

# L<sup>A</sup>T<sub>E</sub>X Class for the *Association for Computing Machinery*\*

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2020/09/13, v1.73

## Abstract

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

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# 1 Introduction

The Association for Computing Machinery<sup>1</sup> is the world's largest educational and scientific computing society, which delivers resources that advance computing as a science and a profession. It was one of the early adopters of  $\TeX$  for its typesetting.

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

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

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

I am grateful to Michael D. Adams, Leif Andersen, Lawrence Christopher Angrave, Dirk Beyer, Andrew Black, Joachim Breitner, Benjamin Byholm, Nils Anders Danielsson, Michael Ekstrand, Matthew Fluet, Paolo G. Giarrusso, Ben Greenman, Enrico Gregorio, Jamie Davis, Jason Hemann, Peter Kemp, Luis Leiva, Ben Liblit, Rholais Lii, LianTze Lim, Kuldeep S. Meel, Kai Mindermann, Frank Mittelbach, Serguei Mokhov, Ross Moore, John Owens, Joel Nider, Scott Pakin, Tobias Pape, Henning Pohl, Philip Quinn, Mathias Rav, Andreas Reichinger, Matteo Riondato, Craig Rodkin, Bernard Rous, Feras Saad, Kerry A. Seitz, Jr., David Shamma, Gabriel Scherer, Kartik Singhal, Stephen Spencer, Shin Hwei Tan, Daniel Thomas, Shari Trewin, Zack Weinberg, John Wickerson and many others for their invaluable help.

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

## 2 User's guide

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

### 2.1 Installation

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

The latest released version of this package can be found on CTAN: <https://www.ctan.org/pkg/acmart>. The development version can be found on GitHub: <https://>

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<sup>1</sup><http://www.acm.org/>

[github.com/borisveytsman/acmart](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.

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

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

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

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

This class uses a number of other packages. They are included in all major  $\TeX$  distributions ( $\TeX$ 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>
- *hyperxmp*, <http://www.ctan.org/pkg/hyperxmp>
- *iftex*, <http://www.ctan.org/pkg/iftex>
- *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.

Starting in 2020, ACM retired formats `sigchi` and `sigchi-a`. SIGCHI conferences now use `sigconf` format for their publications. If a file uses `sigchi` format, a warning is issued, and the format is automatically switched to `sigconf`. Format `sigchi-a` can be used for non-ACM documents only (see Section 2.17).

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.

Two samples in the `samples` directory, `manuscript` and `acmsmall-submission`, show manuscripts formatted for submission to ACM.

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 Bib<sub>T</sub><sub>E</sub>X style is based on `natbib`. In most cases you do not need to set it. See Section 2.11.

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, 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 DTRAP, HEALTH, 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.

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.

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.

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



Others, like `\acmVolume` and `\acmDOI`—by the editors. Below we describe these commands and mention who should issue them. These macros should be used *before* the `\maketitle` command. Note that in previous versions of ACM classes some of these commands should be used before `\maketitle`, and some after it. Now they all must be used before `\maketitle`.

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

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

```
\acmJournal{TOMS}
```

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

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

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

**name:** the name of the conference.

**date:** the date(s) of the conference.

**venue:** the place of the conference.

Examples:

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

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

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

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

`\editor`     In most cases, conference proceedings are edited. You can use the command

`\editor{<editor>}` to set the editor of the volume. This command can be repeated, for example,

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

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

```
\title[<ShortTitle>]{<FullTitle>}
```

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

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

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

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

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

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

`\affiliation` enter them in this order:

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

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

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

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

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

Similarly you can repeat the `\email` command.

You may have several authors with the same affiliation, different affiliations, or 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.

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

The fields `\institution`, `\city` and `\country` are mandatory. If they are not provided, the warning is issued. In the future ACM might decide to change the warning to the error.

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 institution. 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 *not* use this option for journals.

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

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

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

```

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

```

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

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

```

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

```

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

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

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

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

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

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

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

`\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 <i>after</i> the <code>\setcopyright</code> command. Also, the command <code>\acmPrice{}</code> suppresses the printing of the price.
<code>\acmISBN</code>	Book-like volumes have ISBN numbers attached to them. The macro <code>\acmISBN{&lt;ISBN&gt;}</code> sets it. Normally it is set by the typesetter, for example, <pre>\acmISBN{978-1-4503-3916-2}</pre>
	Setting it to the empty string, as <code>\acmISBN{}</code> , suppresses printing the ISBN.
<code>\acmDOI</code>	The macro <code>\acmDOI{&lt;DOI&gt;}</code> sets the DOI of the article, for example, <pre>\acmDOI{10.1145/9999997.9999999}</pre>
	It is normally set by the typesetter. Setting it to the empty string, as <code>\acmDOI{}</code> , suppresses the DOI.
<code>\acmBadgeR</code> <code>\acmBadgeL</code>	Some conference articles get special distinctions, for example, the artifact evaluation for PPOPP 2016 (see <a href="http://ctuning.org/ae/ppopp2016.html">http://ctuning.org/ae/ppopp2016.html</a> ). These articles display special badges supplied by the conference organizers. This class provides commands to add these badges: <code>\acmBadgeR[&lt;url&gt;]{&lt;graphics&gt;}</code> and <code>\acmBadgeL[&lt;url&gt;]{&lt;graphics&gt;}</code> . The first command puts the badge to the right of the title, and the second one—to the left. The arguments have the following meaning: [ <code>&lt;url&gt;</code> ], if provided, sets the link to the badge authority in the screen version, while <code>{&lt;graphics&gt;}</code> sets the graphics file with the badge image. The file must be a cropped square, which is scaled to a standard size in the output. For example, if the badge image is <code>ae-logo.pdf</code> , the command is <pre>\acmBadgeR[http://ctuning.org/ae/ppopp2016.html]{ae-logo}</pre>
<code>\startPage</code>	The macro <code>\startPage{&lt;page&gt;}</code> sets the first page of the article in a journal or book. It is used by the typesetter.
<code>\terms</code> <code>\keywords</code>	The command <code>\keywords{&lt;keyword, keyword,...&gt;}</code> sets keywords for the article. They must be separated by commas, for example, <pre>\keywords{wireless sensor networks, media access control, multi-channel, radio interference, time synchronization}</pre>
CCSXML <code>\ccsdesc</code>	ACM publications are classified according to the ACM Computing Classification Scheme (CCS). CCS codes are used both in the typeset version of the publications <i>and</i> in the metadata in various databases. Therefore you need to provide both TeX commands and XML metadata with the paper. <p>The tool at <a href="http://dl.acm.org/ccs.cfm">http://dl.acm.org/ccs.cfm</a> can be used to generate CCS codes. After you select the topics, click on “Generate CCS codes” to get results like the following:</p> <pre>\begin{CCSXML} &lt;ccs2012&gt; &lt;concept&gt; &lt;concept_id&gt;10010520.10010553.10010562&lt;/concept_id&gt; &lt;concept_desc&gt;Computer systems organization~Embedded systems&lt;/concept_desc&gt;</pre>



```

    <concept_significance>500</concept_significance>
  </concept>
  <concept>
    <concept_id>10010520.10010575.10010755</concept_id>
    <concept_desc>Computer systems organization~Redundancy</concept_desc>
    <concept_significance>300</concept_significance>
  </concept>
  <concept>
    <concept_id>10010520.10010553.10010554</concept_id>
    <concept_desc>Computer systems organization~Robotics</concept_desc>
    <concept_significance>100</concept_significance>
  </concept>
  <concept>
    <concept_id>10003033.10003083.10003095</concept_id>
    <concept_desc>Networks~Network reliability</concept_desc>
    <concept_significance>100</concept_significance>
  </concept>
</ccs2012>
\end{CCSXML}

```

```

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

```

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

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

`\setcopyright`

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

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

`\copyrightyear`

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

```

\acmYear{2016}
\copyrightyear{2015}

```

There is a special case for a personal copy that the authors may be allowed to generate for their use or a posting on a personal site (check the instructions for the specific journal or conference for the details). The document option `authorversion=true` produces

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.

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 L<sup>A</sup>T<sub>E</sub>X. Putting `abstract` after `\maketitle` will trigger an error.

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

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

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

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

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

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

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

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

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

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

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

`\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 L<sup>A</sup>T<sub>E</sub>X 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`.

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`.

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

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

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

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

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

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

Tables and 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`  
`\grantnum` All financial support *must* be listed using the commands `\grantsponsor` and `\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  $\langle sponsorID \rangle$  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 Bib $\TeX$  style file `ACM-Reference-Format.bst` for Bib $\TeX$  processing. You can disable loading of `natbib` using the option `natbib=false` in `\documentclass`. However, it is not recommended, as well as the use of Bib $\TeX$  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](https://www.ifla.org/files/assets/cataloguing/pubs/names-of-persons_1996.pdf)). While I do not want to take a part in this dispute, I would like to point to the old “noopsort” trick by Oren Patashnik. Add to the .bib file the line

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

and then encode the author as

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

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

## 2.12 Colors

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

The ACM provides the following recommendation on color use.

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

1. The most common type of inherited Color Vision Deficiency (CVD) is red-green (in which similar-brightness colors that differ only in their amounts of red or green are often confused), and it affects up to 8% of males and 0.5% of females of Northern European descent.
2. The most common type of acquired Color Vision Deficiency (CVD) is blue-yellow (including mild cases for many older adults).

3. Most printing is in black and white.
4. Situational impairments (e.g., bright sunlight shining on a mobile screen) tend to reduce the entire color gamut, reducing color discriminability.

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

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

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

## 2.13 Other notable packages and typographic remarks

Several other packages are recommended for specialized tasks.

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

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

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

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

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

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

## 2.14 Disabled or forbidden commands

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

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

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

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

You should not load `amssymb` package since the package `acmart` defines the corresponding symbols itself.

## 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
DGOV	Digital Government: Research and Practice
DTRAP	Digital Threats: Research and Practice

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

Abbreviation	Publication
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
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/IMS 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

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

Abbreviation	Publication
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
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.

## 2.17 A note about sigchi-a format

Starting in Spring 2020 ACM retired SIGCHI Extended Abstract format (sigchi-a). ACM will not, under any circumstances, accept documents in this format for publication and will not offer technical support to the authors who use this template.

You may use this format in the `nonacm` mode only, as in

```
\documentclass[sigchi-a, nonacm]{acmart}
```

sidebar  
marginfigure  
margintable

This format has large margin uses for special figures and tables. 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.

The environments `figure` and `table` produce figures and tables with the width of the text column. The environments `figure*` and `table*` produce “wide” figures and tables, which take a large part of the margin.

The horizontal sizes of figures are:

1. figure: \columnwidth,
2. marginfigure: \marginparwidth,
3. figure\*: \fulltextwidth.



## 3 Implementation

### 3.1 Identification

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

```
1 <class>\NeedsTeXFormat{LaTeX2e}
2 <*gobble>
3 \ProvidesFile{acmart.dtx}
4 </gobble>
5 <class>\ProvidesClass{acmart}
6 [2020/09/13 v1.73 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}
```

We need iftex to check the engine

```
31 \RequirePackage{iftex}
```

format The possible formats

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

\if@ACM@screen Whether we use screen mode

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

\if@ACM@urlbreakonhyphens

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

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

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

```

71     false}}
72 \ExecuteOptionsX{acmthm=true}

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

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

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

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

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

\if@ACM@natbib Whether we use natbib mode
106 \define@boolkey+{acmart.cls}[@ACM@]{natbib}[true]{%
107   \if@ACM@natbib

```

```

108 \PackageInfo{\@classname}{Explicitly selecting natbib mode}%
109 \else
110 \PackageInfo{\@classname}{Explicitly deselecting natbib mode}%
111 \fi}{\PackageError{\@classname}{The option natbib can be either true or
112 false}}
113 \ExecuteOptionsX{natbib=true}

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

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

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

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

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

```

### 3.4 Setting switches

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

#### Setting up switches

```
153 \ifnum\ACM@format@nr=5\relax % siggraph
154 \ClassWarning{\@classname}{%
155   The format siggraph is now obsolete.\MessageBreak
156   I am switching to sigconf.}
157   \setkeys{acmart.cls}{format=sigconf}
158 \fi
159 \ifnum\ACM@format@nr=7\relax % sigchi
160 \ClassWarning{\@classname}{%
161   The format sigchi is now obsolete.\MessageBreak
162   I am switching to sigconf.}
163   \setkeys{acmart.cls}{format=sigconf}
164 \fi
165 \ifnum\ACM@format@nr=8\relax % sigchi
166 \ClassWarning{\@classname}{%
167   ACM SIGCHI has retired the SIGCHI-A template\MessageBreak
168   effective immediately. ACM is keeping this template\MessageBreak
169   option available to authors who are working on legacy\MessageBreak
170   documents only. ACM will not, under any circumstances,\MessageBreak
171   accept documents in this format for publication and\MessageBreak
172   will not offer technical support to the authors who use\MessageBreak
173   this template.\MessageBreak
174   ACM SIGCHI is directing Conference leaders and\MessageBreak
175   authors to publish their articles using the SIGCONF\MessageBreak
176   template call.}
177 \fi
178 \ifnum\ACM@format@nr=0\relax
179   \@ACM@manuscripttrue
180 \else
181   \@ACM@manuscriptfalse
182 \fi
183 \@ACM@sigchiamodefalse
184 \ifcase\ACM@format@nr
```

```

185 \relax % manuscript
186 \ACM@journaltrue
187 \or % acmsmall
188 \ACM@journaltrue
189 \or % acmlarge
190 \ACM@journaltrue
191 \or % acmtog
192 \ACM@journaltrue
193 \or % sigconf
194 \ACM@journalfalse
195 \or % siggraph
196 \ACM@journalfalse
197 \or % sigplan
198 \ACM@journalfalse
199 \or % sigchi
200 \ACM@journalfalse
201 \or % sigchi-a
202 \ACM@journalfalse
203 \ACM@sigchiamodetrue
204 \fi
205 \ifACM@journal
206 \ACM@journal@bibstriptrue
207 \else
208 \ACM@journal@bibstripfalse
209 \fi

```

### 3.5 Loading the base class and package

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

```

210 \ifx\ACM@fontsize\@empty
211 \ifcase\ACM@format@nr
212 \relax % manuscript
213 \def\ACM@fontsize{9pt}%
214 \or % acmsmall
215 \def\ACM@fontsize{10pt}%
216 \or % acmlarge
217 \def\ACM@fontsize{10pt}%
218 \or % acmtog
219 \def\ACM@fontsize{9pt}%
220 \or % sigconf
221 \def\ACM@fontsize{9pt}%
222 \or % siggraph
223 \def\ACM@fontsize{9pt}%
224 \or % sigplan
225 \def\ACM@fontsize{10pt}%
226 \or % sigchi
227 \def\ACM@fontsize{9pt}%
228 \or % sigchi-a
229 \def\ACM@fontsize{10pt}%

```

```

230 \fi
231 \fi
232 \ClassInfo{\@classname}{Using fontsize \ACM@fontsize}
233 \LoadClass[\ACM@fontsize, reqno]{amsart}
234 \RequirePackage{microtype}
    We need etoolbox for delayed code
235 \RequirePackage{etoolbox}
    Booktabs is now the default
236 \RequirePackage{booktabs}
    We need totpages to calculate the number of pages and refcount to use that number
237 \RequirePackage{refcount}
238 \RequirePackage{totpages}
    The \collect@body macro in amsmath is defined using \def. We load environ to
    access the \long version of this command
239 \RequirePackage{environ}
    We use setspace for double spacing
240 \if@ACM@manuscript
241 \RequirePackage{setspace}
242 \onehalfspacing
243 \fi
    We need textcase for better upcasing
244 \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.

```

245 \if@ACM@natbib
246 \RequirePackage{natbib}
247 \renewcommand{\bibsection}{%
248 \section*{\refname}%
249 \phantomsection\addcontentsline{toc}{section}{\refname}%
250 }
251 \renewcommand{\bibfont}{\bibliofont}
252 \renewcommand\setcitestyle[1]{
253 \@for\@tempa:=#1\do
254 {\def\@tempb{round}\ifx\@tempa\@tempb
255 \renewcommand\NAT@open{()\renewcommand\NAT@close{}}\fi
256 \def\@tempb{square}\ifx\@tempa\@tempb
257 \renewcommand\NAT@open{[]\renewcommand\NAT@close{]}\fi
258 \def\@tempb{angle}\ifx\@tempa\@tempb
259 \renewcommand\NAT@open{<}\renewcommand\NAT@close{>}\fi
260 \def\@tempb{curly}\ifx\@tempa\@tempb
261 \renewcommand\NAT@open{\{\}\renewcommand\NAT@close{\}}\fi

```

```

262 \def\@tempb{semicolon}\ifx\@tempa\@tempb
263 \renewcommand\NAT@sep{;}\fi
264 \def\@tempb{colon}\ifx\@tempa\@tempb
265 \renewcommand\NAT@sep{;}\fi
266 \def\@tempb{comma}\ifx\@tempa\@tempb
267 \renewcommand\NAT@sep{,}\fi
268 \def\@tempb{authoryear}\ifx\@tempa\@tempb
269 \NAT@numbersfalse\fi
270 \def\@tempb{numbers}\ifx\@tempa\@tempb
271 \NAT@numberstrue\NAT@superfalse\fi
272 \def\@tempb{super}\ifx\@tempa\@tempb
273 \NAT@numberstrue\NAT@supertrue\fi
274 \def\@tempb{nobibstyle}\ifx\@tempa\@tempb
275 \let\bibstyle=\@gobble\fi
276 \def\@tempb{bibstyle}\ifx\@tempa\@tempb
277 \let\bibstyle=\@citestyle\fi
278 \def\@tempb{sort}\ifx\@tempa\@tempb
279 \def\NAT@sort{\@ne}\fi
280 \def\@tempb{nosort}\ifx\@tempa\@tempb
281 \def\NAT@sort{\z@}\fi
282 \def\@tempb{compress}\ifx\@tempa\@tempb
283 \def\NAT@cmprs{\@ne}\fi
284 \def\@tempb{nocompress}\ifx\@tempa\@tempb
285 \def\NAT@cmprs{\z@}\fi
286 \def\@tempb{sort&compress}\ifx\@tempa\@tempb
287 \def\NAT@sort{\@ne}\def\NAT@cmprs{\@ne}\fi
288 \def\@tempb{mcite}\ifx\@tempa\@tempb
289 \let\NAT@merge\@ne\fi
290 \def\@tempb{merge}\ifx\@tempa\@tempb
291 \@ifnum{\NAT@merge<\tw@}{\let\NAT@merge\tw@}\fi
292 \def\@tempb{elide}\ifx\@tempa\@tempb
293 \@ifnum{\NAT@merge<\thr@}{\let\NAT@merge\thr@}\fi
294 \def\@tempb{longnamesfirst}\ifx\@tempa\@tempb
295 \NAT@longnamestrue\fi
296 \def\@tempb{nonamebreak}\ifx\@tempa\@tempb
297 \def\NAT@nmfmt#1{\mbox{\NAT@up#1}}\fi
298 \expandafter\NAT@find@eq\@tempa=\relax\@nil
299 \if\@tempc\relax\else
300 \expandafter\NAT@rem@eq\@tempc
301 \def\@tempb{open}\ifx\@tempa\@tempb
302 \xdef\NAT@open{\@tempc}\fi
303 \def\@tempb{close}\ifx\@tempa\@tempb
304 \xdef\NAT@close{\@tempc}\fi
305 \def\@tempb{aysep}\ifx\@tempa\@tempb
306 \xdef\NAT@aysep{\@tempc}\fi
307 \def\@tempb{yysep}\ifx\@tempa\@tempb
308 \xdef\NAT@yrsep{\@tempc}\fi
309 \def\@tempb{notesep}\ifx\@tempa\@tempb
310 \xdef\NAT@cmt{\@tempc}\fi
311 \def\@tempb{citesep}\ifx\@tempa\@tempb

```



