

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 \TeX 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, Nils Anders Danielsson, Michael Ekstrand, Matthew Fluet, Paolo G. Giarusso, Ben Greenman, Enrico Gregorio, Jamie Davis, Peter Kemp, Luis Leiva, Ben Liblit, Rholais Lii, LianTze Lim, Kai Mindermann, Frank Mittelbach, Serguei Mokhov, Ross Moore, John Owens, Joel Nider, Tobias Pape, Philip Quinn, Mathias Rav, Andreas Reichinger, Matteo Riondato, Craig Rodkin, Bernard Rous, David Shamma, Gabriel Scherer, 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>
- *balance*, <http://www.ctan.org/pkg/balance>
- *booktabs*, <http://www.ctan.org/pkg/booktabs>
- *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 2.11.

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, HEALTH, JACM, JDIQ, JEA, JERIC, JETC, PACMCGIT, PACMHCI, PACMPL, TAAS, TACCESS, TACO, TALG, TALLIP (formerly TALIP), TCPS, TDS, TEAC, TECS, THRI, THS, 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.

The option `balance` determines whether the last page in the two column mode has balanced columns. By default it is true; however, it may lead to problems for some documents. Set it to false if you encounter compilation errors. Note that for one page documents `\balance` command might cause problems.

The option `urlbreakonhyphens` determines whether URLs can be split between lines after hyphens. By default it is true. Set it to false to disallow these breaks.

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

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 2.11)
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)
nonacm	false	Use the class typesetting options for a non-ACM document, which will not include the conference/journal header and footers or permission statements
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 2.7
balance	true	Whether to balance the last page in two column mode
urlbreakonhyphens	true	Whether to break urls on hyphens

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,

```
\acmJournal{TOMS}
```

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

`\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)}
```

An ACM paper should have either `\acmJournal` or `\acmConference` command. If it has both (or more) commands, the last one takes precedence. Note that if you have the command `\acmConference` in a journal format like `acmsmall`, the class will use conference format for bibstrip and reference citation formatting. In the samples directory there is a file `sample-acmsmall-conf.tex` with the example of this usage.

`\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[\langle ShortTitle \rangle]{\langle FullTitle \rangle}
```

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{\langle subtitle \rangle}` 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 OR-

`\orcid` CID, <http://www.orcid.org/>), `\affiliation` and `\email`. In the simplest case, you

`\affiliation` enter them in this order:

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

Do *not* use the \LaTeX `\and` macro or commas, or `\\` between the authors! Each author deserves his or her own `\author` command. An attempt to list several authors or their e-mails in one command leads to a warning or an error. This is not a bug, but the expected behavior.

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.

The `\affiliation` and `\additionalaffiliation` commands are further structured to interact with the metadata extraction tools. Inside these commands you should use the `\position`, `\institution`, `\department`, `\city`, `\streetaddress`, `\state`, `\postcode`, and `\country` commands.

and `\country` 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 *are* necessary since they are used by the XML metadata extraction programs. Do *not* put commas or `\\` between the elements of `\affiliation`. They will be provided automatically.

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 `obeypunctuation`, which can be `false` (the default) or `true`. If this parameter is `true`, `\affiliation` obeys the author's command. Thus

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

will be typeset as

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

	Note that you should <i>not</i> use this option for journals.
	It is expected that these commands are inserted by the author of the manuscript.
<code>\thanks</code>	Like <code>amsart</code> (and unlike standard \LaTeX), we allow <code>\thanks</code> only <i>outside</i> of the commands <code>\title</code> and <code>\author</code> . This command is obsolete and should <i>not</i> be used in most cases. Do not list your acknowledgments or grant sponsors here. Put this information in the <code>acks</code> environment (see Section 2.10).
<code>\authorsaddresses</code>	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 <code>\authorsaddresses{<contact addresses>}</code> , for example, <pre> \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.} </pre>
	You can <i>suppress</i> printing authors' addresses by setting them to an empty string: <code>\authorsaddresses{}</code> .
<code>\titlenote</code>	While the command <code>\thanks</code> generates a note without a footnote mark, sometimes the authors might need notes more tightly connected to the title, subtitle or author. The commands <code>\titlenote</code> , <code>\subtitlenote</code> and <code>\authornote</code> that follow the corresponding commands (<code>\title</code> , <code>\subtitle</code> and <code>\author</code>) generate such notes. For example, <pre> \title{This is a title} \titlenote{This is a titlenote} \author{A. U. Thor} \authornote{This is an authornote} </pre>
<code>\subtitlenote</code>	
<code>\authornote</code>	
	Please never use a <code>\footnote</code> inside an <code>\author</code> or <code>\title</code> command since this confuses the metadata extraction software. (Actually these commands now produce errors.)
<code>\authornotemark</code>	Sometimes one may need to have the same footnote connected to several authors. The command <code>\authornotemark[<number>]</code> adds just the footnote mark, for example, <pre> \author{A. U. Thor} \authornote{Both authors contributed equally to the paper} ... \author{A. N. Other} \authornotemark[1] </pre>
	The correct numbering of these marks is the responsibility of the user.
<code>\acmVolume</code>	The macros <code>\acmVolume</code> , <code>\acmNumber</code> , <code>\acmArticle</code> , <code>\acmYear</code> and <code>\acmMonth</code> are
<code>\acmNumber</code>	
<code>\acmArticle</code>	
<code>\acmYear</code>	
<code>\acmMonth</code>	

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.

\acmArticleSeq 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.

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

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

\acmPrice 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.

\acmISBN 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 \acmISBN{}, suppresses printing the ISBN.

\acmDOI The macro \acmDOI{<DOI>} sets the DOI of the article, for example,

```
\acmDOI{10.1145/9999997.9999999}
```

It is normally set by the typesetter. Setting it to the empty string, as `\acmDOI{}`, suppresses the DOI.

`\acmBadgeR` Some conference articles get special distinctions, for example, the artifact evaluation
`\acmBadgeL` 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: `\acmBadgeR[url]{graphics}` and `\acmBadgeL[url]{graphics}`. The first command puts the badge to the right of the title, and the second one—to the left. The exception is the `sigchi-a` mode for SIGCHI extended abstracts, which puts the badges on the left margin. The arguments have the following meaning: [*url*], if provided, sets the link to the badge authority in the screen version, while {*graphics*} 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 `ae-logo.pdf`, the command is

```
\acmBadgeR[http://ctuning.org/ae/ppopp2016.html]{ae-logo}
```

`\startPage` The macro `\startPage{page}` sets the first page of the article in a journal or book. It is used by the typesetter.

`\terms` The command `\keywords{keyword, keyword,...}` sets keywords for the article.
`\keywords` They must be separated by commas, for example,

```
\keywords{wireless sensor networks, media access control,  
multi-channel, radio interference, time synchronization}
```

`CCSXML` ACM publications are classified according to the ACM Computing Classification
`\ccsdesc` Scheme (CCS). CCS codes are used both in the typeset version of the publications *and* in the metadata in various databases. Therefore you need to provide both \TeX commands and XML metadata with the paper.

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:

```
\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>
</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>
  <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. 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}

```

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

```
\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 Descriptions of images

\Description

Some readers of ACM publications might be visually challenged. These readers might use a voice-over software to read aloud the papers. It is important to provide them a description of each image used in the paper.

The command `\Description[short description][long description]` should be placed inside every figure, `teaserfigure` or `marginfigure` environment to provide

a description of the image(s) used in the figure. Unlike `\caption`, which is used alongside the image, `\Description` is intended to be used instead of the image, for example,

```
\begin{figure}
  \centering
  \includegraphics{voltage}
  \Description{A bell-like histogram centered at  $0.5\text{V}$  with most
measurements between  $0.2\text{V}$  and  $0.8\text{V}$ }
  \caption{Histogram of the measurements of voltage}
  \label{fig:voltage}
\end{figure}
```

At present the lack of descriptions generates a warning at compilation.

2.7 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.

2.8 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.

2.9 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.

2.10 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}

2.11 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 BibTeX 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 \citep 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 BibTeX 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 several special entry types. Types `online` and `game` are used 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",
}
```

Entry types `artifactsoftware`, `artifactdataset` (with synonyms `software` and `dataset`) can be used to cite software artifacts and datasets, for example,

```
@ArtifactSoftware{R,
  title = {R: A Language and Environment for Statistical Computing},
  author = {{R Core Team}},
  organization = {R Foundation for Statistical Computing},
  address = {Vienna, Austria},
  year = {2019},
  url = {https://www.R-project.org/},
}
@ArtifactDataset{UMassCitations,
  author = {Sam Anzaroot and Andrew McCallum},
  title = {{UMass} Citation Field Extraction Dataset},
  year = 2013,
  url =
    {http://www.iesl.cs.umass.edu/data/data-umasscitationfield},
  lastaccessed = {May 27, 2019}
}
```

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",
}
```

A note about sorting. The current ACM bibliography styles always sort the entries according to authors names and publication year. There is a controversy about sorting names with “von” or “van” part: should Ludwig van Beethoven be sorted under “V” or under “B”? The American practice is to use “van” in sorting, i.e. to file van Beethoven under “V”. However, some authorities recommend to sort Dutch persons according to their last names (see e.g. https://www.ifla.org/files/assets/cataloguing/pubs/names-of-persons_1996.pdf). While I do not want to take a part in this dispute, I would like to point to the old “noopsort” trick by Oren Patashnik. Add to the .bib file the line

```
@PREAMBLE{"\providecommand{\noopsort}[1]{}"}}
```

and then encode the author as

```
author = {Ludwig {\noopsort{Beethoven}}van Beethoven},
```

This will make the author to be sorted as “Beethoven” rather than “van Beethoven”.

2.12 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.

2.13 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.

2.14 Disabled or forbidden commands

The goal of `acmart` package is to provide a uniform look and feel for ACM publications. Accordingly, a number of commands is forbidden or disabled in `acmart`.

You may *not* put several authors or several e-mails into a `\author` or `\email` command. This may lead to errors or warning.

You cannot change `\baselinestretch` in your document: this produces an error.

You should not abuse the command `\vspace`: this command may disturb the type-setting of ACM papers.

2.15 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.

2.16 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
HEALTH	ACM Transactions on Computing for Healthcare
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

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

Abbreviation	Publication
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
TDS	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
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

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

Abbreviation	Publication
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 [2019/05/27 v1.61 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 valid

```
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@urlbreakonhyphens

```

57 \define@boolkey+{acmart.cls}[@ACM@]{urlbreakonhyphens}[true]{%
58 \if@ACM@urlbreakonhyphens
59 \PackageInfo{\@classname}{Using breaking urls on hyphens}%
60 \else
61 \PackageInfo{\@classname}{Not breaking urls on hyphens}%
62 \fi}{\PackageError{\@classname}{The option urlbreakonhyphens can be either true or
63 false}}
64 \ExecuteOptionsX{urlbreakonhyphens=true}

```

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

```

65 \define@boolkey+{acmart.cls}[@ACM@]{acmthm}[true]{%
66 \if@ACM@acmthm
67 \PackageInfo{\@classname}{Requiring acmthm}%
68 \else
69 \PackageInfo{\@classname}{Suppressing acmthm}%
70 \fi}{\PackageError{\@classname}{The option acmthm can be either true or
71 false}}
72 \ExecuteOptionsX{acmthm=true}

```

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

```

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

```

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

```

82 \define@boolkey+{acmart.cls}[@ACM@]{authorversion}[true]{%
83   \if@ACM@authorversion
84     \PackageInfo{\@classname}{Using authorversion mode}%
85   \else
86     \PackageInfo{\@classname}{Not using authorversion mode}%
87   \fi}{\PackageError{\@classname}{The option authorversion can be either true or
88     false}}
89 \ExecuteOptionsX{authorversion=false}

```

`\if@ACM@nonacm` Special option for non-ACM publications using the ACM typesetting options.

```

90 \define@boolkey+{acmart.cls}[@ACM@]{nonacm}[true]{%
91   \if@ACM@nonacm
92     \PackageInfo{\@classname}{Using nonacm mode}%
93     \AtBeginDocument{\@ACM@printacmreffalse}%
94     % in 'nonacm' mode we disable the "ACM Reference Format"
95     % printing by default, but this can be re-enabled by the
96     % user using \settopmatter{printacmref=true}
97   \else
98     \PackageInfo{\@classname}{Not using nonacm mode}%
99   \fi}{\PackageError{\@classname}{The option nonacm can be either true or
100     false}}
101 \ExecuteOptionsX{nonacm=false}

```

`\if@ACM@balance` Whether to balance the last page

```

102 \define@boolkey+{acmart.cls}[@ACM@]{balance}[true]{}%
103 \PackageError{\@classname}{The option balance can be either true or
104   false}}
105 \ExecuteOptionsX{balance}

```

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

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

```

106 \define@boolkey+{acmart.cls}[@ACM@]{natbib}[true]{%
107   \if@ACM@natbib
108     \PackageInfo{\@classname}{Explicitly selecting natbib mode}%
109   \else
110     \PackageInfo{\@classname}{Explicitly deselecting natbib mode}%

```

```

111 \fi}{\PackageError{\@classname}{The option natbib can be either true or
112     false}}
113 \ExecuteOptionsX{natbib=true}

\if@ACM@anonymous Whether we use anonymous mode
114 \define@boolkey+{acmart.cls}[@ACM@]{anonymous}[true]{%
115     \if@ACM@anonymous
116         \PackageInfo{\@classname}{Using anonymous mode}%
117     \else
118         \PackageInfo{\@classname}{Not using anonymous mode}%
119     \fi}{\PackageError{\@classname}{The option anonymous can be either true or
120         false}}
121 \ExecuteOptionsX{anonymous=false}

\if@ACM@timestamp Whether we use timestamp mode
122 \define@boolkey+{acmart.cls}[@ACM@]{timestamp}[true]{%
123     \if@ACM@timestamp
124         \PackageInfo{\@classname}{Using timestamp mode}%
125     \else
126         \PackageInfo{\@classname}{Not using timestamp mode}%
127     \fi}{\PackageError{\@classname}{The option timestamp can be either true or
128         false}}
129 \ExecuteOptionsX{timestamp=false}

\if@ACM@authordraft Whether we use author-draft mode
130 \define@boolkey+{acmart.cls}[@ACM@]{authordraft}[true]{%
131     \if@ACM@authordraft
132         \PackageInfo{\@classname}{Using authordraft mode}%
133         \@ACM@timestamptrue
134         \@ACM@reviewtrue
135     \else
136         \PackageInfo{\@classname}{Not using authordraft mode}%
137     \fi}{\PackageError{\@classname}{The option authordraft can be either true or
138         false}}
139 \ExecuteOptionsX{authordraft=false}

\ACM@fontsize The font size to pass to the base class
140 \def\ACM@fontsize{}
141 \DeclareOptionX{9pt}{\edef\ACM@fontsize{\CurrentOption}}
142 \DeclareOptionX{10pt}{\edef\ACM@fontsize{\CurrentOption}}
143 \DeclareOptionX{11pt}{\edef\ACM@fontsize{\CurrentOption}}
144 \DeclareOptionX{12pt}{\edef\ACM@fontsize{\CurrentOption}}

145 \DeclareOptionX{draft}{\PassOptionsToClass{\CurrentOption}{amsart}}
146 \DeclareOptionX{*}{\PassOptionsToClass{\CurrentOption}{amsart}}
147 \ProcessOptionsX
148 \ClassInfo{\@classname}{Using format \ACM@format, number \ACM@format@nr}

```

3.4 Setting switches

<code>\if@ACM@manuscript</code>	Whether we use manuscript mode 149 <code>\newif\if@ACM@manuscript</code>
<code>\if@ACM@journal</code>	There are two kinds of publications: journals and books 150 <code>\newif\if@ACM@journal</code>
<code>\if@ACM@journal@bibstrip</code>	Sometimes ACM wants a journal-like publication to have conference information in the bibstrip and vice versa, so we have an additional switch. 151 <code>\newif\if@ACM@journal@bibstrip</code>
<code>\if@ACM@sigchiamode</code>	The formatting of SIGCHI extended abstracts is quite unusual. We have a special switch for them. 152 <code>\newif\if@ACM@sigchiamode</code>

Setting up switches

```

153 \ifnum\ACM@format@nr=5\relax % siggraph
154   \ClassWarning{\@classname}{The format siggraph is now obsolete.
155     I am switching to sigconf.}
156   \setkeys{acmart.cls}{format=sigconf}
157 \fi
158 \ifnum\ACM@format@nr=0\relax
159   \@ACM@manuscripttrue
160 \else
161   \@ACM@manuscriptfalse
162 \fi
163 \@ACM@sigchiamodefalse
164 \ifcase\ACM@format@nr
165 \relax % manuscript
166   \@ACM@journaltrue
167 \or % acmsmall
168   \@ACM@journaltrue
169 \or % acmlarge
170   \@ACM@journaltrue
171 \or % acmtog
172   \@ACM@journaltrue
173 \or % sigconf
174   \@ACM@journalfalse
175 \or % siggraph
176   \@ACM@journalfalse
177 \or % sigplan
178   \@ACM@journalfalse
179 \or % sigchi
180   \@ACM@journalfalse
181 \or % sigchi-a
182   \@ACM@journalfalse
183   \@ACM@sigchiamodetrue
184 \fi

```

```

185 \if@ACM@journal
186 \@ACM@journal@bibstriptrue
187 \else
188 \@ACM@journal@bibstripfalse
189 \fi

```

3.5 Loading the base class and package

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

```

190 \ifx\ACM@fontsize\@empty
191 \ifcase\ACM@format@nr
192 \relax % manuscript
193 \def\ACM@fontsize{9pt}%
194 \or % acmsmall
195 \def\ACM@fontsize{10pt}%
196 \or % acmlarge
197 \def\ACM@fontsize{10pt}%
198 \or % acmtog
199 \def\ACM@fontsize{9pt}%
200 \or % sigconf
201 \def\ACM@fontsize{9pt}%
202 \or % siggraph
203 \def\ACM@fontsize{9pt}%
204 \or % sigplan
205 \def\ACM@fontsize{10pt}%
206 \or % sigchi
207 \def\ACM@fontsize{10pt}%
208 \or % sigchi-a
209 \def\ACM@fontsize{10pt}%
210 \fi
211 \fi
212 \ClassInfo{\@classname}{Using fontsize \ACM@fontsize}
213 \LoadClass[\ACM@fontsize, reqno]{amsart}
214 \RequirePackage{microtype}

```

We need etoolbox for delayed code

```
215 \RequirePackage{etoolbox}
```

Booktabs is now the default

```
216 \RequirePackage{booktabs}
```

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

```

217 \RequirePackage{refcount}
218 \RequirePackage{totpages}

```

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

```
219 \RequirePackage{environ}
```

We use setspace for double spacing

```
220 \if@ACM@manuscript
221 \RequirePackage{setspace}
222 \onehalfspacing
223 \fi
```

We need textcase for better upcasing

```
224 \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.

