

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

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Abstract

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

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1 Introduction

The Association for Computing Machinery¹ is the world's largest educational and scientific computing society, which delivers resources that advance computing as a science and a profession. It was one of the early adopters of T_EX 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 L^AT_EX package.

This package uses only free T_EX packages and fonts included in T_EXLive, MikT_EX and other popular T_EX 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 customizat^on 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 T_EX Users Group. The world-wide T_EX Users Group is at <https://tug.org/>; please consider joining us if you use T_EX regularly.

2.1 Installation

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

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

¹<http://www.acm.org/>

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

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

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

As an alternative to items 2 and 3 you can just put the files in the working directory where your `.tex` file is.

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

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

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

2.2 Invocation and options

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The option `natbib` is used when the corresponding BibTeX style is based on `natbib`. In most cases you do not need to set it. See Section 2.11.

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

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

Table 1: The possible values for the format option

Value	Meaning
<code>manuscript</code>	A manuscript. This is the default.
<code>acmsmall</code>	Small single-column format. Used for CIE, CSUR, DTRAP, HEALTH, JACM, JDIQ, JEA, JERIC, JETC, PACMCGIT, PACMHCI, PACMPL, TAAS, TACCESS, TACO, TALG, TALLIP (formerly TALIP), TCPS, TDS, TEAC, TECS, 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, TRET, TSAS, TSC, TSLP and TWEB, including special issues.
<code>acmlarge</code>	Large single-column format. Used for IMWUT, JOCCH, POMACS and TAP, including special issues.
<code>acmtog</code>	Large double-column format. Used for TOG, including annual conference Technical Papers.
<code>sigconf</code>	Proceedings format for most ACM conferences (with the exceptions listed below) and all ICPS volumes.
<code>sigplan</code>	Proceedings format for SIGPLAN conferences.
<code>sigchi</code>	Proceedings format for SIGCHI conferences.
<code>sigchi-a</code>	Format for SIGCHI extended abstracts.

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

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

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

2.3 Top matter

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

Table 2: Boolean options

Option	Default	Meaning
review	false	A review version: lines are numbered and hyperlinks are colored
screen	see text	A screen version: hyperlinks are colored
natbib	true	Whether to use the natbib package (see Section 2.11)
anonymous	false	Whether to make author(s) anonymous
authorversion	false	Whether to generate a special version for the authors' personal use or posting (see Section 2.3)
nonacm	false	Use the class typesetting options for a non-ACM document, which will not include the conference/journal header and footers or permission statements
timestamp	false	Whether to put a time stamp in the footer of each page
authordraft	false	Whether author's-draft mode is enabled
acmthm	true	Whether to define theorem-like environments, see Section 2.7
balance	true	Whether to balance the last page in two column mode
urlbreakonhyphens	true	Whether to break urls on hyphens

used before `\maketitle`.

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

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

```
\acmJournal{TOMS}
```

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

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

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

name: the name of the conference.

date: the date(s) of the conference.

venue: the place of the conference.

Examples:

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

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

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

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

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

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

`\title` The command `\title`, as in the `amsart` class, has two arguments: one optional, and one mandatory:

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

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

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

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

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

`\author` The basic commands are `\author`, `\orcid` (for the researchers registered with OR-

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

`\affiliation` enter them in this order:

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

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

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

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

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

Similarly you can repeat the `\email` command.

You may have several authors with the same affiliation, different affiliations, or overlapping affiliations (author A_1 is affiliated with institutions I_1 and I_2 , while author A_2 is affiliated with I_2 only, author A_3 is affiliated with I_1 and I_3 , etc.). The recommended solution is to put the `\affiliation` commands after each author, possibly repeating them:

```
\author{...}
\orcid{...}
```

```

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

```

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

```

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

```

However, this format is not generally recommended.

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

```

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

```

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

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

and `\country` macros to indicate the corresponding parts of the affiliation. Note that in some cases (for example, journals) these parts are not printed in the resulting copy, but they *are* necessary since they are used by the XML metadata extraction programs. Do *not* put commas or `\\` between the elements of `\affiliation`. They will be provided automatically.

An example of the author block:

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

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

Sometimes an author works in several departments within the same insitution. There could be two situations: the departments are independent, or one department is within another. In the first case, just repeat the command `\department` several times. To handle the second case the command has an optional numerical parameter. The departments with higher numbers are higher in the organizational chart. Compare

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

```
\institution{University of San Serriffe}
\country{San Serriffe}}
```

and

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

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

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

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

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

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

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

will be typeset as

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

	Note that you should <i>not</i> use this option for journals.
	It is expected that these commands are inserted by the author of the manuscript.
<code>\thanks</code>	Like <code>amsart</code> (and unlike standard \LaTeX), we allow <code>\thanks</code> only <i>outside</i> of the commands <code>\title</code> and <code>\author</code> . This command is obsolete and should <i>not</i> be used in most cases. Do not list your acknowledgments or grant sponsors here. Put this information in the <code>acks</code> environment (see Section 2.10).
<code>\authorsaddresses</code>	In some formats, addresses are printed as a footnote on the first page. By default \LaTeX typesets them itself using the information you give it. However, you can override its choice using the command <code>\authorsaddresses{<contact addresses>}</code> , for example, <pre> \authorsaddresses{% Authors' addresses: G.~Zhou, Computer Science Department, College of William and Mary, 104 Jameson Rd, Williamsburg, PA 23185, US; V.~B\eranger, Inria Paris-Rocquencourt, Rocquencourt, France; A.~Patel, Rajiv Gandhi University, Rono-Hills, Doimukh, Arunachal Pradesh, India; H.~Chan, Tsinghua University, 30 Shuangqing Rd, Haidian Qu, Beijing Shi, China; T.~Yan, Eaton Innovation Center, Prague, Czech Republic; T.~He, C.~Huang, J.~A.~Stankovic University of Virginia, School of Engineering Charlottesville, VA 22903, USA; T. F. Abdelzaher, (Current address) NASA Ames Research Center, Moffett Field, California 94035.} </pre>
	You can <i>suppress</i> printing authors' addresses by setting them to an empty string: <code>\authorsaddresses{}</code> .
<code>\titlenote</code>	While the command <code>\thanks</code> generates a note without a footnote mark, sometimes the authors might need notes more tightly connected to the title, subtitle or author. The commands <code>\titlenote</code> , <code>\subtitlenote</code> and <code>\authornote</code> that follow the corresponding commands (<code>\title</code> , <code>\subtitle</code> and <code>\author</code>) generate such notes. For example,
<code>\subtitlenote</code>	
<code>\authornote</code>	
	<pre> \title{This is a title} \titlenote{This is a titlenote} \author{A. U. Thor} \authornote{This is an authornote} </pre>
	Please never use a <code>\footnote</code> inside an <code>\author</code> or <code>\title</code> command since this confuses the metadata extraction software. (Actually these commands now produce errors.)
<code>\authornotemark</code>	Sometimes one may need to have the same footnote connected to several authors. The command <code>\authornotemark[<number>]</code> adds just the footnote mark, for example, <pre> \author{A. U. Thor} \authornote{Both authors contributed equally to the paper} ... \author{A. N. Other} \authornotemark[1] </pre>
	The correct numbering of these marks is the responsibility of the user.
<code>\acmVolume</code>	The macros <code>\acmVolume</code> , <code>\acmNumber</code> , <code>\acmArticle</code> , <code>\acmYear</code> and <code>\acmMonth</code> are
<code>\acmNumber</code>	
<code>\acmArticle</code>	
<code>\acmYear</code>	
<code>\acmMonth</code>	

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

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

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

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

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

Setting this number to zero suppresses the blob.

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

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

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

```
\acmPrice{25.00}
```

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

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

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

Setting it to the empty string, as `\acmISBN{}`, suppresses printing the ISBN.

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

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

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

`\acmBadgeR` Some conference articles get special distinctions, for example, the artifact evaluation
`\acmBadgeL` for PPOPP 2016 (see <http://ctuning.org/ae/ppopp2016.html>). These articles display special badges supplied by the conference organizers. This class provides commands to add these badges: `\acmBadgeR[<url>]{<graphics>}` and `\acmBadgeL[<url>]{<graphics>}`. The first command puts the badge to the right of the title, and the second one—to the left. The exception is the `sigchi-a` mode for SIGCHI extended abstracts, which puts the badges on the left margin. The arguments have the following meaning: [*<url>*], if provided, sets the link to the badge authority in the screen version, while {*<graphics>*} sets the graphics file with the badge image. The file must be a cropped square, which is scaled to a standard size in the output. For example, if the badge image is `ae-logo.pdf`, the command is

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

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

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

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

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

The tool at <http://dl.acm.org/ccs.cfm> can be used to generate CCS codes. After you select the topics, click on “Generate CCS codes” to get results like the following:

```
\begin{CCSXML}
<ccs2012>
<concept>
<concept_id>10010520.10010553.10010562</concept_id>
<concept_desc>Computer systems organization~Embedded systems</concept_desc>
<concept_significance>500</concept_significance>
</concept>
<concept>
<concept_id>10010520.10010575.10010755</concept_id>
<concept_desc>Computer systems organization~Redundancy</concept_desc>
<concept_significance>300</concept_significance>
</concept>
<concept>
<concept_id>10010520.10010553.10010554</concept_id>
<concept_desc>Computer systems organization~Robotics</concept_desc>
<concept_significance>100</concept_significance>
```



```

</concept>
<concept>
  <concept_id>10003033.10003083.10003095</concept_id>
  <concept_desc>Networks~Network reliability</concept_desc>
  <concept_significance>100</concept_significance>
</concept>
</ccs2012>
\end{CCSXML}

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

```

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

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

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

`teaserfigure` A special kind of figure is used for many two-column conference proceedings. This figure is placed just after the authors but before the main text. The environment `teaserfigure` is used for these figures. This environment must be used *before* `\maketitle`, for example,

```

\begin{teaserfigure}

```

Table 3: Parameters for the `\setcopyright` command

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

Table 4: Settings for the `\settopmatter` command

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

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

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

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

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

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

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

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

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

`\maketitle` The macro `\maketitle` must be the last command in the top-matter group. That is it must follow the commands defined in this section.

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

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

2.4 Algorithms

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

2.5 Figures and tables

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

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

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

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

teaserfigure: a special figure before `\maketitle`.

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

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

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

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

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

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

```
\begin{table}  
\caption{Simulation Configuration}  
\label{tab:conf}  
\begin{minipage}{\columnwidth}
```

```

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

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

```

sidebar
 marginfigure
 margintable

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

sidebar: textual information in the margin

marginfigure: a figure in the margin

margintable: a table in the margin

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

2.6 Descriptions of images

\Description

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

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

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

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

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

2.7 Theorems

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

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

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

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

2.8 Online-only and offline-only material

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

```
\section{Supplementary materials}

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

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

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

2.9 Note about anonymous mode

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

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

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

2.10 Acknowledgments

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

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

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

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

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

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

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

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

Example:

```
\begin{acks}
  The authors would like to thank Dr. Yuhua Li for providing the
  matlab code of the \textit{BEPS} method.
```

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

\end{acks}

2.11 Bibliography

The ACM uses the natbib package for formatting references and the BibTeX style file ACM-Reference-Format.bst for BibTeX processing. You can disable loading of natbib using the option natbib=false in \documentclass. However, it is not recommended, as well as the use of BibTeX styles other than ACM-Reference-Format.bst, and may delay the processing of the manuscript.

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

\citestyle{acmauthoryear}

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

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

\setcitestyle{numbers,sort&compress}

One of the more common versions is

\setcitestyle{nosort}

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

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

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

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

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

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

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

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

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

There are several special entry types. Types `online` and `game` are used for Web pages and games, for example,

```
@online{Thornburg01,
  author = "Harry Thornburg",
  year = "2001",
  title = "Introduction to Bayesian Statistics",
  url = "http://ccrma.stanford.edu/~jos/bayes/bayes.html",
  month = mar,
  lastaccessed = "March 2, 2005",
}
```

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

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

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

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

```
@online{Obama08,
  author = "Barack Obama",
  year = "2008",
```

```

title =      "A more perfect union",
howpublished = "Video",
day   =      "5",
url    =      "http://video.google.com/videoplay?docid=6528042696351994555",
month  =      mar,
lastaccessed = "March 21, 2008",
}

```

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

```

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

```

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

```

@periodical{JCohen96,
  key =      "Cohen",
  editor =    "Jacques Cohen",
  title =     "Special issue: Digital Libraries",
  journal =   "Communications of the {ACM}",
  volume =    "39",
  number =    "11",
  month =     nov,
  year =      "1996",
}

```

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

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