```

312     \xdef\NAT@sep{\@tempc}\fi
313   \fi
314 }%
315 \NAT@@setcites
316 }
317 \renewcommand\citestyle[1]{%
318   \ifcsname bibstyle@#1\endcsname%
319   \csname bibstyle@#1\endcsname\let\bibstyle@gobble%
320   \else%
321   \@latex@error{Undefined ‘#1’ citestyle}%
322   \fi
323 }%
324 \fi

```

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

```

325 \newcommand{\bibstyle@acmauthoryear}{%
326   \setcitestyle{%
327     authoryear,%
328     open={[]},close={]},citesep={;},%
329     aysep={},yysep={,},%
330     notesep={, }}}

```

`\bibstyle@acmnumeric` The default numeric format:

```

331 \newcommand{\bibstyle@acmnumeric}{%
332   \setcitestyle{%
333     numbers,sort&compress,%
334     open={[]},close={]},citesep={,},%
335     notesep={, }}}

```

The default is numeric:

```

336 \if@ACM@natbib
337 \citestyle{acmnumeric}
338 \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:

```

339 \def\@startsection#1#2#3#4#5#6{%
340   \if@noskipsec \leavevmode \fi
341   \par
342   \@tempkipa #4\relax
343   \@afterindenttrue
344   \ifdim \@tempkipa <\z@
345     \@tempkipa -\@tempkipa \@afterindentfalse
346   \fi
347   \if@nobreak
348     \everypar{}%
349   \else
350     \addpenalty\@secpenalty\addvspace\@tempkipa

```

```

351 \fi
352 \@ifstar
353   {\@ssect{#3}{#4}{#5}{#6}}%
354   {\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}%
355 \def\@sect#1#2#3#4#5#6[#7]#8{%
356   \edef\@toclevel{\ifnum#2=\@m 0\else\@number#2\fi}%
357   \ifnum #2>\c@secnumdepth
358     \let\@svsec\@empty
359   \else
360     \refstepcounter{#1}%
361     \protected@edef\@svsec{\@secntformat{#1}\relax}%
362   \fi
363   \@tempskipa #5\relax
364   \ifdim \@tempskipa>\z@
365     \begingroup
366       #6{%
367         \@hangfrom{\hskip #3\relax\@svsec}%
368         \interlinepenalty \@M #8\@par}%
369     \endgroup
370     \csname #1mark\endcsname{#7}%
371     \ifnum #2>\c@secnumdepth \else
372       \@tochangmeasure{\csname the#1\endcsname}%
373     \fi
374     \addcontentsline{toc}{#1}{%
375       \ifnum #2>\c@secnumdepth \else
376         \protect\numberline{\csname the#1\endcsname}%
377       \fi
378       #7}%
379   \else
380     \def\@svsechd{%
381       #6{\hskip #3\relax
382         \@svsec #8}%
383       \csname #1mark\endcsname{#7}%
384       \ifnum #2>\c@secnumdepth \else
385         \@tochangmeasure{\csname the#1\endcsname\space}%
386       \fi
387       \addcontentsline{toc}{#1}{%
388         \ifnum #2>\c@secnumdepth \else
389           \protect\numberline{\csname the#1\endcsname}%
390         \fi
391         #7}}%
392   \fi
393   \@xsect{#5}}
394 \def\@xsect#1{%
395   \@tempskipa #1\relax
396   \ifdim \@tempskipa>\z@
397     \par \nobreak
398     \vskip \@tempskipa
399     \@afterheading
400   \else

```

```

401 \@nobreakfalse
402 \global\@noskipsectrue
403 \everypar{%
404   \if@noskipsec
405     \global\@noskipsecfalse
406     {\setbox\z@\lastbox}%
407     \clubpenalty\@M
408     \begingroup \@svsechd \endgroup
409     \unskip
410     \@tempskipa #1\relax
411     \hskip -\@tempskipa
412   \else
413     \clubpenalty \@clubpenalty
414     \everypar{}}%
415 \fi}%
416 \fi
417 \ignorespaces}
418 \def\@secCNTformat#1{\csname the#1\endcsname\quad}
419 \def\@ssect#1#2#3#4#5{%
420   \@tempskipa #3\relax
421   \ifdim \@tempskipa>\z@
422     \begingroup
423       #4{%
424         \@hangfrom{\hskip #1}%
425         \interlinepenalty \@M #5\@par}%
426     \endgroup
427   \else
428     \def\@svsechd{#4{\hskip #1\relax #5}}%
429   \fi
430   \@xsect{#3}}

```

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

```

431 \def\@starttoc#1#2{\begingroup\makeatletter
432   \setTrue{#1}%
433   \par\removelastskip\vskip\z@skip
434   \@startsection{section}\@M\z@{\linespacing\@plus\linespacing}%
435     {.5\linespacing}{\centering\contentsnamefont}{#2}%
436   \@input{\jobname.#1}%
437   \if@filesW
438     \xp\newwrite\csname tf@#1\endcsname
439     \immediate\xp\openout\csname tf@#1\endcsname \jobname.#1\relax
440   \fi
441   \global\@nobreakfalse \endgroup
442   \addvspace{32\p@\@plus14\p@}%
443 }

```

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

```

444 \def\l@section{\@toCline{1}{0pt}{1pc}{2pc}{}}

```

```

\l@section The spacing in amsart is too large
445 \def\l@section{\@tocline{2}{0pt}{1pc}{3pc}{}}

\l@subsubsection The spacing in amsart is too large
446 \def\l@subsubsection{\@tocline{3}{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
447 \def\makefnmark{\noindent\makefnmark}

\@footnotetext In sigchi-a mode our footnotes are in the margin!
448 \if@ACM@sigchiamode
449 \long\def\@footnotetext#1{\marginpar{%
450   \reset@font\small
451   \interlinepenalty\interfootnotelinepenalty
452   \protected@edef\@currentlabel{%
453     \csname p@footnote\endcsname\@thefnmark
454   }}%
455   \color@begingroup
456     \makefnmark{%
457       \rule{z}{\footnotesep\ignorespaces#1}\@finalstrut\strutbox}%
458   \color@endgroup}}%
459 \fi

\@mpfootnotetext We want the footnotes in minipages centered:
460 \long\def\@mpfootnotetext#1{%
461   \global\setbox\@mpfootins\vbox{%
462     \unvbox\@mpfootins
463     \reset@font\footnotesize
464     \hsize\columnwidth
465     \@parboxrestore
466     \protected@edef\@currentlabel
467       {\csname p@mpfootnote\endcsname\@thefnmark}%
468     \color@begingroup\centering
469       \makefnmark{%
470         \rule{z}{\footnotesep\ignorespaces#1}\@finalstrut\strutbox}%
471     \color@endgroup}}

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

    And now, hyperref
473 \let\@footnotemark@nolink\@footnotemark
474 \let\@footnotetext@nolink\@footnotetext
475 \RequirePackage[bookmarksnumbered,unicode]{hyperref}
476 \pdfstringdefDisableCommands{%
477   \def\addtocounter#1#2{}%
478   \def\unskip{}%

```

```

479 \def\textbullet{- }%
480 \def\extrightarrow{ -> }%
481 \def\footnotemark{}%
482 }
483 \urlstyle{rm}
484 \ifcase\ACM@format@nr
485 \relax % manuscript
486 \or % acmsmall
487 \or % acmlarge
488 \or % acmtog
489 \or % sigconf
490 \or % siggraph
491 \or % sigplan
492 \urlstyle{sf}
493 \or % sigchi
494 \or % sigchi-a
495 \urlstyle{sf}
496 \fi
497 \AtEndPreamble{%
498 \if@ACM@urlbreakonhyphens
499 \def\do@url@hyp{\do\~}%
500 \fi
501 \if@ACM@screen
502 \hypersetup{colorlinks,
503 linkcolor=ACMPurple,
504 citecolor=ACMPurple,
505 urlcolor=ACMDarkBlue,
506 filecolor=ACMDarkBlue}
507 \else
508 \hypersetup{hidelinks}
509 \fi
510 \hypersetup{pdflang={en},
511 pdfdisplaydoctitle}}
    And hyperxmp
512 \RequirePackage{hyperxmp}
    Bibliography mangling.
513 \if@ACM@natbib
514 \let\citeN\cite
515 \let\cite\citep
516 \let\citeANP\citeauthor
517 \let\citeNN\citeyearpar
518 \let\citeyearNP\citeyear
519 \let\citeNP\citealt
520 \DeclareRobustCommand\citeA
521 {\begingroup\NAT@swafalse
522 \let\NAT@ctype\@ne\NAT@partrue\NAT@fullfalse\NAT@open\NAT@citetp}%
523 \providecommand\newblock{}%
524 \else
525 \AtBeginDocument{%

```

```

526 \let\shortcite\cite%
527 \providecommand\citename[1]{#1}
528 \fi
529 \newcommand\shortcite[2][{}]{%
530 \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:

```

531 \def\bibliographystyle#1{%
532 \ifx\@begindocumenthook\undefined\else
533 \expandafter\AtBeginDocument
534 \fi
535 {\if@filesw
536 \immediate\write\@auxout{\string\bibstyle{#1}}%
537 \fi}}

```

Graphics and color.

```

538 \RequirePackage{graphicx}
539 \RequirePackage[prologue]{xcolor}

```

We define ACM colors according to [7]:

```

540 \definecolor[named]{ACMBlue}{cmyk}{1,0.1,0,0.1}
541 \definecolor[named]{ACMYellow}{cmyk}{0,0.16,1,0}
542 \definecolor[named]{ACMOrange}{cmyk}{0,0.42,1,0.01}
543 \definecolor[named]{ACMRed}{cmyk}{0,0.90,0.86,0}
544 \definecolor[named]{ACMLightBlue}{cmyk}{0.49,0.01,0,0}
545 \definecolor[named]{ACMGreen}{cmyk}{0.20,0,1,0.19}
546 \definecolor[named]{ACMPurple}{cmyk}{0.55,1,0,0.15}
547 \definecolor[named]{ACMDarkBlue}{cmyk}{1,0.58,0,0.21}

```

Author-draft mode or sigchi-a mode

```

548 \if@ACM@authordraft
549 \RequirePackage{draftwatermark}
550 \SetWatermarkFontSize{0.5in}
551 \SetWatermarkColor[gray]{.9}
552 \SetWatermarkText{\parbox{12em}{\centering
553 Unpublished working draft.\
554 Not for distribution.}}
555 \else
556 \if@ACM@sigchiamode
557 \if@ACM@nonacm\else
558 \RequirePackage{draftwatermark}
559 \SetWatermarkFontSize{0.5in}
560 \SetWatermarkColor[gray]{.9}
561 \SetWatermarkText{\parbox{12em}{\centering
562 Legacy document. \
563 Not for publication in an ACM venue}}
564 \fi
565 \fi
566 \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>.

```
567 \RequirePackage{geometry}
568 \ifcase\ACM@format@nr
569 \relax % manuscript
570   \geometry{letterpaper,head=13pt,
571   marginparwidth=6pc,heightrounded}%
572 \or % acmsmall
573   \geometry{twoside=true,
574   includeheadfoot, head=13pt, foot=2pc,
575   paperwidth=6.75in, paperheight=10in,
576   top=58pt, bottom=44pt, inner=46pt, outer=46pt,
577   marginparwidth=2pc,heightrounded
578   }%
579 \or % acmlarge
580   \geometry{twoside=true, head=13pt, foot=2pc,
581   paperwidth=8.5in, paperheight=11in,
582   includeheadfoot,
583   top=78pt, bottom=114pt, inner=81pt, outer=81pt,
584   marginparwidth=4pc,heightrounded
585   }%
586 \or % acmtog
587   \geometry{twoside=true, head=13pt, foot=2pc,
588   paperwidth=8.5in, paperheight=11in,
589   includeheadfoot, columnsep=24pt,
590   top=52pt, bottom=75pt, inner=52pt, outer=52pt,
591   marginparwidth=2pc,heightrounded
592   }%
593 \or % sigconf
594   \geometry{twoside=true, head=13pt,
595   paperwidth=8.5in, paperheight=11in,
596   includeheadfoot, columnsep=2pc,
597   top=57pt, bottom=73pt, inner=54pt, outer=54pt,
598   marginparwidth=2pc,heightrounded
599   }%
600 \or % siggraph
601   \geometry{twoside=true, head=13pt,
602   paperwidth=8.5in, paperheight=11in,
603   includeheadfoot, columnsep=2pc,
604   top=57pt, bottom=73pt, inner=54pt, outer=54pt,
605   marginparwidth=2pc,heightrounded
606   }%
607 \or % sigplan
608   \geometry{twoside=true, head=13pt,
609   paperwidth=8.5in, paperheight=11in,
610   includeheadfoot=false, columnsep=2pc,
611   top=1in, bottom=1in, inner=0.75in, outer=0.75in,
```

```

612     marginparwidth=2pc,heightrounded
613   }%
614 \or % sigchi
615   \geometry{twoside=true, head=13pt,
616     paperwidth=8.5in, paperheight=11in,
617     includeheadfoot, columnsep=2pc,
618     top=66pt, bottom=73pt, inner=54pt, outer=54pt,
619     marginparwidth=2pc,heightrounded
620   }%
621 \or % sigchi-a
622   \geometry{twoside=false, head=13pt,
623     paperwidth=11in, paperheight=8.5in,
624     includeheadfoot, marginparsep=72pt,
625     marginparwidth=170pt, columnsep=20pt,
626     top=72pt, bottom=72pt, left=314pt, right=72pt
627   }%
628   \@mparswitchfalse
629   \reversemarginpar
630 \fi

```

`\parindent` Paragraphing

```

\parskip 631 \setlength\parindent{10\p@}
632 \setlength\parskip{\z@}
633 \ifcase\ACM@format@nr
634 \relax % manuscript
635 \or % acmsmall
636 \or % acmlarge
637 \or % acmtog
638   \setlength\parindent{9\p@}%
639 \or % sigconf
640 \or % siggraph
641 \or % sigplan
642 \or % sigchi
643 \or % sigchi-a
644 \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.

```
645 \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.

```
646 \def\copyrightpermissionfootnoterule{\kern-3\p@
647 \hrule \@width \columnwidth \kern 2.6\p@}
```

```
648 \RequirePackage{manyfoot}
649 \SelectFootnoteRule[2]{copyrightpermission}
650 \DeclareNewFootnote{authorsaddresses}
651 \SelectFootnoteRule[2]{copyrightpermission}
652 \DeclareNewFootnote{copyrightpermission}
```

`\footnoterule` Tschichold's rules:

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

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

```
655 \def\endminipage{%
656 \par
657 \unskip
658 \ifvoid\@mpfootins\else
659 \vskip\skip\@mpfootins
660 \normalcolor
661 \unvbox\@mpfootins
662 \fi
663 \@minipagefalse
664 \color@endgroup
665 \egroup
666 \expandafter\@iiparbox\@mpargs{\unvbox\@tempboxa}}
```

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

```
667 \def\@textbottom{\vskip \z@ \@plus 1pt}
668 \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.

