LaTeX 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 Machinery[1] is the world's largest educational and scientific computing society, which delivers resources that advance computing as a science and a profession. It was one of the early adopters of TeX for its typesetting.

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

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

This package uses only free TeX packages and fonts included in TeXLive, MikTeX 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.

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

2 User's guide

This class uses many commands and customizaton 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.

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[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 LaTeX 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 (TeXLive, MacTeX, MikTeX) of 2015 and later, so you probably have them installed. Just in case here is the list of these packages:

- *amscls*, http://www.ctan.org/pkg/amscls

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

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

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

\subtitle   Besides title, ACM classes allow a subtitle, set with the \subtitle{⟨*subtitle*⟩} macro.

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

\author   The basic commands are \author, \orcid (for the researchers registered with 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 over-lapping 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.

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

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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
Sonenallee 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, \afffiliation 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
Sonenallee 17
123456 Helm, Germany
```

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

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

\thanks   Like amsart (and unlike standard LaTeX), we allow \thanks only *outside* of the commands \title and \author. This command is obsolete and should *not* be used in most cases. Do not list your acknowledgments or grant sponsors here. Put this information in the acks environment (see Section 2.10).

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

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

You can *suppress* printing authors' addresses by setting them to an empty string: \authorsaddresses{}. Please note that authors' addresses are mandatory for journal articles.

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

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

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

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

```
\author{A. U. Thor}
\authornote{Both authors contributed equally to the paper}
...
\author{A. N. Other}
\authornotemark[1]
```

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

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

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

Note that \acmArticle is used not only for journals but also for some conference pro-
ceedings.

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

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

\acmPrice \quad 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 \quad 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 \quad 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_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`.

CCS Concepts and user-defined keywords are required for all articles over two pages in length, and are optional for one- and two-page articles (or abstracts).

`\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. This command must be placed in the preamble, before `\begin{document}`.

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 permssion 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. Putting `abstract` after `\maketitle` will trigger an error.

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

Table 3: Parameters for the \setcopyright command

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

Table 4: Settings for the \settopmatter command

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

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

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

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

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

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

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

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

The parameter printacmref specifies whether to print the ACM bibliographic entry (default), or not. Note that this entry is required for all articles over one page in length, and is optional for one-page articles (abstracts).

\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 $0.5$~V with most
  measurements between $0.2$~V and $0.8$~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 bibliograpy 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 typesetting 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/35

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
DGOV	Digital Government: Research and Practice
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

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

Abbreviation	Publication
JOCCH	ACM Journal on Computing and Cultural Heritage
PACMCGIT	Proceedings of the ACM on Computer Graphics and Interactive Techniques
PACMHCI	PACM on Human-Computer Interaction
PACMPL	PACM on Programming Languages
POMACS	PACM on Measurement and Analysis of Computing Systems
TAAS	ACM Transactions on Autonomous and Adaptive Systems
TACCESS	ACM Transactions on Accessible Computing
TACO	ACM Transactions on Architecture and Code Optimization
TALG	ACM Transactions on Algorithms
TALLIP	ACM Transactions on Asian and Low-Resource Language Information Processing
TAP	ACM Transactions on Applied Perception
TCPS	ACM Transactions on Cyber-Physical Systems
TDS	ACM Transactions on Data Science
TEAC	ACM Transactions on Economics and Computation
TECS	ACM Transactions on Embedded Computing Systems
TELO	ACM Transactions on Evolutionary Learning
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

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

Abbreviation	Publication
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
TQC	ACM Transactions on Quantum Computing
TRETS	ACM Transactions on Reconfigurable Technology and Systems
TSAS	ACM Transactions on Spatial Algorithms and Systems
TSC	ACM Transactions on Social Computing
TSLP	ACM Transactions on Speech and Language Processing
TWEB	ACM Transactions on the Web

Besides the publications listed in Table 5, there is a special "publication" type FACMP, a forthcoming ACM publication, reserved for new journals which are not assigned an ISSN yet.

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 [2020/02/08 v1.69 Typesetting articles for the Association for Computing Machinery]
```

And the driver code:

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

3.2 Preload hook

We preload `acmart-preload-hook`:

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

3.3 Options

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

```
29 \RequirePackage{xkeyval}
```

We use `xstring` to check whether user input is valid

```
30 \RequirePackage{xstring}
```

format   The possible formats

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

\if@ACM@screen   Whether we use screen mode

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

\if@ACM@urlbreakonhyphens

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

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

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

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

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

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

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

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

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

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

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

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

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

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

34

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

\if@ACM@anonymous   Whether we use anonymous mode

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

\if@ACM@timestamp   Whether we use timestamp mode

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

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

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

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

```
139 \def\ACM@fontsize{}
140 \DeclareOptionX{9pt}{\edef\ACM@fontsize{\CurrentOption}}
141 \DeclareOptionX{10pt}{\edef\ACM@fontsize{\CurrentOption}}
142 \DeclareOptionX{11pt}{\edef\ACM@fontsize{\CurrentOption}}
143 \DeclareOptionX{12pt}{\edef\ACM@fontsize{\CurrentOption}}

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

3.4 Setting switches

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

```
148 \newif\if@ACM@manuscript
```

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

```
149 \newif\if@ACM@journal
```

`\if@ACM@journal@bibstrip` Sometimes ACM wants a journal-like publication to have conference information in the bibstrip and vice versa, so we have an additional switch.

```
150 \newif\if@ACM@journal@bibstrip
```

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

```
151 \newif\if@ACM@sigchiamode
```

Setting up switches

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

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

3.5 Loading the base class and package

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

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

We need etoolbox for delayed code

```
214 \RequirePackage{etoolbox}
```

Booktabs is now the default

```
215 \RequirePackage{booktabs}
```

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

```
216 \RequirePackage{refcount}
217 \RequirePackage{totpages}
```

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

```
218 \RequirePackage{environ}
```

We use `setspace` for double spacing

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

We need `textcase` for better upcasing

```
223 \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.

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

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

\bibstyle@acmauthoryear   The default author-year format:

```
304 \newcommand{\bibstyle@acmauthoryear}{%
305   \setcitestyle{%
306     authoryear,%
307     open={[},close={]},citesep={;},%
```

39

```
308    aysep={},yysep={,},%
309    notesep={, }}}
```

The default numeric format:

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

The default is numeric:

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

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

40

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

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

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

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

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

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

\l@subsection   The spacing in amsart is too large

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

\l@subsubsection The spacing in amsart is too large

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

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

\@makefntext   We do not use indentation for footnotes

```
426 \def\@makefntext{\noindent\@makefnmark}
```

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

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

```
433    }%
434    \color@begingroup
435      \@makefntext{%
436        \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
437    \color@endgroup}}%
438 \fi
```

\@mpfootnotetext We want the footnotes in minipages centered:

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

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

```
451 \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}
```

And now, hyperref

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

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

Bibliography mangling.

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

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

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

Graphics and color.

```
516 \RequirePackage{graphicx}
517 \RequirePackage[prologue]{xcolor}
```

We define ACM colors according to [7]:

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

Author-draft mode

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

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

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

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

```
607 \or % siggraph
608 \or % sigplan
609 \or % sigchi
610 \or % sigchi-a
611 \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.

```
612 \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.

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

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

\footnoterule   Tschichold's rules:

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

\endminipage   We do not use footnote rules in minipages

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

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

```
634 \def\@textbottom{\vskip \z@ \@plus 1pt}
635 \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.

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

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

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

```
665 \newif\if@ACM@newfonts
666 \@ACM@newfontstrue
667 \IfFileExists{libertine.sty}{}{\ClassWarning{\@classname}{You do not
668     have the libertine package installed.  Please upgrade your
669     TeX}\@ACM@newfontsfalse}
670 \IfFileExists{zi4.sty}{}{\ClassWarning{\@classname}{You do not
```

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

We use Libertine throughout.

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

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

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

The SIGCHI extended abstracts are sans serif:

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

3.9   Image descriptions

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

```
693 \newif\if@Description@present
694 \@Description@presenttrue
```

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

```
695 \newif\if@undescribed@images
696 \@undescribed@imagesfalse
```

\Description   The Description macro right now just sets switches

```
697 \newcommand\Description[2][]{\global\@Description@presenttrue\ignorespaces}
```

The global warning

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

49

Hooks for figures and tables. We also patch `algorithm` and `algorithm*` in case somebody uses them.

```
700 \AtBeginEnvironment{figure}{\@Description@presentfalse
701   \let\@vspace\@vspace@orig
702   \let\@vspacer\@vspacer@orig}
703 \AtBeginEnvironment{figure*}{\@Description@presentfalse
704   \let\@vspace\@vspace@orig
705   \let\@vspacer\@vspacer@orig}
706 \AtEndEnvironment{figure}{\if@Description@present\else
707   \global\@undescribed@imagestrue
708   \ClassWarning{\@classname}{A possible image without description}\fi}
709 \AtEndEnvironment{figure*}{\if@Description@present\else
710   \global\@undescribed@imagestrue
711   \ClassWarning{\@classname}{A possible image without description}\fi}
712 \AtBeginEnvironment{table}{\let\@vspace\@vspace@orig
713   \let\@vspacer\@vspacer@orig}
714 \AtBeginEnvironment{table*}{\let\@vspace\@vspace@orig
715   \let\@vspacer\@vspacer@orig}
716 \AtBeginEnvironment{algorithm}{\let\@vspace\@vspace@orig
717   \let\@vspacer\@vspacer@orig}
718 \AtBeginEnvironment{algorithm*}{\let\@vspace\@vspace@orig
719   \let\@vspacer\@vspacer@orig}
720 \AtBeginEnvironment{lstlisting}{\let\@vspace\@vspace@orig
721   \let\@vspacer\@vspacer@orig}
722 \AtBeginEnvironment{lstlisting*}{\let\@vspace\@vspace@orig
723   \let\@vspacer\@vspacer@orig}
724
```

3.10 Floats

We use the `caption` package

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

```
743     \captionsetup{labelfont={bf},
744       textfont={normalfont}, labelsep=period, margin=\z@}
745   \or % sigchi
746     \captionsetup[figure]{labelfont={bf, small},
747       textfont={bf, small}}
748     \captionsetup[table]{labelfont={bf, small},
749       textfont={bf, small}}
750   \or % sigchi-a
751     \captionsetup[figure]{labelfont={bf, small},
752       textfont={bf, small}}
753     \captionsetup[table]{labelfont={bf, small},
754       textfont={bf, small}}
755   \fi
756 \fi
```

sidebar The sidebar environment:

```
757 \newfloat{sidebar}{}{sbar}
758 \floatname{sidebar}{Sidebar}
759 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}
```

\@sidebar The processing of the saved text

```
760 \long\def\@sidebar#1{\bgroup\let\@vspace\@vspace@orig
761   \let\@vspacer\@vspacer@orig\captionsetup{type=sidebar}%
762   \marginpar{\small#1}\egroup}
```

marginfigure The marginfigure environment:

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

\@marginfigure The processing of the saved text

```
764 \long\def\@marginfigure#1{\bgroup
765   \let\@vspace\@vspace@orig
766   \let\@vspacer\@vspacer@orig
767   \captionsetup{type=figure}%
768   \marginpar{\@Description@presentfalse\centering
769     \small#1\if@Description@present\else
770       \global\@undescribed@imagestrue
771       \ClassWarning{\@classname}{A possible image without description}
772     \fi}%
773   \egroup}
```

margintable The margintable environment:

```
774 \newenvironment{margintable}{\Collect@Body\@margintable}{}
```

\@margintable The processing of the saved text

```
775 \long\def\@margintable#1{\bgroup\let\@vspace\@vspace@orig
776   \let\@vspacer\@vspacer@orig\captionsetup{type=table}%
777   \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

```
778 \newdimen\fulltextwidth
779 \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)

```
780 \if@ACM@sigchiamode
781 \def\@dblfloat{\bgroup\let\@vspace\@vspace@orig
782   \let\@vspacer\@vspacer@orig\columnwidth=\fulltextwidth
783   \let\@endfloatbox\@endwidefloatbox
784   \def\@fpsadddefault{\def\@fps{tp}}%
785   \@float}
786 \fi
```

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

```
787 \if@ACM@sigchiamode
788 \def\end@dblfloat{%
789     \end@float\egroup}
790 \fi
```

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

```
791 \def\@endwidefloatbox{%
792   \par\vskip\z@skip
793   \@minipagefalse
794   \outer@nobreak
795   \egroup
796   \color@endbox
797   \global\setbox\@currbox=\vbox{\moveleft
798     \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
799   \wd\@currbox=\textwidth
800 }
```

3.11   Lists