```
225 \if@ACM@natbib
226   \RequirePackage{natbib}
227   \renewcommand{\bibsection}{%
228     \section*{\refname}%
229     \phantomsection\addcontentsline{toc}{section}{\refname}%
230   }
231   \renewcommand{\bibfont}{\bibliofont}
232   \renewcommand\setcitestyle[1]{
233     \@for\@tempa:=#1\do
234     {\def\@tempb{round}\ifx\@tempa\@tempb
235       \renewcommand\NAT@open{(\}\renewcommand\NAT@close{)}\fi
236     \def\@tempb{square}\ifx\@tempa\@tempb
237       \renewcommand\NAT@open{[\}\renewcommand\NAT@close{]}\fi
238     \def\@tempb{angle}\ifx\@tempa\@tempb
239       \renewcommand\NAT@open{$<$}\renewcommand\NAT@close{$>$}\fi
240     \def\@tempb{curly}\ifx\@tempa\@tempb
241       \renewcommand\NAT@open{\{\}\renewcommand\NAT@close{\}}\fi
242     \def\@tempb{semicolon}\ifx\@tempa\@tempb
243       \renewcommand\NAT@sep{;}\fi
244     \def\@tempb{colon}\ifx\@tempa\@tempb
245       \renewcommand\NAT@sep{;}\fi
246     \def\@tempb{comma}\ifx\@tempa\@tempb
247       \renewcommand\NAT@sep{,}\fi
248     \def\@tempb{authoryear}\ifx\@tempa\@tempb
249       \NAT@numbersfalse\fi
250     \def\@tempb{numbers}\ifx\@tempa\@tempb
251       \NAT@numberstrue\NAT@superfalse\fi
252     \def\@tempb{super}\ifx\@tempa\@tempb
253       \NAT@numberstrue\NAT@supertrue\fi
254     \def\@tempb{nobibstyle}\ifx\@tempa\@tempb
255       \let\bibstyle=\@gobble\fi
256     \def\@tempb{bibstyle}\ifx\@tempa\@tempb
257       \let\bibstyle=\@citestyle\fi
258     \def\@tempb{sort}\ifx\@tempa\@tempb
259       \def\NAT@sort{\@ene}\fi
260     \def\@tempb{nosort}\ifx\@tempa\@tempb
```

```

261 \def\NAT@sort{\z@}\fi
262 \def\@tempb{compress}\ifx\@tempa\@tempb
263 \def\NAT@cmprs{\@ne}\fi
264 \def\@tempb{nocompress}\ifx\@tempa\@tempb
265 \def\NAT@cmprs{\z@}\fi
266 \def\@tempb{sort&compress}\ifx\@tempa\@tempb
267 \def\NAT@sort{\@ne}\def\NAT@cmprs{\@ne}\fi
268 \def\@tempb{mcite}\ifx\@tempa\@tempb
269 \let\NAT@merge\@ne\fi
270 \def\@tempb{merge}\ifx\@tempa\@tempb
271 \ifnum{\NAT@merge<\tw@}{\let\NAT@merge\tw@}\fi
272 \def\@tempb{elide}\ifx\@tempa\@tempb
273 \ifnum{\NAT@merge<\thr@@}{\let\NAT@merge\thr@@}\fi
274 \def\@tempb{longnamesfirst}\ifx\@tempa\@tempb
275 \NAT@longnamestrue\fi
276 \def\@tempb{nonamebreak}\ifx\@tempa\@tempb
277 \def\NAT@nmfmt#1{\mbox{\NAT@up#1}}\fi
278 \expandafter\NAT@find@eq\@tempa=\relax\@nil
279 \if\@tempc\relax\else
280 \expandafter\NAT@rem@eq\@tempc
281 \def\@tempb{open}\ifx\@tempa\@tempb
282 \xdef\NAT@open{\@tempc}\fi
283 \def\@tempb{close}\ifx\@tempa\@tempb
284 \xdef\NAT@close{\@tempc}\fi
285 \def\@tempb{aysep}\ifx\@tempa\@tempb
286 \xdef\NAT@aysep{\@tempc}\fi
287 \def\@tempb{yysep}\ifx\@tempa\@tempb
288 \xdef\NAT@yrsep{\@tempc}\fi
289 \def\@tempb{notesep}\ifx\@tempa\@tempb
290 \xdef\NAT@cmt{\@tempc}\fi
291 \def\@tempb{citesep}\ifx\@tempa\@tempb
292 \xdef\NAT@sep{\@tempc}\fi
293 \fi
294 }%
295 \NAT@@setcites
296 }
297 \renewcommand\citestyle[1]{%
298 \ifcsname bibstyle@#1\endcsname%
299 \csname bibstyle@#1\endcsname\let\bibstyle\@gobble%
300 \else%
301 \@latex@error{Undefined ‘#1’ citestyle}%
302 \fi
303 }%
304 \fi

```

\bibstyle@acmauthoryear The default author-year format:

```

305 \newcommand{\bibstyle@acmauthoryear}{%
306 \setcitestyle{%
307   authoryear,%
308   open={},close={},citesep={;},%

```

```

309   aysep={},yysep={,},%
310   notesep={, }}

```

`\bibstyle@acmnumeric` The default numeric format:

```

311 \newcommand{\bibstyle@acmnumeric}{%
312   \setcitestyle{%
313     numbers,sort&compress,%
314     open={},close={},citesep={,},%
315     notesep={, }}

```

The default is numeric:

```

316 \if@ACM@natbib
317 \citestyle{acmnumeric}
318 \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:

```

319 \def\@startsection#1#2#3#4#5#6{%
320   \if@noskipsec \leavevmode \fi
321   \par
322   \@tempskipa #4\relax
323   \@afterindenttrue
324   \ifdim \@tempskipa <\z@
325     \@tempskipa -\@tempskipa \@afterindentfalse
326   \fi
327   \if@nobreak
328     \everypar{}%
329   \else
330     \addpenalty\@secpenalty\addvspace\@tempskipa
331   \fi
332   \ifstar
333     {\@ssect{#3}{#4}{#5}{#6}}%
334     {\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}
335 \def\@sect#1#2#3#4#5#6[#7]#8{%
336   \edef\@toclevel{\ifnum#2=\@m 0\else\number#2\fi}%
337   \ifnum #2>\c@secnumdepth
338     \let\@svsec\@empty
339   \else
340     \refstepcounter{#1}%
341     \protected@edef\@svsec{\@secntformat{#1}\relax}%
342   \fi
343   \@tempskipa #5\relax
344   \ifdim \@tempskipa>\z@
345     \begingroup
346       #6{%
347         \@hangfrom{\hskip #3\relax\@svsec}%
348         \interlinepenalty \@M #8\@par}%
349     \endgroup

```



```

350 \csname #1mark\endcsname{#7}%
351 \ifnum #2>\c@secnumdepth \else
352   \@tochangmeasure{\csname the#1\endcsname}%
353 \fi
354 \addcontentsline{toc}{#1}{%
355   \ifnum #2>\c@secnumdepth \else
356     \protect\numberline{\csname the#1\endcsname}%
357   \fi
358   #7}%
359 \else
360   \def\@svsechd{%
361     #6{\hskip #3\relax
362       \@svsec #8}%
363     \csname #1mark\endcsname{#7}%
364     \ifnum #2>\c@secnumdepth \else
365       \@tochangmeasure{\csname the#1\endcsname\space}%
366     \fi
367     \addcontentsline{toc}{#1}{%
368       \ifnum #2>\c@secnumdepth \else
369         \protect\numberline{\csname the#1\endcsname}%
370       \fi
371       #7}}%
372 \fi
373 \xsect{#5}}
374 \def\@xsect#1{%
375   \@tempskipa #1\relax
376   \ifdim \@tempskipa>\z@
377     \par \nobreak
378     \vskip \@tempskipa
379     \afterheading
380   \else
381     \@nobreakfalse
382     \global\@noskipsectrue
383     \everypar{%
384       \if@noskipsec
385         \global\@noskipsecfalse
386         {\setbox\z@\lastbox}%
387         \clubpenalty\@M
388         \begingroup \@svsechd \endgroup
389         \unskip
390         \@tempskipa #1\relax
391         \hskip -\@tempskipa
392       \else
393         \clubpenalty \@clubpenalty
394       \everypar{}}%
395     \fi}%
396 \fi
397 \ignorespaces}
398 \def\@secntformat#1{\csname the#1\endcsname\quad}
399 \def\@ssect#1#2#3#4#5{%

```

```

400 \@tempskipa #3\relax
401 \ifdim \@tempskipa>\z@
402   \begingroup
403     #4{%
404       \@hangfrom{\hskip #1}%
405       \interlinepenalty \@M #5\@par}%
406   \endgroup
407 \else
408   \def\@svsechd{#4{\hskip #1\relax #5}}%
409 \fi
410 \xsect{#3}}

```

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

```

411 \def\@starttoc#1#2{\begingroup\makeatletter
412   \setTrue{#1}%
413   \par\removelastskip\vskip\z@skip
414   \@startsection{section}\@M\z@{\linespacing\@plus\linespacing}%
415     {.5\linespacing}{\centering\contentsnamefont}{#2}%
416   \@input{\jobname.#1}%
417   \if@filesw
418     \xp\newwrite\csname tf@#1\endcsname
419     \immediate\xp\openout\csname tf@#1\endcsname \jobname.#1\relax
420   \fi
421   \global\@nobreakfalse \endgroup
422   \addvspace{32\p@\@plus14\p@}%
423 }

```

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

```

424 \def\l@section{\@tocline{1}{0pt}{1pc}{2pc}{}}

```

\l@subsection The spacing in amsart is too large

```

425 \def\l@subsection{\@tocline{2}{0pt}{1pc}{3pc}{}}

```

\l@subsubsection The spacing in amsart is too large

```

426 \def\l@subsubsection{\@tocline{2}{0pt}{1pc}{5pc}{}}

```

We need to define footnote-related stuff before the call to hyperref (Ross Moore)

\@makefnmark We do not use indentation for footnotes

```

427 \def\@makefnmark{\noindent\@makefnmark}

```

\@footnotetext In sigchi-a mode our footnotes are in the margin!

```

428 \if@ACM@sigchiamode
429 \long\def\@footnotetext#1{\marginpar{%
430   \reset@font\small
431   \interlinepenalty\interfootnotelinepenalty
432   \protected@edef\@currentlabel{%
433     \csname p@footnote\endcsname\@thefnmark

```

```

434 }%
435 \color@begingroup
436 \makefnfont{%
437 \rule\z@{\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
438 \color@endgroup}}%
439 \fi

```

\mpfootnotetext We want the footnotes in minipages centered:

```

440 \long\def\mpfootnotetext#1{%
441 \global\setbox\mpfootins\vbox{%
442 \unvbox\mpfootins
443 \reset@font\footnotesize
444 \hsize\columnwidth
445 \@parboxrestore
446 \protected@edef\@currentlabel
447 {\csname p\mpfootnote\endcsname\@thefnmark}%
448 \color@begingroup\centering
449 \makefnfont{%
450 \rule\z@{\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
451 \color@endgroup}}

```

\makefnmark AMS classes use a buggy definition of \makefnmark. We revert to the standard one.

```

452 \def\makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}

```

And now, hyperref

```

453 \let\@footnotemark@nolink\@footnotemark
454 \let\@footnotetext@nolink\@footnotetext
455 \RequirePackage[bookmarksnumbered,unicode]{hyperref}
456 \pdfstringdefDisableCommands{%
457 \def\addtocounter#1#2{}%
458 \def\unskip{}%
459 \def\textbullet{- }%
460 \def\textrightarrow{-> }%
461 \def\footnotemark{}%
462 }
463 \urlstyle{rm}
464 \ifcase\ACM@format@nr
465 \relax % manuscript
466 \or % acmsmall
467 \or % acmlarge
468 \or % acmtog
469 \or % sigconf
470 \or % siggraph
471 \or % sigplan
472 \urlstyle{sf}
473 \or % sigchi
474 \or % sigchi-a
475 \urlstyle{sf}
476 \fi

```

```

477 \AtEndPreamble{%
478   \if@ACM@urlbreakonhyphens
479     \def\do@url@hyp{\do\~}%
480   \fi
481   \if@ACM@screen
482     \hypersetup{colorlinks,
483       linkcolor=ACMPurple,
484       citecolor=ACMPurple,
485       urlcolor=ACMDarkBlue,
486       filecolor=ACMDarkBlue}
487   \else
488     \hypersetup{hidelinks}
489   \fi
490   \hypersetup{pdflang={en},
491     pdfdisplaydoctitle}}

```

Bibliography mangling.

```

492 \if@ACM@natbib
493   \let\citeN\cite
494   \let\cite\citep
495   \let\citeANP\citeauthor
496   \let\citeNN\citeyearpar
497   \let\citeyearNP\citeyear
498   \let\citeNP\citealt
499   \DeclareRobustCommand\citeA
500     {\begingroup\NAT@swafalse
501       \let\NAT@ctype\@ne\NAT@partrue\NAT@fullfalse\NAT@open\NAT@citetp}%
502   \providecommand\newblock{}%
503 \else
504   \AtBeginDocument{%
505     \let\shortcite\cite%
506     \providecommand\citename[1]{#1}}
507 \fi
508 \newcommand\shortcite[2][]{%
509   \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:

```

510 \def\bibliographystyle#1{%
511   \ifx\@begindocumenthook\@undefined\else
512     \expandafter\AtBeginDocument
513   \fi
514   {\if@filesw
515     \immediate\write\@auxout{\string\bibstyle{#1}}%
516   \fi}}

```

Graphics and color.