```
669 \ifcase\ACM@format@nr
670 \relax % manuscript
671 \or % acmsmall
672 \or % acmlarge
673 \or % acmtog
674 \flushbottom
675 \or % sigconf
676 \flushbottom
677 \or % siggraph
678 \flushbottom
679 \or % sigplan
680 \flushbottom
681 \or % sigchi
```

```

682 \flushbottom
683 \or % sigchi-a
684 \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.

```

685 \ifPDFTeX
686 \input{glyphtounicode}
687 \pdfglyphtounicode{f_f}{FB00}
688 \pdfglyphtounicode{f_f_i}{FB03}
689 \pdfglyphtounicode{f_f_l}{FB04}
690 \pdfglyphtounicode{f_i}{FB01}
691 \pdfglyphtounicode{t_t}{0074 0074}
692 \pdfglyphtounicode{f_t}{0066 0074}
693 \pdfglyphtounicode{T_h}{0054 0068}
694 \pdfgentounicode=1
695 \RequirePackage{cmap}
696 \fi

```

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

```

697 \newif\if@ACM@newfonts
698 \@ACM@newfontstrue
699 \IfFileExists{libertine.sty}{\ClassWarning{\@classname}{You do not
700   have the libertine package installed. Please upgrade your
701   TeX}\@ACM@newfontsfalse}
702 \IfFileExists{zi4.sty}{\ClassWarning{\@classname}{You do not
703   have the inconsolata (zi4.sty) package installed. Please upgrade your
704   TeX}\@ACM@newfontsfalse}
705 \IfFileExists{newtxmath.sty}{\ClassWarning{\@classname}{You do not
706   have the newtxmath package installed. Please upgrade your
707   TeX}\@ACM@newfontsfalse}

```

We use Libertine throughout.

```

708 \if@ACM@newfonts
709   \RequirePackage[T1]{fontenc}
710   \RequirePackage[libertine]{newtxmath}
711   \ifxetex
712     \RequirePackage[tt=false]{libertine}
713     \setmonofont[StylisticSet=3]{inconsolata}
714   \else
715     \ifluatex
716       \RequirePackage[tt=false]{libertine}
717       \setmonofont[StylisticSet=3]{inconsolata}
718     \else
719       \RequirePackage[tt=false, type1=true]{libertine}
720       \RequirePackage[varqu]{zi4}

```

```

721 \fi
722 \fi
723 \fi

```

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

```

724 \let\liningnums\@undefined
725 \AtEndPreamble{%
726 \DeclareTextFontCommand{\liningnums}{\libertineLF}}

```

The SIGCHI extended abstracts are sans serif:

```

727 \if@ACM@sigchiamode
728 \renewcommand{\familydefault}{\sfdefault}
729 \fi

```

### 3.9 Image descriptions

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

```

730 \newif\if@Description@present
731 \@Description@presenttrue

```

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

```

732 \newif\if@undescribed@images
733 \@undescribed@imagesfalse

```

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

```

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

```

The global warning

```

735 \AtEndDocument{\if@undescribed@images
736 \ClassWarningNoLine{\@classname}{Some images may lack descriptions}\fi}

```

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

```

737 \AtBeginEnvironment{figure}{\@Description@presentfalse
738 \let\@vspace\@vspace@orig
739 \let\@vspacer\@vspacer@orig}
740 \AtBeginEnvironment{figure*}{\@Description@presentfalse
741 \let\@vspace\@vspace@orig
742 \let\@vspacer\@vspacer@orig}
743 \AtEndEnvironment{figure}{\if@Description@presentfalse
744 \global\@undescribed@imagestrue
745 \ClassWarning{\@classname}{A possible image without description}\fi}
746 \AtEndEnvironment{figure*}{\if@Description@presentfalse
747 \global\@undescribed@imagestrue
748 \ClassWarning{\@classname}{A possible image without description}\fi}
749 \AtBeginEnvironment{table}{\let\@vspace\@vspace@orig
750 \let\@vspacer\@vspacer@orig}
751 \AtBeginEnvironment{table*}{\let\@vspace\@vspace@orig

```

```

752 \let\@vspacer\@vspacer@orig}
753 \AtBeginEnvironment{algorithm}{\let\@vspace\@vspace@orig
754 \let\@vspacer\@vspacer@orig}
755 \AtBeginEnvironment{algorithm*}{\let\@vspace\@vspace@orig
756 \let\@vspacer\@vspacer@orig}
757 \AtBeginEnvironment{lstlisting}{\let\@vspace\@vspace@orig
758 \let\@vspacer\@vspacer@orig}
759 \AtBeginEnvironment{lstlisting*}{\let\@vspace\@vspace@orig
760 \let\@vspacer\@vspacer@orig}
761 \AtBeginEnvironment{minted}{\let\@vspace\@vspace@orig
762 \let\@vspacer\@vspacer@orig}
763 \AtBeginEnvironment{minted*}{\let\@vspace\@vspace@orig
764 \let\@vspacer\@vspacer@orig}
765 \AtBeginEnvironment{listing}{\let\@vspace\@vspace@orig
766 \let\@vspacer\@vspacer@orig}
767 \AtBeginEnvironment{listing*}{\let\@vspace\@vspace@orig
768 \let\@vspacer\@vspacer@orig}
769

```

### 3.10 Floats

We use the caption package

```

770 \RequirePackage{caption, float}
771 \captionsetup[table]{position=top}
772 \if@ACM@journal
773 \captionsetup{labelfont={sf, small},
774 textfont={sf, small}, margin=\z@}
775 \captionsetup[figure]{name={Fig.}}
776 \else
777 \captionsetup{labelfont={bf},
778 textfont={bf}, labelsep=colon, margin=\z@}
779 \ifcase\ACM@format@nr
780 \relax % manuscript
781 \or % acmsmall
782 \or % acmlarge
783 \or % acmtog
784 \or % sigconf
785 \or % siggraph
786 \captionsetup{textfont={it}}
787 \or % sigplan
788 \captionsetup{labelfont={bf},
789 textfont={normalfont}, labelsep=period, margin=\z@}
790 \or % sigchi
791 \captionsetup[figure]{labelfont={bf, small},
792 textfont={bf, small}}
793 \captionsetup[table]{labelfont={bf, small},
794 textfont={bf, small}}
795 \or % sigchi-a
796 \captionsetup[figure]{labelfont={bf, small},

```

```

797     textfont={bf, small}}
798   \captionsetup[table]{labelfont={bf, small},
799     textfont={bf, small}}
800   \fi
801 \fi

```

sidebar The sidebar environment:

```

802 \newfloat{sidebar}{}{sbar}
803 \floatname{sidebar}{Sidebar}
804 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}

```

\@sidebar The processing of the saved text

```

805 \long\def\@sidebar#1{\bgroup\let\@vspace\@vspace@orig
806   \let\@vspacer\@vspacer@orig\captionsetup{type=sidebar}%
807   \marginpar{\small#1}\egroup}

```

marginfigure The marginfigure environment:

```

808 \newenvironment{marginfigure}{\Collect@Body\@marginfigure}{}

```

\@marginfigure The processing of the saved text

```

809 \long\def\@marginfigure#1{\bgroup
810   \let\@vspace\@vspace@orig
811   \let\@vspacer\@vspacer@orig
812   \captionsetup{type=figure}%
813   \marginpar{\@Description@presentfalse\centering
814     \small#1\if@Description@present\else
815       \global\@undescribed@imagestrue
816       \ClassWarning{\@classname}{A possible image without description}
817       \fi}%
818   \egroup}

```

marginable The marginable environment:

```

819 \newenvironment{marginable}{\Collect@Body\@marginable}{}

```

\@marginable The processing of the saved text

```

820 \long\def\@marginable#1{\bgroup\let\@vspace\@vspace@orig
821   \let\@vspacer\@vspacer@orig\captionsetup{type=table}%
822   \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

```

823 \newdimen\fulltextwidth
824 \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)

```

825 \if@ACM@sigchiamode

```

```

826 \def\@dblfloat{\bgroup\let\@vspace\@vspace@orig
827 \let\@vspacer\@vspacer@orig\columnwidth=\fulltextwidth
828 \let\@endfloatbox\@endwidefloatbox
829 \def\@fpsaddefault{\def\@fps{tp}}%
830 \@float}
831 \fi

```

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

```

832 \if@ACM@sigchiamode
833 \def\end@dblfloat{%
834 \end@float\egroup}
835 \fi

```

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

```

836 \def\@endwidefloatbox{%
837 \par\vskip\z@skip
838 \@minipagefalse
839 \outer@nobreak
840 \egroup
841 \color@endbox
842 \global\setbox\@currbox=\vbox{\moveleft
843 \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
844 \wd\@currbox=\textwidth
845 }

```

### 3.11 Lists

```

846 \ifcase\ACM@format@nr
847 \relax % manuscript
848 \or % acmsmall
849 \or % acmlarge
850 \or % acmtog
851 \or % sigconf
852 \or % siggraph
853 \or % sigplan
854 \def\labelenumi{\theenumi.}
855 \def\labelenumii{\theenumii.}
856 \def\labelenumiii{\theenumiii.}
857 \def\labelenumiv{\theenumiv.}
858 \or % sigchi
859 \or % sigchi-a
860 \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`.

```

861 \newdimen\@ACM@labelwidth
862 \AtBeginDocument{%
863   \setlength\labelsep{4pt}
864   \setlength{\@ACM@labelwidth}{6.5pt}
865
866   %% First-level list: when beginning after the first line of an
867   %% indented paragraph or ending before an indented paragraph, labels
868   %% should not hang to the left of the preceding/following text.
869   \setlength\leftmargini{\z@}
870   \addtolength\leftmargini{\parindent}
871   \addtolength\leftmargini{2\labelsep}
872   \addtolength\leftmargini{\@ACM@labelwidth}
873
874   %% Second-level and higher lists.
875   \setlength\leftmarginii{\z@}
876   \addtolength\leftmarginii{0.5\labelsep}
877   \addtolength\leftmarginii{\@ACM@labelwidth}
878   \setlength\leftmarginiii{\leftmarginii}
879   \setlength\leftmarginiv{\leftmarginiii}
880   \setlength\leftmarginv{\leftmarginiv}
881   \setlength\leftmarginvi{\leftmarginv}
882   \@listi}
883 \newskip\listisep
884 \listisep\smallskipamount
885 \def\@listI{\leftmargin\leftmargini
886   \labelwidth\leftmargini \advance\labelwidth-\labelsep
887   \listparindent\z@
888   \topsep\listisep}
889 \let\@listi\@listI
890 \def\@listii{\leftmargin\leftmarginii
891   \labelwidth\leftmarginii \advance\labelwidth-\labelsep
892   \topsep\z@skip}
893 \def\@listiii{\leftmargin\leftmarginiii
894   \labelwidth\leftmarginiii \advance\labelwidth-\labelsep}
895 \def\@listiv{\leftmargin\leftmarginiv
896   \labelwidth\leftmarginiv \advance\labelwidth-\labelsep}
897 \def\@listv{\leftmargin\leftmarginv
898   \labelwidth\leftmarginv \advance\labelwidth-\labelsep}
899 \def\@listvi{\leftmargin\leftmarginvi
900   \labelwidth\leftmarginvi \advance\labelwidth-\labelsep}
\descriptionlabel We do not use a colon by default like amsart does:
901 \renewcommand{\descriptionlabel}[1]{\upshape\bfseries #1}

\description Make the description environment indentation consistent with that of the itemize
and enumerate environments.
902 \renewenvironment{description}{\list{}}{%
903   \labelwidth\@ACM@labelwidth
904   \let\makelabel\descriptionlabel}%
905 }{

```

```

906 \endlist
907 }
908 \let\enddescription=\endlist % for efficiency

```

### 3.12 Top-matter data

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

```

909 \newif\if@ACM@maketitle@typeset
910 \@ACM@maketitle@typesetfalse

```

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

```

911 \define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
912 CIE,%
913 CSUR,%
914 DGOV,%
915 DTRAP,%
916 HEALTH,%
917 IMWUT,%
918 JACM,%
919 JDIQ,%
920 JEA,%
921 JERIC,%
922 JETC,%
923 JOCCH,%
924 PACMCGIT,%
925 PACMHCI,%
926 PACMPL,%
927 POMACS,%
928 TAAS,%
929 TACCESS,%
930 TACO,%
931 TALG,%
932 TALLIP,%
933 TAP,%
934 TCPS,%
935 TDS,%
936 TEAC,%
937 TECS,%
938 TELO,%
939 THRI,%
940 TIIS,%
941 TIOT,%
942 TISSEC,%
943 TIST,%
944 TKDD,%
945 TMIS,%
946 TOCE,%
947 TOCHI,%

```



```

948 TOCL,%
949 TOCS,%
950 TOCT,%
951 TODAES,%
952 TODS,%
953 TOG,%
954 TOIS,%
955 TOIT,%
956 TOMACS,%
957 TOMM,%
958 TOMPECS,%
959 TOMS,%
960 TOPC,%
961 TOPS,%
962 TOPLAS,%
963 TOS,%
964 TOSEM,%
965 TOSN,%
966 TQC,%
967 TRETs,%
968 TSAS,%
969 TSC,%
970 TSLP,%
971 TWEB,%
972 FACMP%
973 }{%
974 \ifcase\@journalCode@nr
975 \relax % CIE
976 \def\@journalName{ACM Computers in Entertainment}%
977 \def\@journalNameShort{ACM Comput. Entertain.}%
978 \def\@permissionCodeOne{1544-3574}%
979 \or % CSUR
980 \def\@journalName{ACM Computing Surveys}%
981 \def\@journalNameShort{ACM Comput. Surv.}%
982 \def\@permissionCodeOne{0360-0300}%
983 \or % DGOV
984 \def\@journalName{Digital Government: Research and Practice}%
985 \def\@journalNameShort{Digit. Gov. Res. Pract.}%
986 \def\@permissionCodeOne{2639-0175}%
987 \or % DTRAP
988 \def\@journalName{Digital Threats: Research and Practice}%
989 \def\@journalNameShort{Digit. Threat. Res. Pract.}%
990 \def\@permissionCodeOne{2576-5337}%
991 \or % HEALTH
992 \def\@journalName{ACM Transactions on Computing for Healthcare}%
993 \def\@journalNameShort{ACM Trans. Comput. Healthcare}%
994 \def\@permissionCodeOne{2637-8051}%
995 \or % IMWUT
996 \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
997 Wearable and Ubiquitous Technologies}%

```

```

998 \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
999 \def\@permissionCodeOne{2474-9567}%
1000 \@ACM@screentru
1001 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1002 \or % JACM
1003 \def\@journalName{Journal of the ACM}%
1004 \def\@journalNameShort{J. ACM}%
1005 \def\@permissionCodeOne{0004-5411}%
1006 \or % JDIQ
1007 \def\@journalName{ACM Journal of Data and Information Quality}%
1008 \def\@journalNameShort{ACM J. Data Inform. Quality}%
1009 \def\@permissionCodeOne{1936-1955}%
1010 \or % JEA
1011 \def\@journalName{ACM Journal of Experimental Algorithmics}%
1012 \def\@journalNameShort{ACM J. Exp. Algor.}%
1013 \def\@permissionCodeOne{1084-6654}%
1014 \or % JERIC
1015 \def\@journalName{ACM Journal of Educational Resources in Computing}%
1016 \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
1017 \def\@permissionCodeOne{1073-0516}%
1018 \or % JETC
1019 \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
1020 \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
1021 \def\@permissionCodeOne{1550-4832}%
1022 \or % JOCCH
1023 \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
1024 \def\@journalNameShort{ACM J. Comput. Cult. Herit.}%
1025 \or % PACMCGIT
1026 \def\@journalName{Proceedings of the ACM on Computer Graphics and Interactive Techniques}%
1027 \def\@journalNameShort{Proc. ACM Comput. Graph. Interact. Tech.}%
1028 \def\@permissionCodeOne{2577-6193}%
1029 \@ACM@screentru
1030 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1031 \or % PACMHCI
1032 \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
1033 \def\@journalNameShort{Proc. ACM Hum.-Comput. Interact.}%
1034 \def\@permissionCodeOne{2573-0142}%
1035 \@ACM@screentru
1036 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1037 \or % PACMPL
1038 \def\@journalName{Proceedings of the ACM on Programming Languages}%
1039 \def\@journalNameShort{Proc. ACM Program. Lang.}%
1040 \def\@permissionCodeOne{2475-1421}%
1041 \@ACM@screentru
1042 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1043 \or % POMACS
1044 \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
1045 \def\@journalNameShort{Proc. ACM Meas. Anal. Comput. Syst.}%
1046 \def\@permissionCodeOne{2476-1249}%
1047 \@ACM@screentru

```

```

1048 \PackageInfo{\@classname}{Using screen mode due to \@journalCode}%
1049 \or % TAAS
1050 \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
1051 \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
1052 \def\@permissionCodeOne{1556-4665}%
1053 \or % TACCESS
1054 \def\@journalName{ACM Transactions on Accessible Computing}%
1055 \def\@journalNameShort{ACM Trans. Access. Comput.}%
1056 \def\@permissionCodeOne{1936-7228}%
1057 \or % TACO
1058 \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
1059 \def\@journalNameShort{ACM Trans. Arch. Code Optim.}%
1060 \or % TALG
1061 \def\@journalName{ACM Transactions on Algorithms}%
1062 \def\@journalNameShort{ACM Trans. Algor.}%
1063 \def\@permissionCodeOne{1549-6325}%
1064 \or % TALLIP
1065 \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
1066 \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
1067 \def\@permissionCodeOne{2375-4699}%
1068 \or % TAP
1069 \def\@journalName{ACM Transactions on Applied Perception}%
1070 \or % TCPS
1071 \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
1072 \or % TDS
1073 \def\@journalName{ACM/IMS Transactions on Data Science}%
1074 \def\@journalNameShort{ACM/IMS Trans. Data Sci.}%
1075 \def\@permissionCodeOne{2577-3224}%
1076 \or % TEAC
1077 \def\@journalName{ACM Transactions on Economics and Computation}%
1078 \or % TECS
1079 \def\@journalName{ACM Transactions on Embedded Computing Systems}%
1080 \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
1081 \def\@permissionCodeOne{1539-9087}%
1082 \or % TELO
1083 \def\@journalName{ACM Transactions on Evolutionary Learning}%
1084 \def\@journalNameShort{ACM Trans. Evol. Learn.}%
1085 \def\@permissionCodeOne{2688-3007}%
1086 \or % THRI
1087 \def\@journalName{ACM Transactions on Human-Robot Interaction}%
1088 \def\@journalNameShort{ACM Trans. Hum.-Robot Interact.}%
1089 \def\@permissionCodeOne{2573-9522}%
1090 \or % TIIS
1091 \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
1092 \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
1093 \def\@permissionCodeOne{2160-6455}%
1094 \or % TIOT
1095 \def\@journalName{ACM Transactions on Internet of Things}%
1096 \def\@journalNameShort{ACM Trans. Internet Things}%
1097 \def\@permissionCodeOne{2577-6207}%

```

```

1098 \or % TISSEC
1099 \def\@journalName{ACM Transactions on Information and System Security}%
1100 \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
1101 \def\@permissionCodeOne{1094-9224}%
1102 \or % TIST
1103 \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
1104 \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
1105 \def\@permissionCodeOne{2157-6904}%
1106 \or % TKDD
1107 \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
1108 \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
1109 \def\@permissionCodeOne{1556-4681}%
1110 \or % TMIS
1111 \def\@journalName{ACM Transactions on Management Information Systems}%
1112 \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
1113 \def\@permissionCodeOne{2158-656X}%
1114 \or % TOCE
1115 \def\@journalName{ACM Transactions on Computing Education}%
1116 \def\@journalNameShort{ACM Trans. Comput. Educ.}%
1117 \def\@permissionCodeOne{1946-6226}%
1118 \or % TOCHI
1119 \def\@journalName{ACM Transactions on Computer-Human Interaction}%
1120 \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
1121 \def\@permissionCodeOne{1073-0516}%
1122 \or % TOCL
1123 \def\@journalName{ACM Transactions on Computational Logic}%
1124 \def\@journalNameShort{ACM Trans. Comput. Logic}%
1125 \def\@permissionCodeOne{1529-3785}%
1126 \or % TOCS
1127 \def\@journalName{ACM Transactions on Computer Systems}%
1128 \def\@journalNameShort{ACM Trans. Comput. Syst.}%
1129 \def\@permissionCodeOne{0734-2071}%
1130 \or % TOCT
1131 \def\@journalName{ACM Transactions on Computation Theory}%
1132 \def\@journalNameShort{ACM Trans. Comput. Theory}%
1133 \def\@permissionCodeOne{1942-3454}%
1134 \or % TODAES
1135 \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
1136 \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
1137 \def\@permissionCodeOne{1084-4309}%
1138 \or % TODS
1139 \def\@journalName{ACM Transactions on Database Systems}%
1140 \def\@journalNameShort{ACM Trans. Datab. Syst.}%
1141 \def\@permissionCodeOne{0362-5915}%
1142 \or % TOG
1143 \def\@journalName{ACM Transactions on Graphics}%
1144 \def\@journalNameShort{ACM Trans. Graph.}%
1145 \def\@permissionCodeOne{0730-0301}
1146 \or % TOIS
1147 \def\@journalName{ACM Transactions on Information Systems}%

```