```
801 \ifcase\ACM@format@nr
802 \relax % manuscript
803 \or % acmsmall
804 \or % acmlarge
805 \or % acmtog
806 \or % sigconf
807 \or % siggraph
808 \or % sigplan
809 \def\labelenumi{\theenumi.}
810 \def\labelenumii{\theenumii.}
811 \def\labelenumiii{\theenumiii.}
812 \def\labelenumiv{\theenumiv.}
813 \or % sigchi
814 \or % sigchi-a
815 \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`.

```
816 \newdimen\@ACM@labelwidth
817 \AtBeginDocument{%
818   \setlength\labelsep{4pt}
819   \setlength{\@ACM@labelwidth}{6.5pt}
820
821   %% First-level list: when beginning after the first line of an
822   %% indented paragraph or ending before an indented paragraph, labels
823   %% should not hang to the left of the preceding/following text.
824   \setlength\leftmargini{\z@}
825   \addtolength\leftmargini{\parindent}
826   \addtolength\leftmargini{2\labelsep}
827   \addtolength\leftmargini{\@ACM@labelwidth}
828
829   %% Second-level and higher lists.
830   \setlength\leftmarginii{\z@}
831   \addtolength\leftmarginii{0.5\labelsep}
832   \addtolength\leftmarginii{\@ACM@labelwidth}
833   \setlength\leftmarginiii{\leftmarginii}
834   \setlength\leftmarginiv{\leftmarginiii}
835   \setlength\leftmarginv{\leftmarginiv}
836   \setlength\leftmarginvi{\leftmarginv}
837   \@listi}
838 \newskip\listisep
839 \listisep\smallskipamount
840 \def\@listI{\leftmargin\leftmargini
841   \labelwidth\leftmargini \advance\labelwidth-\labelsep
842   \listparindent\z@
843   \topsep\listisep}
844 \let\@listi\@listI
845 \def\@listii{\leftmargin\leftmarginii
846   \labelwidth\leftmarginii \advance\labelwidth-\labelsep
847   \topsep\z@skip}
848 \def\@listiii{\leftmargin\leftmarginiii
849   \labelwidth\leftmarginiii \advance\labelwidth-\labelsep}
850 \def\@listiv{\leftmargin\leftmarginiv
851   \labelwidth\leftmarginiv \advance\labelwidth-\labelsep}
852 \def\@listv{\leftmargin\leftmarginv
853   \labelwidth\leftmarginv \advance\labelwidth-\labelsep}
854 \def\@listvi{\leftmargin\leftmarginvi
855   \labelwidth\leftmarginvi \advance\labelwidth-\labelsep}
```

\descriptionlabel   We do not use a colon by default like amsart does:

```
856 \renewcommand{\descriptionlabel}[1]{\upshape\bfseries #1}
```

\description Make the `description` environment indentation consistent with that of the `itemize` and `enumerate` environments.

```
857 \renewenvironment{description}{\list{}{%
858     \labelwidth\@ACM@labelwidth
859     \let\makelabel\descriptionlabel}%
860 }{
861   \endlist
862 }
863 \let\enddescription=\endlist % for efficiency
```

3.12 Top-matter data

\if@ACM@maketitle@typeset The switch to check whether `\maketitle` is already typeset. It is initally false, and setting top matter when it is true is wrong.

```
864 \newif\if@ACM@maketitle@typeset
865 \@ACM@maketitle@typesetfalse
```

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

```
866 \define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
867   CIE,%
868   CSUR,%
869   DGOV,%
870   DTRAP,%
871   HEALTH,%
872   IMWUT,%
873   JACM,%
874   JDIQ,%
875   JEA,%
876   JERIC,%
877   JETC,%
878   JOCCH,%
879   PACMCGIT,%
880   PACMHCI,%
881   PACMPL,%
882   POMACS,%
883   TAAS,%
884   TACCESS,%
885   TACO,%
886   TALG,%
887   TALLIP,%
888   TAP,%
889   TCPS,%
890   TDS,%
891   TEAC,%
892   TECS,%
893   TELO,%
894   THRI,%
895   TIIS,%
896   TIOT,%
```

```
897    TISSEC,%
898    TIST,%
899    TKDD,%
900    TMIS,%
901    TOCE,%
902    TOCHI,%
903    TOCL,%
904    TOCS,%
905    TOCT,%
906    TODAES,%
907    TODS,%
908    TOG,%
909    TOIS,%
910    TOIT,%
911    TOMACS,%
912    TOMM,%
913    TOMPECS,%
914    TOMS,%
915    TOPC,%
916    TOPS,%
917    TOPLAS,%
918    TOS,%
919    TOSEM,%
920    TOSN,%
921    TQC,%
922    TRETS,%
923    TSAS,%
924    TSC,%
925    TSLP,%
926    TWEB,%
927    FACMP%
928 }{%
929 \ifcase\@journalCode@nr
930 \relax % CIE
931    \def\@journalName{ACM Computers in Entertainment}%
932    \def\@journalNameShort{ACM Comput. Entertain.}%
933    \def\@permissionCodeOne{1544-3574}%
934 \or % CSUR
935    \def\@journalName{ACM Computing Surveys}%
936    \def\@journalNameShort{ACM Comput. Surv.}%
937    \def\@permissionCodeOne{0360-0300}%
938 \or % DGOV
939    \def\@journalName{Digital Government: Research and Practice}%
940    \def\@journalNameShort{Digit. Gov. Res. Pract.}%
941    \def\@permissionCodeOne{2639-0175}%
942 \or % DTRAP
943    \def\@journalName{Digital Threats: Research and Practice}%
944    \def\@journalNameShort{Digit. Threat. Res. Pract.}%
945    \def\@permissionCodeOne{2576-5337}%
946 \or % HEALTH
```

```
947  \def\@journalName{ACM Transactions on Computing for Healthcare}%
948  \def\@journalNameShort{ACM Trans. Comput. Healthcare}%
949  \def\@permissionCodeOne{2637-8051}%
950 \or % IMWUT
951  \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
952    Wearable and Ubiquitous Technologies}%
953  \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
954  \def\@permissionCodeOne{2474-9567}%
955  \@ACM@screentrue
956  \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
957 \or % JACM
958  \def\@journalName{Journal of the ACM}%
959  \def\@journalNameShort{J. ACM}%
960  \def\@permissionCodeOne{0004-5411}%
961 \or % JDIQ
962  \def\@journalName{ACM Journal of Data and Information Quality}%
963  \def\@journalNameShort{ACM J. Data Inform. Quality}%
964  \def\@permissionCodeOne{1936-1955}%
965 \or % JEA
966  \def\@journalName{ACM Journal of Experimental Algorithmics}%
967  \def\@journalNameShort{ACM J. Exp. Algor.}%
968  \def\@permissionCodeOne{1084-6654}%
969 \or % JERIC
970  \def\@journalName{ACM Journal of Educational Resources in Computing}%
971  \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
972  \def\@permissionCodeOne{1073-0516}%
973 \or % JETC
974  \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
975  \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
976  \def\@permissionCodeOne{1550-4832}%
977 \or % JOCCH
978  \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
979  \def\@journalNameShort{ACM J. Comput. Cult. Herit.}%
980 \or % PACMCGIT
981  \def\@journalName{Proceedings of the ACM on Computer Graphics and Interactive Techniques}%
982  \def\@journalNameShort{Proc. ACM Comput. Graph. Interact. Tech.}%
983  \def\@permissionCodeOne{2577-6193}%
984  \@ACM@screentrue
985  \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
986 \or % PACMHCI
987  \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
988  \def\@journalNameShort{Proc. ACM Hum.-Comput. Interact.}%
989  \def\@permissionCodeOne{2573-0142}%
990  \@ACM@screentrue
991  \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
992 \or % PACMPL
993  \def\@journalName{Proceedings of the ACM on Programming Languages}%
994  \def\@journalNameShort{Proc. ACM Program. Lang.}%
995  \def\@permissionCodeOne{2475-1421}%
996  \@ACM@screentrue
```

```
997    \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
998 \or % POMACS
999    \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
1000   \def\@journalNameShort{Proc. ACM Meas. Anal. Comput. Syst.}%
1001   \def\@permissionCodeOne{2476-1249}%
1002   \@ACM@screentrue
1003   \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1004 \or % TAAS
1005   \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
1006   \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
1007   \def\@permissionCodeOne{1556-4665}%
1008 \or % TACCESS
1009   \def\@journalName{ACM Transactions on Accessible Computing}%
1010   \def\@journalNameShort{ACM Trans. Access. Comput.}%
1011   \def\@permissionCodeOne{1936-7228}%
1012 \or % TACO
1013   \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
1014   \def\@journalNameShort{ACM Trans. Arch. Code Optim.}%
1015 \or % TALG
1016   \def\@journalName{ACM Transactions on Algorithms}%
1017   \def\@journalNameShort{ACM Trans. Algor.}%
1018   \def\@permissionCodeOne{1549-6325}%
1019 \or % TALLIP
1020   \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
1021   \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
1022   \def\@permissionCodeOne{2375-4699}%
1023 \or % TAP
1024   \def\@journalName{ACM Transactions on Applied Perception}%
1025 \or % TCPS
1026   \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
1027 \or % TDS
1028   \def\@journalName{ACM Transactions on Data Science}%
1029   \def\@journalNameShort{ACM Trans. Data Sci.}%
1030   \def\@permissionCodeOne{2577-3224}%
1031 \or % TEAC
1032   \def\@journalName{ACM Transactions on Economics and Computation}%
1033 \or % TECS
1034   \def\@journalName{ACM Transactions on Embedded Computing Systems}%
1035   \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
1036   \def\@permissionCodeOne{1539-9087}%
1037 \or % TELO
1038   \def\@journalName{ACM Transactions on Evolutionary Learning}%
1039   \def\@journalNameShort{ACM Trans. Evol. Learn.}%
1040   \def\@permissionCodeOne{2688-3007}%
1041 \or % THRI
1042   \def\@journalName{ACM Transactions on Human-Robot Interaction}%
1043   \def\@journalNameShort{ACM Trans. Hum.-Robot Interact.}%
1044   \def\@permissionCodeOne{2573-9522}%
1045 \or % TIIS
1046   \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
```

```
1047    \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
1048    \def\@permissionCodeOne{2160-6455}%
1049 \or % TIOT
1050    \def\@journalName{ACM Transactions on Internet of Things}%
1051    \def\@journalNameShort{ACM Trans. Internet Things}%
1052    \def\@permissionCodeOne{2577-6207}%
1053 \or % TISSEC
1054    \def\@journalName{ACM Transactions on Information and System Security}%
1055    \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
1056    \def\@permissionCodeOne{1094-9224}%
1057 \or % TIST
1058    \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
1059    \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
1060    \def\@permissionCodeOne{2157-6904}%
1061 \or % TKDD
1062    \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
1063    \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
1064    \def\@permissionCodeOne{1556-4681}%
1065 \or % TMIS
1066    \def\@journalName{ACM Transactions on Management Information Systems}%
1067    \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
1068    \def\@permissionCodeOne{2158-656X}%
1069 \or % TOCE
1070    \def\@journalName{ACM Transactions on Computing Education}%
1071    \def\@journalNameShort{ACM Trans. Comput. Educ.}%
1072    \def\@permissionCodeOne{1946-6226}%
1073 \or % TOCHI
1074    \def\@journalName{ACM Transactions on Computer-Human Interaction}%
1075    \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
1076    \def\@permissionCodeOne{1073-0516}%
1077 \or % TOCL
1078    \def\@journalName{ACM Transactions on Computational Logic}%
1079    \def\@journalNameShort{ACM Trans. Comput. Logic}%
1080    \def\@permissionCodeOne{1529-3785}%
1081 \or % TOCS
1082    \def\@journalName{ACM Transactions on Computer Systems}%
1083    \def\@journalNameShort{ACM Trans. Comput. Syst.}%
1084    \def\@permissionCodeOne{0734-2071}%
1085 \or % TOCT
1086    \def\@journalName{ACM Transactions on Computation Theory}%
1087    \def\@journalNameShort{ACM Trans. Comput. Theory}%
1088    \def\@permissionCodeOne{1942-3454}%
1089 \or % TODAES
1090    \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
1091    \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
1092    \def\@permissionCodeOne{1084-4309}%
1093 \or % TODS
1094    \def\@journalName{ACM Transactions on Database Systems}%
1095    \def\@journalNameShort{ACM Trans. Datab. Syst.}%
1096    \def\@permissionCodeOne{0362-5915}%
```

```
1097 \or % TOG
1098   \def\@journalName{ACM Transactions on Graphics}%
1099   \def\@journalNameShort{ACM Trans. Graph.}%
1100   \def\@permissionCodeOne{0730-0301}
1101 \or % TOIS
1102   \def\@journalName{ACM Transactions on Information Systems}%
1103   \def\@permissionCodeOne{1046-8188}%
1104 \or % TOIT
1105   \def\@journalName{ACM Transactions on Internet Technology}%
1106   \def\@journalNameShort{ACM Trans. Internet Technol.}%
1107   \def\@permissionCodeOne{1533-5399}%
1108 \or % TOMACS
1109   \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
1110   \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
1111 \or % TOMM
1112   \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
1113   \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
1114   \def\@permissionCodeOne{1551-6857}%
1115   \def\@permissionCodeTwo{0100}%
1116 \or % TOMPECS
1117   \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
1118   \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
1119   \def\@permissionCodeOne{2376-3639}%
1120 \or % TOMS
1121   \def\@journalName{ACM Transactions on Mathematical Software}%
1122   \def\@journalNameShort{ACM Trans. Math. Softw.}%
1123   \def\@permissionCodeOne{0098-3500}%
1124 \or % TOPC
1125   \def\@journalName{ACM Transactions on Parallel Computing}%
1126   \def\@journalNameShort{ACM Trans. Parallel Comput.}%
1127   \def\@permissionCodeOne{1539-9087}%
1128 \or % TOPS
1129   \def\@journalName{ACM Transactions on Privacy and Security}%
1130   \def\@journalNameShort{ACM Trans. Priv. Sec.}%
1131   \def\@permissionCodeOne{2471-2566}%
1132 \or % TOPLAS
1133   \def\@journalName{ACM Transactions on Programming Languages and Systems}%
1134   \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
1135   \def\@permissionCodeOne{0164-0925}%
1136 \or % TOS
1137   \def\@journalName{ACM Transactions on Storage}%
1138   \def\@journalNameShort{ACM Trans. Storage}%
1139   \def\@permissionCodeOne{1553-3077}%
1140 \or % TOSEM
1141   \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
1142   \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
1143   \def\@permissionCodeOne{1049-331X}%
1144 \or % TOSN
1145   \def\@journalName{ACM Transactions on Sensor Networks}%
1146   \def\@journalNameShort{ACM Trans. Sensor Netw.}%
```

```
1147    \def\@permissionCodeOne{1550-4859}%
1148 \or % TQC
1149    \def\@journalName{ACM Transactions on Quantum Computing}%
1150    \def\@journalNameShort{ACM Trans. Quantum Comput.}%
1151    \def\@permissionCodeOne{2643-6817}%
1152 \or % TRETS
1153    \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
1154    \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
1155    \def\@permissionCodeOne{1936-7406}%
1156 \or % TSAS
1157    \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
1158    \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
1159    \def\@permissionCodeOne{2374-0353}%
1160 \or % TSC
1161    \def\@journalName{ACM Transactions on Social Computing}%
1162    \def\@journalNameShort{ACM Trans. Soc. Comput.}%
1163    \def\@permissionCodeOne{2469-7818}%
1164 \or % TSLP
1165    \def\@journalName{ACM Transactions on Speech and Language Processing}%
1166    \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
1167    \def\@permissionCodeOne{1550-4875}%
1168 \or % TWEB
1169    \def\@journalName{ACM Transactions on the Web}%
1170    \def\@journalNameShort{ACM Trans. Web}%
1171    \def\@permissionCodeOne{1559-1131}%
1172 \else % FACMP, a dummy journal
1173    \def\@journalName{Forthcoming ACM Publication}%
1174    \def\@journalNameShort{ACM Forthcoming}%
1175    \def\@permissionCodeOne{XXXX-XXXX}%
1176 \fi
1177 \ClassInfo{\@classname}{Using journal code \@journalCode}%
1178 }{%
1179    \ClassError{\@classname}{Incorrect journal #1}%
1180 }%
```

