LaTeX Class for *Association for Computing Machinery*[*]

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Abstract

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

Contents

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1 Introduction

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

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

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

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

I am grateful to Matthew Fluet, John Owens, Craig Rodkin, Bernard Rous, David Shamma, Stephen Spencer 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

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 the package uses a number of relatively recent packages, especially the ones related to the fonts.

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

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

1. Run latex on `acmart.ins`. This will produce the file `acmart.cls`.

2. Put the file `acmart.cls` and the bibliography files `*.bst` to the places where LaTeX can find them (see [?] or the documentation for your TeX system).

3. Update the database of file names. Again, see [?] 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 the file you are probably reading now).

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[1] http://www.acm.org/

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

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

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

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

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

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

- *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

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

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

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

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

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

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

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

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

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

- *latex-tools*, http://www.ctan.org/pkg/latex-tools

- *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

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

- *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

2.2 Invocation and options

To use the 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}
```

Table 1: The possible values for the `format` option

Value	Meaning
manuscript	A manuscript. This is the default
acmsmall	Small single column format, used for CIE, CSUR, JACM, JDIQ, JEA, JERIC, JETC, TAAS, TACCESS, TACO, TALG, TALLIP (formerly TALIP), TCPS, TEAC, TECS, TIIS, 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, TRETS, TSAS, TSC, TSLP, TWEB, including special issues.
acmlarge	Large single column format, used for IMWUT, JOCCH, PACMPL, PO-MACS, TAP, including special issues.
acmtog	Large double column format, used for TOG, including special issues.
sigconf	Proceedings format for most of ACM conferences (with the exceptions listed below) and all ICPS volumes.
siggraph	As of March 2017, this format is no longer used. Please use sigconf for SIGGRAPH conferences.
sigplan	Proceedings format for SIGPLAN conferences.
sigchi	Proceedings format for SIGCHI conferences.
sigchi-a	Format for SIGCHI extended abstract.

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

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

There are several Boolean options which can take `true` or `false` values. They are listed in Table 2. The words `=true` can be omitted when setting the 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 copyeditors.

The option `screen` may in the future involve additional features suitable for on-screen versions of the articles.

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

The option `anonymous` is used for anonymous review process: all author information becomes 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

Table 2: Boolean options

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

footer also include the page range of the document. This helps detect missing pages in hard copies.

The option authordraft is intended for the authors' drafts, not intended for distribution. It typesets copyright block to give the authors the idea of its size and overall size of the paper, but overprints it with the phrase "Unpublished working draft. Not for distribution", which also is used as a watermark. This option sets timestamp and review to true, but these decisions can be overriden by setting these options to false *after* authordraft.

2.3 Topmatter commands

A number of commands set up *top matter* information, or, in the computer science jargon, *metadata* for the article. They establish the publication name, article title, authors, doi and other data. Some of these commands, like \title or \author, should be put by the authors. Others, like \acmVolume or \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 the 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.

The class internally loads amsart class, so many top matter commands are inherited from amsart [?].

\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 3. Note that conference proceedings published in *book* form do not set this macro.

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

Table 3: ACM publications and arguments of the \acmJournal command

Abbreviation	Publication
CIE	ACM Computers in Entertainment
CSUR	ACM Computing Surveys
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
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
TEAC	ACM Transactions on Economics and Computation
TECS	ACM Transactions on Embedded Computing Systems
TIIS	ACM Transactions on Interactive Intelligent Systems
TISSEC	ACM Transactions on Information and System Security
TIST	ACM Transactions on Intelligent Systems and Technology
TKDD	ACM Transactions on Knowledge Discovery from Data
TMIS	ACM Transactions on Management Information Systems
TOCE	ACM Transactions on Computing Education
TOCHI	ACM Transactions on Computer-Human Interaction
TOCL	ACM Transactions on Computational Logic
TOCS	ACM Transactions on Computer Systems
TOCT	ACM Transactions on Computation Theory
TODAES	ACM Transactions on Design Automation of Electronic Systems
TODS	ACM Transactions on Database Systems
TOG	ACM Transactions on Graphics
TOIS	ACM Transactions on Information Systems
TOIT	ACM Transactions on Internet Technology
TOMACS	ACM Transactions on Modeling and Computer Simulation
TOMM	ACM Transactions on Multimedia Computing, Communications and Applications
TOMPECS	ACM Transactions on Modeling and Performance Evaluation of Computing Systems
TOMS	ACM Transactions on Mathematical Software
TOPC	ACM Transactions on Parallel Computing
TOPLAS	ACM Transactions on Programming Languages and Systems
TOPS	ACM Transactions on Privacy and Security
TOS	ACM Transactions on Storage
TOSEM	ACM Transactions on Software Engineering and Methodology
TOSN	ACM Transactions on Sensor Networks
TRETS	ACM Transactions on Reconfigurable Technology and Systems
TSAS	ACM Transactions on Spatial Algorithms and Systems
TSC	ACM Transactions on Social Computing
TSLP	ACM Transactions on Speech and Language Processing
TWEB	ACM Transactions on the Web

\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 *or* the name of the book as set by the editor.

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}
```

Normally this command is entered either by the editor or by the typesetter.

\title The command \title, as in 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 subtitle, set with the \subtitle{⟨*subtitle*⟩} macro.

The commands for specification of 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 LATEX \and macro! Each author deserves his or her own \author command.

Note that some formats do not typset e-mails of ORCID identifiers. Do not worry: 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 `\email` command.

You may have several authors with the same affiliation, different affiliations or over-lapping affiliations (author A_1 is affiliated with institutions I_1 and I_2, while author A_2 is affiliated with I_2 only, and author A_3 is affiliated with I_1 and I_3, …). 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 may try to save the space using the format

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

However, this format is not generally recommended.

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

```
\author{G. Tobin}
\author{Ben Trovato}
\additionalaffiliation{%
  \institution{The Th{\o}rv{\"a}ld Group}
  \streetaddress{1 Th{\o}rv{\"a}ld Circle}
  \city{Hekla}
  \country{Iceland}}
\affiliation{%
```

```
  \institution{Institute for Clarity in Documentation}
  \streetaddress{P.O. Box 1212}
  \city{Dublin}
  \state{Ohio}
  \postcode{43017-6221}
}
```

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

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

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

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

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

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

and

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

The command \affiliation formats the output according to American conventions. This might be wrong for some cases. Consider, for example, a German address. In Germany postcode is put before 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 postcode is unfortunate: the address will be typeset (with a SIG format) as

```
Fluginstitut
Sonenallee 17
123456, Helm, Germany
```

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

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

will be typeset as

```
Fluginstitut
Sonenallee 17
123456 Helm, Germany
```

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

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

\thanks   Like amsart (and unlike standard LaTeX), we allow \thanks only *outside* of commands \title and \author. Example:

```
\thanks{This work is supported by the Widget Corporation Grant
\#312-001.\\
Author's address: D. Pineo, Kingsbury Hall, 33 Academic Way, Durham,
N.H. 03824; email: dspineo@comcast.net; Colin Ware, Jere A. Chase
Ocean Engineering Lab, 24 Colovos Road, Durham, NH 03824; email:
cware@ccom.unh.edu;
Sean Fogarty, (Current address) NASA Ames Research Center, Moffett
Field, California 94035.}
```

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

\titlenote   While the command \thanks generates a note without 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 correspond-
             ing 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 \footnotes inside \author or \title commands, since this con-
fuses metadata extraction software (actually these commands now produce errors).

\acmVolume   The macros \acmVolume, \acmNumber, \acmArticle, \acmYear and \acmMonth are
\acmNumber   inserted by the editor and set the journal volume, issue, article number, year and month
\acmArticle corrspondingly. The arguments of all these commands, including \acmMonth is numer-
\acmYear   ical, including \acmMonth, for example,
\acmMonth
```
\acmVolume{9}
```

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

\acmArticleSeq   The articles in the same issue of a journal have a *sequential number*. It is used to
vertically position the black blob in some formats. By default it is the same as 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
```

\acmSubmissionID   If you 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

```
\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 or rightsretained, when it
is suppressed Note that to override the defaults you need to set the price *after* the
\setcopyright command to override the default. Also, the command \acmPrice{}
suppresses the printing of the price.

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

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

\acmDOI   The macro \acmDOI{⟨*DOI*⟩} sets the DOI number of the article, for example,

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

It is normally set by the typesetter.

\acmBadgeR   Some conference articles get special distinction, for example, the artifact evaluation
\acmBadgeL   for PPoPP 2016 (see http://ctuning.org/ae/ppopp2016.html). These articles display
special badges supplied by the conference organizers. The class provides commands to
add these badges: \acmBadgeR[⟨*url*⟩]{⟨*graphics*⟩} and \acmBadgeL[⟨*url*⟩]{⟨*graphics*⟩}.
The first command puts the badge to the right of the title, and the second one—to the
left. The exception is the sigchi-a mode for SIGCHI Extended abstract, which puts
the badges on the left margin. The argument have the following meaning: [⟨*url*⟩], if
provided, sets the link to the badge authority in the screen version, while {⟨*graphics*⟩}
sets the graphics file with the badge image. The file must be a cropped square, which is

scaled to a standard size in the output. For example, if the badge image is `ae-logo.pdf`, the command is

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

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

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

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

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

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

```
\begin{CCSXML}
<ccs2012>
 <concept>
  <concept_id>10010520.10010553.10010562</concept_id>
  <concept_desc>Computer systems organization˜Embedded systems</concept_desc>
  <concept_significance>500</concept_significance>
 </concept>
 <concept>
  <concept_id>10010520.10010575.10010755</concept_id>
  <concept_desc>Computer systems organization˜Redundancy</concept_desc>
  <concept_significance>300</concept_significance>
 </concept>
 <concept>
  <concept_id>10010520.10010553.10010554</concept_id>
  <concept_desc>Computer systems organization˜Robotics</concept_desc>
  <concept_significance>100</concept_significance>
 </concept>
 <concept>
  <concept_id>10003033.10003083.10003095</concept_id>
  <concept_desc>Networks˜Network reliability</concept_desc>
  <concept_significance>100</concept_significance>
 </concept>
</ccs2012>
\end{CCSXML}

\ccsdesc[500]{Computer systems organization˜Embedded systems}
\ccsdesc[300]{Computer systems organization˜Redundancy}
\ccsdesc{Computer systems organization˜Robotics}
```

Table 4: Parameters for \setcopyright command

Parameter	Meaning
none	The copyright and permission information is not typeset (this is the option for some ACM conferences).
acmcopyright	The authors transfer the copyright to ACM (the "traditional" choice).
acmlicensed	The authors retain the copyright but license the publication rights to ACM.
rightsretained	The authors retain the copyright and publication rights to themselves or somebody else.
usgov	All the authors are employees of the US Government.
usgovmixed	Some authors are employees of the US Government.
cagov	All the authors are employees of the Canadian Government.
cagovmixed	Some authors are employees of the Canadian Government.

```
\ccsdesc[100]{Networks~Network reliability}
```

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

\setcopyright There are several possibilities for the copyright of the papers published by ACM: the authors may transfer the rights to ACM, license them to ACM, some or all authors might be employees of the US or Canada Government, 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 4.

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 decision 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 the special form of the copyright statement for this case. Note that you still need the \setcopyright command and (optionally) \copyrightyear command to tell TeX about the copyright owner and year. Also, you should be aware that due to the different sizes of the permssion blocks for the printed version and authors' version the page breaks might be different between them.

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

Table 5: Settings for \settopmatter command

Parameter	Values	Meaning
printccs	true/false	Whether to print CCS categories
printacmref	true/false	Whether to print ACM bibliographic entry
printfolios	true/false	Whether to print page numbers (folios)

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 may override these defaults using the command \settopmatter{⟨*settings*⟩}. The settings and their meanings are listed in Table 5. For example,

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

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

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

\maketitle   The macro \maketitle must be the last command in the top matter group: i.e., 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 may redefine it if the list of author's name is too long, e.g.,

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

2.4 Algorithms

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

2.5 Figures and tables

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

1. The captions for figures must be entered *after* the figure bodies, and for the tables *before* the table bodies.

2. ACM uses the standard types for figures and types and adds several new ones. In total there are the following types:

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

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

   teaserfigure: a special figure before \maketitle.

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

3. Accordingly, when scaling the images, one should use the following sizes:

   (a) For figure in one-column mode, figure* in two-column mode or teaserfigure—\textwidth (in the one-column you can also use \columnwidth, which coincides with \textwidth in this case).

   (b) For figure in two-column mode—\columnwidth.

   (c) For marginfigure–\marginparwidth.

   (d) For figure* in SIGCHI Extended abstracts—\fulltextwidth.

It is strongly recommended to use the package booktabs [?] 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 TeX FAQ [?]. The simplest one is to use \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}
```

SIGCHI extended abstract extensively uses margin space. The package provides three environments for this with option captions:

sidebar: textual information on the margin

marginfigure: a figure on the margin

margintable: a table on the margin

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

2.6 Theorems

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.

2.7 Online-only and offline-only material

Some supplementary material in ACM publication is put online, but not in the printed

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 typset only when this option is set to `false`. For example

```
\section{Supplementary materials}

\begin{printonly}
  This section is included in the online version of the paper.
\end{printonly}

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

We use *comment* package for typesetting this code, so \begin and \end should start at the first positions of the lines of their own (no initial spaces etc.).

2.8   Note about anonymous mode

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

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

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

2.9   Acknowledgments

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

First, in the anonymous mode this section must be omitted: it gives too much information to the reviewers. Second, the data about the 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 `printonly` and `screenonly` environments, \begin{acks} and \end{acls} should start the line of their own (no leading or trailing spaces).

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

20

```
\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 \sponsorID of a
\grantsponsor command. Some awards have their own web pages, which you can in-
clude using the optional argument of \grantnum command.

At present {⟨*sponsorID*⟩} is chosen by the authors and can be an arbitrary key, in
the same way the label of \cite is arbitrarily chosen. There might be a change to this
policy if 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. The 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/youngscientsts]{GS501100001809}{Young
  Scientsts' Support Program}.
\end{acks}
```

2.10 Bibliography

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

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

```
\citestyle{acmauthoryear}
```

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

\setcitestyle   You may further customize *natbib* using \setcitestyle command, for example,

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

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 the author-date mode.

There are several customized BibTeX entries and fields in ACM style `ACM-Reference-Format.bst` you may want to be aware of.

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

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

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

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

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

There are special entries `online` and `game` for Web pages and games, for example,

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

For these entries you can use the `lastaccessed` field to add the access date to the URL.