```

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

```

```
lastaccessed = "May 27, 2017",
}
```

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

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

and then encode the author as

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

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

2.12 Colors

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

The ACM provides the following recommendation on color use.

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

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

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

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

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

2.13 Other notable packages and typographic remarks

Several other packages are recommended for specialized tasks.

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

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

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

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

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

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

2.14 Disabled or forbidden commands

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

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

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

You should not abuse the command `\vspace`: this command may disturb the 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/357265/using-titletoc-with-acm-acmart-style>).

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

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

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

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

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

you will pass `dvipsnames` to `xcolor`.

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

2.16 Currently supported publications

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

Abbreviation	Publication
CIE	ACM Computers in Entertainment
CSUR	ACM Computing Surveys
DTRAP	Digital Threats: Research and Practice
HEALTH	ACM Transactions on Computing for Healthcare
IMWUT	PACM on Interactive, Mobile, Wearable and Ubiquitous Technologies
JACM	Journal of the ACM
JDIQ	ACM Journal of Data and Information Quality
JEA	ACM Journal of Experimental Algorithmics
JERIC	ACM Journal of Educational Resources in Computing
JETC	ACM Journal on Emerging Technologies in Computing Systems
JOCCH	ACM Journal on Computing and Cultural Heritage
PACMCGIT	Proceedings of the ACM on Computer Graphics and Interactive Techniques
PACMHCI	PACM on Human-Computer Interaction
PACMPL	PACM on Programming Languages
POMACS	PACM on Measurement and Analysis of Computing Systems

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

Abbreviation	Publication
TAAS	ACM Transactions on Autonomous and Adaptive Systems
TACCESS	ACM Transactions on Accessible Computing
TACO	ACM Transactions on Architecture and Code Optimization
TALG	ACM Transactions on Algorithms
TALLIP	ACM Transactions on Asian and Low-Resource Language Information Processing
TAP	ACM Transactions on Applied Perception
TCPS	ACM Transactions on Cyber-Physical Systems
TDS	ACM Transactions on Data Science
TEAC	ACM Transactions on Economics and Computation
TECS	ACM Transactions on Embedded Computing Systems
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
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

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

Abbreviation	Publication
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 [2019/08/05 v1.63a 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}%

```

```

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

<code>\if@ACM@manuscript</code>	Whether we use manuscript mode 148 <code>\newif\if@ACM@manuscript</code>
<code>\if@ACM@journal</code>	There are two kinds of publications: journals and books 149 <code>\newif\if@ACM@journal</code>
<code>\if@ACM@journal@bibstrip</code>	Sometimes ACM wants a journal-like publication to have conference information in the bibstrip and vice versa, so we have an additional switch. 150 <code>\newif\if@ACM@journal@bibstrip</code>
<code>\if@ACM@sigchiamode</code>	The formatting of SIGCHI extended abstracts is quite unusual. We have a special switch for them. 151 <code>\newif\if@ACM@sigchiamode</code>

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={;},%

```

```

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

```

`\bibstyle@acmnumeric` 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{\@secntformat{#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

```



```

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\@secntformat#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@section 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 footnote-related stuff before the call to hyperref (Ross Moore)

\@makefnmark We do not use indentation for footnotes

```

426 \def\@makefnmark{\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 \makefnfont{%
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 \makefnfont{%
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 bibliography 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#issuecomment-272881329>.

```
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\@iiparbox\@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@undescrbed@images` A global switch whether some images were *not* described

```

695 \newif\if@undescrbed@images
696 \@undescrbed@imagesfalse

```

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

```

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

```

The global warning

```

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

```

Hooks for figures and tables

```
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\@undescrbed@imagestrue
708   \ClassWarning{\@classname}{A possible image without description}\fi}
709 \AtEndEnvironment{figure*}{\if@Description@present\else
710   \global\@undescrbed@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}
```

3.10 Floats

We use the caption package

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

```

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

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

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

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

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

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

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

```

```

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

```

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

```

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

```

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

```

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

```

3.11 Lists

```

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

```

807 \newdimen\ACM@labelwidth

```

```

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

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

```

```

853 }
854 \let\enddescription=\endlist % for efficiency

```

3.12 Top-matter data

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

```

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

```

```

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

```

```

948 \def\@permissionCodeOne{1936-1955}%
949 \or % JEA
950 \def\@journalName{ACM Journal of Experimental Algorithmics}%
951 \def\@journalNameShort{ACM J. Exp. Algor.}%
952 \def\@permissionCodeOne{1084-6654}%
953 \or % JERIC
954 \def\@journalName{ACM Journal of Educational Resources in Computing}%
955 \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
956 \def\@permissionCodeOne{1073-0516}%
957 \or % JETC
958 \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
959 \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
960 \def\@permissionCodeOne{1550-4832}%
961 \or % JOCH
962 \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
963 \def\@journalNameShort{ACM J. Comput. Cult. Herit.}%
964 \or % PACMCGIT
965 \def\@journalName{Proceedings of the ACM on Computer Graphics and Interactive Techniques}%
966 \def\@journalNameShort{Proc. ACM Comput. Graph. Interact. Tech.}%
967 \def\@permissionCodeOne{2577-6193}%
968 \@ACM@screentru
969 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
970 \or % PACMHCI
971 \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
972 \def\@journalNameShort{Proc. ACM Hum.-Comput. Interact.}%
973 \def\@permissionCodeOne{2573-0142}%
974 \@ACM@screentru
975 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
976 \or % PACMPL
977 \def\@journalName{Proceedings of the ACM on Programming Languages}%
978 \def\@journalNameShort{Proc. ACM Program. Lang.}%
979 \def\@permissionCodeOne{2475-1421}%
980 \@ACM@screentru
981 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
982 \or % POMACS
983 \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
984 \def\@journalNameShort{Proc. ACM Meas. Anal. Comput. Syst.}%
985 \def\@permissionCodeOne{2476-1249}%
986 \@ACM@screentru
987 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
988 \or % TAAS
989 \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
990 \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
991 \def\@permissionCodeOne{1556-4665}%
992 \or % TACCESS
993 \def\@journalName{ACM Transactions on Accessible Computing}%
994 \def\@journalNameShort{ACM Trans. Access. Comput.}%
995 \def\@permissionCodeOne{1936-7228}%
996 \or % TACO
997 \def\@journalName{ACM Transactions on Architecture and Code Optimization}%

```



```

998 \def\@journalNameShort{ACM Trans. Arch. Code Optim.}%
999 \or % TALG
1000 \def\@journalName{ACM Transactions on Algorithms}%
1001 \def\@journalNameShort{ACM Trans. Algor.}%
1002 \def\@permissionCodeOne{1549-6325}%
1003 \or % TALLIP
1004 \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
1005 \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
1006 \def\@permissionCodeOne{2375-4699}%
1007 \or % TAP
1008 \def\@journalName{ACM Transactions on Applied Perception}%
1009 \or % TCPS
1010 \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
1011 \or % TDS
1012 \def\@journalName{ACM Transactions on Data Science}%
1013 \def\@journalNameShort{ACM Trans. Data Sci.}%
1014 \def\@permissionCodeOne{2577-3224}%
1015 \or % TEAC
1016 \def\@journalName{ACM Transactions on Economics and Computation}%
1017 \or % TECS
1018 \def\@journalName{ACM Transactions on Embedded Computing Systems}%
1019 \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
1020 \def\@permissionCodeOne{1539-9087}%
1021 \or % TELO
1022 \def\@journalName{ACM Transactions on Evolutionary Learning}%
1023 \def\@journalNameShort{ACM Trans. Evol. Learn.}%
1024 \def\@permissionCodeOne{2688-3007}%
1025 \or % THRI
1026 \def\@journalName{ACM Transactions on Human-Robot Interaction}%
1027 \def\@journalNameShort{ACM Trans. Hum.-Robot Interact.}%
1028 \def\@permissionCodeOne{2573-9522}%
1029 \or % TIIS
1030 \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
1031 \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
1032 \def\@permissionCodeOne{2160-6455}%
1033 \or % TIOT
1034 \def\@journalName{ACM Transactions on Internet of Things}%
1035 \def\@journalNameShort{ACM Trans. Internet Things}%
1036 \def\@permissionCodeOne{2577-6207}%
1037 \or % TISSEC
1038 \def\@journalName{ACM Transactions on Information and System Security}%
1039 \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
1040 \def\@permissionCodeOne{1094-9224}%
1041 \or % TIST
1042 \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
1043 \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
1044 \def\@permissionCodeOne{2157-6904}%
1045 \or % TKDD
1046 \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
1047 \def\@journalNameShort{ACM Trans. Knowl. Discov. Data}%

```

```

1048 \def\@permissionCodeOne{1556-4681}%
1049 \or % TMIS
1050 \def\@journalName{ACM Transactions on Management Information Systems}%
1051 \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
1052 \def\@permissionCodeOne{2158-656X}%
1053 \or % TOCE
1054 \def\@journalName{ACM Transactions on Computing Education}%
1055 \def\@journalNameShort{ACM Trans. Comput. Educ.}%
1056 \def\@permissionCodeOne{1946-6226}%
1057 \or % TOCHI
1058 \def\@journalName{ACM Transactions on Computer-Human Interaction}%
1059 \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
1060 \def\@permissionCodeOne{1073-0516}%
1061 \or % TOCL
1062 \def\@journalName{ACM Transactions on Computational Logic}%
1063 \def\@journalNameShort{ACM Trans. Comput. Logic}%
1064 \def\@permissionCodeOne{1529-3785}%
1065 \or % TOCS
1066 \def\@journalName{ACM Transactions on Computer Systems}%
1067 \def\@journalNameShort{ACM Trans. Comput. Syst.}%
1068 \def\@permissionCodeOne{0734-2071}%
1069 \or % TOCT
1070 \def\@journalName{ACM Transactions on Computation Theory}%
1071 \def\@journalNameShort{ACM Trans. Comput. Theory}%
1072 \def\@permissionCodeOne{1942-3454}%
1073 \or % TODAES
1074 \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
1075 \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
1076 \def\@permissionCodeOne{1084-4309}%
1077 \or % TODS
1078 \def\@journalName{ACM Transactions on Database Systems}%
1079 \def\@journalNameShort{ACM Trans. Datab. Syst.}%
1080 \def\@permissionCodeOne{0362-5915}%
1081 \or % TOG
1082 \def\@journalName{ACM Transactions on Graphics}%
1083 \def\@journalNameShort{ACM Trans. Graph.}%
1084 \def\@permissionCodeOne{0730-0301}%
1085 \or % TOIS
1086 \def\@journalName{ACM Transactions on Information Systems}%
1087 \def\@permissionCodeOne{1046-8188}%
1088 \or % TOIT
1089 \def\@journalName{ACM Transactions on Internet Technology}%
1090 \def\@journalNameShort{ACM Trans. Internet Technol.}%
1091 \def\@permissionCodeOne{1533-5399}%
1092 \or % TOMACS
1093 \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
1094 \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
1095 \or % TOMM
1096 \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
1097 \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%

```

```

1098 \def\@permissionCodeOne{1551-6857}%
1099 \def\@permissionCodeTwo{0100}%
1100 \or % TOMPECS
1101 \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
1102 \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
1103 \def\@permissionCodeOne{2376-3639}%
1104 \or % TOMS
1105 \def\@journalName{ACM Transactions on Mathematical Software}%
1106 \def\@journalNameShort{ACM Trans. Math. Softw.}%
1107 \def\@permissionCodeOne{0098-3500}%
1108 \or % TOPC
1109 \def\@journalName{ACM Transactions on Parallel Computing}%
1110 \def\@journalNameShort{ACM Trans. Parallel Comput.}%
1111 \def\@permissionCodeOne{1539-9087}%
1112 \or % TOPS
1113 \def\@journalName{ACM Transactions on Privacy and Security}%
1114 \def\@journalNameShort{ACM Trans. Priv. Sec.}%
1115 \def\@permissionCodeOne{2471-2566}%
1116 \or % TOPLAS
1117 \def\@journalName{ACM Transactions on Programming Languages and Systems}%
1118 \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
1119 \def\@permissionCodeOne{0164-0925}%
1120 \or % TOS
1121 \def\@journalName{ACM Transactions on Storage}%
1122 \def\@journalNameShort{ACM Trans. Storage}%
1123 \def\@permissionCodeOne{1553-3077}%
1124 \or % TOSEM
1125 \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
1126 \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
1127 \def\@permissionCodeOne{1049-331X}%
1128 \or % TOSN
1129 \def\@journalName{ACM Transactions on Sensor Networks}%
1130 \def\@journalNameShort{ACM Trans. Sensor Netw.}%
1131 \def\@permissionCodeOne{1550-4859}%
1132 \or % TQC
1133 \def\@journalName{ACM Transactions on Quantum Computing}%
1134 \def\@journalNameShort{ACM Trans. Quantum Comput.}%
1135 \def\@permissionCodeOne{2643-6817}%
1136 \or % TRETs
1137 \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
1138 \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
1139 \def\@permissionCodeOne{1936-7406}%
1140 \or % TSAS
1141 \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
1142 \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
1143 \def\@permissionCodeOne{2374-0353}%
1144 \or % TSC
1145 \def\@journalName{ACM Transactions on Social Computing}%
1146 \def\@journalNameShort{ACM Trans. Soc. Comput.}%
1147 \def\@permissionCodeOne{2469-7818}%

```

