

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

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Abstract

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

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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 profession¹. It was one of the early adopters of T_EX 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 L^AT_EX package.

The package uses only free T_EX packages and fonts included in T_EXLive, MikT_EX and other popular T_EX distributions. It is intended to be published in these distributions itself, which minimizes users' efforts in the installation and support of 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 T_EX 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 T_EX distributions to provide it. If you decide to install the package yourself, follow the standard rules:

1. Run `latex onacmart.ins`. This will produce the file `acmart.cls`.
2. Put the file `acmart.cls` and the bibliography files `*.bst` to the places where L^AT_EX can find them (see [1] or the documentation for your T_EX system).
3. Update the database of file names. Again, see [1] or the documentation for your T_EX 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).

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 T_EX distributions (T_EXLive, MacT_EX, MikT_EX) of 2015 and later, so you probably have them installed. Just in case here is the list of these packages:

- *amscs*, <http://www.ctan.org/pkg/amscs>
- *amsfonts*, <http://www.ctan.org/pkg/amsfonts>
- *amsmath*, <http://www.ctan.org/pkg/amsmath>
- *binhex*, <http://www.ctan.org/pkg/binhex>
- *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, TRET, TSAS, TSC, TSLP, TWEB, including special issues.
acmlarge	Large single column format, used for IMWUT, JOCCH, PACMPL, POMACS, 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 BibTeX 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 overridden 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` [2].

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

```
\acmJournal{TOMS}
```

The currently recognized journals are listed in Table 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}
```

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

`\subtitle` It is expected that this command is inserted by the author of the manuscript.
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 ORCID, <http://www.orcid.org/>), `\affiliation` and `\email`. In the simplest case you enter them in this order:

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

Do *not* use `\TeX` `\and` macro! Each author deserves his or her own `\author` command.

Note that some formats do not typeset 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 overlapping 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, \dots). 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.

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

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

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

and

```
\affiliation{%
\department{Department of Lunar Studies} % Not 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
Sonnenallee 17
123456, Helm, Germany
```

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

```

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

```

will be typeset as

```

Fluginstitut
Sonnenallee 17
123456 Helm, Germany

```

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

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

`\thanks` Like `amsart` (and unlike standard \TeX), 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 corresponding
commands (`\title`, `\subtitle` and `\author`) generate such notes, for example

```

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

```

Please never use `\footnotes` inside `\author` or `\title` commands, since this confuses 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` correspondingly. The arguments of all these commands, including `\acmMonth` is numerical,
`\acmYear` including `\acmMonth`, for example,
`\acmMonth`

```

\acmVolume{9}

```

	<pre> \acmNumber{4} \acmArticle{39} \acmYear{2010} \acmMonth{3} </pre>
\acmArticleSeq	<p>The articles in the same issue of a journal have a <i>sequential number</i>. It is used to vertically position the black blob in some formats. By default it is the same as article number, but the command <code>\acmArticleSeq{<n>}</code> can be used to change it:</p> <pre> \acmArticle{39} % The sequence number will be 39 by default \acmArticleSeq{5} % We redefine it to 5 </pre>
\acmSubmissionID	<p>If you paper got a Submission ID from the Conference Management System, put it here:</p> <pre> \acmSubmissionID{123-A56-BU3} </pre>
\acmPrice	<p>The macro <code>\acmPrice{<price>}</code> sets the price for the article (by default 15.00), for example,</p> <pre> \acmPrice{25.00} </pre>
\acmISBN	<p>Book-like volumes have ISBN numbers attached to them. The macro <code>\acmISBN{<ISBN>}</code> sets it. Normally it is set by the typesetter, for example,</p> <pre> \acmISBN{978-1-4503-3916-2} </pre>
\acmDOI	<p>The macro <code>\acmDOI{<DOI>}</code> sets the DOI number of the article, for example,</p> <pre> \acmDOI{10.1145/9999997.9999999} </pre>
\acmBadgerR \acmBadgerL	<p>It is normally set by the typesetter.</p> <p>Some conference articles get special distinction, for example, the artifact evaluation 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: <code>\acmBadgerR[<url>]{<graphics>}</code> and <code>\acmBadgerL[<url>]{<graphics>}</code>. The first command puts the badge to the right of the title, and the second one—to the left. The exception is the <code>sigchi</code>—a mode for SIGCHI Extended abstract, which puts the badges on the left margin. The argument have the following meaning: <code>[<url>]</code>, if provided, sets the link to the badge authority in the screen version, while <code>{<graphics>}</code> sets the graphics file with the badge image. The file must be a cropped square, which is scaled to a standard size in the output. For example, if the badge image is <code>ae-logo.pdf</code>, the command is</p> <pre> \acmBadgerR[http://ctuning.org/ae/ppopp2016.html]{ae-logo} </pre>

`\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 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}
\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:

Table 4: Parameters for `\setcopyright` command

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

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 permission 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 .

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

```
\begin{teaserfigure}
```


Table 5: Settings for `\settopmatter` command

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

```

\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 [3, 4, 5], 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 [6] and follow its main principles of typography with respect to tables:

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

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

For table *footnotes* you have several options described in TeX FAQ [1]. 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\end{tabular}
\end{center}
\end{minipage}
\end{table}
```

```

Routing Layer & GF\\
MAC Layer & CSMA/MMSN\\
Radio Layer & RADIO-ACCNOISE\\
Radio Bandwidth & 250Kbps\\
Radio Range & 20m--45m\\
\bottomrule
\end{tabular}
\end{center}
\bigskip
\footnotesize\emph{Source:} This is a table
sourcernote. This is a table sourcernote. This is a table
sourcernote.