```

517 \RequirePackage{graphicx}
518 \RequirePackage[prologue]{xcolor}

```

We define ACM colors according to [7]:

```
519 \definecolor[named]{ACMBlue}{cmyk}{1,0.1,0,0.1}
520 \definecolor[named]{ACMYellow}{cmyk}{0,0.16,1,0}
521 \definecolor[named]{ACMOrange}{cmyk}{0,0.42,1,0.01}
522 \definecolor[named]{ACMRed}{cmyk}{0,0.90,0.86,0}
523 \definecolor[named]{ACMLightBlue}{cmyk}{0.49,0.01,0,0}
524 \definecolor[named]{ACMGreen}{cmyk}{0.20,0,1,0.19}
525 \definecolor[named]{ACMPurple}{cmyk}{0.55,1,0,0.15}
526 \definecolor[named]{ACMDarkBlue}{cmyk}{1,0.58,0,0.21}
```

Author-draft mode

```
527 \if@ACM@authordraft
528   \RequirePackage{draftwatermark}
529   \SetWatermarkFontSize{0.5in}
530   \SetWatermarkColor[gray]{.9}
531   \SetWatermarkText{\parbox{12em}{\centering
532     Unpublished working draft.\}
533     Not for distribution.}}
534 \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>.

```
535 \RequirePackage{geometry}
536 \ifcase\ACM@format@nr
537 \relax % manuscript
538   \geometry{letterpaper,head=13pt,
539     marginparwidth=6pc,heightrounded}%
540 \or % acmsmall
541   \geometry{twoside=true,
542     includeheadfoot, head=13pt, foot=2pc,
543     paperwidth=6.75in, paperheight=10in,
544     top=58pt, bottom=44pt, inner=46pt, outer=46pt,
545     marginparwidth=2pc,heightrounded
546   }%
547 \or % acmlarge
548   \geometry{twoside=true, head=13pt, foot=2pc,
549     paperwidth=8.5in, paperheight=11in,
550     includeheadfoot,
551     top=78pt, bottom=114pt, inner=81pt, outer=81pt,
552     marginparwidth=4pc,heightrounded
553   }%
554 \or % acmtog
555   \geometry{twoside=true, head=13pt, foot=2pc,
556     paperwidth=8.5in, paperheight=11in,
557     includeheadfoot, columnsep=24pt,
558     top=52pt, bottom=75pt, inner=52pt, outer=52pt,
```

```

559     marginparwidth=2pc,heightrounded
560   }%
561 \or % sigconf
562   \geometry{twoside=true, head=13pt,
563     paperwidth=8.5in, paperheight=11in,
564     includeheadfoot, columnsep=2pc,
565     top=57pt, bottom=73pt, inner=54pt, outer=54pt,
566     marginparwidth=2pc,heightrounded
567   }%
568 \or % siggraph
569   \geometry{twoside=true, head=13pt,
570     paperwidth=8.5in, paperheight=11in,
571     includeheadfoot, columnsep=2pc,
572     top=57pt, bottom=73pt, inner=54pt, outer=54pt,
573     marginparwidth=2pc,heightrounded
574   }%
575 \or % sigplan
576   \geometry{twoside=true, head=13pt,
577     paperwidth=8.5in, paperheight=11in,
578     includeheadfoot=false, columnsep=2pc,
579     top=1in, bottom=1in, inner=0.75in, outer=0.75in,
580     marginparwidth=2pc,heightrounded
581   }%
582 \or % sigchi
583   \geometry{twoside=true, head=13pt,
584     paperwidth=8.5in, paperheight=11in,
585     includeheadfoot, columnsep=2pc,
586     top=66pt, bottom=73pt, inner=54pt, outer=54pt,
587     marginparwidth=2pc,heightrounded
588   }%
589 \or % sigchi-a
590   \geometry{twoside=false, head=13pt,
591     paperwidth=11in, paperheight=8.5in,
592     includeheadfoot, marginparsep=72pt,
593     marginparwidth=170pt, columnsep=20pt,
594     top=72pt, bottom=72pt, left=314pt, right=72pt
595   }%
596   \@mparswitchfalse
597   \reversemarginpar
598 \fi

\parindent Paragraphing
\parskip 599 \setlength\parindent{10\p@}
600 \setlength\parskip{\z@}
601 \ifcase\ACM@format@nr
602 \relax % manuscript
603 \or % acmsmall
604 \or % acmlarge
605 \or % acmtog
606   \setlength\parindent{9\p@}%

```

```

607 \or % sigconf
608 \or % siggraph
609 \or % sigplan
610 \or % sigchi
611 \or % sigchi-a
612 \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` command. We set `\normalparindent` to the value of `\parindent` as selected by `acmart` for consistent paragraph indents.

```

613 \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.

```

614 \def\copyrightpermissionfootnoterule{\kern-3\p@
615   \hrule \@width \columnwidth \kern 2.6\p@}

616 \RequirePackage{manyfoot}
617 \SelectFootnoteRule[2]{copyrightpermission}
618 \DeclareNewFootnote{authorsaddresses}
619 \SelectFootnoteRule[2]{copyrightpermission}
620 \DeclareNewFootnote{copyrightpermission}

```

`\footnoterule` Tschichold’s rules:

```

621 \def\footnoterule{\kern-3\p@
622   \hrule \@width 4pc \kern 2.6\p@}

```

`\endminipage` We do not use footnote rules in minipages

```

623 \def\endminipage{%
624   \par
625   \unskip
626   \ifvoid\@mpfootins\else
627     \vskip\skip\@mpfootins
628     \normalcolor
629     \unvbox\@mpfootins
630   \fi
631   \@minipagefalse
632   \color@endgroup
633   \egroup
634   \expandafter\@iiparbox\@mpargs{\unvbox\@tempboxa}}

```

\@textbottom Add some stretch according to David Carlisle's advice at <http://tex.stackexchange.com/a/62318/5522>

```
635 \def\@textbottom{\vskip \z@ \@plus 1pt}
636 \let\@texttop\relax
```

In two-column layouts, force both columns to be the same height by inserting extra internal vertical space to fill out the page.

```
637 \ifcase\ACM@format@nr
638 \relax % manuscript
639 \or % acmsmall
640 \or % acmlarge
641 \or % acmtog
642 \flushbottom
643 \or % sigconf
644 \flushbottom
645 \or % siggraph
646 \flushbottom
647 \or % sigplan
648 \flushbottom
649 \or % sigchi
650 \flushbottom
651 \or % sigchi-a
652 \fi
```

3.8 Fonts

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

The code below is by Ross Moore.

```
653 \RequirePackage{iftex}
654 \ifPDFTeX
655 \input{glyphtounicode}
656 \pdfglyphtounicode{f_f}{FB00}
657 \pdfglyphtounicode{f_f_i}{FB03}
658 \pdfglyphtounicode{f_f_l}{FB04}
659 \pdfglyphtounicode{f_i}{FB01}
660 \pdfglyphtounicode{t_t}{0074 0074}
661 \pdfglyphtounicode{f_t}{0066 0074}
662 \pdfglyphtounicode{T_h}{0054 0068}
663 \pdfgentounicode=1
664 \fi
665 \RequirePackage{cmap}
```

\if@ACM@newfonts Whether we load the new fonts

```
666 \newif\if@ACM@newfonts
667 \@ACM@newfontstrue
668 \IfFileExists{libertine.sty}{\ClassWarning{\@classname}{You do not
669 have the libertine package installed. Please upgrade your
```



```

670 TeX}\@ACM@newfontsfalse}
671 \IfFileExists{zi4.sty}{\ClassWarning{\@classname}{You do not
672   have the zi4 package installed. Please upgrade your
673   TeX}\@ACM@newfontsfalse}
674 \IfFileExists{newtxmath.sty}{\ClassWarning{\@classname}{You do not
675   have the newtxmath package installed. Please upgrade your
676   TeX}\@ACM@newfontsfalse}

```

We use Libertine throughout.

```

677 \if@ACM@newfonts
678   \RequirePackage[T1]{fontenc}
679 \ifxetex
680   \RequirePackage[tt=false]{libertine}
681   \setmonofont{inconsolata}
682 \else
683   \RequirePackage[tt=false, type1=true]{libertine}
684 \fi
685 \RequirePackage[varqu]{zi4}
686 \RequirePackage[libertine]{newtxmath}
687 \fi

```

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

```

688 \let\liningnums\@undefined
689 \AtEndPreamble{%
690   \DeclareTextFontCommand{\liningnums}{\libertineLF}}

```

The SIGCHI extended abstracts are sans serif:

```

691 \if@ACM@sigchiamode
692   \renewcommand{\familydefault}{\sfdefault}
693 \fi

```

3.9 Image descriptions

`\if@Description@present` A local switch: whether there is a description in the given figure

```

694 \newif\if@Description@present
695 \@Description@presenttrue

```

`\if@undescribed@images` A global switch whether some images were *not* described

```

696 \newif\if@undescribed@images
697 \@undescribed@imagesfalse

```

`\Description` The `Description` macro right now just sets switches

```

698 \newcommand\Description[2][\global\@Description@presenttrue\ignorespaces}

```

The global warning

```

699 \AtEndDocument{\if@undescribed@images
700   \ClassWarningNoLine{\@classname}{Some images may lack descriptions}\fi}

```

Hooks for figures and tables

```
701 \AtBeginEnvironment{figure}{\@Description@presentfalse
702   \let\@vspace\@vspace@orig
703   \let\@vspacer\@vspacer@orig}
704 \AtBeginEnvironment{figure*}{\@Description@presentfalse
705   \let\@vspace\@vspace@orig
706   \let\@vspacer\@vspacer@orig}
707 \AtEndEnvironment{figure}{\if@Description@present\else
708   \global\@undescrbed@imagestrue
709   \ClassWarning{\@classname}{A possible image without description}\fi}
710 \AtEndEnvironment{figure*}{\if@Description@present\else
711   \global\@undescrbed@imagestrue
712   \ClassWarning{\@classname}{A possible image without description}\fi}
713 \AtBeginEnvironment{table}{\let\@vspace\@vspace@orig
714   \let\@vspacer\@vspacer@orig}
715 \AtBeginEnvironment{table*}{\let\@vspace\@vspace@orig
716   \let\@vspacer\@vspacer@orig}
```

3.10 Floats

We use the caption package

```
717 \RequirePackage{caption, float}
718 \captionsetup[table]{position=top}
719 \if@ACM@journal
720   \captionsetup{labelfont={sf, small},
721     textfont={sf, small}, margin=\z@}
722   \captionsetup[figure]{name={Fig.}}
723 \else
724   \captionsetup{labelfont={bf},
725     textfont={bf}, labelsep=colon, margin=\z@}
726   \ifcase\ACM@format@nr
727     \relax % manuscript
728     \or % acmsmall
729     \or % acmlarge
730     \or % acmtog
731     \or % sigconf
732     \or % siggraph
733     \captionsetup{textfont={it}}
734     \or % sigplan
735     \captionsetup{labelfont={bf},
736       textfont={normalfont}, labelsep=period, margin=\z@}
737     \or % sigchi
738     \captionsetup[figure]{labelfont={bf, small},
739       textfont={bf, small}}
740     \captionsetup[table]{labelfont={bf, small},
741       textfont={bf, small}}
742     \or % sigchi-a
743     \captionsetup[figure]{labelfont={bf, small},
744       textfont={bf, small}}
```

```

745     \captionsetup[table]{labelfont={bf, small},
746         textfont={bf, small}}
747     \fi
748 \fi

sidebar The sidebar environment:
749 \newfloat{sidebar}{}{sbar}
750 \floatname{sidebar}{Sidebar}
751 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}

\@sidebar The processing of the saved text
752 \long\def\@sidebar#1{\bgroup\let\@vspace\@vspace@orig
753     \let\@vspacer\@vspacer@orig\captionsetup{type=sidebar}%
754     \marginpar{\small#1}\egroup}

marginfigure The marginfigure environment:
755 \newenvironment{marginfigure}{\Collect@Body\@marginfigure}{}

\@marginfigure The processing of the saved text
756 \long\def\@marginfigure#1{\bgroup
757     \let\@vspace\@vspace@orig
758     \let\@vspacer\@vspacer@orig
759     \captionsetup{type=figure}%
760     \marginpar{\@Description@presentfalse\centering
761         \small#1\if@Description@present\else
762             \global\@undescrbed@imagestrue
763             \ClassWarning{\@classname}{A possible image without description}
764             \fi}%
765     \egroup}

margintable The margintable environment:
766 \newenvironment{margintable}{\Collect@Body\@margintable}{}

\@margintable The processing of the saved text
767 \long\def\@margintable#1{\bgroup\let\@vspace\@vspace@orig
768     \let\@vspacer\@vspacer@orig\captionsetup{type=table}%
769     \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
770 \newdimen\fulltextwidth
771 \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)
772 \if@ACM@sigchiamode
773 \def\@dblfloat{\bgroup\let\@vspace\@vspace@orig

```

```

774 \let\@vspacer\@vspacer@orig\columnwidth=\fulltextwidth
775 \let\@endfloatbox\@endwidefloatbox
776 \def\@fpsaddddefault{\def\@fps{tp}}%
777 \@float}
778 \fi

```

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

```

779 \if@ACM@sigchiamode
780 \def\end@dblfloat{%
781     \end@float\egroup}
782 \fi

```

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

```

783 \def\@endwidefloatbox{%
784     \par\vskip\z@skip
785     \minipagefalse
786     \outer@nobreak
787     \egroup
788     \color@endbox
789     \global\setbox\@currbox=\vbox{\moveleft
790         \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
791     \wd\@currbox=\textwidth
792 }

```

3.11 Lists

```

793 \ifcase\ACM@format@nr
794 \relax % manuscript
795 \or % acmsmall
796 \or % acmlarge
797 \or % acmtog
798 \or % sigconf
799 \or % siggraph
800 \or % sigplan
801 \def\labelenumi{\theenumi.}
802 \def\labelenumii{\theenumii.}
803 \def\labelenumiii{\theenumiii.}
804 \def\labelenumiv{\theenumiv.}
805 \or % sigchi
806 \or % sigchi-a
807 \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`.

```

808 \newdimen\ACM@labelwidth

```

```

809 \AtBeginDocument{%
810   \setlength\labelsep{4pt}
811   \setlength{\@ACM@labelwidth}{6.5pt}
812
813   %% First-level list: when beginning after the first line of an
814   %% indented paragraph or ending before an indented paragraph, labels
815   %% should not hang to the left of the preceding/following text.
816   \setlength\leftmargini{\z@}
817   \addtolength\leftmargini{\parindent}
818   \addtolength\leftmargini{2\labelsep}
819   \addtolength\leftmargini{\@ACM@labelwidth}
820
821   %% Second-level and higher lists.
822   \setlength\leftmarginii{\z@}
823   \addtolength\leftmarginii{0.5\labelsep}
824   \addtolength\leftmarginii{\@ACM@labelwidth}
825   \setlength\leftmarginiii{\leftmarginii}
826   \setlength\leftmarginiv{\leftmarginiii}
827   \setlength\leftmarginv{\leftmarginiv}
828   \setlength\leftmarginvi{\leftmarginv}
829   \@listi}
830 \newskip\listisep
831 \listisep\smallskipamount
832 \def\@listI{\leftmargin\leftmargini
833   \labelwidth\leftmargini \advance\labelwidth-\labelsep
834   \listparindent\z@
835   \topsep\listisep}
836 \let\@listi\@listI
837 \def\@listii{\leftmargin\leftmarginii
838   \labelwidth\leftmarginii \advance\labelwidth-\labelsep
839   \topsep\z@skip}
840 \def\@listiii{\leftmargin\leftmarginiii
841   \labelwidth\leftmarginiii \advance\labelwidth-\labelsep}
842 \def\@listiv{\leftmargin\leftmarginiv
843   \labelwidth\leftmarginiv \advance\labelwidth-\labelsep}
844 \def\@listv{\leftmargin\leftmarginv
845   \labelwidth\leftmarginv \advance\labelwidth-\labelsep}
846 \def\@listvi{\leftmargin\leftmarginvi
847   \labelwidth\leftmarginvi \advance\labelwidth-\labelsep}
\descriptionlabel We do not use a colon by default like amsart does:
848 \renewcommand{\descriptionlabel}[1]{\upshape\bfseries #1}

\description Make the description environment indentation consistent with that of the itemize
and enumerate environments.
849 \renewenvironment{description}{\list{}}{%
850   \labelwidth\@ACM@labelwidth
851   \let\makelabel\descriptionlabel}%
852 }{
853   \endlist

```

```

854 }
855 \let\enddescription=\endlist % for efficiency

```

3.12 Top-matter data

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

```

856 \define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
857   CIE,%
858   CSUR,%
859   DTRAP,%
860   HEALTH,%
861   IMWUT,%
862   JACM,%
863   JDIQ,%
864   JEA,%
865   JERIC,%
866   JETC,%
867   JOCCH,%
868   PACMCGIT,%
869   PACMHCI,%
870   PACMPL,%
871   POMACS,%
872   TAAS,%
873   TACCESS,%
874   TACO,%
875   TALG,%
876   TALLIP,%
877   TAP,%
878   TCPS,%
879   TDS,%
880   TEAC,%
881   TECS,%
882   THRI,%
883   TIIS,%
884   TIOT,%
885   TISSEC,%
886   TIST,%
887   TKDD,%
888   TMIS,%
889   TOCE,%
890   TOCHI,%
891   TOCL,%
892   TOCS,%
893   TOCT,%
894   TODAES,%
895   TODS,%
896   TOG,%
897   TOIS,%
898   TOIT,%

```

```

899 TOMACS,%
900 TOMM,%
901 TOMPECS,%
902 TOMS,%
903 TOPC,%
904 TOPS,%
905 TOPLAS,%
906 TOS,%
907 TOSEM,%
908 TOSN,%
909 TRETs,%
910 TSAS,%
911 TSC,%
912 TSLP,%
913 TWEB%
914 }{%
915 \ifcase\@journalCode@nr
916 \relax % CIE
917 \def\@journalName{ACM Computers in Entertainment}%
918 \def\@journalNameShort{ACM Comput. Entertain.}%
919 \def\@permissionCodeOne{1544-3574}%
920 \or % CSUR
921 \def\@journalName{ACM Computing Surveys}%
922 \def\@journalNameShort{ACM Comput. Surv.}%
923 \def\@permissionCodeOne{0360-0300}%
924 \or % DTRAP
925 \def\@journalName{Digital Threats: Research and Practice}%
926 \def\@journalNameShort{Digit. Threat. Res. Pract.}%
927 \def\@permissionCodeOne{2576-5337}%
928 \or % HEALTH
929 \def\@journalName{ACM Transactions on Computing for Healthcare}%
930 \def\@journalNameShort{ACM Trans. Comput. Healthcare}%
931 \def\@permissionCodeOne{2637-8051}%
932 \or % IMWUT
933 \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
934 Wearable and Ubiquitous Technologies}%
935 \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
936 \def\@permissionCodeOne{2474-9567}%
937 \@ACM@screentru
938 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
939 \or % JACM
940 \def\@journalName{Journal of the ACM}%
941 \def\@journalNameShort{J. ACM}%
942 \def\@permissionCodeOne{0004-5411}%
943 \or % JDIQ
944 \def\@journalName{ACM Journal of Data and Information Quality}%
945 \def\@journalNameShort{ACM J. Data Inform. Quality}%
946 \def\@permissionCodeOne{1936-1955}%
947 \or % JEA
948 \def\@journalName{ACM Journal of Experimental Algorithmics}%

```

