##1}%
2097   \def\position##1{\unskip\ignorespaces}%
2098   \def\institution##1{\unskip\@addpunct, ##1}%
2099   \def\city##1{\unskip\@addpunct, ##1}%
2100   \def\state##1{\unskip\@addpunct, ##1}%
2101   \renewcommand\department[2][0]{\unskip\@addpunct, ##2}%
2102   \def\country##1{\unskip\@addpunct, ##1}%
2103   \def\and{\unskip\@addpunct; }%
2104   \def\@author##1{##1}%
2105   \def\email##1##2{\unskip\@addpunct, \nolinkurl{##2}}%
2106   \addresses
2107   \egroup}

```

\@setaddresses This is an amsart macro that we do not need.

```

2108 \def\@setaddresses{}

```


\@authornotemark Adding a footnote mark to authors. This version adds a “normal” footnote mark.
2109 \def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark\relax}}

\@@authornotemark Adding a footnote mark to authors with a given number
2110 \def\@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}

\@mkteasers Typesetting the teasers
2111 \def\@mkteasers{%
2112 \ifx\@teaserfigures\@empty\else
2113 \def\@teaser##1{\par\bigskip\bgroup
2114 \captionsetup{type=figure}##1\egroup\par}
2115 \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
2116 \noindent\@teaserfigures\par\medskip}%
2117 \fi}

\@mkabstract Typesetting the abstract
2118 \def\@mkabstract{\bgroup
2119 \ifx\@abstract\@empty\else
2120 {\phantomsection\addcontentsline{toc}{section}{Abstract}}%
2121 \if@ACM@journal
2122 \everypar{\setbox\z@=\lastbox\everypar{}}\small
2123 \else
2124 \section*{Abstract}%
2125 \fi
2126 \ignorespaces\@abstract\par}%
2127 \fi\egroup}

\@mkbibcitation Print the bibcitation format
2128 \def\@mkbibcitation{\bgroup
2129 \def\@pages@word{\ifnum\getrefnumber{TotPages}=1\relax page\else pages\fi}%
2130 \def\footnotemark{}%
2131 \def\{\unskip}\ignorespaces}%
2132 \def\footnote{\ClassError{\@classname}{Please do not use footnotes
2133 inside a \string\title{} or \string\author{} command! Use
2134 \string\titlenote{} or \string\authornote{} instead!}}%
2135 \def\@article@string{\ifx\@acmArticle\@empty{\ }else,
2136 Article~\@acmArticle\ }fi}%
2137 \par\medskip\small\noindent{\bfseries ACM Reference Format:}\par\nobreak
2138 \noindent\authors. \@acmYear. \@title
2139 \ifx\@subtitle\@empty. \else: \@subtitle. \fi
2140 \if@ACM@journal
2141 \textit{\@journalNameShort}
2142 \@acmVolume, \@acmNumber \@article@string (\@acmPubDate),
2143 \ref{TotPages}~\@pages@word.
2144 \else
2145 In \textit{\@acmBooktitle}%
2146 \ifx\@acmEditors\@empty\textit{.}\else
2147 \andify\@acmEditors\textit{, }\@acmEditors~\@editorsAbbrev.%
2148 \fi\

```

2149     ACM, New York, NY, USA%
2150     \@article@string\unskip, \ref{TotPages}~\@pages@word.
2151 \fi
2152 \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
2153 \par\egroup}

```

```

\@printendtopmatter End the top matter
2154 \def\@printendtopmatter{\par\bigskip}

```

```

\@setthanks We redefine \setthanks using \long
2155 \def\@setthanks{\long\def\thanks##1{\par##1\@addpunct.}\thanks}

```

```

\@setauthorsaddresses
2156 \def\@setauthorsaddresses{\@authorsaddresses\unskip\@addpunct.}

```

3.15 Headers and Footers

We use fancyhdr for our headers and footers:

```

2157 \RequirePackage{fancyhdr}

```

```

\ACM@linecount@bx This is the box displayed in review mode
2158 \if@ACM@review
2159 \newsavebox{\ACM@linecount@bx}
2160 \newlength\ACM@linecount@bxht
2161 \newcount\ACM@linecount
2162 \ACM@linecount\@ne\relax
2163 \def\ACM@mk@linecount{%
2164 \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{%
2165 \setlength{\ACM@linecount@bxht}{0pt}%
2166 \loop{\color{red}\scriptsize\the\ACM@linecount}\
2167 \global\advance\ACM@linecount by \@ne
2168 \addtolength{\ACM@linecount@bxht}{\baselineskip}%
2169 \ifdim\ACM@linecount@bxht<\textheight\repeat
2170 {\color{red}\scriptsize\the\ACM@linecount}\hfill
2171 \global\advance\ACM@linecount by \@ne}}
2172 \fi

```