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

```

sidebar
marginfigure
margintable

 SIGCHI extended 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

printonly
screenonly

 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 typeset 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{acks}` 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:

```

\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 include 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 Bib_{TeX} 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 Bib_{TeX} styles other than `ACM-Reference-Format.bst`, and may delay the processing of the manuscript.

`\citestyle` If you use *natbib*, you can select one of two predefined citation styles: 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 Bib_{TeX} 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/hypertext/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 bibliography 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 [7]: `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* [8] is recommended for complex figures with several subplots or subfigures that require separate subcaptioning. The packages *nomencl* [9] and *glossaries* [10] can be used for the automatic creation of the lists of symbols and concepts used.

By default *acmart* prevents all widows and orphans (i.e. lonely lines at the beginning 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 [2017/04/09 v1.34 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

```

```

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

\l@section Amsart has too large spacing
380 \def\l@section{\@tocline{2}{0pt}{1pc}{3pc}{}}

\l@subsection Amsart has too large spacing
381 \def\l@subsection{\@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\cite\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 \TeX 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 [7]:

```

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}}

\@makefnmark We do not use indentation for footnotes
554 \def\@makefnmark{\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     \@makefnmark{%
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       \@makefnmark{%
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\@fpsaddddefault{\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 TRETTS,%
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 % TRET
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 orcid's 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{}

```

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

```

1100 \long\def\@empty{}

```

`\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
\texttrightarrow):
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}\texttrightarrow\ }%
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 owns 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 \fi
1187 \ifnum\acm@copyrightmode=4\relax % usgov
1188 \@printpermissiontrue
1189 \@printcopyrightfalse
1190 \@acmownedfalse
1191 \fi
1192 \ifnum\acm@copyrightmode=6\relax % cagov
1193 \@acmownedfalse
1194 \fi
1195 \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1196 \@acmownedfalse
1197 \fi
1198 \ifnum\acm@copyrightmode=9\relax % licensedcagovmixed
1199 \@acmownedfalse
1200 \fi
1201 \ifnum\acm@copyrightmode=10\relax % othergov
1202 \@acmownedtrue
1203 \fi
1204 \ifnum\acm@copyrightmode=11\relax % licensedothergov
1205 \@acmownedfalse
1206 \fi}

```

\setcopyright This is the syntactic sugar around setting keys.

```

1207 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
1208 \setcopyright{acmcopyright}

```

\@copyrightowner Here is the owner of the copyright

```

1209 \def\@copyrightowner{%
1210 \ifcase\acm@copyrightmode\relax % none
1211 \or % acmcopyright
1212 Association for Computing Machinery.
1213 \or % acmlicensed
1214 Copyright held by the owner/author(s). Publication rights licensed to
1215 Association for Computing Machinery.
1216 \or % rightsretained
1217 Copyright held by the owner/author(s).
1218 \or % usgov
1219 \or % usgovmixed
1220 Association for Computing Machinery.
1221 \or % cagov
1222 Crown in Right of Canada.
1223 \or %cagovmixed
1224 Association for Computing Machinery.
1225 \or %licensedusgovmixed
1226 Copyright held by the owner/author(s). Publication rights licensed to
1227 Association for Computing Machinery.
1228 \or %licensedcagovmixed
1229 Copyright held by the owner/author(s). Publication rights licensed to

```



```

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

```

\@formatdoi Print a clickable doi

```

1237 \def\@formatdoi#1{\url{https://doi.org/#1}}

```

\@copyrightpermission The canned permission block.