```

1148 \or % TSLP
1149 \def\@journalName{ACM Transactions on Speech and Language Processing}%
1150 \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
1151 \def\@permissionCodeOne{1550-4875}%
1152 \or % TWEB
1153 \def\@journalName{ACM Transactions on the Web}%
1154 \def\@journalNameShort{ACM Trans. Web}%
1155 \def\@permissionCodeOne{1559-1131}%
1156 \else % FACMP, a dummy journal
1157 \def\@journalName{Forthcoming ACM Publication}%
1158 \def\@journalNameShort{ACM Forthcoming}%
1159 \def\@permissionCodeOne{XXXX-XXXX}%
1160 \fi
1161 \ClassInfo{\@classname}{Using journal code \@journalCode}%
1162 }{%
1163 \ClassError{\@classname}{Incorrect journal #1}%
1164 }%

\acmJournal And the syntactic sugar around it
1165 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}%
1166 \global\@ACM@journal@bibstriptrue}

The defaults:
1167 \def\@journalCode@nr{0}
1168 \def\@journalName{}%
1169 \def\@journalNameShort{\@journalName}%
1170 \def\@permissionCodeOne{XXXX-XXXX}%
1171 \def\@permissionCodeTwo{}%

\acmConference This is the conference command
1172 \newcommand\acmConference[4][{}]{%
1173 \gdef\acmConference@shortname{#1}%
1174 \gdef\acmConference@name{#2}%
1175 \gdef\acmConference@date{#3}%
1176 \gdef\acmConference@venue{#4}%
1177 \ifx\acmConference@shortname\empty
1178 \gdef\acmConference@shortname{#2}%
1179 \fi
1180 \global\@ACM@journal@bibstripfalse
1181 }
1182 \if@ACM@journal\else
1183 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
1184 DC, USA}%
1185 \fi

\acmBooktitle The book title of the conference:
\@acmBooktitle
1186 \def\acmBooktitle#1{\gdef\@acmBooktitle{#1}}
1187 \acmBooktitle{Proceedings of \acmConference@name
1188 \ifx\acmConference@name\acmConference@shortname\else
1189 \ (\acmConference@shortname)\fi}

```

`\@editorsAbbrev` How to abbreviate editors
1190 `\def\@editorsAbbrev{(Ed.)}`

`\@acmEditors` The list of editors
1191 `\def\@acmEditors{}`

`\editor` Add a new editor to the list
1192 `\def\editor#1{\ifx\@acmEditors\empty`
1193 `\gdef\@acmEditors{#1}%`
1194 `\else`
1195 `\gdef\@editorsAbbrev{(Eds.)}%`
1196 `\g@addto@macro\@acmEditors{\and#1}%`
1197 `\fi}`

`\subtitle` The subtitle macro
1198 `\def\subtitle#1{\def\@subtitle{#1}}`
1199 `\subtitle{}`

`\num@authorgroups` The total number of “groups”. Each group is several authors with the same affiliations(s)
1200 `\newcount\num@authorgroups`
1201 `\num@authorgroups=0\relax`

`\num@author` The total number of authors
1202 `\newcount\num@author`
1203 `\num@author=0\relax`

`\if@insideauthorgroup` Whether we are continuing an author group
1204 `\newif\if@insideauthorgroup`
1205 `\@insideauthorgroupfalse`

`\author` Adding an author to the list of authors and addresses
1206 `\renewcommand\author[2][]{%`
1207 `\IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several`
1208 `authors in the same \string\author\space macro!}}}%`
1209 `\global\advance\num@author by 1\relax`
1210 `\if@insideauthorgroup\else`
1211 `\global\advance\num@authorgroups by 1\relax`
1212 `\global\@insideauthorgrouptrue`
1213 `\fi`
1214 `\ifx\addresses\empty`
1215 `\if@ACM@anonymous`
1216 `\gdef\addresses{\@author{Anonymous Author(s)%`
1217 `\ifx\@acmSubmissionID\empty\else\\Submission Id:`
1218 `\@acmSubmissionID\fi}}%`
1219 `\gdef\authors{Anonymous Author(s)}%`
1220 `\else`
1221 `\gdef\addresses{\@author{#2}}%`
1222 `\gdef\authors{#2}%`

```

1223 \fi
1224 \else
1225 \if@ACM@anonymous\else
1226 \g@addto@macro\addresses{\and\@author{#2}}%
1227 \g@addto@macro\authors{\and#2}%
1228 \fi
1229 \fi
1230 \if@ACM@anonymous
1231 \ifx\shortauthors\@empty
1232 \gdef\shortauthors{Anon.
1233 \ifx\@acmSubmissionID\@empty\else Submission Id:
1234 \@acmSubmissionID\fi}%
1235 \fi
1236 \else
1237 \def\@tempa{#1}%
1238 \ifx\@tempa\@empty
1239 \ifx\shortauthors\@empty
1240 \gdef\shortauthors{#2}%
1241 \else
1242 \g@addto@macro\shortauthors{\and#2}%
1243 \fi
1244 \else
1245 \ifx\shortauthors\@empty
1246 \gdef\shortauthors{#1}%
1247 \else
1248 \g@addto@macro\shortauthors{\and#1}%
1249 \fi
1250 \fi
1251 \fi}

```

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

```

1252 \newcommand{\affiliation}[2][{}]{%
1253 \global\@insideauthorgroupfalse
1254 \if@ACM@anonymous\else
1255 \g@addto@macro\addresses{\affiliation{#1}{#2}}%
1256 \fi}

```

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

```

1257 \define@boolkey+{@ACM@affiliation@}[@ACM@affiliation@]{obeypunctuation}%
1258 [true]{\ClassError{\@classname}{The option obeypunctuation can be either true or false}}

```

`\additionalaffiliation` Additional affiliations go to footnotes

```

1259 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}

```

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

```

1260 \def\@additionalaffiliation#1{\bgroup
1261 \def\position##1{\ignorespaces}%

```

```

1262 \def\institution##1{##1\ignorespaces}%
1263 \def\department{\@ifnextchar[{\@department}{\@department[]}}%
1264 \def\@department[#1]##2{\unskip, ##2\ignorespaces}%
1265 \let\streetaddress\position
1266 \let\city\position
1267 \let\state\position
1268 \let\postcode\position
1269 \let\country\position
1270 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.
1271 \renewcommand{\email}[2][{}]{%
1272 \IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several
1273 addresses in the same \string\email\space macro!}}{}%
1274 \if@ACM@anonymous\else
1275 \g@addto@macro\addresses{\email{#1}{#2}}%
1276 \fi}

\orcid Right now we do not typeset ORCIDs
1277 \def\orcid#1{\unskip\ignorespaces}

\authorsaddresses Setting up authors' addresses
1278 \def\authorsaddresses#1{\def\@authorsaddresses{#1}}
1279 \authorsaddresses{\mkauthorsaddresses}

\@titlenotes The title notes
1280 \def\@titlenotes{}

\titlenote Adding a note to the title
1281 \def\titlenote#1{%
1282 \g@addto@macro\@title{\footnotemark}%
1283 \if@ACM@anonymous
1284 \g@addto@macro\@titlenotes{%
1285 \stepcounter{footnote}\footnotetext{Title note}}%
1286 \else
1287 \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
1288 \fi}

\@subtitlenotes The subtitle notes
1289 \def\@subtitlenotes{}

\subtitlenote Adding a note to the subtitle
1290 \def\subtitlenote#1{%
1291 \g@addto@macro\@subtitle{\footnotemark}%
1292 \if@ACM@anonymous
1293 \g@addto@macro\@subtitlenotes{%
1294 \stepcounter{footnote}\footnotetext{Subtitle note}}%
1295 \else

```

```

1296     \g@addto@macro\@subtitlenotes{%
1297         \stepcounter{footnote}\footnotetext{#1}}%
1298     \fi}

\@authornotes The author notes
1299 \def\@authornotes{}

\authornote Adding a note to the author
1300 \def\authornote#1{%
1301     \if@ACM@anonymous\else
1302         \g@addto@macro\addresses{\@authornotemark}%
1303         \g@addto@macro\@authornotes{%
1304             \stepcounter{footnote}\footnotetext{#1}}%
1305         \fi}

\authornotemark Adding a footnote mark to the authors
1306 \newcommand\authornotemark[1][\relax]{%
1307     \ifx#1\relax\relax\relax
1308         \g@addto@macro\addresses{\@authornotemark}%
1309     \else
1310         \g@addto@macro\addresses{\@authornotemark{#1}}%
1311     \fi}

\acmVolume The current volume
1312 \def\acmVolume#1{\def\@acmVolume{#1}}
1313 \acmVolume{1}

\acmNumber The current number
1314 \def\acmNumber#1{\def\@acmNumber{#1}}
1315 \acmNumber{1}

\acmArticle The current article
1316 \def\acmArticle#1{\def\@acmArticle{#1}}
1317 \acmArticle{}

\acmArticleSeq The sequence number
1318 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
1319 \acmArticleSeq{\@acmArticle}

\acmYear The current year
1320 \def\acmYear#1{\def\@acmYear{#1}}
1321 \acmYear{\the\year}

\acmMonth The current month
1322 \def\acmMonth#1{\def\@acmMonth{#1}}
1323 \acmMonth{\the\month}

```


\acmPubDate The publication date
1324 \def\acmPubDate{\ifcase\acmMonth\or
1325 January\or February\or March\or April\or May\or June\or
1326 July\or August\or September\or October\or November\or
1327 December\fi~\acmYear}

\acmPrice The price
1328 \def\acmPrice#1{\def\acmPrice{#1}}
1329 \acmPrice{15.00}

\acmSubmissionID The submission ID
1330 \def\acmSubmissionID#1{\def\acmSubmissionID{#1}}
1331 \acmSubmissionID{}

\acmISBN The book ISBN
1332 \def\acmISBN#1{\def\acmISBN{#1}}
1333 \acmISBN{978-x-xxxx-xxxx-x/YY/MM}

\acmDOI The paper DOI
1334 \def\acmDOI#1{\def\acmDOI{#1}}
1335 \acmDOI{10.1145/nnnnnnn.nnnnnnn}

\if@ACM@badge Whether to print a badge. Note that either a left or right badge triggers it:
1336 \newif\if@ACM@badge
1337 \@ACM@badgefalse

\@ACM@badge@width The width of the badge
1338 \newlength\@ACM@badge@width
1339 \setlength\@ACM@badge@width{5pc}

\@ACM@title@width The width of the badge
1340 \newlength\@ACM@title@width

\@ACM@badge@skip The space between the badge and the title
1341 \newlength\@ACM@badge@skip
1342 \setlength\@ACM@badge@skip{1pc}

\acmBadgeR Setting the right badge
1343 \newcommand\acmBadgeR[2][\@ACM@badgetrue
1344 \def\acmBadgeR@url{#1}%
1345 \def\acmBadgeR@image{#2}}
1346 \def\acmBadgeR@url{
1347 \def\acmBadgeR@image{}

\acmBadgeL Setting the left badge
1348 \newcommand\acmBadgeL[2][\@ACM@badgetrue
1349 \def\acmBadgeL@url{#1}%
1350 \def\acmBadgeL@image{#2}}
1351 \def\acmBadgeL@url{
1352 \def\acmBadgeL@image{}

`\startPage` The start page of the paper

```

1353 \def\startPage#1{\def\@startPage{#1}}
1354 \startPage{}

```

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

```

1355 \def\terms#1{\ClassWarning{\@classname}{The command \string\terms{} is
1356     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.

```

1357 \def\keywords#1{\def\@keywords{#1}}
1358 \keywords{}

```

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

```

1359 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}

```

`\@saveabstract` And saving the abstract

```

1360 \long\def\@saveabstract#1{\long\gdef\@abstract{#1}}
1361 \@saveabstract{}

```

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

```

1362 \long\def\@empty{}

```

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

```

1363 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
1364     \if@ACM@printccs
1365         \ClassInfo{\@classname}{Printing CCS}%
1366     \else
1367         \ClassInfo{\@classname}{Suppressing CCS}%
1368     \fi}{\ClassError{\@classname}{The option printccs can be either true or false}}

```

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

```

1369 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
1370     \if@ACM@printacmref
1371         \ClassInfo{\@classname}{Printing bibformat}%
1372     \else
1373         \ClassInfo{\@classname}{Suppressing bibformat}%
1374     \fi}{\ClassError{\@classname}{The option printacmref can be either true or false}}

```

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

```

1375 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
1376     \if@ACM@printfolios
1377         \ClassInfo{\@classname}{Printing folios}%
1378     \else
1379         \ClassInfo{\@classname}{Suppressing folios}%
1380     \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.