```

\ACM@linecountL How to display the box on the left
2173 \def\ACM@linecountL{%
2174 \if@ACM@review
2175 \ACM@mk@linecount
2176 \begin{picture}(\z@,\z@)%
2177 \put(-26,-22){\usebox{\ACM@linecount@bx}}%
2178 \end{picture}%
2179 \fi}

```

```

\ACM@linecountR How to display the box on the right
2180 \def\ACM@linecountR{%

```

```

2181 \if@ACM@review
2182 \ACM@mk@linecount
2183 \begin{picture}(0,0)%
2184 \put(20,-22){\usebox{\ACM@linecount@bx}}%
2185 \end{picture}%
2186 \fi}

\ACM@timestamp The timestamp system
2187 \if@ACM@timestamp
2188 % Subtracting 30 from \time gives us the effect of rounding down despite
2189 % \numexpr rounding to nearest
2190 \newcounter{ACM@time@hours}
2191 \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
2192 \newcounter{ACM@time@minutes}
2193 \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
2194 \newcommand\ACM@timestamp{%
2195 \footnotesize%
2196 \ifx\@acmSubmissionID\empty\relax\else
2197 Submission ID: \@acmSubmissionID.{ }%
2198 \fi
2199 \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
2200 \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{. }%
2201 Page \thepage\ of \@startPage--\pageref*{TotPages}.%
2202 }
2203 \fi

\@shortauthors Even if the author redefined \shortauthors, we do not print it in the headers when in
anonymous mode:
2204 \def\@shortauthors{\if@ACM@anonymous Anon.\else\shortauthors\fi}

\@headfootfont The font to typeset header and footer text.
2205 \def\@headfootfont{\sffamily}

standardpagestyle The page style for all pages but the first one The page style for all pages but the first one
2206 \fancypagestyle{standardpagestyle}{%
2207 \fancyhf{}%
2208 \renewcommand{\headrulewidth}{\z@}%
2209 \renewcommand{\footrulewidth}{\z@}%
2210 \ifcase\ACM@format@nr
2211 \relax % manuscript
2212 \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
2213 \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
2214 \fancyhead[RE]{\@shortauthors}%
2215 \fancyhead[LO]{\ACM@linecountL\shorttitle}%
2216 \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}%
2217 \or % acmsmall
2218 \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2219 \fancyhead[RO]{\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2220 \fancyhead[RE]{\@headfootfont\@shortauthors}%

```

```

2221 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2222 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2223 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2224 \or % acmlarge
2225 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2226 \@acmArticle\if@ACM@printfolios:\thepage\fi\quad\textbullet\quad\@shortauthors}%
2227 \fancyhead[LO]{\ACM@linecountL}%
2228 \fancyhead[RO]{\@headfootfont
2229 \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2230 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2231 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2232 \or % acmtog
2233 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2234 \@acmArticle\if@ACM@printfolios:\thepage\fi\quad\textbullet\quad\@shortauthors}%
2235 \fancyhead[LO]{\ACM@linecountL}%
2236 \fancyhead[RE]{\ACM@linecountR}%
2237 \fancyhead[RO]{\@headfootfont
2238 \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi\ACM@linecountR}%
2239 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2240 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2241 \else % Proceedings
2242 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2243 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2244 \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2245 \fancyhead[LE]{\ACM@linecountL\@headfootfont\acmConference@shortname,
2246 \acmConference@date, \acmConference@venue}%
2247 \fancyhead[RO]{\@headfootfont\acmConference@shortname,
2248 \acmConference@date, \acmConference@venue\ACM@linecountR}%
2249 \fi
2250 \if@ACM@sigchiamode
2251 \fancyheadoffset[L]{\dimexpr\marginparsep+\marginparwidth}}%
2252 \fi
2253 \if@ACM@timestamp
2254 \fancyfoot[LO,RE]{\ACM@timestamp}
2255 \fi
2256 }
2257 \pagestyle{standardpagestyle}

```

```

\@folio@wd Folio blob width, height, offsets and max number
\@folio@ht
\@folio@voffset
\@folio@max
2258 \newdimen\@folio@wd
2259 \@folio@wd=\z@
2260 \newdimen\@folio@ht
2261 \@folio@ht=\z@
2262 \newdimen\@folio@voffset
2263 \@folio@voffset=\z@
2264 \def\@folio@max{1}
2265 \ifcase\ACM@format@nr
2266 \relax % manuscript
2267 \or % acmsmall
2268 \@folio@wd=45.75pt\relax

```

```

2269 \@folio@ht=1.25in\relax
2270 \@folio@voffset=.2in\relax
2271 \def\@folio@max{8}
2272 \or % acmlarge
2273 \@folio@wd=43.25pt\relax
2274 \@folio@ht=79pt\relax
2275 \@folio@voffset=.55in\relax
2276 \def\@folio@max{10}
2277 \fi

```

`\@folioblob` The macro to typeset the folio blob.