```

949 \def\@journalNameShort{ACM J. Exp. Algor.}%
950 \def\@permissionCodeOne{1084-6654}%
951 \or % JERIC
952 \def\@journalName{ACM Journal of Educational Resources in Computing}%
953 \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
954 \def\@permissionCodeOne{1073-0516}%
955 \or % JETC
956 \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
957 \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
958 \def\@permissionCodeOne{1550-4832}%
959 \or % JOCCH
960 \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
961 \def\@journalNameShort{ACM J. Comput. Cult. Herit.}%
962 \or % PACMCGIT
963 \def\@journalName{Proceedings of the ACM on Computer Graphics and Interactive Techniques}%
964 \def\@journalNameShort{Proc. ACM Comput. Graph. Interact. Tech.}%
965 \def\@permissionCodeOne{2577-6193}%
966 \@ACM@screentru
967 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
968 \or % PACMHCI
969 \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
970 \def\@journalNameShort{Proc. ACM Hum.-Comput. Interact.}%
971 \def\@permissionCodeOne{2573-0142}%
972 \@ACM@screentru
973 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
974 \or % PACMPL
975 \def\@journalName{Proceedings of the ACM on Programming Languages}%
976 \def\@journalNameShort{Proc. ACM Program. Lang.}%
977 \def\@permissionCodeOne{2475-1421}%
978 \@ACM@screentru
979 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
980 \or % POMACS
981 \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
982 \def\@journalNameShort{Proc. ACM Meas. Anal. Comput. Syst.}%
983 \def\@permissionCodeOne{2476-1249}%
984 \@ACM@screentru
985 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
986 \or % TAAS
987 \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
988 \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
989 \def\@permissionCodeOne{1556-4665}%
990 \or % TACCESS
991 \def\@journalName{ACM Transactions on Accessible Computing}%
992 \def\@journalNameShort{ACM Trans. Access. Comput.}%
993 \def\@permissionCodeOne{1936-7228}%
994 \or % TACO
995 \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
996 \def\@journalNameShort{ACM Trans. Arch. Code Optim.}%
997 \or % TALG
998 \def\@journalName{ACM Transactions on Algorithms}%

```



```

999 \def\@journalNameShort{ACM Trans. Algor.}%
1000 \def\@permissionCodeOne{1549-6325}%
1001 \or % TALLIP
1002 \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
1003 \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
1004 \def\@permissionCodeOne{2375-4699}%
1005 \or % TAP
1006 \def\@journalName{ACM Transactions on Applied Perception}%
1007 \or % TCPS
1008 \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
1009 \or % TDS
1010 \def\@journalName{ACM Transactions on Data Science}%
1011 \def\@journalNameShort{ACM Trans. Data Sci.}%
1012 \def\@permissionCodeOne{2577-3224}%
1013 \or % TEAC
1014 \def\@journalName{ACM Transactions on Economics and Computation}%
1015 \or % TECS
1016 \def\@journalName{ACM Transactions on Embedded Computing Systems}%
1017 \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
1018 \def\@permissionCodeOne{1539-9087}%
1019 \or % THRI
1020 \def\@journalName{ACM Transactions on Human-Robot Interaction}%
1021 \def\@journalNameShort{ACM Trans. Hum.-Robot Interact.}%
1022 \def\@permissionCodeOne{2573-9522}%
1023 \or % TIIS
1024 \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
1025 \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
1026 \def\@permissionCodeOne{2160-6455}%
1027 \or % TIOT
1028 \def\@journalName{ACM Transactions on Internet of Things}%
1029 \def\@journalNameShort{ACM Trans. Internet Things}%
1030 \def\@permissionCodeOne{2577-6207}%
1031 \or % TISSEC
1032 \def\@journalName{ACM Transactions on Information and System Security}%
1033 \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
1034 \def\@permissionCodeOne{1094-9224}%
1035 \or % TIST
1036 \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
1037 \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
1038 \def\@permissionCodeOne{2157-6904}%
1039 \or % TKDD
1040 \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
1041 \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
1042 \def\@permissionCodeOne{1556-4681}%
1043 \or % TMIS
1044 \def\@journalName{ACM Transactions on Management Information Systems}%
1045 \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
1046 \def\@permissionCodeOne{2158-656X}%
1047 \or % TOCE
1048 \def\@journalName{ACM Transactions on Computing Education}%

```

```

1049 \def\@journalNameShort{ACM Trans. Comput. Educ.}%
1050 \def\@permissionCodeOne{1946-6226}%
1051 \or % TOCHI
1052 \def\@journalName{ACM Transactions on Computer-Human Interaction}%
1053 \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
1054 \def\@permissionCodeOne{1073-0516}%
1055 \or % TOCL
1056 \def\@journalName{ACM Transactions on Computational Logic}%
1057 \def\@journalNameShort{ACM Trans. Comput. Logic}%
1058 \def\@permissionCodeOne{1529-3785}%
1059 \or % TOCS
1060 \def\@journalName{ACM Transactions on Computer Systems}%
1061 \def\@journalNameShort{ACM Trans. Comput. Syst.}%
1062 \def\@permissionCodeOne{0734-2071}%
1063 \or % TOCT
1064 \def\@journalName{ACM Transactions on Computation Theory}%
1065 \def\@journalNameShort{ACM Trans. Comput. Theory}%
1066 \def\@permissionCodeOne{1942-3454}%
1067 \or % TODAES
1068 \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
1069 \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
1070 \def\@permissionCodeOne{1084-4309}%
1071 \or % TODS
1072 \def\@journalName{ACM Transactions on Database Systems}%
1073 \def\@journalNameShort{ACM Trans. Datab. Syst.}%
1074 \def\@permissionCodeOne{0362-5915}%
1075 \or % TOG
1076 \def\@journalName{ACM Transactions on Graphics}%
1077 \def\@journalNameShort{ACM Trans. Graph.}%
1078 \def\@permissionCodeOne{0730-0301}%
1079 \or % TOIS
1080 \def\@journalName{ACM Transactions on Information Systems}%
1081 \def\@permissionCodeOne{1046-8188}%
1082 \or % TOIT
1083 \def\@journalName{ACM Transactions on Internet Technology}%
1084 \def\@journalNameShort{ACM Trans. Internet Technol.}%
1085 \def\@permissionCodeOne{1533-5399}%
1086 \or % TOMACS
1087 \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
1088 \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
1089 \or % TOMM
1090 \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
1091 \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
1092 \def\@permissionCodeOne{1551-6857}%
1093 \def\@permissionCodeTwo{0100}%
1094 \or % TOMPECS
1095 \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
1096 \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
1097 \def\@permissionCodeOne{2376-3639}%
1098 \or % TOMS

```

```

1099 \def\@journalName{ACM Transactions on Mathematical Software}%
1100 \def\@journalNameShort{ACM Trans. Math. Softw.}%
1101 \def\@permissionCodeOne{0098-3500}%
1102 \or % TOPC
1103 \def\@journalName{ACM Transactions on Parallel Computing}%
1104 \def\@journalNameShort{ACM Trans. Parallel Comput.}%
1105 \def\@permissionCodeOne{1539-9087}%
1106 \or % TOPS
1107 \def\@journalName{ACM Transactions on Privacy and Security}%
1108 \def\@journalNameShort{ACM Trans. Priv. Sec.}%
1109 \def\@permissionCodeOne{2471-2566}%
1110 \or % TOPLAS
1111 \def\@journalName{ACM Transactions on Programming Languages and Systems}%
1112 \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
1113 \def\@permissionCodeOne{0164-0925}%
1114 \or % TOS
1115 \def\@journalName{ACM Transactions on Storage}%
1116 \def\@journalNameShort{ACM Trans. Storage}%
1117 \def\@permissionCodeOne{1553-3077}%
1118 \or % TOSEM
1119 \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
1120 \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
1121 \def\@permissionCodeOne{1049-331X}%
1122 \or % TOSN
1123 \def\@journalName{ACM Transactions on Sensor Networks}%
1124 \def\@journalNameShort{ACM Trans. Sensor Netw.}%
1125 \def\@permissionCodeOne{1550-4859}%
1126 \or % TRET
1127 \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
1128 \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
1129 \def\@permissionCodeOne{1936-7406}%
1130 \or % TSAS
1131 \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
1132 \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
1133 \def\@permissionCodeOne{2374-0353}%
1134 \or % TSC
1135 \def\@journalName{ACM Transactions on Social Computing}%
1136 \def\@journalNameShort{ACM Trans. Soc. Comput.}%
1137 \def\@permissionCodeOne{2469-7818}%
1138 \or % TSLP
1139 \def\@journalName{ACM Transactions on Speech and Language Processing}%
1140 \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
1141 \def\@permissionCodeOne{1550-4875}%
1142 \or % TWEB
1143 \def\@journalName{ACM Transactions on the Web}%
1144 \def\@journalNameShort{ACM Trans. Web}%
1145 \def\@permissionCodeOne{1559-1131}%
1146 \fi
1147 \ClassInfo{\@classname}{Using journal code \@journalCode}%
1148 }{%

```

```

1149 \ClassError{\@classname}{Incorrect journal #1}%
1150 }%

\acmJournal And the syntactic sugar around it
1151 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}%
1152 \global\@ACM@journal@bibstriptrue}

The defaults:
1153 \def\@journalCode@nr{0}
1154 \def\@journalName{}%
1155 \def\@journalNameShort{\@journalName}%
1156 \def\@permissionCodeOne{XXXX-XXXX}%
1157 \def\@permissionCodeTwo{}%

\acmConference This is the conference command
1158 \newcommand\acmConference[4][{}]{%
1159 \gdef\acmConference@shortname{#1}%
1160 \gdef\acmConference@name{#2}%
1161 \gdef\acmConference@date{#3}%
1162 \gdef\acmConference@venue{#4}%
1163 \ifx\acmConference@shortname\@empty
1164 \gdef\acmConference@shortname{#2}%
1165 \fi
1166 \global\@ACM@journal@bibstripfalse
1167 }
1168 \if@ACM@journal\else
1169 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
1170 DC, USA}%
1171 \fi

\acmBooktitle The book title of the conference:
\@acmBooktitle 1172 \def\acmBooktitle#1{\gdef\@acmBooktitle{#1}}
1173 \acmBooktitle{Proceedings of \acmConference@name
1174 \ifx\acmConference@name\acmConference@shortname\else
1175 \ (\acmConference@shortname)\fi}

\@editorsAbbrev How to abbreviate editors
1176 \def\@editorsAbbrev{(Ed.)}

\@acmEditors The list of editors
1177 \def\@acmEditors{}

\editor Add a new editor to the list
1178 \def\editor#1{\ifx\@acmEditors\@empty
1179 \gdef\@acmEditors{#1}%
1180 \else
1181 \gdef\@editorsAbbrev{(Eds.)}%
1182 \g@addto@macro\@acmEditors{\and#1}%
1183 \fi}

```

`\subtitle` The subtitle macro

```

1184 \def\subtitle#1{\def\@subtitle{#1}}
1185 \subtitle{}

```

`\num@authorgroups` The total number of “groups”. Each group is several authors with the same affiliations(s)

```

1186 \newcount\num@authorgroups
1187 \num@authorgroups=0\relax

```

`\num@author` The total number of authors

```

1188 \newcount\num@author
1189 \num@author=0\relax

```

`\if@insideauthorgroup` Whether we are continuing an author group

```

1190 \newif\if@insideauthorgroup
1191 \@insideauthorgroupfalse

```

`\author` Adding an author to the list of authors and addresses

```

1192 \renewcommand\author[2][{}%
1193   \IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several
1194     authors in the same \string\author\space macro!}}{}%
1195   \global\advance\num@author by 1\relax
1196   \if@insideauthorgroup\else
1197     \global\advance\num@authorgroups by 1\relax
1198     \global\@insideauthorgrouptrue
1199   \fi
1200   \ifx\addresses\@empty
1201     \if@ACM@anonymous
1202       \gdef\addresses{\@author{Anonymous Author(s)}%
1203         \ifx\@acmSubmissionID\@empty\else\Submission Id:
1204           \@acmSubmissionID\fi}}%
1205       \gdef\authors{Anonymous Author(s)}%
1206     \else
1207       \gdef\addresses{\@author{#2}}%
1208       \gdef\authors{#2}%
1209     \fi
1210   \else
1211     \if@ACM@anonymous\else
1212       \g@addto@macro\addresses{\and\@author{#2}}%
1213       \g@addto@macro\authors{\and#2}%
1214     \fi
1215   \fi
1216   \if@ACM@anonymous
1217     \ifx\shortauthors\@empty
1218       \gdef\shortauthors{Anon.
1219         \ifx\@acmSubmissionID\@empty\else Submission Id:
1220           \@acmSubmissionID\fi}%
1221     \fi
1222   \else
1223     \def\@tempa{#1}%

```

```

1224 \ifx\@tempa\@empty
1225 \ifx\shortauthors\@empty
1226 \gdef\shortauthors{#2}%
1227 \else
1228 \g@addto@macro\shortauthors{\and#2}%
1229 \fi
1230 \else
1231 \ifx\shortauthors\@empty
1232 \gdef\shortauthors{#1}%
1233 \else
1234 \g@addto@macro\shortauthors{\and#1}%
1235 \fi
1236 \fi
1237 \fi}

```

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

```

1238 \newcommand{\affiliation}[2][{}]{%
1239 \global\@insideauthorgroupfalse
1240 \if@ACM@anonymous\else
1241 \g@addto@macro\addresses{\affiliation{#1}{#2}}%
1242 \fi}

```

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

```

1243 \define@boolkey+{@ACM@affiliation@}{@ACM@affiliation@}{obeypunctuation}%
1244 [true]{\ClassError{\@classname}{The option obeypunctuation can be either true or false}}

```

`\additionalaffiliation` Additional affiliations go to footnotes

```

1245 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}

```

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

```

1246 \def\@additionalaffiliation#1{\bgroup
1247 \def\position##1{\ignorespaces}%
1248 \def\institution##1{##1\ignorespaces}%
1249 \def\department{\@ifnextchar[\@department]{\@department[]}}%
1250 \def\@department[##1]##2{\unskip, ##2\ignorespaces}%
1251 \let\streetaddress\position
1252 \let\city\position
1253 \let\state\position
1254 \let\postcode\position
1255 \let\country\position
1256 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.

```

1257 \renewcommand{\email}[2][{}]{%
1258 \IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several
1259 addresses in the same \string\email\space macro!}}{}}%

```

```

1260 \if@ACM@anonymous\else
1261 \g@addto@macro\addresses{\email{#1}{#2}}%
1262 \fi}

\orcid Right now we do not typeset ORCIDs
1263 \def\orcid#1{\unskip\ignorespaces}

\authorsaddresses Setting up authors' addresses
1264 \def\authorsaddresses#1{\def\@authorsaddresses{#1}}
1265 \authorsaddresses{\mkauthorsaddresses}

\@titlenotes The title notes
1266 \def\@titlenotes{}

\titlenote Adding a note to the title
1267 \def\titlenote#1{%
1268 \g@addto@macro\@title{\footnotemark}%
1269 \if@ACM@anonymous
1270 \g@addto@macro\@titlenotes{%
1271 \stepcounter{footnote}\footnotetext{Title note}}%
1272 \else
1273 \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
1274 \fi}

\@subtitlenotes The subtitle notes
1275 \def\@subtitlenotes{}

\subtitlenote Adding a note to the subtitle
1276 \def\subtitlenote#1{%
1277 \g@addto@macro\@subtitle{\footnotemark}%
1278 \if@ACM@anonymous
1279 \g@addto@macro\@subtitlenotes{%
1280 \stepcounter{footnote}\footnotetext{Subtitle note}}%
1281 \else
1282 \g@addto@macro\@subtitlenotes{%
1283 \stepcounter{footnote}\footnotetext{#1}}%
1284 \fi}

\@authornotes The author notes
1285 \def\@authornotes{}

\authornote Adding a note to the author
1286 \def\authornote#1{%
1287 \if@ACM@anonymous\else
1288 \g@addto@macro\addresses{\@authornotemark}%
1289 \g@addto@macro\authornotes{%
1290 \stepcounter{footnote}\footnotetext{#1}}%
1291 \fi}

```

`\authornotemark` Adding a footnote mark to the authors

```

1292 \newcommand\authornotemark[1][\relax]{%
1293   \ifx#1\relax\relax\relax
1294   \g@addto@macro\addresses{\@authornotemark}%
1295   \else
1296   \g@addto@macro\addresses{\@authornotemark{#1}}%
1297   \fi}

```

`\acmVolume` The current volume

```

1298 \def\acmVolume#1{\def\@acmVolume{#1}}
1299 \acmVolume{1}

```

`\acmNumber` The current number

```

1300 \def\acmNumber#1{\def\@acmNumber{#1}}
1301 \acmNumber{1}

```

`\acmArticle` The current article

```

1302 \def\acmArticle#1{\def\@acmArticle{#1}}
1303 \acmArticle{}

```

`\acmArticleSeq` The sequence number

```

1304 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
1305 \acmArticleSeq{\@acmArticle}