\acmJournal   And the syntactic sugar around it

```
1181 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}%
1182    \global\@ACM@journal@bibstriptrue}
```

The defaults:

```
1183 \def\@journalCode@nr{0}
1184 \def\@journalName{}%
1185 \def\@journalNameShort{\@journalName}%
1186 \def\@permissionCodeOne{XXXX-XXXX}%
1187 \def\@permissionCodeTwo{}%
```

\acmConference   This is the conference command

```
1188 \newcommand\acmConference[4][]{%
1189    \gdef\acmConference@shortname{#1}%
```

60

```
1190    \gdef\acmConference@name{#2}%
1191    \gdef\acmConference@date{#3}%
1192    \gdef\acmConference@venue{#4}%
1193    \ifx\acmConference@shortname\@empty
1194      \gdef\acmConference@shortname{#2}%
1195    \fi
1196    \global\@ACM@journal@bibstripfalse
1197 }
1198 \if@ACM@journal\else
1199 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
1200   DC, USA}%
1201 \fi
```

\acmBooktitle   The book title of the conference:
\@acmBooktitle
```
1202 \def\acmBooktitle#1{\gdef\@acmBooktitle{#1}}
1203 \acmBooktitle{Proceedings of \acmConference@name
1204        \ifx\acmConference@name\acmConference@shortname\else
1205          \ (\acmConference@shortname)\fi}
```

\@editorsAbbrev   How to abbreviate editors
```
1206 \def\@editorsAbbrev{(Ed.)}
```

\@acmEditors   The list of editors
```
1207 \def\@acmEditors{}
```

\editor   Add a new editor to the list
```
1208 \def\editor#1{\ifx\@acmEditors\@empty
1209    \gdef\@acmEditors{#1}%
1210  \else
1211    \gdef\@editorsAbbrev{(Eds.)}%
1212    \g@addto@macro\@acmEditors{\and#1}%
1213 \fi}
```

\subtitle   The subtitle macro
```
1214 \def\subtitle#1{\def\@subtitle{#1}}
1215 \subtitle{}
```

\num@authorgroups   The total number of "groups". Each group is several authors with the same affiliations(s)
```
1216 \newcount\num@authorgroups
1217 \num@authorgroups=0\relax
```

\num@authors   The total number of authors
```
1218 \newcount\num@authors
1219 \num@authors=0\relax
```

\if@insideauthorgroup   Whether we are continuing an author group
```
1220 \newif\if@insideauthorgroup
1221 \@insideauthorgroupfalse
```

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

```
1222 \renewcommand\author[2][]{%
1223 \IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several
1224     authors in the same \string\author\space macro!}}{}%
1225 \global\advance\num@authors by 1\relax
1226 \if@insideauthorgroup\else
1227   \global\advance\num@authorgroups by 1\relax
1228   \global\@insideauthorgrouptrue
1229 \fi
1230 \ifx\addresses\@empty
1231   \if@ACM@anonymous
1232     \gdef\addresses{\@author{Anonymous Author(s)%
1233       \ifx\@acmSubmissionID\@empty\else\\Submission Id:
1234         \@acmSubmissionID\fi}}%
1235     \gdef\authors{Anonymous Author(s)}%
1236   \else
1237     \gdef\addresses{\@author{#2}}%
1238     \gdef\authors{#2}%
1239   \fi
1240 \else
1241   \if@ACM@anonymous\else
1242     \g@addto@macro\addresses{\and\@author{#2}}%
1243     \g@addto@macro\authors{\and#2}%
1244   \fi
1245 \fi
1246 \if@ACM@anonymous
1247   \ifx\shortauthors\@empty
1248     \gdef\shortauthors{Anon.
1249       \ifx\@acmSubmissionID\@empty\else Submission Id:
1250       \@acmSubmissionID\fi}%
1251   \fi
1252 \else
1253   \def\@tempa{#1}%
1254   \ifx\@tempa\@empty
1255     \ifx\shortauthors\@empty
1256       \gdef\shortauthors{#2}%
1257     \else
1258       \g@addto@macro\shortauthors{\and#2}%
1259     \fi
1260   \else
1261     \ifx\shortauthors\@empty
1262       \gdef\shortauthors{#1}%
1263     \else
1264       \g@addto@macro\shortauthors{\and#1}%
1265     \fi
1266   \fi
1267 \fi}
```

\affiliation   The macro \affiliation mimics \address from amsart. Note that it has an optional

argument, which we use differently from amsart.

```
1268 \newcommand{\affiliation}[2][]{%
1269   \global\@insideauthorgroupfalse
1270   \if@ACM@anonymous\else
1271     \g@addto@macro\addresses{\affiliation{#1}{#2}}%
1272   \fi}
```

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

```
1273 \define@boolkey+{@ACM@affiliation@}[@ACM@affiliation@]{obeypunctuation}%
1274 [true]{}{\ClassError{\@classname}{The option obeypunctuation can be either true or false}}
```

\additionalaffiliation Additional affiliations go to footnotes

```
1275 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}
```

\@additionalaffiliation Process \additionalaffiliation inside \authornote

```
1276 \def\@additionalaffiliation#1{\bgroup
1277   \def\position##1{\ignorespaces}%
1278   \def\institution##1{##1\ignorespaces}%
1279   \def\department{\@ifnextchar[{\@department}{\@department[]}}%
1280   \def\@department[##1]##2{\unskip, ##2\ignorespaces}%
1281   \let\streetaddress\position
1282   \let\city\position
1283   \let\state\position
1284   \let\postcode\position
1285   \let\country\position
1286   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.

```
1287 \renewcommand{\email}[2][]{%
1288   \IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several
1289     addresses in the same \string\email\space macro!}}{}%
1290   \if@ACM@anonymous\else
1291     \g@addto@macro\addresses{\email{#1}{#2}}%
1292   \fi}
```

\orcid Right now we do not typeset ORCIDs

```
1293 \def\orcid#1{\unskip\ignorespaces}
```

\authorsaddresses Setting up authors' addresses

```
1294 \def\authorsaddresses#1{\def\@authorsaddresses{#1}}
1295 \authorsaddresses{\@mkauthorsaddresses}
```

\@titlenotes The title notes

```
1296 \def\@titlenotes{}
```

\titlenote Adding a note to the title

```
1297 \def\titlenote#1{%
1298   \g@addto@macro\@title{\footnotemark}%
1299   \if@ACM@anonymous
1300     \g@addto@macro\@titlenotes{%
1301       \stepcounter{footnote}\footnotetext{Title note}}%
1302   \else
1303     \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
1304   \fi}
```

\@subtitlenotes The subtitle notes

```
1305 \def\@subtitlenotes{}
```

\subtitlenote Adding a note to the subtitle

```
1306 \def\subtitlenote#1{%
1307   \g@addto@macro\@subtitle{\footnotemark}%
1308   \if@ACM@anonymous
1309     \g@addto@macro\@subtitlenotes{%
1310       \stepcounter{footnote}\footnotetext{Subtitle note}}%
1311   \else
1312     \g@addto@macro\@subtitlenotes{%
1313       \stepcounter{footnote}\footnotetext{#1}}%
1314   \fi}
```

\@authornotes The author notes

```
1315 \def\@authornotes{}
```

\authornote Adding a note to the author

```
1316 \def\authornote#1{%
1317   \if@ACM@anonymous\else
1318     \g@addto@macro\addresses{\@authornotemark}%
1319     \g@addto@macro\@authornotes{%
1320       \stepcounter{footnote}\footnotetext{#1}}%
1321   \fi}
```

\authornotemark Adding a footnote mark to the authors

```
1322 \newcommand\authornotemark[1][\relax]{%
1323   \ifx#1\relax\relax\relax
1324     \g@addto@macro\addresses{\@authornotemark}%
1325   \else
1326     \g@addto@macro\addresses{\@@authornotemark{#1}}%
1327   \fi}
```

\acmVolume The current volume

```
1328 \def\acmVolume#1{\def\@acmVolume{#1}}
1329 \acmVolume{1}
```

\acmNumber The current number

```
1330 \def\acmNumber#1{\def\@acmNumber{#1}}
1331 \acmNumber{1}
```

\acmArticle   The current article

```
1332 \def\acmArticle#1{\def\@acmArticle{#1}}
1333 \acmArticle{}
```

\acmArticleSeq   The sequence number

```
1334 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
1335 \acmArticleSeq{\@acmArticle}
```

\acmYear   The current year

```
1336 \def\acmYear#1{\def\@acmYear{#1}}
1337 \acmYear{\the\year}
```

\acmMonth   The current month

```
1338 \def\acmMonth#1{\def\@acmMonth{#1}}
1339 \acmMonth{\the\month}
```

\@acmPubDate   The publication date

```
1340 \def\@acmPubDate{\ifcase\@acmMonth\or
1341   January\or February\or March\or April\or May\or June\or
1342   July\or August\or September\or October\or November\or
1343   December\fi~\@acmYear}
```

\acmPrice   The price

```
1344 \def\acmPrice#1{\def\@acmPrice{#1}}
1345 \acmPrice{15.00}
```

\acmSubmissionID   The submission ID

```
1346 \def\acmSubmissionID#1{\def\@acmSubmissionID{#1}}
1347 \acmSubmissionID{}
```

\acmISBN   The book ISBN

```
1348 \def\acmISBN#1{\def\@acmISBN{#1}}
1349 \acmISBN{978-x-xxxx-xxxx-x/YY/MM}
```

\acmDOI   The paper DOI

```
1350 \def\acmDOI#1{\def\@acmDOI{#1}}
1351 \acmDOI{10.1145/nnnnnnn.nnnnnnn}
```

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

```
1352 \newif\if@ACM@badge
1353 \@ACM@badgefalse
```

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

```
1354 \newlength\@ACM@badge@width
1355 \setlength\@ACM@badge@width{5pc}
```

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

```
1356 \newlength\@ACM@title@width
```

65

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

```
1357 \newlength\@ACM@badge@skip
1358 \setlength\@ACM@badge@skip{1pc}
```

\acmBadgeR Setting the right badge

```
1359 \newcommand\acmBadgeR[2][]{\@ACM@badgetrue
1360   \def\@acmBadgeR@url{#1}%
1361   \def\@acmBadgeR@image{#2}}
1362 \def\@acmBadgeR@url{}
1363 \def\@acmBadgeR@image{}
```

\acmBadgeL Setting the left badge

```
1364 \newcommand\acmBadgeL[2][]{\@ACM@badgetrue
1365   \def\@acmBadgeL@url{#1}%
1366   \def\@acmBadgeL@image{#2}}
1367 \def\@acmBadgeL@url{}
1368 \def\@acmBadgeL@image{}
```

\startPage The start page of the paper

```
1369 \def\startPage#1{\def\@startPage{#1}}
1370 \startPage{}
```

\terms Terms are obsolete. We use CCS now.