```

2278 \def\@folioblob{\@tempcnta=0\@acmArticleSeq\relax
2279 \ifnum\@tempcnta=0\relax\else
First, we calculate \@acmArticleSeq modulo \@folio@max
2280 \loop
2281 \ifnum\@tempcnta>\@folio@max\relax
2282 \advance\@tempcnta by - \@folio@max
2283 \repeat
2284 \advance\@tempcnta by -1\relax
2285 \@tempdima=\@folio@ht\relax
2286 \multiply\@tempdima by \the\@tempcnta\relax
2287 \advance\@tempdima by -\@folio@voffset\relax
2288 \begin{picture}(0,0)
2289 \makebox[\z@]{\raisebox{-\@tempdima}{%
2290 \rlap{%
2291 \raisebox{-0.45\@folio@ht}{\z@}{\z@}{%
2292 \rule{\@folio@wd}{\@folio@ht}}}%
2293 \parbox{\@folio@wd}{%
2294 \centering
2295 \textcolor{white}{\LARGE\sffamily\bfseries\@acmArticle}}}}
2296 \end{picture}\fi}
2297

```

`firstpagestyle` The page style for the first page only.

```

2298 \fancypagestyle{firstpagestyle}{%
2299 \fancyhf{}%
2300 \renewcommand{\headrulewidth}{\z@}%
2301 \renewcommand{\footrulewidth}{\z@}%
2302 \ifcase\ACM@format@nr
2303 \relax % manuscript
2304 \fancyhead[L]{\ACM@linecountL}%
2305 \fancyfoot[R0,LE]{\if@ACM@printfolios\small\thepage\fi}%
2306 \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
2307 \or % acmsmall
2308 \fancyfoot[R0,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2309 \@acmNumber, Article \@acmArticle. Publication date:
2310 \@acmPubDate.}%
2311 \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2312 \fancyhead[LO]{\ACM@linecountL}%

```

```

2313 \fancyhead[R0]{\@folioblob}%
2314 \fancyheadoffset[R0,LE]{0.6\@folio@wd}%
2315 \or % acmlarge
2316 \fancyfoot[R0,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2317 \@acmNumber, Article \@acmArticle. Publication date:
2318 \@acmPubDate.}%
2319 \fancyhead[R0]{\@folioblob}%
2320 \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2321 \fancyhead[LO]{\ACM@linecountL}%
2322 \fancyheadoffset[R0,LE]{1.4\@folio@wd}%
2323 \or % acmtog
2324 \fancyfoot[R0,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2325 \@acmNumber, Article \@acmArticle. Publication date:
2326 \@acmPubDate.}%
2327 \fancyhead[L]{\ACM@linecountL}%
2328 \fancyhead[R]{\ACM@linecountR}%
2329 \else % Conference proceedings
2330 \fancyhead[L]{\ACM@linecountL}%
2331 \fancyhead[R]{\ACM@linecountR}%
2332 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2333 \fi
2334 \if@ACM@timestamp
2335 \ifnum\ACM@format@nr=0\relax % Manuscript
2336 \fancyfoot[LO,RE]{\ACM@timestamp\quad
2337 \footnotesize Manuscript submitted to ACM}
2338 \else
2339 \fancyfoot[LO,RE]{\ACM@timestamp}
2340 \fi
2341 \fi
2342 }

```

\ACM@restore@pagestyle The following code by Ross Moore protects against changes by the totpages package:

```

2343 \let\ACM@ps@plain\ps@plain
2344 \let\ACM@ps@myheadings\ps@myheadings
2345 \let\ACM@ps@headings\ps@headings
2346 \def\ACM@restore@pagestyle{%
2347 \let\ps@plain\ACM@ps@plain
2348 \let\ps@myheadings\ACM@ps@myheadings
2349 \let\ps@headings\ACM@ps@headings}
2350 \AtBeginDocument{\ACM@restore@pagestyle}

```

3.16 Sectioning

Sectioning is different for different levels