```

`\acmYear` The current year

```

1306 \def\acmYear#1{\def\@acmYear{#1}}
1307 \acmYear{\the\year}

```

`\acmMonth` The current month

```

1308 \def\acmMonth#1{\def\@acmMonth{#1}}
1309 \acmMonth{\the\month}

```

`\@acmPubDate` The publication date

```

1310 \def\@acmPubDate{\ifcase\@acmMonth\or
1311   January\or February\or March\or April\or May\or June\or
1312   July\or August\or September\or October\or November\or
1313   December\fi~\@acmYear}

```

`\acmPrice` The price

```

1314 \def\acmPrice#1{\def\@acmPrice{#1}}
1315 \acmPrice{15.00}

```

`\acmSubmissionID` The submission ID

```

1316 \def\acmSubmissionID#1{\def\@acmSubmissionID{#1}}
1317 \acmSubmissionID{}

```

`\acmISBN` The book ISBN

```

1318 \def\acmISBN#1{\def\@acmISBN{#1}}
1319 \acmISBN{978-x-xxxx-xxxx-x/YY/MM}

```


`\acmDOI` The paper DOI

```

1320 \def\acmDOI#1{\def\@acmDOI{#1}}
1321 \acmDOI{10.1145/nnnnnnn.nnnnnnn}

```

`\if@ACM@badge` Whether to print a badge. Note that either a left or right badge triggers it:

```

1322 \newif\if@ACM@badge
1323 \@ACM@badgefalse

```

`\@ACM@badge@width` The width of the badge

```

1324 \newlength\@ACM@badge@width
1325 \setlength\@ACM@badge@width{5pc}

```

`\@ACM@title@width` The width of the badge

```

1326 \newlength\@ACM@title@width

```

`\@ACM@badge@skip` The space between the badge and the title

```

1327 \newlength\@ACM@badge@skip
1328 \setlength\@ACM@badge@skip{1pc}

```

`\acmBadgeR` Setting the right badge

```

1329 \newcommand\acmBadgeR[2][\@ACM@badgetrue
1330   \def\@acmBadgeR@url{#1}%
1331   \def\@acmBadgeR@image{#2}}
1332 \def\@acmBadgeR@url{}
1333 \def\@acmBadgeR@image{}

```

`\acmBadgeL` Setting the left badge

```

1334 \newcommand\acmBadgeL[2][\@ACM@badgetrue
1335   \def\@acmBadgeL@url{#1}%
1336   \def\@acmBadgeL@image{#2}}
1337 \def\@acmBadgeL@url{}
1338 \def\@acmBadgeL@image{}

```

`\startPage` The start page of the paper

```

1339 \def\startPage#1{\def\@startPage{#1}}
1340 \startPage{}

```

`\terms` Terms are obsolete. We use CCS now.

```

1341 \def\terms#1{\ClassWarning{\@classname}{The command \string\terms{} is
1342   obsolete. I am going to ignore it}}

```

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

```

1343 \def\keywords#1{\def\@keywords{#1}}
1344 \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

```

1345 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{\}

```

`\@saveabstract` And saving the abstract

```

1346 \long\def\@saveabstract#1{\long\gdef\@abstract{#1}}
1347 \@saveabstract{}
```

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

```

1348 \long\def\@empty{}
```

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

```

1349 \define@boolkey+{@ACM@topmatter@}{@ACM@}{printccs}[true]{%
1350   \if@ACM@printccs
1351     \ClassInfo{\@classname}{Printing CCS}%
1352   \else
1353     \ClassInfo{\@classname}{Suppressing CCS}%
1354   \fi}{\ClassError{\@classname}{The option printccs can be either true or false}}
```

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

```

1355 \define@boolkey+{@ACM@topmatter@}{@ACM@}{printacmref}[true]{%
1356   \if@ACM@printacmref
1357     \ClassInfo{\@classname}{Printing bibformat}%
1358   \else
1359     \ClassInfo{\@classname}{Suppressing bibformat}%
1360   \fi}{\ClassError{\@classname}{The option printacmref can be either true or false}}
```

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

```

1361 \define@boolkey+{@ACM@topmatter@}{@ACM@}{printfolios}[true]{%
1362   \if@ACM@printfolios
1363     \ClassInfo{\@classname}{Printing folios}%
1364   \else
1365     \ClassInfo{\@classname}{Suppressing folios}%
1366   \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.

```

1367 \define@cmdkey{@ACM@topmatter@}{@ACM@}{authorssperrow}[0]{%
1368   \IfInteger{#1}{\ClassInfo{\@classname}{Setting authorssperrow to
1369     #1}}{\ClassWarning{\@classname}{The parameter authorssperrow must be
1370     numerical. Ignoring the input #1}}\gdef\@ACM@authorssperrow{0}}
```

`\settopmatter` The usual syntactic sugar

```

1371 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}
```

Now the settings

```

1372 \settopmatter{printccs=true, printacmref=true}
1373 \if@ACM@manuscript
1374   \settopmatter{printfolios=true}
1375 \else
1376   \if@ACM@journal
1377     \settopmatter{printfolios=true}
1378   \else
```

```

1379 \settopmatter{printfolios=false}
1380 \fi
1381 \fi
1382 \settopmatter{authorsperrow=0}

\@received The container for the paper history
1383 \def\@received{}

\received The \received command
1384 \newcommand\received[2][\def\@tempa{#1}%
1385 \ifx\@tempa\@empty
1386 \ifx\@received\@empty
1387 \gdef\@received{Received #2}%
1388 \else
1389 \g@addto@macro{\@received}{; revised #2}%
1390 \fi
1391 \else
1392 \ifx\@received\@empty
1393 \gdef\@received{#1 #2}%
1394 \else
1395 \g@addto@macro{\@received}{; #1 #2}%
1396 \fi
1397 \fi}
1398 \AtEndDocument{%
1399 \ifx\@received\@empty\else
1400 \par\bigskip\noindent\small\normalfont\@received\par
1401 \fi}

```

3.13 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```

1402 \RequirePackage{comment}
1403 \excludecomment{CCSXML}

\@concepts This is the storage macro and counter for concepts
1404 \let\@concepts\@empty
1405 \newcounter{@concepts}

\ccsdesc The first argument is the significance, the second is the concept(s)
1406 \newcommand\ccsdesc[2][100]{%
1407 \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!
1408 \RequirePackage{textcomp}
1409 \def\ccsdesc@parse#1~#2~#3~{%
1410 \stepcounter{@concepts}%
1411 \expandafter\ifx\csname CCS@General@#2\endcsname\relax

```

```

1412 \expandafter\gdef\csname CCS@General@#2\endcsname{\textbullet\
1413 \textbf{#2}}%
1414 \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{; }%
1415 \expandafter\gdef\csname CCS@Specific@#2\endcsname{}%
1416 \g@addto@macro{\@concepts}{\csname CCS@General@#2\endcsname
1417 \csname CCS@Punctuation@#2\endcsname
1418 \csname CCS@Specific@#2\endcsname}%
1419 \fi
1420 \ifx#3\relax\relax\else
1421 \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{
1422 \textrightarrow }%
1423 \expandafter\g@addto@macro\expandafter{\csname CCS@Specific@#2\endcsname}{%
1424 \addtocounter{@concepts}{-1}}%
1425 \ifnum#1>499\textbf{#3}\else
1426 \ifnum#1>299\textit{#3}\else
1427 #3\fi\fi\ifnum\value{@concepts}=0.\else; \fi}%
1428 \fi
1429 \ccsdesc@parse@finish}

```

```

\ccdesc@parse@finish Gobble everything to \ccsdesc@parse@end
1430 \def\ccsdesc@parse@finish#1\ccsdesc@parse@end{}

```

3.14 Copyright system

This is from acmcopyright.sty

```

\if@printcopyright Whether to print a copyright symbol
1431 \newif\if@printcopyright
1432 \@printcopyrighttrue

\if@printpermission Whether to print the permission block
1433 \newif\if@printpermission
1434 \@printpermissiontrue

\if@acmowned Whether the ACM owns the rights to the paper
1435 \newif\if@acmowned
1436 \@acmownedtrue

```

Keys:

```

1437 \define@choicekey*{ACM@}{acmcopyrightmode}[%
1438 \acm@copyrightinput\acm@copyrightmode]{none,%
1439 acmcopyright,acmlicensed,rightsretained,%
1440 usgov,usgovmixed,cagov,cagovmixed,licensedusgovmixed,%
1441 licensedcagov,licensedcagovmixed,othergov,licensedothergov,%
1442 iw3c2w3,iw3c2w3g}{%
1443 \@printpermissiontrue
1444 \@printcopyrighttrue
1445 \@acmownedtrue
1446 \ifnum\acm@copyrightmode=0\relax % none

```

```

1447 \@printpermissionfalse
1448 \@printcopyrightfalse
1449 \@acmownedfalse
1450 \fi
1451 \ifnum\acm@copyrightmode=2\relax % acmlicensed
1452 \@acmownedfalse
1453 \fi
1454 \ifnum\acm@copyrightmode=3\relax % rightsretained
1455 \@acmownedfalse
1456 \AtBeginDocument{\acmPrice{}}%
1457 \fi
1458 \ifnum\acm@copyrightmode=4\relax % usgov
1459 \@printpermissiontrue
1460 \@printcopyrightfalse
1461 \@acmownedfalse
1462 \AtBeginDocument{\acmPrice{}}%
1463 \fi
1464 \ifnum\acm@copyrightmode=6\relax % cagov
1465 \@acmownedfalse
1466 \fi
1467 \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1468 \@acmownedfalse
1469 \fi
1470 \ifnum\acm@copyrightmode=9\relax % licensedcagov
1471 \@acmownedfalse
1472 \fi
1473 \ifnum\acm@copyrightmode=10\relax % licensedcagovmixed
1474 \@acmownedfalse
1475 \fi
1476 \ifnum\acm@copyrightmode=11\relax % othergov
1477 \@acmownedtrue
1478 \fi
1479 \ifnum\acm@copyrightmode=12\relax % licensedothergov
1480 \@acmownedfalse
1481 \fi
1482 \ifnum\acm@copyrightmode=13\relax % iw3c2w3
1483 \@acmownedfalse
1484 \AtBeginDocument{\acmPrice{}}%
1485 \fi
1486 \ifnum\acm@copyrightmode=14\relax % iw3c2w3g
1487 \@acmownedfalse
1488 \AtBeginDocument{\acmPrice{}}%
1489 \fi}

```

\setcopyright This is the syntactic sugar around setting keys.

```

1490 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
1491 \setcopyright{acmcopyright}

```

\copyrightowner Here is the owner of the copyright

```

1492 \def\@copyrightowner{%
1493   \ifcase\acm@copyrightmode\relax % none
1494   \or % acmcopyright
1495   Association for Computing Machinery.
1496   \or % acmlicensed
1497   Copyright held by the owner/author(s). Publication rights licensed to
1498   ACM\@.
1499   \or % rightsretained
1500   Copyright held by the owner/author(s).
1501   \or % usgov
1502   \or % usgovmixed
1503   Association for Computing Machinery.
1504   \or % cagov
1505   Crown in Right of Canada.
1506   \or %cagovmixed
1507   Association for Computing Machinery.
1508   \or %licensedusgovmixed
1509   Copyright held by the owner/author(s). Publication rights licensed to
1510   ACM\@.
1511   \or % licensedcagov
1512   Crown in Right of Canada. Publication rights licensed to
1513   ACM\@.
1514   \or %licensedcagovmixed
1515   Copyright held by the owner/author(s). Publication rights licensed to
1516   ACM\@.
1517   \or % othergov
1518   Association for Computing Machinery.
1519   \or % licensedothergov
1520   Copyright held by the owner/author(s). Publication rights licensed to
1521   ACM\@.
1522   \or % ic2w3www
1523   IW3C2 (International World Wide Web Conference Committee), published
1524   under Creative Commons CC-BY~4.0 License.
1525   \or % ic2w3wwwgoogle
1526   IW3C2 (International World Wide Web Conference Committee), published
1527   under Creative Commons CC-BY-NC-ND~4.0 License.
1528   \fi}

```

\@formatdoi Print a clickable DOI

```

1529 \def\@formatdoi#1{\url{https://doi.org/#1}}

```

\@copyrightpermission The canned permission block.

```

1530 \def\@copyrightpermission{%
1531   \ifcase\acm@copyrightmode\relax % none
1532   \or % acmcopyright
1533   Permission to make digital or hard copies of all or part of this
1534   work for personal or classroom use is granted without fee provided
1535   that copies are not made or distributed for profit or commercial
1536   advantage and that copies bear this notice and the full citation on
1537   the first page. Copyrights for components of this work owned by

```

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 1543 \or % acmlicensed
 1544 Permission to make digital or hard copies of all or part of this
 1545 work for personal or classroom use is granted without fee provided
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 1547 advantage and that copies bear this notice and the full citation on
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 1549 others than the author(s) must be honored. Abstracting with credit
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 1553 permissions@acm.org.
 1554 \or % rightsretained
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 1558 and that copies bear this notice and the full citation on the first
 1559 page. Copyrights for third-party components of this work must be
 1560 honored. For all other uses, contact the
 1561 owner\hspace*{.5pt}/author(s).
 1562 \or % usgov
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1588 \or % cagovmixed
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1644 disseminate the work on their personal and corporate Web sites with
1645 the appropriate attribution.
1646 \or % iw3c2w3g
1647 This paper is published under the Creative Commons
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1649 (CC-BY-NC-ND~4.0) license. Authors reserve their rights to
1650 disseminate the work on their personal and corporate Web sites with
1651 the appropriate attribution.
1652 \fi}

\copyrightyear By default, the copyright year is the same as \acmYear, but one can override this:
1653 \def\copyrightyear#1{\def\copyrightyear{#1}}
1654 \copyrightyear{\@acmYear}

\@teaserfigures The teaser figures container
1655 \def\@teaserfigures{}

teaserfigure The teaser figure
1656 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}

\@saveteaser Saving the teaser
1657 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}

\thanks We redefine amsart \thanks so the anonymous key works
1658 \renewcommand{\thanks}[1]{%
1659 \ifnotempty{#1}{%
1660 \if@ACM@anonymous
1661 \g@addto@macro\thankses{\thanks{A note}}%
1662 \else
1663 \g@addto@macro\thankses{\thanks{#1}}%
1664 \fi}}}

3.15 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>*].
1665 \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.

```

1666 \def\maketitle{%
1667   \if@ACM@anonymous
1668     % Anonymize omission of \author-s
1669     \ifnum\num@authorgroups=0\author{}\fi
1670   \fi
1671   \begingroup
1672   \let\@vspace\@vspace@orig
1673   \let\@vspacer\@vspacer@orig
1674   \let\@footnotemark\@footnotemark@nolink
1675   \let\@footnotetext\@footnotetext@nolink
1676   \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1677   \hsize=\textwidth
1678   \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1679   \mktitle\if@ACM@sigchiamode\else\mkauthors\fi\mkteasers
1680   \@printtopmatter
1681   \if@ACM@sigchiamode\mkauthors\fi
1682   \setcounter{footnote}{0}%
1683   \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1684   \@titlenotes
1685   \@subtitlenotes
1686   \@authornotes
1687   \let\@makefnmark\relax
1688   \let\@thefnmark\relax
1689   \let\@makefntext\noindent
1690   \ifx\@empty\thankses\else
1691     \footnotetextauthorsaddresses{%
1692       \def\par{\let\par\@par}\parindent\z@\@setthanks}%
1693   \fi
1694   \ifx\@empty\@authorsaddresses\else
1695     \if@ACM@anonymous\else
1696       \if@ACM@journal@bibstrip
1697         \footnotetextauthorsaddresses{%
1698           \def\par{\let\par\@par}\parindent\z@\@setauthorsaddresses}%
1699       \fi
1700     \fi
1701   \fi
1702   \if@ACM@nonacm\else\footnotetextcopyrightpermission{%
1703     \if@ACM@authordraft
1704       \raisebox{-2ex}{\z@\z@{\makebox[0pt][l]{\large\bfseries
1705         Unpublished working draft. Not for distribution.}}}%
1706       \color[gray]{0.9}%
1707     \fi
1708     \parindent\z@\parskip0.1\baselineskip
1709     \if@ACM@authorversion\else
1710       \if@printpermission\copyrightpermission\par\fi
1711     \fi

```

```

1712 \if@ACM@manuscript\else
1713   \if@ACM@journal@bibstrip\else % Print the conference information
1714     {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
1715     \fi
1716   \fi
1717   \if@printcopyright
1718     \copyright\ \@copyrightyear\ \@copyrightowner\
1719   \else
1720     \@copyrightyear.\
1721   \fi
1722   \if@ACM@manuscript
1723     Manuscript submitted to ACM\
1724   \else
1725     \if@ACM@authorversion
1726       This is the author's version of the work. It is posted here for
1727       your personal use. Not for redistribution. The definitive Version
1728       of Record was published in
1729       \if@ACM@journal@bibstrip
1730         \emph{\@journalName}%
1731       \else
1732         \emph{\@acmBooktitle}%
1733       \fi
1734       \ifx\@acmDOI\@empty
1735         .
1736       \else
1737         , \@formatdoi{\@acmDOI}.
1738       \fi\
1739     \else
1740       \if@ACM@nonacm\else
1741         \if@ACM@journal@bibstrip
1742           \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1743           \ifx\@acmPrice\@empty\else\ $\@acmPrice\fi\
1744           \@formatdoi{\@acmDOI}%
1745         \else % Conference
1746           \ifx\@acmISBN\@empty\else ACM~ISBN~\@acmISBN
1747           \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\\\fi
1748           \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi%
1749         \fi
1750       \fi
1751     \fi
1752   \fi}
1753 \fi
1754 \endgroup
1755 \setcounter{footnote}{0}%
1756 \mkabstract
1757 \if@ACM@printccs
1758   \ifx\@concepts\@empty\else\bgroup
1759     {\@specialsection{CCS Concepts}%
1760      \@concepts\par}\egroup
1761   \fi

```