There are two ways to enter video and audio sources in the bibliograpy corresponding to two different possibilities. For standalone sources available on WWW you can use an `online` entry, setting there `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 the sources available as attachments to conference proceedings and similar documents, you can use the usual `inproceedings` entry, again setting the `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 entry `periodical` 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",
}
```

2.11   Colors

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

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 only differ 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 & 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, ACM recommends that you choose sets of colors to help ensure suitable variations in Black & White using either of the following tools:

1. ColourBrewer: http://colorbrewer2.org/

2. ACE: The Accessible Colour Evaluator: http://daprlab.com/ace/ for designing WCAG 2.0 compliant palettes.

2.12 Other notable packages and typographic remarks

Several other packages are recommended for specialized tasks.

The package *subcaption* [**?**] is recommended for complex figures with several sub-plots or subfigures that require separate subcaptioning. The packages *nomencl* [**?**] and *glossaries* [**?**] 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 and the end of the page) and hyphenation at the end of the page. This is done by 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.

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

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

For example, one may want to use 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 package. Suppose you want to use dvipsnames option of xcolor package. Normally you cannot do this because acmart loads this package itself without options.

The file acmart-preload-hook.tex may 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 which is not acceptable by ACM. Even easier it is to create a file which 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 decided to use this hook, you are on your own.

3 Implementation

3.1 Identification

We start with the declaration who we are. Most `.dtx` files put driver code in a separate driver file `.drv`. 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 [2017/04/23 v1.35 Typesetting articles for Association of
7 Computing Machinery]
```

And the driver code:

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

3.2 Preload

We preload `acmart-preload-hook`:

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

3.3 Options

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

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

format   The possible formats

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

\if@ACM@screen   Whether we use screen mode

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

\if@ACM@review   Whether we use review mode

```
56 \define@boolkey+{acmart.cls}[@ACM@]{review}[true]{%
57   \if@ACM@review
58     \PackageInfo{\@classname}{Using review mode}%
59   \else
60     \PackageInfo{\@classname}{Not using review mode}%
61   \fi}{\PackageError{\@classname}{Option review can be either true or
62     false}}
63 \ExecuteOptionsX{review=false}
```

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

```
64 \define@boolkey+{acmart.cls}[@ACM@]{authorversion}[true]{%
65   \if@ACM@authorversion
66     \PackageInfo{\@classname}{Using authorversion mode}%
67   \else
68     \PackageInfo{\@classname}{Not using authorversion mode}%
69   \fi}{\PackageError{\@classname}{Option authorversion can be either true or
70     false}}
71 \ExecuteOptionsX{authorversion=false}
```

\if@ACM@natbib@override

\if@ACM@natbib   Whether we use natbib mode

```
72 \define@boolkey+{acmart.cls}[@ACM@]{natbib}[true]{%
73   \if@ACM@natbib
74     \PackageInfo{\@classname}{Explicitly selecting natbib mode}%
75   \else
76     \PackageInfo{\@classname}{Explicitly deselecting natbib mode}%
77   \fi}{\PackageError{\@classname}{Option natbib can be either true or
78     false}}
79 \ExecuteOptionsX{natbib=true}
```

\if@ACM@anonymous   Whether we use anonymous mode

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

\if@ACM@timestamp   Whether we use timestamp mode

```
88 \define@boolkey+{acmart.cls}[@ACM@]{timestamp}[true]{%
89   \if@ACM@timestamp
90     \PackageInfo{\@classname}{Using timestamp mode}%
91   \else
92     \PackageInfo{\@classname}{Not using timestamp mode}%
93   \fi}{\PackageError{\@classname}{Option timestamp can be either true or
94     false}}
95 \ExecuteOptionsX{timestamp=false}
```

\if@ACM@authordraft   Whether we use authordraft mode

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

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

```
106 \def\ACM@fontsize{}
107 \DeclareOptionX{9pt}{\edef\ACM@fontsize{\CurrentOption}}
108 \DeclareOptionX{10pt}{\edef\ACM@fontsize{\CurrentOption}}
109 \DeclareOptionX{11pt}{\edef\ACM@fontsize{\CurrentOption}}
110 \DeclareOptionX{12pt}{\edef\ACM@fontsize{\CurrentOption}}
```

```
111 \DeclareOptionX{draft}{\PassOptionsToClass{\CurrentOption}{amsart}}
112 \DeclareOptionX{*}{\PassOptionsToClass{\CurrentOption}{amsart}}
113 \ProcessOptionsX
114 \ClassInfo{\@classname}{Using format \ACM@format, number \ACM@format@nr}
```

3.4 Setting switches

\if@ACM@manuscript Whether we use manuscript mode

```
115 \newif\if@ACM@manuscript
```

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

```
116 \newif\if@ACM@journal
```

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

```
117 \newif\if@ACM@sigchiamode
```

Setting up switches

```
118 \ifnum\ACM@format@nr=5\relax % siggraph
119   \ClassWarning{\@classname}{The format 'siggraph' is now obsolete.
120     I am switching to sigconf.}
121   \setkeys{acmart.cls}{format=sigconf}
122 \fi
123 \ifnum\ACM@format@nr=0\relax
124   \@ACM@manuscripttrue
125 \else
126   \@ACM@manuscriptfalse
127 \fi
128 \@ACM@sigchiamodefalse
129 \ifcase\ACM@format@nr
130 \relax % manuscript
131   \@ACM@journaltrue
132 \or % acmsmall
133   \@ACM@journaltrue
134 \or % acmlarge
135   \@ACM@journaltrue
136 \or % acmtog
137   \@ACM@journaltrue
138 \or % sigconf
139   \@ACM@journalfalse
140 \or % siggraph
141   \@ACM@journalfalse
142 \or % sigplan
143   \@ACM@journalfalse
144 \or % sigchi
145   \@ACM@journalfalse
146 \or % sigchi-a
147   \@ACM@journalfalse
148   \@ACM@sigchiamodetrue
149 \fi
```

3.5   Loading base class and package

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

```
150 \ifx\ACM@fontsize\@empty
151   \ifcase\ACM@format@nr
152   \relax % manuscript
153     \def\ACM@fontsize{9pt}%
154   \or % acmsmall
155     \def\ACM@fontsize{10pt}%
156   \or % acmlarge
157     \def\ACM@fontsize{10pt}%
158   \or % acmtog
159     \def\ACM@fontsize{9pt}%
160   \or % sigconf
161     \def\ACM@fontsize{9pt}%
162   \or % siggraph
163     \def\ACM@fontsize{9pt}%
164    \or % sigplan
165     \def\ACM@fontsize{9pt}%
166    \or % sigchi
167     \def\ACM@fontsize{10pt}%
168   \or % sigchi-a
169     \def\ACM@fontsize{10pt}%
170   \fi
171 \fi
172 \ClassInfo{\@classname}{Using fontsize \ACM@fontsize}
173 \LoadClass[\ACM@fontsize, reqno]{amsart}
174 \RequirePackage{microtype}
```

We need `totpages` package to calculate the number of pages

```
175 \RequirePackage{totpages}
```

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

```
176 \RequirePackage{environ}
```

We use `setspace` for doublespacing

```
177 \if@ACM@manuscript
178 \RequirePackage{setspace}
179 \onehalfspacing
180 \fi
```

Citations. We patch \setcitestyle to allow, e.g., \setcitestyle{sort} and \setcitestyle{nosort}. We patch \citestyle to warn about undefined citation styles.

```
181 \if@ACM@natbib
182   \RequirePackage{natbib}
183   \renewcommand{\bibsection}{%
184     \section*{\refname}%
185     \phantomsection\addcontentsline{toc}{section}{\refname}%
186   }
```

```
187  \renewcommand{\bibfont}{\bibliofont}
188  \renewcommand\setcitestyle[1]{
189  \@for\@tempa:=#1\do
190  {\def\@tempb{round}\ifx\@tempa\@tempb
191     \renewcommand\NAT@open{(}\renewcommand\NAT@close{)}\fi
192   \def\@tempb{square}\ifx\@tempa\@tempb
193     \renewcommand\NAT@open{[}\renewcommand\NAT@close{]}\fi
194   \def\@tempb{angle}\ifx\@tempa\@tempb
195     \renewcommand\NAT@open{$<$}\renewcommand\NAT@close{$>$}\fi
196   \def\@tempb{curly}\ifx\@tempa\@tempb
197     \renewcommand\NAT@open{\{}\renewcommand\NAT@close{\}}\fi
198   \def\@tempb{semicolon}\ifx\@tempa\@tempb
199     \renewcommand\NAT@sep{;}\fi
200   \def\@tempb{colon}\ifx\@tempa\@tempb
201     \renewcommand\NAT@sep{;}\fi
202   \def\@tempb{comma}\ifx\@tempa\@tempb
203     \renewcommand\NAT@sep{,}\fi
204   \def\@tempb{authoryear}\ifx\@tempa\@tempb
205     \NAT@numbersfalse\fi
206   \def\@tempb{numbers}\ifx\@tempa\@tempb
207     \NAT@numberstrue\NAT@superfalse\fi
208   \def\@tempb{super}\ifx\@tempa\@tempb
209     \NAT@numberstrue\NAT@supertrue\fi
210   \def\@tempb{nobibstyle}\ifx\@tempa\@tempb
211     \let\bibstyle=\@gobble\fi
212   \def\@tempb{bibstyle}\ifx\@tempa\@tempb
213     \let\bibstyle=\@citestyle\fi
214   \def\@tempb{sort}\ifx\@tempa\@tempb
215     \def\NAT@sort{\@ne}\fi
216   \def\@tempb{nosort}\ifx\@tempa\@tempb
217     \def\NAT@sort{\z@}\fi
218   \def\@tempb{compress}\ifx\@tempa\@tempb
219     \def\NAT@cmprs{\@ne}\fi
220   \def\@tempb{nocompress}\ifx\@tempa\@tempb
221     \def\NAT@cmprs{\@z}\fi
222   \def\@tempb{sort&compress}\ifx\@tempa\@tempb
223     \def\NAT@sort{\@ne}\def\NAT@cmprs{\@ne}\fi
224   \def\@tempb{mcite}\ifx\@tempa\@tempb
225     \let\NAT@merge\@ne\fi
226   \def\@tempb{merge}\ifx\@tempa\@tempb
227     \@ifnum{\NAT@merge<\tw@}{\let\NAT@merge\tw@}{}\fi
228   \def\@tempb{elide}\ifx\@tempa\@tempb
229     \@ifnum{\NAT@merge<\thr@@}{\let\NAT@merge\thr@@}{}\fi
230   \def\@tempb{longnamesfirst}\ifx\@tempa\@tempb
231     \NAT@longnamestrue\fi
232   \def\@tempb{nonamebreak}\ifx\@tempa\@tempb
233     \def\NAT@nmfmt#1{\mbox{\NAT@up#1}}\fi
234   \expandafter\NAT@find@eq\@tempa=\relax\@nil
235   \if\@tempc\relax\else
236     \expandafter\NAT@rem@eq\@tempc
```

31

```
237    \def\@tempb{open}\ifx\@tempa\@tempb
238     \xdef\NAT@open{\@tempc}\fi
239    \def\@tempb{close}\ifx\@tempa\@tempb
240     \xdef\NAT@close{\@tempc}\fi
241    \def\@tempb{aysep}\ifx\@tempa\@tempb
242     \xdef\NAT@aysep{\@tempc}\fi
243    \def\@tempb{yysep}\ifx\@tempa\@tempb
244     \xdef\NAT@yrsep{\@tempc}\fi
245    \def\@tempb{notesep}\ifx\@tempa\@tempb
246     \xdef\NAT@cmt{\@tempc}\fi
247    \def\@tempb{citesep}\ifx\@tempa\@tempb
248     \xdef\NAT@sep{\@tempc}\fi
249   \fi
250   }%
251   \NAT@@setcites
252   }
253   \renewcommand\citestyle[1]{%
254     \ifcsname bibstyle@#1\endcsname%
255     \csname bibstyle@#1\endcsname\let\bibstyle\@gobble%
256     \else%
257     \@latex@error{Undefined '#1' citestyle}%
258     \fi
259   }%
260 \fi
```

\bibstyle@acmauthoryear   The default author-year format:

```
261 \newcommand{\bibstyle@acmauthoryear}{%
262   \setcitestyle{%
263     authoryear,%
264     open={[},close={]},citesep={;},%
265     aysep={},yysep={,},%
266     notesep={, }}}
```

\bibstyle@acmnumeric   The default numeric format:

```
267 \newcommand{\bibstyle@acmnumeric}{%
268   \setcitestyle{%
269     numbers,sort&compress,%
270     open={[},close={]},citesep={,},%
271     notesep={, }}}
```

The default is numeric:

```
272 \if@ACM@natbib
273 \citestyle{acmnumeric}
274 \fi
```

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

```
275 \def\@startsection#1#2#3#4#5#6{%
```

```
276  \if@noskipsec \leavevmode \fi
277  \par
278  \@tempskipa #4\relax
279  \@afterindenttrue
280  \ifdim \@tempskipa <\z@
281    \@tempskipa -\@tempskipa \@afterindentfalse
282  \fi
283  \if@nobreak
284    \everypar{}%
285  \else
286    \addpenalty\@secpenalty\addvspace\@tempskipa
287  \fi
288  \@ifstar
289    {\@ssect{#3}{#4}{#5}{#6}}%
290    {\@dblarg{\@sect{#1}{#2}{#3}{#4}{#5}{#6}}}}
291 \def\@sect#1#2#3#4#5#6[#7]#8{%
292  \edef\@toclevel{\ifnum#2=\@m 0\else\number#2\fi}%
293  \ifnum #2>\c@secnumdepth
294    \let\@svsec\@empty
295  \else
296    \refstepcounter{#1}%
297    \protected@edef\@svsec{\@seccntformat{#1}\relax}%
298  \fi
299  \@tempskipa #5\relax
300  \ifdim \@tempskipa>\z@
301    \begingroup
302      #6{%
303        \@hangfrom{\hskip #3\relax\@svsec}%
304          \interlinepenalty \@M #8\@@par}%
305    \endgroup
306    \csname #1mark\endcsname{#7}%
307    \ifnum #2>\c@secnumdepth \else
308        \@tochangmeasure{\csname the#1\endcsname}%
309    \fi
310    \addcontentsline{toc}{#1}{%
311      \ifnum #2>\c@secnumdepth \else
312        \protect\numberline{\csname the#1\endcsname}%
313      \fi
314      #7}%
315  \else
316    \def\@svsechd{%
317      #6{\hskip #3\relax
318      \@svsec #8}%
319      \csname #1mark\endcsname{#7}%
320      \ifnum #2>\c@secnumdepth \else
321        \@tochangmeasure{\csname the#1\endcsname\space}%
322      \fi
323      \addcontentsline{toc}{#1}{%
324        \ifnum #2>\c@secnumdepth \else
325          \protect\numberline{\csname the#1\endcsname}%
```

```
326        \fi
327        #7}}%
328    \fi
329    \@xsect{#5}}
330 \def\@xsect#1{%
331    \@tempskipa #1\relax
332    \ifdim \@tempskipa>\z@
333      \par \nobreak
334      \vskip \@tempskipa
335      \@afterheading
336    \else
337      \@nobreakfalse
338      \global\@noskipsectrue
339      \everypar{%
340        \if@noskipsec
341          \global\@noskipsecfalse
342        {\setbox\z@\lastbox}%
343          \clubpenalty\@M
344          \begingroup \@svsechd \endgroup
345          \unskip
346          \@tempskipa #1\relax
347          \hskip -\@tempskipa
348        \else
349          \clubpenalty \@clubpenalty
350          \everypar{}%
351        \fi}%
352    \fi
353    \ignorespaces}
354 \def\@seccntformat#1{\csname the#1\endcsname\quad}
355 \def\@ssect#1#2#3#4#5{%
356    \@tempskipa #3\relax
357    \ifdim \@tempskipa>\z@
358      \begingroup
359        #4{%
360          \@hangfrom{\hskip #1}%
361            \interlinepenalty \@M #5\@@par}%
362      \endgroup
363    \else
364      \def\@svsechd{#4{\hskip #1\relax #5}}%
365    \fi
366    \@xsect{#3}}
```