```

2351 \renewcommand\section{\@startsection{section}{1}{\z@}%
2352 {-0.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2353 {.25\baselineskip}%
2354 {\@secfont}}
2355 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%

```

```

2356 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2357 {.25\baselineskip}%
2358 {\@subsecfont}}
2359 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{10pt}%
2360 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2361 {-3.5\p@}%
2362 {\@subsubsecfont\@adddotafter}}
2363 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
2364 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2365 {-3.5\p@}%
2366 {\@parfont\@adddotafter}}
2367 \renewcommand\part{\@startsection{part}{9}{\z@}%
2368 {-10\p@ \@plus -4\p@ \@minus -2\p@}%
2369 {4\p@}%
2370 {\@parfont}}

```

\section@raggedright Special version of \raggedright compatible with \MakeUppercase

```

2371 \def\section@raggedright{\@rightskip\@flushglue
2372 \rightskip\@rightskip
2373 \leftskip\z@skip
2374 \parindent\z@}

```

\@secfont Fonts for sections etc. are different for different formats.

```

\@subsecfont 2375 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
\@subsubsecfont 2376 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
\@parfont 2377 \def\@subsubsecfont{\sffamily\itshape}
2378 \def\@parfont{\itshape}
2379 \setcounter{secnumdepth}{3}
2380 \ifcase\ACM@format@nr
2381 \relax % manuscript
2382 \or % acmsmall
2383 \or % acmlarge
2384 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2385 \def\@subsecfont{\sffamily\large\section@raggedright}
2386 \or % acmtog
2387 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2388 \def\@subsecfont{\sffamily\large\section@raggedright}
2389 \or % sigconf
2390 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
2391 \def\@subsecfont{\bfseries\Large\section@raggedright}
2392 \or % siggraph
2393 \def\@secfont{\sffamily\bfseries\Large\section@raggedright\MakeTextUppercase}
2394 \def\@subsecfont{\sffamily\bfseries\Large\section@raggedright}
2395 \or % sigplan
2396 \def\@secfont{\bfseries\Large\section@raggedright}
2397 \def\@subsecfont{\bfseries\section@raggedright}
2398 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2399 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2400 {.25\baselineskip}%
2401 {\@subsubsecfont}}

```

```

2402 \def\@subsubsecfont{\bfseries\section@raggedright}
2403 \renewcommand\paragraph{\@startsection{paragraph}{4}{\z@}%
2404   {-1.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2405   {-3.5\p@}%
2406   {\@parfont\@addspaceafter}}
2407 \def\@parfont{\bfseries\itshape}
2408 \renewcommand\subparagraph{\@startsection{subparagraph}{5}{\z@}%
2409   {-1.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2410   {-3.5\p@}%
2411   {\@subparfont\@addspaceafter}}
2412 \def\@subparfont{\itshape}
2413 \or % sigchi
2414 \setcounter{secnumdepth}{1}
2415 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2416 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2417 \or % sigchi-a
2418 \setcounter{secnumdepth}{0}
2419 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2420 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2421 \fi

```

\@adddotafter Add punctuation after a sectioning command

```
2422 \def\@adddotafter#1{#1\@addpunct{.}}
```

\@addspaceafter Add space after a sectioning command

```
2423 \def\@addspaceafter#1{#1\@addpunct{\enspace}}
```

3.17 TOC lists

\@dotsep Related to the \tableofcontents are all the horizontal fillers. Base \TeX defines \@dottedtocline, which we should not disable. Yet, this command expects \@dotsep to be defined but leaves this to the class implementation. Since `amsart` does not provide this, we copy the standard variant from `article` here.

```
2424 \providecommand*\@dotsep{4.5}
```

3.18 Theorems

\@acmplainbodyfont The font to typeset the body of the `acmplain` theorem style.

```
2425 \def\@acmplainbodyfont{\itshape}
```

\@acmplainindent The amount to indent the `acmplain` theorem style.

```
2426 \def\@acmplainindent{\parindent}
```

\@acmplainheadfont The font to typeset the head of the `acmplain` theorem style.

```
2427 \def\@acmplainheadfont{\scshape}
```

\@acmplainnotefont The font to typeset the note of the `acmplain` theorem style.