```

1148 \def\@permissionCodeOne{1046-8188}%
1149 \or % TOIT
1150 \def\@journalName{ACM Transactions on Internet Technology}%
1151 \def\@journalNameShort{ACM Trans. Internet Technol.}%
1152 \def\@permissionCodeOne{1533-5399}%
1153 \or % TOMACS
1154 \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
1155 \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
1156 \or % TOMM
1157 \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
1158 \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
1159 \def\@permissionCodeOne{1551-6857}%
1160 \def\@permissionCodeTwo{0100}%
1161 \or % TOMPECS
1162 \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
1163 \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
1164 \def\@permissionCodeOne{2376-3639}%
1165 \or % TOMS
1166 \def\@journalName{ACM Transactions on Mathematical Software}%
1167 \def\@journalNameShort{ACM Trans. Math. Softw.}%
1168 \def\@permissionCodeOne{0098-3500}%
1169 \or % TOPC
1170 \def\@journalName{ACM Transactions on Parallel Computing}%
1171 \def\@journalNameShort{ACM Trans. Parallel Comput.}%
1172 \def\@permissionCodeOne{1539-9087}%
1173 \or % TOPS
1174 \def\@journalName{ACM Transactions on Privacy and Security}%
1175 \def\@journalNameShort{ACM Trans. Priv. Sec.}%
1176 \def\@permissionCodeOne{2471-2566}%
1177 \or % TOPLAS
1178 \def\@journalName{ACM Transactions on Programming Languages and Systems}%
1179 \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
1180 \def\@permissionCodeOne{0164-0925}%
1181 \or % TOS
1182 \def\@journalName{ACM Transactions on Storage}%
1183 \def\@journalNameShort{ACM Trans. Storage}%
1184 \def\@permissionCodeOne{1553-3077}%
1185 \or % TOSEM
1186 \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
1187 \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
1188 \def\@permissionCodeOne{1049-331X}%
1189 \or % TOSN
1190 \def\@journalName{ACM Transactions on Sensor Networks}%
1191 \def\@journalNameShort{ACM Trans. Sensor Netw.}%
1192 \def\@permissionCodeOne{1550-4859}%
1193 \or % TQC
1194 \def\@journalName{ACM Transactions on Quantum Computing}%
1195 \def\@journalNameShort{ACM Trans. Quantum Comput.}%
1196 \def\@permissionCodeOne{2643-6817}%
1197 \or % TRET

```

```

1198 \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
1199 \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
1200 \def\@permissionCodeOne{1936-7406}%
1201 \or % TSAS
1202 \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
1203 \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
1204 \def\@permissionCodeOne{2374-0353}%
1205 \or % TSC
1206 \def\@journalName{ACM Transactions on Social Computing}%
1207 \def\@journalNameShort{ACM Trans. Soc. Comput.}%
1208 \def\@permissionCodeOne{2469-7818}%
1209 \or % TSLP
1210 \def\@journalName{ACM Transactions on Speech and Language Processing}%
1211 \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
1212 \def\@permissionCodeOne{1550-4875}%
1213 \or % TWEB
1214 \def\@journalName{ACM Transactions on the Web}%
1215 \def\@journalNameShort{ACM Trans. Web}%
1216 \def\@permissionCodeOne{1559-1131}%
1217 \else % FACMP, a dummy journal
1218 \def\@journalName{Forthcoming ACM Publication}%
1219 \def\@journalNameShort{ACM Forthcoming}%
1220 \def\@permissionCodeOne{XXXX-XXXX}%
1221 \fi
1222 \ClassInfo{\@classname}{Using journal code \@journalCode}%
1223 }{%
1224 \ClassError{\@classname}{Incorrect journal #1}%
1225 }%

```

`\acmJournal` And the syntactic sugar around it

```

1226 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}%
1227 \global\@ACM@journal@bibstriptrue}

```

The defaults:

```

1228 \def\@journalCode@nr{0}
1229 \def\@journalName{}%
1230 \def\@journalNameShort{\@journalName}%
1231 \def\@permissionCodeOne{XXXX-XXXX}%
1232 \def\@permissionCodeTwo{}%

```

`\acmConference` This is the conference command

```

1233 \newcommand\acmConference[4][[]]{%
1234 \gdef\acmConference@shortname{#1}%
1235 \gdef\acmConference@name{#2}%
1236 \gdef\acmConference@date{#3}%
1237 \gdef\acmConference@venue{#4}%
1238 \ifx\acmConference@shortname\empty
1239 \gdef\acmConference@shortname{#2}%
1240 \fi

```

```

1241 \global\@ACM@journal@bibstripfalse
1242 }
1243 \if@ACM@journal\else
1244 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
1245 DC, USA}%
1246 \fi

\acmBooktitle The book title of the conference:
\@acmBooktitle 1247 \def\acmBooktitle#1{\gdef\@acmBooktitle{#1}}
1248 \acmBooktitle{Proceedings of \acmConference@name
1249 \ifx\acmConference@name\acmConference@shortname\else
1250 \ (\acmConference@shortname)\fi}

\@editorsAbbrev How to abbreviate editors
1251 \def\@editorsAbbrev{(Ed.)}

\@acmEditors The list of editors
1252 \def\@acmEditors{}

\editor Add a new editor to the list
1253 \def\editor#1{\ifx\@acmEditors\empty
1254 \gdef\@acmEditors{#1}%
1255 \else
1256 \gdef\@editorsAbbrev{(Eds.)}%
1257 \g@addto@macro\@acmEditors{\and#1}%
1258 \fi}

\subtitle The subtitle macro
1259 \def\subtitle#1{\def\@subtitle{#1}}
1260 \subtitle{}

\num@authorgroups The total number of “groups”. Each group is several authors with the same affiliations(s)
1261 \newcount\num@authorgroups
1262 \num@authorgroups=0\relax

\num@author The total number of authors
1263 \newcount\num@author
1264 \num@author=0\relax

\if@insideauthorgroup Whether we are continuing an author group
1265 \newif\if@insideauthorgroup
1266 \@insideauthorgroupfalse

\author Adding an author to the list of authors and addresses
1267 \renewcommand\author[2][]{%
1268 \IfSubStr{\detokenize{#2}}{,}{\ClassWarning{\@classname}{Do not put several
1269 authors in the same \string\author\space macro!}}}%
1270 \global\advance\num@author by 1\relax
1271 \if@insideauthorgroup\else

```

```

1272 \global\advance\num@authorgroups by 1\relax
1273 \global\@insideauthorgrouptrue
1274 \fi
1275 \ifx\addresses\@empty
1276 \if@ACM@anonymous
1277 \gdef\addresses{\@author{Anonymous Author(s)}%
1278 \ifx\@acmSubmissionID\@empty\else\Submission Id:
1279 \@acmSubmissionID\fi}%
1280 \gdef\authors{Anonymous Author(s)}%
1281 \else
1282 \gdef\addresses{\@author{#2}}%
1283 \gdef\authors{#2}%
1284 \fi
1285 \else
1286 \if@ACM@anonymous\else
1287 \g@addto@macro\addresses{\and\@author{#2}}%
1288 \g@addto@macro\authors{\and#2}%
1289 \fi
1290 \fi
1291 \if@ACM@anonymous
1292 \ifx\shortauthors\@empty
1293 \gdef\shortauthors{Anon.
1294 \ifx\@acmSubmissionID\@empty\else Submission Id:
1295 \@acmSubmissionID\fi}%
1296 \fi
1297 \else
1298 \def\@tempa{#1}%
1299 \ifx\@tempa\@empty
1300 \ifx\shortauthors\@empty
1301 \gdef\shortauthors{#2}%
1302 \else
1303 \g@addto@macro\shortauthors{\and#2}%
1304 \fi
1305 \else
1306 \ifx\shortauthors\@empty
1307 \gdef\shortauthors{#1}%
1308 \else
1309 \g@addto@macro\shortauthors{\and#1}%
1310 \fi
1311 \fi
1312 \fi}

```

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

```

1313 \newcommand{\affiliation}[2][]{%
1314 \global\@insideauthorgroupfalse
1315 \if@ACM@anonymous\else
1316 \g@addto@macro\addresses{\affiliation{#1}{#2}}%
1317 \fi}

```



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

```

1318 \define@boolkey+{@ACM@affiliation@}[@ACM@affiliation@]{obeypunctuation}%
1319 [true]{}{\ClassError{\@classname}{The option obeypunctuation can be either true or false}}

```

`\additionalaffiliation` Additional affiliations go to footnotes

```

1320 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}

```

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

```

1321 \def\@additionalaffiliation#1{\bgroup
1322   \def\position##1{\ignorespaces}%
1323   \def\institution##1{##1\ignorespaces}%
1324   \def\department{\@ifnextchar[{\@department}{\@department[]}}%
1325   \def\@department[##1]##2{\unskip, ##2\ignorespaces}%
1326   \let\streetaddress\position
1327   \let\city\position
1328   \let\state\position
1329   \let\postcode\position
1330   \let\country\position
1331   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.

```

1332 \renewcommand{\email}[2][{}%
1333   \IfSubStr{#2}{,}{\ClassWarning{\@classname}{Do not put several
1334     addresses in the same \string\email\space macro!}}{}%
1335   \if@ACM@anonymous\else
1336     \g@addto@macro\addresses{\email{#1}{#2}}%
1337   \fi}

```

`\orcid` Right now we do not typeset ORCIDs

```

1338 \def\orcid#1{\unskip\ignorespaces}

```

`\authorsaddresses` Setting up authors' addresses

```

1339 \def\authorsaddresses#1{\def\@authorsaddresses{#1}}
1340 \authorsaddresses{\mkauthorsaddresses}

```

`\@titlenotes` The title notes

```

1341 \def\@titlenotes{}

```

`\titlenote` Adding a note to the title

```

1342 \def\titlenote#1{%
1343   \g@addto@macro\@title{\footnotemark}%
1344   \if@ACM@anonymous
1345     \g@addto@macro\@titlenotes{%
1346       \stepcounter{footnote}\footnotetext{Title note}}%
1347   \else
1348     \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
1349   \fi}

```

```

\@subtitlenotes The subtitle notes
1350 \def\@subtitlenotes{}

\subtitlenote Adding a note to the subtitle
1351 \def\subtitlenote#1{%
1352   \g@addto@macro\@subtitle{\footnotemark}%
1353   \if@ACM@anonymous
1354     \g@addto@macro\@subtitlenotes{%
1355       \stepcounter{footnote}\footnotetext{Subtitle note}}%
1356   \else
1357     \g@addto@macro\@subtitlenotes{%
1358       \stepcounter{footnote}\footnotetext{#1}}%
1359   \fi}

\@authornotes The author notes
1360 \def\@authornotes{}

\authornote Adding a note to the author
1361 \def\authornote#1{%
1362   \if@ACM@anonymous\else
1363     \g@addto@macro\addresses{\@authornotemark}%
1364     \g@addto@macro\@authornotes{%
1365       \stepcounter{footnote}\footnotetext{#1}}%
1366   \fi}

\authornotemark Adding a footnote mark to the authors
1367 \newcommand\authornotemark[1][\relax]{%
1368   \ifx#1\relax\relax\relax
1369   \g@addto@macro\addresses{\@authornotemark}%
1370   \else
1371   \g@addto@macro\addresses{\@authornotemark{#1}}%
1372   \fi}

\acmVolume The current volume
1373 \def\acmVolume#1{\def\@acmVolume{#1}}
1374 \acmVolume{1}

\acmNumber The current number
1375 \def\acmNumber#1{\def\@acmNumber{#1}}
1376 \acmNumber{1}

\acmArticle The current article
1377 \def\acmArticle#1{\def\@acmArticle{#1}}
1378 \acmArticle{}

\acmArticleSeq The sequence number
1379 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
1380 \acmArticleSeq{\@acmArticle}

```

`\acmYear` The current year  
1381 `\def\acmYear#1{\def\@acmYear{#1}}`  
1382 `\acmYear{\the\year}`

`\acmMonth` The current month  
1383 `\def\acmMonth#1{\def\@acmMonth{#1}}`  
1384 `\acmMonth{\the\month}`

`\@acmPubDate` The publication date  
1385 `\def\@acmPubDate{\ifcase\@acmMonth\or`  
1386 `January\or February\or March\or April\or May\or June\or`  
1387 `July\or August\or September\or October\or November\or`  
1388 `December\fi~\@acmYear}`

`\acmPrice` The price  
1389 `\def\acmPrice#1{\def\@acmPrice{#1}}`  
1390 `\acmPrice{15.00}`

`\acmSubmissionID` The submission ID  
1391 `\def\acmSubmissionID#1{\def\@acmSubmissionID{#1}}`  
1392 `\acmSubmissionID{}`

`\acmISBN` The book ISBN  
1393 `\def\acmISBN#1{\def\@acmISBN{#1}}`  
1394 `\acmISBN{978-x-xxxx-xxxx-x/YY/MM}`

`\acmDOI` The paper DOI  
1395 `\def\acmDOI#1{\def\@acmDOI{#1}}`  
1396 `\acmDOI{10.1145/nnnnnnn.nnnnnn}`

`\if@ACM@badge` Whether to print a badge. Note that either a left or right badge triggers it:  
1397 `\newif\if@ACM@badge`  
1398 `\@ACM@badgefalse`

`\@ACM@badge@width` The width of the badge  
1399 `\newlength\@ACM@badge@width`  
1400 `\setlength\@ACM@badge@width{5pc}`

`\@ACM@title@width` The width of the badge  
1401 `\newlength\@ACM@title@width`

`\@ACM@badge@skip` The space between the badge and the title  
1402 `\newlength\@ACM@badge@skip`  
1403 `\setlength\@ACM@badge@skip{1pc}`

`\acmBadgeR` Setting the right badge

```

1404 \newcommand\acmBadgeR[2][\@ACM@badgetrue
1405   \def\@acmBadgeR@url{#1}%
1406   \def\@acmBadgeR@image{#2}}
1407 \def\@acmBadgeR@url{}
1408 \def\@acmBadgeR@image{}

```

`\acmBadgeL` Setting the left badge

```

1409 \newcommand\acmBadgeL[2][\@ACM@badgetrue
1410   \def\@acmBadgeL@url{#1}%
1411   \def\@acmBadgeL@image{#2}}
1412 \def\@acmBadgeL@url{}
1413 \def\@acmBadgeL@image{}

```

`\startPage` The start page of the paper

```

1414 \def\startPage#1{\def\@startPage{#1}}
1415 \startPage{}

```

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

```

1416 \def\terms#1{\ClassWarning{\@classname}{The command \string\terms{} is
1417   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.

```

1418 \def\keywords#1{\def\@keywords{#1}}
1419 \let\@keywords\@empty

1420 \AtEndDocument{\if@ACM@nonacm\else\ifx\@keywords\@empty
1421   \ifnum\getrefnumber{TotPages}>2\relax
1422   \ClassWarningNoLine{\@classname}{ACM keywords are mandatory
1423     for papers over two pages}%
1424   \fi\fi\fi}

```

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

```

1425 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}

```

`\@saveabstract` And saving the abstract

```

1426 \long\def\@saveabstract#1{\if@ACM@maketitle@typeset
1427   \ClassError{\@classname}{Abstract must be defined before maketitle
1428     command. Please move it!}\fi
1429   \long\gdef\@abstract{#1}}
1430 \@saveabstract{}

```

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

```

1431 \long\def\@empty{}

```

```

\if@ACM@printccs Whether to print CCS
1432 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
1433   \if@ACM@printccs
1434     \ClassInfo{\@classname}{Printing CCS}%
1435   \else
1436     \ClassInfo{\@classname}{Suppressing CCS}%
1437 \fi}{\ClassError{\@classname}{The option printccs can be either true or false}}

\if@ACM@printacmref Whether to print the ACM bibstrip
1438 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
1439   \if@ACM@printacmref
1440     \ClassInfo{\@classname}{Printing bibformat}%
1441   \else
1442     \ClassInfo{\@classname}{Suppressing bibformat}%
1443 \fi}{\ClassError{\@classname}{The option printacmref can be either true or false}}

1444 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@printacmref\else
1445   \ifnum\getrefnumber{TotPages}>1\relax
1446   \ClassWarningNoLine{\@classname}{ACM reference format is mandatory
1447     for papers over one page}%
1448 \fi\fi\fi}

\if@ACM@printfolios Whether to print folios
1449 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
1450   \if@ACM@printfolios
1451     \ClassInfo{\@classname}{Printing folios}%
1452   \else
1453     \ClassInfo{\@classname}{Suppressing folios}%
1454 \fi}{\ClassError{\@classname}{The option printfolios can be either true or false}}

\@ACM@authorsperrrow The number of authors per row. 0 means use the default algorithm.
1455 \define@cmdkey{@ACM@topmatter@}[@ACM@]{authorsperrrow}[0]{%
1456   \IfInteger{#1}{\ClassInfo{\@classname}{Setting authorsperrrow to
1457     #1}}{\ClassWarning{\@classname}{The parameter authorsperrrow must be
1458     numerical. Ignoring the input #1}\gdef\@ACM@authorsperrrow{0}}

\settopmatter The usual syntactic sugar
1459 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}

      Now the settings
1460 \settopmatter{printccs=true, printacmref=true}
1461 \if@ACM@manuscript
1462   \settopmatter{printfolios=true}
1463 \else
1464   \if@ACM@journal
1465     \settopmatter{printfolios=true}
1466   \else
1467     \settopmatter{printfolios=false}
1468 \fi

```