```

1762 \fi
1763 \ifx\@keywords\@empty\else\bgroup
1764   {\if@ACM@journal
1765     \@specialsection{Additional Key Words and Phrases}%
1766     \else
1767       \@specialsection{Keywords}%
1768     \fi
1769     \@keywords}\par\egroup
1770 \fi
1771 \andify\authors
1772 \andify\shortauthors
1773 \global\let\authors=\authors
1774 \global\let\shortauthors=\shortauthors
1775 \if@ACM@printacmref
1776   \@mkbibcitation
1777 \fi
1778 \hypersetup{%
1779   pdfauthor={\authors},
1780   pdftitle={\@title},
1781   pdfsubject={\@concepts},
1782   pdfkeywords={\@keywords},
1783   pdfcreator={LaTeX with acmart
1784     \csname ver@acmart.cls\endcsname\space
1785     and hyperref
1786     \csname ver@hyperref.sty\endcsname}}%
1787 \global\@topnum\z@ % this prevents floats from falling
1788                   % at the top of page 1
1789 \global\@botnum\z@ % we do not want them to be on the bottom either
1790 \@printendtopmatter
1791 \@afterindentfalse
1792 \@afterheading
1793 }

```

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

```

1794 \def\@specialsection#1{%
1795   \ifcase\ACM@format@nr
1796     \relax % manuscript
1797     \par\medskip\small\noindent#1: %
1798   \or % acmsmall
1799     \par\medskip\small\noindent#1: %
1800   \or % acmlarge
1801     \par\medskip\small\noindent#1: %
1802   \or % acmtog
1803     \par\medskip\small\noindent#1: %
1804   \or % sigconf
1805     \section*{#1}%
1806   \or % siggraph
1807     \section*{#1}%
1808   \or % sigplan
1809     \paragraph*{#1}%

```

```

1810 \or % sigchi
1811     \section*{#1}%
1812 \or % sigchi-a
1813     \section*{#1}%
1814 \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.

```

1815 \def\@printtopmatter{%
1816     \ifx\@startPage\@empty
1817         \gdef\@startPage{1}%
1818     \else
1819         \setcounter{page}{\@startPage}%
1820     \fi
1821     \thispagestyle{firstpagestyle}%
1822     \noindent
1823     \ifcase\ACM@format@nr
1824     \relax % manuscript
1825     \box\mkttitle@bx\par
1826 \or % acmsmall
1827     \box\mkttitle@bx\par
1828 \or % acmlarge
1829     \box\mkttitle@bx\par
1830 \or % acmtog
1831     \twocolumn[\box\mkttitle@bx]%
1832 \or % sigconf
1833     \twocolumn[\box\mkttitle@bx]%
1834 \or % siggraph
1835     \twocolumn[\box\mkttitle@bx]%
1836 \or % sigplan
1837     \twocolumn[\box\mkttitle@bx]%
1838 \or % sigchi
1839     \twocolumn[\box\mkttitle@bx]%
1840 \or % sigchi-a
1841     \par\box\mkttitle@bx\par\bigskip
1842     \if@ACM@badge
1843         \marginpar{\noindent
1844             \ifx\@acmBadgeL@image\@empty\else
1845                 \href{\@acmBadgeL@url}{%
1846                     \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
1847                 \hskip\@ACM@badge@skip
1848             \fi
1849             \ifx\@acmBadgeR@image\@empty\else
1850                 \href{\@acmBadgeR@url}{%
1851                     \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
1852                 \fi}%
1853         \fi
1854     \fi
1855 }

```

```

\@mktitle The title of the article
1856 \def\@mktitle{%
1857   \ifcase\ACM@format@nr
1858   \relax % manuscript
1859   \@mktitle@i
1860   \or % acmsmall
1861   \@mktitle@i
1862   \or % acmlarge
1863   \@mktitle@i
1864   \or % acmtog
1865   \@mktitle@i
1866   \or % sigconf
1867   \@mktitle@iii
1868   \or % siggraph
1869   \@mktitle@iii
1870   \or % sigplan
1871   \@mktitle@iii
1872   \or % sigchi
1873   \@mktitle@iii
1874   \or % sigchi-a
1875   \@mktitle@iv
1876   \fi
1877 }

\@titlefont The font to typeset the title
1878 \def\@titlefont{%
1879   \ifcase\ACM@format@nr
1880   \relax % manuscript
1881   \LARGE\sffamily\bfseries
1882   \or % acmsmall
1883   \LARGE\sffamily\bfseries
1884   \or % acmlarge
1885   \LARGE\sffamily\bfseries
1886   \or % acmtog
1887   \Huge\sffamily
1888   \or % sigconf
1889   \Huge\sffamily\bfseries
1890   \or % siggraph
1891   \Huge\sffamily\bfseries
1892   \or % sigplan
1893   \Huge\bfseries
1894   \or % sigchi
1895   \Huge\sffamily\bfseries
1896   \or % sigchi-a
1897   \Huge\bfseries
1898   \fi}

\@subtitlefont The font to typeset the subtitle
1899 \def\@subtitlefont{\normalsize

```

```

1900 \ifcase\ACM@format@nr
1901 \relax % manuscript
1902   \mdseries
1903 \or % acmsmall
1904   \mdseries
1905 \or % acmlarge
1906   \mdseries
1907 \or % acmtog
1908   \LARGE
1909 \or % sigconf
1910   \LARGE\mdseries
1911 \or % siggraph
1912   \LARGE\mdseries
1913 \or % sigplan
1914   \LARGE\mdseries
1915 \or % sigchi
1916   \LARGE\mdseries
1917 \or % sigchi-a
1918   \mdseries
1919 \fi}

```

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

```

1920 \def\@mktitle@i{\hsize=\textwidth
1921   \@ACM@title@width=\hsize
1922   \ifx\@acmBadgeL@image\@empty\else
1923     \advance\@ACM@title@width by -\@ACM@badge@width
1924     \advance\@ACM@title@width by -\@ACM@badge@skip
1925   \fi
1926   \ifx\@acmBadgeR@image\@empty\else
1927     \advance\@ACM@title@width by -\@ACM@badge@width
1928     \advance\@ACM@title@width by -\@ACM@badge@skip
1929   \fi
1930   \setbox\mktitle@bx=\vbox{\noindent\@titlefont
1931     \ifx\@acmBadgeL@image\@empty\else
1932       \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1933         \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1934       \hskip\@ACM@badge@skip
1935     \fi
1936     \parbox[t]{\@ACM@title@width}{\raggedright
1937       \@titlefont\noindent
1938       \@title
1939     \ifx\@subtitle\@empty\else
1940       \par\noindent{\@subtitlefont\@subtitle}
1941     \fi}%
1942     \ifx\@acmBadgeR@image\@empty\else
1943       \hskip\@ACM@badge@skip
1944       \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1945         \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1946     \fi
1947   \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.

```

1948 \def\@mkttitle@iii{\hsize=\textwidth
1949   \setbox\mkttitle@bx=\vbox{\@titlefont\centering
1950     \@ACM@title@width=\hsize
1951     \if@ACM@badge
1952       \advance\@ACM@title@width by -2\@ACM@badge@width
1953       \advance\@ACM@title@width by -2\@ACM@badge@skip
1954       \parbox[b]{\@ACM@badge@width}{\strut
1955         \ifx\@acmBadgeL@image\@empty\else
1956           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1957             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1958         \fi}%
1959       \hskip\@ACM@badge@skip
1960     \fi
1961     \parbox[t]{\@ACM@title@width}{\centering\@titlefont
1962       \@title
1963       \ifx\@subtitle\@empty\else
1964         \par\noindent{\@subtitlefont\@subtitle}
1965       \fi
1966     }%
1967     \if@ACM@badge
1968       \hskip\@ACM@badge@skip
1969       \parbox[b]{\@ACM@badge@width}{\strut
1970         \ifx\@acmBadgeR@image\@empty\else
1971           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1972             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1973         \fi}%
1974       \fi
1975     \par\bigskip}}%
```

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

```

1976 \def\@mkttitle@iv{\hsize=\textwidth
1977   \setbox\mkttitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
1978     \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
1979     \noindent\@title
1980     \ifx\@subtitle\@empty\else
1981       \par\noindent\@subtitlefont\@subtitle
1982     \fi
1983     \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.

```

1984 \newbox\@ACM@commabox
1985 \def\@ACM@addtoaddress#1{%
1986   \ifvmode\else
1987     \if@ACM@affiliation@obexpunctuation\else
1988     \setbox\@ACM@commabox=\hbox{, }%
1989     \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
1990   \fi\fi
1991   #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` 1992 \def\streetaddress#1{\unskip\ignorespaces}

`\city` 1993 \def\postcode#1{\unskip\ignorespaces}

`\state` 1994 \if@ACM@journal

`\postcode` 1995 \def\position#1{\unskip\ignorespaces}

`\country` 1996 \def\institution#1{\unskip~#1\ignorespaces}

1997 \def\city#1{\unskip\ignorespaces}

1998 \def\state#1{\unskip\ignorespaces}

1999 \newcommand\department[2][0]{\unskip\ignorespaces}

2000 \def\country#1{\if@ACM@affiliation@obexpunctuation\else, \fi#1\ignorespaces}

2001 \else

2002 \def\position#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%

2003 \def\institution#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%

2004 \newcommand\department[2][0]{\if@ACM@affiliation@obexpunctuation

2005 #2\else#2\par\fi}%

2006 % \def\streetaddress#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%

2007 \let\city\@ACM@addtoaddress

2008 \let\state\@ACM@addtoaddress

2009 % \def\postcode#1{\if@ACM@affiliation@obexpunctuation#1\else\unskip\space#1\fi}%

2010 \let\country\@ACM@addtoaddress

2011 \fi

`\@mkauthors` Typesetting the authors

```

2012 \def\@mkauthors{\begingroup
2013   \hsize=\textwidth
2014   \ifcase\ACM@format@nr
2015   \relax % manuscript
2016   \@mkauthors@i
2017   \or % acmsmall
2018   \@mkauthors@i
2019   \or % acmlarge
2020   \@mkauthors@i
2021   \or % acmtog
2022   \@mkauthors@i
2023   \or % sigconf
2024   \@mkauthors@iii

```

```

2025 \or % siggraph
2026 \mkauthors@iii
2027 \or % sigplan
2028 \mkauthors@iii
2029 \or % sigchi
2030 \mkauthors@iii
2031 \or % sigchi-a
2032 \mkauthors@iv
2033 \fi
2034 \endgroup
2035 }

```

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

```

2036 \def\@authorfont{\Large\sffamily}

```

\@affiliationfont Font for affiliations

```

2037 \def\@affiliationfont{\normalsize\normalfont}

```

Adjusting fonts for different formats

```

2038 \ifcase\ACM@format@nr
2039 \relax % manuscript
2040 \or % acmsmall
2041 \def\@authorfont{\large\sffamily}
2042 \def\@affiliationfont{\small\normalfont}
2043 \or % acmlarge
2044 \or % acmtog
2045 \def\@authorfont{\LARGE\sffamily}
2046 \def\@affiliationfont{\large}
2047 \or % sigconf
2048 \def\@authorfont{\LARGE}
2049 \def\@affiliationfont{\large}
2050 \or % siggraph
2051 \def\@authorfont{\normalsize\normalfont}
2052 \def\@affiliationfont{\normalsize\normalfont}
2053 \or % sigplan
2054 \def\@authorfont{\Large\normalfont}
2055 \def\@affiliationfont{\normalsize\normalfont}
2056 \or % sigchi
2057 \def\@authorfont{\bfseries}
2058 \def\@affiliationfont{\mdseries}
2059 \or % sigchi-a
2060 \def\@authorfont{\bfseries}
2061 \def\@affiliationfont{\mdseries}
2062 \fi

```

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

```

2063 \def\@typeset@author@line{%
2064 \andify\@currentauthors\par\noindent

```

```

2065 \@currentauthors\def\@currentauthors{%
2066 \ifx\@currentaffiliations\@empty\else
2067 \andify\@currentaffiliations
2068 \unskip, {\@currentaffiliations}\par
2069 \fi
2070 \def\@currentaffiliations{}}

```

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

```

2071 \def\@mkauthors@i{%
2072 \def\@currentauthors{%
2073 \def\@currentaffiliations{%
2074 \global\let\and\@typeset@author@line
2075 \def\@author##1{%
2076 \ifx\@currentauthors\@empty
2077 \gdef\@currentauthors{\@authorfont\MakeTextUppercase{##1}}%
2078 \else
2079 \g@addto@macro{\@currentauthors}{\and\MakeTextUppercase{##1}}%
2080 \fi
2081 \gdef\and{}}%
2082 \def\email##1##2{%
2083 \def\affiliation##1##2{%
2084 \def\@tempa{##2}\ifx\@tempa\@empty\else
2085 \ifx\@currentaffiliations\@empty
2086 \gdef\@currentaffiliations{%
2087 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2088 \setkeys{@ACM@affiliation@}{##1}%
2089 \@affiliationfont##2}%
2090 \else
2091 \g@addto@macro{\@currentaffiliations}{\and
2092 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2093 \setkeys{@ACM@affiliation@}{##1}##2}%
2094 \fi
2095 \fi
2096 \global\let\and\@typeset@author@line}%
2097 \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
2098 \noindent\addresses\@typeset@author@line
2099 \par\medskip}%
2100 }

```

`\@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

```
2101 \newbox\author@bx
```

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

```
2102 \newdimen\author@bx@wd
```

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

```

2103 \newskip\author@bx@sep
2104 \author@bx@sep=1pc\relax

```

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

```

2105 \def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd
2106   \def\and{\par}\normalbaselines
2107   \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
2108     \@authorfont\@currentauthors\par\@affiliationfont
2109     \@currentaffiliation}\egroup
2110   \box\author@bx\hspace{\author@bx@sep}%
2111   \gdef\@currentauthors{}}%
2112   \gdef\@currentaffiliation{}}

```

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

```

2113 \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 $(\texttt{\textbackslash textwidth} - \texttt{\textbackslash author@bx@sep})/N - \texttt{\textbackslash author@bx@sep}$, where N is the number of boxes per row.

```

2114   \author@bx@wd=\textwidth\relax
2115   \advance\author@bx@wd by -\author@bx@sep\relax
2116   \ifnum\@ACM@authorsperrow>0\relax
2117     \divide\author@bx@wd by \@ACM@authorsperrow\relax
2118   \else
2119     \ifcase\num@authorgroups
2120       \relax % 0?
2121     \or % 1=one author per row
2122     \or % 2=two authors per row
2123       \divide\author@bx@wd by \num@authorgroups\relax
2124     \or % 3=three authors per row
2125       \divide\author@bx@wd by \num@authorgroups\relax
2126     \or % 4=two authors per row (!)
2127       \divide\author@bx@wd by 2\relax
2128     \else % three authors per row
2129       \divide\author@bx@wd by 3\relax
2130     \fi
2131   \fi
2132   \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of `\addresses`:

```

2133   \gdef\@currentauthors{}%
2134   \gdef\@currentaffiliation{}%
2135   \def\@author##1{\ifx\@currentauthors\empty
2136     \gdef\@currentauthors{\par##1}%
2137   \else
2138     \g@addto@macro\@currentauthors{\par##1}%
2139   \fi
2140   \gdef\and{}}%

```

```

2141 \def\email##1##2{\ifx\@currentaffiliation\@empty
2142 \gdef\@currentaffiliation{\bgroup
2143 \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2144 \else
2145 \g@addto@macro\@currentaffiliation{\par\bgroup
2146 \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2147 \fi}%
2148 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2149 \gdef\@currentaffiliation{%
2150 \setkeys{ACM@affiliation@}{obeypunctuation=false}%
2151 \setkeys{ACM@affiliation@}{##1}##2}%
2152 \else
2153 \g@addto@macro\@currentaffiliation{\par
2154 \setkeys{ACM@affiliation@}{obeypunctuation=false}%
2155 \setkeys{ACM@affiliation@}{##1}##2}%
2156 \fi
2157 \global\let\and\@typeset@author@bx
2158 }%

```

Actual typesetting is done by the \and macro:

```

2159 \hspace=\textwidth
2160 \global\setbox\mktitle@bx=\vbox{\noindent
2161 \box\mktitle@bx\par\medskip\leavevmode
2162 \lineskip=1pc\relax\centering\hspace*{-1em}%
2163 \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.

```

2164 \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.