```

1238 \def\@copyrightpermission{%
1239 \ifcase\acm@copyrightmode\relax % none
1240 \or % acmcopyright
1241 Permission to make digital or hard copies of all or part of this
1242 work for personal or classroom use is granted without fee provided
1243 that copies are not made or distributed for profit or commercial
1244 advantage and that copies bear this notice and the full citation on
1245 the first page. Copyrights for components of this work owned by
1246 others than ACM must be honored. Abstracting with credit is
1247 permitted. To copy otherwise, or republish, to post on servers or to
1248 redistribute to lists, requires prior specific permission
1249 and\hspace*{.5pt}/or a fee. Request permissions from
1250 permissions@acm.org.
1251 \or % acmlicensed
1252 Permission to make digital or hard copies of all or part of this
1253 work for personal or classroom use is granted without fee provided
1254 that copies are not made or distributed for profit or commercial
1255 advantage and that copies bear this notice and the full citation on
1256 the first page. Copyrights for components of this work owned by
1257 others than the author(s) must be honored. Abstracting with credit
1258 is permitted. To copy otherwise, or republish, to post on servers
1259 or to redistribute to lists, requires prior specific permission
1260 and\hspace*{.5pt}/or a fee. Request permissions from
1261 permissions@acm.org.
1262 \or % rightsretained
1263 Permission to make digital or hard copies of part or all of this work
1264 for personal or classroom use is granted without fee provided that
1265 copies are not made or distributed for profit or commercial advantage
1266 and that copies bear this notice and the full citation on the first
1267 page. Copyrights for third-party components of this work must be
1268 honored. For all other uses, contact the
1269 owner\hspace*{.5pt}/author(s).
1270 \or % usgov
1271 This paper is authored by an employee(s) of the United States
1272 Government and is in the public domain. Non-exclusive copying or
1273 redistribution is allowed, provided that the article citation is
1274 given and the authors and agency are clearly identified as its
1275 source.

```

1276 \or % usgovmixed
1277 ACM acknowledges that this contribution was authored or co-authored
1278 by an employee, or contractor of the national government. As such,
1279 the Government retains a nonexclusive, royalty-free right to
1280 publish or reproduce this article, or to allow others to do so, for
1281 Government purposes only. Permission to make digital or hard copies
1282 for personal or classroom use is granted. Copies must bear this
1283 notice and the full citation on the first page. Copyrights for
1284 components of this work owned by others than ACM must be
1285 honored. To copy otherwise, distribute, republish, or post,
1286 requires prior specific permission and\hspace*{.5pt}/or a
1287 fee. Request permissions from permissions@acm.org.

1288 \or % cagov
1289 This article was authored by employees of the Government of Canada.
1290 As such, the Canadian government retains all interest in the
1291 copyright to this work and grants to ACM a nonexclusive,
1292 royalty-free right to publish or reproduce this article, or to allow
1293 others to do so, provided that clear attribution is given both to
1294 the authors and the Canadian government agency employing them.
1295 Permission to make digital or hard copies for personal or classroom
1296 use is granted. Copies must bear this notice and the full citation
1297 on the first page. Copyrights for components of this work owned by
1298 others than the Canadian Government must be honored. To copy
1299 otherwise, distribute, republish, or post, requires prior specific
1300 permission and\hspace*{.5pt}/or a fee. Request permissions from
1301 permissions@acm.org.

1302 \or % cagovmixed
1303 ACM acknowledges that this contribution was co-authored by an
1304 affiliate of the national government of Canada. As such, the Crown
1305 in Right of Canada retains an equal interest in the copyright.
1306 Reprints must include clear attribution to ACM and the author's
1307 government agency affiliation. Permission to make digital or hard
1308 copies for personal or classroom use is granted. Copies must bear
1309 this notice and the full citation on the first page. Copyrights for
1310 components of this work owned by others than ACM must be honored.
1311 To copy otherwise, distribute, republish, or post, requires prior
1312 specific permission and\hspace*{.5pt}/or a fee. Request permissions
1313 from permissions@acm.org.

1314 \or % licensedusgovmixed
1315 Publication rights licensed to ACM\@. ACM acknowledges that this
1316 contribution was authored or co-authored by an employee, contractor
1317 or affiliate of the United States government. As such, the
1318 Government retains a nonexclusive, royalty-free right to publish or
1319 reproduce this article, or to allow others to do so, for Government
1320 purposes only.

1321 \or % licensedcagovmixed
1322 Publication rights licensed to ACM\@. ACM acknowledges that this
1323 contribution was authored or co-authored by an employee, contractor
1324 or affiliate of the national government of Canada. As such, the
1325 Government retains a nonexclusive, royalty-free right to publish or

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

\copyrightyear By default, the copyright year is the same as \acmYear, but one can override this:
1342 \def\copyrightyear#1{\def\copyrightyear{#1}}
1343 \copyrightyear{\@acmYear}

\@teaserfigures The teaser figures container
1344 \def\@teaserfigures{}

teaserfigure The teaser figure
1345 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}

\@saveteaser Saving the teaser
1346 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}

\thanks We redefine amsart \thanks, so the anonymous key works
1347 \renewcommand{\thanks}[1]{%
1348 \ifnotempty{#1}{%
1349 \if@ACM@anonymous
1350 \g@addto@macro\thankses{\thanks{A note}}%
1351 \else
1352 \g@addto@macro\thankses{\thanks{#1}}%
1353 \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>*].
1354 \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 copy-right/permission block. By the way, this was the default behavior of the old ACM classes.

```

1355 \def\maketitle{%
1356   \if@ACM@anonymous
1357     % Anonymize omission of \author-s
1358     \ifnum\num@authorgroups=0\author{}\fi
1359   \fi
1360   \begingroup
1361   \let\@footnotemark\@footnotemark@nolink
1362   \let\@footnotetext\@footnotetext@nolink
1363   \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1364   \global\@topnum\z@ % this prevents floats from falling
1365                       % at the top of page 1
1366   \global\@botnum\z@ % we do not want them to be on bottom either
1367   \hsize=\textwidth
1368   \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1369   \@mktitle\if@ACM@sigchiamode\else\mkauthors\fi\mkteasers
1370   \@printtopmatter
1371   \if@ACM@sigchiamode\mkauthors\fi
1372   \setcounter{footnote}{0}%
1373   \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1374   \@titlenotes
1375   \@subtitlenotes
1376   \@authornotes
1377   \let\@makefnmark\relax \let\@thefnmark\relax
1378   \let\@makefnmark\relax \let\@thefnmark\relax
1379   \ifx\@empty\thankses\else
1380     \footnotetextcopyrightpermission{%
1381       \def\par{\let\par\@par}\parindent\z@\@setthanks}%
1382     \fi
1383   \footnotetextcopyrightpermission{%
1384     \if@ACM@authordraft
1385       \raisebox{-2ex}{\z@}{\z@}{\makebox[0pt][l]{\large\bfseries
1386         Unpublished
1387         working draft. Not for distribution}}}%
1388     \color[gray]{0.9}%
1389     \fi
1390     \parindent\z@\parskip0.1\baselineskip
1391     \if@ACM@authorversion\else
1392       \if@printpermission\@copyrightpermission\par\fi
1393     \fi
1394     \if@ACM@manuscript\else
1395       \if@ACM@journal\else % Print the conference information
1396         {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
1397       \fi
1398     \fi
1399     \if@printcopyright
1400       \copyright\ \@copyrightyear\ \@copyrightowner\

```