```
2428 \def\@acmplainnotefont{\@empty}
```


Customization of the acmplain theorem style:

```

2429 \ifcase\ACM@format@nr
2430 \relax % manuscript
2431 \or % acmsmall
2432 \or % acmlarge
2433 \or % acmtog
2434 \or % sigconf
2435 \or % siggraph
2436 \or % sigplan
2437 \def\@acmplainbodyfont{\itshape}
2438 \def\@acmplainindent{\z@}
2439 \def\@acmplainheadfont{\bfseries}
2440 \def\@acmplainnotefont{\normalfont}
2441 \or % sigchi
2442 \or % sigchi-a
2443 \fi

```

acmplain The acmplain theorem style

```

2444 \newtheoremstyle{acmplain}%
2445 { .5\baselineskip \@plus.2\baselineskip
2446   \@minus.2\baselineskip}% space above
2447 { .5\baselineskip \@plus.2\baselineskip
2448   \@minus.2\baselineskip}% space below
2449 {\@acmplainbodyfont}% body font
2450 {\@acmplainindent}% indent amount
2451 {\@acmplainheadfont}% head font
2452 { .}% punctuation after head
2453 { .5em}% spacing after head
2454 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont{#3}}}}% head spec

```

\@acmdefinitionbodyfont The font to typeset the body of the acmdefinition theorem style.

```

2455 \def\@acmdefinitionbodyfont{\normalfont}

```

\@acmdefinitionindent The amount to indent the acmdefinition theorem style.

```

2456 \def\@acmdefinitionindent{\parindent}

```

\@acmdefinitionheadfont The font to typeset the head of the acmdefinition theorem style.

```

2457 \def\@acmdefinitionheadfont{\itshape}

```

\@acmdefinitionnotefont The font to typeset the note of the acmdefinition theorem style.

```

2458 \def\@acmdefinitionnotefont{\@empty}

```

Customization of the acmdefinition theorem style:

```

2459 \ifcase\ACM@format@nr
2460 \relax % manuscript
2461 \or % acmsmall
2462 \or % acmlarge
2463 \or % acmtog
2464 \or % sigconf

```

```

2465 \or % siggraph
2466 \or % sigplan
2467 \def\acmdefinitionbodyfont{\normalfont}
2468 \def\acmdefinitionindent{\z@}
2469 \def\acmdefinitionheadfont{\bfseries}
2470 \def\acmdefinitionnotefont{\normalfont}
2471 \or % sigchi
2472 \or % sigchi-a
2473 \fi

```

acmdefinition The acmdefinition theorem style

```

2474 \newtheoremstyle{acmdefinition}%
2475 { .5\baselineskip \@plus.2\baselineskip
2476   \@minus.2\baselineskip}% space above
2477 { .5\baselineskip \@plus.2\baselineskip
2478   \@minus.2\baselineskip}% space below
2479 {\@acmdefinitionbodyfont}% body font
2480 {\@acmdefinitionindent}% indent amount
2481 {\@acmdefinitionheadfont}% head font
2482 { .}% punctuation after head
2483 { .5em}% spacing after head
2484 {\thmname{#1}\thmnumber{ #2}\thmnote{ \@acmdefinitionnotefont{#3}}}% head spec

```

Make acmplain the default theorem style.

```

2485 \theoremstyle{acmplain}

```

Delay defining the theorem environments until after other packages have been loaded. In particular, the `cleveref` package must be loaded before the theorem environments are defined in order to show the correct environment name (see <https://github.com/borisveytsman/acmart/issues/138>). The `acmthm` option is used to suppress the definition of any theorem environments. Also, to avoid obscure errors arising from these environment definitions conflicting with environments defined by the user or by user-loaded packages, we only define environments that have not yet been defined.

```

2486 \AtEndPreamble{%
2487   \if@ACM@acmthm
2488     \theoremstyle{acmplain}
2489     \@ifundefined{theorem}{%
2490       \newtheorem{theorem}{Theorem}[section]
2491     }{}
2492     \@ifundefined{conjecture}{%
2493       \newtheorem{conjecture}[theorem]{Conjecture}
2494     }{}
2495     \@ifundefined{proposition}{%
2496       \newtheorem{proposition}[theorem]{Proposition}
2497     }{}
2498     \@ifundefined{lemma}{%
2499       \newtheorem{lemma}[theorem]{Lemma}
2500     }{}

```

```

2501 \ifundefined{corollary}{%
2502 \newtheorem{corollary}[theorem]{Corollary}
2503 }{}
2504 \theoremstyle{acmdefinition}
2505 \ifundefined{example}{%
2506 \newtheorem{example}[theorem]{Example}
2507 }{}
2508 \ifundefined{definition}{%
2509 \newtheorem{definition}[theorem]{Definition}
2510 }{}
2511 \fi
2512 \theoremstyle{acmplain}
2513 }