```

2165 \author@bx@wd=\columnwidth\relax
2166 \advance\author@bx@wd by -\author@bx@sep\relax
2167 \ifnum\@ACM@authorsperrow>0\relax
2168 \divide\author@bx@wd by \@ACM@authorsperrow\relax
2169 \else
2170 \ifcase\@num@authorgroups
2171 \relax % 0?
2172 \or % 1=one author per row
2173 \else % 2=two authors per row
2174 \divide\author@bx@wd by 2\relax
2175 \fi
2176 \fi
2177 \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of \addresses:

```

2178 \gdef\@currentauthors{}%

```

```

2179 \gdef\@currentaffiliation{}%
2180 \def\@author##1{\ifx\@currentauthors\@empty
2181   \gdef\@currentauthors{\par##1}%
2182   \else
2183     \g@addto@macro\@currentauthors{\par##1}%
2184   \fi
2185   \gdef\and{}}%
2186 \def\email##1##2{\ifx\@currentaffiliation\@empty
2187   \gdef\@currentaffiliation{\nolinkurl{##2}}%
2188   \else
2189     \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
2190   \fi}%
2191 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2192   \gdef\@currentaffiliation{%
2193     \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2194     \setkeys{@ACM@affiliation@}{##1}##2}%
2195   \else
2196     \g@addto@macro\@currentaffiliation{\par
2197       \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2198       \setkeys{@ACM@affiliation@}{##1}##2}%
2199   \fi
2200 \global\let\and\@typeset@author@bx}%
2201 %

```

Actual typesetting is done by the \and macro

```

2202 \bgroup\hsize=\columnwidth
2203 \par\raggedright\leftskip=\z@
2204 \lineskip=1pc\noindent
2205 \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}

```

\@mkauthorsaddresses Typesetting authors' addresses in the footnote style

```

2206 \def\@mkauthorsaddresses{%
2207   \ifnum\num@authors>1\relax
2208     Authors' \else Author's \fi
2209   \ifnum\num@authorgroups>1\relax
2210     addresses: \else address: \fi
2211   \bgroup
2212   \def\streetaddress##1{\unskip\@addpunct, ##1}%
2213   \def\postcode##1{\unskip\@addpunct, ##1}%
2214   \def\position##1{\unskip\ignorespaces}%
2215   \def\institution##1{\unskip\@addpunct, ##1}%
2216   \def\city##1{\unskip\@addpunct, ##1}%
2217   \def\state##1{\unskip\@addpunct, ##1}%
2218   \renewcommand\department[2][0]{\unskip\@addpunct, ##2}%
2219   \def\country##1{\unskip\@addpunct, ##1}%
2220   \def\and{\unskip\@addpunct; }%
2221   \def\@author##1{##1}%
2222   \def\email##1##2{\unskip\@addpunct, \nolinkurl{##2}}%
2223   \addresses
2224   \egroup}

```

`\@setaddresses` This is an amsart macro that we do not need.
2225 `\def\@setaddresses{}`

`\@authornotemark` Adding a footnote mark to authors. This version adds a “normal” footnote mark.
2226 `\def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark\relax}}`

`\@@authornotemark` Adding a footnote mark to authors with a given number
2227 `\def\@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}`

`\@mkteasers` Typesetting the teasers
2228 `\def\@mkteasers{%`
2229 `\ifx\@teaserfigures\@empty\else`
2230 `\def\@teaser##1{\par\bigskip\bgroup`
2231 `\captionsetup{type=figure}##1\egroup\par}`
2232 `\global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par`
2233 `\noindent\@Description@presentfalse`
2234 `\@teaserfigures\par\if@Description@present\else`
2235 `\global\@undescrbed@imagestrue`
2236 `\ClassWarning{\@classname}{A possible image without`
2237 `description}\fi`
2238 `\medskip}%`
2239 `\fi}`

`\@mkabstract` Typesetting the abstract
2240 `\def\@mkabstract{\bgroup`
2241 `\ifx\@abstract\@empty\else`
2242 `{\phantomsection\addcontentsline{toc}{section}{Abstract}%`
2243 `\if@ACM@journal`
2244 `\everypar{\setbox\z@\lastbox\everypar{}}\small`
2245 `\else`
2246 `\section*{\abstractname}%`
2247 `\fi`
2248 `\ignorespaces\@abstract\par}%`
2249 `\fi\egroup}`

`\@mkbibcitation` Print the bibcitation format
2250 `\def\@mkbibcitation{\bgroup`
2251 `\let\@vspace\@vspace@orig`
2252 `\let\@vspacer\@vspacer@orig`
2253 `\def\@pages@word{\ifnum\getrefnumber{TotPages}=1\relax page\else pages\fi}%`
2254 `\def\footnotemark{}%`
2255 `\def\@unskip{\ignorespaces}%`
2256 `\def\footnote{\ClassError{\@classname}{Please do not use footnotes`
2257 `inside a \string\title{} or \string\author{} command! Use`
2258 `\string\titlenote{} or \string\authornote{} instead!}}%`
2259 `\def\@article@string{\ifx\@acmArticle\@empty{\ } \else,`
2260 `Article~\@acmArticle\ } \fi}%`
2261 `\par\medskip\small\noindent{\bfseries ACM Reference Format:}\par\nobreak`
2262 `\noindent\bgroup`

```

2263 \def\{\unskip{, \ignorespaces}\authors\egroup. \@acmYear. \@title
2264 \ifx\@subtitle\@empty. \else: \@subtitle. \fi
2265 \if@ACM@nonacm\else
2266 % The 'nonacm' option disables 'printacmref' by default,
2267 % and the present \mkbibcitation definition is never used
2268 % in this case. The conditional remains useful if the user
2269 % explicitly sets \settopmatter{printacmref=true}.
2270 \if@ACM@journal@bibstrip
2271 \textit{\@journalNameShort}
2272 \@acmVolume, \@acmNumber \@article@string (\@acmPubDate),
2273 \ref{TotPages}~\@pages@word.
2274 \else
2275 In \textit{\@acmBooktitle}%
2276 \ifx\@acmEditors\@empty\textit{.}\else
2277 \andify\@acmEditors\textit{, }\@acmEditors~\@editorsAbbrev.%
2278 \fi\
2279 ACM, New York, NY, USA%
2280 \@article@string\unskip, \ref{TotPages}~\@pages@word.
2281 \fi
2282 \fi
2283 \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
2284 \par\egroup}

```

\@printendtopmatter End the top matter

```

2285 \def\@printendtopmatter{\bgroup
2286 \let\@vspace\@vspace@orig
2287 \let\@vspacer\@vspacer@orig
2288 \par\bigskip
2289 \egroup}

```

\@setthanks We redefine \@setthanks using \@long

```

2290 \def\@setthanks{\@long\def\thanks##1{\par##1\@addpunct.}\thankses}

```

\@setauthorsaddresses

```

2291 \def\@setauthorsaddresses{\@authorsaddresses\unskip\@addpunct.}

```

3.16 Headers and Footers

We use fancyhdr for our headers and footers:

```

2292 \RequirePackage{fancyhdr}

```

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

```

2293 \let\ACM@ps@plain\ps@plain
2294 \let\ACM@ps@myheadings\ps@myheadings
2295 \let\ACM@ps@headings\ps@headings
2296 \def\ACM@restore@pagestyle{%
2297 \let\ps@plain\ACM@ps@plain
2298 \let\ps@myheadings\ACM@ps@myheadings
2299 \let\ps@headings\ACM@ps@headings}
2300 \AtBeginDocument{\ACM@restore@pagestyle}

```


\ACM@linecount@bx This is the box displayed in review mode

```
2301 \if@ACM@review
2302   \newsavebox{\ACM@linecount@bx}
2303   \newlength\ACM@linecount@bxht
2304   \newcount\ACM@linecount
2305   \ACM@linecount\@ne\relax
2306   \def\ACM@mk@linecount{%
2307     \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{%
2308       \setlength{\ACM@linecount@bxht}{0pt}%
2309       \loop{\color{red}\scriptsize\the\ACM@linecount}\
2310       \global\advance\ACM@linecount by \@ne
2311       \addtolength{\ACM@linecount@bxht}{\baselineskip}%
2312       \ifdim\ACM@linecount@bxht<\textheight\repeat
2313       {\color{red}\scriptsize\the\ACM@linecount}\hfill
2314       \global\advance\ACM@linecount by \@ne}}
2315 \fi
```

\ACM@linecountL How to display the box on the left

```
2316 \def\ACM@linecountL{%
2317   \if@ACM@review
2318     \ACM@mk@linecount
2319     \begin{picture}(0,0)%
2320       \put(-26,-22){\usebox{\ACM@linecount@bx}}%
2321     \end{picture}%
2322   \fi}
```

\ACM@linecountR How to display the box on the right

```
2323 \def\ACM@linecountR{%
2324   \if@ACM@review
2325     \ACM@mk@linecount
2326     \begin{picture}(0,0)%
2327       \put(20,-22){\usebox{\ACM@linecount@bx}}%
2328     \end{picture}%
2329   \fi}
```

\ACM@timestamp The timestamp system

```
2330 \if@ACM@timestamp
2331   % Subtracting 30 from \time gives us the effect of rounding down despite
2332   % \numexpr rounding to nearest
2333   \newcounter{ACM@time@hours}
2334   \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
2335   \newcounter{ACM@time@minutes}
2336   \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
2337   \newcommand\ACM@timestamp{%
2338     \footnotesize%
2339     \ifx\@acmSubmissionID\@empty\relax\else
2340       Submission ID: \@acmSubmissionID.{ }%
2341     \fi
2342     \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
```

```

2343     \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{. }%
2344     Page \thepage\ of \@startPage--\pageref*{TotPages}.%
2345 }
2346 \fi

\@shortauthors Even if the author redefined \shortauthors, we do not print it in the headers when in
anonymous mode:
2347 \def\@shortauthors{%
2348   \if@ACM@anonymous
2349     Anon.
2350     \ifx\@acmSubmissionID\@empty\else Submission Id: \@acmSubmissionID\fi
2351   \else\shortauthors\fi}

\@headfootfont The font to typeset header and footer text.
2352 \def\@headfootfont{\sffamily\footnotesize}

standardpagestyle The page style for all pages but the first one The page style for all pages but the first one
2353 \AtBeginDocument{%
2354   \fancypagestyle{standardpagestyle}{%
2355     \fancyhf{}%
2356     \renewcommand{\headrulewidth}{\z@}%
2357     \renewcommand{\footrulewidth}{\z@}%
2358     \def\@acmArticlePage{%
2359       \ifx\@acmArticle\empty%
2360         \if@ACM@printfolios\thepage\fi%
2361       \else%
2362         \@acmArticle\if@ACM@printfolios:\thepage\fi%
2363       \fi%
2364     }%
2365     \if@ACM@journal@bibstrip
2366       \ifcase\ACM@format@nr
2367         \relax % manuscript
2368         \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
2369         \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
2370         \fancyhead[RE]{\@shortauthors}%
2371         \fancyhead[LO]{\ACM@linecountL\shorttitle}%
2372         \if@ACM@nonacm\else%
2373           \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}
2374         \fi%
2375       \or % acmsmall
2376         \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticlePage}%
2377         \fancyhead[RO]{\@headfootfont\@acmArticlePage}%
2378         \fancyhead[RE]{\@headfootfont\@shortauthors}%
2379         \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2380         \if@ACM@nonacm\else%
2381           \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2382             \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2383         \fi
2384       \or % acmlarge

```

```

2385 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2386 \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2387 \fancyhead[LO]{\ACM@linecountL}%
2388 \fancyhead[RO]{\@headfootfont
2389 \shorttitle\quad\textbullet\quad\@acmArticlePage}%
2390 \if@ACM@nonacm\else%
2391 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2392 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2393 \fi
2394 \or % acmtog
2395 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2396 \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2397 \fancyhead[LO]{\ACM@linecountL}%
2398 \fancyhead[RE]{\ACM@linecountR}%
2399 \fancyhead[RO]{\@headfootfont
2400 \shorttitle\quad\textbullet\quad\@acmArticlePage\ACM@linecountR}%
2401 \if@ACM@nonacm\else%
2402 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2403 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2404 \fi
2405 \else % Proceedings
2406 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2407 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2408 \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2409 \if@ACM@nonacm\else%
2410 \fancyhead[LE]{\ACM@linecountL\@headfootfont\footnotesize
2411 \acmConference@shortname,
2412 \acmConference@date, \acmConference@venue}%
2413 \fancyhead[RO]{\@headfootfont
2414 \acmConference@shortname,
2415 \acmConference@date, \acmConference@venue\ACM@linecountR}%
2416 \fi
2417 \fi
2418 \else % Proceedings
2419 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2420 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2421 \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2422 \if@ACM@nonacm\else%
2423 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2424 \acmConference@shortname,
2425 \acmConference@date, \acmConference@venue}%
2426 \fancyhead[RO]{\@headfootfont
2427 \acmConference@shortname,
2428 \acmConference@date, \acmConference@venue\ACM@linecountR}%
2429 \fi
2430 \fi
2431 \if@ACM@sigchiamode
2432 \fancyheadoffset[L]{\dimexpr(\marginparsep+\marginparwidth)}%
2433 \fi
2434 \if@ACM@timestamp

```

```

2435     \fancyfoot[LO,RE]{\ACM@timestamp}
2436     \fi
2437 }%
2438 \pagestyle{standardpagestyle}
2439 }

\@folio@wd Folio blob width, height, offsets and max number
\@folio@ht
\@folio@voffset
\@folio@max
2440 \newdimen\@folio@wd
2441 \@folio@wd=\z@
2442 \newdimen\@folio@ht
2443 \@folio@ht=\z@
2444 \newdimen\@folio@voffset
2445 \@folio@voffset=\z@
2446 \def\@folio@max{1}
2447 \ifcase\ACM@format@nr
2448 \relax % manuscript
2449 \or % acmsmall
2450     \@folio@wd=45.75pt\relax
2451     \@folio@ht=1.25in\relax
2452     \@folio@voffset=.2in\relax
2453     \def\@folio@max{8}
2454 \or % acmlarge
2455     \@folio@wd=43.25pt\relax
2456     \@folio@ht=79pt\relax
2457     \@folio@voffset=.55in\relax
2458     \def\@folio@max{10}
2459 \fi

\@folioblob The macro to typeset the folio blob.
2460 \def\@folioblob{\@tempcnta=0\@acmArticleSeq\relax
2461     \ifnum\@tempcnta=0\relax\else
First, we calculate \@acmArticleSeq modulo \@folio@max
2462     \loop
2463         \ifnum\@tempcnta>\@folio@max\relax
2464             \advance\@tempcnta by - \@folio@max
2465         \repeat
2466         \advance\@tempcnta by -1\relax
2467         \@tempdima=\@folio@ht\relax
2468         \multiply\@tempdima by \the\@tempcnta\relax
2469         \advance\@tempdima by -\@folio@voffset\relax
2470         \begin{picture}(0,0)
2471             \makebox[\z@]{\raisebox{-\@tempdima}{%
2472                 \rlap{%
2473                     \raisebox{-0.45\@folio@ht}{\z@}\z@}{%
2474                         \rule{\@folio@wd}{\@folio@ht}}}%
2475                 \parbox{\@folio@wd}{%
2476                     \centering
2477                     \textcolor{white}{\LARGE\sffamily\bfseries\@acmArticle}}}}
2478         \end{picture}\fi}

```

2479

firstpagestyle The page style for the first page only.

```
2480 \AtBeginDocument{%
2481 \fancypagestyle{firstpagestyle}{%
2482   \fancyhf{}%
2483   \renewcommand{\headrulewidth}{\z@}%
2484   \renewcommand{\footrulewidth}{\z@}%
2485   \if@ACM@journal@bibstrip
2486     \ifcase\ACM@format@nr
2487       \relax % manuscript
2488       \fancyhead[L]{\ACM@linecountL}%
2489       \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
2490       \if@ACM@nonacm\else%
2491         \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
2492       \fi%
2493     \or % acmsmall
2494       \if@ACM@nonacm\else%
2495         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2496           \@acmNumber, Article \@acmArticle. Publication date:
2497             \@acmPubDate.}%
2498       \fi%
2499       \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2500       \fancyhead[LO]{\ACM@linecountL}%
2501       \fancyhead[RO]{\@folioblob}%
2502       \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
2503     \or % acmlarge
2504       \if@ACM@nonacm\else%
2505         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2506           \@acmNumber, Article \@acmArticle. Publication date:
2507             \@acmPubDate.}%
2508       \fi%
2509       \fancyhead[RO]{\@folioblob}%
2510       \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2511       \fancyhead[LO]{\ACM@linecountL}%
2512       \fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2513     \or % acmtog
2514       \if@ACM@nonacm\else%
2515         \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2516           \@acmNumber, Article \@acmArticle. Publication date:
2517             \@acmPubDate.}%
2518       \fi%
2519       \fancyhead[L]{\ACM@linecountL}%
2520       \fancyhead[R]{\ACM@linecountR}%
2521     \else % Conference proceedings
2522       \fancyhead[L]{\ACM@linecountL}%
2523       \fancyhead[R]{\ACM@linecountR}%
2524       \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2525     \fi
2526   \else
```

```

2527 \fancyhead[L]{\ACM@linecountL}%
2528 \fancyhead[R]{\ACM@linecountR}%
2529 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2530 \fi
2531 \if@ACM@timestamp
2532 \ifnum\ACM@format@nr=0\relax % Manuscript
2533 \fancyfoot[LO,RE]{\ACM@timestamp\quad
2534 \if@ACM@nonacm\else
2535 \footnotesize Manuscript submitted to ACM
2536 \fi}
2537 \else
2538 \fancyfoot[LO,RE]{\ACM@timestamp}
2539 \fi
2540 \fi
2541 }}

```

3.17 Sectioning

\ACM@NRadjust Ross Moore's macro.