\@startsection   Amsart redefines \startsection. Here we redefine it again to make TOC working

```
367 \def\@starttoc#1#2{\begingroup
368    \setTrue{#1}%
369    \par\removelastskip\vskip\z@skip
370    \@startsection{section}\@M\z@{\linespacing\@plus\linespacing}%
371      {.5\linespacing}{\centering\contentsnamefont}{#2}%
372    \@input{\jobname.#1}%
373    \if@filesw
```

```
374     \@xp\newwrite\csname tf@#1\endcsname
375     \immediate\@xp\openout\csname tf@#1\endcsname \jobname.#1\relax
376   \fi
377   \global\@nobreakfalse \endgroup
378   \addvspace{32\p@\@plus14\p@}%
379 }
```

\l@subsection   Amsart has too large spacing

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

\l@subsubsection   Amsart has too large spacing

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

And hyperref

```
382 \let\@footnotemark@nolink\@footnotemark
383 \let\@footnotetext@nolink\@footnotetext
384 \RequirePackage[bookmarksnumbered,unicode]{hyperref}
385 \pdfstringdefDisableCommands{%
386   \def\unskip{}%
387   \def\textbullet{- }%
388   \def\textrightarrow{ -> }%
389   \def\footnotemark{}%
390 }
391 \urlstyle{rm}
392 \ifcase\ACM@format@nr
393 \relax % manuscript
394 \or % acmsmall
395 \or % acmlarge
396 \or % acmtog
397 \or % sigconf
398 \or % siggraph
399 \or % sigplan
400   \urlstyle{sf}
401 \or % sigchi
402 \or % sigchi-a
403   \urlstyle{sf}
404 \fi
405 \if@ACM@screen
406   \hypersetup{colorlinks,
407     linkcolor=ACMRed,
408     citecolor=ACMPurple,
409     urlcolor=ACMDarkBlue,
410     filecolor=ACMDarkBlue}
411 \else
412   \hypersetup{hidelinks}
413 \fi
```

Bibliography mangling.

```
414 \if@ACM@natbib
415   \let\citeN\cite
```

```
416  \let\cite\citep
417  \let\citeANP\citeauthor
418  \let\citeNN\citeyearpar
419  \let\citeyearNP\citeyear
420  \let\citeyear\citeyearpar
421  \let\citeNP\citealt
422  \DeclareRobustCommand\citeA
423    {\begingroup\NAT@swafalse
424      \let\NAT@ctype\@ne\NAT@partrue\NAT@fullfalse\NAT@open\NAT@citetp}%
425  \providecommand\newblock{}%
426 \else
427  \AtBeginDocument{%
428    \let\shortcite\cite%
429    \providecommand\citename[1]{#1}}
430 \fi
431 \newcommand\shortcite[2][]{%
432  \ifNAT@numbers\cite[#1]{#2}\else\citeyear[#1]{#2}\fi}
```

\bibliographystyle   Amsart redefines \bibliographystyle since it prefers AMS bibliography. We turn it back to LaTeX definition:

```
433 \def\bibliographystyle#1{%
434  \ifx\@begindocumenthook\@undefined\else
435    \expandafter\AtBeginDocument
436  \fi
437    {\if@filesw
438      \immediate\write\@auxout{\string\bibstyle{#1}}%
439    \fi}}
```

Graphics and color

```
440 \RequirePackage{graphicx, xcolor}
```

We define ACM colors according to [?]:

```
441 \definecolor[named]{ACMBlue}{cmyk}{1,0.1,0,0.1}
442 \definecolor[named]{ACMYellow}{cmyk}{0,0.16,1,0}
443 \definecolor[named]{ACMOrange}{cmyk}{0,0.42,1,0.01}
444 \definecolor[named]{ACMRed}{cmyk}{0,0.90,0.86,0}
445 \definecolor[named]{ACMLightBlue}{cmyk}{0.49,0.01,0,0}
446 \definecolor[named]{ACMGreen}{cmyk}{0.20,0,1,0.19}
447 \definecolor[named]{ACMPurple}{cmyk}{0.55,1,0,0.15}
448 \definecolor[named]{ACMDarkBlue}{cmyk}{1,0.58,0,0.21}
```

Author draft mode

```
449 \if@ACM@authordraft
450  \RequirePackage{draftwatermark}
451  \SetWatermarkFontSize{0.5in}
452  \SetWatermarkColor[gray]{.9}
453  \SetWatermarkText{\parbox{12em}{\centering
454      Unpublished working draft\\
455      Not for distribution}}
456 \fi
```

3.6 Paper size and paragraphing

We use geometry for dimensions. Note the presently margins do not depend on the font size option - maybe we will need to change this. See https://github.com/borisveytsman/acmart/issues/5#issuecomment-272881329.

```
457 \RequirePackage{geometry}
458 \ifcase\ACM@format@nr
459 \relax % manuscript
460    \geometry{letterpaper,head=13pt,
461    marginparwidth=6pc}%
462 \or % acmsmall
463    \geometry{twoside=true,
464    includeheadfoot, head=13pt, foot=2pc,
465    paperwidth=6.75in, paperheight=10in,
466    top=58pt, bottom=44pt, inner=46pt, outer=46pt,
467    marginparwidth=2pc
468    }%
469 \or % acmlarge
470    \geometry{twoside=true, head=13pt, foot=2pc,
471    paperwidth=8.5in, paperheight=11in,
472    includeheadfoot,
473    top=78pt, bottom=114pt, inner=81pt, outer=81pt,
474    marginparwidth=4pc
475    }%
476 \or % acmtog
477    \geometry{twoside=true, head=13pt, foot=2pc,
478    paperwidth=8.5in, paperheight=11in,
479    includeheadfoot, columnsep=24pt,
480    top=52pt, bottom=75pt, inner=52pt, outer=52pt,
481    marginparwidth=2pc
482    }%
483 \or % sigconf
484    \geometry{twoside=true, head=13pt,
485    paperwidth=8.5in, paperheight=11in,
486    includeheadfoot, columnsep=2pc,
487    top=57pt, bottom=73pt, inner=54pt, outer=54pt,
488    marginparwidth=2pc
489    }%
490 \or % siggraph
491    \geometry{twoside=true, head=13pt,
492    paperwidth=8.5in, paperheight=11in,
493    includeheadfoot, columnsep=2pc,
494    top=57pt, bottom=73pt, inner=54pt, outer=54pt,
495    marginparwidth=2pc
496    }%
497 \or % sigplan
498    \geometry{twoside=true, head=13pt,
499    paperwidth=8.5in, paperheight=11in,
500    includeheadfoot=false, columnsep=2pc,
501    top=1in, bottom=1in, inner=0.75in, outer=0.75in,
```

```
502     marginparwidth=2pc
503     }%
504 \or % sigchi
505    \geometry{twoside=true, head=13pt,
506       paperwidth=8.5in, paperheight=11in,
507       includeheadfoot, columnsep=2pc,
508       top=66pt, bottom=73pt, inner=54pt, outer=54pt,
509       marginparwidth=2pc
510       }%
511 \or % sigchi-a
512    \geometry{twoside=false, head=13pt,
513       paperwidth=11in, paperheight=8.5in,
514       includeheadfoot, marginparsep=72pt,
515       marginparwidth=170pt, columnsep=20pt,
516       top=72pt, bottom=72pt, left=314pt, right=72pt
517       }%
518    \@mparswitchfalse
519    \reversemarginpar
520 \fi
```

\parindent   Paragraphing
\parskip
```
521 \setlength\parindent{10\p@}
522 \setlength\parskip{\z@}
523 \ifcase\ACM@format@nr
524 \relax % manuscript
525 \or % acmsmall
526 \or % acmlarge
527 \or % acmtog
528   \setlength\parindent{9\p@}%
529 \or % sigconf
530 \or % siggraph
531 \or % sigplan
532 \or % sigchi
533 \or % sigchi-a
534 \fi
```

Footnotes require some consideration. We have several layers of footnotes: front-matter footnotes, "regular" footnotes and the special insert for bibstrip. In the old ACM classes 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 bibstrip from the rest of the paper. It is a full width rule.

```
535 \def\copyrightpermissionfootnoterule{\kern-3\p@
536   \hrule \@width \columnwidth \kern 2.6\p@}

537 \RequirePackage{manyfoot}
538 \SelectFootnoteRule[2]{copyrightpermission}
539 \DeclareNewFootnote{copyrightpermission}
```

\footnoterule   Tschichold's rules:

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

\endminipage   We do not use footnote rules in minipages

```
542 \def\endminipage{%
543     \par
544     \unskip
545     \ifvoid\@mpfootins\else
546       \vskip\skip\@mpfootins
547       \normalcolor
548       \unvbox\@mpfootins
549     \fi
550     \@minipagefalse    %% added 24 May 89
551   \color@endgroup
552   \egroup
553   \expandafter\@iiiparbox\@mpargs{\unvbox\@tempboxa}}
```

\@makefntext   We do note use indentation for footnotes

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

\@footnotetext   In sigchi-a mode our footnotes are on the margins!

```
555 \if@ACM@sigchiamode
556 \long\def\@footnotetext#1{\marginpar{%
557     \reset@font\small
558     \interlinepenalty\interfootnotelinepenalty
559     \protected@edef\@currentlabel{%
560         \csname p@footnote\endcsname\@thefnmark
561     }%
562     \color@begingroup
563       \@makefntext{%
564         \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
565     \color@endgroup}}%
566 \fi
```

\@mpfootnotetext   We want the footnotes in minipages centered:

```
567 \long\def\@mpfootnotetext#1{%
568   \global\setbox\@mpfootins\vbox{%
569     \unvbox\@mpfootins
570     \reset@font\footnotesize
571     \hsize\columnwidth
572     \@parboxrestore
573     \protected@edef\@currentlabel
574         {\csname p@mpfootnote\endcsname\@thefnmark}%
575     \color@begingroup\centering
576       \@makefntext{%
577         \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
578     \color@endgroup}}
```

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

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

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

580 \def\@textbottom{\vskip \z@ \@plus 1pt}
581 \let\@texttop\relax

3.7   Fonts

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

582 \RequirePackage{iftex}
583 \ifPDFTeX
584 \input{glyphtounicode}
585 \pdfgentounicode=1
586 \fi
587 \RequirePackage{cmap}

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

588 \newif\if@ACM@newfonts
589 \@ACM@newfontstrue
590 \IfFileExists{libertine.sty}{}{\ClassWarning{\@classname}{You do not
591   have libertine package installed. Please upgrade your
592   TeX}\@ACM@newfontsfalse}
593 \IfFileExists{zi4.sty}{}{\ClassWarning{\@classname}{You do not
594   have zi4 package installed. Please upgrade your TeX}\@ACM@newfontsfalse}
595 \IfFileExists{newtxmath.sty}{}{\ClassWarning{\@classname}{You do not
596   have newtxmath package installed. Please upgrade your
597   TeX}\@ACM@newfontsfalse}

    We use Libertine throughout.

598 \if@ACM@newfonts
599 \RequirePackage[tt=false, type1=true]{libertine}
600 \RequirePackage[varqu]{zi4}
601 \RequirePackage[libertine]{newtxmath}
602 \RequirePackage[T1]{fontenc}
603 \fi

    The SIGCHI extended abstracts are sans serif:

604 \if@ACM@sigchiamode
605   \renewcommand{\familydefault}{\sfdefault}
606 \fi

3.8   Floats

We use caption package

607 \RequirePackage{caption, float}
608 \captionsetup[table]{position=top}

```
609 \if@ACM@journal
610   \captionsetup{labelfont={sf, small},
611     textfont={sf, small},  margin=\z@}
612   \captionsetup[figure]{name={Fig.}}
613 \else
614   \captionsetup{labelfont={bf},
615     textfont={bf}, labelsep=colon, margin=\z@}
616   \ifcase\ACM@format@nr
617   \relax % manuscript
618   \or % acmsmall
619   \or % acmlarge
620   \or % acmtog
621   \or % sigconf
622   \or % siggraph
623     \captionsetup{textfont={it}}
624   \or % sigplan
625     \captionsetup{labelfont={bf},
626       textfont={normalfont}, labelsep=period, margin=\z@}
627   \or % sigchi
628     \captionsetup[figure]{labelfont={bf, small},
629       textfont={bf, small}}
630   \or % sigchi-a
631     \captionsetup[figure]{labelfont={bf, small},
632       textfont={bf, small}}
633   \fi
634 \fi
```

sidebar   The sidebar environment:

```
635 \newfloat{sidebar}{}{sbar}
636 \floatname{sidebar}{Sidebar}
637 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}
```

\@sidebar   The processing of the saved text

```
638 \long\def\@sidebar#1{\bgroup\captionsetup{type=sidebar}%
639   \marginpar{\small#1}\egroup}
```

marginfigure   The marginfigure environment:

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

\@marginfigure   The processing of the saved text

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

margintable   The margintable environment:

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

\@margintable   The processing of the saved text

```
644 \long\def\@margintable#1{\bgroup\captionsetup{type=table}%
645   \marginpar{\centering\small#1}\egroup}
```

SIGCHI extended abstract provides 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

```
646 \newdimen\fulltextwidth
647 \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)

```
648 \if@ACM@sigchiamode
649 \def\@dblfloat{\bgroup\columnwidth=\fulltextwidth
650   \let\@endfloatbox\@endwidefloatbox
651   \def\@fpsadddefault{\def\@fps{tp}}%
652   \@float}
653 \fi
```

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

```
654 \if@ACM@sigchiamode
655 \def\end@dblfloat{%
656     \end@float\egroup}
657 \fi
```

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

```
658 \def\@endwidefloatbox{%
659   \par\vskip\z@skip
660   \@minipagefalse
661   \outer@nobreak
662   \egroup
663   \color@endbox
664   \global\setbox\@currbox=\vbox{\moveleft
665     \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
666   \wd\@currbox=\textwidth
667 }
```

3.9 Lists

```
668 \ifcase\ACM@format@nr
669 \relax % manuscript
670 \or % acmsmall
671 \or % acmlarge
672 \or % acmtog
673 \or % sigconf
674 \or % siggraph
675 \or % sigplan
676 \def\labelenumi{\theenumi.}
677 \def\labelenumii{\theenumii.}
678 \def\labelenumiii{\theenumiii.}
679 \def\labelenumiv{\theenumiv.}
680 \or % sigchi
```

```
681 \or % sigchi-a
682 \fi
```

\descriptionlabel   We do not use default colon as \amsart does:

```
683 \renewcommand{\descriptionlabel}[1]{\hspace\labelsep \upshape\bfseries #1}
```

\description   AMS uses additional indent of 6pt. Frank recommends dropping it.