```

1381 \define@cmdkey{@ACM@topmatter@}{@ACM@}{authorsperrow}[0]{%
1382   \IfInteger{#1}{\ClassInfo{\@classname}{Setting authorsperrow to
1383     #1}}{\ClassWarning{\@classname}{The parameter authorsperrow must be
1384       numerical. Ignoring the input #1}\gdef\@ACM@authorsperrow{0}}}
```

`\settopmatter` The usual syntactic sugar

```

1385 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}
```

Now the settings

```

1386 \settopmatter{printccs=true, printacmref=true}
1387 \if@ACM@manuscript
1388   \settopmatter{printfolios=true}
1389 \else
1390   \if@ACM@journal
1391     \settopmatter{printfolios=true}
1392   \else
1393     \settopmatter{printfolios=false}
1394   \fi
1395 \fi
1396 \settopmatter{authorsperrow=0}
```

`\@received` The container for the paper history

```

1397 \def\@received{}
```

`\received` The `\received` command

```

1398 \newcommand\received[2][\def\@tempa{#1}%
1399   \ifx\@tempa\@empty
1400     \ifx\@received\@empty
1401       \gdef\@received{Received #2}%
1402     \else
1403       \g@addto@macro{\@received}{; revised #2}%
1404     \fi
1405   \else
1406     \ifx\@received\@empty
1407       \gdef\@received{#1 #2}%
1408     \else
1409       \g@addto@macro{\@received}{; #1 #2}%
1410     \fi
1411   \fi}
1412 \AtEndDocument{%
1413   \ifx\@received\@empty\else
1414     \par\bigskip\noindent\small\normalfont\@received\par
1415   \fi}
```

3.13 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```

1416 \RequirePackage{comment}
1417 \excludecomment{CCSXML}

\@concepts This is the storage macro and counter for concepts
1418 \let\@concepts\empty
1419 \newcounter{@concepts}

\ccsdesc The first argument is the significance, the second is the concept(s)
1420 \newcommand\ccsdesc[2][100]{%
1421   \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!
1422 \RequirePackage{textcomp}
1423 \def\ccsdesc@parse#1~#2~#3~{%
1424   \stepcounter{@concepts}%
1425   \expandafter\ifx\csname CCS@General@#2\endcsname\relax
1426     \expandafter\gdef\csname CCS@General@#2\endcsname{\textbullet\
1427       \textbf{#2}}%
1428     \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{; }%
1429     \expandafter\gdef\csname CCS@Specific@#2\endcsname{}%
1430     \g@addto@macro{\@concepts}{\csname CCS@General@#2\endcsname
1431       \csname CCS@Punctuation@#2\endcsname
1432       \csname CCS@Specific@#2\endcsname}%
1433     \fi
1434     \ifx#3\relax\relax\else
1435       \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{
1436         \textrightarrow\ }%
1437       \expandafter\g@addto@macro\expandafter{\csname CCS@Specific@#2\endcsname}{%
1438         \addtocounter{@concepts}{-1}%
1439         \ifnum#1>499\textbf{#3}\else
1440         \ifnum#1>299\textit{#3}\else
1441         #3\fi\fi\ifnum\value{@concepts}=0.\else; \fi}%
1442       \fi
1443 \ccsdesc@parse@finish}

\ccdesc@parse@finish Gobble everything to \ccsdesc@parse@end
1444 \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
1445 \newif\if@printcopyright
1446 \@printcopyrighttrue

\if@printpermission Whether to print the permission block
1447 \newif\if@printpermission
1448 \@printpermissiontrue
```

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

1449 \newif\if@acmowned

1450 \@acmownedtrue

Keys:

```
1451 \define@choicekey*{ACM@}{acmcopyrightmode}[%
1452   \acm@copyrightinput\acm@copyrightmode]{none,%
1453     acmcopyright,acmlicensed,rightsretained,%
1454     usgov,usgovmixed,cagov,cagovmixed,licensedusgovmixed,%
1455     licensedcagov,licensedcagovmixed,othergov,licensedothergov,%
1456     iw3c2w3,iw3c2w3g}{%
1457   \@printpermissiontrue
1458   \@printcopyrighttrue
1459   \@acmownedtrue
1460   \ifnum\acm@copyrightmode=0\relax % none
1461     \@printpermissionfalse
1462     \@printcopyrightfalse
1463     \@acmownedfalse
1464   \fi
1465   \ifnum\acm@copyrightmode=2\relax % acmlicensed
1466     \@acmownedfalse
1467   \fi
1468   \ifnum\acm@copyrightmode=3\relax % rightsretained
1469     \@acmownedfalse
1470   \AtBeginDocument{\acmPrice{}}%
1471   \fi
1472   \ifnum\acm@copyrightmode=4\relax % usgov
1473     \@printpermissiontrue
1474     \@printcopyrightfalse
1475     \@acmownedfalse
1476     \AtBeginDocument{\acmPrice{}}%
1477   \fi
1478   \ifnum\acm@copyrightmode=6\relax % cagov
1479     \@acmownedfalse
1480   \fi
1481   \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1482     \@acmownedfalse
1483   \fi
1484   \ifnum\acm@copyrightmode=9\relax % licensedcagov
1485     \@acmownedfalse
1486   \fi
1487   \ifnum\acm@copyrightmode=10\relax % licensedcagovmixed
1488     \@acmownedfalse
1489   \fi
1490   \ifnum\acm@copyrightmode=11\relax % othergov
1491     \@acmownedtrue
1492   \fi
1493   \ifnum\acm@copyrightmode=12\relax % licensedothergov
1494     \@acmownedfalse
1495   \fi
```

```

1496 \ifnum\acm@copyrightmode=13\relax % iw3c2w3
1497 \@acmownedfalse
1498 \AtBeginDocument{\acmPrice{}}%
1499 \fi
1500 \ifnum\acm@copyrightmode=14\relax % iw3c2w3g
1501 \@acmownedfalse
1502 \AtBeginDocument{\acmPrice{}}%
1503 \fi}

```

\setcopyright This is the syntactic sugar around setting keys.

```

1504 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
1505 \setcopyright{acmcopyright}

```

\@copyrightowner Here is the owner of the copyright

```

1506 \def\@copyrightowner{%
1507 \ifcase\acm@copyrightmode\relax % none
1508 \or % acmcopyright
1509 Association for Computing Machinery.
1510 \or % acmlicensed
1511 Copyright held by the owner/author(s). Publication rights licensed to
1512 ACM\@.
1513 \or % rightsretained
1514 Copyright held by the owner/author(s).
1515 \or % usgov
1516 \or % usgovmixed
1517 Association for Computing Machinery.
1518 \or % cagov
1519 Crown in Right of Canada.
1520 \or %cagovmixed
1521 Association for Computing Machinery.
1522 \or %licensedusgovmixed
1523 Copyright held by the owner/author(s). Publication rights licensed to
1524 ACM\@.
1525 \or % licensedcagov
1526 Crown in Right of Canada. Publication rights licensed to
1527 ACM\@.
1528 \or %licensedcagovmixed
1529 Copyright held by the owner/author(s). Publication rights licensed to
1530 ACM\@.
1531 \or % othergov
1532 Association for Computing Machinery.
1533 \or % licensedothergov
1534 Copyright held by the owner/author(s). Publication rights licensed to
1535 ACM\@.
1536 \or % ic2w3www
1537 IW3C2 (International World Wide Web Conference Committee), published
1538 under Creative Commons CC-BY~4.0 License.
1539 \or % ic2w3wwwgoogle
1540 IW3C2 (International World Wide Web Conference Committee), published
1541 under Creative Commons CC-BY-NC-ND~4.0 License.

```

```

1542 \fi}

\@formatdoi Print a clickable DOI
1543 \def\@formatdoi#1{\url{https://doi.org/#1}}

\@copyrightpermission The canned permission block.
1544 \def\@copyrightpermission{%
1545 \ifcase\acm@copyrightmode\relax % none
1546 \or % acmcopyright
1547 Permission to make digital or hard copies of all or part of this
1548 work for personal or classroom use is granted without fee provided
1549 that copies are not made or distributed for profit or commercial
1550 advantage and that copies bear this notice and the full citation on
1551 the first page. Copyrights for components of this work owned by
1552 others than ACM must be honored. Abstracting with credit is
1553 permitted. To copy otherwise, or republish, to post on servers or to
1554 redistribute to lists, requires prior specific permission
1555 and\hspace*{.5pt}/or a fee. Request permissions from
1556 permissions@acm.org.
1557 \or % acmlicensed
1558 Permission to make digital or hard copies of all or part of this
1559 work for personal or classroom use is granted without fee provided
1560 that copies are not made or distributed for profit or commercial
1561 advantage and that copies bear this notice and the full citation on
1562 the first page. Copyrights for components of this work owned by
1563 others than the author(s) must be honored. Abstracting with credit
1564 is permitted. To copy otherwise, or republish, to post on servers
1565 or to redistribute to lists, requires prior specific permission
1566 and\hspace*{.5pt}/or a fee. Request permissions from
1567 permissions@acm.org.
1568 \or % rightsretained
1569 Permission to make digital or hard copies of part or all of this work
1570 for personal or classroom use is granted without fee provided that
1571 copies are not made or distributed for profit or commercial advantage
1572 and that copies bear this notice and the full citation on the first
1573 page. Copyrights for third-party components of this work must be
1574 honored. For all other uses, contact the
1575 owner\hspace*{.5pt}/author(s).
1576 \or % usgov
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1582 \or % usgovmixed
1583 ACM acknowledges that this contribution was authored or co-authored
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```

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1613 from permissions@acm.org.

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1620 purposes only.

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1628 Permission to make digital or hard copies for personal or classroom
1629 use is granted. Copies must bear this notice and the full citation
1630 on the first page. Copyrights for components of this work owned by
1631 others than the Canadian Government must be honored. To copy
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```

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1654 only.
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1657 International (CC-BY~4.0) license. Authors reserve their rights to
1658 disseminate the work on their personal and corporate Web sites with
1659 the appropriate attribution.
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1661 This paper is published under the Creative Commons
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1663 (CC-BY-NC-ND~4.0) license. Authors reserve their rights to
1664 disseminate the work on their personal and corporate Web sites with
1665 the appropriate attribution.
1666 \fi}

\copyrightyear By default, the copyright year is the same as \acmYear, but one can override this:
1667 \def\copyrightyear#1{\def\@copyrightyear{#1}}
1668 \copyrightyear{\@acmYear}

\@teaserfigures The teaser figures container
1669 \def\@teaserfigures{}

teaserfigure The teaser figure
1670 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}

\@saveteaser Saving the teaser
1671 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}}

\thanks We redefine amsart \thanks so the anonymous key works
1672 \renewcommand{\thanks}[1]{%
1673 \ifnotempty{#1}{%
1674 \if@ACM@anonymous
1675 \g@addto@macro\thankses{\thanks{A note}}%
1676 \else
1677 \g@addto@macro\thankses{\thanks{#1}}%
1678 \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⟩]`.

1679 `\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.