\@proofnamefont The font to typeset the proof name.
2514 \def\@proofnamefont{\scshape}

\@proofindent Whether or not to indent proofs.
2515 \def\@proofindent{\indent}

Customization of the proof environment.
2516 \ifcase\ACM@format@nr
2517 \relax % manuscript
2518 \or % acmsmall
2519 \or % acmlarge
2520 \or % acmtog
2521 \or % sigconf
2522 \or % siggraph
2523 \or % sigplan
2524 \def\@proofnamefont{\itshape}
2525 \def\@proofindent{\noindent}
2526 \or % sigchi
2527 \or % sigchi-a
2528 \fi

proof We want some customization of the proof environment.
2529 \renewenvironment{proof}[1][\proofname]{\par
2530 \pushQED{\qed}%
2531 \normalfont \topsep6\p@\@plus6\p@\relax
2532 \trivlist
2533 \item[\@proofindent\hspace\labelsep
2534 {\@proofnamefont #1\@addpunct{.}}]\ignorespaces
2535 }{%
2536 \popQED\endtrivlist\@endpfalse
2537 }

```

3.19 Acknowledgments

\acks This is a comment-like structure

```

2538 \specialcomment{acks}{%
2539   \begingroup
2540   \section*{Acknowledgments}
2541   \phantomsection\addcontentsline{toc}{section}{Acknowledgments}
2542 }{%
2543   \endgroup
2544 }

```

`\grantsponsor` We just typeset the name of the sponsor

```

2545 \def\grantsponsor#1#2#3{#2}

```

`\grantnum`

```

2546 \newcommand\grantnum[3][{}]{#3%
2547   \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}

```

3.20 Conditional typesetting

We use the `comment` package for conditional typesetting:

```

2548 \AtEndPreamble{%
2549   \if@ACM@screen
2550     \includecomment{screenonly}
2551     \excludecomment{printonly}
2552   \else
2553     \excludecomment{screenonly}
2554     \includecomment{printonly}
2555   \fi
2556   \if@ACM@anonymous
2557     \excludecomment{anonsuppress}
2558     \excludecomment{acks}
2559   \else
2560     \includecomment{anonsuppress}
2561   \fi}

```

3.21 Additional bibliography commands

`\showeprint` The command `\showeprint` has two arguments: the (optional) prefix and the eprint number. Right now the only prefix we understand is the (lowercase) word ‘arxiv’ (see <http://arxiv.org/hypertex/bibstyles/>).

```

2562 \newcommand\showeprint[2][arxiv]{%
2563   \def\@tempa{#1}%
2564   \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
2565   \def\@tempb{arxiv}%
2566   \ifx\@tempa\@tempb
2567     arXiv:\href{http://arxiv.org/abs/#2}{#2}\else arXiv:#2%
2568   \fi}

```

3.22 End of Class