```
684 \renewenvironment{description}{\list{}{%
685     \itemindent-12\p@
686     \labelwidth\z@ \let\makelabel\descriptionlabel}%
687 }{
688   \endlist
689 }
690 \let\enddescription=\endlist % for efficiency
```

3.10   Top matter data

We use keyval interface to define journal title and relevant information

```
691 \define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
692   CIE,%
693   CSUR,%
694   IMWUT,%
695   JACM,%
696   JDIQ,%
697   JEA,%
698   JERIC,%
699   JETC,%
700   JOCCH,%
701   PACMPL,%
702   POMACS,%
703   TAAS,%
704   TACCESS,%
705   TACO,%
706   TALG,%
707   TALLIP,%
708   TAP,%
709   TCPS,%
710   TEAC,%
711   TECS,%
712   TIIS,%
713   TISSEC,%
714   TIST,%
715   TKDD,%
716   TMIS,%
717   TOCE,%
718   TOCHI,%
719   TOCL,%
720   TOCS,%
721   TOCT,%
```

```
722    TODAES,%
723    TODS,%
724    TOG,%
725    TOIS,%
726    TOIT,%
727    TOMACS,%
728    TOMM,%
729    TOMPECS,%
730    TOMS,%
731    TOPC,%
732    TOPS,%
733    TOPLAS,%
734    TOS,%
735    TOSEM,%
736    TOSN,%
737    TRETS,%
738    TSAS,%
739    TSC,%
740    TSLP,%
741    TWEB%
742 }{%
743 \ifcase\@journalCode@nr
744 \relax % CIE
745    \def\@journalName{ACM Computers in Entertainment}%
746    \def\@journalNameShort{ACM Comput. Entertain.}%
747    \def\@permissionCodeOne{1544-3574}%
748 \or % CSUR
749    \def\@journalName{ACM Computing Surveys}%
750    \def\@journalNameShort{ACM Comput. Surv.}%
751    \def\@permissionCodeOne{0360-0300}%
752 \or % IMWUT
753    \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
754       Wearable and Ubiquitous Technologies}%
755    \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
756    \def\@permissionCodeOne{2474-9567}%
757 \or % JACM
758    \def\@journalName{Journal of the ACM}%
759    \def\@journalNameShort{J. ACM}%
760    \def\@permissionCodeOne{0004-5411}%
761 \or % JDIQ
762    \def\@journalName{ACM Journal of Data and Information Quality}%
763    \def\@journalNameShort{ACM J. Data Inform. Quality}%
764    \def\@permissionCodeOne{1936-1955}%
765 \or % JEA
766    \def\@journalName{ACM Journal of Experimental Algorithmics}%
767    \def\@journalNameShort{ACM J. Exp. Algor.}%
768    \def\@permissionCodeOne{1084-6654}%
769 \or % JERIC
770    \def\@journalName{ACM Journal of Educational Resources in Computing}%
771    \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
```

```
772    \def\@permissionCodeOne{1073-0516}%
773 \or % JETC
774    \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
775    \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
776    \def\@permissionCodeOne{1550-4832}%
777 \or % JOCCH
778    \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
779    \def\@journalName{ACM J. Comput. Cult. Herit.}%
780 \or % PACMPL
781    \def\@journalName{Proceedings of the ACM on Programming Languages}%
782    \def\@journalName{Proc. ACM Program. Lang.}%
783    \def\@permissionCodeOne{2475-1421}%
784 \or % POMACS
785    \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
786    \def\@journalName{Proc. ACM Meas. Anal. Comput. Syst.}%
787    \def\@permissionCodeOne{2476-1249}%
788 \or % TAAS
789    \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
790    \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
791    \def\@permissionCodeOne{1556-4665}%
792 \or % TACCESS
793    \def\@journalName{ACM Transactions on Accessible Computing}%
794    \def\@journalNameShort{ACM Trans. Access. Comput.}%
795    \def\@permissionCodeOne{1936-7228}%
796 \or % TACO
797    \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
798 \or % TALG
799    \def\@journalName{ACM Transactions on Algorithms}%
800    \def\@journalNameShort{ACM Trans. Algor.}%
801    \def\@permissionCodeOne{1549-6325}%
802 \or % TALLIP
803    \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
804    \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
805    \def\@permissionCodeOne{2375-4699}%
806 \or % TAP
807    \def\@journalName{ACM Transactions on Applied Perception}%
808 \or % TCPS
809    \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
810 \or % TEAC
811    \def\@journalName{ACM Transactions on Economics and Computation}%
812 \or % TECS
813    \def\@journalName{ACM Transactions on Embedded Computing Systems}%
814    \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
815    \def\@permissionCodeOne{1539-9087}%
816 \or % TIIS
817    \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
818    \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
819    \def\@permissionCodeOne{2160-6455}%
820 \or % TISSEC
821    \def\@journalName{ACM Transactions on Information and System Security}%
```

```
822   \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
823   \def\@permissionCodeOne{1094-9224}%
824 \or % TIST
825   \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
826   \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
827   \def\@permissionCodeOne{2157-6904}%
828 \or % TKDD
829   \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
830   \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
831   \def\@permissionCodeOne{1556-4681}%
832 \or % TMIS
833   \def\@journalName{ACM Transactions on Management Information Systems}%
834   \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
835   \def\@permissionCodeOne{2158-656X}%
836 \or % TOCE
837   \def\@journalName{ACM Transactions on Computing Education}%
838   \def\@journalNameShort{ACM Trans. Comput. Educ.}%
839   \def\@permissionCodeOne{1946-6226}%
840 \or % TOCHI
841   \def\@journalName{ACM Transactions on Computer-Human Interaction}%
842   \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
843   \def\@permissionCodeOne{1073-0516}%
844 \or % TOCL
845   \def\@journalName{ACM Transactions on Computational Logic}%
846   \def\@journalNameShort{ACM Trans. Comput. Logic}%
847   \def\@permissionCodeOne{1529-3785}%
848 \or % TOCS
849   \def\@journalName{ACM Transactions on Computer Systems}%
850   \def\@journalNameShort{ACM Trans. Comput. Syst.}%
851   \def\@permissionCodeOne{0734-2071}%
852 \or % TOCT
853   \def\@journalName{ACM Transactions on Computation Theory}%
854   \def\@journalNameShort{ACM Trans. Comput. Theory}%
855   \def\@permissionCodeOne{1942-3454}%
856 \or % TODAES
857   \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
858   \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
859   \def\@permissionCodeOne{1084-4309}%
860 \or % TODS
861   \def\@journalName{ACM Transactions on Database Systems}%
862   \def\@journalNameShort{ACM Trans. Datab. Syst.}%
863   \def\@permissionCodeOne{0362-5915}%
864 \or % TOG
865   \def\@journalName{ACM Transactions on Graphics}%
866   \def\@journalNameShort{ACM Trans. Graph.}%
867   \def\@permissionCodeOne{0730-0301}
868 \or % TOIS
869   \def\@journalName{ACM Transactions on Information Systems}%
870   \def\@journalName{ACM Transactions on Information Systems}%
871   \def\@permissionCodeOne{1046-8188}%
```

```
872 \or % TOIT
873   \def\@journalName{ACM Transactions on Internet Technology}%
874   \def\@journalNameShort{ACM Trans. Internet Technol.}%
875   \def\@permissionCodeOne{1533-5399}%
876 \or % TOMACS
877   \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
878   \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
879   \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
880 \or % TOMM
881   \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
882   \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
883   \def\@permissionCodeOne{1551-6857}%
884   \def\@permissionCodeTwo{0100}%
885 \or % TOMPECS
886   \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
887   \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
888   \def\@permissionCodeOne{2376-3639}%
889 \or % TOMS
890   \def\@journalName{ACM Transactions on Mathematical Software}%
891   \def\@journalNameShort{ACM Trans. Math. Softw.}%
892   \def\@permissionCodeOne{0098-3500}%
893 \or % TOPC
894   \def\@journalName{ACM Transactions on Parallel Computing}%
895   \def\@journalNameShort{ACM Trans. Parallel Comput.}%
896   \def\@permissionCodeOne{1539-9087}%
897 \or % TOPS
898   \def\@journalName{ACM Transactions on Privacy and Security}%
899   \def\@journalNameShort{ACM Trans. Priv. Sec.}%
900   \def\@permissionCodeOne{2471-2566}%
901 \or % TOPLAS
902   \def\@journalName{ACM Transactions on Programming Languages and Systems}%
903   \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
904   \def\@permissionCodeOne{0164-0925}%
905 \or % TOS
906   \def\@journalName{ACM Transactions on Storage}%
907   \def\@journalNameShort{ACM Trans. Storage}%
908   \def\@permissionCodeOne{1553-3077}%
909 \or % TOSEM
910   \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
911   \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
912   \def\@permissionCodeOne{1049-331X}%
913 \or % TOSN
914   \def\@journalName{ACM Transactions on Sensor Networks}%
915   \def\@journalNameShort{ACM Trans. Sensor Netw.}%
916   \def\@permissionCodeOne{1550-4859}%
917 \or % TRETS
918   \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
919   \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
920   \def\@permissionCodeOne{1936-7406}%
921 \or % TSAS
```

```
922    \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
923    \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
924    \def\@permissionCodeOne{2374-0353}%
925 \or % TSC
926    \def\@journalName{ACM Transactions on Social Computing}%
927    \def\@journalNameShort{ACM Trans. Soc. Comput.}%
928    \def\@permissionCodeOne{2469-7818}%
929 \or % TSLP
930    \def\@journalName{ACM Transactions on Speech and Language Processing}%
931    \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
932    \def\@permissionCodeOne{1550-4875}%
933 \or % TWEB
934    \def\@journalName{ACM Transactions on the Web}%
935    \def\@journalNameShort{ACM Trans. Web}%
936    \def\@permissionCodeOne{1559-1131}%
937 \fi
938 \ClassInfo{\@classname}{Using journal code \@journalCode}%
939 }{%
940    \ClassError{\@classname}{Incorrect journal #1}%
941 }%
```

\acmJournal And the syntactic sugar around it

```
942 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}}
```

The defaults:

```
943 \def\@journalCode@nr{0}
944 \def\@journalName{}%
945 \def\@journalNameShort{\@journalName}%
946 \def\@permissionCodeOne{XXXX-XXXX}%
947 \def\@permissionCodeTwo{}%
```

\acmConference This is the conference command

```
948 \newcommand\acmConference[4][]{%
949    \gdef\acmConference@shortname{#1}%
950    \gdef\acmConference@name{#2}%
951    \gdef\acmConference@date{#3}%
952    \gdef\acmConference@venue{#4}%
953    \ifx\acmConference@shortname\@empty
954      \gdef\acmConference@shortname{#2}%
955    \fi}
956 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
957    DC, USA}
```

\subtitle The subtitle macro

```
958 \def\subtitle#1{\def\@subtitle{#1}}
959 \subtitle{}
```

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

```
960 \newcount\num@authorgroups
961 \num@authorgroups=0\relax
```

\if@insideauthorgroup   Whether we are continuing an author group @insideauthorgroup insideauthorgroup-
false

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

```
962 \renewcommand\author[2][]{%
963   \if@insideauthorgroup\else
964     \global\advance\num@authorgroups by 1\relax
965     \global\@insideauthorgrouptrue
966   \fi
967   \ifx\addresses\@empty
968     \if@ACM@anonymous
969       \gdef\addresses{\@author{Anonymous Author(s)}}%
970       \gdef\authors{Anonymous Author(s)}%
971     \else
972       \gdef\addresses{\@author{#2}}%
973       \gdef\authors{#2}%
974     \fi
975   \else
976     \if@ACM@anonymous\else
977       \g@addto@macro\addresses{\and\@author{#2}}%
978       \g@addto@macro\authors{\and#2}%
979     \fi
980   \fi
981   \if@ACM@anonymous
982     \ifx\shortauthors\@empty
983       \gdef\shortauthors{Anon.}%
984     \fi
985   \else
986     \def\@tempa{#1}%
987     \ifx\@tempa\@empty
988       \ifx\shortauthors\@empty
989         \gdef\shortauthors{#2}%
990       \else
991         \g@addto@macro\shortauthors{\and#2}%
992       \fi
993     \else
994       \ifx\shortauthors\@empty
995         \gdef\shortauthors{#1}%
996       \else
997         \g@addto@macro\shortauthors{\and#1}%
998       \fi
999     \fi
1000  \fi}
```

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

```
1001 \newcommand{\affiliation}[2][]{%
1002   \global\@insideauthorgroupfalse
1003   \if@ACM@anonymous\else
```

1004   \g@addto@macro\addresses{\affiliation{#1}{#2}}%
1005   \fi}

@ACM@affiliation@obeypunctuation   Whether to use author's punctuation (by default false = add American punctuation)

1006 \define@boolkey+{@ACM@affiliation@}[@ACM@affiliation@]{obeypunctuation}%
1007 [true]{}{\ClassError{\@classname}{obeypunctuation must be true or false}}

\additionalaffiliation   Additional affiliations go to footnotes

1008 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}

\@additionalaffiliation   Process additionalaffiliation inside \authornote

1009 \def\@additionalaffiliation#1{\bgroup
1010   \def\position##1{\ignorespaces}%
1011   \def\institution##1{##1\ignorespaces}%
1012   \def\department{\@ifnextchar[{\@department}{\@department[]}}%
1013   \def\@department[##1]##2{\unskip, ##2\ignorespaces}%
1014   \let\streetaddress\position
1015   \let\city\position
1016   \let\state\position
1017   \let\postcode\position
1018   \let\country\position
1019   Also with #1\unskip.\egroup}

\email   The macro \email mimics \email from amsart. Agian it has an optional argument we do not currently need, but keep for the possible future use.

1020 \renewcommand{\email}[2][]{%
1021   \if@ACM@anonymous\else
1022   \g@addto@macro\addresses{\email{#1}{#2}}%
1023   \fi}

\orcid   Right now we do not typeset orcids gobble

\@titlenotes   The titlenotes

1024 \def\@titlenotes{}

\titlenote   Adding note to the title

1025 \def\titlenote#1{%
1026   \g@addto@macro\@title{\footnotemark}%
1027   \if@ACM@anonymous
1028   \g@addto@macro\@titlenotes{%
1029   \stepcounter{footnote}\footnotetext{Title note}}%
1030   \else
1031   \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
1032   \fi}

\@subtitlenotes   The subtitlenotes

1033 \def\@subtitlenotes{}

\subtitlenote Adding note to the subtitle

```
1034 \def\subtitlenote#1{%
1035   \g@addto@macro\@subtitle{\footnotemark}%
1036   \if@ACM@anonymous
1037     \g@addto@macro\@subtitlenotes{%
1038       \stepcounter{footnote}\footnotetext{Subtitle note}}%
1039   \else
1040     \g@addto@macro\@subtitlenotes{%
1041       \stepcounter{footnote}\footnotetext{#1}}%
1042   \fi}
```

\@authornotes The authornotes