Initially \ACM@sect@format@ just passes through its #1 argument unchanged. When a sectioning macro such as \section occurs, the \ACM@NRadjust redefines \ACM@sect@format@ to expand into the styling commands; e.g., \@secfont. Then \Sectionformat is temporarily redefined to produce \realSectionformat{\ACM@sect@format{#1}}{#2}, which ultimately becomes \Sectionformat{\@secfont{#1}}{#2}. This is done to allow \Sectionformat to be variable, as may be needed in particular circumstances. Its current expansion is saved as \realSectionformat which is used with the modified 1st argument, then \Sectionformat is reverted to its former expansion.

To style the section-number, the line #1{} is used at the end of \ACM@NRadjust. This imposes style-changing commands for fonts and sizes, but any \MakeUppercase acts on just the {}. It's a bit hacky, by essentially assuming that only numbers occur here, not letters to be case-changed. (This should be acceptable in a class-file, as it ought to be possible to change the case elsewhere, if that was ever desired.) Also, it can result in \@adddotafter being called too soon, so a slight adjustment is made, via \ACM@adddotafter, which now tests whether its argument is empty. But the coding has to allow for other packages to have also patched \@adddotafter.

```

2542 \def\ACM@NRadjust#1{%
2543 \begingroup
2544 \expandafter\ifx\csname Sectionformat\endcsname\relax
2545 % do nothing when \Sectionformat is unknown
2546 \def\next{\endgroup #1}%
2547 \else
2548 \def\next{\endgroup
2549 \let\realSectionformat\Sectionformat
2550 \def\ACM@sect@format@{#1}%
2551 \let\Sectionformat\ACM@NR@adjustedSectionformat

```

```

2552 %% next lines added 2018-06-17 to ensure section number is styled
2553 \let\real@adddotafter\@adddotafter
2554 \let\@adddotafter\ACM@adddotafter
2555 #1{ }% imposes the styles, but nullifies \MakeUppercase
2556 \let\@adddotafter\real@adddotafter
2557 }%
2558 \fi \next
2559 }

```

\ACM@NR@adjustedSectionformat

```

2560 \def\ACM@NR@adjustedSectionformat#1#2{%
2561 \realSectionformat{\ACM@sect@format{#1}}{#2}%
2562 \let\Sectionformat\realSectionformat}
2563 \DeclareRobustCommand{\ACM@sect@format}{\ACM@sect@format@}
2564 \def\ACM@sect@format@null#1{#1}
2565 \let\ACM@sect@format@null#1{#1}
2566 \AtBeginDocument{%
2567 \expandafter\ifx\csname LTX@adddotafter\endcsname\relax
2568 \let\LTX@adddotafter\@adddotafter
2569 \fi
2570 }

```

\ACM@adddotafter

```

2571 \def\ACM@adddotafter#1{\ifx\relax#1\relax\else\LTX@adddotafter{#1}\fi}

```

Sectioning is different for different levels

```

2572 \renewcommand\section{\@startsection{section}{1}{\z@}%
2573 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2574 {.25\baselineskip}%
2575 {\ACM@NRadjust\@secfont}}
2576 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2577 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2578 {.25\baselineskip}%
2579 {\ACM@NRadjust\@subsecfont}}
2580 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2581 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2582 {-3.5\p@}%
2583 {\ACM@NRadjust{\@subsubsecfont\@adddotafter}}}
2584 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
2585 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2586 {-3.5\p@}%
2587 {\ACM@NRadjust{\@parfont\@adddotafter}}}
2588 \renewcommand\part{\@startsection{part}{9}{\z@}%
2589 {-10\p@ \@plus -4\p@ \@minus -2\p@}%
2590 {4\p@}%
2591 {\ACM@NRadjust\@parfont}}

```

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

```

2592 \def\section@raggedright{\@rightskip\@flushglue

```

```

2593 \rightskip\@rightskip
2594 \leftskip\z@skip
2595 \parindent\z@}

\@secfont Fonts for sections etc. are different for different formats.
\@subsecfont 2596 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
\@subsubsecfont 2597 \def\@subsubsecfont{\sffamily\bfseries\section@raggedright}
\@parfont 2598 \def\@subsubsecfont{\sffamily\itshape}
2599 \def\@parfont{\itshape}
2600 \setcounter{secnumdepth}{3}
2601 \ifcase\ACM@format@nr
2602 \relax % manuscript
2603 \or % acmsmall
2604 \or % acmlarge
2605 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2606 \def\@subsecfont{\sffamily\large\section@raggedright}
2607 \or % acmtog
2608 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2609 \def\@subsecfont{\sffamily\large\section@raggedright}
2610 \or % sigconf
2611 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
2612 \def\@subsecfont{\bfseries\Large\section@raggedright}
2613 \or % siggraph
2614 \def\@secfont{\sffamily\bfseries\Large\section@raggedright\MakeTextUppercase}
2615 \def\@subsecfont{\sffamily\bfseries\Large\section@raggedright}
2616 \or % sigplan
2617 \def\@secfont{\bfseries\Large\section@raggedright}
2618 \def\@subsecfont{\bfseries\section@raggedright}
2619 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2620 {-0.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2621 {0.25\baselineskip}%
2622 {\@subsubsecfont}}
2623 \def\@subsubsecfont{\bfseries\section@raggedright}
2624 \renewcommand\paragraph{\@startsection{paragraph}{4}{\z@}%
2625 {-0.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2626 {-3.5\p@}%
2627 {\@parfont\@addspaceafter}}
2628 \def\@parfont{\bfseries\itshape}
2629 \renewcommand\subparagraph{\@startsection{subparagraph}{5}{\z@}%
2630 {-0.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2631 {-3.5\p@}%
2632 {\@subparfont\@addspaceafter}}
2633 \def\@subparfont{\itshape}
2634 \or % sigchi
2635 \setcounter{secnumdepth}{1}
2636 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2637 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2638 \or % sigchi-a
2639 \setcounter{secnumdepth}{0}
2640 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}

```



```

2641 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2642 \fi

```

`\@adddotafter` Add punctuation after a sectioning command

```

2643 \def\@adddotafter#1{#1\@addpunct{.}}

```

`\@addspaceafter` Add space after a sectioning command

```

2644 \def\@addspaceafter#1{#1\@addpunct{\enspace}}

```

3.18 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.

```

2645 \providecommand*\@dotsep{4.5}

```

3.19 Theorems

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

```

2646 \def\@acmplainbodyfont{\itshape}

```

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

```

2647 \def\@acmplainindent{\parindent}

```

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

```

2648 \def\@acmplainheadfont{\scshape}

```

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

```

2649 \def\@acmplainnotefont{\@empty}

```

Customization of the `acmplain` theorem style:

```

2650 \ifcase\ACM@format@nr
2651 \relax % manuscript
2652 \or % acmsmall
2653 \or % acmlarge
2654 \or % acmtog
2655 \or % sigconf
2656 \or % siggraph
2657 \or % sigplan
2658 \def\@acmplainbodyfont{\itshape}
2659 \def\@acmplainindent{\z@}
2660 \def\@acmplainheadfont{\bfseries}
2661 \def\@acmplainnotefont{\normalfont}
2662 \or % sigchi
2663 \or % sigchi-a
2664 \fi

```

acmplain The acmplain theorem style

```

2665 \newtheoremstyle{acmplain}%
2666   {.5\baselineskip\@plus.2\baselineskip
2667     \@minus.2\baselineskip}% space above
2668   {.5\baselineskip\@plus.2\baselineskip
2669     \@minus.2\baselineskip}% space below
2670   {\acmplainbodyfont}% body font
2671   {\acmplainindent}% indent amount
2672   {\acmplainheadfont}% head font
2673   {.}% punctuation after head
2674   {.5em}% spacing after head
2675   {\thmname{#1}\thmnumber{ #2}\thmnote{ {\acmplainnotefont{#3}}}}% head spec

```

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

```

2676 \def\acmdefinitionbodyfont{\normalfont}

```

\acmdefinitionindent The amount to indent the acmdefinition theorem style.

```

2677 \def\acmdefinitionindent{\parindent}

```

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

```

2678 \def\acmdefinitionheadfont{\itshape}

```

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

```

2679 \def\acmdefinitionnotefont{\empty}

```

Customization of the acmdefinition theorem style:

```

2680 \ifcase\ACM@format@nr
2681 \relax % manuscript
2682 \or % acmsmall
2683 \or % acmlarge
2684 \or % acmtog
2685 \or % sigconf
2686 \or % siggraph
2687 \or % sigplan
2688 \def\acmdefinitionbodyfont{\normalfont}
2689 \def\acmdefinitionindent{\z@}
2690 \def\acmdefinitionheadfont{\bfseries}
2691 \def\acmdefinitionnotefont{\normalfont}
2692 \or % sigchi
2693 \or % sigchi-a
2694 \fi

```

acmdefinition The acmdefinition theorem style

```

2695 \newtheoremstyle{acmdefinition}%
2696   {.5\baselineskip\@plus.2\baselineskip
2697     \@minus.2\baselineskip}% space above
2698   {.5\baselineskip\@plus.2\baselineskip
2699     \@minus.2\baselineskip}% space below
2700   {\acmdefinitionbodyfont}% body font

```

```

2701 {\@acmdefinitionindent}% indent amount
2702 {\@acmdefinitionheadfont}% head font
2703 {.}% punctuation after head
2704 {.5em}% spacing after head
2705 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmdefinitionnotefont{#3}}}}% head spec

```

Make acmplain the default theorem style.

```

2706 \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.

```

2707 \AtEndPreamble{%
2708   \if@ACM@acmthm
2709     \theoremstyle{acmplain}
2710     \@ifundefined{theorem}{%
2711       \newtheorem{theorem}{Theorem}[section]
2712     }{}
2713     \@ifundefined{conjecture}{%
2714       \newtheorem{conjecture}[theorem]{Conjecture}
2715     }{}
2716     \@ifundefined{proposition}{%
2717       \newtheorem{proposition}[theorem]{Proposition}
2718     }{}
2719     \@ifundefined{lemma}{%
2720       \newtheorem{lemma}[theorem]{Lemma}
2721     }{}
2722     \@ifundefined{corollary}{%
2723       \newtheorem{corollary}[theorem]{Corollary}
2724     }{}
2725     \theoremstyle{acmdefinition}
2726     \@ifundefined{example}{%
2727       \newtheorem{example}[theorem]{Example}
2728     }{}
2729     \@ifundefined{definition}{%
2730       \newtheorem{definition}[theorem]{Definition}
2731     }{}
2732   \fi
2733   \theoremstyle{acmplain}
2734 }

```

`\@proofnamefont` The font to typeset the proof name.

```

2735 \def\@proofnamefont{\scshape}

```

\@proofindent Whether or not to indent proofs.

```
2736 \def\@proofindent{\indent}
```

Customization of the proof environment.

```
2737 \ifcase\ACM@format@nr
2738 \relax % manuscript
2739 \or % acmsmall
2740 \or % acmlarge
2741 \or % acmtog
2742 \or % sigconf
2743 \or % siggraph
2744 \or % sigplan
2745 \def\@proofnamefont{\itshape}
2746 \def\@proofindent{\noindent}
2747 \or % sigchi
2748 \or % sigchi-a
2749 \fi
```

proof We want some customization of the proof environment.

```
2750 \renewenvironment{proof}[1][\proofname]{\par
2751 \pushQED{\qed}%
2752 \normalfont \topsep6\p@\@plus6\p@\relax
2753 \trivlist
2754 \item[\@proofindent\hskip\labelsep
2755 {\@proofnamefont #1\@addpunct{.}}]\ignorespaces
2756 }{%
2757 \popQED\endtrivlist\endpfalse
2758 }
```

3.20 Balancing columns

We need balancing only if the user did not disable it, and we use a two column format

```
2759 \AtEndPreamble{%
2760 \if@ACM@balance
2761 \ifcase\ACM@format@nr
2762 \relax % manuscript
2763 \global\@ACM@balancefalse
2764 \or % acmsmall
2765 \global\@ACM@balancefalse
2766 \or % acmlarge
2767 \global\@ACM@balancefalse
2768 \or % acmtog
2769 \RequirePackage{balance}%
2770 \or % sigconf
2771 \RequirePackage{balance}%
2772 \or % siggraph
2773 \RequirePackage{balance}%
2774 \or % sigplan
2775 \RequirePackage{balance}%
```

```

2776      \or % sigchi
2777          \RequirePackage{balance}%
2778      \or % sigchi-a
2779          \global\@ACM@balancefalse
2780      \fi
2781  \fi
2782 }
2783 \AtEndDocument{%
2784     \if@ACM@balance
2785     \if@twocolumn
2786     \balance
2787     \fi\fi}

```

3.21 Acknowledgments

```

\acksname
2788 \newcommand\acksname{Acknowledgments}

\acks This is a comment-like structure
2789 \specialcomment{acks}{%
2790     \begin{group}
2791     \section*\acksname}
2792     \phantomsection\addcontentsline{toc}{section}{\acksname}
2793 }{%
2794     \end{group}
2795 }

\grantsponsor We just typeset the name of the sponsor
2796 \def\grantsponsor#1#2#3{#2}

\grantnum
2797 \newcommand\grantnum[3][{}]{#3%
2798     \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}

```

3.22 Conditional typesetting

We use the comment package for conditional typesetting:

```

2799 \AtEndPreamble{%
2800     \if@ACM@screen
2801     \includecomment{screenonly}
2802     \excludecomment{printonly}
2803 \else
2804     \excludecomment{screenonly}
2805     \includecomment{printonly}
2806 \fi
2807 \if@ACM@anonymous
2808     \excludecomment{anonsuppress}
2809     \excludecomment{acks}

```

```

2810 \else
2811   \includecomment{anonsuppress}
2812 \fi}

```

3.23 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/hypertext/bibstyles/>).

```

2813 \newcommand\showeprint[2][arxiv]{%
2814   \def\@tempa{#1}%
2815   \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
2816   \def\@tempb{arxiv}%
2817   \ifx\@tempa\@tempb
2818     arXiv:\href{http://arxiv.org/abs/#2}{#2}\else arXiv:#2%
2819   \fi}

```

3.24 End of Class

`\vspace` We do not disable `\vspace`, but add warning to it

```

2820 \let\@vspace@orig=\@vspace
2821 \let\@vspacer@orig=\@vspacer
2822 \apptocmd{\@vspace}{\ClassWarning{\@classname}{\string\vspace\space should
2823   only be used to provide space above/below surrounding
2824   objects}}{}{}
2825 \apptocmd{\@vspacer}{\ClassWarning{\@classname}{\string\vspace\space should
2826   only be used to provide space above/below surrounding
2827   objects}}{}{}

```

`\ACM@origbaselinestretch` We produce an error if the user tries to change `\baselinestretch`

```

2828 \let\ACM@origbaselinestretch\baselinestretch
2829 \AtEndDocument{\ifx\baselinestretch\ACM@origbaselinestretch\else
2830   \ClassError{\@classname}{An attempt to redefine
2831     \string\baselinestretch\space detected. Please do not do this for
2832     ACM submissions!}\fi}

```

```

2833 \normalsize\normalfont\frenchspacing
2834 </class>

```

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Change History

1.48	General: Added prologue option to xcolor 44 Bib code cleanup (Zack Weinberg) 32 Documentation update (siggraph) . 32	v1.02	General: Added TOPS and TSC (closes https://github.com/borisveytsman/ acmart/issues/12) 32 Documentation changes (closes https://github.com/borisveytsman/ acmart/issues/13) 32
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1.53	General: New journals: PACMCGIT, TIOT, TDSCI 32 Rearranged docs 32	v1.03	\@formatdoi: Added macro 70 \if@ACM@authorversion: Added macro 34 \maketitle: Added special case of authorversion 73 General: Added anonsuppress environment 32 Added authorversion option (closes https://github.com/borisveytsman/ acmart/issues/9) 32
1.54	General: Moved footnote stuff before hyperref call (Ross Moore) 32		
1.56	General: Documented \Description 32		
1.57	General: Booktabs package is now the default 32		
1.58	General: Changes in samples (Enrico Gregorio) 32 New journal: HEALTH. TDS is renamed to TDSCI 32	v1.04	\acmArticleSeq: Name change by Matthew Fluet 64 \acmDOI: Name change by Matthew Fluet 65 \acmISBN: Name change by Matthew Fluet 64 General: Updated bibliography for siggraph 32
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v1.01	General: Changed hyperref colors in screen mode (closes https://github.com/borisveytsman/ acmart/issues/1) 32 Defined ACM colors 32 Explicitly put draft option (closes https://github.com/borisveytsman/ acmart/issues/4) 35 Set headheight to 1pc for all formats (closes https://github.com/borisveytsman/ acmart/issues/5) 32	v1.06	\@ACM@badge@skip: Added macro . . 65 \@ACM@badge@width: Added macro . 65 \@ACM@title@width: Added macro . 65 \@mktitle@i: Added processing badges 79 Made generic 79 \@mktitle@ii: Now this macro is obsolete 80

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