```

1680 \def\maketitle{%
1681   \if@ACM@anonymous
1682     % Anonymize omission of \author-s
1683     \ifnum\num@authorgroups=0\author{}\fi
1684   \fi
1685   \begingroup
1686   \let\@vspace\@vspace@orig
1687   \let\@vspacer\@vspacer@orig
1688   \let\@footnotemark\@footnotemark@nolink
1689   \let\@footnotetext\@footnotetext@nolink
1690   \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1691   \hsize=\textwidth
1692   \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1693   \mktitle\if@ACM@sigchiamode\else\mkauthors\fi\mkteasers
1694   \@printtopmatter
1695   \if@ACM@sigchiamode\mkauthors\fi
1696   \setcounter{footnote}{0}%
1697   \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1698   \@titlenotes
1699   \@subtitlenotes
1700   \@authornotes
1701   \let\@makefnmark\relax
1702   \let\@thefnmark\relax
1703   \let\@makefntext\noindent
1704   \ifx\@empty\thankses\else
1705     \footnotetextauthorsaddresses{%
1706       \def\par{\let\par\@par}\parindent\z@\@setthanks}%
1707   \fi
1708   \ifx\@empty\@authorsaddresses\else
1709     \if@ACM@anonymous\else
1710       \if@ACM@journal@bibstrip
1711         \footnotetextauthorsaddresses{%
1712           \def\par{\let\par\@par}\parindent\z@\@setauthorsaddresses}%
1713       \fi
1714     \fi
1715   \fi
1716   \if@ACM@nonacm\else\footnotetextcopyrightpermission{%

```

```

1717 \if@ACM@authordraft
1718     \raisebox{-2ex}{\z@\z@{\makebox[0pt][l]{\large\bfseries
1719         Unpublished working draft. Not for distribution.}}}%
1720     \color[gray]{0.9}%
1721 \fi
1722 \parindent\z@\parskip0.1\baselineskip
1723 \if@ACM@authorversion\else
1724     \if@printpermission\@copyrightpermission\par\fi
1725 \fi
1726 \if@ACM@manuscript\else
1727     \if@ACM@journal@bibstrip\else % Print the conference information
1728         {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
1729         \fi
1730 \fi
1731 \if@printcopyright
1732     \copyright\ \@copyrightyear\ \@copyrightowner\
1733 \else
1734     \@copyrightyear.\
1735 \fi
1736 \if@ACM@manuscript
1737     Manuscript submitted to ACM\
1738 \else
1739     \if@ACM@authorversion
1740         This is the author's version of the work. It is posted here for
1741         your personal use. Not for redistribution. The definitive Version
1742         of Record was published in
1743         \if@ACM@journal@bibstrip
1744             \emph{\@journalName}%
1745         \else
1746             \emph{\@acmBooktitle}%
1747         \fi
1748         \ifx\@acmDOI\@empty
1749             .
1750         \else
1751             , \@formatdoi{\@acmDOI}.
1752         \fi\
1753     \else
1754         \if@ACM@nonacm\else
1755             \if@ACM@journal@bibstrip
1756                 \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1757                 \ifx\@acmPrice\@empty\else\ $\@acmPrice\fi\
1758                 \@formatdoi{\@acmDOI}%
1759             \else % Conference
1760                 \ifx\@acmISBN\@empty\else ACM~ISBN~\@acmISBN
1761                 \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\\\fi
1762                 \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi%
1763             \fi
1764         \fi
1765     \fi
1766 \fi}

```

```

1767 \fi
1768 \endgroup
1769 \setcounter{footnote}{0}%
1770 \@mkabstract
1771 \if@ACM@printccs
1772 \ifx\@concepts\@empty\else\bgroup
1773   {\@specialsection{CCS Concepts}%
1774     \@concepts\par}\egroup
1775 \fi
1776 \fi
1777 \ifx\@keywords\@empty\else\bgroup
1778   {\if@ACM@journal
1779     \@specialsection{Additional Key Words and Phrases}%
1780     \else
1781       \@specialsection{Keywords}%
1782     \fi
1783     \@keywords}\par\egroup
1784 \fi
1785 \andify\authors
1786 \andify\shortauthors
1787 \global\let\authors=\authors
1788 \global\let\shortauthors=\shortauthors
1789 \if@ACM@printacmref
1790   \@mkbibcitation
1791 \fi
1792 \hypersetup{%
1793   pdfauthor={\authors},
1794   pdftitle={\@title},
1795   pdfsubject={\@concepts},
1796   pdfkeywords={\@keywords},
1797   pdfcreator={LaTeX with acmart
1798     \csname ver@acmart.cls\endcsname\space
1799     and hyperref
1800     \csname ver@hyperref.sty\endcsname}}%
1801 \global\@topnum\z@ % this prevents floats from falling
1802                   % at the top of page 1
1803 \global\@botnum\z@ % we do not want them to be on the bottom either
1804 \@printendtopmatter
1805 \@afterindentfalse
1806 \@afterheading
1807 }

```

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

```

1808 \def\@specialsection#1{%
1809   \ifcase\ACM@format@nr
1810     \relax % manuscript
1811     \par\medskip\small\noindent#1: %
1812   \or % acmsmall
1813     \par\medskip\small\noindent#1: %
1814   \or % acmlarge

```

```

1815 \par\medskip\small\noindent#1: %
1816 \or % acmtog
1817 \par\medskip\small\noindent#1: %
1818 \or % sigconf
1819 \section*{#1}%
1820 \or % siggraph
1821 \section*{#1}%
1822 \or % sigplan
1823 \paragraph*{#1}%
1824 \or % sigchi
1825 \section*{#1}%
1826 \or % sigchi-a
1827 \section*{#1}%
1828 \fi}

```

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

```

1829 \def\@printtopmatter{%
1830 \ifx\@startPage\@empty
1831 \gdef\@startPage{1}%
1832 \else
1833 \setcounter{page}{\@startPage}%
1834 \fi
1835 \thispagestyle{firstpagestyle}%
1836 \noindent
1837 \ifcase\ACM@format@nr
1838 \relax % manuscript
1839 \box\mktitle@bx\par
1840 \or % acmsmall
1841 \box\mktitle@bx\par
1842 \or % acmlarge
1843 \box\mktitle@bx\par
1844 \or % acmtog
1845 \twocolumn[\box\mktitle@bx]%
1846 \or % sigconf
1847 \twocolumn[\box\mktitle@bx]%
1848 \or % siggraph
1849 \twocolumn[\box\mktitle@bx]%
1850 \or % sigplan
1851 \twocolumn[\box\mktitle@bx]%
1852 \or % sigchi
1853 \twocolumn[\box\mktitle@bx]%
1854 \or % sigchi-a
1855 \par\box\mktitle@bx\par\bigskip
1856 \ifACM@badge
1857 \marginpar{\noindent
1858 \ifx\@acmBadgeL@image\@empty\else
1859 \href{\@acmBadgeL@url}{%
1860 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%

```

```

1861         \hskip\@ACM@badge@skip
1862         \fi
1863         \ifx\@acmBadgeR@image\@empty\else
1864         \href{\@acmBadgeR@url}{%
1865         \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
1866         \fi}%
1867     \fi
1868 \fi
1869 }

\@mktitle The title of the article
1870 \def\@mktitle{%
1871     \ifcase\ACM@format@nr
1872     \relax % manuscript
1873     \@mktitle@i
1874     \or % acmsmall
1875     \@mktitle@i
1876     \or % acmlarge
1877     \@mktitle@i
1878     \or % acmtog
1879     \@mktitle@i
1880     \or % sigconf
1881     \@mktitle@iii
1882     \or % siggraph
1883     \@mktitle@iii
1884     \or % sigplan
1885     \@mktitle@iii
1886     \or % sigchi
1887     \@mktitle@iii
1888     \or % sigchi-a
1889     \@mktitle@iv
1890     \fi
1891 }

\@titlefont The font to typeset the title
1892 \def\@titlefont{%
1893     \ifcase\ACM@format@nr
1894     \relax % manuscript
1895     \LARGE\sffamily\bfseries
1896     \or % acmsmall
1897     \LARGE\sffamily\bfseries
1898     \or % acmlarge
1899     \LARGE\sffamily\bfseries
1900     \or % acmtog
1901     \Huge\sffamily
1902     \or % sigconf
1903     \Huge\sffamily\bfseries
1904     \or % siggraph
1905     \Huge\sffamily\bfseries
1906     \or % sigplan

```

```

1907 \Huge\bfseries
1908 \or % sigchi
1909 \Huge\sffamily\bfseries
1910 \or % sigchi-a
1911 \Huge\bfseries
1912 \fi}

\@subtitlefont The font to typeset the subtitle
1913 \def\@subtitlefont{\normalsize
1914 \ifcase\ACM@format@nr
1915 \relax % manuscript
1916 \mdseries
1917 \or % acmsmall
1918 \mdseries
1919 \or % acmlarge
1920 \mdseries
1921 \or % acmtog
1922 \LARGE
1923 \or % sigconf
1924 \LARGE\mdseries
1925 \or % siggraph
1926 \LARGE\mdseries
1927 \or % sigplan
1928 \LARGE\mdseries
1929 \or % sigchi
1930 \LARGE\mdseries
1931 \or % sigchi-a
1932 \mdseries
1933 \fi}

\@mktitle@i The version of \mktitle for most journals
1934 \def\@mktitle@i{\hsize=\textwidth
1935 \ACM@title@width=\hsize
1936 \ifx\@acmBadgeL@image\@empty\else
1937 \advance\ACM@title@width by -\ACM@badge@width
1938 \advance\ACM@title@width by -\ACM@badge@skip
1939 \fi
1940 \ifx\@acmBadgeR@image\@empty\else
1941 \advance\ACM@title@width by -\ACM@badge@width
1942 \advance\ACM@title@width by -\ACM@badge@skip
1943 \fi
1944 \setbox\mktitle@bx=\vbox{\noindent\@titlefont
1945 \ifx\@acmBadgeL@image\@empty\else
1946 \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1947 \includegraphics[width=\ACM@badge@width]{\@acmBadgeL@image}}}%
1948 \hskip\ACM@badge@skip
1949 \fi
1950 \parbox[t]{\ACM@title@width}{\raggedright
1951 \@titlefont\noindent
1952 \@title

```

```

1953 \ifx\@subtitle\@empty\else
1954   \par\noindent{\@subtitlefont\@subtitle}
1955 \fi}%
1956 \ifx\@acmBadgeR@image\@empty\else
1957   \hskip\@ACM@badge@skip
1958   \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1959     \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1960 \fi
1961 \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.
1962 \def\@mktitle@iii{\hsize=\textwidth
1963   \setbox\mktitle@bx=\vbox{\@titlefont\centering
1964     \@ACM@title@width=\hsize
1965     \if@ACM@badge
1966       \advance\@ACM@title@width by -2\@ACM@badge@width
1967       \advance\@ACM@title@width by -2\@ACM@badge@skip
1968       \parbox[b]{\@ACM@badge@width}{\strut
1969         \ifx\@acmBadgeL@image\@empty\else
1970           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1971             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1972         \fi}%
1973       \hskip\@ACM@badge@skip
1974     \fi
1975     \parbox[t]{\@ACM@title@width}{\centering\@titlefont
1976       \@title
1977       \ifx\@subtitle\@empty\else
1978         \par\noindent{\@subtitlefont\@subtitle}
1979       \fi
1980     }%
1981     \if@ACM@badge
1982       \hskip\@ACM@badge@skip
1983       \parbox[b]{\@ACM@badge@width}{\strut
1984         \ifx\@acmBadgeR@image\@empty\else
1985           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1986             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1987         \fi}%
1988       \fi
1989     \par\bigskip}}%

\@mktitle@iv The version of \@mktitle for sigchi-a
1990 \def\@mktitle@iv{\hsize=\textwidth
1991   \setbox\mktitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
1992     \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
1993     \noindent\@title
1994     \ifx\@subtitle\@empty\else

```



```

1995      \par\noindent\@subtitlefont\@subtitle
1996      \fi
1997      \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.

```

1998 \newbox\@ACM@commabox
1999 \def\@ACM@addtoaddress#1{%
2000   \ifvmode\else
2001     \if@ACM@affiliation@obexpunctuation\else
2002       \setbox\@ACM@commabox=\hbox{, }%
2003       \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
2004     \fi\fi
2005   #1}

```

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

`\position`

`\department`

`\streetaddress`

`\city`

`\state`

`\postcode`

`\country`

```

2006 \def\streetaddress#1{\unskip\ignorespaces}
2007 \def\postcode#1{\unskip\ignorespaces}
2008 \if@ACM@journal
2009   \def\position#1{\unskip\ignorespaces}
2010   \def\institution#1{\unskip~#1\ignorespaces}
2011   \def\city#1{\unskip\ignorespaces}
2012   \def\state#1{\unskip\ignorespaces}
2013   \newcommand\department[2][0]{\unskip\ignorespaces}
2014   \def\country#1{\if@ACM@affiliation@obexpunctuation\else, \fi#1\ignorespaces}
2015 \else
2016   \def\position#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
2017   \def\institution#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
2018   \newcommand\department[2][0]{\if@ACM@affiliation@obexpunctuation
2019     #2\else#2\par\fi}%
2020 % \def\streetaddress#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
2021 \let\city\@ACM@addtoaddress
2022 \let\state\@ACM@addtoaddress
2023 % \def\postcode#1{\if@ACM@affiliation@obexpunctuation#1\else\unskip\space#1\fi}%
2024 \let\country\@ACM@addtoaddress
2025 \fi

```

`\@mkauthors` Typesetting the authors

```

2026 \def\@mkauthors{\begingroup
2027   \hsize=\textwidth
2028   \ifcase\ACM@format@nr