```
1043 \def\@authornotes{}
```

\authornote Adding note to the author

```
1044 \def\authornote#1{%
1045   \if@ACM@anonymous\else
1046     \g@addto@macro\addresses{\@authornotemark}
1047     \g@addto@macro\@authornotes{%
1048       \stepcounter{footnote}\footnotetext{#1}}%
1049   \fi}
```

\acmVolume The current volume

```
1050 \def\acmVolume#1{\def\@acmVolume{#1}}
1051 \acmVolume{1}
```

\acmNumber The current number

```
1052 \def\acmNumber#1{\def\@acmNumber{#1}}
1053 \acmNumber{1}
```

\acmArticle The current article

```
1054 \def\acmArticle#1{\def\@acmArticle{#1}}
1055 \acmArticle{1}
```

\acmArticleSeq The sequence number

```
1056 \def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}
1057 \acmArticleSeq{\@acmArticle}
```

\acmYear The current year

```
1058 \def\acmYear#1{\def\@acmYear{#1}}
1059 \acmYear{\the\year}
```

\acmMonth The current month

```
1060 \def\acmMonth#1{\def\@acmMonth{#1}}
1061 \acmMonth{\the\month}
```

\@acmPubDate	The publication date

```
1062 \def\@acmPubDate{\ifcase\@acmMonth\or
1063   January\or February\or March\or April\or May\or June\or
1064   July\or August\or September\or October\or November\or
1065   December\fi~\@acmYear}
```

\acmPrice	The price

```
1066 \def\acmPrice#1{\def\@acmPrice{#1}}
1067 \acmPrice{15.00}
```

\acmSubmissionID	The submission id

```
1068 \def\acmSubmissionID#1{\def\@acmSubmissionID{#1}}
1069 \acmSubmissionID{}
```

\acmISBN	The book isbn

```
1070 \def\acmISBN#1{\def\@acmISBN{#1}}
1071 \acmISBN{978-x-xxxx-xxxx-x/YY/MM}
```

\acmDOI	The paper doi

```
1072 \def\acmDOI#1{\def\@acmDOI{#1}}
1073 \acmDOI{10.1145/nnnnnnn.nnnnnnn}
```

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

```
1074 \newif\if@ACM@badge
1075 \@ACM@badgefalse
```

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

```
1076 \newlength\@ACM@badge@width
1077 \setlength\@ACM@badge@width{5pc}
```

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

```
1078 \newlength\@ACM@title@width
```

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

```
1079 \newlength\@ACM@badge@skip
1080 \setlength\@ACM@badge@skip{1pc}
```

\acmBadgeR	Setting the right badge

```
1081 \newcommand\acmBadgeR[2][]{\@ACM@badgetrue
1082   \def\@acmBadgeR@url{#1}%
1083   \def\@acmBadgeR@image{#2}}
1084 \def\@acmBadgeR@url{}
1085 \def\@acmBadgeR@image{}
```

\acmBadgeL	Setting the left badge

```
1086 \newcommand\acmBadgeL[2][]{\@ACM@badgetrue
1087   \def\@acmBadgeL@url{#1}%
1088   \def\@acmBadgeL@image{#2}}
1089 \def\@acmBadgeL@url{}
1090 \def\@acmBadgeL@image{}
```

\startPage The start page of the paper

```
1091 \def\startPage#1{\def\@startPage{#1}}
1092 \startPage{}
```

\terms Terms are obsolete, we use CCS now.

```
1093 \def\terms#1{\ClassWarning{\@classname}{The command \string\terms{} is
1094    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.

```
1095 \def\keywords#1{\def\@keywords{#1}}
1096 \keywords{}
```

abstract Amsart puts abstract in the box. Since we do not know whether we will use two column mode, we prefer to save the text

```
1097 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}
```

\@saveabstract And saving the abstract

```
1098 \long\def\@saveabstract#1{\long\gdef\@abstract{#1}}
1099 \@saveabstract{}
```

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

```
1100 \long\def\@lempty{}
```

\if@ACM@printccs Whether to print CCS

```
1101 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printccs}[true]{%
1102    \if@ACM@printccs
1103       \ClassInfo{\@classname}{Printing CCS}%
1104    \else
1105       \ClassInfo{\@classname}{Suppressing CCS}%
1106    \fi}{\ClassError{\@classname}{printccs must be true or false}}
```

\if@ACM@printacmref Whether to print ACM bib

```
1107 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
1108    \if@ACM@printacmref
1109       \ClassInfo{\@classname}{Printing bibformat}%
1110    \else
1111       \ClassInfo{\@classname}{Suppressing bibformat}%
1112    \fi}{\ClassError{\@classname}{printacmref must be true or false}}
```

\if@ACM@printfolios Whether to print folios

```
1113 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
1114    \if@ACM@printfolios
1115       \ClassInfo{\@classname}{Printing folios}%
1116    \else
1117       \ClassInfo{\@classname}{Suppressing folios}%
1118    \fi}{\ClassError{\@classname}{printfolios must be true or false}}
```

`\settopmatter`   The usual syntactic sugar

```
1119 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}
```

Now the settings

```
1120 \settopmatter{printccs=true, printacmref=true}
1121 \if@ACM@manuscript
1122   \settopmatter{printfolios=true}
1123 \else
1124   \if@ACM@journal
1125     \settopmatter{printfolios=true}
1126   \else
1127     \settopmatter{printfolios=false}
1128   \fi
1129 \fi
```

`\@received`   The container for the paper history

```
1130 \def\@received{}
```

`\received`   The `\received` command

```
1131 \newcommand\received[2][]{\def\@tempa{#1}%
1132   \ifx\@tempa\@empty
1133     \ifx\@received\@empty
1134       \gdef\@received{Received #2}%
1135     \else
1136       \g@addto@macro{\@received}{; revised #2}%
1137     \fi
1138   \else
1139     \ifx\@received\@empty
1140       \gdef\@received{#1 #2}%
1141     \else
1142       \g@addto@macro{\@received}{; #1 #2}%
1143     \fi
1144 \fi}
1145 \AtEndDocument{%
1146   \ifx\@received\@empty\else
1147     \par\bigskip\noindent\small\normalfont\@received\par
1148 \fi}
```

3.11 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```
1149 \RequirePackage{comment}
1150 \excludecomment{CCSXML}
```

`\@concepts`   This is the storage macro for concepts

```
1151 \let\@concepts\@empty
```

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

```
1152 \newcommand\ccsdesc[2][100]{%
1153   \ccsdesc@parse#1~#2~}
```

\ccsdesc@parse The parser of the expression `Significance~General~Specific` (we need textcomp for \\textrightarrow):

```
1154 \RequirePackage{textcomp}
1155 \def\ccsdesc@parse#1~#2~#3~{%
1156   \expandafter\ifx\csname CCS@#2\endcsname\relax
1157     \expandafter\gdef\csname CCS@#2\endcsname{\textbullet\ \textbf{#2} \textrightarrow\ }%
1158   \g@addto@macro{\@concepts}{\csname CCS@#2\endcsname}\fi
1159   \expandafter\g@addto@macro\expandafter{\csname CCS@#2\endcsname}{%
1160     \ifnum#1>499\textbf{#3}; \else
1161     \ifnum#1>299\textit{#3}; \else
1162     #3; \fi\fi}}
```

3.12 Copyright system

This is from `acmcopyright.sty`

\if@printcopyright A flag whether to print copyright symbol

```
1163 \newif\if@printcopyright
1164 \@printcopyrighttrue
```

\if@printpermission Whether to print permission block

```
1165 \newif\if@printpermission
1166 \@printpermissiontrue
```

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

```
1167 \newif\if@acmowned
1168 \@acmownedtrue
```

Keys:

```
1169 \define@choicekey*{ACM@}{acmcopyrightmode}[%
1170   \acm@copyrightinput\acm@copyrightmode]{none,acmcopyright,acmlicensed,%
1171   rightsretained,usgov,usgovmixed,cagov,cagovmixed,%
1172   licensedusgovmixed,licensedcagovmixed,othergov,licensedothergov}{%
1173   \@printpermissiontrue
1174   \@printcopyrighttrue
1175   \@acmownedtrue
1176   \ifnum\acm@copyrightmode=0\relax % none
1177     \@printpermissionfalse
1178     \@printcopyrightfalse
1179     \@acmownedfalse
1180   \fi
1181   \ifnum\acm@copyrightmode=2\relax % acmlicensed
1182     \@acmownedfalse
1183   \fi
```

```
1184  \ifnum\acm@copyrightmode=3\relax % rightsretained
1185   \@acmownedfalse
1186   \acmPrice{}%
1187  \fi
1188  \ifnum\acm@copyrightmode=4\relax % usgov
1189   \@printpermissiontrue
1190   \@printcopyrightfalse
1191   \@acmownedfalse
1192   \acmPrice{}%
1193  \fi
1194  \ifnum\acm@copyrightmode=6\relax % cagov
1195   \@acmownedfalse
1196  \fi
1197  \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1198   \@acmownedfalse
1199  \fi
1200  \ifnum\acm@copyrightmode=9\relax % licensedcagovmixed
1201   \@acmownedfalse
1202  \fi
1203  \ifnum\acm@copyrightmode=10\relax % othergov
1204   \@acmownedtrue
1205  \fi
1206  \ifnum\acm@copyrightmode=11\relax % licensedothergov
1207   \@acmownedfalse
1208  \fi}
```

\setcopyright   This is the syntactic sugar around setting keys.

```
1209 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
1210 \setcopyright{acmcopyright}
```

\@copyrightowner   Here is the owner of the copyright

```
1211 \def\@copyrightowner{%
1212  \ifcase\acm@copyrightmode\relax % none
1213  \or % acmcopyright
1214  Association for Computing Machinery.
1215  \or % acmlicensed
1216  Copyright held by the owner/author(s). Publication rights licensed to
1217  Association for Computing Machinery.
1218  \or % rightsretained
1219  Copyright held by the owner/author(s).
1220  \or % usgov
1221  \or % usgovmixed
1222  Association for Computing Machinery.
1223  \or % cagov
1224  Crown in Right of Canada.
1225  \or %cagovmixed
1226  Association for Computing Machinery.
1227  \or %licensedusgovmixed
1228  Copyright held by the owner/author(s). Publication rights licensed to
1229  Association for Computing Machinery.
```

```
1230  \or %licensedcagovmixed
1231  Copyright held by the owner/author(s). Publication rights licensed to
1232  Association for Computing Machinery.
1233  \or % othergov
1234  Association for Computing Machinery.
1235  \or % licensedothergov
1236  Copyright held by the owner/author(s). Publication rights licensed to
1237  Association for Computing Machinery.
1238  \fi}
```

\@formatdoi Print a clickable doi

```
1239 \def\@formatdoi#1{\url{https://doi.org/#1}}
```

\@copyrightpermission The canned permission block.

```
1240 \def\@copyrightpermission{%
1241  \ifcase\acm@copyrightmode\relax % none
1242  \or % acmcopyright
1243  Permission to make digital or hard copies of all or part of this
1244  work for personal or classroom use is granted without fee provided
1245  that copies are not made or distributed for profit or commercial
1246  advantage and that copies bear this notice and the full citation on
1247  the first page. Copyrights for components of this work owned by
1248  others than ACM must be honored. Abstracting with credit is
1249  permitted. To copy otherwise, or republish, to post on servers or to
1250  redistribute to lists, requires prior specific permission
1251  and\hspace*{.5pt}/or  a fee. Request permissions from
1252  permissions@acm.org.
1253  \or % acmlicensed
1254  Permission to make digital or hard copies of all or part of this
1255  work for personal or classroom use is granted without fee provided
1256  that copies are not made or distributed for profit or commercial
1257  advantage and that copies bear this notice and the full citation on
1258  the first page. Copyrights for components of this work owned by
1259  others than the author(s) must be honored. Abstracting with credit
1260  is permitted.  To copy otherwise, or republish, to post on servers
1261  or to  redistribute to lists, requires prior specific permission
1262  and\hspace*{.5pt}/or  a fee. Request permissions from
1263  permissions@acm.org.
1264  \or % rightsretained
1265  Permission to make digital or hard copies of part or all of this work
1266  for personal or classroom use is granted without fee provided that
1267  copies are not made or distributed for profit or commercial advantage
1268  and that copies bear this notice and the full citation on the first
1269  page. Copyrights for third-party components of this work must be
1270  honored. For all other uses, contact the
1271  owner\hspace*{.5pt}/author(s).
1272  \or % usgov
1273  This paper is authored by an employee(s) of the United States
1274  Government and is in the public domain. Non-exclusive copying or
1275  redistribution is allowed, provided that the article citation is
```

```
1276    given and the authors and agency are clearly identified as its
1277    source.
1278  \or % usgovmixed
1279    ACM acknowledges that this contribution was authored or co-authored
1280    by an employee, or contractor of the national government. As such,
1281    the Government retains a nonexclusive, royalty-free right to
1282    publish or reproduce this article, or to allow others to do so, for
1283    Government purposes only. Permission to make digital or hard copies
1284    for personal or classroom use is granted. Copies must bear this
1285    notice and the full citation on the first page. Copyrights for
1286    components of this work owned by others than ACM must be
1287    honored. To copy otherwise, distribute, republish, or post,
1288    requires prior specific permission and\hspace*{.5pt}/or a
1289    fee. Request permissions from permissions@acm.org.
1290  \or % cagov
1291    This article was authored by employees of the Government of Canada.
1292    As such, the Canadian government retains all interest in the
1293    copyright to this work and grants to ACM a nonexclusive,
1294    royalty-free right to publish or reproduce this article, or to allow
1295    others to do so, provided that clear attribution is given both to
1296    the authors and the Canadian government agency employing them.
1297    Permission to make digital or hard copies for personal or classroom
1298    use is granted. Copies must bear this notice and the full citation
1299    on the first page.  Copyrights for components of this work owned by
1300    others than the Canadain Government must be honored. To copy
1301    otherwise, distribute, republish, or post, requires prior specific
1302    permission and\hspace*{.5pt}/or a fee. Request permissions from
1303    permissions@acm.org.
1304  \or % cagovmixed
1305    ACM acknowledges that this contribution was co-authored by an
1306    affiliate of the national government of Canada. As such, the Crown
1307    in Right of Canada retains an equal interest in the copyright.
1308    Reprints must include clear attribution to ACM and the author's
1309    government agency affiliation.  Permission to make digital or hard
1310    copies for personal or classroom use is granted.  Copies must bear
1311    this notice and the full citation on the first page. Copyrights for
1312    components of this work owned by others than ACM must be honored.
1313    To copy otherwise, distribute, republish, or post, requires prior
1314    specific permission and\hspace*{.5pt}/or a fee. Request permissions
1315    from permissions@acm.org.
1316  \or % licensedusgovmixed
1317    Publication rights licensed to ACM\@. ACM acknowledges that this
1318    contribution was authored or co-authored by an employee, contractor
1319    or affiliate of the United States government. As such, the
1320    Government retains a nonexclusive, royalty-free right to publish or
1321    reproduce this article, or to allow others to do so, for Government
1322    purposes only.
1323  \or % licensedcagovmixed
1324    Publication rights licensed to ACM\@. ACM acknowledges that this
1325    contribution was authored or co-authored by an employee, contractor
```

```
1326    or affiliate of the national government of Canada. As such, the
1327    Government retains a nonexclusive, royalty-free right to publish or
1328    reproduce this article, or to allow others to do so, for Government
1329    purposes only.
1330  \or % othergov
1331    ACM acknowledges that this contribution was authored or co-authored
1332    by an employee, contractor or affiliate of a national government. As
1333    such, the Government retains a nonexclusive, royalty-free right to
1334    publish or reproduce this article, or to allow others to do so, for
1335    Government purposes only.
1336  \or % licensedothergov
1337    Publication rights licensed to ACM\@. ACM acknowledges that this
1338    contribution was authored or co-authored by an employee, contractor
1339    or affiliate of a national government. As such, the Government
1340    retains a nonexclusive, royalty-free right to publish or reproduce
1341    this article, or to allow others to do so, for Government purposes
1342    only.
1343  \fi}
```

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

```
1344 \def\copyrightyear#1{\def\@copyrightyear{#1}}
1345 \copyrightyear{\@acmYear}
```

\@teaserfigures   The teaser figures container

```
1346 \def\@teaserfigures{}
```

teaserfigure   The teaser figure

```
1347 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}
```

\@saveteaser   Saving the teaser

```
1348 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}
```

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

```
1349 \renewcommand{\thanks}[1]{%
1350   \@ifnotempty{#1}{%
1351     \if@ACM@anonymous
1352       \g@addto@macro\thankses{\thanks{A note}}%
1353     \else
1354       \g@addto@macro\thankses{\thanks{#1}}%
1355   \fi}}
```

3.13   Typesetting top matter

\mktitle@bx   Some of our formats use two column design, some use one column one. In all cases
we use wide title. Thus we typeset the top matter in a special box to be use in the
construction \@twocolumn[⟨box⟩].