```

1401 \else
1402   \@copyrightyear.\
1403 \fi
1404 \if@ACM@manuscript
1405   Manuscript submitted to ACM\
1406 \else
1407   \if@ACM@authorversion
1408     This is the author's version of the work. It is posted here for
1409     your personal use. Not for redistribution. The definitive Version
1410     of Record was published in
1411     \if@ACM@journal
1412       \emph{\@journalName}%
1413     \else
1414       \emph{Proceedings of \@acmConference@name, \@acmConference@date}%
1415     \fi
1416     \ifx\@acmDOI\@empty
1417       .
1418     \else
1419       , \@formatdoi{\@acmDOI}.
1420     \fi\
1421   \else
1422     \if@ACM@journal
1423       \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle\
1424       \$\@acmPrice\
1425       \@formatdoi{\@acmDOI}%
1426     \else % Conference
1427       ACM~ISBN~\@acmISBN
1428       \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\
1429       \@formatdoi{\@acmDOI}%
1430     \fi
1431   \fi
1432 \fi}
1433 \endgroup
1434 \setcounter{footnote}{0}%
1435 \@mkabstract
1436 \if@ACM@printccs
1437   \ifx\@concepts\@empty\else\bgroup
1438     {\@specialsection{CCS Concepts}%
1439     \@concepts\par}\egroup
1440   \fi
1441 \fi
1442 \ifx\@keywords\@empty\else\bgroup
1443   {\if@ACM@journal
1444     \@specialsection{Additional Key Words and Phrases}%
1445   \else
1446     \@specialsection{Keywords}%
1447   \fi
1448   \@keywords}\par\egroup
1449 \fi
1450 \andify\authors

```

```

1451 \andify\shortauthors
1452 \global\let\authors=\authors
1453 \global\let\shortauthors=\shortauthors
1454 \if@ACM@printacmref
1455     \mkbibcitation
1456 \fi
1457 \hypersetup{pdfauthor={\authors},
1458     pdftitle={\@title}, pdfkeywords={\@concepts}}%
1459 \@printendtopmatter
1460 \@afterindentfalse
1461 \@afterheading
1462 }

```

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

```

1463 \def\@specialsection#1{%
1464     \ifcase\ACM@format@nr
1465     \relax % manuscript
1466     \par\medskip\small\noindent#1: %
1467     \or % acmsmall
1468     \par\medskip\small\noindent#1: %
1469     \or % acmlarge
1470     \par\medskip\small\noindent#1: %
1471     \or % acmtog
1472     \par\medskip\small\noindent#1: %
1473     \or % sigconf
1474     \section*{#1}%
1475     \or % siggraph
1476     \section*{#1}%
1477     \or % sigplan
1478     \paragraph*{#1}%
1479     \or % sigchi
1480     \section*{#1}%
1481     \or % sigchi-a
1482     \section*{#1}%
1483     \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 \mkttitle since we want them on the margins.

```

1484 \def\@printtopmatter{%
1485     \ifx\@startPage\@empty
1486     \gdef\@startPage{1}%
1487     \else
1488     \setcounter{page}{\@startPage}%
1489     \fi
1490     \thispagestyle{firstpagestyle}%
1491     \noindent
1492     \ifcase\ACM@format@nr
1493     \relax % manuscript

```

```

1494 \box\mktitle@bx\par
1495 \noindent\hrulefill\par
1496 \or % acmsmall
1497 \box\mktitle@bx\par
1498 \noindent\hrulefill\par
1499 \or % acmlarge
1500 \box\mktitle@bx\par
1501 \noindent\hrulefill\par
1502 \or % acmtog
1503 \twocolumn[\box\mktitle@bx]%
1504 \or % sigconf
1505 \twocolumn[\box\mktitle@bx]%
1506 \or % siggraph
1507 \twocolumn[\box\mktitle@bx]%
1508 \or % sigplan
1509 \twocolumn[\box\mktitle@bx]%
1510 \or % sigchi
1511 \twocolumn[\box\mktitle@bx]%
1512 \or % sigchi-a
1513 \par\box\mktitle@bx\par\bigskip
1514 \if@ACM@badge
1515 \marginpar{\noindent
1516 \ifx\@acmBadgeL@image\empty\else
1517 \href{\@acmBadgeL@url}{%
1518 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
1519 \hskip\@ACM@badge@skip
1520 \fi
1521 \ifx\@acmBadgeR@image\empty\else
1522 \href{\@acmBadgeR@url}{%
1523 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%
1524 \fi}%
1525 \fi
1526 \fi
1527 }

```

\@mktitle The title of the article

```

1528 \def\@mktitle{%
1529 \ifcase\ACM@format@nr
1530 \relax % manuscript
1531 \@mktitle@i
1532 \or % acmsmall
1533 \@mktitle@i
1534 \or % acmlarge
1535 \@mktitle@i
1536 \or % acmtog
1537 \@mktitle@i
1538 \or % sigconf
1539 \@mktitle@iii
1540 \or % siggraph
1541 \@mktitle@iii

```

```

1542 \or % sigplan
1543     \@mktitle@iii
1544 \or % sigchi
1545     \@mktitle@iii
1546 \or % sigchi-a
1547     \@mktitle@iv
1548 \fi
1549 }

\@titlefont The font to typeset title
1550 \def\@titlefont{%
1551     \ifcase\ACM@format@nr
1552     \relax % manuscript
1553     \LARGE\bfseries\sffamily
1554     \or % acmsmall
1555     \LARGE\bfseries\sffamily
1556     \or % acmlarge
1557     \LARGE\bfseries\sffamily
1558     \or % acmtog
1559     \Huge\sffamily
1560     \or % sigconf
1561     \Huge\sffamily\bfseries
1562     \or % siggraph
1563     \Huge\sffamily\bfseries
1564     \or % sigplan
1565     \Huge\bfseries
1566     \or % sigchi
1567     \Huge\sffamily\bfseries
1568     \or % sigchi-a
1569     \Huge\bfseries
1570     \fi}

\@subtitlefont The font to typeset title
1571 \def\@subtitlefont{\normalsize
1572     \ifcase\ACM@format@nr
1573     \relax % manuscript
1574     \mdseries
1575     \or % acmsmall
1576     \mdseries
1577     \or % acmlarge
1578     \mdseries
1579     \or % acmtog
1580     \LARGE
1581     \or % sigconf
1582     \LARGE\mdseries
1583     \or % siggraph
1584     \LARGE\mdseries
1585     \or % sigplan
1586     \LARGE\mdseries
1587     \or % sigchi