```

```

2029 \relax % manuscript
2030 \mkauthors@i
2031 \or % acmsmall
2032 \mkauthors@i
2033 \or % acmlarge
2034 \mkauthors@i
2035 \or % acmtog
2036 \mkauthors@i
2037 \or % sigconf
2038 \mkauthors@iii
2039 \or % siggraph
2040 \mkauthors@iii
2041 \or % sigplan
2042 \mkauthors@iii
2043 \or % sigchi
2044 \mkauthors@iii
2045 \or % sigchi-a
2046 \mkauthors@iv
2047 \fi
2048 \endgroup
2049 }

```

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

```

2050 \def\@authorfont{\Large\sffamily}

```

\@affiliationfont Font for affiliations

```

2051 \def\@affiliationfont{\normalsize\normalfont}

```

Adjusting fonts for different formats

```

2052 \ifcase\ACM@format@nr
2053 \relax % manuscript
2054 \or % acmsmall
2055 \def\@authorfont{\large\sffamily}
2056 \def\@affiliationfont{\small\normalfont}
2057 \or % acmlarge
2058 \or % acmtog
2059 \def\@authorfont{\LARGE\sffamily}
2060 \def\@affiliationfont{\large}
2061 \or % sigconf
2062 \def\@authorfont{\LARGE}
2063 \def\@affiliationfont{\large}
2064 \or % siggraph
2065 \def\@authorfont{\normalsize\normalfont}
2066 \def\@affiliationfont{\normalsize\normalfont}
2067 \or % sigplan
2068 \def\@authorfont{\Large\normalfont}
2069 \def\@affiliationfont{\normalsize\normalfont}
2070 \or % sigchi
2071 \def\@authorfont{\bfseries}

```

```

2072 \def\@affiliationfont{\mdseries}
2073 \or % sigchi-a
2074 \def\@authorfont{\bfseries}
2075 \def\@affiliationfont{\mdseries}
2076 \fi

```

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

```

2077 \def\@typeset@author@line{%
2078   \andify\@currentauthors\par\noindent
2079   \@currentauthors\def\@currentauthors{}%
2080   \ifx\@currentaffiliations\@empty\else
2081     \andify\@currentaffiliations
2082     \unskip, {\@currentaffiliations}\par
2083   \fi
2084   \def\@currentaffiliations{}}

```

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

```

2085 \def\@mkauthors@i{%
2086   \def\@currentauthors{}%
2087   \def\@currentaffiliations{}%
2088   \global\let\and\@typeset@author@line
2089   \def\@author##1{%
2090     \ifx\@currentauthors\@empty
2091       \gdef\@currentauthors{\@authorfont\MakeTextUppercase{##1}}%
2092     \else
2093       \g@addto@macro{\@currentauthors}{\and\MakeTextUppercase{##1}}%
2094     \fi
2095     \gdef\and{}}%
2096   \def\email##1##2{%
2097     \def\affiliation##1##2{%
2098       \def\@tempa{##2}\ifx\@tempa\@empty\else
2099         \ifx\@currentaffiliations\@empty
2100           \gdef\@currentaffiliations{%
2101             \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2102             \setkeys{@ACM@affiliation@}{##1}%
2103             \@affiliationfont##2}%
2104         \else
2105           \g@addto@macro{\@currentaffiliations}{\and
2106             \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2107             \setkeys{@ACM@affiliation@}{##1}##2}%
2108         \fi
2109       \fi
2110       \global\let\and\@typeset@author@line}%
2111   \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
2112     \noindent\addresses\@typeset@author@line
2113     \par\medskip}%
2114 }

```

`\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
2115 `\newbox\author@bx`

`\author@bx@wd` The width of the author box
2116 `\newdimen\author@bx@wd`

`\author@bx@sep` The separation between author boxes
2117 `\newskip\author@bx@sep`
2118 `\author@bx@sep=1pc\relax`

`\@typeset@author@bx` Typesetting the box with authors. Note that in sigchi-a the box is not centered.
2119 `\def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd`
2120 `\def\and{\par}\normalbaselines`
2121 `\global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi`
2122 `\@authorfont\@currentauthors\par\@affiliationfont`
2123 `\@currentaffiliation}\egroup`
2124 `\box\author@bx\hspace{\author@bx@sep}%`
2125 `\gdef\@currentauthors{}`
2126 `\gdef\@currentaffiliation{}}`

`\mkauthors@iii` The sigconf version. Here we use a centered design with each author in a separate box.
2127 `\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.
2128 `\author@bx@wd=\textwidth\relax`
2129 `\advance\author@bx@wd by -\author@bx@sep\relax`
2130 `\ifnum\@ACM@authorssperrow>0\relax`
2131 `\divide\author@bx@wd by \@ACM@authorssperrow\relax`
2132 `\else`
2133 `\ifcase\num@authorgroups`
2134 `\relax % 0?`
2135 `\or % 1=one author per row`
2136 `\or % 2=two authors per row`
2137 `\divide\author@bx@wd by \num@authorgroups\relax`
2138 `\or % 3=three authors per row`
2139 `\divide\author@bx@wd by \num@authorgroups\relax`
2140 `\or % 4=two authors per row (!)`
2141 `\divide\author@bx@wd by 2\relax`
2142 `\else % three authors per row`
2143 `\divide\author@bx@wd by 3\relax`
2144 `\fi`
2145 `\fi`
2146 `\advance\author@bx@wd by -\author@bx@sep\relax`

Now, parsing of \addresses:

```

2147 \gdef\@currentauthors{}%
2148 \gdef\@currentaffiliation{}%
2149 \def\@author##1{\ifx\@currentauthors\empty
2150 \gdef\@currentauthors{\par##1}%
2151 \else
2152 \g@addto@macro\@currentauthors{\par##1}%
2153 \fi
2154 \gdef\and{}}%
2155 \def\email##1##2{\ifx\@currentaffiliation\empty
2156 \gdef\@currentaffiliation{\bgroup
2157 \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2158 \else
2159 \g@addto@macro\@currentaffiliation{\par\bgroup
2160 \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2161 \fi}%
2162 \def\affiliation##1##2{\ifx\@currentaffiliation\empty
2163 \gdef\@currentaffiliation{%
2164 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2165 \setkeys{@ACM@affiliation@}{##1}##2}%
2166 \else
2167 \g@addto@macro\@currentaffiliation{\par
2168 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2169 \setkeys{@ACM@affiliation@}{##1}##2}%
2170 \fi
2171 \global\let\and\@typeset@author@bx
2172 }%

```

Actual typesetting is done by the \and macro:

```

2173 \hsize=\textwidth
2174 \global\setbox\mktitle@bx=\vbox{\noindent
2175 \box\mktitle@bx\par\medskip\leavevmode
2176 \lineskip=1pc\relax\centering\hspace*{-1em}%
2177 \addresses\let\and\@typeset@author@bx\and\par\bigskip}}

```

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

```

2178 \def\@mkauthors@iv{%

```

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

```

2179 \author@bx@wd=\columnwidth\relax
2180 \advance\author@bx@wd by -\author@bx@sep\relax
2181 \ifnum\@ACM@authorsperrrow>0\relax
2182 \divide\author@bx@wd by \@ACM@authorsperrrow\relax
2183 \else
2184 \ifcase\@num@authorgroups
2185 \relax % 0?

```

```

2186 \or % 1=one author per row
2187 \else % 2=two authors per row
2188 \divide\author@bx@wd by 2\relax
2189 \fi
2190 \fi
2191 \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of \addresses:

```

2192 \gdef\@currentauthors{}%
2193 \gdef\@currentaffiliation{}%
2194 \def\author##1{\ifx\@currentauthors\@empty
2195 \gdef\@currentauthors{\par##1}%
2196 \else
2197 \g@addto@macro\@currentauthors{\par##1}%
2198 \fi
2199 \gdef\and{}}%
2200 \def\email##1##2{\ifx\@currentaffiliation\@empty
2201 \gdef\@currentaffiliation{\nolinkurl{##2}}%
2202 \else
2203 \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
2204 \fi}%
2205 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2206 \gdef\@currentaffiliation{%
2207 \setkeys{@ACM@affiliation@}{obexpunctuation=false}%
2208 \setkeys{@ACM@affiliation@}{##1}##2}%
2209 \else
2210 \g@addto@macro\@currentaffiliation{\par
2211 \setkeys{@ACM@affiliation@}{obexpunctuation=false}%
2212 \setkeys{@ACM@affiliation@}{##1}##2}%
2213 \fi
2214 \global\let\and\@typeset@author@bx}%
2215 %

```

Actual typesetting is done by the \and macro

```

2216 \bgroup\hsize=\columnwidth
2217 \par\raggedright\leftskip=\z@
2218 \lineskip=1pc\noindent
2219 \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}

```

\@mkauthorsaddresses Typesetting authors' addresses in the footnote style

```

2220 \def\@mkauthorsaddresses{%
2221 \ifnum\num@authors>1\relax
2222 Authors' \else Author's \fi
2223 \ifnum\num@authorgroups>1\relax
2224 addresses: \else address: \fi
2225 \bgroup
2226 \def\streetaddress##1{\unskip\@addpunct, ##1}%
2227 \def\postcode##1{\unskip\@addpunct, ##1}%
2228 \def\position##1{\unskip\ignorespaces}%
2229 \def\institution##1{\unskip\@addpunct, ##1}%

```

```

2230 \def\city##1{\unskip\@addpunct, ##1}%
2231 \def\state##1{\unskip\@addpunct, ##1}%
2232 \renewcommand\department[2][0]{\unskip\@addpunct, ##2}%
2233 \def\country##1{\unskip\@addpunct, ##1}%
2234 \def\and{\unskip\@addpunct; }%
2235 \def\@author##1{##1}%
2236 \def\email##1##2{\unskip\@addpunct, \nolinkurl{##2}}%
2237 \addresses
2238 \egroup}

\@setaddresses This is an amsart macro that we do not need.
2239 \def\@setaddresses{}

\@authornotemark Adding a footnote mark to authors. This version adds a “normal” footnote mark.
2240 \def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark\relax}}

\@@authornotemark Adding a footnote mark to authors with a given number
2241 \def\@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}

\@mkteasers Typesetting the teasers
2242 \def\@mkteasers{%
2243   \ifx\@teaserfigures\@empty\else
2244     \def\@teaser##1{\par\bigskip\bgroup
2245       \captionsetup{type=figure}##1\egroup\par}
2246     \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
2247       \noindent\@Description@presentfalse
2248       \@teaserfigures\par\if@Description@present\else
2249         \global\@undescrbed@imagestrue
2250         \ClassWarning{\@classname}{A possible image without
2251           description}\fi
2252       \medskip}%
2253     \fi}

\@mkabstract Typesetting the abstract
2254 \def\@mkabstract{\bgroup
2255   \ifx\@abstract\@empty\else
2256     {\phantomsection\addcontentsline{toc}{section}{Abstract}%
2257     \if@ACM@journal
2258       \everypar{\setbox\z@\lastbox\everypar{}}\small
2259     \else
2260       \section*{\abstractname}%
2261     \fi
2262     \ignorespaces\@abstract\par}%
2263   \fi\egroup}

\@mkbibcitation Print the bibcitation format
2264 \def\@mkbibcitation{\bgroup
2265   \let\@vspace\@vspace@orig
2266   \let\@vspacer\@vspacer@orig

```

```

2267 \def\@pages@word{\ifnum\getrefnumber{TotPages}=1\relax page\else pages\fi}%
2268 \def\footnotemark{}%
2269 \def\{\unskip{} \ignorespaces}%
2270 \def\footnote{\ClassError{\@classname}{Please do not use footnotes
2271     inside a \string\title{} or \string\author{} command! Use
2272     \string\titlenote{} or \string\authornote{} instead!}}%
2273 \def\@article@string{\ifx\@acmArticle\@empty{\ } \else,
2274     Article~\@acmArticle\ }%
2275 \par\medskip\small\noindent{\bfseries ACM Reference Format:}\par\nobreak
2276 \noindent\bgroup
2277     \def\{\unskip{}, \ignorespaces}\authors\egroup. \@acmYear. \@title
2278     \ifx\@subtitle\@empty. \else: \@subtitle. \fi
2279     \if@ACM@nonacm\else
2280         % The 'nonacm' option disables 'printacmref' by default,
2281         % and the present \mkbibcitation definition is never used
2282         % in this case. The conditional remains useful if the user
2283         % explicitly sets \settopmatter{printacmref=true}.
2284         \if@ACM@journal@bibstrip
2285             \textit{\@journalNameShort}
2286             \@acmVolume, \@acmNumber \@article@string (\@acmPubDate),
2287             \ref{TotPages}~\@pages@word.
2288         \else
2289             In \textit{\@acmBooktitle}%
2290             \ifx\@acmEditors\@empty\textit{.}\else
2291                 \andify\@acmEditors\textit{, }\@acmEditors~\@editorsAbbrev.%
2292             \fi\
2293             ACM, New York, NY, USA%
2294             \@article@string\unskip, \ref{TotPages}~\@pages@word.
2295         \fi
2296     \fi
2297     \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
2298 \par\egroup}

```

\@printendtopmatter End the top matter