```
1371 \def\terms#1{\ClassWarning{\@classname}{The command \string\terms{} is
1372   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.

```
1373 \def\keywords#1{\def\@keywords{#1}}
1374 \let\@keywords\@empty
```

```
1375 \AtEndDocument{\if@ACM@nonacm\else\ifx\@keywords\@empty
1376   \ifnum\getrefnumber{TotPages}>2\relax
1377   \ClassWarningNoLine{\@classname}{ACM keywords are mandatory
1378     for papers over two pages}%
1379   \fi\fi\fi}
```

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

```
1380 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}
```

\@saveabstract And saving the abstract

```
1381 \long\def\@saveabstract#1{\if@ACM@maketitle@typeset
1382   \ClassError{\@classname}{Abstract must be defined before maketitle
1383     command. Please move it!}\fi
1384   \long\gdef\@abstract{#1}}
1385 \@saveabstract{}
```

66

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

```
1386 \long\def\@lempty{}
```

\if@ACM@printccs Whether to print CCS

```
1387 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
1388  \if@ACM@printccs
1389    \ClassInfo{\@classname}{Printing CCS}%
1390  \else
1391    \ClassInfo{\@classname}{Suppressing CCS}%
1392  \fi}{\ClassError{\@classname}{The option printccs can be either true or false}}
```

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

```
1393 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
1394  \if@ACM@printacmref
1395    \ClassInfo{\@classname}{Printing bibformat}%
1396  \else
1397    \ClassInfo{\@classname}{Suppressing bibformat}%
1398  \fi}{\ClassError{\@classname}{The option printacmref can be either true or false}}
```

```
1399 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@printacmref\else
1400  \ifnum\getrefnumber{TotPages}>1\relax
1401  \ClassWarningNoLine{\@classname}{ACM reference format is mandatory
1402    for papers over one page}%
1403  \fi\fi\fi}
```

\if@ACM@printfolios Whether to print folios

```
1404 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
1405  \if@ACM@printfolios
1406    \ClassInfo{\@classname}{Printing folios}%
1407  \else
1408    \ClassInfo{\@classname}{Suppressing folios}%
1409  \fi}{\ClassError{\@classname}{The option printfolios can be either true or false}}
```

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

```
1410 \define@cmdkey{@ACM@topmatter@}[@ACM@]{authorsperrow}[0]{%
1411  \IfInteger{#1}{\ClassInfo{\@classname}{Setting authorsperrow to
1412    #1}}{\ClassWarning{\@classname}{The parameter authorsperrow must be
1413    numerical. Ignoring the input #1}\gdef\@ACM@authorsperrow{0}}}
```

\settopmatter The usual syntactic sugar

```
1414 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}
```

Now the settings

```
1415 \settopmatter{printccs=true, printacmref=true}
1416 \if@ACM@manuscript
1417  \settopmatter{printfolios=true}
1418 \else
1419  \if@ACM@journal
1420    \settopmatter{printfolios=true}
```

```
1421    \else
1422      \settopmatter{printfolios=false}
1423    \fi
1424 \fi
1425 \settopmatter{authorsperrow=0}
```

\@received   The container for the paper history

```
1426 \def\@received{}
```

\received   The \received command

```
1427 \newcommand\received[2][]{\def\@tempa{#1}%
1428   \ifx\@tempa\@empty
1429     \ifx\@received\@empty
1430       \gdef\@received{Received #2}%
1431     \else
1432       \g@addto@macro{\@received}{; revised #2}%
1433     \fi
1434   \else
1435     \ifx\@received\@empty
1436       \gdef\@received{#1 #2}%
1437     \else
1438       \g@addto@macro{\@received}{; #1 #2}%
1439     \fi
1440   \fi}
1441 \AtEndDocument{%
1442   \ifx\@received\@empty\else
1443     \par\bigskip\noindent\small\normalfont\@received\par
1444   \fi}
```

3.13 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```
1445 \RequirePackage{comment}
1446 \excludecomment{CCSXML}
```

\@concepts   This is the storage macro and counter for concepts

```
1447 \let\@concepts\@empty
1448 \newcounter{@concepts}
```

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

```
1449 \newcommand\ccsdesc[2][100]{%
1450   \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!

```
1451 \def\textrightarrow{$\rightarrow$}
1452 \def\ccsdesc@parse#1~#2~#3~{%
1453   \stepcounter{@concepts}%
```

```
1454  \expandafter\ifx\csname CCS@General@#2\endcsname\relax
1455    \expandafter\gdef\csname CCS@General@#2\endcsname{\textbullet\
1456      \textbf{#2}}%
1457    \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{; }%
1458    \expandafter\gdef\csname CCS@Specific@#2\endcsname{}%
1459  \g@addto@macro{\@concepts}{\csname CCS@General@#2\endcsname
1460    \csname CCS@Punctuation@#2\endcsname
1461    \csname CCS@Specific@#2\endcsname}%
1462  \fi
1463  \ifx#3\relax\relax\else
1464    \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{
1465      \textrightarrow\ }%
1466  \expandafter\g@addto@macro\expandafter{\csname CCS@Specific@#2\endcsname}{%
1467    \addtocounter{@concepts}{-1}%
1468    \ifnum#1>499\textbf{#3}\else
1469    \ifnum#1>299\textit{#3}\else
1470    #3\fi\fi\ifnum\value{@concepts}=0.\else; \fi}%
1471  \fi
1472 \ccsdesc@parse@finish}

1473 \AtEndDocument{\if@ACM@nonacm\else\ifx\@concepts\@empty\relax
1474  \ifnum\getrefnumber{TotPages}>2\relax
1475  \ClassWarningNoLine{\@classname}{CCS concepts are mandatory
1476    for papers over two pages}%
1477  \fi\fi\fi}
```

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

```
1478 \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

```
1479 \newif\if@printcopyright
1480 \@printcopyrighttrue
```

\if@printpermission   Whether to print the permission block

```
1481 \newif\if@printpermission
1482 \@printpermissiontrue
```

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

```
1483 \newif\if@acmowned
1484 \@acmownedtrue
```

   Keys:

```
1485 \define@choicekey*{ACM@}{acmcopyrightmode}[%
1486  \acm@copyrightinput\acm@copyrightmode]{none,%
1487    acmcopyright,acmlicensed,rightsretained,%
```

```
1488    usgov,usgovmixed,cagov,cagovmixed,licensedusgovmixed,%
1489    licensedcagov,licensedcagovmixed,othergov,licensedothergov,%
1490    iw3c2w3,iw3c2w3g}{%
1491 \@printpermissiontrue
1492 \@printcopyrighttrue
1493 \@acmownedtrue
1494 \ifnum\acm@copyrightmode=0\relax % none
1495  \@printpermissionfalse
1496  \@printcopyrightfalse
1497  \@acmownedfalse
1498 \fi
1499 \ifnum\acm@copyrightmode=2\relax % acmlicensed
1500  \@acmownedfalse
1501 \fi
1502 \ifnum\acm@copyrightmode=3\relax % rightsretained
1503  \@acmownedfalse
1504  \AtBeginDocument{\acmPrice{}}%
1505 \fi
1506 \ifnum\acm@copyrightmode=4\relax % usgov
1507  \@printpermissiontrue
1508  \@printcopyrightfalse
1509  \@acmownedfalse
1510  \AtBeginDocument{\acmPrice{}}%
1511 \fi
1512 \ifnum\acm@copyrightmode=6\relax % cagov
1513  \@acmownedfalse
1514 \fi
1515 \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1516  \@acmownedfalse
1517 \fi
1518 \ifnum\acm@copyrightmode=9\relax % licensedcagov
1519  \@acmownedfalse
1520 \fi
1521 \ifnum\acm@copyrightmode=10\relax % licensedcagovmixed
1522  \@acmownedfalse
1523 \fi
1524 \ifnum\acm@copyrightmode=11\relax % othergov
1525  \@acmownedtrue
1526 \fi
1527 \ifnum\acm@copyrightmode=12\relax % licensedothergov
1528  \@acmownedfalse
1529 \fi
1530 \ifnum\acm@copyrightmode=13\relax % iw3c2w3
1531  \@acmownedfalse
1532  \AtBeginDocument{\acmPrice{}}%
1533 \fi
1534 \ifnum\acm@copyrightmode=14\relax % iw3c2w3g
1535  \@acmownedfalse
1536  \AtBeginDocument{\acmPrice{}}%
1537 \fi}
```

\setcopyright   This is the syntactic sugar around setting keys.

```
1538 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
1539 \setcopyright{acmcopyright}
```

\@copyrightowner   Here is the owner of the copyright

```
1540 \def\@copyrightowner{%
1541   \ifcase\acm@copyrightmode\relax % none
1542   \or % acmcopyright
1543   Association for Computing Machinery.
1544   \or % acmlicensed
1545   Copyright held by the owner/author(s). Publication rights licensed to
1546   ACM\@.
1547   \or % rightsretained
1548   Copyright held by the owner/author(s).
1549   \or % usgov
1550   \or % usgovmixed
1551   Association for Computing Machinery.
1552   \or % cagov
1553   Crown in Right of Canada.
1554   \or %cagovmixed
1555   Association for Computing Machinery.
1556   \or %licensedusgovmixed
1557   Copyright held by the owner/author(s). Publication rights licensed to
1558   ACM\@.
1559   \or % licensedcagov
1560   Crown in Right of Canada. Publication rights licensed to
1561   ACM\@.
1562   \or %licensedcagovmixed
1563   Copyright held by the owner/author(s). Publication rights licensed to
1564   ACM\@.
1565   \or % othergov
1566   Association for Computing Machinery.
1567   \or % licensedothergov
1568   Copyright held by the owner/author(s). Publication rights licensed to
1569   ACM\@.
1570   \or % ic2w3www
1571   IW3C2 (International World Wide Web Conference Committee), published
1572   under Creative Commons CC-BY~4.0 License.
1573   \or % ic2w3wwwgoogle
1574   IW3C2 (International World Wide Web Conference Committee), published
1575   under Creative Commons CC-BY-NC-ND~4.0 License.
1576   \fi}
```

\@formatdoi   Print a clickable DOI

```
1577 \def\@formatdoi#1{\url{https://doi.org/#1}}
```

\@copyrightpermission   The canned permission block.

```
1578 \def\@copyrightpermission{%
1579   \ifcase\acm@copyrightmode\relax % none
```

```
1580  \or % acmcopyright
1581  Permission to make digital or hard copies of all or part of this
1582  work for personal or classroom use is granted without fee provided
1583  that copies are not made or distributed for profit or commercial
1584  advantage and that copies bear this notice and the full citation on
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1592  Permission to make digital or hard copies of all or part of this
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1595  advantage and that copies bear this notice and the full citation on
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1597  others than the author(s) must be honored. Abstracting with credit
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1599  or to  redistribute to lists, requires prior specific permission
1600  and\hspace*{.5pt}/or  a fee. Request permissions from
1601  permissions@acm.org.
1602  \or % rightsretained
1603  Permission to make digital or hard copies of part or all of this work
1604  for personal or classroom use is granted without fee provided that
1605  copies are not made or distributed for profit or commercial advantage
1606  and that copies bear this notice and the full citation on the first
1607  page. Copyrights for third-party components of this work must be
1608  honored. For all other uses, contact the
1609  owner\hspace*{.5pt}/author(s).
1610  \or % usgov
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1614  given and the authors and agency are clearly identified as its
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1622  \or % cagov
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```

```
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1636  \or % cagovmixed
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1664    on the first page.  Copyrights for components of this work owned by
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1685    or affiliate of a national government. As such, the Government
1686    retains a nonexclusive, royalty-free right to publish or reproduce
1687    this article, or to allow others to do so, for Government purposes
1688    only.
1689 \or % iw3c2w3
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1691    International (CC-BY~4.0) license. Authors reserve their rights to
1692    disseminate the work on their personal and corporate Web sites with
1693    the appropriate attribution.
1694 \or % iw3c2w3g
1695    This paper is published under the Creative Commons
1696    Attribution-NonCommercial-NoDerivs~4.0 International
1697    (CC-BY-NC-ND~4.0) license. Authors reserve their rights to
1698    disseminate the work on their personal and corporate Web sites with
1699    the appropriate attribution.
1700 \fi}
```

\copyrightyear By default, the copyright year is the same as \acmYear, but one can override this:

```
1701 \def\copyrightyear#1{\def\@copyrightyear{#1}}
1702 \copyrightyear{\@acmYear}
```

\@teaserfigures The teaser figures container

```
1703 \def\@teaserfigures{}
```

teaserfigure The teaser figure

```
1704 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}
```

\@saveteaser Saving the teaser

```
1705 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}
```

\thanks We redefine amsart \thanks so the anonymous key works

```
1706 \renewcommand{\thanks}[1]{%
1707   \@ifnotempty{#1}{%
1708     \if@ACM@anonymous
1709       \g@addto@macro\thankses{\thanks{A note}}%
1710     \else
1711     \g@addto@macro\thankses{\thanks{#1}}%
1712   \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*⟩].