```
1356 \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 thankses. The latter 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.

```
1357 \def\maketitle{%
1358   \if@ACM@anonymous
1359     % Anonymize omission of \author-s
1360     \ifnum\num@authorgroups=0\author{}\fi
1361   \fi
1362   \begingroup
1363   \let\@footnotemark\@footnotemark@nolink
1364   \let\@footnotetext\@footnotetext@nolink
1365   \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1366   \global\@topnum\z@ % this prevents floats from falling
1367                      % at the top of page 1
1368   \global\@botnum\z@ % we do not want them to be on bottom either
1369   \hsize=\textwidth
1370   \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1371   \@mktitle\if@ACM@sigchiamode\else\@mkauthors\fi\@mkteasers
1372   \@printtopmatter
1373   \if@ACM@sigchiamode\@mkauthors\fi
1374   \setcounter{footnote}{0}%
1375   \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1376   \@titlenotes
1377   \@subtitlenotes
1378   \@authornotes
1379   \let\@makefnmark\relax  \let\@thefnmark\relax
1380   \let\@makefntext\noindent
1381   \ifx\@empty\thankses\else
1382     \footnotetextcopyrightpermission{%
1383       \def\par{\let\par\@par}\parindent\z@\@setthanks}%
1384   \fi
1385   \iffalse %%!! added for CCS submission
1386   \footnotetextcopyrightpermission{%
1387     \if@ACM@authordraft
1388        \raisebox{-2ex}[\z@][\z@]{\makebox[0pt][l]{\large\bfseries
1389          Unpublished
1390          working draft. Not for distribution}}%
1391        \color[gray]{0.9}%
1392     \fi
1393     \parindent\z@\parskip0.1\baselineskip
1394     \if@ACM@authorversion\else
1395       \if@printpermission\@copyrightpermission\par\fi
1396     \fi
1397     \if@ACM@manuscript\else
1398       \if@ACM@journal\else % Print the conference information
1399       {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
1400       \fi
1401     \fi
```

```
1402    \if@printcopyright
1403      \copyright\ \@copyrightyear\ \@copyrightowner\\
1404    \else
1405     \@copyrightyear.\
1406    \fi
1407    \if@ACM@manuscript
1408      Manuscript submitted to ACM\\
1409    \else
1410      \if@ACM@authorversion
1411        This is the author's version of the work. It is posted here for
1412        your personal use. Not for redistribution. The definitive Version
1413        of Record was published in
1414        \if@ACM@journal
1415          \emph{\@journalName}%
1416        \else
1417          \emph{Proceedings of \acmConference@name, \acmConference@date}%
1418        \fi
1419        \ifx\@acmDOI\@empty
1420          .
1421        \else
1422          , \@formatdoi{\@acmDOI}.
1423        \fi\\
1424      \else
1425        \if@ACM@journal
1426          \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1427          \ifx\@acmPrice\@empty\else\ \$\@acmPrice\fi\\
1428          \@formatdoi{\@acmDOI}%
1429        \else % Conference
1430        %%! Not supposed to change this, but can't figure out a better way to remove it
1431          %% ACM~ISBN~\@acmISBN
1432          %% \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\\
1433          %% \@formatdoi{\@acmDOI}%
1434        \fi
1435      \fi
1436    \fi}
1437    \fi %%!
1438  \endgroup
1439  \setcounter{footnote}{0}%
1440  \@mkabstract
1441  \if@ACM@printccs
1442    \ifx\@concepts\@empty\else\bgroup
1443      {\@specialsection{CCS Concepts}%
1444        \@concepts\par}\egroup
1445    \fi
1446  \fi
1447  \ifx\@keywords\@empty\else\bgroup
1448    {\if@ACM@journal
1449      \@specialsection{Additional Key Words and Phrases}%
1450    \else
1451      \@specialsection{Keywords}%
```

```
1452        \fi
1453          \@keywords}\par\egroup
1454    \fi
1455  \andify\authors
1456  \andify\shortauthors
1457  \global\let\authors=\authors
1458  \global\let\shortauthors=\shortauthors
1459  \if@ACM@printacmref
1460      \@mkbibcitation
1461  \fi
1462  \hypersetup{pdfauthor={\authors},
1463      pdftitle={\@title}, pdfkeywords={\@concepts}}%
1464  \@printendtopmatter
1465  \@afterindentfalse
1466  \@afterheading
1467 }
```

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

```
1468 \def\@specialsection#1{%
1469  \ifcase\ACM@format@nr
1470  \relax % manuscript
1471    \par\medskip\small\noindent#1: %
1472  \or % acmsmall
1473    \par\medskip\small\noindent#1: %
1474  \or % acmlarge
1475    \par\medskip\small\noindent#1: %
1476  \or % acmtog
1477    \par\medskip\small\noindent#1: %
1478  \or % sigconf
1479    \section*{#1}%
1480  \or % siggraph
1481    \section*{#1}%
1482  \or % sigplan
1483    \paragraph*{#1}%
1484  \or % sigchi
1485    \section*{#1}%
1486  \or % sigchi-a
1487    \section*{#1}%
1488  \fi}
```

\@printtopmatter   The printing of top matter starts the 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 on the margins.

```
1489 \def\@printtopmatter{%
1490  \ifx\@startPage\@empty
1491    \gdef\@startPage{1}%
1492  \else
1493    \setcounter{page}{\@startPage}%
1494  \fi
```

```
1495    \thispagestyle{firstpagestyle}%
1496    \noindent
1497    \ifcase\ACM@format@nr
1498    \relax % manuscript
1499      \box\mktitle@bx\par
1500      \noindent\hrulefill\par
1501    \or % acmsmall
1502      \box\mktitle@bx\par
1503      \noindent\hrulefill\par
1504    \or % acmlarge
1505      \box\mktitle@bx\par
1506      \noindent\hrulefill\par
1507    \or % acmtog
1508      \twocolumn[\box\mktitle@bx]%
1509    \or % sigconf
1510      \twocolumn[\box\mktitle@bx]%
1511    \or % siggraph
1512      \twocolumn[\box\mktitle@bx]%
1513    \or % sigplan
1514      \twocolumn[\box\mktitle@bx]%
1515    \or % sigchi
1516      \twocolumn[\box\mktitle@bx]%
1517    \or % sigchi-a
1518      \par\box\mktitle@bx\par\bigskip
1519      \if@ACM@badge
1520        \marginpar{\noindent
1521          \ifx\@acmBadgeL@image\@empty\else
1522            \href{\@acmBadgeL@url}{%
1523              \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
1524            \hskip\@ACM@badge@skip
1525          \fi
1526          \ifx\@acmBadgeR@image\@empty\else
1527            \href{\@acmBadgeR@url}{%
1528              \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
1529          \fi}%
1530      \fi
1531    \fi
1532 }
```

\@mktitle   The title of the article

```
1533 \def\@mktitle{%
1534    \ifcase\ACM@format@nr
1535    \relax % manuscript
1536      \@mktitle@i
1537    \or % acmsmall
1538      \@mktitle@i
1539    \or % acmlarge
1540      \@mktitle@i
1541    \or % acmtog
1542      \@mktitle@i
```

```
1543   \or % sigconf
1544      \@mktitle@iii
1545   \or % siggraph
1546      \@mktitle@iii
1547   \or % sigplan
1548      \@mktitle@iii
1549   \or % sigchi
1550      \@mktitle@iii
1551   \or % sigchi-a
1552      \@mktitle@iv
1553   \fi
1554 }
```

\@titlefont   The font to typeset title

```
1555 \def\@titlefont{%
1556   \ifcase\ACM@format@nr
1557   \relax % manuscript
1558     \LARGE\bfseries\sffamily
1559   \or % acmsmall
1560     \LARGE\bfseries\sffamily
1561   \or % acmlarge
1562     \LARGE\bfseries\sffamily
1563   \or % acmtog
1564     \Huge\sffamily
1565   \or % sigconf
1566     \Huge\sffamily\bfseries
1567   \or % siggraph
1568     \Huge\sffamily\bfseries
1569   \or % sigplan
1570     \Huge\bfseries
1571   \or % sigchi
1572     \Huge\sffamily\bfseries
1573   \or % sigchi-a
1574      \Huge\bfseries
1575   \fi}
```

\@subtitlefont   The font to typeset title

```
1576 \def\@subtitlefont{\normalsize
1577   \ifcase\ACM@format@nr
1578   \relax % manuscript
1579     \mdseries
1580   \or % acmsmall
1581     \mdseries
1582   \or % acmlarge
1583     \mdseries
1584   \or % acmtog
1585      \LARGE
1586   \or % sigconf
1587      \LARGE\mdseries
1588   \or % siggraph
```

64

```
1589        \LARGE\mdseries
1590    \or % sigplan
1591        \LARGE\mdseries
1592    \or % sigchi
1593        \LARGE\mdseries
1594    \or % sigchi-a
1595        \mdseries
1596    \fi}
```

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

```
1597 \def\@mktitle@i{\hsize=\textwidth
1598    \@ACM@title@width=\hsize
1599    \ifx\@acmBadgeL@image\@empty\else
1600        \advance\@ACM@title@width by -\@ACM@badge@width
1601        \advance\@ACM@title@width by -\@ACM@badge@skip
1602    \fi
1603    \ifx\@acmBadgeR@image\@empty\else
1604        \advance\@ACM@title@width by -\@ACM@badge@width
1605        \advance\@ACM@title@width by -\@ACM@badge@skip
1606    \fi
1607    \setbox\mktitle@bx=\vbox{\noindent\@titlefont
1608        \ifx\@acmBadgeL@image\@empty\else
1609            \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1610                \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1611            \hskip\@ACM@badge@skip
1612        \fi
1613        \parbox[t]{\@ACM@title@width}{\raggedright
1614            \@titlefont\noindent
1615            \@title
1616    \ifx\@subtitle\@empty\else
1617        \par\noindent{\@subtitlefont\@subtitle}
1618    \fi}%
1619    \ifx\@acmBadgeR@image\@empty\else
1620        \hskip\@ACM@badge@skip
1621        \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1622            \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1623    \fi
1624    \par\bigskip}}%
```

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

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

```
1625 \def\@mktitle@iii{\hsize=\textwidth
1626    \setbox\mktitle@bx=\vbox{\@titlefont\centering
1627        \@ACM@title@width=\hsize
1628        \if@ACM@badge
1629            \advance\@ACM@title@width by -2\@ACM@badge@width
1630            \advance\@ACM@title@width by -2\@ACM@badge@skip
1631            \parbox[b]{\@ACM@badge@width}{\strut
```

65

```
1632            \ifx\@acmBadgeL@image\@empty\else
1633              \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1634                \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1635            \fi}%
1636          \hskip\@ACM@badge@skip
1637        \fi
1638        \parbox[t]{\@ACM@title@width}{\centering\@titlefont
1639          \@title
1640          \ifx\@subtitle\@empty\else
1641            \par\noindent{\@subtitlefont\@subtitle}
1642          \fi
1643        }%
1644        \if@ACM@badge
1645          \hskip\@ACM@badge@skip
1646          \parbox[b]{\@ACM@badge@width}{\strut
1647            \ifx\@acmBadgeR@image\@empty\else
1648              \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1649                \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1650          \fi}%
1651        \fi
1652        \par\bigskip}}%
```

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

```
1653 \def\@mktitle@iv{\hsize=\textwidth
1654      \setbox\mktitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
1655        \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
1656        \noindent\@title
1657      \ifx\@subtitle\@empty\else
1658        \par\noindent\@subtitlefont\@subtitle
1659      \fi
1660      \par\bigskip}}%
```

\@ACM@addtoaddress   The macro adds an item to 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 on the end of the line. We use the magic cleaders trick for this.

```
1661 \newbox\@ACM@commabox
1662 \def\@ACM@addtoaddress#1{%
1663  \ifvmode\else
1664    \if@ACM@affiliation@obeypunctuation\else
1665    \setbox\@ACM@commabox=\hbox{, }%
1666    \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
1667  \fi\fi
1668  #1}
```

\institution	Theoretically we can define the macros for \affiliation inside the \@mkauthors-style
\position	commands. However, this would lead to a strange error if an author uses them outside
\department	\affiliation. Of course we can make them produce an error message, but…
\streetaddress	We follow the strange American tradtion of no comma before zip code.

```
1669 \if@ACM@journal
1670   \let\position\@gobble
1671   \def\institution#1{#1\ignorespaces}%
1672   \newcommand\department[2][0]{}%
1673   \let\streetaddress\@gobble
1674   \let\city\@gobble
1675   \let\state\@gobble
1676   \let\postcode\@gobble
1677   \let\country\@gobble
1678 \else
1679   \def\position#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
1680   \def\institution#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
1681   \newcommand\department[2][0]{\if@ACM@affiliation@obeypunctuation
1682     #2\else#2\par\fi}%
1683   \def\streetaddress#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
1684   \let\city\@ACM@addtoaddress
1685   \let\state\@ACM@addtoaddress
1686   \def\postcode#1{\if@ACM@affiliation@obeypunctuation#1\else\unskip\space#1\fi}%
1687   \let\country\@ACM@addtoaddress
1688 \fi
```