```

1469 \fi
1470 \settopmatter{authorsperrow=0}

\@received The container for the paper history
1471 \def\@received{}

\received The \received command
1472 \newcommand\received[2][\def\@tempa{#1}%
1473 \ifx\@tempa\@empty
1474 \ifx\@received\@empty
1475 \gdef\@received{Received #2}%
1476 \else
1477 \g@addto@macro{\@received}{; revised #2}%
1478 \fi
1479 \else
1480 \ifx\@received\@empty
1481 \gdef\@received{#1 #2}%
1482 \else
1483 \g@addto@macro{\@received}{; #1 #2}%
1484 \fi
1485 \fi}
1486 \AtEndDocument{%
1487 \ifx\@received\@empty\else
1488 \par\bigskip\noindent\small\normalfont\@received\par
1489 \fi}

```

### 3.13 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```

1490 \RequirePackage{comment}
1491 \excludcomment{CCSXML}

\@concepts This is the storage macro and counter for concepts
1492 \let\@concepts\@empty
1493 \newcounter{@concepts}

\ccsdesc The first argument is the significance, the second is the concept(s)
1494 \newcommand\ccsdesc[2][100]{%
1495 \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!
1496 \def\textrightarrow{\rightarrow}
1497 \def\ccsdesc@parse#1~#2~#3~{%
1498 \stepcounter{@concepts}%
1499 \expandafter\ifx\csname CCS@General@#2\endcsname\relax
1500 \expandafter\gdef\csname CCS@General@#2\endcsname{\textbullet\
1501 \textbf{#2}}%

```

```

1502 \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{;}%
1503 \expandafter\gdef\csname CCS@Specific@#2\endcsname{}%
1504 \g@addto@macro{\@concepts}{\csname CCS@General@#2\endcsname
1505 \csname CCS@Punctuation@#2\endcsname
1506 \csname CCS@Specific@#2\endcsname}%
1507 \fi
1508 \ifx#3\relax\relax\else
1509 \expandafter\gdef\csname CCS@Punctuation@#2\endcsname{
1510 \textrightarrow\}%
1511 \expandafter\g@addto@macro\expandafter{\csname CCS@Specific@#2\endcsname}{%
1512 \addtocounter{@concepts}{-1}%
1513 \ifnum#1>499\textbf{#3}\else
1514 \ifnum#1>299\textit{#3}\else
1515 #3\fi\fi\ifnum\value{@concepts}=0.\else; \fi}%
1516 \fi
1517 \ccsdesc@parse@finish}

1518 \AtEndDocument{\if@ACM@nonacm\else\ifx\@concepts\empty\relax
1519 \ifnum\getrefnumber{TotPages}>2\relax
1520 \ClassWarningNoLine{\@classname}{CCS concepts are mandatory
1521 for papers over two pages}%
1522 \fi\fi\fi}

```

```

\ccdesc@parse@finish Gobble everything to \ccsdesc@parse@end
1523 \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
1524 \newif\if@printcopyright
1525 \@printcopyrighttrue

```

```

\if@printpermission Whether to print the permission block
1526 \newif\if@printpermission
1527 \@printpermissiontrue

```

```

\if@acmowned Whether the ACM owns the rights to the paper
1528 \newif\if@acmowned
1529 \@acmownedtrue

```

Keys:

```

1530 \define@choicekey*{ACM@}{acmcopyrightmode}[%
1531 \acm@copyrightinput\acm@copyrightmode]{none,%
1532 acmcopyright,acmlicensed,rightsretained,%
1533 usgov,usgovmixed,cagov,cagovmixed,licensedusgovmixed,%
1534 licensedcagov,licensedcagovmixed,othergov,licensedothergov,%
1535 iw3c2w3,iw3c2w3g}{%

```

```

1536 \@printpermissiontrue
1537 \@printcopyrighttrue
1538 \@acmownedtrue
1539 \ifnum\acm@copyrightmode=0\relax % none
1540 \@printpermissionfalse
1541 \@printcopyrightfalse
1542 \@acmownedfalse
1543 \fi
1544 \ifnum\acm@copyrightmode=2\relax % acmlicensed
1545 \@acmownedfalse
1546 \fi
1547 \ifnum\acm@copyrightmode=3\relax % rightsretained
1548 \@acmownedfalse
1549 \AtBeginDocument{\acmPrice{}}%
1550 \fi
1551 \ifnum\acm@copyrightmode=4\relax % usgov
1552 \@printpermissiontrue
1553 \@printcopyrightfalse
1554 \@acmownedfalse
1555 \AtBeginDocument{\acmPrice{}}%
1556 \fi
1557 \ifnum\acm@copyrightmode=6\relax % cagov
1558 \@acmownedfalse
1559 \fi
1560 \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1561 \@acmownedfalse
1562 \fi
1563 \ifnum\acm@copyrightmode=9\relax % licensedcagov
1564 \@acmownedfalse
1565 \fi
1566 \ifnum\acm@copyrightmode=10\relax % licensedcagovmixed
1567 \@acmownedfalse
1568 \fi
1569 \ifnum\acm@copyrightmode=11\relax % othergov
1570 \@acmownedtrue
1571 \fi
1572 \ifnum\acm@copyrightmode=12\relax % licensedothergov
1573 \@acmownedfalse
1574 \fi
1575 \ifnum\acm@copyrightmode=13\relax % iw3c2w3
1576 \@acmownedfalse
1577 \AtBeginDocument{\acmPrice{}}%
1578 \fi
1579 \ifnum\acm@copyrightmode=14\relax % iw3c2w3g
1580 \@acmownedfalse
1581 \AtBeginDocument{\acmPrice{}}%
1582 \fi}

```

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

```
1583 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
```



1584 \setcopyright{acmcopyright}

\@copyrightowner Here is the owner of the copyright

```
1585 \def\@copyrightowner{%
1586   \ifcase\acm@copyrightmode\relax % none
1587   \or % acmcopyright
1588   Association for Computing Machinery.
1589   \or % acmlicensed
1590   Copyright held by the owner/author(s). Publication rights licensed to
1591   ACM\@.
1592   \or % rightsretained
1593   Copyright held by the owner/author(s).
1594   \or % usgov
1595   \or % usgovmixed
1596   Association for Computing Machinery.
1597   \or % cagov
1598   Crown in Right of Canada.
1599   \or %cagovmixed
1600   Association for Computing Machinery.
1601   \or %licensedusgovmixed
1602   Copyright held by the owner/author(s). Publication rights licensed to
1603   ACM\@.
1604   \or % licensedcagov
1605   Crown in Right of Canada. Publication rights licensed to
1606   ACM\@.
1607   \or %licensedcagovmixed
1608   Copyright held by the owner/author(s). Publication rights licensed to
1609   ACM\@.
1610   \or % othergov
1611   Association for Computing Machinery.
1612   \or % licensedothergov
1613   Copyright held by the owner/author(s). Publication rights licensed to
1614   ACM\@.
1615   \or % ic2w3www
1616   IW3C2 (International World Wide Web Conference Committee), published
1617   under Creative Commons CC-BY~4.0 License.
1618   \or % ic2w3wwwgoogle
1619   IW3C2 (International World Wide Web Conference Committee), published
1620   under Creative Commons CC-BY-NC-ND~4.0 License.
1621   \fi}
```

\@formatdoi Print a clickable DOI

```
1622 \def\@formatdoi#1{\url{https://doi.org/#1}}
```

\@copyrightpermission The canned permission block.

```
1623 \def\@copyrightpermission{%
1624   \ifcase\acm@copyrightmode\relax % none
1625   \or % acmcopyright
1626   Permission to make digital or hard copies of all or part of this
```

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1743 disseminate the work on their personal and corporate Web sites with
1744 the appropriate attribution.
1745 \fi}

```

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

```

1746 \def\copyrightyear#1{\def\@copyrightyear{#1}}
1747 \copyrightyear{\@acmYear}

```

`\@teaserfigures` The teaser figures container

```

1748 \def\@teaserfigures{}

```

`teaserfigure` The teaser figure

```

1749 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}

```

`\@saveteaser` Saving the teaser

```

1750 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}

```

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

```

1751 \renewcommand{\thanks}[1]{%
1752   \ifnotempty{#1}{%
1753     \if@ACM@anonymous
1754       \g@addto@macro\thankses{\thanks{A note}}%
1755     \else
1756       \g@addto@macro\thankses{\thanks{#1}}%
1757     \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>]`.

```

1758 \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.

```
1759 \def\maketitle{%
1760   \@ACM@maketitle@typesettrue
1761   \if@ACM@anonymous
1762     % Anonymize omission of \author-s
1763     \ifnum\num@authorgroups=0\author{}\fi
1764   \fi
1765   \begingroup
1766   \let\@vspace\@vspace@orig
1767   \let\@vspacer\@vspacer@orig
1768   \let\@footnotemark\@footnotemark@nolink
1769   \let\@footnotetext\@footnotetext@nolink
1770   \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1771   \hsize=\textwidth
1772   \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1773   \@mktitle\if@ACM@sigchiamode\else\mkauthors\fi\mkteasers
1774   \@printtopmatter
1775   \if@ACM@sigchiamode\mkauthors\fi
1776   \setcounter{footnote}{0}%
1777   \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1778   \@titlenotes
1779   \@subtitlenotes
1780   \@authornotes
1781   \let\@makefnmark\relax
1782   \let\@thefnmark\relax
1783   \let\@makefntext\@noindent
1784   \ifx\@empty\thankses\else
1785     \footnotetextauthorsaddresses{%
1786       \def\par{\let\par\@par}\parindent\z@\@setthanks}%
1787   \fi
1788   \ifx\@empty\@authorsaddresses\else
1789     \if@ACM@anonymous\else
1790       \if@ACM@journal@bibstrip
1791         \footnotetextauthorsaddresses{%
1792           \def\par{\let\par\@par}\parindent\z@\@setauthorsaddresses}%
1793       \fi
1794     \fi
1795   \fi
1796   \if@ACM@nonacm\else\footnotetextcopyrightpermission{%
1797     \if@ACM@authordraft
1798       \raisebox{-2ex}{\z@}{\z@}{\makebox[0pt][l]{\large\bfseries
1799         Unpublished working draft. Not for distribution.}}%
1800     \color[gray]{0.9}%
1801   \fi
1802   \parindent\z@\parskip0.1\baselineskip
```

```

1803 \if@ACM@authorversion\else
1804   \if@printpermission\@copyrightpermission\par\fi
1805 \fi
1806 \if@ACM@manuscript\else
1807   \if@ACM@journal@bibstrip\else % Print the conference information
1808     {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
1809   \fi
1810 \fi
1811 \if@printcopyright
1812   \copyright\ \@copyrightyear\ \@copyrightowner\
1813 \else
1814   \@copyrightyear.\
1815 \fi
1816 \if@ACM@manuscript
1817   Manuscript submitted to ACM\
1818 \else
1819   \if@ACM@authorversion
1820     This is the author's version of the work. It is posted here for
1821     your personal use. Not for redistribution. The definitive Version
1822     of Record was published in
1823     \if@ACM@journal@bibstrip
1824       \emph{\@journalName}%
1825     \else
1826       \emph{\@acmBooktitle}%
1827     \fi
1828     \ifx\@acmDOI\@empty
1829       .
1830     \else
1831       , \@formatdoi{\@acmDOI}.
1832     \fi\
1833 \else
1834   \if@ACM@nonacm\else
1835     \if@ACM@journal@bibstrip
1836       \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1837       \ifx\@acmPrice\@empty\else\ $\@acmPrice\fi\
1838       \@formatdoi{\@acmDOI}%
1839     \else % Conference
1840       \ifx\@acmISBN\@empty\else ACM~ISBN~\@acmISBN
1841       \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\
1842       \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
1843     \fi
1844   \fi
1845 \fi
1846 \fi}
1847 \fi
1848 \endgroup
1849 \setcounter{footnote}{0}%
1850 \mkabstract
1851 \if@ACM@printccs
1852 \ifx\@concepts\@empty\else\bgroup

```

```

1853     {\@specialsection{CCS Concepts}%
1854       \noindent\@concepts\par}\egroup
1855   \fi
1856 \fi
1857 \ifx\@keywords\empty\else\bgroup
1858   {\if@ACM@journal
1859     \@specialsection{Additional Key Words and Phrases}%
1860     \else
1861       \@specialsection{Keywords}%
1862     \fi
1863     \noindent\@keywords}\par\egroup
1864 \fi
1865 \let\metadata@authors=\authors
1866 \xandlist{, }{, }{\, }\metadata@authors
1867 \def\@ACM@checkaffil{}%
1868 \hypersetup{%
1869   pdfauthor={\metadata@authors},
1870   pdftitle={\@title},
1871   pdfsubject={\@concepts},
1872   pdfkeywords={\@keywords},
1873   pdfcreator={LaTeX with acmart
1874     \csname ver@acmart.cls\endcsname\space
1875     and hyperref
1876     \csname ver@hyperref.sty\endcsname}}%
1877 \andify\authors
1878 \andify\shortauthors
1879 \global\let\authors=\authors
1880 \global\let\shortauthors=\shortauthors
1881 \if@ACM@printacmref
1882   \@mkbibcitation
1883 \fi
1884 \global\@topnum\z@ % this prevents floats from falling
1885                   % at the top of page 1
1886 \global\@botnum\z@ % we do not want them to be on the bottom either
1887 \@printendtopmatter
1888 \@afterindentfalse
1889 \@afterheading
1890 }

```

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

```

1891 \def\@specialsection#1{%
1892   \ifcase\ACM@format@nr
1893     \relax % manuscript
1894     \par\medskip\small\noindent#1: %
1895     \or % acmsmall
1896     \par\medskip\small\noindent#1: %
1897     \or % acmlarge
1898     \par\medskip\small\noindent#1: %
1899     \or % acmtog
1900     \par\medskip\small\noindent#1: %

```

```

1901 \or % sigconf
1902   \section*{#1}%
1903 \or % siggraph
1904   \section*{#1}%
1905 \or % sigplan
1906   \noindentparagraph*{#1:~}%
1907 \or % sigchi
1908   \section*{#1}%
1909 \or % sigchi-a
1910   \section*{#1}%
1911   \fi
1912 }

```

`\@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.

```

1913 \def\@printtopmatter{%
1914   \ifx\@startPage\@empty
1915     \gdef\@startPage{1}%
1916   \else
1917     \setcounter{page}{\@startPage}%
1918   \fi
1919   \thispagestyle{firstpagestyle}%
1920   \noindent
1921   \ifcase\ACM@format@nr
1922   \relax % manuscript
1923     \box\mktitle@bx\par
1924   \or % acsmall
1925     \box\mktitle@bx\par
1926   \or % acmlarge
1927     \box\mktitle@bx\par
1928   \or % acmtog
1929     \twocolumn[\box\mktitle@bx]%
1930   \or % sigconf
1931     \twocolumn[\box\mktitle@bx]%
1932   \or % siggraph
1933     \twocolumn[\box\mktitle@bx]%
1934   \or % sigplan
1935     \twocolumn[\box\mktitle@bx]%
1936   \or % sigchi
1937     \twocolumn[\box\mktitle@bx]%
1938   \or % sigchi-a
1939     \par\box\mktitle@bx\par\bigskip
1940   \if@ACM@badge
1941     \marginpar{\noindent
1942       \ifx\@acmBadgeL@image\@empty\else
1943         \href{\@acmBadgeL@url}{%
1944           \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
1945         \hskip\@ACM@badge@skip
1946       \fi

```



```

1947         \ifx\@acmBadgeR@image\empty\else
1948         \href{\@acmBadgeR@url}{%
1949         \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
1950         \fi}%
1951     \fi
1952 \fi
1953 }

\@mktitle The title of the article
1954 \def\@mktitle{%
1955     \ifcase\ACM@format@nr
1956     \relax % manuscript
1957     \@mktitle@i
1958     \or % acmsmall
1959     \@mktitle@i
1960     \or % acmlarge
1961     \@mktitle@i
1962     \or % acmtog
1963     \@mktitle@i
1964     \or % sigconf
1965     \@mktitle@iii
1966     \or % siggraph
1967     \@mktitle@iii
1968     \or % sigplan
1969     \@mktitle@iii
1970     \or % sigchi
1971     \@mktitle@iii
1972     \or % sigchi-a
1973     \@mktitle@iv
1974     \fi
1975 }

\@titlefont The font to typeset the title
1976 \def\@titlefont{%
1977     \ifcase\ACM@format@nr
1978     \relax % manuscript
1979     \LARGE\sffamily\bfseries
1980     \or % acmsmall
1981     \LARGE\sffamily\bfseries
1982     \or % acmlarge
1983     \LARGE\sffamily\bfseries
1984     \or % acmtog
1985     \Huge\sffamily
1986     \or % sigconf
1987     \Huge\sffamily\bfseries
1988     \or % siggraph
1989     \Huge\sffamily\bfseries
1990     \or % sigplan
1991     \Huge\bfseries
1992     \or % sigchi

```

```

1993   \Huge\sffamily\bfseries
1994   \or % sigchi-a
1995     \Huge\bfseries
1996   \fi}

\@subtitlefont The font to typeset the subtitle
1997 \def\@subtitlefont{\normalsize
1998   \ifcase\ACM@format@nr
1999   \relax % manuscript
2000     \mdseries
2001   \or % acmsmall
2002     \mdseries
2003   \or % acmlarge
2004     \mdseries
2005   \or % acmtog
2006     \LARGE
2007   \or % sigconf
2008     \LARGE\mdseries
2009   \or % siggraph
2010     \LARGE\mdseries
2011   \or % sigplan
2012     \LARGE\mdseries
2013   \or % sigchi
2014     \LARGE\mdseries
2015   \or % sigchi-a
2016     \mdseries
2017   \fi}

\@mktitle@i The version of \mktitle for most journals
2018 \def\@mktitle@i{\hsize=\textwidth
2019   \@ACM@title@width=\hsize
2020   \ifx\@acmBadgeL@image\@empty\else
2021     \advance\@ACM@title@width by -\@ACM@badge@width
2022     \advance\@ACM@title@width by -\@ACM@badge@skip
2023   \fi
2024   \ifx\@acmBadgeR@image\@empty\else
2025     \advance\@ACM@title@width by -\@ACM@badge@width
2026     \advance\@ACM@title@width by -\@ACM@badge@skip
2027   \fi
2028   \setbox\mktitle@bx=\vbox{\noindent\@titlefont
2029     \ifx\@acmBadgeL@image\@empty\else
2030       \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
2031         \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
2032       \hskip\@ACM@badge@skip
2033     \fi
2034     \parbox[t]{\@ACM@title@width}{\raggedright
2035       \@titlefont\noindent
2036       \@title
2037     \ifx\@subtitle\@empty\else
2038       \par\noindent{\@subtitlefont\@subtitle}

```