```
1713 \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.

```
1714 \def\maketitle{%
1715   \@ACM@maketitle@typesettrue
1716   \if@ACM@anonymous
1717     % Anonymize omission of \author-s
1718     \ifnum\num@authorgroups=0\author{}\fi
1719   \fi
1720   \begingroup
1721   \let\@vspace\@vspace@orig
1722   \let\@vspacer\@vspacer@orig
1723   \let\@footnotemark\@footnotemark@nolink
1724   \let\@footnotetext\@footnotetext@nolink
1725   \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1726   \hsize=\textwidth
1727   \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1728   \@mktitle\if@ACM@sigchiamode\else\@mkauthors\fi\@mkteasers
1729   \@printtopmatter
1730   \if@ACM@sigchiamode\@mkauthors\fi
1731   \setcounter{footnote}{0}%
1732   \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1733   \@titlenotes
1734   \@subtitlenotes
1735   \@authornotes
1736   \let\@makefnmark\relax
1737   \let\@thefnmark\relax
1738   \let\@makefntext\noindent
1739   \ifx\@empty\thankses\else
1740     \footnotetextauthorsaddresses{%
1741       \def\par{\let\par\@par}\parindent\z@\@setthanks}%
1742   \fi
1743   \ifx\@empty\@authorsaddresses\else
1744     \if@ACM@anonymous\else
1745       \if@ACM@journal@bibstrip
1746         \footnotetextauthorsaddresses{%
1747           \def\par{\let\par\@par}\parindent\z@\@setauthorsaddresses}%
1748       \fi
1749     \fi
1750   \fi
1751   \if@ACM@nonacm\else\footnotetextcopyrightpermission{%
1752     \if@ACM@authordraft
1753       \raisebox{-2ex}[\z@][\z@]{\makebox[0pt][l]{\large\bfseries
1754         Unpublished working draft. Not for distribution.}}%
1755       \color[gray]{0.9}%
1756     \fi
1757     \parindent\z@\parskip0.1\baselineskip
```

```
1758    \if@ACM@authorversion\else
1759      \if@printpermission\@copyrightpermission\par\fi
1760    \fi
1761    \if@ACM@manuscript\else
1762      \if@ACM@journal@bibstrip\else % Print the conference information
1763     {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
1764       \fi
1765    \fi
1766    \if@printcopyright
1767      \copyright\ \@copyrightyear\ \@copyrightowner\\
1768    \else
1769      \@copyrightyear.\
1770    \fi
1771    \if@ACM@manuscript
1772      Manuscript submitted to ACM\\
1773    \else
1774      \if@ACM@authorversion
1775         This is the author's version of the work. It is posted here for
1776         your personal use. Not for redistribution. The definitive Version
1777         of Record was published in
1778         \if@ACM@journal@bibstrip
1779           \emph{\@journalName}%
1780         \else
1781           \emph{\@acmBooktitle}%
1782         \fi
1783         \ifx\@acmDOI\@empty
1784           .
1785         \else
1786           , \@formatdoi{\@acmDOI}.
1787         \fi\\
1788       \else
1789         \if@ACM@nonacm\else
1790           \if@ACM@journal@bibstrip
1791             \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1792             \ifx\@acmPrice\@empty\else\ \$\@acmPrice\fi\\
1793             \@formatdoi{\@acmDOI}%
1794           \else % Conference
1795             \ifx\@acmISBN\@empty\else ACM~ISBN~\@acmISBN
1796             \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\\\fi
1797             \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi%
1798           \fi
1799         \fi
1800       \fi
1801    \fi}
1802    \fi
1803  \endgroup
1804  \setcounter{footnote}{0}%
1805  \@mkabstract
1806  \if@ACM@printccs
1807  \ifx\@concepts\@empty\else\bgroup
```

```
1808      {\@specialsection{CCS Concepts}%
1809          \noindent\@concepts\par}\egroup
1810      \fi
1811    \fi
1812    \ifx\@keywords\@empty\else\bgroup
1813      {\if@ACM@journal
1814          \@specialsection{Additional Key Words and Phrases}%
1815        \else
1816          \@specialsection{Keywords}%
1817        \fi
1818        \noindent\@keywords}\par\egroup
1819    \fi
1820    \andify\authors
1821    \andify\shortauthors
1822    \global\let\authors=\authors
1823    \global\let\shortauthors=\shortauthors
1824    \if@ACM@printacmref
1825      \@mkbibcitation
1826    \fi
1827    \hypersetup{%
1828      pdfauthor={\authors},
1829      pdftitle={\@title},
1830      pdfsubject={\@concepts},
1831      pdfkeywords={\@keywords},
1832      pdfcreator={LaTeX with acmart
1833        \csname ver@acmart.cls\endcsname\space
1834        and hyperref
1835        \csname ver@hyperref.sty\endcsname}}%
1836    \global\@topnum\z@ % this prevents floats from falling
1837                        % at the top of page 1
1838    \global\@botnum\z@ % we do not want them to be on the bottom either
1839    \@printendtopmatter
1840    \@afterindentfalse
1841    \@afterheading
1842 }
```

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

```
1843 \def\@specialsection#1{%
1844    \ifcase\ACM@format@nr
1845    \relax % manuscript
1846      \par\medskip\small\noindent#1: %
1847    \or % acmsmall
1848      \par\medskip\small\noindent#1: %
1849    \or % acmlarge
1850      \par\medskip\small\noindent#1: %
1851    \or % acmtog
1852      \par\medskip\small\noindent#1: %
1853    \or % sigconf
1854      \section*{#1}%
1855    \or % siggraph
```

```
1856      \section*{#1}%
1857    \or % sigplan
1858      \noindentparagraph*{#1:~}%
1859    \or % sigchi
1860      \section*{#1}%
1861    \or % sigchi-a
1862      \section*{#1}%
1863    \fi
1864 }
```

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 \mktitle since we want them in the margins.

```
1865 \def\@printtopmatter{%
1866   \ifx\@startPage\@empty
1867     \gdef\@startPage{1}%
1868   \else
1869     \setcounter{page}{\@startPage}%
1870   \fi
1871   \thispagestyle{firstpagestyle}%
1872   \noindent
1873   \ifcase\ACM@format@nr
1874   \relax % manuscript
1875     \box\mktitle@bx\par
1876   \or % acmsmall
1877     \box\mktitle@bx\par
1878   \or % acmlarge
1879     \box\mktitle@bx\par
1880   \or % acmtog
1881     \twocolumn[\box\mktitle@bx]%
1882   \or % sigconf
1883     \twocolumn[\box\mktitle@bx]%
1884   \or % siggraph
1885     \twocolumn[\box\mktitle@bx]%
1886   \or % sigplan
1887     \twocolumn[\box\mktitle@bx]%
1888   \or % sigchi
1889     \twocolumn[\box\mktitle@bx]%
1890   \or % sigchi-a
1891     \par\box\mktitle@bx\par\bigskip
1892     \if@ACM@badge
1893       \marginpar{\noindent
1894         \ifx\@acmBadgeL@image\@empty\else
1895           \href{\@acmBadgeL@url}{%
1896             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
1897           \hskip\@ACM@badge@skip
1898         \fi
1899         \ifx\@acmBadgeR@image\@empty\else
1900           \href{\@acmBadgeR@url}{%
1901             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
```

```
1902              \fi}%
1903      \fi
1904    \fi
1905 }
```

\@mktitle The title of the article

```
1906 \def\@mktitle{%
1907   \ifcase\ACM@format@nr
1908   \relax % manuscript
1909     \@mktitle@i
1910   \or % acmsmall
1911     \@mktitle@i
1912   \or % acmlarge
1913     \@mktitle@i
1914   \or % acmtog
1915     \@mktitle@i
1916   \or % sigconf
1917     \@mktitle@iii
1918   \or % siggraph
1919     \@mktitle@iii
1920   \or % sigplan
1921     \@mktitle@iii
1922   \or % sigchi
1923     \@mktitle@iii
1924   \or % sigchi-a
1925     \@mktitle@iv
1926   \fi
1927 }
```

\@titlefont The font to typeset the title

```
1928 \def\@titlefont{%
1929   \ifcase\ACM@format@nr
1930   \relax % manuscript
1931     \LARGE\sffamily\bfseries
1932   \or % acmsmall
1933     \LARGE\sffamily\bfseries
1934   \or % acmlarge
1935     \LARGE\sffamily\bfseries
1936   \or % acmtog
1937     \Huge\sffamily
1938   \or % sigconf
1939     \Huge\sffamily\bfseries
1940   \or % siggraph
1941     \Huge\sffamily\bfseries
1942   \or % sigplan
1943     \Huge\bfseries
1944   \or % sigchi
1945     \Huge\sffamily\bfseries
1946   \or % sigchi-a
1947      \Huge\bfseries
```

```
1948     \fi}
```

\@subtitlefont The font to typeset the subtitle
```
1949 \def\@subtitlefont{\normalsize
1950   \ifcase\ACM@format@nr
1951   \relax % manuscript
1952     \mdseries
1953   \or % acmsmall
1954     \mdseries
1955   \or % acmlarge
1956     \mdseries
1957   \or % acmtog
1958     \LARGE
1959   \or % sigconf
1960     \LARGE\mdseries
1961   \or % siggraph
1962     \LARGE\mdseries
1963   \or % sigplan
1964     \LARGE\mdseries
1965   \or % sigchi
1966     \LARGE\mdseries
1967   \or % sigchi-a
1968     \mdseries
1969   \fi}
```

\@mktitle@i The version of \mktitle for most journals
```
1970 \def\@mktitle@i{\hsize=\textwidth
1971   \@ACM@title@width=\hsize
1972   \ifx\@acmBadgeL@image\@empty\else
1973     \advance\@ACM@title@width by -\@ACM@badge@width
1974     \advance\@ACM@title@width by -\@ACM@badge@skip
1975   \fi
1976   \ifx\@acmBadgeR@image\@empty\else
1977     \advance\@ACM@title@width by -\@ACM@badge@width
1978     \advance\@ACM@title@width by -\@ACM@badge@skip
1979   \fi
1980   \setbox\mktitle@bx=\vbox{\noindent\@titlefont
1981     \ifx\@acmBadgeL@image\@empty\else
1982       \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1983         \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1984       \hskip\@ACM@badge@skip
1985     \fi
1986     \parbox[t]{\@ACM@title@width}{\raggedright
1987       \@titlefont\noindent
1988       \@title
1989   \ifx\@subtitle\@empty\else
1990     \par\noindent{\@subtitlefont\@subtitle}
1991   \fi}%
1992   \ifx\@acmBadgeR@image\@empty\else
1993     \hskip\@ACM@badge@skip
```

```
1994    \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1995        \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1996    \fi
1997    \par\bigskip}}%
```

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

\@mktitle@iii   The version of \@mktitle 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.

```
1998 \def\@mktitle@iii{\hsize=\textwidth
1999    \setbox\mktitle@bx=\vbox{\@titlefont\centering
2000        \@ACM@title@width=\hsize
2001        \if@ACM@badge
2002            \advance\@ACM@title@width by -2\@ACM@badge@width
2003            \advance\@ACM@title@width by -2\@ACM@badge@skip
2004            \parbox[b]{\@ACM@badge@width}{\strut
2005                \ifx\@acmBadgeL@image\@empty\else
2006                    \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
2007                        \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
2008                \fi}%
2009            \hskip\@ACM@badge@skip
2010        \fi
2011        \parbox[t]{\@ACM@title@width}{\centering\@titlefont
2012            \@title
2013            \ifx\@subtitle\@empty\else
2014                \par\noindent{\@subtitlefont\@subtitle}
2015            \fi
2016        }%
2017        \if@ACM@badge
2018            \hskip\@ACM@badge@skip
2019            \parbox[b]{\@ACM@badge@width}{\strut
2020                \ifx\@acmBadgeR@image\@empty\else
2021                    \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
2022                        \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
2023                \fi}%
2024        \fi
2025        \par\bigskip}}%
```

\@mktitle@iv   The version of \@mktitle for sigchi-a

```
2026 \def\@mktitle@iv{\hsize=\textwidth
2027    \setbox\mktitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
2028        \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
2029        \noindent\@title
2030        \ifx\@subtitle\@empty\else
2031            \par\noindent\@subtitlefont\@subtitle
2032        \fi
2033        \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.