```

2299 \def\@printendtopmatter{\bgroup
2300     \let\@vspace\@vspace@orig
2301     \let\@vspacer\@vspacer@orig
2302     \par\bigskip
2303     \egroup}

```

\@setthanks We redefine \setthanks using \long

```

2304 \def\@setthanks{\long\def\thanks##1{\par##1\@addpunct.}\thankses}

```

\@setauthorsaddresses

```

2305 \def\@setauthorsaddresses{\@authorsaddresses\unskip\@addpunct.}

```

3.16 Headers and Footers

We use fancyhdr for our headers and footers:

```

2306 \RequirePackage{fancyhdr}

```


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

```

2307 \let\ACM@ps@plain\ps@plain
2308 \let\ACM@ps@myheadings\ps@myheadings
2309 \let\ACM@ps@headings\ps@headings
2310 \def\ACM@restore@pagestyle{%
2311   \let\ps@plain\ACM@ps@plain
2312   \let\ps@myheadings\ACM@ps@myheadings
2313   \let\ps@headings\ACM@ps@headings}
2314 \AtBeginDocument{\ACM@restore@pagestyle}

```

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

```

2315 \if@ACM@review
2316   \newsavebox{\ACM@linecount@bx}
2317   \newlength\ACM@linecount@bxht
2318   \newcount\ACM@linecount
2319   \ACM@linecount\@ne\relax
2320   \def\ACM@mk@linecount{%
2321     \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{%
2322       \setlength{\ACM@linecount@bxht}{0pt}%
2323       \loop{\color{red}\scriptsize\the\ACM@linecount}\
2324       \global\advance\ACM@linecount by \@ne
2325       \addtolength{\ACM@linecount@bxht}{\baselineskip}%
2326       \ifdim\ACM@linecount@bxht<\textheight\repeat
2327       {\color{red}\scriptsize\the\ACM@linecount}\hfill
2328       \global\advance\ACM@linecount by \@ne}}}%
2329 \fi

```

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

```

2330 \def\ACM@linecountL{%
2331   \if@ACM@review
2332     \ACM@mk@linecount
2333     \begin{picture}(0,0)%
2334       \put(-26,-22){\usebox{\ACM@linecount@bx}}%
2335     \end{picture}%
2336   \fi}

```

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

```

2337 \def\ACM@linecountR{%
2338   \if@ACM@review
2339     \ACM@mk@linecount
2340     \begin{picture}(0,0)%
2341       \put(20,-22){\usebox{\ACM@linecount@bx}}%
2342     \end{picture}%
2343   \fi}

```

`\ACM@timestamp` The timestamp system

```

2344 \if@ACM@timestamp
2345   % Subtracting 30 from \time gives us the effect of rounding down despite
2346   % \numexpr rounding to nearest

```

```

2347 \newcounter{ACM@time@hours}
2348 \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
2349 \newcounter{ACM@time@minutes}
2350 \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
2351 \newcommand\ACM@timestamp{%
2352   \footnotesize%
2353   \ifx\@acmSubmissionID\empty\relax\else
2354     Submission ID: \@acmSubmissionID.{ }%
2355   \fi
2356   \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
2357   \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{. }%
2358   Page \thepage\ of \@startPage--\pageref*{TotPages}.%
2359 }
2360 \fi

```

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

```

2361 \def\@shortauthors{%
2362   \if@ACM@anonymous
2363     Anon.
2364     \ifx\@acmSubmissionID\empty\else Submission Id: \@acmSubmissionID\fi
2365   \else\shortauthors\fi}

```

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

```

2366 \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

```

2367 \AtBeginDocument{%
2368 \fancypagestyle{standardpagestyle}{%
2369   \fancyhf{}%
2370   \renewcommand{\headrulewidth}{\z@}%
2371   \renewcommand{\footrulewidth}{\z@}%
2372   \def\@acmArticlePage{%
2373     \ifx\@acmArticle\empty%
2374       \if@ACM@printfolios\thepage\fi%
2375     \else%
2376       \@acmArticle\if@ACM@printfolios:\thepage\fi%
2377     \fi%
2378   }%
2379   \if@ACM@journal@bibstrip
2380     \ifcase\ACM@format@nr
2381       \relax % manuscript
2382       \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
2383       \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
2384       \fancyhead[RE]{\@shortauthors}%
2385       \fancyhead[LO]{\ACM@linecountL\shorttitle}%
2386       \if@ACM@nonacm\else%
2387         \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}
2388       \fi%

```

```

2389 \or % acmsmall
2390 \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticlePage}%
2391 \fancyhead[RO]{\@headfootfont\@acmArticlePage}%
2392 \fancyhead[RE]{\@headfootfont\@shortauthors}%
2393 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2394 \if@ACM@nonacm\else%
2395 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2396 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2397 \fi
2398 \or % acmlarge
2399 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2400 \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2401 \fancyhead[LO]{\ACM@linecountL}%
2402 \fancyhead[RO]{\@headfootfont
2403 \shorttitle\quad\textbullet\quad\@acmArticlePage}%
2404 \if@ACM@nonacm\else%
2405 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2406 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2407 \fi
2408 \or % acmtog
2409 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2410 \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2411 \fancyhead[LO]{\ACM@linecountL}%
2412 \fancyhead[RE]{\ACM@linecountR}%
2413 \fancyhead[RO]{\@headfootfont
2414 \shorttitle\quad\textbullet\quad\@acmArticlePage\ACM@linecountR}%
2415 \if@ACM@nonacm\else%
2416 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2417 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2418 \fi
2419 \else % Proceedings
2420 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2421 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2422 \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2423 \if@ACM@nonacm\else%
2424 \fancyhead[LE]{\ACM@linecountL\@headfootfont\footnotesize
2425 \acmConference@shortname,
2426 \acmConference@date, \acmConference@venue}%
2427 \fancyhead[RO]{\@headfootfont
2428 \acmConference@shortname,
2429 \acmConference@date, \acmConference@venue\ACM@linecountR}%
2430 \fi
2431 \fi
2432 \else % Proceedings
2433 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2434 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2435 \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2436 \if@ACM@nonacm\else%
2437 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2438 \acmConference@shortname,

```

```

2439         \acmConference@date, \acmConference@venue}%
2440     \fancyhead[R0]{\@headfootfont
2441         \acmConference@shortname,
2442         \acmConference@date, \acmConference@venue\ACM@linecountR}%
2443     \fi
2444 \fi
2445 \if@ACM@sigchiamode
2446     \fancyheadoffset[L]{\dimexpr\marginparsep+\marginparwidth}}%
2447 \fi
2448 \if@ACM@timestamp
2449     \fancyfoot[LO,RE]{\ACM@timestamp}
2450 \fi
2451 }%
2452 \pagestyle{standardpagestyle}
2453 }

\@folio@wd Folio blob width, height, offsets and max number
\@folio@ht
\@folio@voffset
\@folio@max
2454 \newdimen\@folio@wd
2455 \@folio@wd=\z@
2456 \newdimen\@folio@ht
2457 \@folio@ht=\z@
2458 \newdimen\@folio@voffset
2459 \@folio@voffset=\z@
2460 \def\@folio@max{1}
2461 \ifcase\ACM@format@nr
2462 \relax % manuscript
2463 \or % acmsmall
2464     \@folio@wd=45.75pt\relax
2465     \@folio@ht=1.25in\relax
2466     \@folio@voffset=.2in\relax
2467     \def\@folio@max{8}
2468 \or % acmlarge
2469     \@folio@wd=43.25pt\relax
2470     \@folio@ht=79pt\relax
2471     \@folio@voffset=.55in\relax
2472     \def\@folio@max{10}
2473 \fi

\@folioblob The macro to typeset the folio blob.
2474 \def\@folioblob{\@tempcnta=0\@acmArticleSeq\relax
2475     \ifnum\@tempcnta=0\relax\else
First, we calculate \@acmArticleSeq modulo \@folio@max
2476     \loop
2477         \ifnum\@tempcnta>\@folio@max\relax
2478         \advance\@tempcnta by - \@folio@max
2479     \repeat
2480     \advance\@tempcnta by -1\relax
2481     \@tempdima=\@folio@ht\relax
2482     \multiply\@tempdima by \the\@tempcnta\relax

```

```

2483 \advance\@tempdima by -\@folio@voffset\relax
2484 \begin{picture}(0,0)
2485 \makebox[\z@]{\raisebox{-\@tempdima}{%
2486 \rlap{%
2487 \raisebox{-0.45\@folio@ht}{\z@}{\z@}{%
2488 \rule{\@folio@wd}{\@folio@ht}}}%
2489 \parbox{\@folio@wd}{%
2490 \centering
2491 \textcolor{white}{\LARGE\sffamily\bfseries\@acmArticle}}}}
2492 \end{picture}\fi}
2493

```

firstpagestyle The page style for the first page only.

```

2494 \AtBeginDocument{%
2495 \fancypagestyle{firstpagestyle}{%
2496 \fancyhf{}%
2497 \renewcommand{\headrulewidth}{\z@}%
2498 \renewcommand{\footrulewidth}{\z@}%
2499 \if@ACM@journal@bibstrip
2500 \ifcase\ACM@format@nr
2501 \relax % manuscript
2502 \fancyhead[L]{\ACM@linecountL}%
2503 \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
2504 \if@ACM@nonacm\else%
2505 \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
2506 \fi%
2507 \or % acmsmall
2508 \if@ACM@nonacm\else%
2509 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2510 \@acmNumber, Article \@acmArticle. Publication date:
2511 \@acmPubDate.}%
2512 \fi%
2513 \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2514 \fancyhead[LO]{\ACM@linecountL}%
2515 \fancyhead[RO]{\@folioblob}%
2516 \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
2517 \or % acmlarge
2518 \if@ACM@nonacm\else%
2519 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2520 \@acmNumber, Article \@acmArticle. Publication date:
2521 \@acmPubDate.}%
2522 \fi%
2523 \fancyhead[RO]{\@folioblob}%
2524 \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2525 \fancyhead[LO]{\ACM@linecountL}%
2526 \fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2527 \or % acmtog
2528 \if@ACM@nonacm\else%
2529 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2530 \@acmNumber, Article \@acmArticle. Publication date:

```

```

2531         \@acmPubDate.}%
2532     \fi%
2533     \fancyhead[L]{\ACM@linecountL}%
2534     \fancyhead[R]{\ACM@linecountR}%
2535     \else % Conference proceedings
2536         \fancyhead[L]{\ACM@linecountL}%
2537         \fancyhead[R]{\ACM@linecountR}%
2538         \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2539     \fi
2540 \else
2541     \fancyhead[L]{\ACM@linecountL}%
2542     \fancyhead[R]{\ACM@linecountR}%
2543     \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2544 \fi
2545 \if@ACM@timestamp
2546     \ifnum\ACM@format@nr=0\relax % Manuscript
2547     \fancyfoot[LO,RE]{\ACM@timestamp\quad
2548         \if@ACM@nonacm\else
2549             \footnotesize Manuscript submitted to ACM
2550         \fi}
2551     \else
2552     \fancyfoot[LO,RE]{\ACM@timestamp}
2553     \fi
2554 \fi
2555 }}

```

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`.

```

2556 \def\ACM@NRadjust#1{%
2557   \begingroup
2558   \expandafter\ifx\csname Sectionformat\endcsname\relax
2559     % do nothing when \Sectionformat is unknown
2560     \def\next{\endgroup #1}%
2561   \else
2562     \def\next{\endgroup
2563       \let\realSectionformat\Sectionformat
2564       \def\ACM@sect@format@{#1}%
2565       \let\Sectionformat\ACM@NR@adjustedSectionformat
2566       %% next lines added 2018-06-17 to ensure section number is styled
2567       \let\real@adddotafter\@adddotafter
2568       \let\@adddotafter\ACM@adddotafter
2569       #1}% imposes the styles, but nullifies \MakeUppercase
2570       \let\@adddotafter\real@adddotafter
2571     }%
2572   \fi \next
2573 }