```
2569 \normalsize\normalfont\frenchspacing  
2570 </class>
```

References

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Change History

1.48	General: Added prologue option to xcolor 40	//github.com/borisveytsman/ acmart/issues/9) 29
	Bib code cleanup (Zack Weinberg) 29	v1.04
	Documentation update (siggraph) . 29	\acmArticleSeq: Name change by Matthew Fluet 58
1.49	General: New journal: DTRAP 29	\acmDOI: Name change by Matthew Fluet 59
1.53	General: New journals: PACMCGIT, TIOT, TDSCI 29	\acmISBN: Name change by Matthew Fluet 59
	Rearranged docs 29	General: Updated bibliography for siggraph 29
		v1.05
v1.00	General: First released version 29	General: Added processing doi numbers for acmsiggraph and doi numbers for sigproc.bib 29
v1.01	General: Changed hyperref colors in screen mode (closes https: //github.com/borisveytsman/ acmart/issues/1) 29	Patched \setcitestyle command; closes https: //github.com/borisveytsman/ acmart/issues/19 29
	Defined ACM colors 29	v1.06
	Explicitly put draft option (closes https: //github.com/borisveytsman/ acmart/issues/4) 32	\@ACM@badge@skip: Added macro . . 59
	Set headheight to 1pc for all formats (closes https: //github.com/borisveytsman/ acmart/issues/5) 29	\@ACM@badge@width: Added macro . 59
v1.02	General: Added TOPS and TSC (closes https: //github.com/borisveytsman/ acmart/issues/12) 29	\@ACM@title@width: Added macro . 59
	Documentation changes (closes https: //github.com/borisveytsman/ acmart/issues/13) 29	\@mktitle@i: Added processing badges 73
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	\if@ACM@authorversion: Added macro 31	\@mktitle@ii: Now this macro is obsolete 74
	\maketitle: Added special case of authorversion 68	\@mktitle@iii: Added processing badges 74
General: Added anon suppress environment 29		Made more generic 74
Added authorversion option (closes https: //github.com/borisveytsman/ acmart/issues/13) 29		\@mktitle@iv: Made more generic . 74
		\@printtopmatter: Added processing badges 71
		\@subtitlefont: Added macro 72
		\@titlefont: Added macro 72
		\acmBadgeL: Added macro 59
		\acmBadgeR: Added macro 59
		\if@ACM@badge: Added macro 59
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		\maketitle: Corrected a bug with abstract footnotes 68
		Corrected a bug with permssion and footnotes order 68
		v1.08
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in manuscript and author version,		for sigs	83
https://github.com/borisveytsman/		Expanded headers for sigchi-a . . .	83
acmart/issues/36	68	Suppressed folios if sig	83
General: Changes of		v1.14	
‘licensedothergov’ wording	62	\bibstyle@acmauthoryear: Moved	
standardpagestyle: Reversed folios		def of \bibstyle@acmauthoryear	
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General: Customization of ACM		\bibstyle@numeric before use . .	36
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\@marginable: Now centering by		\@mkauthors@iii: New authors	
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\footnoterule: Made shorter	42	groups	56
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\if@ACM@newfonts: Added macro . .	44	\city: Added macro	75
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\bibliographystyle: Redefined		\postcode: Added macro	75
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\bibstyle@acmnumeric: Added		of anonymous mode	83
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\@mkbibcitation: Added \nobreak	81	v1.24
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\acmArticle: The default is now		v1.25
numerical	58	General: Updated PACMPL 48
\acmMonth: The default must be		v1.26
numerical. Closes #50.	58	General: Corrected \shortcite bug . 29
\acmNumber: The default is now		Documentation typos fixed (thanks
numerical	58	to Stephen Spencer) 29
\acmVolume: The default is now		v1.27
numerical	58	\if@ACM@printccs: Typo corrected . 60
\acmYear: The default is now		v1.28
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\description: Decreased indent . .	48	\textrightarrow (Matteo
\grantnum: Added url	92	Riondato) 62
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v1.18		bullet and around rightarrow;
\@mkauthors@i: Now we andify		semicolon separators no longer in
affiliations	77	bold/italic (John Wickerson) 62
\@typeset@author@line: Added		General: Increased head to 13pt 40
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PDF bookmarks (Matthew Fluet) .	81	General: Added \frenchspacing 93
\acks: Include 'Acknowledgements' in		Bibtex style now recognizes https://
PDF bookmarks (Matthew Fluet) .	91	in doi 29
General: Include 'Abstract',		Switched to T1: looks like libertine
'Acknowledgements', and		has problems with \l in OT1 44
'References' in PDF bookmarks		Updated IMWUT and PACMPL 48
(Matthew Fluet)	29	v1.31
Include 'References' in PDF		\@additionalaffiliation: Added
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\@mkabstract: Deleted spurious space	81	\@startsection: Added
General: Bug fixes for bst	29	\tochangmeasure 36
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\@textbottom: Redefined	43	\position: Added obeypunctuation code	75