```
2034 \newbox\@ACM@commabox
2035 \def\@ACM@addtoaddress#1{%
2036   \ifvmode\else
2037     \if@ACM@affiliation@obeypunctuation\else
2038     \setbox\@ACM@commabox=\hbox{, }%
2039     \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
2040   \fi\fi
2041   #1}
```

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

```
2042 \def\streetaddress#1{\unskip\ignorespaces}
2043 \def\postcode#1{\unskip\ignorespaces}
2044 \if@ACM@journal
2045   \def\position#1{\unskip\ignorespaces}
2046   \def\institution#1{\unskip~#1\ignorespaces}
2047   \def\city#1{\unskip\ignorespaces}
2048   \def\state#1{\unskip\ignorespaces}
2049   \newcommand\department[2][0]{\unskip\ignorespaces}
2050   \def\country#1{\if@ACM@affiliation@obeypunctuation\else, \fi#1\ignorespaces}
2051 \else
2052   \def\position#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
2053   \def\institution#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
2054   \newcommand\department[2][0]{\if@ACM@affiliation@obeypunctuation
2055     #2\else#2\par\fi}%
2056 % \def\streetaddress#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
2057   \let\city\@ACM@addtoaddress
2058   \let\state\@ACM@addtoaddress
2059 % \def\postcode#1{\if@ACM@affiliation@obeypunctuation#1\else\unskip\space#1\fi}%
2060   \let\country\@ACM@addtoaddress
2061 \fi
```

\@mkauthors Typesetting the authors

```
2062 \def\@mkauthors{\begingroup
2063   \hsize=\textwidth
2064   \ifcase\ACM@format@nr
2065   \relax % manuscript
2066     \@mkauthors@i
2067   \or % acmsmall
2068     \@mkauthors@i
2069   \or % acmlarge
2070     \@mkauthors@i
```

```
2071  \or % acmtog
2072    \@mkauthors@i
2073  \or % sigconf
2074    \@mkauthors@iii
2075  \or % siggraph
2076    \@mkauthors@iii
2077  \or % sigplan
2078    \@mkauthors@iii
2079  \or % sigchi
2080    \@mkauthors@iii
2081  \or % sigchi-a
2082    \@mkauthors@iv
2083  \fi
2084  \endgroup
2085 }
```

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

```
2086 \def\@authorfont{\Large\sffamily}
```

\@affiliationfont   Font for affiliations

```
2087 \def\@affiliationfont{\normalsize\normalfont}
```

Adjusting fonts for different formats

```
2088 \ifcase\ACM@format@nr
2089 \relax % manuscript
2090 \or % acmsmall
2091   \def\@authorfont{\large\sffamily}
2092   \def\@affiliationfont{\small\normalfont}
2093 \or % acmlarge
2094 \or % acmtog
2095   \def\@authorfont{\LARGE\sffamily}
2096   \def\@affiliationfont{\large}
2097 \or % sigconf
2098   \def\@authorfont{\LARGE}
2099   \def\@affiliationfont{\large}
2100 \or % siggraph
2101   \def\@authorfont{\normalsize\normalfont}
2102   \def\@affiliationfont{\normalsize\normalfont}
2103 \or % sigplan
2104   \def\@authorfont{\Large\normalfont}
2105   \def\@affiliationfont{\normalsize\normalfont}
2106 \or % sigchi
2107   \def\@authorfont{\bfseries}
2108   \def\@affiliationfont{\mdseries}
2109 \or % sigchi-a
2110   \def\@authorfont{\bfseries}
2111   \def\@affiliationfont{\mdseries}
2112 \fi
```

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

```
2113 \def\@typeset@author@line{%
2114   \andify\@currentauthors\par\noindent
2115   \@currentauthors\def\@currentauthors{}%
2116   \ifx\@currentaffiliations\@empty\else
2117     \andify\@currentaffiliations
2118       \unskip, {\@currentaffiliations}\par
2119   \fi
2120   \def\@currentaffiliations{}}
```

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

```
2121 \def\@mkauthors@i{%
2122   \def\@currentauthors{}%
2123   \def\@currentaffiliations{}%
2124   \global\let\and\@typeset@author@line
2125   \def\@author##1{%
2126     \ifx\@currentauthors\@empty
2127       \gdef\@currentauthors{\@authorfont\MakeTextUppercase{##1}}%
2128     \else
2129       \g@addto@macro{\@currentauthors}{\and\MakeTextUppercase{##1}}%
2130     \fi
2131     \gdef\and{}}%
2132   \def\email##1##2{}%
2133   \def\affiliation##1##2{%
2134     \def\@tempa{##2}\ifx\@tempa\@empty\else
2135       \ifx\@currentaffiliations\@empty
2136         \gdef\@currentaffiliations{%
2137           \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2138           \setkeys{@ACM@affiliation@}{##1}%
2139           \@affiliationfont##2}%
2140       \else
2141         \g@addto@macro{\@currentaffiliations}{\and
2142           \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2143           \setkeys{@ACM@affiliation@}{##1}##2}%
2144       \fi
2145     \fi
2146     \global\let\and\@typeset@author@line}%
2147   \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
2148     \noindent\addresses\@typeset@author@line
2149   \par\medskip}%
2150 }
```

\@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

```
2151 \newbox\author@bx
```

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

2152 `\newdimen\author@bx@wd`

\author@bx@sep   The separation between author boxes

2153 `\newskip\author@bx@sep`
2154 `\author@bx@sep=1pc\relax`

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

2155 `\def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd`
2156 `  \def\and{\par}\normalbaselines`
2157 `  \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi`
2158 `    \@authorfont\@currentauthors\par\@affiliationfont`
2159 `    \@currentaffiliation}\egroup`
2160 `  \box\author@bx\hspace{\author@bx@sep}%`
2161 `  \gdef\@currentauthors{}%`
2162 `  \gdef\@currentaffiliation{}}`

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

2163 `\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.

2164 `  \author@bx@wd=\textwidth\relax`
2165 `  \advance\author@bx@wd by -\author@bx@sep\relax`
2166 `  \ifnum\@ACM@authorsperrow>0\relax`
2167 `    \divide\author@bx@wd by \@ACM@authorsperrow\relax`
2168 `  \else`
2169 `    \ifcase\num@authorgroups`
2170 `    \relax % 0?`
2171 `    \or  % 1=one author per row`
2172 `    \or  % 2=two authors per row`
2173 `      \divide\author@bx@wd by \num@authorgroups\relax`
2174 `    \or  % 3=three authors per row`
2175 `      \divide\author@bx@wd by \num@authorgroups\relax`
2176 `    \or  % 4=two authors per row (!)`
2177 `      \divide\author@bx@wd by 2\relax`
2178 `    \else % three authors per row`
2179 `      \divide\author@bx@wd by 3\relax`
2180 `    \fi`
2181 `  \fi`
2182 `  \advance\author@bx@wd by -\author@bx@sep\relax`

Now, parsing of \addresses:

2183 `  \gdef\@currentauthors{}%`
2184 `  \gdef\@currentaffiliation{}%`
2185 `  \def\@author##1{\ifx\@currentauthors\@empty`
2186 `    \gdef\@currentauthors{\par##1}%`
2187 `  \else`

```
2188     \g@addto@macro\@currentauthors{\par##1}%
2189   \fi
2190   \gdef\and{}}%
2191   \def\email##1##2{\ifx\@currentaffiliation\@empty
2192     \gdef\@currentaffiliation{\bgroup
2193       \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2194   \else
2195     \g@addto@macro\@currentaffiliation{\par\bgroup
2196       \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2197   \fi}%
2198   \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2199     \gdef\@currentaffiliation{%
2200       \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2201       \setkeys{@ACM@affiliation@}{##1}##2}%
2202   \else
2203     \g@addto@macro\@currentaffiliation{\par
2204       \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2205       \setkeys{@ACM@affiliation@}{##1}##2}%
2206   \fi
2207   \global\let\and\@typeset@author@bx
2208 }%
```

Actual typesetting is done by the \and macro:

```
2209   \hsize=\textwidth
2210   \global\setbox\mktitle@bx=\vbox{\noindent
2211     \box\mktitle@bx\par\medskip\leavevmode
2212     \lineskip=1pc\relax\centering\hspace*{-1em}%
2213     \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 overriden.

```
2214 \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 (\textwidth − \author@bx@sep)/N − \author@bx@sep, where N is the number of boxes per row.

```
2215   \author@bx@wd=\columnwidth\relax
2216   \advance\author@bx@wd by -\author@bx@sep\relax
2217   \ifnum\@ACM@authorsperrow>0\relax
2218     \divide\author@bx@wd by \@ACM@authorsperrow\relax
2219   \else
2220     \ifcase\num@authorgroups
2221     \relax % 0?
2222     \or  % 1=one author per row
2223     \else  % 2=two authors per row
2224       \divide\author@bx@wd by 2\relax
2225     \fi
2226   \fi
2227   \advance\author@bx@wd by -\author@bx@sep\relax
```

Now, parsing of \addresses:

```
2228  \gdef\@currentauthors{}%
2229  \gdef\@currentaffiliation{}%
2230  \def\@author##1{\ifx\@currentauthors\@empty
2231    \gdef\@currentauthors{\par##1}%
2232  \else
2233    \g@addto@macro\@currentauthors{\par##1}%
2234  \fi
2235  \gdef\and{}}%
2236  \def\email##1##2{\ifx\@currentaffiliation\@empty
2237    \gdef\@currentaffiliation{\nolinkurl{##2}}%
2238  \else
2239    \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
2240  \fi}%
2241  \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2242    \gdef\@currentaffiliation{%
2243      \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2244        \setkeys{@ACM@affiliation@}{##1}##2}%
2245  \else
2246    \g@addto@macro\@currentaffiliation{\par
2247      \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2248      \setkeys{@ACM@affiliation@}{##1}##2}%
2249  \fi
2250  \global\let\and\@typeset@author@bx}%
2251 %
```

Actual typesetting is done by the \and macro

```
2252      \bgroup\hsize=\columnwidth
2253      \par\raggedright\leftskip=\z@
2254      \lineskip=1pc\noindent
2255      \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}
```

\@mkauthorsaddresses Typesetting authors' addresses in the footnote style

```
2256 \def\@mkauthorsaddresses{%
2257  \ifnum\num@authors>1\relax
2258  Authors' \else Author's \fi
2259  \ifnum\num@authorgroups>1\relax
2260  addresses: \else address: \fi
2261  \bgroup
2262  \def\streetaddress##1{\unskip, ##1}%
2263  \def\postcode##1{\unskip, ##1}%
2264  \def\position##1{\unskip\ignorespaces}%
2265  \def\institution##1{\unskip, ##1}%
2266  \def\city##1{\unskip, ##1}%
2267  \def\state##1{\unskip, ##1}%
2268  \renewcommand\department[2][0]{\unskip\@addpunct, ##2}%
2269  \def\country##1{\unskip, ##1}%
2270  \def\and{\unskip; }%
2271  \def\@author##1{##1}%
2272  \def\email##1##2{\unskip, \nolinkurl{##2}}%
```

```
2273    \addresses
2274    \egroup}

2275 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@journal
2276   \ifx\@authorsaddresses\@empty
2277   \ClassWarningNoLine{\@classname}{Authors'
2278     addresses are mandatory for ACM journals}%
2279   \fi\fi\fi}
```

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

```
2280 \def\@setaddresses{}
```

\@authornotemark   Adding a footnote mark to authors. This version adds a "normal" footnote mark.

```
2281 \def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark\relax}}
```

\@@authornotemark   Adding a footnote mark to authors with a given number

```
2282 \def\@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}
```

\@mkteasers   Typesetting the teasers

```
2283 \def\@mkteasers{%
2284   \ifx\@teaserfigures\@empty\else
2285     \def\@teaser##1{\par\bigskip\bgroup
2286       \captionsetup{type=figure}##1\egroup\par}
2287     \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
2288       \noindent\@Description@presentfalse
2289       \@teaserfigures\par\if@Description@present\else
2290         \global\@undescribed@imagestrue
2291         \ClassWarning{\@classname}{A possible image without
2292           description}\fi
2293     \medskip}%
2294   \fi}
```

\@mkabstract   Typesetting the abstract

```
2295 \def\@mkabstract{\bgroup
2296   \ifx\@abstract\@lempty\else
2297   {\phantomsection\addcontentsline{toc}{section}{Abstract}%
2298     \if@ACM@journal
2299       \everypar{\setbox\z@\lastbox\everypar{}}\small
2300     \else
2301       \section*{\abstractname}%
2302     \fi
2303   \ignorespaces\@abstract\par}%
2304   \fi\egroup}
```

\@mkbibcitation   Print the bibcitation format

```
2305 \def\@mkbibcitation{\bgroup
2306   \let\@vspace\@vspace@orig
2307   \let\@vspacer\@vspacer@orig
2308   \def\@pages@word{\ifnum\getrefnumber{TotPages}=1\relax page\else pages\fi}%
```

```
2309  \def\footnotemark{}%
2310  \def\\{\unskip{} \ignorespaces}%
2311  \def\footnote{\ClassError{\@classname}{Please do not use footnotes
2312      inside a \string\title{} or \string\author{} command! Use
2313      \string\titlenote{} or \string\authornote{} instead!}}%
2314  \def\@article@string{\ifx\@acmArticle\@empty{\ }\else,
2315      Article~\@acmArticle\ \fi}%
2316  \par\medskip\small\noindent{\bfseries ACM Reference Format:}\par\nobreak
2317  \noindent\bgroup
2318      \def\\{\unskip{}, \ignorespaces}\authors\egroup. \@acmYear. \@title
2319  \ifx\@subtitle\@empty. \else: \@subtitle. \fi
2320  \if@ACM@nonacm\else
2321      % The 'nonacm' option disables 'printacmref' by default,
2322      % and the present \@mkbibcitation definition is never used
2323      % in this case. The conditional remains useful if the user
2324      % explicitly sets \settopmatter{printacmref=true}.
2325      \if@ACM@journal@bibstrip
2326          \textit{\@journalNameShort}
2327          \@acmVolume, \@acmNumber \@article@string (\@acmPubDate),
2328          \ref{TotPages}~\@pages@word.
2329      \else
2330          In \textit{\@acmBooktitle}%
2331          \ifx\@acmEditors\@empty\textit{.}\else
2332              \andify\@acmEditors\textit{, }\@acmEditors~\@editorsAbbrev.%
2333          \fi\
2334          ACM, New York, NY, USA%
2335              \@article@string\unskip, \ref{TotPages}~\@pages@word.
2336      \fi
2337  \fi
2338  \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
2339 \par\egroup}
```

\@printendtopmatter End the top matter