```

2039 \fi}%
2040 \ifx\@acmBadgeR@image\@empty\else
2041   \hskip\@ACM@badge@skip
2042   \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
2043     \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
2044 \fi
2045 \par\bigskip}}%

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

\@mkttitle@iii The version of \@mkttitle for SIG proceedings. Note that since the title is centered, we
leave space for the left badge even if only the right badge is defined.
2046 \def\@mkttitle@iii{\hsize=\textwidth
2047   \setbox\mkttitle@bx=\vbox{\@titlefont\centering
2048     \@ACM@title@width=\hsize
2049     \if@ACM@badge
2050       \advance\@ACM@title@width by -2\@ACM@badge@width
2051       \advance\@ACM@title@width by -2\@ACM@badge@skip
2052       \parbox[b]{\@ACM@badge@width}{\strut
2053         \ifx\@acmBadgeL@image\@empty\else
2054           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
2055             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
2056         \fi}%
2057       \hskip\@ACM@badge@skip
2058     \fi
2059     \parbox[t]{\@ACM@title@width}{\centering\@titlefont
2060       \@title
2061       \ifx\@subtitle\@empty\else
2062         \par\noindent{\@subtitlefont\@subtitle}
2063       \fi
2064     }%
2065     \if@ACM@badge
2066       \hskip\@ACM@badge@skip
2067       \parbox[b]{\@ACM@badge@width}{\strut
2068         \ifx\@acmBadgeR@image\@empty\else
2069           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
2070             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
2071         \fi}%
2072     \fi
2073     \par\bigskip}}%

\@mkttitle@iv The version of \@mkttitle for sigchi-a
2074 \def\@mkttitle@iv{\hsize=\textwidth
2075   \setbox\mkttitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
2076     \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
2077     \noindent\@title
2078     \ifx\@subtitle\@empty\else
2079       \par\noindent\@subtitlefont\@subtitle
2080     \fi

```

```
2081 \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.

```
2082 \newbox\@ACM@commabox
2083 \def\@ACM@addtoaddress#1{%
2084   \ifvmode\else
2085     \if@ACM@affiliation@obexpunctuation\else
2086       \setbox\@ACM@commabox=\hbox{, }%
2087       \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
2088     \fi\fi
2089   #1}
```

`\institution` `\position` `\department` `\streetaddress` `\city` `\state` `\postcode` `\country` 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...

```
2090 \def\streetaddress#1{\unskip\ignorespaces}
2091 \def\postcode#1{\unskip\ignorespaces}
2092 \if@ACM@journal
2093   \def\position#1{\unskip\ignorespaces}
2094   \def\institution#1{\global\@ACM@instpresenttrue
2095     \unskip~#1\ignorespaces}
2096   \def\city#1{\global\@ACM@citypresenttrue\unskip\ignorespaces}
2097   \def\state#1{\unskip\ignorespaces}
2098   \newcommand\department[2][0]{\unskip\ignorespaces}
2099   \def\country#1{\global\@ACM@countrypresenttrue
2100     \if@ACM@affiliation@obexpunctuation\else, \fi#1\ignorespaces}
2101 \else
2102   \def\position#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
2103   \def\institution#1{\global\@ACM@instpresenttrue
2104     \if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
2105   \newcommand\department[2][0]{\if@ACM@affiliation@obexpunctuation
2106     #2\else#2\par\fi}%
2107 % \def\streetaddress#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
2108 \def\city#1{\global\@ACM@citypresenttrue\@ACM@addtoaddress{#1}}%
2109 \let\state\@ACM@addtoaddress
2110 % \def\postcode#1{\if@ACM@affiliation@obexpunctuation#1\else\unskip\space#1\fi}%
2111 \def\country#1{\global\@ACM@countrypresenttrue\@ACM@addtoaddress{#1}}%
2112 \fi
```

`\@mkauthors` Typesetting the authors

```
2113 \def\@mkauthors{\begingroup
2114   \hspace=\textwidth
```

```

2115 \ifcase\ACM@format@nr
2116 \relax % manuscript
2117 \mkauthors@i
2118 \or % acsmall
2119 \mkauthors@i
2120 \or % acmlarge
2121 \mkauthors@i
2122 \or % acmtog
2123 \mkauthors@i
2124 \or % sigconf
2125 \mkauthors@iii
2126 \or % siggraph
2127 \mkauthors@iii
2128 \or % sigplan
2129 \mkauthors@iii
2130 \or % sigchi
2131 \mkauthors@iii
2132 \or % sigchi-a
2133 \mkauthors@iv
2134 \fi
2135 \endgroup
2136 }

```

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

```
2137 \def\@authorfont{\Large\sffamily}
```

\@affiliationfont Font for affiliations

```
2138 \def\@affiliationfont{\normalsize\normalfont}
```

#### Adjusting fonts for different formats

```

2139 \ifcase\ACM@format@nr
2140 \relax % manuscript
2141 \or % acsmall
2142 \def\@authorfont{\large\sffamily}
2143 \def\@affiliationfont{\small\normalfont}
2144 \or % acmlarge
2145 \or % acmtog
2146 \def\@authorfont{\LARGE\sffamily}
2147 \def\@affiliationfont{\large}
2148 \or % sigconf
2149 \def\@authorfont{\LARGE}
2150 \def\@affiliationfont{\large}
2151 \or % siggraph
2152 \def\@authorfont{\normalsize\normalfont}
2153 \def\@affiliationfont{\normalsize\normalfont}
2154 \or % sigplan
2155 \def\@authorfont{\Large\normalfont}
2156 \def\@affiliationfont{\normalsize\normalfont}
2157 \or % sigchi

```

```

2158 \def\@authorfont{\bfseries}
2159 \def\@affiliationfont{\mdseries}
2160 \or % sigchi-a
2161 \def\@authorfont{\bfseries}
2162 \def\@affiliationfont{\mdseries}
2163 \fi

```

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

```

2164 \def\@typeset@author@line{%
2165 \andify\@currentauthors\par\noindent
2166 \@currentauthors\def\@currentauthors{}}%
2167 \ifx\@currentaffiliations\@empty\else
2168 \andify\@currentaffiliations
2169 \unskip, {\@currentaffiliations}\par
2170 \fi
2171 \def\@currentaffiliations{}}

```

\if@ACM@instpresent Whether the given affiliation has institution

```

2172 \newif\if@ACM@instpresent
2173 \@ACM@instpresenttrue

```

\if@ACM@citypresent Whether the given affiliation has city

```

2174 \newif\if@ACM@citypresent
2175 \@ACM@citypresenttrue

```

\if@ACM@countrypresent Whether the given affiliation has country

```

2176 \newif\if@ACM@countrypresent
2177 \@ACM@countrypresenttrue

```

\@ACM@resetaffil Reset affiliation flags

```

2178 \def\@ACM@resetaffil{%
2179 \global\@ACM@instpresentfalse
2180 \global\@ACM@citypresentfalse
2181 \global\@ACM@countrypresentfalse
2182 }

```

\@ACM@checkaffil Check affiliation flags

```

2183 \def\@ACM@checkaffil{%
2184 \if@ACM@instpresent\else
2185 \ClassWarningNoLine{\@classname}{No institution present for an affiliation}%
2186 \fi
2187 \if@ACM@citypresent\else
2188 \ClassWarningNoLine{\@classname}{No city present for an affiliation}%
2189 \fi
2190 \if@ACM@countrypresent\else
2191 \ClassWarningNoLine{\@classname}{No country present for an affiliation}%
2192 \fi
2193 }

```

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

```

2194 \def\mkauthors@i{%
2195   \def\@currentauthors{}%
2196   \def\@currentaffiliations{}%
2197   \global\let\and\@typeset@author@line
2198   \def\@author##1{%
2199     \ifx\@currentauthors\@empty
2200       \gdef\@currentauthors{\@authorfont\MakeTextUppercase{##1}}%
2201     \else
2202       \g@addto@macro{\@currentauthors}{\and\MakeTextUppercase{##1}}%
2203     \fi
2204     \gdef\and{}%
2205   \def\email##1##2{%
2206     \def\@tempa{##2}\ifx\@tempa\@empty\else
2207       \ifx\@currentaffiliations\@empty
2208         \gdef\@currentaffiliations{%
2209           \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2210           \setkeys{@ACM@affiliation@}{##1}%
2211           \@ACM@resetaffil
2212           \@affiliationfont##2\@ACM@checkaffil}%
2213         \else
2214           \g@addto@macro{\@currentaffiliations}{\and
2215             \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
2216             \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2217             ##2\@ACM@checkaffil}%
2218           \fi
2219         \fi
2220       \global\let\and\@typeset@author@line}%
2221   \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
2222     \noindent\addresses\@typeset@author@line
2223     \par\medskip}%
2224   \par\medskip}%
2225 }
```

`\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  
2226 `\newbox\author@bx`

`\author@bx@wd` The width of the author box  
2227 `\newdimen\author@bx@wd`

`\author@bx@sep` The separation between author boxes  
2228 `\newskip\author@bx@sep`  
2229 `\author@bx@sep=1pc\relax`

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

```

2230 \def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd
2231 \def\and{\par}\normalbaselines
2232 \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
2233 \@authorfont\@currentauthors\par\@affiliationfont
2234 \@currentaffiliation}\egroup
2235 \box\author@bx\hspace{\author@bx@sep}%
2236 \gdef\@currentauthors{}}%
2237 \gdef\@currentaffiliation{}}

```

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

```

2238 \def\@mkauthors@iii{%

```

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

```

2239 \author@bx@wd=\textwidth\relax
2240 \advance\author@bx@wd by -\author@bx@sep\relax
2241 \ifnum\@ACM@authorsperrow>0\relax
2242 \divide\author@bx@wd by \@ACM@authorsperrow\relax
2243 \else
2244 \ifcase\num@authorgroups
2245 \relax % 0?
2246 \or % 1=one author per row
2247 \or % 2=two authors per row
2248 \divide\author@bx@wd by \num@authorgroups\relax
2249 \or % 3=three authors per row
2250 \divide\author@bx@wd by \num@authorgroups\relax
2251 \or % 4=two authors per row (!)
2252 \divide\author@bx@wd by 2\relax
2253 \else % three authors per row
2254 \divide\author@bx@wd by 3\relax
2255 \fi
2256 \fi
2257 \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of \addresses:

```

2258 \gdef\@currentauthors{}}%
2259 \gdef\@currentaffiliation{}}%
2260 \def\@author##1{\ifx\@currentauthors\@empty
2261 \gdef\@currentauthors{\par##1}%
2262 \else
2263 \g@addto@macro\@currentauthors{\par##1}%
2264 \fi
2265 \gdef\and{}}%
2266 \def\email##1##2{\ifx\@currentaffiliation\@empty
2267 \gdef\@currentaffiliation{\bgroup
2268 \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2269 \else
2270 \g@addto@macro\@currentaffiliation{\par\bgroup

```



```

2271     \mathchardef\UrlBreakPenalty=10000\nolinkurl{##2}\egroup}%
2272 \fi}%
2273 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2274   \gdef\@currentaffiliation{%
2275     \setkeys{@ACM@affiliation@}{obexpunctuation=false}%
2276     \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2277     ##2\@ACM@checkaffil}%
2278   \else
2279     \g@addto@macro\@currentaffiliation{\par
2280       \setkeys{@ACM@affiliation@}{obexpunctuation=false}%
2281       \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2282       ##2\@ACM@checkaffil}%
2283   \fi
2284   \global\let\and\@typeset@author@bx
2285 }%

```

Actual typesetting is done by the `\and` macro:

```

2286 \hsize=\textwidth
2287 \global\setbox\mktitle@bx=\vbox{\noindent
2288   \box\mktitle@bx\par\medskip\leavevmode
2289   \lineskip=1pc\relax\centering\hspace*{-1em}%
2290   \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.

```
2291 \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.

```

2292 \author@bx@wd=\columnwidth\relax
2293 \advance\author@bx@wd by -\author@bx@sep\relax
2294 \ifnum\@ACM@authorsperrow>0\relax
2295   \divide\author@bx@wd by \@ACM@authorsperrow\relax
2296   \else
2297     \ifcase\@num@authorgroups
2298       \relax % 0?
2299       \or % 1=one author per row
2300       \else % 2=two authors per row
2301         \divide\author@bx@wd by 2\relax
2302     \fi
2303   \fi
2304   \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of `\addresses`:

```

2305 \gdef\@currentauthors{}%
2306 \gdef\@currentaffiliation{}%
2307 \def\@author##1{\ifx\@currentauthors\@empty
2308   \gdef\@currentauthors{\par##1}%

```

```

2309 \else
2310   \g@addto@macro\@currentauthors{\par##1}%
2311 \fi
2312 \gdef\and{}}%
2313 \def\email##1##2{\ifx\@currentaffiliation\@empty
2314   \gdef\@currentaffiliation{\nolinkurl{##2}}%
2315 \else
2316   \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
2317 \fi}%
2318 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
2319   \gdef\@currentaffiliation{
2320     \setkeys{@ACM@affiliation@}{obexpunctuation=false}%
2321     \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2322     ##2\@ACM@checkaffil}%
2323 \else
2324   \g@addto@macro\@currentaffiliation{\par
2325     \setkeys{@ACM@affiliation@}{obexpunctuation=false}%
2326     \setkeys{@ACM@affiliation@}{##1}\@ACM@resetaffil
2327     ##2\@ACM@checkaffil}%
2328 \fi
2329 \global\let\and\@typeset@author@bx}%
2330 %

```

Actual typesetting is done by the \and macro

```

2331 \bgroup\hsize=\columnwidth
2332 \par\raggedright\leftskip=\z@
2333 \lineskip=1pc\noindent
2334 \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}

```

\@mkauthorsaddresses Typesetting authors' addresses in the footnote style

```

2335 \def\@mkauthorsaddresses{%
2336   \ifnum\num@authors>1\relax
2337   Authors' \else Author's \fi
2338   \ifnum\num@authorgroups>1\relax
2339   addresses: \else address: \fi
2340   \bgroup
2341   \def\streetaddress##1{\unskip, ##1}%
2342   \def\postcode##1{\unskip, ##1}%
2343   \def\position##1{\unskip\ignorespaces}%
2344   \def\institution##1{\unskip, ##1}%
2345   \def\city##1{\unskip, ##1}%
2346   \def\state##1{\unskip, ##1}%
2347   \renewcommand\department[2][0]{\unskip\@addpunct, ##2}%
2348   \def\country##1{\unskip, ##1}%
2349   \def\and{\unskip; }%
2350   \def\@author##1{##1}%
2351   \def\email##1##2{\unskip, \nolinkurl{##2}}%
2352   \addresses
2353   \egroup}

```

```

2354 \AtEndDocument{\if@ACM@nonacm\else\if@ACM@journal
2355 \ifx\@authorsaddresses\@empty
2356 \ClassWarningNoLine{\@classname}{Authors'
2357 addresses are mandatory for ACM journals}%
2358 \fi\fi\fi}

\@setaddresses This is an amsart macro that we do not need.
2359 \def\@setaddresses{}

\@authornotemark Adding a footnote mark to authors. This version adds a “normal” footnote mark.
2360 \def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark\relax}}

@@authornotemark Adding a footnote mark to authors with a given number
2361 \def@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}

\@mkteasers Typesetting the teasers
2362 \def\@mkteasers{%
2363 \ifx\@teaserfigures\@empty\else
2364 \def\@teaser##1{\par\bigskip\bgroup
2365 \captionsetup{type=figure}##1\egroup\par}
2366 \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
2367 \noindent\@Description@presentfalse
2368 \@teaserfigures\par\if@Description@present\else
2369 \global\@undescrbed@imagestrue
2370 \ClassWarning{\@classname}{A possible image without
2371 description}\fi
2372 \medskip}%
2373 \fi}

\@mkabstract Typesetting the abstract
2374 \def\@mkabstract{\bgroup
2375 \ifx\@abstract\@empty\else
2376 {\phantomsection\addcontentsline{toc}{section}{Abstract}%
2377 \if@ACM@journal
2378 \everypar{\setbox\z@\lastbox\everypar{}}\small
2379 \else
2380 \section*\@abstractname}%
2381 \fi
2382 \ignorespaces\@abstract\par}%
2383 \fi\egroup}

\@mkbibcitation Print the bibcitation format
2384 \def\@mkbibcitation{\bgroup
2385 \let\@vspace\@vspace@orig
2386 \let\@vspacer\@vspacer@orig
2387 \def\@pages@word{\ifnum\getrefnumber{TotPages}=1\relax page\else pages\fi}%
2388 \def\footnotemark{}%
2389 \def\@unskip{\ignorespaces}%
2390 \def\footnote{\ClassError{\@classname}{Please do not use footnotes

```

```

2391     inside a \string\title{} or \string\author{} command! Use
2392     \string\titlenote{} or \string\authornote{} instead!}}%
2393 \def\@article@string{\ifx\@acmArticle\@empty{\ } \else,
2394   Article~\@acmArticle\ }fi}%
2395 \par\medskip\small\noindent{\bfseries ACM Reference Format:}\par\nobreak
2396 \noindent\bgroup
2397   \def\{\unskip{, \ignorespaces}\authors\egroup. \@acmYear. \@title
2398   \ifx\@subtitle\@empty. \else: \@subtitle. \fi
2399   \if@ACM@nonacm\else
2400     % The 'nonacm' option disables 'printacmref' by default,
2401     % and the present \mkbibcitation definition is never used
2402     % in this case. The conditional remains useful if the user
2403     % explicitly sets \settopmatter{printacmref=true}.
2404     \if@ACM@journal@bibstrip
2405       \textit{\@journalNameShort}
2406       \@acmVolume, \@acmNumber \@article@string (\@acmPubDate),
2407       \ref{TotPages}~\@pages@word.
2408     \else
2409       In \textit{\@acmBooktitle}%
2410       \ifx\@acmEditors\@empty\textit{.}\else
2411         \andify\@acmEditors\textit{, }\@acmEditors~\@editorsAbbrev.%
2412       \fi\
2413       ACM, New York, NY, USA%
2414       \@article@string\unskip, \ref{TotPages}~\@pages@word.
2415     \fi
2416   \fi
2417   \ifx\@acmDOI\@empty\else\@formatdoi{\@acmDOI}\fi
2418 \par\egroup}

```

\@printendtopmatter End the top matter

```

2419 \def\@printendtopmatter{%
2420   \let\@vspace\@vspace@orig
2421   \let\@vspacer\@vspacer@orig
2422   \par\bigskip
2423   \let\@vspace\@vspace@acm
2424   \let\@vspacer\@vspacer@acm
2425 }