\@mkauthors   Typesetting authors

```
1689 \def\@mkauthors{\begingroup
1690   \hsize=\textwidth
1691   \ifcase\ACM@format@nr
1692   \relax % manuscript
1693     \@mkauthors@i
1694 \or % acmsmall
1695     \@mkauthors@i
1696 \or % acmlarge
1697     \@mkauthors@i
1698 \or % acmtog
1699     \@mkauthors@i
1700 \or % sigconf
1701     \@mkauthors@iii
1702 \or % siggraph
1703     \@mkauthors@iii
1704 \or % sigplan
1705     \@mkauthors@iii
1706 \or % sigchi
1707     \@mkauthors@iii
1708 \or % sigchi-a
1709     \@mkauthors@iv
1710   \fi
1711   \endgroup
```

```
1712 }
```

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

```
1713 \def\@authorfont{\Large\sffamily}
```

\@affiliationfont   Font for affiliations

```
1714 \def\@affiliationfont{\normalsize\normalfont}
```

Adjusting fonts for different formats

```
1715 \ifcase\ACM@format@nr
1716 \relax % manuscript
1717 \or % acmsmall
1718   \def\@authorfont{\large\sffamily}
1719   \def\@affiliationfont{\small\normalfont}
1720 \or % acmlarge
1721 \or % acmtog
1722   \def\@authorfont{\LARGE\sffamily}
1723   \def\@affiliationfont{\large}
1724 \or % sigconf
1725   \def\@authorfont{\LARGE}
1726   \def\@affiliationfont{\large}
1727 \or % siggraph
1728   \def\@authorfont{\normalsize\normalfont}
1729   \def\@affiliationfont{\normalsize\normalfont}
1730 \or % sigplan
1731   \def\@authorfont{\Large\normalfont}
1732   \def\@affiliationfont{\normalsize\normalfont}
1733 \or % sigchi
1734   \def\@authorfont{\bfseries}
1735   \def\@affiliationfont{\mdseries}
1736 \or % sigchi-a
1737   \def\@authorfont{\bfseries}
1738   \def\@affiliationfont{\mdseries}
1739 \fi
```

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

```
1740 \def\@typeset@author@line{%
1741   \andify\@currentauthors\par\noindent
1742   \@currentauthors\def\@currentauthors{}%
1743   \ifx\@currentaffiliations\@empty\else
1744     \andify\@currentaffiliations
1745       \unskip, {\@currentaffiliations}\par
1746   \fi
1747   \def\@currentaffiliations{}}
```

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

```
1748 \def\@mkauthors@i{%
```

```
1749    \def\@currentauthors{}%
1750    \def\@currentaffiliations{}%
1751    \global\let\and\@typeset@author@line
1752    \def\@author##1{%
1753      \ifx\@currentauthors\@empty
1754        \gdef\@currentauthors{\@authorfont\MakeUppercase{##1}}%
1755      \else
1756        \g@addto@macro{\@currentauthors}{\and\MakeUppercase{##1}}%
1757      \fi
1758      \gdef\and{}}%
1759    \def\email##1##2{}%
1760    \def\affiliation##1##2{%
1761      \def\@tempa{##2}\ifx\@tempa\@empty\else
1762        \ifx\@currentaffiliations\@empty
1763          \gdef\@currentaffiliations{%
1764            \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1765            \setkeys{@ACM@affiliation@}{##1}%
1766            \@affiliationfont##2}%
1767        \else
1768          \g@addto@macro{\@currentaffiliations}{\and
1769            \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1770            \setkeys{@ACM@affiliation@}{##1}##2}%
1771        \fi
1772      \fi
1773      \global\let\and\@typeset@author@line}%
1774    \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
1775      \noindent\addresses\@typeset@author@line
1776    \par\medskip}%
1777 }
```

\@mkauthors@ii   \@mkauthors@iI was version used in acmtog. No longer necessary

\author@bx   The box to put individual author to

```
1778 \newbox\author@bx
```

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

```
1779 \newdimen\author@bx@wd
```

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

```
1780 \newskip\author@bx@sep
1781 \author@bx@sep=1pc\relax
```

\@typeset@author@bx   Typesetting the box with authors. Note that in SIGCHI-A the box is not centered.

```
1782 \def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd\def\and{\par}%
1783   \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
1784     \@authorfont\@currentauthors\par\@affiliationfont
1785     \@currentaffiliation}\egroup
1786   \box\author@bx\hspace{\author@bx@sep}%
1787   \gdef\@currentauthors{}%
1788   \gdef\@currentaffiliation{}}
```

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

```
1789 \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 $(\text{\textbackslash textwidth} - \text{\textbackslash author@bx@sep})/N - \text{\textbackslash author@bx@sep}$, where N is the number of boxes per row.

```
1790   \author@bx@wd=\textwidth\relax
1791   \advance\author@bx@wd by -\author@bx@sep\relax
1792   \ifcase\num@authorgroups
1793   \relax % 0?
1794   \or   % 1=one author per row
1795   \or   % 2=two authors per row
1796     \divide\author@bx@wd by \num@authorgroups\relax
1797   \or   % 3=three authors per row
1798     \divide\author@bx@wd by \num@authorgroups\relax
1799   \or   % 4=two authors per row (!)
1800     \divide\author@bx@wd by 2\relax
1801   \else % three authors per row
1802     \divide\author@bx@wd by 3\relax
1803   \fi
1804   \advance\author@bx@wd by -\author@bx@sep\relax
```

Now, parsing of \addresses:

```
1805   \gdef\@currentauthors{}%
1806   \gdef\@currentaffiliation{}%
1807   \def\@author##1{\ifx\@currentauthors\@empty
1808     \gdef\@currentauthors{\par##1}%
1809   \else
1810     \g@addto@macro\@currentauthors{\par##1}%
1811   \fi
1812   \gdef\and{}}%
1813   \def\email##1##2{\ifx\@currentaffiliation\@empty
1814     \gdef\@currentaffiliation{\nolinkurl{##2}}%
1815   \else
1816     \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
1817   \fi}%
1818   \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
1819     \gdef\@currentaffiliation{%
1820       \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1821       \setkeys{@ACM@affiliation@}{##1}##2}%
1822   \else
1823     \g@addto@macro\@currentaffiliation{\par
1824       \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1825       \setkeys{@ACM@affiliation@}{##1}##2}%
1826   \fi
1827   \global\let\and\@typeset@author@bx
1828 }%
```

Actual typesetting is done by \and macro:

```
1829    \hsize=\textwidth
1830    \global\setbox\mktitle@bx=\vbox{\noindent
1831      \box\mktitle@bx\par\medskip\leavevmode
1832      \lineskip=1pc\relax\centering\hspace*{-1em}%
1833      \addresses\let\and\@typeset@author@bx\and\par\bigskip}}
```

\@mkauthors@iv The sigchia version. Now we put authors in the main text, and no more than 2 authors per line.

```
1834 \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.

```
1835    \author@bx@wd=\columnwidth\relax
1836    \advance\author@bx@wd by -\author@bx@sep\relax
1837    \ifcase\num@authorgroups
1838    \relax % 0?
1839    \or   % 1=one author per row
1840    \else  % 2=two authors per row
1841      \divide\author@bx@wd by 2\relax
1842    \fi
1843    \advance\author@bx@wd by -\author@bx@sep\relax
```

Now, parsing of \addresses:

```
1844    \gdef\@currentauthors{}%
1845    \gdef\@currentaffiliation{}%
1846    \def\@author##1{\ifx\@currentauthors\@empty
1847      \gdef\@currentauthors{\par##1}%
1848    \else
1849      \g@addto@macro\@currentauthors{\par##1}%
1850    \fi
1851    \gdef\and{}}%
1852    \def\email##1##2{\ifx\@currentaffiliation\@empty
1853      \gdef\@currentaffiliation{\nolinkurl{##2}}%
1854    \else
1855      \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
1856    \fi}%
1857    \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
1858      \gdef\@currentaffiliation{%
1859        \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1860          \setkeys{@ACM@affiliation@}{##1}##2}%
1861    \else
1862      \g@addto@macro\@currentaffiliation{\par
1863        \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1864        \setkeys{@ACM@affiliation@}{##1}##2}%
1865    \fi
1866    \global\let\and\@typeset@author@bx}%
1867 %
```

Actual typesetting is done by \and macro

```
1868        \bgroup\hsize=\columnwidth
1869        \par\raggedright\leftskip=\z@
1870        \lineskip=1pc\noindent
1871        \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}
```

\@authornotemark   Adding footnotemark to authors

```
1872 \def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark}}
```

\@mkteasers   Typesetting teasers

```
1873 \def\@mkteasers{%
1874   \ifx\@teaserfigures\@empty\else
1875     \def\@teaser##1{\par\bigskip\bgroup
1876       \captionsetup{type=figure}##1\egroup\par}
1877     \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
1878     \noindent\@teaserfigures\par\medskip}%
1879   \fi}
```

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

```
1880 \def\@setaddresses{}
```

\@mkabstract   Typesetting abstract

```
1881 \def\@mkabstract{\bgroup
1882   \ifx\@abstract\@lempty\else
1883   {\phantomsection\addcontentsline{toc}{section}{Abstract}%
1884     \if@ACM@journal
1885       \small\noindent
1886     \else
1887       \section*{Abstract}%
1888     \fi
1889   \ignorespaces\@abstract\par}%
1890   \fi\egroup}
```

\@mkbibcitation   Print bibcitation format

```
1891 \def\@mkbibcitation{\bgroup
1892   \def\footnotemark{}%
1893   \def\\{\unskip{} \ignorespaces}%
1894   \def\footnote{\ClassError{\@classname}{Please do note use footnotes
1895       inside \string\title{} or \string\author{} command! Use
1896       \string\titlenote{} or \string\authornote{} instead!}}%
1897   \par\medskip\small\noindent{\bfseries ACM Reference format:}\par\nobreak
1898   \noindent\authors. \@acmYear. \@title.
1899   \if@ACM@journal
1900     \textit{\@journalNameShort}
1901     \@acmVolume, \@acmNumber, Article~\@acmArticle\ (\@acmPubDate),
1902     \ref{TotPages}~pages.
1903   \else
1904     In \textit{Proceedings of \acmConference@name, \acmConference@venue,
1905       \acmConference@date
1906       \ifx\acmConference@name\acmConference@shortname\else
```

```
1907          \ (\acmConference@shortname)\fi
1908          ,} \ref{TotPages}~pages.
1909    \fi\par
1910    \noindent\@formatdoi{\@acmDOI}
1911 \par\egroup}
```

\@printendtopmatter End the top matter

```
1912 \def\@printendtopmatter{\par\medskip
1913   \ifcase\ACM@format@nr
1914   \relax % manuscript
1915     \noindent\hrulefill\par\medskip
1916   \or % acmsmall
1917     \noindent\hrulefill\par\medskip
1918   \or % acmlarge
1919     \noindent\hrulefill\par\medskip
1920   \or % acmtog
1921     \par\bigskip
1922   \or % sigconf
1923     \par\bigskip
1924   \or % siggraph
1925     \par\bigskip
1926   \or % sigplan
1927     \par\bigskip
1928   \or % sigchi
1929     \par\bigskip
1930   \or % sigchi-a
1931   \fi
1932 }
```

\@setthanks We redefine \setthanks using \long

```
1933 \def\@setthanks{\long\def\thanks##1{\par##1\@addpunct.}\thankses}
```

3.14   Headers and Footers

We use fancyhdr for our headers and footers:

```
1934 \RequirePackage{fancyhdr}
```

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

```
1935 \if@ACM@review
1936   \newsavebox{\ACM@linecount@bx}
1937   \newlength\ACM@linecount@bxht
1938   \newcount\ACM@linecount
1939   \ACM@linecount\@ne\relax
1940   \def\ACM@mk@linecount{%
1941     \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{%
1942       \setlength{\ACM@linecount@bxht}{-\baselineskip}%
1943       \loop{\color{ACMRed}\scriptsize\the\ACM@linecount}\\
1944       \global\advance\ACM@linecount by \@ne
1945       \addtolength{\ACM@linecount@bxht}{\baselineskip}%
```

```
1946              \ifdim\ACM@linecount@bxht<\textheight\repeat}}}
1947 \fi
```

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

```
1948 \def\ACM@linecountL{%
1949   \if@ACM@review
1950   \ACM@mk@linecount
1951   \begin{picture}(0,0)%
1952     \put(-26,-22){\usebox{\ACM@linecount@bx}}%
1953   \end{picture}%
1954   \fi}
```

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

```
1955 \def\ACM@linecountR{%
1956   \if@ACM@review
1957   \ACM@mk@linecount
1958   \begin{picture}(0,0)%
1959     \put(20,-22){\usebox{\ACM@linecount@bx}}%
1960   \end{picture}%
1961   \fi}
```

\ACM@timestamp The timestamp system

```
1962 \if@ACM@timestamp
1963   % Subtracting 30 from \time gives us the effect of rounding-down despite
1964   % \numexpr rounding to nearest
1965   \newcounter{ACM@time@hours}
1966   \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
1967   \newcounter{ACM@time@minutes}
1968   \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
1969   \newcommand\ACM@timestamp{%
1970     \footnotesize%
1971     \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
1972     \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{ }%
1973     page~\thepage\ (pp. \@startPage-\pageref*{TotPages})%
1974     \ifx\@acmSubmissionID\@empty\relax\else
1975     ~Submission~ID: \@acmSubmissionID
1976     \fi
1977   }
1978 \fi
```

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

```
1979 \def\@shortauthors{\if@ACM@anonymous Anon.\else\shortauthors\fi}
```

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

```
1980 \def\@headfootfont{%
1981   \ifcase\ACM@format@nr
1982   \relax % manuscript
1983     \sffamily
```

```
1984  \or % acmsmall
1985    \sffamily
1986  \or % acmlarge
1987    \sffamily
1988  \or % acmtog
1989    \sffamily
1990  \or % sigconf
1991    \sffamily
1992  \or % siggraph
1993    \sffamily
1994  \or % sigplan
1995    \sffamily
1996  \or % sigchi
1997    \sffamily
1998  \or % sigchi-a
1999    \sffamily
2000  \fi}
```

standardpagestyle   The pagestyle for all pages but the first one

```
2001 \fancypagestyle{standardpagestyle}{%
2002   \fancyhf{}%
2003   \renewcommand{\headrulewidth}{\z@}%
2004   \renewcommand{\footrulewidth}{\z@}%
2005   \ifcase\ACM@format@nr
2006   \relax % manuscript
2007     \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
2008     \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
2009     \fancyhead[RE]{\@shortauthors}%
2010     \fancyhead[LO]{\ACM@linecountL\shorttitle}%
2011     \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}%
2012   \or % acmsmall
2013     \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2014     \fancyhead[RO]{\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2015     \fancyhead[RE]{\@headfootfont\@shortauthors}%
2016     \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2017     \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2018     \@acmNumber, Article \@acmArticle.  Publication date: \@acmPubDate.}%
2019   \or % acmlarge
2020     \fancyhead[LE]{\ACM@linecountL\@headfootfont
2021     \@acmArticle\if@ACM@printfolios:\thepage\fi\quad\textbullet\quad\@shortauthors}%
2022     \fancyhead[LO]{\ACM@linecountL}%
2023     \fancyhead[RO]{\@headfootfont
2024     \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2025     \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2026     \@acmNumber, Article \@acmArticle.  Publication date: \@acmPubDate.}%
2027   \or % acmtog
2028     \fancyhead[LE]{\ACM@linecountL\@headfootfont
2029     \@acmArticle\if@ACM@printfolios:\thepage\fi\quad\textbullet\quad\@shortauthors}%
2030     \fancyhead[LO]{\ACM@linecountL}%
2031     \fancyhead[RE]{\ACM@linecountR}%
```

```
2032    \fancyhead[RO]{\@headfootfont
2033     \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi\ACM@linecountR}%
2034    \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2035    \@acmNumber, Article \@acmArticle.   Publication date: \@acmPubDate.}%
2036  \else % Proceedings
2037    \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2038    \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2039    \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2040    \fancyhead[LE]{\ACM@linecountL\@headfootfont\acmConference@shortname,
2041      \acmConference@date, \acmConference@venue}%
2042    \fancyhead[RO]{\@headfootfont\acmConference@shortname,
2043      \acmConference@date, \acmConference@venue\ACM@linecountR}%
2044  \fi
2045  \if@ACM@sigchiamode
2046    \fancyheadoffset[L]{\dimexpr(\marginparsep+\marginparwidth)}%
2047  \fi
2048  \if@ACM@timestamp
2049    \fancyfoot[LO,RE]{\ACM@timestamp}
2050  \fi
2051 }
2052 \pagestyle{standardpagestyle}
```