\acmMonth: The default now is the current month (Matteo Riondato)	58	\postcode: Added obeypunctuation code	75
\acmYear: The default now is the current year (Matteo Riondato)	58	\state: Added obeypunctuation code	75
\additionalaffiliation: Added macro	56	\streetaddress: Added obeypunctuation code	75
\l@section: Redefined macro	38	General: Added acmart-preload-hook	29
\l@subsection: Redefined macro	38	Added cmap and glyptounicode	44
General: Documentation changes	29	BibTeX comma before articleno bug corrected	29
v1.32		BibTeX crossref bug corrected	29
\@formatdoi: New doi format	64	BibTeX numpages bug corrected	29
General: Added POMACS journal option	29	Documentation updates	29
Format siggraph is now obsolete	29	Moved \citenam definition for non-natbib bibliography, so a package may redefine it	39
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\@ACM@addtoaddress: Added obeypunctuation code	74	firstpagestyle: Added right linecount for two-column formats	85
\@mkauthors@i: Added obeypunctuation code	77	Added timestamp (Michael D. Adams)	85
\@mkauthors@iii: Added obeypunctuation code	78	standardpagestyle: Added right linecount for two-column formats	83
\@mkauthors@iv: Added obeypunctuation code	79	Added timestamp (Michael D. Adams)	83
\@subtitlefont: Added \normalsize	72	v1.34	
\ACM@linecountL: Renamed macro	82	\@mkbibcitation: Deleted DOI from doi numbers	81
\ACM@linecountR: Added macro	82	\ACM@linecount@bx: Rulers now are continuous	82
\ACM@timestamp: Added current page number	83	\ACM@linecountL: Rulers now are continuous	82
Added macro (Michael D. Adams)	83	\ACM@linecountR: Rulers now are continuous	82
Added submission id	83	\maketitle: Added date to the bibstrip in conf proceedings	68
\acmSubmissionID: Added macro	59	Deleted 'DOI' from doi numbers	68
\city: Added obeypunctuation code	75	Rearranged bibstrip	68
\country: Added obeypunctuation code	75	The \terms command is now obsolete	68
\department: Added obeypunctuation code	75	\terms: The \terms command now just produces a warning	59
\if@ACM@affiliation@obeypunctuation: Added macro	56	v1.35	
\if@ACM@authordraft: Added macro	31	\bibstyle@acmauthoryear: Square brackets for author-year style	35
\if@ACM@natbib@override: Deleted macro	31	General: BibTeX bug fixed: et al.	29
\if@ACM@timestamp: Added macro (Michael D. Adams)	31		
\institution: Added obeypunctuation code	75		
\maketitle: Fixed the bug with figures on top and bottom of the title page, thanks to David Epstein	68		

If the copyright is set to usgov or rightsretained, the price is suppressed	62	\country: Fixed bugs with extra spaces	75
v1.36		\l@section: Redefined macro . .	38
\@ACM@authorsperrow: Added macro	60	\postcode: We now do not print this even in SIG	75
\@mkauthors@iii: Added authorsperrow override	78	\state: We now do not print this even in SIG	75
\@mkauthors@iv: Added authorsperrow override	79	\streetaddress: We now do not print this even in SIG	75
\if@ACM@authordraft: Corrected typo, thanks to bargteil	31	General: Added 'textcase' package . .	34
General: Added PACMHCI journal options	48	Added heightrounded to geometry	40
Added the possibility to adjust number of author boxes per row in conference formats	29	Added new copyright version: licensedcagov	29
v1.37		Added package cleveref	29
\description: Reduce list indentation (Matthew Fluet)	48	Added Ross Moore code for glyptounicode	44
\descriptionlabel: Reduce list indentation (Matthew Fluet)	48	Bibliography changes	29
\normalparindent: Set \normalparindent (Matthew Fluet)	42	v1.41	
General: Reduce list indentation (Matthew Fluet)	47	General: Added new badges	29
Set \normalparindent; Reduce list indentation (Matthew Fluet)	29	v1.42	
v1.38		General: Deleted ACM badges	29
General: Increase default font size for SIGPLAN	29, 33	v1.43	
v1.39		\@startsection: Added \makeatletter	38
\@authornotemark: Added macro . .	81	\country: Added comma before country for journals	75
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\@copyrightpermission: Added new copyright version: licensedcagov .	64	\@editorsAbbrev: Added macro . . .	55
\@mkauthors@i: Switched to MakeTextUppercase	77	\@folioblob: Suppress the blob if acmArticleSeq is empty	85
\@parfont: Switched to MakeTextUppercase	87	\@mkbibcitation: If the paper has just one page, use 'page' instead of 'pages'	81
\ACM@linecount@bx: Work around a bug in xcolor: looks like cmyk colors in boxes do not work	82	\ACM@restore@pagestyle: Added macro	86
\ccdesc@parse@finish: Added macro	62	\acmArticle: The default is now empty	58
\city: We now do not print this even in SIG	75	\acmArticleSeq: Now acmArticle might be empty	58
		\acmBooktitle: Added macro	54
		\editor: Added macro	55
		\if@ACM@acmthm: Added macro	30
		\maketitle: Empty DOI or ISBN are not printed (by Michael Ekstrand)	68
		General: Added package refcount . . .	29
		Deleted package cleveref	29
		Put theorem defs in a separate style	29

v1.45		D. Adams)	83
\@folioblob: Switched		\@mkabstract: Removed spurious	
\bfseries\sffamily to		indentation if abstract is followed	
\sffamily\bfseries	85	by an empty line	81
\@parfont: Switched		\ACM@timestamp: Fromatting change	
\bfseries\sffamily to		(Michael D. Adams)	83
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