```

\@setthanks We redefine \setthanks using \long

```

2426 \def\@setthanks{\long\def\thanks##1{\par##1\@addpunct.}\thankses}

```

\@setauthorsaddresses

```

2427 \def\@setauthorsaddresses{\@authorsaddresses\unskip\@addpunct.}

```

### 3.16 Headers and Footers

We use fancyhdr for our headers and footers:

```

2428 \RequirePackage{fancyhdr}

```

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

```
2429 \let\ACM@ps@plain\ps@plain
2430 \let\ACM@ps@myheadings\ps@myheadings
2431 \let\ACM@ps@headings\ps@headings
2432 \def\ACM@restore@pagestyle{%
2433   \let\ps@plain\ACM@ps@plain
2434   \let\ps@myheadings\ACM@ps@myheadings
2435   \let\ps@headings\ACM@ps@headings}
2436 \AtBeginDocument{\ACM@restore@pagestyle}
```

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

```
2437 \if@ACM@review
2438   \newsavebox{\ACM@linecount@bx}
2439   \newlength\ACM@linecount@bxht
2440   \newcount\ACM@linecount
2441   \ACM@linecount\@ne\relax
2442   \def\ACM@mk@linecount{%
2443     \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{\normalfont
2444       \normalsize
2445       \setlength{\ACM@linecount@bxht}{0pt}%
2446       \loop{\color{red}\scriptsize\the\ACM@linecount}\
2447       \global\advance\ACM@linecount by \@ne
2448       \addtolength{\ACM@linecount@bxht}{\baselineskip}%
2449       \ifdim\ACM@linecount@bxht<\textheight\repeat
2450       {\color{red}\scriptsize\the\ACM@linecount}\hfill
2451       \global\advance\ACM@linecount by \@ne}}
2452 \fi
```

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

```
2453 \def\ACM@linecountL{%
2454   \if@ACM@review
2455     \ACM@mk@linecount
2456     \begin{picture}(0,0)%
2457       \put(-26,-22){\usebox{\ACM@linecount@bx}}%
2458     \end{picture}%
2459   \fi}
```

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

```
2460 \def\ACM@linecountR{%
2461   \if@ACM@review
2462     \ifcase\ACM@format@nr
2463       \relax % manuscript
2464       \relax
2465       \or % acmsmall
2466       \relax
2467       \or % acmlarge
2468       \relax
2469       \or % acmtog
2470       \ACM@mk@linecount
```

```

2471     \or % sigconf
2472         \ACM@mk@linecount
2473     \or % siggraph
2474         \ACM@mk@linecount
2475     \or % sigplan
2476         \ACM@mk@linecount
2477     \or % sigchi
2478         \ACM@mk@linecount
2479     \or % sigchi-a
2480         \ACM@mk@linecount
2481 \fi
2482 \begin{picture}(0,0)%
2483     \put(20,-22){\usebox{\ACM@linecount@bx}}%
2484 \end{picture}%
2485 \fi}

```

\ACM@timestamp The timestamp system

```

2486 \if@ACM@timestamp
2487 % Subtracting 30 from \time gives us the effect of rounding down despite
2488 % \numexpr rounding to nearest
2489 \newcounter{ACM@time@hours}
2490 \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
2491 \newcounter{ACM@time@minutes}
2492 \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
2493 \newcommand\ACM@timestamp{%
2494     \footnotesize%
2495     \ifx\@acmSubmissionID\@empty\relax\else
2496     Submission ID: \@acmSubmissionID.{ }%
2497 \fi
2498 \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
2499 \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{. }%
2500 Page \thepage\ of \@startPage--\pageref*{TotPages}.%
2501 }
2502 \fi

```

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

```

2503 \def\@shortauthors{%
2504     \if@ACM@anonymous
2505     Anon.
2506     \ifx\@acmSubmissionID\@empty\else Submission Id: \@acmSubmissionID\fi
2507     \else\shortauthors\fi}

```

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

```

2508 \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

```

2509 \AtBeginDocument{%
2510 \fancypagestyle{standardpagestyle}{%

```

```

2511 \fancyhf{}%
2512 \renewcommand{\headrulewidth}{\z@}%
2513 \renewcommand{\footrulewidth}{\z@}%
2514 \def\@acmArticlePage{%
2515   \ifx\@acmArticle\empty%
2516     \if@ACM@printfolios\thepage\fi%
2517   \else%
2518     \@acmArticle\if@ACM@printfolios:\thepage\fi%
2519   \fi%
2520 }%
2521 \if@ACM@journal@bibstrip
2522 \ifcase\ACM@format@nr
2523 \relax % manuscript
2524 \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
2525 \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
2526 \fancyhead[RE]{\@shortauthors}%
2527 \fancyhead[LO]{\ACM@linecountL\shorttitle}%
2528 \if@ACM@nonacm\else%
2529 \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}%
2530 \fi%
2531 \or % acmsmall
2532 \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticlePage}%
2533 \fancyhead[RO]{\@headfootfont\@acmArticlePage}%
2534 \fancyhead[RE]{\@headfootfont\@shortauthors}%
2535 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2536 \if@ACM@nonacm\else%
2537 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2538   \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2539 \fi
2540 \or % acmlarge
2541 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2542   \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2543 \fancyhead[LO]{\ACM@linecountL}%
2544 \fancyhead[RO]{\@headfootfont
2545   \shorttitle\quad\textbullet\quad\@acmArticlePage}%
2546 \if@ACM@nonacm\else%
2547 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2548   \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2549 \fi
2550 \or % acmtog
2551 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2552   \@acmArticlePage\quad\textbullet\quad\@shortauthors}%
2553 \fancyhead[LO]{\ACM@linecountL}%
2554 \fancyhead[RE]{\ACM@linecountR}%
2555 \fancyhead[RO]{\@headfootfont
2556   \shorttitle\quad\textbullet\quad\@acmArticlePage\ACM@linecountR}%
2557 \if@ACM@nonacm\else%
2558 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2559   \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2560 \fi

```

```

2561 \else % Proceedings
2562 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2563 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2564 \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2565 \if@ACM@nonacm\else%
2566 \fancyhead[LE]{\ACM@linecountL\@headfootfont\footnotesize
2567 \acmConference@shortname,
2568 \acmConference@date, \acmConference@venue}%
2569 \fancyhead[RO]{\@headfootfont
2570 \acmConference@shortname,
2571 \acmConference@date, \acmConference@venue\ACM@linecountR}%
2572 \fi
2573 \fi
2574 \else % Proceedings
2575 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2576 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2577 \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2578 \if@ACM@nonacm\else%
2579 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2580 \acmConference@shortname,
2581 \acmConference@date, \acmConference@venue}%
2582 \fancyhead[RO]{\@headfootfont
2583 \acmConference@shortname,
2584 \acmConference@date, \acmConference@venue\ACM@linecountR}%
2585 \fi
2586 \fi
2587 \if@ACM@sigchiamode
2588 \fancyheadoffset[L]{\dimexpr(\marginparsep+\marginparwidth)}%
2589 \fi
2590 \if@ACM@timestamp
2591 \fancyfoot[LO,RE]{\ACM@timestamp}
2592 \fi
2593 }%
2594 \pagestyle{standardpagestyle}
2595 }

```

```

\@folio@wd Folio blob width, height, offsets and max number
\@folio@ht
\@folio@voffset 2596 \newdimen\@folio@wd
\@folio@max 2597 \@folio@wd=\z@
2598 \newdimen\@folio@ht
2599 \@folio@ht=\z@
2600 \newdimen\@folio@voffset
2601 \@folio@voffset=\z@
2602 \def\@folio@max{1}
2603 \ifcase\ACM@format@nr
2604 \relax % manuscript
2605 \or % acmsmall
2606 \@folio@wd=45.75pt\relax
2607 \@folio@ht=1.25in\relax
2608 \@folio@voffset=.2in\relax

```



```

2609 \def\@folio@max{8}
2610 \or % acmlarge
2611 \@folio@wd=43.25pt\relax
2612 \@folio@ht=79pt\relax
2613 \@folio@voffset=.55in\relax
2614 \def\@folio@max{10}
2615 \fi

```

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

```

2616 \def\@folioblob{\@tempcnta=0\@acmArticleSeq\relax
2617 \ifnum\@tempcnta=0\relax\else
First, we calculate \@acmArticleSeq modulo \@folio@max
2618 \loop
2619 \ifnum\@tempcnta>\@folio@max\relax
2620 \advance\@tempcnta by - \@folio@max
2621 \repeat
2622 \advance\@tempcnta by -1\relax
2623 \@tempdima=\@folio@ht\relax
2624 \multiply\@tempdima by \the\@tempcnta\relax
2625 \advance\@tempdima by -\@folio@voffset\relax
2626 \begin{picture}(0,0)
2627 \makebox[\z@]{\raisebox{-\@tempdima}{%
2628 \rlap{%
2629 \raisebox{-0.45\@folio@ht}[\z@][\z@]{%
2630 \rule{\@folio@wd}{\@folio@ht}}}%
2631 \parbox{\@folio@wd}{%
2632 \centering
2633 \textcolor{white}{\LARGE\sffamily\bfseries\@acmArticle}}}}
2634 \end{picture}\fi}
2635

```

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

```

2636 \AtBeginDocument{%
2637 \fancypagestyle{firstpagestyle}{%
2638 \fancyhf{}%
2639 \renewcommand{\headrulewidth}{\z@}%
2640 \renewcommand{\footrulewidth}{\z@}%
2641 \if@ACM@journal@bibstrip
2642 \ifcase\ACM@format@nr
2643 \relax % manuscript
2644 \fancyhead[L]{\ACM@linecountL}%
2645 \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
2646 \if@ACM@nonacm\else%
2647 \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
2648 \fi%
2649 \or % acmsmall
2650 \if@ACM@nonacm\else%
2651 \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2652 \@acmNumber, Article \@acmArticle. Publication date:

```

```

2653     \@acmPubDate.}%
2654     \fi%
2655     \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2656     \fancyhead[LO]{\ACM@linecountL}%
2657     \fancyhead[RO]{\@folioblob}%
2658     \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
2659 \or % acmlarge
2660     \if@ACM@nonacm\else%
2661     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2662     \@acmNumber, Article \@acmArticle. Publication date:
2663     \@acmPubDate.}%
2664     \fi%
2665     \fancyhead[RO]{\@folioblob}%
2666     \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2667     \fancyhead[LO]{\ACM@linecountL}%
2668     \fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2669 \or % acmtog
2670     \if@ACM@nonacm\else%
2671     \fancyfoot[RO,LE]{\footnotesize \@journalNameShort, Vol. \@acmVolume, No.
2672     \@acmNumber, Article \@acmArticle. Publication date:
2673     \@acmPubDate.}%
2674     \fi%
2675     \fancyhead[L]{\ACM@linecountL}%
2676     \fancyhead[R]{\ACM@linecountR}%
2677 \else % Conference proceedings
2678     \fancyhead[L]{\ACM@linecountL}%
2679     \fancyhead[R]{\ACM@linecountR}%
2680     \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2681     \fi
2682 \else
2683     \fancyhead[L]{\ACM@linecountL}%
2684     \fancyhead[R]{\ACM@linecountR}%
2685     \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2686     \fi
2687 \if@ACM@timestamp
2688     \ifnum\ACM@format@nr=0\relax % Manuscript
2689     \fancyfoot[LO,RE]{\ACM@timestamp\quad
2690     \if@ACM@nonacm\else
2691     \footnotesize Manuscript submitted to ACM
2692     \fi}
2693 \else
2694     \fancyfoot[LO,RE]{\ACM@timestamp}
2695     \fi
2696 \fi
2697 }}

```

### 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`.

```

2698 \def\ACM@NRadjust#1{%
2699   \begingroup
2700   \expandafter\ifx\csname Sectionformat\endcsname\relax
2701   % do nothing when \Sectionformat is unknown
2702   \def\next{\endgroup #1}%
2703   \else
2704     \def\next{\endgroup
2705       \let\realSectionformat\Sectionformat
2706       \def\ACM@sect@format@{#1}%
2707       \let\Sectionformat\ACM@NR@adjustedSectionformat
2708       %% next lines added 2018-06-17 to ensure section number is styled
2709       \let\real@adddotafter\@adddotafter
2710       \let\@adddotafter\ACM@adddotafter
2711       #1}% imposes the styles, but nullifies \MakeUppercase
2712       \let\@adddotafter\real@adddotafter
2713     }%
2714   \fi \next
2715 }

```

`\ACM@NR@adjustedSectionformat`

```

2716 \def\ACM@NR@adjustedSectionformat#1#2{%
2717   \realSectionformat{\ACM@sect@format{#1}}{#2}%
2718   \let\Sectionformat\realSectionformat}
2719 \DeclareRobustCommand{\ACM@sect@format@}{\ACM@sect@format@}
2720 \def\ACM@sect@format@null#1{#1}
2721 \let\ACM@sect@format@\ACM@sect@format@null
2722 \AtBeginDocument{%
2723   \expandafter\ifx\csname LTX@adddotafter\endcsname\relax
2724   \let\LTX@adddotafter\@adddotafter
2725   \fi

```

2726 }

\ACM@adddotafter

```
2727 \def\ACM@adddotafter#1{\ifx\relax#1\relax\else\LTX@adddotafter{#1}\fi}
```

Sectioning is different for different levels

```
2728 \renewcommand\section{\@startsection{section}{1}{\z@}%
2729 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2730 {.25\baselineskip}%
2731 {\ACM@NRadjust\@secfont}}
2732 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2733 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2734 {.25\baselineskip}%
2735 {\ACM@NRadjust\@subsecfont}}
2736 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2737 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2738 {-3.5\p@}%
2739 {\ACM@NRadjust{\@subsubsecfont\@adddotafter}}}}
2740 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
2741 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2742 {-3.5\p@}%
2743 {\ACM@NRadjust{\@parfont\@adddotafter}}}}
2744 \newcommand\noindentparagraph{\@startsection{paragraph}{4}{\z@}%
2745 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2746 {-3.5\p@}%
2747 {\ACM@NRadjust{\@parfont}}}}
2748
2749 \renewcommand\part{\@startsection{part}{9}{\z@}%
2750 {-10\p@ \@plus -4\p@ \@minus -2\p@}%
2751 {4\p@}%
2752 {\ACM@NRadjust\@parfont}}
```

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

```
2753 \def\section@raggedright{\@rightskip\@flushglue
2754 \rightskip\@rightskip
2755 \leftskip\z@skip
2756 \parindent\z@}
```

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

```
\@subsecfont 2757 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
\@subsubsecfont 2758 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
\@parfont 2759 \def\@subsubsecfont{\sffamily\itshape}
2760 \def\@parfont{\itshape}
2761 \setcounter{secnumdepth}{3}
2762 \ifcase\ACM@format@nr
2763 \relax % manuscript
2764 \or % acsmall
2765 \or % acmlarge
2766 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
```

```

2767 \def\@subsecfont{\sffamily\large\section@raggedright}
2768 \or % acmtog
2769 \def\@secfont{\sffamily\large\section@raggedright\MakeTextUppercase}
2770 \def\@subsecfont{\sffamily\large\section@raggedright}
2771 \or % sigconf
2772 \def\@secfont{\bfseries\Large\section@raggedright\MakeTextUppercase}
2773 \def\@subsecfont{\bfseries\Large\section@raggedright}
2774 \or % siggraph
2775 \def\@secfont{\sffamily\bfseries\Large\section@raggedright\MakeTextUppercase}
2776 \def\@subsecfont{\sffamily\bfseries\Large\section@raggedright}
2777 \or % sigplan
2778 \def\@secfont{\bfseries\Large\section@raggedright}
2779 \def\@subsecfont{\bfseries\section@raggedright}
2780 \def\@subsubsecfont{\bfseries\section@raggedright}
2781 \def\@parfont{\bfseries\itshape}
2782 \def\@subparfont{\itshape}
2783 \or % sigchi
2784 \setcounter{secnumdepth}{1}
2785 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2786 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2787 \or % sigchi-a
2788 \setcounter{secnumdepth}{0}
2789 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeTextUppercase}
2790 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
2791 \fi

```

`\@adddotafter` Add punctuation after a sectioning command

```
2792 \def\@adddotafter#1{#1\@addpunct{.}}
```

`\@addspaceafter` Add space after a sectioning command

```
2793 \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.

```
2794 \providecommand*\@dotsep{4.5}
```

### 3.19 Theorems

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

```
2795 \def\@acmplainbodyfont{\itshape}
```

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

```
2796 \def\@acmplainindent{\parindent}
```

```

\@acmplainheadfont The font to typeset the head of the acmplain theorem style.
2797 \def\@acmplainheadfont{\scshape}

\@acmplainnotefont The font to typeset the note of the acmplain theorem style.
2798 \def\@acmplainnotefont{\@empty}

      Customization of the acmplain theorem style:
2799 \ifcase\ACM@format@nr
2800 \relax % manuscript
2801 \or % acsmall
2802 \or % acmlarge
2803 \or % acmtog
2804 \or % sigconf
2805 \or % siggraph
2806 \or % sigplan
2807 \def\@acmplainbodyfont{\itshape}
2808 \def\@acmplainindent{\z@}
2809 \def\@acmplainheadfont{\bfseries}
2810 \def\@acmplainnotefont{\normalfont}
2811 \or % sigchi
2812 \or % sigchi-a
2813 \fi

acmplain The acmplain theorem style
2814 \newtheoremstyle{acmplain}%
2815 { .5\baselineskip\@plus.2\baselineskip
2816   \@minus.2\baselineskip}% space above
2817 { .5\baselineskip\@plus.2\baselineskip
2818   \@minus.2\baselineskip}% space below
2819 {\@acmplainbodyfont}% body font
2820 {\@acmplainindent}% indent amount
2821 {\@acmplainheadfont}% head font
2822 { .}% punctuation after head
2823 { .5em}% spacing after head
2824 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont(#3)}}}% head spec

\@acmdefinitionbodyfont The font to typeset the body of the acmdefinition theorem style.
2825 \def\@acmdefinitionbodyfont{\normalfont}

\@acmdefinitionindent The amount to indent the acmdefinition theorem style.
2826 \def\@acmdefinitionindent{\parindent}

\@acmdefinitionheadfont The font to typeset the head of the acmdefinition theorem style.
2827 \def\@acmdefinitionheadfont{\itshape}

\@acmdefinitionnotefont The font to typeset the note of the acmdefinition theorem style.
2828 \def\@acmdefinitionnotefont{\@empty}

```

Customization of the acmdefinition theorem style:

```
2829 \ifcase\ACM@format@nr
2830 \relax % manuscript
2831 \or % acmsmall
2832 \or % acmlarge
2833 \or % acmtog
2834 \or % sigconf
2835 \or % siggraph
2836 \or % sigplan
2837 \def\@acmdefinitionbodyfont{\normalfont}
2838 \def\@acmdefinitionindent{\z@}
2839 \def\@acmdefinitionheadfont{\bfseries}
2840 \def\@acmdefinitionnotefont{\normalfont}
2841 \or % sigchi
2842 \or % sigchi-a
2843 \fi
```

acmdefinition The acmdefinition theorem style

```
2844 \newtheoremstyle{acmdefinition}%
2845   {.5\baselineskip\@plus.2\baselineskip
2846     \@minus.2\baselineskip}% space above
2847   {.5\baselineskip\@plus.2\baselineskip
2848     \@minus.2\baselineskip}% space below
2849   {\@acmdefinitionbodyfont}% body font
2850   {\@acmdefinitionindent}% indent amount
2851   {\@acmdefinitionheadfont}% head font
2852   {.}% punctuation after head
2853   {.5em}% spacing after head
2854   {\thmname{#1}\thmnumber{ #2}\thmnote{ \@acmdefinitionnotefont{#3}}}% head spec
```

Make acmplain the default theorem style.

```
2855 \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.