```



```

1588     \LARGE\mdseries
1589     \or % sigchi-a
1590     \mdseries
1591     \fi}

\mktitle@i The version of \mktitle for most journals
1592 \def\mktitle@i{\hsize=\textwidth
1593   \@ACM@title@width=\hsize
1594   \ifx\@acmBadgeL@image\@empty\else
1595     \advance\@ACM@title@width by -\@ACM@badge@width
1596     \advance\@ACM@title@width by -\@ACM@badge@skip
1597   \fi
1598   \ifx\@acmBadgeR@image\@empty\else
1599     \advance\@ACM@title@width by -\@ACM@badge@width
1600     \advance\@ACM@title@width by -\@ACM@badge@skip
1601   \fi
1602   \setbox\mktitle@bx=\vbox{\noindent\@titlefont
1603     \ifx\@acmBadgeL@image\@empty\else
1604       \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1605         \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1606       \hskip\@ACM@badge@skip
1607     \fi
1608     \parbox[t]{\@ACM@title@width}{\raggedright
1609       \@titlefont\noindent
1610       \@title
1611       \ifx\@subtitle\@empty\else
1612         \par\noindent{\@subtitlefont\@subtitle}
1613       \fi}%
1614     \ifx\@acmBadgeR@image\@empty\else
1615       \hskip\@ACM@badge@skip
1616       \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1617         \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1618     \fi
1619     \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.
1620 \def\mktitle@iii{\hsize=\textwidth
1621   \setbox\mktitle@bx=\vbox{\@titlefont\centering
1622     \@ACM@title@width=\hsize
1623     \if@ACM@badge
1624       \advance\@ACM@title@width by -2\@ACM@badge@width
1625       \advance\@ACM@title@width by -2\@ACM@badge@skip
1626       \parbox[b]{\@ACM@badge@width}{\strut
1627         \ifx\@acmBadgeL@image\@empty\else
1628           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1629             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1630         \fi}%

```

```

1631      \hskip\@ACM@badge@skip
1632    \fi
1633    \parbox[t]{\@ACM@title@width}{\centering\@titlefont
1634      \@title
1635      \ifx\@subtitle\@empty\else
1636        \par\noindent{\@subtitlefont\@subtitle}
1637      \fi
1638    }%
1639    \if@ACM@badge
1640      \hskip\@ACM@badge@skip
1641      \parbox[b]{\@ACM@badge@width}{\strut
1642        \ifx\@acmBadgeR@image\@empty\else
1643          \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1644            \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1645        \fi}%
1646      \fi
1647    \par\bigskip}}%

```

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

```

1648 \def\@mktitle@iv{\hsize=\textwidth
1649   \setbox\mktitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
1650     \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
1651     \noindent\@title
1652     \ifx\@subtitle\@empty\else
1653       \par\noindent\@subtitlefont\@subtitle
1654     \fi
1655     \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.

```

1656 \newbox\@ACM@commabox
1657 \def\@ACM@addtoaddress#1{%
1658   \ifvmode\else
1659     \if@ACM@affiliation@obeypunctuation\else
1660       \setbox\@ACM@commabox=\hbox{, }%
1661       \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
1662     \fi\fi
1663   #1}

```

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

`\city`
`\state`
`\postcode`
`\country`

```

1664 \if@ACM@journal
1665   \let\position\@gobble
1666   \def\institution#1{#1\ignorespaces}%
1667   \newcommand\department[2][0]{}%
1668   \let\streetaddress\@gobble
1669   \let\city\@gobble
1670   \let\state\@gobble
1671   \let\postcode\@gobble
1672   \let\country\@gobble
1673 \else
1674   \def\position#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
1675   \def\institution#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
1676   \newcommand\department[2][0]{\if@ACM@affiliation@obeypunctuation
1677     #2\else#2\par\fi}%
1678   \def\streetaddress#1{\if@ACM@affiliation@obeypunctuation#1\else#1\par\fi}%
1679   \let\city\@ACM@addtoaddress
1680   \let\state\@ACM@addtoaddress
1681   \def\postcode#1{\if@ACM@affiliation@obeypunctuation#1\else\unskip\space#1\fi}%
1682   \let\country\@ACM@addtoaddress
1683 \fi

```

\@mkauthors Typesetting authors

```

1684 \def\@mkauthors{\begingroup
1685   \hsize=\textwidth
1686   \ifcase\ACM@format@nr
1687     \relax % manuscript
1688     \@mkauthors@i
1689   \or % acmsmall
1690     \@mkauthors@i
1691   \or % acmlarge
1692     \@mkauthors@i
1693   \or % acmtog
1694     \@mkauthors@i
1695   \or % sigconf
1696     \@mkauthors@iii
1697   \or % siggraph
1698     \@mkauthors@iii
1699   \or % sigplan
1700     \@mkauthors@iii
1701   \or % sigchi
1702     \@mkauthors@iii
1703   \or % sigchi-a
1704     \@mkauthors@iv
1705   \fi
1706   \endgroup
1707 }

```

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

```

1708 \def\@authorfont{\Large\sffamily}

```

`\@affiliationfont` Font for affiliations