```
2340 \def\@printendtopmatter{%
2341  \let\@vspace\@vspace@orig
2342  \let\@vspacer\@vspacer@orig
2343  \par\bigskip
2344  \let\@vspace\@vspace@acm
2345  \let\@vspacer\@vspacer@acm
2346  }
```

\@setthanks We redefine \setthanks using \long

```
2347 \def\@setthanks{\long\def\thanks##1{\par##1\@addpunct.}\thankses}
```

\@setauthorsaddresses

```
2348 \def\@setauthorsaddresses{\@authorsaddresses\unskip\@addpunct.}
```

3.16 Headers and Footers

We use fancyhdr for our headers and footers:

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

```
2350 \let\ACM@ps@plain\ps@plain
2351 \let\ACM@ps@myheadings\ps@myheadings
2352 \let\ACM@ps@headings\ps@headings
2353 \def\ACM@restore@pagestyle{%
2354   \let\ps@plain\ACM@ps@plain
2355   \let\ps@myheadings\ACM@ps@myheadings
2356   \let\ps@headings\ACM@ps@headings}
2357 \AtBeginDocument{\ACM@restore@pagestyle}
```

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

```
2358 \if@ACM@review
2359   \newsavebox{\ACM@linecount@bx}
2360   \newlength\ACM@linecount@bxht
2361   \newcount\ACM@linecount
2362   \ACM@linecount\@ne\relax
2363   \def\ACM@mk@linecount{%
2364     \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{\normalfont
2365       \normalsize
2366       \setlength{\ACM@linecount@bxht}{0pt}%
2367       \loop{\color{red}\scriptsize\the\ACM@linecount}\\
2368       \global\advance\ACM@linecount by \@ne
2369       \addtolength{\ACM@linecount@bxht}{\baselineskip}%
2370       \ifdim\ACM@linecount@bxht<\textheight\repeat
2371       {\color{red}\scriptsize\the\ACM@linecount}\hfill
2372       \global\advance\ACM@linecount by \@ne}}}
2373 \fi
```

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

```
2374 \def\ACM@linecountL{%
2375   \if@ACM@review
2376   \ACM@mk@linecount
2377   \begin{picture}(0,0)%
2378     \put(-26,-22){\usebox{\ACM@linecount@bx}}%
2379   \end{picture}%
2380   \fi}
```

\ACM@linecountR   How to display the box on the right. In one column formats we do not step the numbers.

```
2381 \def\ACM@linecountR{%
2382   \if@ACM@review
2383     \ifcase\ACM@format@nr
2384     \relax % manuscript
2385         \relax
2386       \or % acmsmall
2387         \relax
2388       \or % acmlarge
2389         \relax
```

```
2390        \or % acmtog
2391            \ACM@mk@linecount
2392        \or % sigconf
2393            \ACM@mk@linecount
2394        \or % siggraph
2395            \ACM@mk@linecount
2396        \or % sigplan
2397            \ACM@mk@linecount
2398        \or % sigchi
2399            \ACM@mk@linecount
2400        \or % sigchi-a
2401            \ACM@mk@linecount
2402    \fi
2403    \begin{picture}(0,0)%
2404      \put(20,-22){\usebox{\ACM@linecount@bx}}%
2405     \end{picture}%
2406  \fi}
```

\ACM@timestamp   The timestamp system

```
2407 \if@ACM@timestamp
2408  % Subtracting 30 from \time gives us the effect of rounding down despite
2409  % \numexpr rounding to nearest
2410  \newcounter{ACM@time@hours}
2411  \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
2412  \newcounter{ACM@time@minutes}
2413  \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
2414  \newcommand\ACM@timestamp{%
2415    \footnotesize%
2416    \ifx\@acmSubmissionID\@empty\relax\else
2417    Submission ID: \@acmSubmissionID.{ }%
2418    \fi
2419    \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
2420    \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{. }%
2421    Page \thepage\ of \@startPage--\pageref*{TotPages}.%
2422  }
2423 \fi
```

\@shortauthors   Even if the author redefined \shortauthors, we do not print it in the headers when in
                  anonymous mode:

```
2424 \def\@shortauthors{%
2425  \if@ACM@anonymous
2426    Anon.
2427    \ifx\@acmSubmissionID\@empty\else Submission Id: \@acmSubmissionID\fi
2428  \else\shortauthors\fi}
```

\@headfootfont   The font to typeset header and footer text.

```
2429 \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

```
2430 \AtBeginDocument{%
2431 \fancypagestyle{standardpagestyle}{%
2432   \fancyhf{}%
2433   \renewcommand{\headrulewidth}{\z@}%
2434   \renewcommand{\footrulewidth}{\z@}%
2435   \def\@acmArticlePage{%
2436     \ifx\@acmArticle\empty%
2437       \if@ACM@printfolios\thepage\fi%
2438     \else%
2439       \@acmArticle\if@ACM@printfolios:\thepage\fi%
2440     \fi%
2441   }%
2442   \if@ACM@journal@bibstrip
2443     \ifcase\ACM@format@nr
2444     \relax % manuscript
2445       \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
2446       \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
2447       \fancyhead[RE]{\@shortauthors}%
2448       \fancyhead[LO]{\ACM@linecountL\shorttitle}%
2449       \if@ACM@nonacm\else%
2450         \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}
2451       \fi%
2452     \or % acmsmall
2453       \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticlePage}%
2454       \fancyhead[RO]{\@headfootfont\@acmArticlePage}%
2455       \fancyhead[RE]{\@headfootfont\@shortauthors}%
2456       \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2457       \if@ACM@nonacm\else%
2458     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2459       \@acmNumber, Article \@acmArticle.  Publication date: \@acmPubDate.}%
2460       \fi
2461     \or % acmlarge
2462       \fancyhead[LE]{\ACM@linecountL\@headfootfont
2463       \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2464       \fancyhead[LO]{\ACM@linecountL}%
2465       \fancyhead[RO]{\@headfootfont
2466         \shorttitle\quad\textbullet\quad\@acmArticlePage}%
2467       \if@ACM@nonacm\else%
2468     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2469       \@acmNumber, Article \@acmArticle.  Publication date: \@acmPubDate.}%
2470       \fi
2471     \or % acmtog
2472       \fancyhead[LE]{\ACM@linecountL\@headfootfont
2473         \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2474       \fancyhead[LO]{\ACM@linecountL}%
2475       \fancyhead[RE]{\ACM@linecountR}%
2476       \fancyhead[RO]{\@headfootfont
2477         \shorttitle\quad\textbullet\quad\@acmArticlePage\ACM@linecountR}%
2478       \if@ACM@nonacm\else%
2479     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
```

```
2480        \@acmNumber, Article \@acmArticle.  Publication date: \@acmPubDate.}%
2481      \fi
2482    \else % Proceedings
2483      \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2484      \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2485      \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2486      \if@ACM@nonacm\else%
2487        \fancyhead[LE]{\ACM@linecountL\@headfootfont\footnotesize
2488          \acmConference@shortname,
2489          \acmConference@date, \acmConference@venue}%
2490        \fancyhead[RO]{\@headfootfont
2491          \acmConference@shortname,
2492          \acmConference@date, \acmConference@venue\ACM@linecountR}%
2493      \fi
2494    \fi
2495  \else % Proceedings
2496    \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2497    \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2498    \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2499    \if@ACM@nonacm\else%
2500      \fancyhead[LE]{\ACM@linecountL\@headfootfont
2501        \acmConference@shortname,
2502        \acmConference@date, \acmConference@venue}%
2503      \fancyhead[RO]{\@headfootfont
2504        \acmConference@shortname,
2505        \acmConference@date, \acmConference@venue\ACM@linecountR}%
2506    \fi
2507  \fi
2508  \if@ACM@sigchiamode
2509      \fancyheadoffset[L]{\dimexpr(\marginparsep+\marginparwidth)}%
2510  \fi
2511  \if@ACM@timestamp
2512      \fancyfoot[LO,RE]{\ACM@timestamp}
2513  \fi
2514 }%
2515 \pagestyle{standardpagestyle}
2516 }
```

\@folio@wd   Folio blob width, height, offsets and max number
\@folio@ht
\@folio@voffset
\@folio@max

```
2517 \newdimen\@folio@wd
2518 \@folio@wd=\z@
2519 \newdimen\@folio@ht
2520 \@folio@ht=\z@
2521 \newdimen\@folio@voffset
2522 \@folio@voffset=\z@
2523 \def\@folio@max{1}
2524 \ifcase\ACM@format@nr
2525 \relax % manuscript
2526 \or % acmsmall
2527   \@folio@wd=45.75pt\relax
```

```
2528  \@folio@ht=1.25in\relax
2529  \@folio@voffset=.2in\relax
2530  \def\@folio@max{8}
2531 \or % acmlarge
2532  \@folio@wd=43.25pt\relax
2533  \@folio@ht=79pt\relax
2534  \@folio@voffset=.55in\relax
2535  \def\@folio@max{10}
2536 \fi
```

\@folioblob   The macro to typeset the folio blob.

```
2537 \def\@folioblob{\@tempcnta=0\@acmArticleSeq\relax
2538   \ifnum\@tempcnta=0\relax\else
```

First, we calculate \@acmArticleSeq modulo \@folio@max

```
2539   \loop
2540     \ifnum\@tempcnta>\@folio@max\relax
2541       \advance\@tempcnta by - \@folio@max
2542   \repeat
2543   \advance\@tempcnta by -1\relax
2544   \@tempdima=\@folio@ht\relax
2545   \multiply\@tempdima by \the\@tempcnta\relax
2546   \advance\@tempdima by -\@folio@voffset\relax
2547   \begin{picture}(0,0)
2548   \makebox[\z@]{\raisebox{-\@tempdima}{%
2549       \rlap{%
2550         \raisebox{-0.45\@folio@ht}[\z@][\z@]{%
2551           \rule{\@folio@wd}{\@folio@ht}}}%
2552       \parbox{\@folio@wd}{%
2553         \centering
2554         \textcolor{white}{\LARGE\sffamily\bfseries\@acmArticle}}}}
2555   \end{picture}\fi}
2556
```

firstpagestyle   The page style for the first page only.

```
2557 \AtBeginDocument{%
2558 \fancypagestyle{firstpagestyle}{%
2559 \fancyhf{}%
2560 \renewcommand{\headrulewidth}{\z@}%
2561 \renewcommand{\footrulewidth}{\z@}%
2562 \if@ACM@journal@bibstrip
2563   \ifcase\ACM@format@nr
2564   \relax % manuscript
2565     \fancyhead[L]{\ACM@linecountL}%
2566     \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
2567     \if@ACM@nonacm\else%
2568       \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
2569     \fi%
2570   \or % acmsmall
2571     \if@ACM@nonacm\else%
```

```
2572      \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2573        \@acmNumber, Article \@acmArticle.  Publication date:
2574        \@acmPubDate.}%
2575      \fi%
2576      \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2577      \fancyhead[LO]{\ACM@linecountL}%
2578      \fancyhead[RO]{\@folioblob}%
2579      \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
2580    \or % acmlarge
2581      \if@ACM@nonacm\else%
2582     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2583        \@acmNumber, Article \@acmArticle.  Publication date:
2584        \@acmPubDate.}%
2585      \fi%
2586      \fancyhead[RO]{\@folioblob}%
2587      \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2588      \fancyhead[LO]{\ACM@linecountL}%
2589      \fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2590    \or % acmtog
2591      \if@ACM@nonacm\else%
2592     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2593        \@acmNumber, Article \@acmArticle.  Publication date:
2594        \@acmPubDate.}%
2595      \fi%
2596      \fancyhead[L]{\ACM@linecountL}%
2597      \fancyhead[R]{\ACM@linecountR}%
2598    \else % Conference proceedings
2599      \fancyhead[L]{\ACM@linecountL}%
2600      \fancyhead[R]{\ACM@linecountR}%
2601      \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2602    \fi
2603  \else
2604    \fancyhead[L]{\ACM@linecountL}%
2605    \fancyhead[R]{\ACM@linecountR}%
2606    \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2607  \fi
2608  \if@ACM@timestamp
2609    \ifnum\ACM@format@nr=0\relax % Manuscript
2610    \fancyfoot[LO,RE]{\ACM@timestamp\quad
2611      \if@ACM@nonacm\else
2612        \footnotesize Manuscript submitted to ACM
2613      \fi}
2614    \else
2615    \fancyfoot[LO,RE]{\ACM@timestamp}
2616    \fi
2617  \fi
2618 }}
```

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.

```
2619 \def\ACM@NRadjust#1{%
2620 \begingroup
2621 \expandafter\ifx\csname Sectionformat\endcsname\relax
2622 % do nothing when  \Sectionformat  is unknown
2623   \def\next{\endgroup #1}%
2624 \else
2625 \def\next{\endgroup
2626   \let\realSectionformat\Sectionformat
2627   \def\ACM@sect@format@{#1}%
2628   \let\Sectionformat\ACM@NR@adjustedSectionformat
2629 %%  next lines added 2018-06-17 to ensure section number is styled
2630   \let\real@adddotafter\@adddotafter
2631   \let\@adddotafter\ACM@adddotafter
2632   #1{}% imposes the styles, but nullifies  \MakeUppercase
2633   \let\@adddotafter\real@adddotafter
2634   }%
2635 \fi \next
2636 }
```