```
2856 \AtEndPreamble{%
2857   \if@ACM@acmthm
2858     \theoremstyle{acmplain}
2859     \ifundefined{theorem}{%
2860       \newtheorem{theorem}{Theorem}[section]
2861     }{}
2862     \ifundefined{conjecture}{%
2863       \newtheorem{conjecture}{Conjecture}
```

```

2864 }{}
2865 \@ifundefined{proposition}{%
2866 \newtheorem{proposition}[theorem]{Proposition}
2867 }{}
2868 \@ifundefined{lemma}{%
2869 \newtheorem{lemma}[theorem]{Lemma}
2870 }{}
2871 \@ifundefined{corollary}{%
2872 \newtheorem{corollary}[theorem]{Corollary}
2873 }{}
2874 \theoremstyle{acmdefinition}
2875 \@ifundefined{example}{%
2876 \newtheorem{example}[theorem]{Example}
2877 }{}
2878 \@ifundefined{definition}{%
2879 \newtheorem{definition}[theorem]{Definition}
2880 }{}
2881 \fi
2882 \theoremstyle{acmplain}
2883 }

```

`\@proofnamefont` The font to typeset the proof name.  
2884 `\def\@proofnamefont{\scshape}`

`\@proofindent` Whether or not to indent proofs.  
2885 `\def\@proofindent{\indent}`

Customization of the proof environment.

```

2886 \ifcase\ACM@format@nr
2887 \relax % manuscript
2888 \or % acmsmall
2889 \or % acmlarge
2890 \or % acmtog
2891 \or % sigconf
2892 \or % siggraph
2893 \or % sigplan
2894 \def\@proofnamefont{\itshape}
2895 \def\@proofindent{\noindent}
2896 \or % sigchi
2897 \or % sigchi-a
2898 \fi

```

`proof` We want some customization of the proof environment.

```

2899 \renewenvironment{proof}[1][\proofname]{\par
2900 \pushQED{\qed}%
2901 \normalfont \topsep6\p@\@plus6\p@\relax
2902 \trivlist
2903 \item[\@proofindent\hskip\labelsep
2904 \@proofnamefont #1\@addpunct{.}]\ignorespaces

```



```

2905 }{%
2906 \popQED\endtrivlist\@endpefalse
2907 }

```

### 3.20 Balancing columns

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

```

2908 \AtEndPreamble{%
2909 \if@ACM@balance
2910 \ifcase\ACM@format@nr
2911 \relax % manuscript
2912 \global\@ACM@balancefalse
2913 \or % acmsmall
2914 \global\@ACM@balancefalse
2915 \or % acmlarge
2916 \global\@ACM@balancefalse
2917 \or % acmtog
2918 \RequirePackage{balance}%
2919 \or % sigconf
2920 \RequirePackage{balance}%
2921 \or % siggraph
2922 \RequirePackage{balance}%
2923 \or % sigplan
2924 \RequirePackage{balance}%
2925 \or % sigchi
2926 \RequirePackage{balance}%
2927 \or % sigchi-a
2928 \global\@ACM@balancefalse
2929 \fi
2930 \fi
2931 }
2932 \AtEndDocument{%
2933 \if@ACM@balance
2934 \if@twocolumn
2935 \balance
2936 \fi\fi}

```

### 3.21 Acknowledgments

\acksname

```
2937 \newcommand\acksname{Acknowledgments}
```

\acks This is a comment-like structure

```

2938 \specialcomment{acks}{%
2939 \begingroup
2940 \section*{\acksname}
2941 \phantomsection\addcontentsline{toc}{section}{\acksname}
2942 }{%
2943 \endgroup

```

```
2944 }
```

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

```
2945 \def\grantsponsor#1#2#3{#2}
```

`\grantnum`

```
2946 \newcommand\grantnum[3][]{#3%
```

```
2947 \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}
```

### 3.22 Conditional typesetting

We use the `comment` package for conditional typesetting:

```
2948 \AtEndPreamble{%
```

```
2949 \if@ACM@screen
```

```
2950 \includecomment{screenonly}
```

```
2951 \excludecomment{printonly}
```

```
2952 \else
```

```
2953 \excludecomment{screenonly}
```

```
2954 \includecomment{printonly}
```

```
2955 \fi
```

```
2956 \if@ACM@anonymous
```

```
2957 \excludecomment{anonsuppress}
```

```
2958 \excludecomment{acks}
```

```
2959 \else
```

```
2960 \includecomment{anonsuppress}
```

```
2961 \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’.

```
2962 \newcommand\showeprint[2][arxiv]{%
```

```
2963 \def\@tempa{#1}%
```

```
2964 \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
```

```
2965 \def\@tempb{arxiv}%
```

```
2966 \ifx\@tempa\@tempb
```

```
2967 arXiv:\href{https://arxiv.org/abs/#2}{#2}\else arXiv:#2%
```

```
2968 \fi}
```

### 3.24 End of Class

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

```
2969 \let\@vspace@orig=\vspace
```

```
2970 \let\@vspacer@orig=\vspacer
```

```
2971 \apptocmd{\@vspace}{\ClassWarning{\@classname}{\string\vspace\space should
```

```
2972 only be used to provide space above/below surrounding
```

```
2973 objects}}{}}{}
```

```
2974 \apptocmd{\@vspacer}{\ClassWarning{\@classname}{\string\vspace\space should
```

```
2975     only be used to provide space above/below surrounding
2976     objects}}{}}
2977 \let\@vspace@acm=\@vspace
2978 \let\@vspacer@acm=\@vspacer
```

```
\ACM@origbaselinestretch We produce an error if the user tries to change \baselinestretch
2979 \let\ACM@origbaselinestretch\baselinestretch
2980 \AtEndDocument{\ifx\baselinestretch\ACM@origbaselinestretch\else
2981   \ClassError{\@classname}{An attempt to redefine
2982     \string\baselinestretch\space detected. Please do not do this for
2983     ACM submissions!}\fi}

2984 \normalsize\normalfont\frenchspacing
2985 </class>
```

## References

- [1] UK T<sub>E</sub>X Users Group. UK list of T<sub>E</sub>X frequently asked questions. <https://texfaq.org>, 2019.
- [2] Michael Downes and Barbara Beeton. *The amsart, amsproc, and amsbook document classes*. American Mathematical Society, August 2004. <http://www.ctan.org/pkg/amslatex>.
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- [9] Boris Veytsman, Bern Schandl, Lee Netherton, and C. V. Radhakrishnan. *A package to create a nomenclature*, September 2005. <http://www.ctan.org/pkg/nomencl>.
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- [11] David Carlisle. *The textcase package*, October 2004. <http://www.ctan.org/pkg/textcase>.

## Change History

1.48	General: Added prologue option to xcolor . . . . .	46	\if@ACM@printacmref: Added warning for longer papers . . . . .	69
	Bib code cleanup (Zack Weinberg)	33	\keywords: Added warning for missing keywords . . . . .	68
	Documentation update (siggraph)	33	General: ACM reference format is now mandatory for papers over one page; CCS concepts and keywords are now mandatory for papers over two pages . . . . .	33
1.49	General: New journal: DTRAP . . . . .	33	Authors' addresses are mandatory for journal articles . . . . .	33
1.53	General: New journals: PACMCGIT, TIOT, TDSCI . . . . .	33		
	Rearranged docs . . . . .	33	1.69	\vspace: Added the changed command to avoid grouping . . . . .
1.54	General: Moved footnote stuff before hyperref call (Ross Moore) . . . . .	33	1.70	General: Name change for TDS . . . . .
1.56	General: Documented \Description	33	1.71	General: Bibliography change: volume for @inproceedings is now in brackets together with series . . . . .
1.57	General: Booktabs package is now the default . . . . .	33		LuaTeX now uses the OTF versions of fonts . . . . .
1.58	General: Changes in samples (Enrico Gregorio) . . . . .	33		Retired sigchi and sigchi-a . . . . .
	New journal: HEALTH. TDS is renamed to TDSCI . . . . .	33	v1.00	General: First released version . . . . .
1.60	\if@ACM@urlbreakonhyphens: introduced macro . . . . .	34	v1.01	General: Changed hyperref colors in screen mode (closes <a href="https://github.com/borisveytsman/acmart/issues/1">https://github.com/borisveytsman/acmart/issues/1</a> ) . . . . .
	General: New option: urlbreakonhyphens . . . . .	33		Defined ACM colors . . . . .
1.62	General: New journal: TELO . . . . .	33		Explicitly put draft option (closes <a href="https://github.com/borisveytsman/acmart/issues/4">https://github.com/borisveytsman/acmart/issues/4</a> ) . . . . .
1.63	General: New journal: FACMP . . . . .	33		Set headheight to 1pc for all formats (closes <a href="https://github.com/borisveytsman/acmart/issues/5">https://github.com/borisveytsman/acmart/issues/5</a> ) . . . . .
	New journal: TQUANT . . . . .	33	v1.02	General: Added TOPS and TSC (closes <a href="https://github.com/borisveytsman/acmart/issues/12">https://github.com/borisveytsman/acmart/issues/12</a> ) . . . . .
1.63a	General: Move: TQUANT to TQC . . . . .	33		Documentation changes (closes <a href="https://github.com/borisveytsman/acmart/issues/12">https://github.com/borisveytsman/acmart/issues/12</a> ) . . . . .
1.64	General: Putting abstract after \maketitle now causes an error . . . . .	33		
1.65	General: New journal: DGOV . . . . .	33		
1.66	\@mkauthorsaddresses: Added warning for missing addresses . . . . .	90		
	\ccsdesc@parse: Added warning for missing concepts . . . . .	71		

	<a href="https://github.com/borisveytsman/acmart/issues/13">//github.com/borisveytsman/acmart/issues/13</a> ) . . . . .	33		<code>\if@ACM@badge</code> : Added macro . . . . .	67
v1.03	<code>\@formatdoi</code> : Added macro . . . . .	73		<code>\maketitle</code> : Corrected a bug with abstract footnotes . . . . .	77
	<code>\if@ACM@authorversion</code> : Added macro . . . . .	35		Corrected a bug with permission and footnotes order . . . . .	77
	<code>\maketitle</code> : Added special case of authorversion . . . . .	77	v1.08	General: SIGPLAN reformatting by Matthew Fluet . . . . .	33
	General: Added anonsuppress environment . . . . .	33		Typos corrected (Tobias Pape) . . . . .	33
	Added authorversion option (closes <a href="https://github.com/borisveytsman/acmart/issues/9">https://github.com/borisveytsman/acmart/issues/9</a> ) . . . . .	33	v1.09	General: Revert SIGPLAN caption rules . . . . .	33
v1.04	<code>\acmArticleSeq</code> : Name change by Matthew Fluet . . . . .	66	v1.10	<code>\maketitle</code> : Corrected a bug with doi in manuscript and author version, <a href="https://github.com/borisveytsman/acmart/issues/36">https://github.com/borisveytsman/acmart/issues/36</a> . . . . .	77
	<code>\acmDOI</code> : Name change by Matthew Fluet . . . . .	67		General: Changes of ‘licensedothergov’ wording . . . . .	71
	<code>\acmISBN</code> : Name change by Matthew Fluet . . . . .	67		<code>standardpagestyle</code> : Reversed folios location . . . . .	94
	General: Updated bibliography for siggraph . . . . .	33	v1.11	General: Customization of ACM theorem styles and proof environment by Matthew Fluet . . . . .	33
v1.05	General: Added processing doi numbers for acmsiggraph and doi numbers for sigproc.bib . . . . .	33	v1.12	<code>\@marginfigure</code> : Now centering by default . . . . .	53
	Patched <code>\setcitetstyle</code> command; closes <a href="https://github.com/borisveytsman/acmart/issues/19">https://github.com/borisveytsman/acmart/issues/19</a> . . . . .	33		<code>\@marginable</code> : Now centering by default . . . . .	53
v1.06	<code>\@ACM@badge@skip</code> : Added macro . . . . .	67		<code>\@parfont</code> : Moved to <code>\section@raggedright</code> . . . . .	100
	<code>\@ACM@badge@width</code> : Added macro . . . . .	67		<code>\copyrightpermissionfootnoterule</code> : Added macro . . . . .	49
	<code>\@ACM@title@width</code> : Added macro . . . . .	67		<code>\descriptionlabel</code> : Redefined . . . . .	55
	<code>\@mktitle@i</code> : Added processing badges . . . . .	82		<code>\footnoterule</code> : Made shorter . . . . .	49
	Made generic . . . . .	82		<code>\if@ACM@natbib@override</code> : Added macro . . . . .	35
	<code>\@mktitle@ii</code> : Now this macro is obsolete . . . . .	83		<code>\if@ACM@newfonts</code> : Added macro . . . . .	50
	<code>\@mktitle@iii</code> : Added processing badges . . . . .	83		<code>\maketitle</code> : Moved thankses to <code>copyrightpermission</code> box . . . . .	77
	Made more generic . . . . .	83		<code>\section@raggedright</code> : Introduced macro . . . . .	100
	<code>\@mktitle@iv</code> : Made more generic . . . . .	83		General: Added graceful behavior when libertine fonts are absent . . . . .	50
	<code>\@printtopmatter</code> : Added processing badges . . . . .	80		Documentation updates . . . . .	33
	<code>\@subtitlefont</code> : Added macro . . . . .	82			
	<code>\@titlefont</code> : Added macro . . . . .	81			
	<code>\acmBadgel</code> : Added macro . . . . .	68			
	<code>\acmBadger</code> : Added macro . . . . .	68			

v1.13		\position: Added macro . . . . .	84
	\@mpfootnotetext: Made minipage	\postcode: Added macro . . . . .	84
	footnotes centered . . . . .	\state: Added macro . . . . .	84
	44	\streetaddress: Added macro . . . . .	84
	\bibliographystyle: Redefined	standardpagestyle: Better handling	
	macro . . . . .	of anonymous mode . . . . .	94
	46	v1.16	
	\bibstyle@acmauthoryear: Added	\@headfootfont: Added macro . . . . .	94
	macro . . . . .	General: Formatting header/footer	
	41	(Matthew Fluet) . . . . .	33
	\bibstyle@acmnumeric: Added	standardpagestyle: Customize	
	macro . . . . .	header/footer text font . . . . .	94
	41	v1.17	
	\if@ACM@printfolios: Added macro	\@makefnmark: Redefined . . . . .	44
	69	\@mkauthors: TOG now uses the same	
	General: Font adjustments for	authors block as other journals . . . . .	84
	acmsmall . . . . .	\@mkauthors@ii: Deleted . . . . .	87
	85	\@mkbibcitation: Added \nobreak	91
	Increased font size for ACM Large	Changed format for sigs . . . . .	91
	Print bibliographic information by	\acmArticle: The default is now	
	default for the proceedings . . . . .	numerical . . . . .	66
	69	\acmMonth: The default must be	
	standardpagestyle: Added headers	numerical. Closes #50. . . . .	67
	for sigs . . . . .	\acmNumber: The default is now	
	94	numerical . . . . .	66
	Expanded headers for sigchi-a . . . . .	\acmVolume: The default is now	
	94	numerical . . . . .	66
	Suppressed folios if sig . . . . .	\acmYear: The default is now	
	94	numerical . . . . .	67
v1.14		\description: Decreased indent . . . . .	55
	\bibstyle@acmauthoryear: Moved	\grantnum: Added url . . . . .	106
	def of \bibstyle@acmauthoryear	\grantsponsor: Renamed . . . . .	106
	before use . . . . .	\if@ACM@printacmref: Renamed	
	41	from \if@ACM@printbib . . . . .	69
	\bibstyle@acmnumeric: Moved def of	General: Slightly decreased margins	
	\bibstyle@numeric before use . . . . .	for sigs . . . . .	47
	41	standardpagestyle: Added paper	
	General: \citestyle updates	title to sigs . . . . .	94
	(Matthew Fluet) . . . . .	v1.18	
	33	\@mkauthors@i: Now we andify	
	Patched \citestyle . . . . .	affiliations . . . . .	87
	39	\@typeset@author@line: Added	
v1.15		macro . . . . .	86
	\@ACM@addtoaddress: Added macro	General: Natbib is now the default for	
	84	all formats . . . . .	33
	\@mkauthors@iii: New authors	v1.19	
	system . . . . .	\@mkabstract: Include 'Abstract' in	
	88	PDF bookmarks (Matthew Fluet) . . . . .	91
	\@shortauthors: Introduced macro . . . . .	\acks: Include 'Acknowledgements' in	
	94	PDF bookmarks (Matthew Fluet) . . . . .	105
	\@typeset@author@bx: Moved to		
	separate macro . . . . .		
	87		
	\acks: Added macro . . . . .		
	105		
	\affiliation: Added code for author		
	groups . . . . .		
	64		
	\author: Added code for author		
	groups . . . . .		
	63		
	\city: Added macro . . . . .		
	84		
	\country: Added macro . . . . .		
	84		
	\department: Added macro . . . . .		
	84		
	\grantnum: Added macro . . . . .		
	106		
	\grantsponsor: Added macro . . . . .		
	106		
	\if@insideauthorgroup: Introduced		
	macro . . . . .		
	63		
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