```
1709 \def\@affiliationfont{\normalsize\normalfont}
```

Adjusting fonts for different formats

```
1710 \ifcase\ACM@format@nr
1711 \relax % manuscript
1712 \or % acmsmall
1713   \def\@authorfont{\large\sffamily}
1714   \def\@affiliationfont{\small\normalfont}
1715 \or % acmlarge
1716 \or % acmtog
1717   \def\@authorfont{\LARGE\sffamily}
1718   \def\@affiliationfont{\large}
1719 \or % sigconf
1720   \def\@authorfont{\LARGE}
1721   \def\@affiliationfont{\large}
1722 \or % siggraph
1723   \def\@authorfont{\normalsize\normalfont}
1724   \def\@affiliationfont{\normalsize\normalfont}
1725 \or % sigplan
1726   \def\@authorfont{\Large\normalfont}
1727   \def\@affiliationfont{\normalsize\normalfont}
1728 \or % sigchi
1729   \def\@authorfont{\bfseries}
1730   \def\@affiliationfont{\mdseries}
1731 \or % sigchi-a
1732   \def\@authorfont{\bfseries}
1733   \def\@affiliationfont{\mdseries}
1734 \fi
```

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

```
1735 \def\@typeset@author@line{%
1736   \andify\@currentauthors\par\noindent
1737   \@currentauthors\def\@currentauthors{}%
1738   \ifx\@currentaffiliations\empty\else
1739     \andify\@currentaffiliations
1740     \unskip, {\@currentaffiliations}\par
1741   \fi
1742   \def\@currentaffiliations{}}
```

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

```
1743 \def\@mkauthors@i{%
1744   \def\@currentauthors{}%
1745   \def\@currentaffiliations{}%
1746   \global\let\and\@typeset@author@line
1747   \def\@author##1{%
1748     \ifx\@currentauthors\empty
```

```

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

```

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

\author@bx The box to put individual author to

1773 \newbox\author@bx

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

1774 \newdimen\author@bx@wd

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

1775 \newskip\author@bx@sep

1776 \author@bx@sep=1pc\relax

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

```

1777 \def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd\def\and{\par}%
1778 \global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi
1779 \@authorfont\@currentauthors\par\@affiliationfont
1780 \@currentaffiliation}\egroup
1781 \box\author@bx\hspace{\author@bx@sep}%
1782 \gdef\@currentauthors{}}%
1783 \gdef\@currentaffiliation{}}

```

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

1784 \def\@mkauthors@iii{%

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

```

1785 \author@bx@wd=\textwidth\relax
1786 \advance\author@bx@wd by -\author@bx@sep\relax
1787 \ifcase\num@authorgroups
1788 \relax % 0?
1789 \or % 1=one author per row
1790 \or % 2=two authors per row
1791 \divide\author@bx@wd by \num@authorgroups\relax
1792 \or % 3=three authors per row
1793 \divide\author@bx@wd by \num@authorgroups\relax
1794 \or % 4=two authors per row (!)
1795 \divide\author@bx@wd by 2\relax
1796 \else % three authors per row
1797 \divide\author@bx@wd by 3\relax
1798 \fi
1799 \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of `\addresses`:

```

1800 \gdef\@currentauthors{}%
1801 \gdef\@currentaffiliation{}%
1802 \def\author##1{\ifx\@currentauthors\empty
1803 \gdef\@currentauthors{\par##1}%
1804 \else
1805 \g@addto@macro\@currentauthors{\par##1}%
1806 \fi
1807 \gdef\and{}}%
1808 \def\email##1##2{\ifx\@currentaffiliation\empty
1809 \gdef\@currentaffiliation{\nolinkurl{##2}}%
1810 \else
1811 \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
1812 \fi}%
1813 \def\affiliation##1##2{\ifx\@currentaffiliation\empty
1814 \gdef\@currentaffiliation{%
1815 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1816 \setkeys{@ACM@affiliation@}{##1}##2}%
1817 \else
1818 \g@addto@macro\@currentaffiliation{\par
1819 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1820 \setkeys{@ACM@affiliation@}{##1}##2}%
1821 \fi
1822 \global\let\and\@typeset@author@bx
1823 }%

```

Actual typesetting is done by `\and` macro:

```

1824 \hsize=\textwidth
1825 \global\setbox\mktitle@bx=\vbox{\noindent
1826 \box\mktitle@bx\par\medskip\leavevmode

```

```

1827 \lineskip=1pc\relax\centering\hspace*{-1em}%
1828 \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.

```

1829 \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.

```

1830 \author@bx@wd=\columnwidth\relax
1831 \advance\author@bx@wd by -\author@bx@sep\relax
1832 \ifcase\@num@authorgroups
1833 \relax % 0?
1834 \or % 1=one author per row
1835 \else % 2=two authors per row
1836 \divide\author@bx@wd by 2\relax
1837 \fi
1838 \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of \addresses:

```

1839 \gdef\@currentauthors{}%
1840 \gdef\@currentaffiliation{}%
1841 \def\@author##1{\ifx\@currentauthors\@empty
1842 \gdef\@currentauthors{\par##1}%
1843 \else
1844 \g@addto@macro\@currentauthors{\par##1}%
1845 \fi
1846 \gdef\and{}}%
1847 \def\@email##1##2{\ifx\@currentaffiliation\@empty
1848 \gdef\@currentaffiliation{\nolinkurl{##2}}%
1849 \else
1850 \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
1851 \fi}%
1852 \def\@affiliation##1##2{\ifx\@currentaffiliation\@empty
1853 \gdef\@currentaffiliation{%
1854 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1855 \setkeys{@ACM@affiliation@}{##1}##2}%
1856 \else
1857 \g@addto@macro\@currentaffiliation{\par
1858 \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1859 \setkeys{@ACM@affiliation@}{##1}##2}%
1860 \fi
1861 \global\let\and\@typeset@author@bx}%
1862 %

```

Actual typesetting is done by \and macro