```

\ACM@NR@adjustedSectionformat

```

2574 \def\ACM@NR@adjustedSectionformat#1#2{%
2575   \realSectionformat{\ACM@sect@format{#1}}{#2}%
2576   \let\Sectionformat\realSectionformat}
2577 \DeclareRobustCommand{\ACM@sect@format}{\ACM@sect@format@}
2578 \def\ACM@sect@format@null#1{#1}
2579 \let\ACM@sect@format@\ACM@sect@format@null
2580 \AtBeginDocument{%
2581   \expandafter\ifx\csname LTX@adddotafter\endcsname\relax
2582     \let\LTX@adddotafter\@adddotafter
2583   \fi
2584 }

```

\ACM@adddotafter

```

2585 \def\ACM@adddotafter#1{\ifx\relax#1\relax\else\LTX@adddotafter{#1}\fi}

```

Sectioning is different for different levels

```

2586 \renewcommand\section{\@startsection{section}{1}{\z@}%
2587   {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2588   {.25\baselineskip}%
2589   {\ACM@NRadjust\secfont}}
2590 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2591   {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2592   {.25\baselineskip}%
2593   {\ACM@NRadjust\subsecfont}}
2594 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2595   {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2596   {-3.5\p@}%
2597   {\ACM@NRadjust{\@subsubsecfont\@adddotafter}}}}
2598 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%

```

```

2599 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2600 {-3.5\p@}%
2601 {\ACM@NRadjust{\@parfont\@adddotafter}}
2602 \renewcommand\part{\@startsection{part}{9}{\z@}%
2603 {-10\p@ \@plus -4\p@ \@minus -2\p@}%
2604 {4\p@}%
2605 {\ACM@NRadjust\@parfont}}

```

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

```

2606 \def\section@raggedright{\@rightskip\@flushglue
2607 \rightskip\@rightskip
2608 \leftskip\z@skip
2609 \parindent\z@}

```

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

```

\@subsecfont 2610 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
\@subsubsecfont 2611 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
\@parfont 2612 \def\@subsubsecfont{\sffamily\itshape}
2613 \def\@parfont{\itshape}
2614 \setcounter{secnumdepth}{3}
2615 \ifcase\ACM@format@nr
2616 \relax % manuscript
2617 \or % acmsmall
2618 \or % acmlarge
2619 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2620 \def\@subsecfont{\sffamily\large\section@raggedright}
2621 \or % acmtog
2622 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2623 \def\@subsecfont{\sffamily\large\section@raggedright}
2624 \or % sigconf
2625 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
2626 \def\@subsecfont{\bfseries\Large\section@raggedright}
2627 \or % siggraph
2628 \def\@secfont{\sffamily\bfseries\Large\section@raggedright\MakeTextUppercase}
2629 \def\@subsecfont{\sffamily\bfseries\Large\section@raggedright}
2630 \or % sigplan
2631 \def\@secfont{\bfseries\Large\section@raggedright}
2632 \def\@subsecfont{\bfseries\section@raggedright}
2633 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2634 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2635 {.25\baselineskip}%
2636 {\@subsubsecfont}}
2637 \def\@subsubsecfont{\bfseries\section@raggedright}
2638 \renewcommand\paragraph{\@startsection{paragraph}{4}{\z@}%
2639 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2640 {-3.5\p@}%
2641 {\@parfont\@addspaceafter}}
2642 \def\@parfont{\bfseries\itshape}
2643 \renewcommand\subparagraph{\@startsection{subparagraph}{5}{\z@}%
2644 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%

```



```

2645 {-3.5\p@}%
2646 {\@subparfont\@addspaceafter}}
2647 \def\@subparfont{\itshape}
2648 \or % sigchi
2649 \setcounter{secnumdepth}{1}
2650 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2651 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2652 \or % sigchi-a
2653 \setcounter{secnumdepth}{0}
2654 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2655 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2656 \fi

```

\@adddotafter Add punctuation after a sectioning command

```
2657 \def\@adddotafter#1{#1\@addpunct{.}}
```

\@addspaceafter Add space after a sectioning command

```
2658 \def\@addspaceafter#1{#1\@addpunct{\enspace}}
```

3.18 TOC lists

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

```
2659 \providecommand*\@dotsep{4.5}
```

3.19 Theorems

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

```
2660 \def\@acmplainbodyfont{\itshape}
```

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

```
2661 \def\@acmplainindent{\parindent}
```

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

```
2662 \def\@acmplainheadfont{\scshape}
```

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

```
2663 \def\@acmplainnotefont{\@empty}
```

Customization of the acmplain theorem style:

```

2664 \ifcase\ACM@format@nr
2665 \relax % manuscript
2666 \or % acmsmall
2667 \or % acmlarge
2668 \or % acmtog
2669 \or % sigconf

```

```

2670 \or % siggraph
2671 \or % sigplan
2672 \def\@acmplainbodyfont{\itshape}
2673 \def\@acmplainindent{\z@}
2674 \def\@acmplainheadfont{\bfseries}
2675 \def\@acmplainnotefont{\normalfont}
2676 \or % sigchi
2677 \or % sigchi-a
2678 \fi

```

acmplain The acmplain theorem style

```

2679 \newtheoremstyle{acmplain}%
2680 { .5\baselineskip \@plus.2\baselineskip
2681 \@minus.2\baselineskip}% space above
2682 { .5\baselineskip \@plus.2\baselineskip
2683 \@minus.2\baselineskip}% space below
2684 {\@acmplainbodyfont}% body font
2685 {\@acmplainindent}% indent amount
2686 {\@acmplainheadfont}% head font
2687 { .}% punctuation after head
2688 { .5em}% spacing after head
2689 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont{#3}}}}% head spec

```

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

```

2690 \def\@acmdefinitionbodyfont{\normalfont}

```

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

```

2691 \def\@acmdefinitionindent{\parindent}

```

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

```

2692 \def\@acmdefinitionheadfont{\itshape}

```

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

```

2693 \def\@acmdefinitionnotefont{\@empty}

```

Customization of the acmdefinition theorem style:

```

2694 \ifcase\ACM@format@nr
2695 \relax % manuscript
2696 \or % acmsmall
2697 \or % acmlarge
2698 \or % acmtog
2699 \or % sigconf
2700 \or % siggraph
2701 \or % sigplan
2702 \def\@acmdefinitionbodyfont{\normalfont}
2703 \def\@acmdefinitionindent{\z@}
2704 \def\@acmdefinitionheadfont{\bfseries}
2705 \def\@acmdefinitionnotefont{\normalfont}
2706 \or % sigchi

```

```

2707 \or % sigchi-a
2708 \fi

```

acmdefinition The acmdefinition theorem style

```

2709 \newtheoremstyle{acmdefinition}%
2710   {.5\baselineskip\@plus.2\baselineskip
2711     \@minus.2\baselineskip}% space above
2712   {.5\baselineskip\@plus.2\baselineskip
2713     \@minus.2\baselineskip}% space below
2714   {\@acmdefinitionbodyfont}% body font
2715   {\@acmdefinitionindent}% indent amount
2716   {\@acmdefinitionheadfont}% head font
2717   {.}% punctuation after head
2718   {.5em}% spacing after head
2719   {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmdefinitionnotefont{#3}}}}% head spec

```

Make acmplain the default theorem style.

```

2720 \theoremstyle{acmplain}

```

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

```

2721 \AtEndPreamble{%
2722   \if@ACM@acmthm
2723     \theoremstyle{acmplain}
2724     \@ifundefined{theorem}{%
2725       \newtheorem{theorem}{Theorem}[section]
2726     }{}
2727     \@ifundefined{conjecture}{%
2728       \newtheorem{conjecture}[theorem]{Conjecture}
2729     }{}
2730     \@ifundefined{proposition}{%
2731       \newtheorem{proposition}[theorem]{Proposition}
2732     }{}
2733     \@ifundefined{lemma}{%
2734       \newtheorem{lemma}[theorem]{Lemma}
2735     }{}
2736     \@ifundefined{corollary}{%
2737       \newtheorem{corollary}[theorem]{Corollary}
2738     }{}
2739     \theoremstyle{acmdefinition}
2740     \@ifundefined{example}{%
2741       \newtheorem{example}[theorem]{Example}
2742     }{}

```

```

2743 \@ifundefined{definition}{%
2744 \newtheorem{definition}[theorem]{Definition}
2745 }{}
2746 \fi
2747 \theoremstyle{acmplain}
2748 }

\@proofnamefont The font to typeset the proof name.
2749 \def\@proofnamefont{\scshape}

\@proofindent Whether or not to indent proofs.
2750 \def\@proofindent{\indent}

Customization of the proof environment.
2751 \ifcase\ACM@format@nr
2752 \relax % manuscript
2753 \or % acmsmall
2754 \or % acmlarge
2755 \or % acmtog
2756 \or % sigconf
2757 \or % siggraph
2758 \or % sigplan
2759 \def\@proofnamefont{\itshape}
2760 \def\@proofindent{\noindent}
2761 \or % sigchi
2762 \or % sigchi-a
2763 \fi

proof We want some customization of the proof environment.
2764 \renewenvironment{proof}[1][\proofname]{\par
2765 \pushQED{\qed}%
2766 \normalfont \topsep6\p@\@plus6\p@\relax
2767 \trivlist
2768 \item[\@proofindent\hskip\labelsep
2769 {\@proofnamefont #1\@addpunct{.}}]\ignorespaces
2770 }{%
2771 \popQED\endtrivlist\@endpfalse
2772 }

```

3.20 Balancing columns

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

```

2773 \AtEndPreamble{%
2774 \if@ACM@balance
2775 \ifcase\ACM@format@nr
2776 \relax % manuscript
2777 \global\@ACM@balancefalse
2778 \or % acmsmall
2779 \global\@ACM@balancefalse

```

```

2780 \or % acmlarge
2781 \global\@ACM@balancefalse
2782 \or % acmtog
2783 \RequirePackage{balance}%
2784 \or % sigconf
2785 \RequirePackage{balance}%
2786 \or % siggraph
2787 \RequirePackage{balance}%
2788 \or % sigplan
2789 \RequirePackage{balance}%
2790 \or % sigchi
2791 \RequirePackage{balance}%
2792 \or % sigchi-a
2793 \global\@ACM@balancefalse
2794 \fi
2795 \fi
2796 }
2797 \AtEndDocument{%
2798 \if@ACM@balance
2799 \if@twocolumn
2800 \balance
2801 \fi\fi}

```

3.21 Acknowledgments

```

\acksname
2802 \newcommand\acksname{Acknowledgments}

\acks This is a comment-like structure
2803 \specialcomment{acks}{%
2804 \begingroup
2805 \section*{\acksname}
2806 \phantomsection\addcontentsline{toc}{section}{\acksname}
2807 }{%
2808 \endgroup
2809 }

\grantsponsor We just typeset the name of the sponsor
2810 \def\grantsponsor#1#2#3{#2}

\grantnum
2811 \newcommand\grantnum[3][[]]{#3%
2812 \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}

```

3.22 Conditional typesetting

We use the comment package for conditional typesetting:

```

2813 \AtEndPreamble{%

```

```

2814 \if@ACM@screen
2815   \includecomment{screenonly}
2816   \excludecomment{printonly}
2817 \else
2818   \excludecomment{screenonly}
2819   \includecomment{printonly}
2820 \fi
2821 \if@ACM@anonymous
2822   \excludecomment{anonsuppress}
2823   \excludecomment{acks}
2824 \else
2825   \includecomment{anonsuppress}
2826 \fi}

```

3.23 Additional bibliography commands

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

```

2827 \newcommand\showeprint[2][arxiv]{%
2828   \def\@tempa{#1}%
2829   \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
2830   \def\@tempb{arxiv}%
2831   \ifx\@tempa\@tempb
2832     arXiv:\href{http://arxiv.org/abs/#2}{#2}\else arXiv:#2%
2833   \fi}

```

3.24 End of Class

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

```

2834 \let\@vspace@orig=\@vspace
2835 \let\@vspacer@orig=\@vspacer
2836 \apptocmd{\@vspace}{\ClassWarning{\@classname}{\string\vspace\space should
2837   only be used to provide space above/below surrounding
2838   objects}}{}{}
2839 \apptocmd{\@vspacer}{\ClassWarning{\@classname}{\string\vspace\space should
2840   only be used to provide space above/below surrounding
2841   objects}}{}{}

```

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

```

2842 \let\ACM@origbaselinestretch\baselinestretch
2843 \AtEndDocument{\ifx\baselinestretch\ACM@origbaselinestretch\else
2844   \ClassError{\@classname}{An attempt to redefine
2845     \string\baselinestretch\space detected. Please do not do this for
2846     ACM submissions!}\fi}

2847 \normalsize\normalfont\frenchspacing
2848 </class>

```

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