\ACM@NR@adjustedSectionformat

```
2637 \def\ACM@NR@adjustedSectionformat#1#2{%
2638 \realSectionformat{\ACM@sect@format{#1}}{#2}%
2639 \let\Sectionformat\realSectionformat}
2640 \DeclareRobustCommand{\ACM@sect@format}{\ACM@sect@format@}
2641 \def\ACM@sect@format@null#1{#1}
2642 \let\ACM@sect@format@\ACM@sect@format@null
```

```
2643 \AtBeginDocument{%
2644 \expandafter\ifx\csname LTX@adddotafter\endcsname\relax
2645  \let\LTX@adddotafter\@adddotafter
2646 \fi
2647 }
```

\ACM@adddotafter

```
2648 \def\ACM@adddotafter#1{\ifx\relax#1\relax\else\LTX@adddotafter{#1}\fi}
```

Sectioning is different for different levels

```
2649 \renewcommand\section{\@startsection{section}{1}{\z@}%
2650  {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2651  {.25\baselineskip}%
2652  {\ACM@NRadjust\@secfont}}
2653 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2654  {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2655  {.25\baselineskip}%
2656  {\ACM@NRadjust\@subsecfont}}
2657 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2658  {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2659  {-3.5\p@}%
2660  {\ACM@NRadjust{\@subsubsecfont\@adddotafter}}}
2661 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
2662  {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2663  {-3.5\p@}%
2664  {\ACM@NRadjust{\@parfont\@adddotafter}}}
2665 \newcommand\noindentparagraph{\@startsection{paragraph}{4}{\z@}%
2666  {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2667  {-3.5\p@}%
2668  {\ACM@NRadjust{\@parfont}}}
2669
2670 \renewcommand\part{\@startsection{part}{9}{\z@}%
2671  {-10\p@ \@plus -4\p@ \@minus -2\p@}%
2672  {4\p@}%
2673  {\ACM@NRadjust\@parfont}}
```

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

```
2674 \def\section@raggedright{\@rightskip\@flushglue
2675  \rightskip\@rightskip
2676  \leftskip\z@skip
2677  \parindent\z@}
```

\@secfont   Fonts for sections etc. are different for different formats.
\@subsecfont
\@subsubsecfont
\@parfont
```
2678 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2679 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2680 \def\@subsubsecfont{\sffamily\itshape}
2681 \def\@parfont{\itshape}
2682 \setcounter{secnumdepth}{3}
2683 \ifcase\ACM@format@nr
```

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```
2684 \relax % manuscript
2685 \or % acmsmall
2686 \or % acmlarge
2687 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2688 \def\@subsecfont{\sffamily\large\section@raggedright}
2689 \or % acmtog
2690 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2691 \def\@subsecfont{\sffamily\large\section@raggedright}
2692 \or % sigconf
2693 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
2694 \def\@subsecfont{\bfseries\Large\section@raggedright}
2695 \or % siggraph
2696 \def\@secfont{\sffamily\bfseries\Large\section@raggedright\MakeTextUppercase}
2697 \def\@subsecfont{\sffamily\bfseries\Large\section@raggedright}
2698 \or % sigplan
2699 \def\@secfont{\bfseries\Large\section@raggedright}
2700 \def\@subsecfont{\bfseries\section@raggedright}
2701 \def\@subsubsecfont{\bfseries\section@raggedright}
2702 \def\@parfont{\bfseries\itshape}
2703 \def\@subparfont{\itshape}
2704 \or % sigchi
2705 \setcounter{secnumdepth}{1}
2706 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2707 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2708 \or % sigchi-a
2709 \setcounter{secnumdepth}{0}
2710 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2711 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2712 \fi
```

\@adddotafter   Add punctuation after a sectioning command

```
2713 \def\@adddotafter#1{#1\@addpunct{.}}
```

\@addspaceafter   Add space after a sectioning command

```
2714 \def\@addspaceafter#1{#1\@addpunct{\enspace}}
```

3.18   TOC lists

\@dotsep   Related to the \tableofcontents are all the horizontal fillers. Base LaTeX 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.

```
2715 \providecommand*\@dotsep{4.5}
```

3.19   Theorems

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

```
2716 \def\@acmplainbodyfont{\itshape}
```

\@acmplainindent	The amount to indent the `acmplain` theorem style.
	2717 `\def\@acmplainindent{\parindent}`
\@acmplainheadfont	The font to typeset the head of the `acmplain` theorem style.
	2718 `\def\@acmplainheadfont{\scshape}`
\@acmplainnotefont	The font to typeset the note of the `acmplain` theorem style.
	2719 `\def\@acmplainnotefont{\@empty}`

Customization of the `acmplain` theorem style:

```
2720 \ifcase\ACM@format@nr
2721 \relax % manuscript
2722 \or % acmsmall
2723 \or % acmlarge
2724 \or % acmtog
2725 \or % sigconf
2726 \or % siggraph
2727 \or % sigplan
2728   \def\@acmplainbodyfont{\itshape}
2729   \def\@acmplainindent{\z@}
2730   \def\@acmplainheadfont{\bfseries}
2731   \def\@acmplainnotefont{\normalfont}
2732 \or % sigchi
2733 \or % sigchi-a
2734 \fi
```

acmplain	The `acmplain` theorem style

```
2735 \newtheoremstyle{acmplain}%
2736   {.5\baselineskip\@plus.2\baselineskip
2737     \@minus.2\baselineskip}% space above
2738   {.5\baselineskip\@plus.2\baselineskip
2739     \@minus.2\baselineskip}% space below
2740   {\@acmplainbodyfont}% body font
2741   {\@acmplainindent}% indent amount
2742   {\@acmplainheadfont}% head font
2743   {.}% punctuation after head
2744   {.5em}% spacing after head
2745   {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont(#3)}}}% head spec
```

\@acmdefinitionbodyfont	The font to typeset the body of the `acmdefinition` theorem style.
	2746 `\def\@acmdefinitionbodyfont{\normalfont}`
\@acmdefinitionindent	The amount to indent the `acmdefinition` theorem style.
	2747 `\def\@acmdefinitionindent{\parindent}`
\@acmdefinitionheadfont	The font to typeset the head of the `acmdefinition` theorem style.
	2748 `\def\@acmdefinitionheadfont{\itshape}`

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

```
2749 \def\@acmdefinitionnotefont{\@empty}
```

Customization of the `acmdefinition` theorem style:

```
2750 \ifcase\ACM@format@nr
2751 \relax % manuscript
2752 \or % acmsmall
2753 \or % acmlarge
2754 \or % acmtog
2755 \or % sigconf
2756 \or % siggraph
2757 \or % sigplan
2758   \def\@acmdefinitionbodyfont{\normalfont}
2759   \def\@acmdefinitionindent{\z@}
2760   \def\@acmdefinitionheadfont{\bfseries}
2761   \def\@acmdefinitionnotefont{\normalfont}
2762 \or % sigchi
2763 \or % sigchi-a
2764 \fi
```

acmdefinition The acmdefinition theorem style

```
2765 \newtheoremstyle{acmdefinition}%
2766   {.5\baselineskip\@plus.2\baselineskip
2767     \@minus.2\baselineskip}% space above
2768   {.5\baselineskip\@plus.2\baselineskip
2769     \@minus.2\baselineskip}% space below
2770   {\@acmdefinitionbodyfont}% body font
2771   {\@acmdefinitionindent}% indent amount
2772   {\@acmdefinitionheadfont}% head font
2773   {.}% punctuation after head
2774   {.5em}% spacing after head
2775   {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmdefinitionnotefont(#3)}}}% head spec
```

Make `acmplain` the default theorem style.

```
2776 \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/acm). 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.

```
2777 \AtEndPreamble{%
2778   \if@ACM@acmthm
2779   \theoremstyle{acmplain}
2780   \@ifundefined{theorem}{%
2781   \newtheorem{theorem}{Theorem}[section]
2782   }{}
```

```
2783   \@ifundefined{conjecture}{%
2784   \newtheorem{conjecture}[theorem]{Conjecture}
2785   }{}
2786   \@ifundefined{proposition}{%
2787   \newtheorem{proposition}[theorem]{Proposition}
2788   }{}
2789   \@ifundefined{lemma}{%
2790   \newtheorem{lemma}[theorem]{Lemma}
2791   }{}
2792   \@ifundefined{corollary}{%
2793   \newtheorem{corollary}[theorem]{Corollary}
2794   }{}
2795   \theoremstyle{acmdefinition}
2796   \@ifundefined{example}{%
2797   \newtheorem{example}[theorem]{Example}
2798   }{}
2799   \@ifundefined{definition}{%
2800   \newtheorem{definition}[theorem]{Definition}
2801   }{}
2802   \fi
2803   \theoremstyle{acmplain}
2804 }
```

\@proofnamefont   The font to typeset the proof name.

```
2805 \def\@proofnamefont{\scshape}
```

\@proofindent   Whether or not to indent proofs.

```
2806 \def\@proofindent{\indent}
```

Customization of the proof environment.

```
2807 \ifcase\ACM@format@nr
2808 \relax % manuscript
2809 \or % acmsmall
2810 \or % acmlarge
2811 \or % acmtog
2812 \or % sigconf
2813 \or % siggraph
2814 \or % sigplan
2815   \def\@proofnamefont{\itshape}
2816   \def\@proofindent{\noindent}
2817 \or % sigchi
2818 \or % sigchi-a
2819 \fi
```

proof   We want some customization of the proof environment.

```
2820 \renewenvironment{proof}[1][\proofname]{\par
2821   \pushQED{\qed}%
2822   \normalfont \topsep6\p@\@plus6\p@\relax
2823   \trivlist
```

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```
2824  \item[\@proofindent\hskip\labelsep
2825        {\@proofnamefont #1\@addpunct{.}}]\ignorespaces
2826 }{%
2827  \popQED\endtrivlist\@endpefalse
2828 }
```

3.20 Balancing columns

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

```
2829 \AtEndPreamble{%
2830  \if@ACM@balance
2831    \ifcase\ACM@format@nr
2832    \relax % manuscript
2833        \global\@ACM@balancefalse
2834      \or % acmsmall
2835        \global\@ACM@balancefalse
2836      \or % acmlarge
2837        \global\@ACM@balancefalse
2838      \or % acmtog
2839        \RequirePackage{balance}%
2840      \or % sigconf
2841        \RequirePackage{balance}%
2842      \or % siggraph
2843        \RequirePackage{balance}%
2844      \or % sigplan
2845        \RequirePackage{balance}%
2846      \or % sigchi
2847        \RequirePackage{balance}%
2848      \or % sigchi-a
2849        \global\@ACM@balancefalse
2850    \fi
2851  \fi
2852 }
2853 \AtEndDocument{%
2854  \if@ACM@balance
2855  \if@twocolumn
2856  \balance
2857  \fi\fi}
```

3.21 Acknowledgments

\acksname

```
2858 \newcommand\acksname{Acknowledgments}
```

\acks   This is a comment-like structure

```
2859 \specialcomment{acks}{%
2860  \begingroup
2861  \section*{\acksname}
2862  \phantomsection\addcontentsline{toc}{section}{\acksname}
```

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```
2863 }{%
2864   \endgroup
2865 }
```

\grantsponsor   We just typeset the name of the sponsor

```
2866 \def\grantsponsor#1#2#3{#2}
```

\grantnum

```
2867 \newcommand\grantnum[3][]{#3%
2868   \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}
```

3.22   Conditional typesetting

We use the comment package for conditional typesetting:

```
2869 \AtEndPreamble{%
2870 \if@ACM@screen
2871   \includecomment{screenonly}
2872   \excludecomment{printonly}
2873 \else
2874   \excludecomment{screenonly}
2875   \includecomment{printonly}
2876 \fi
2877 \if@ACM@anonymous
2878   \excludecomment{anonsuppress}
2879   \excludecomment{acks}
2880 \else
2881   \includecomment{anonsuppress}
2882 \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/hypertex/bibstyles/>).

```
2883 \newcommand\showeprint[2][arxiv]{%
2884   \def\@tempa{#1}%
2885   \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
2886   \def\@tempb{arxiv}%
2887   \ifx\@tempa\@tempb
2888     arXiv:\href{http://arxiv.org/abs/#2}{#2}\else arXiv:#2%
2889   \fi}
```

3.24   End of Class

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

```
2890 \let\@vspace@orig=\@vspace
2891 \let\@vspacer@orig=\@vspacer
2892 \apptocmd{\@vspace}{\ClassWarning{\@classname}{\string\vspace\space should
```

```
2893     only be used to provide space above/below surrounding
2894     objects}}{}{}
2895 \apptocmd{\@vspacer}{\ClassWarning{\@classname}{\string\vspace\space should
2896     only be used to provide space above/below surrounding
2897     objects}}{}{}
2898 \let\@vspace@acm=\@vspace
2899 \let\@vspacer@acm=\@vspacer
```

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

```
2900 \let\ACM@origbaselinestretch\baselinestretch
2901 \AtEndDocument{\ifx\baselinestretch\ACM@origbaselinestretch\else
2902  \ClassError{\@classname}{An attempt to redefine
2903    \string\baselinestretch\space detected.  Please do not do this for
2904    ACM submissions!}\fi}

2905 \normalsize\normalfont\frenchspacing
2906 ⟨/class⟩
```

References

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