```

1863 \bgroup\hsize=\columnwidth
1864 \par\raggedright\leftskip=\z@

```

```

1865 \lineskip=1pc\noindent
1866 \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}

\@authornotemark Adding footnotemark to authors
1867 \def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark}}

\@mkteasers Typesetting teasers
1868 \def\@mkteasers{%
1869 \ifx\@teaserfigures\@empty\else
1870 \def\@teaser##1{\par\bigskip\bgroup
1871 \captionsetup{type=figure}##1\egroup\par}
1872 \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
1873 \noindent\@teaserfigures\par\medskip}%
1874 \fi}

\@setaddresses This is an amsart macro, which we do not need.
1875 \def\@setaddresses{}

\@mkabstract Typesetting abstract
1876 \def\@mkabstract{\bgroup
1877 \ifx\@abstract\@empty\else
1878 {\phantomsection\addcontentsline{toc}{section}{Abstract}%
1879 \if@ACM@journal
1880 \small\noindent
1881 \else
1882 \section*{Abstract}%
1883 \fi
1884 \ignorespaces\@abstract\par}%
1885 \fi\egroup}

\@mkbibcitation Print bibcitation format
1886 \def\@mkbibcitation{\bgroup
1887 \def\footnotemark{}}%
1888 \def\{\unskip\} \ignorespaces}%
1889 \def\footnote{\ClassError{\@classname}{Please do not use footnotes
1890 inside \string\title{ } or \string\author{ } command! Use
1891 \string\titlenote{ } or \string\authornote{ } instead!}}%
1892 \par\medskip\small\noindent{\bfseries ACM Reference format:}\par\nobreak
1893 \noindent\authors. \@acmYear. \@title.
1894 \if@ACM@journal
1895 \textit{\@journalNameShort}
1896 \@acmVolume, \@acmNumber, Article~\@acmArticle\ (\@acmPubDate),
1897 \ref{TotPages}~pages.
1898 \else
1899 In \textit{Proceedings of \acmConference@name, \acmConference@venue,
1900 \acmConference@date}
1901 \ifx\acmConference@name\acmConference@shortname\else
1902 \ (\acmConference@shortname)\fi
1903 ,} \ref{TotPages}~pages.

```



```

1904 \fi\par
1905 \noindent\@formatdoi{\@acmDOI}
1906 \par\egroup}

```

\@printendtopmatter End the top matter

```

1907 \def\@printendtopmatter{\par\medskip
1908 \ifcase\ACM@format@nr
1909 \relax % manuscript
1910 \noindent\hrulefill\par\medskip
1911 \or % acmsmall
1912 \noindent\hrulefill\par\medskip
1913 \or % acmlarge
1914 \noindent\hrulefill\par\medskip
1915 \or % acmtog
1916 \par\bigskip
1917 \or % sigconf
1918 \par\bigskip
1919 \or % siggraph
1920 \par\bigskip
1921 \or % sigplan
1922 \par\bigskip
1923 \or % sigchi
1924 \par\bigskip
1925 \or % sigchi-a
1926 \fi
1927 }

```

\@setthanks We redefine \@setthanks using \long

```

1928 \def\@setthanks{\long\def\thanks##1{\par##1\@addpunct.}\thankses}

```

3.14 Headers and Footers

We use fancyhdr for our headers and footers:

```

1929 \RequirePackage{fancyhdr}

```

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

```

1930 \if@ACM@review
1931 \newsavebox{\ACM@linecount@bx}
1932 \newlength\ACM@linecount@bxht
1933 \newcount\ACM@linecount
1934 \ACM@linecount\@ne\relax
1935 \def\ACM@mk@linecount{%
1936 \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{%
1937 \setlength{\ACM@linecount@bxht}{-\baselineskip}%
1938 \loop{\color{ACMRed}\scriptsize\the\ACM@linecount}\
1939 \global\advance\ACM@linecount by \@ne
1940 \addtolength{\ACM@linecount@bxht}{\baselineskip}%
1941 \ifdim\ACM@linecount@bxht<\textheight\repeat}}
1942 \fi

```

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

```
1943 \def\ACM@linecountL{%
1944   \if@ACM@review
1945   \ACM@mk@linecount
1946   \begin{picture}(0,0)%
1947     \put(-26,-22){\usebox{\ACM@linecount@bx}}%
1948   \end{picture}%
1949   \fi}
```

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

```
1950 \def\ACM@linecountR{%
1951   \if@ACM@review
1952   \ACM@mk@linecount
1953   \begin{picture}(0,0)%
1954     \put(20,-22){\usebox{\ACM@linecount@bx}}%
1955   \end{picture}%
1956   \fi}
```

\ACM@timestamp The timestamp system

```
1957 \if@ACM@timestamp
1958   % Subtracting 30 from \time gives us the effect of rounding-down despite
1959   % \numexpr rounding to nearest
1960   \newcounter{ACM@time@hours}
1961   \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
1962   \newcounter{ACM@time@minutes}
1963   \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
1964   \newcommand\ACM@timestamp{%
1965     \footnotesize%
1966     \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
1967     \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{ }%
1968     page~\thepage\ (pp. \@startPage-\pageref*{TotPages})%
1969     \ifx\@acmSubmissionID\@empty\relax\else
1970     ~Submission~ID: \@acmSubmissionID
1971   \fi
1972 }
1973 \fi
```

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