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

```
2053 \newdimen\@folio@wd
2054 \@folio@wd=\z@
2055 \newdimen\@folio@ht
2056 \@folio@ht=\z@
2057 \newdimen\@folio@voffset
2058 \@folio@voffset=\z@
2059 \def\@folio@max{1}
2060 \ifcase\ACM@format@nr
2061 \relax % manuscript
2062 \or % acmsmall
2063   \@folio@wd=45.75pt\relax
2064   \@folio@ht=1.25in\relax
2065   \@folio@voffset=.2in\relax
2066   \def\@folio@max{8}
2067 \or % acmlarge
2068   \@folio@wd=43.25pt\relax
2069   \@folio@ht=79pt\relax
2070   \@folio@voffset=.55in\relax
2071   \def\@folio@max{10}
2072 \fi
```

\@folioblob   The macro to typeset the folio blob.

```
2073 \def\@folioblob{\@tempcnta=\@acmArticleSeq\relax
```

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

```
2074   \loop
2075     \ifnum\@tempcnta>\@folio@max\relax
```

```
2076        \advance\@tempcnta by - \@folio@max
2077     \repeat
2078     \advance\@tempcnta by -1\relax
2079     \@tempdima=\@folio@ht\relax
2080     \multiply\@tempdima by \the\@tempcnta\relax
2081     \advance\@tempdima by -\@folio@voffset\relax
2082     \begin{picture}(0,0)
2083     \makebox[\z@]{\raisebox{-\@tempdima}{%
2084        \rlap{%
2085           \raisebox{-0.45\@folio@ht}[\z@][\z@]{%
2086              \rule{\@folio@wd}{\@folio@ht}}}%
2087        \parbox{\@folio@wd}{%
2088           \centering
2089           \textcolor{white}{\LARGE\bfseries\sffamily\@acmArticle}}}}
2090     \end{picture}}
2091
```

firstpagestyle The pagestyle for the first page only.

```
2092 \fancypagestyle{firstpagestyle}{%
2093   \fancyhf{}%
2094   \renewcommand{\headrulewidth}{\z@}%
2095   \renewcommand{\footrulewidth}{\z@}%
2096   \ifcase\ACM@format@nr
2097   \relax % manuscript
2098     \fancyhead[L]{\ACM@linecountL}%
2099     \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
2100     \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
2101   \or % acmsmall
2102     \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2103     \@acmNumber, Article \@acmArticle.  Publication date:
2104     \@acmPubDate.}%
2105     \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2106     \fancyhead[LO]{\ACM@linecountL}%
2107     \fancyhead[RO]{\@folioblob}%
2108     \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
2109   \or % acmlarge
2110     \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2111     \@acmNumber, Article \@acmArticle.  Publication date:
2112     \@acmPubDate.}%
2113     \fancyhead[RO]{\@folioblob}%
2114     \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2115     \fancyhead[LO]{\ACM@linecountL}%
2116     \fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2117   \or % acmtog
2118     \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2119     \@acmNumber, Article \@acmArticle.  Publication date:
2120     \@acmPubDate.}%
2121     \fancyhead[L]{\ACM@linecountL}%
2122     \fancyhead[R]{\ACM@linecountR}%
```

```
2123  \else % Conference proceedings
2124    \fancyhead[L]{\ACM@linecountL}%
2125    \fancyhead[R]{\ACM@linecountR}%
2126    \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2127  \fi
2128  \if@ACM@timestamp
2129    \ifnum\ACM@format@nr=0\relax % Manuscript
2130    \fancyfoot[LO,RE]{\ACM@timestamp\quad
2131      \footnotesize Manuscript submitted to ACM}
2132    \else
2133    \fancyfoot[LO,RE]{\ACM@timestamp}
2134    \fi
2135  \fi
2136 }
```

3.15 Sectioning

Sectioning is different for different levels

```
2137 \renewcommand\section{\@startsection{section}{1}{\z@}%
2138    {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2139    {.25\baselineskip}%
2140    {\@secfont}}
2141 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2142    {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2143    {.25\baselineskip}%
2144    {\@subsecfont}}
2145 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{10pt}%
2146    {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2147    {-3.5\p@}%
2148    {\@subsubsecfont\@adddotafter}}
2149 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
2150    {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2151    {-3.5\p@}%
2152    {\@parfont\@adddotafter}}
2153 \renewcommand\part{\@startsection{part}{9}{\z@}%
2154    {-10\p@ \@plus -4\p@ \@minus -2\p@}%
2155    {4\p@}%
2156    {\@parfont}}
```

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

```
2157 \def\section@raggedright{\@rightskip\@flushglue
2158    \rightskip\@rightskip
2159    \leftskip\z@skip
2160    \parindent\z@}
```

\@secfont   Fonts for sections etc. are different for different formats.
\@subsecfont
\@subsubsecfont `2161 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeUppercase}`
\@parfont   `2162 \def\@subsecfont{\sffamily\bfseries\section@raggedright}`
                `2163 \def\@subsubsecfont{\sffamily\itshape}`

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```
2164 \def\@parfont{\itshape}
2165 \setcounter{secnumdepth}{3}
2166 \ifcase\ACM@format@nr
2167 \relax % manuscript
2168 \or % acmsmall
2169 \or % acmlarge
2170 \def\@secfont{\sffamily\large\section@raggedright\MakeUppercase}
2171 \def\@subsecfont{\sffamily\large\section@raggedright}
2172 \or % acmtog
2173 \def\@secfont{\sffamily\large\section@raggedright\MakeUppercase}
2174 \def\@subsecfont{\sffamily\large\section@raggedright}
2175 \or % sigconf
2176 \def\@secfont{\bfseries\Large\section@raggedright\MakeUppercase}
2177 \def\@subsecfont{\bfseries\Large\section@raggedright}
2178 \or % siggraph
2179 \def\@secfont{\bfseries\sffamily\Large\section@raggedright\MakeUppercase}
2180 \def\@subsecfont{\bfseries\sffamily\Large\section@raggedright}
2181 \or % sigplan
2182 \def\@secfont{\bfseries\Large\section@raggedright}
2183 \def\@subsecfont{\bfseries\section@raggedright}
2184 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2185   {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2186   {.25\baselineskip}%
2187   {\@subsubsecfont}}
2188 \def\@subsubsecfont{\bfseries\section@raggedright}
2189 \renewcommand\paragraph{\@startsection{paragraph}{4}{\z@}%
2190   {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2191   {-3.5\p@}%
2192   {\@parfont\@addspaceafter}}
2193 \def\@parfont{\bfseries\itshape}
2194 \renewcommand\subparagraph{\@startsection{subparagraph}{5}{\z@}%
2195   {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2196   {-3.5\p@}%
2197   {\@subparfont\@addspaceafter}}
2198 \def\@subparfont{\itshape}
2199 \or % sigchi
2200 \setcounter{secnumdepth}{1}
2201 \def\@secfont{\bfseries\sffamily\section@raggedright\MakeUppercase}
2202 \def\@subsecfont{\bfseries\sffamily\section@raggedright}
2203 \or % sigchi-a
2204 \setcounter{secnumdepth}{0}
2205 \def\@secfont{\bfseries\sffamily\section@raggedright\MakeUppercase}
2206 \def\@subsecfont{\bfseries\sffamily\section@raggedright}
2207 \fi
```

\@adddotafter   Add punctuation after the command

```
2208 \def\@adddotafter#1{#1\@addpunct{.}}
```

\@addspaceafter   Add space after the command

```
2209 \def\@addspaceafter#1{#1\@addpunct{\enspace}}
```

3.16 TOC Lists

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

2210 \providecommand*\@dotsep{4.5}

3.17 Theorems

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

2211 \def\@acmplainbodyfont{\itshape}

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

2212 \def\@acmplainindent{\parindent}

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

2213 \def\@acmplainheadfont{\scshape}

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

2214 \def\@acmplainnotefont{\@empty}

Customization of acmplain theorem style:

```
2215 \ifcase\ACM@format@nr
2216 \relax % manuscript
2217 \or % acmsmall
2218 \or % acmlarge
2219 \or % acmtog
2220 \or % sigconf
2221 \or % siggraph
2222 \or % sigplan
2223   \def\@acmplainbodyfont{\itshape}
2224   \def\@acmplainindent{\z@}
2225   \def\@acmplainheadfont{\bfseries}
2226   \def\@acmplainnotefont{\normalfont}
2227 \or % sigchi
2228 \or % sigchi-a
2229 \fi
```

acmplain   The acmplain theorem style

```
2230 \newtheoremstyle{acmplain}%
2231  {.5\baselineskip\@plus.2\baselineskip
2232    \@minus.2\baselineskip}% space above
2233  {.5\baselineskip\@plus.2\baselineskip
2234    \@minus.2\baselineskip}% space below
2235  {\@acmplainbodyfont}% body font
2236  {\@acmplainindent}% indent amount
2237  {\@acmplainheadfont}% head font
```

```
2238    {.}% punctuation after head
2239    {.5em}% spacing after head
2240    {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont(#3)}}}}% head spec
```

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

```
2241 \def\@acmdefinitionbodyfont{\normalfont}
```

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

```
2242 \def\@acmdefinitionindent{\parindent}
```

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

```
2243 \def\@acmdefinitionheadfont{\itshape}
```

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

```
2244 \def\@acmdefinitionnotefont{\@empty}
```

Customization of acmdefinition theorem style:

```
2245 \ifcase\ACM@format@nr
2246 \relax % manuscript
2247 \or % acmsmall
2248 \or % acmlarge
2249 \or % acmtog
2250 \or % sigconf
2251 \or % siggraph
2252 \or % sigplan
2253    \def\@acmdefinitionbodyfont{\normalfont}
2254    \def\@acmdefinitionindent{\z@}
2255    \def\@acmdefinitionheadfont{\bfseries}
2256    \def\@acmdefinitionnotefont{\normalfont}
2257 \or % sigchi
2258 \or % sigchi-a
2259 \fi
```

acmdefinition   The acmdefinition theorem style

```
2260 \newtheoremstyle{acmdefinition}%
2261    {.5\baselineskip\@plus.2\baselineskip
2262      \@minus.2\baselineskip}% space above
2263    {.5\baselineskip\@plus.2\baselineskip
2264      \@minus.2\baselineskip}% space below
2265    {\@acmdefinitionbodyfont}% body font
2266    {\@acmdefinitionindent}% indent amount
2267    {\@acmdefinitionheadfont}% head font
2268    {.}% punctuation after head
2269    {.5em}% spacing after head
2270    {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmdefinitionnotefont(#3)}}}}% head spec
```

The definitions for theorems:

```
2271 \theoremstyle{acmplain}
2272 \newtheorem{theorem}{Theorem}[section]
```

```
2273 \newtheorem{conjecture}[theorem]{Conjecture}
2274 \newtheorem{proposition}[theorem]{Proposition}
2275 \newtheorem{lemma}[theorem]{Lemma}
2276 \newtheorem{corollary}[theorem]{Corollary}
2277 \theoremstyle{acmdefinition}
2278 \newtheorem{example}[theorem]{Example}
2279 \newtheorem{definition}[theorem]{Definition}
2280 \theoremstyle{acmplain}
```

\@proofnamefont   The font to typeset the proof name.

```
2281 \def\@proofnamefont{\scshape}
```

\@proofindent   Whether or not to indent proofs.

```
2282 \def\@proofindent{\indent}
```

Customization of proof environment.

```
2283 \ifcase\ACM@format@nr
2284 \relax % manuscript
2285 \or % acmsmall
2286 \or % acmlarge
2287 \or % acmtog
2288 \or % sigconf
2289 \or % siggraph
2290 \or % sigplan
2291   \def\@proofnamefont{\itshape}
2292   \def\@proofindent{\noindent}
2293 \or % sigchi
2294 \or % sigchi-a
2295 \fi
```

proof   We want some customization of proof environment.

```
2296 \renewenvironment{proof}[1][\proofname]{\par
2297   \pushQED{\qed}%
2298   \normalfont \topsep6\p@\@plus6\p@\relax
2299   \trivlist
2300   \item[\@proofindent\hskip\labelsep
2301         {\@proofnamefont #1\@addpunct{.}}]\ignorespaces
2302 }{%
2303   \popQED\endtrivlist\@endpefalse
2304 }
```

3.18   Acknowledgments

\acks   This is a comment-like structure

```
2305 \specialcomment{acks}{%
2306   \begingroup
2307   \section*{Acknowledgments}
2308   \phantomsection\addcontentsline{toc}{section}{Acknowledgments}
2309 }{%
```

```
2310    \endgroup
2311 }
```

\grantsponsor   We just typeset the name of the sponsor

```
2312 \def\grantsponsor#1#2#3{#2}
```

\grantnum

```
2313 \newcommand\grantnum[3][]{#3%
2314    \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}
```

3.19   Conditional typesetting

We use the comment package for conditional typesetting:

```
2315 \if@ACM@screen
2316    \includecomment{screenonly}
2317    \excludecomment{printonly}
2318 \else
2319    \excludecomment{screenonly}
2320    \includecomment{printonly}
2321 \fi
2322 \if@ACM@anonymous
2323    \excludecomment{anonsuppress}
2324    \excludecomment{acks}
2325 \else
2326    \includecomment{anonsuppress}
2327 \fi
```

3.20   Additional bibliography commands

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

```
2328 \newcommand\showeprint[2][arxiv]{%
2329    \def\@tempa{#1}%
2330    \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
2331    \def\@tempb{arxiv}%
2332    \ifx\@tempa\@tempb
2333       arXiv:\href{http://arxiv.org/abs/#2}{#2}\else arXiv:#2%
2334    \fi}
```

3.21   End of Class

```
2335 \normalsize\normalfont\frenchspacing
2336 ⟨/class⟩
```

References