```
1974 \def\@shortauthors{\if@ACM@anonymous Anon.\else\shortauthors\fi}
```

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

```
1975 \def\@headfootfont{%
1976   \ifcase\ACM@format@nr
1977   \relax % manuscript
1978   \sffamily
1979   \or % acmsmall
1980   \sffamily
1981   \or % acmlarge
```

```

1982 \sffamily
1983 \or % acmtog
1984 \sffamily
1985 \or % sigconf
1986 \sffamily
1987 \or % siggraph
1988 \sffamily
1989 \or % sigplan
1990 \sffamily
1991 \or % sigchi
1992 \sffamily
1993 \or % sigchi-a
1994 \sffamily
1995 \fi}

```

standardpagestyle The pagestyle for all pages but the first one

```

1996 \fancypagestyle{standardpagestyle}{%
1997 \fancyhf{}%
1998 \renewcommand{\headrulewidth}{\z@}%
1999 \renewcommand{\footrulewidth}{\z@}%
2000 \ifcase\ACM@format@nr
2001 \relax % manuscript
2002 \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
2003 \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
2004 \fancyhead[RE]{\@shortauthors}%
2005 \fancyhead[LO]{\ACM@linecountL\shorttitle}%
2006 \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}%
2007 \or % acmsmall
2008 \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2009 \fancyhead[RO]{\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2010 \fancyhead[RE]{\@headfootfont\@shortauthors}%
2011 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2012 \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2013 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2014 \or % acmlarge
2015 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2016 \@acmArticle\if@ACM@printfolios:\thepage\fi\quad\textbullet\quad\@shortauthors}%
2017 \fancyhead[LO]{\ACM@linecountL}%
2018 \fancyhead[RO]{\@headfootfont
2019 \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2020 \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2021 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2022 \or % acmtog
2023 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2024 \@acmArticle\if@ACM@printfolios:\thepage\fi\quad\textbullet\quad\@shortauthors}%
2025 \fancyhead[LO]{\ACM@linecountL}%
2026 \fancyhead[RE]{\ACM@linecountR}%
2027 \fancyhead[RO]{\@headfootfont
2028 \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi\ACM@linecountR}%
2029 \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.

```

```

2030 \acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2031 \else % Proceedings
2032 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2033 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2034 \fancyhead[RE]{\@headfootfont\shortauthors\ACM@linecountR}%
2035 \fancyhead[LE]{\ACM@linecountL\@headfootfont\acmConference@shortname,
2036 \acmConference@date, \acmConference@venue}%
2037 \fancyhead[RO]{\@headfootfont\acmConference@shortname,
2038 \acmConference@date, \acmConference@venue\ACM@linecountR}%
2039 \fi
2040 \if@ACM@sigchiamode
2041 \fancyheadoffset[L]{\dimexpr(\marginparsep+\marginparwidth)}%
2042 \fi
2043 \if@ACM@timestamp
2044 \fancyfoot[LO,RE]{\ACM@timestamp}
2045 \fi
2046 }
2047 \pagestyle{standardpagestyle}

\@folio@wd Folio blob width, height, offsets and max number
\@folio@ht
\@folio@voffset
\@folio@max
2048 \newdimen\@folio@wd
2049 \@folio@wd=\z@
2050 \newdimen\@folio@ht
2051 \@folio@ht=\z@
2052 \newdimen\@folio@voffset
2053 \@folio@voffset=\z@
2054 \def\@folio@max{1}
2055 \ifcase\ACM@format@nr
2056 \relax % manuscript
2057 \or % acmsmall
2058 \@folio@wd=45.75pt\relax
2059 \@folio@ht=1.25in\relax
2060 \@folio@voffset=.2in\relax
2061 \def\@folio@max{8}
2062 \or % acmlarge
2063 \@folio@wd=43.25pt\relax
2064 \@folio@ht=79pt\relax
2065 \@folio@voffset=.55in\relax
2066 \def\@folio@max{10}
2067 \fi

\@folioblob The macro to typeset the folio blob.
2068 \def\@folioblob{\@tempcnta=\@acmArticleSeq\relax
First, we calculate \@acmArticleSeq modulo \@folio@max
2069 \loop
2070 \ifnum\@tempcnta>\@folio@max\relax
2071 \advance\@tempcnta by - \@folio@max
2072 \repeat

```

```

2073 \advance\@tempcnta by -1\relax
2074 \@tempdima=\@folio@ht\relax
2075 \multiply\@tempdima by \the\@tempcnta\relax
2076 \advance\@tempdima by -\@folio@voffset\relax
2077 \begin{picture}(0,0)
2078 \makebox[\z@]{\raisebox{-\@tempdima}{%
2079 \rlap{%
2080 \raisebox{-0.45\@folio@ht}{\z@}{\z@}{%
2081 \rule{\@folio@wd}{\@folio@ht}}}%
2082 \parbox{\@folio@wd}{%
2083 \centering
2084 \textcolor{white}{\LARGE\bfseries\sffamily\@acmArticle}}}%
2085 \end{picture}}
2086

```

firstpagestyle The pagestyle for the first page only.

```

2087 \fancypagestyle{firstpagestyle}{%
2088 \fancyhf{}%
2089 \renewcommand{\headrulewidth}{\z@}%
2090 \renewcommand{\footrulewidth}{\z@}%
2091 \ifcase\ACM@format@nr
2092 \relax % manuscript
2093 \fancyhead[L]{\ACM@linecountL}%
2094 \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
2095 \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
2096 \or % acmsmall
2097 \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2098 \@acmNumber, Article \@acmArticle. Publication date:
2099 \@acmPubDate.}%
2100 \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2101 \fancyhead[LO]{\ACM@linecountL}%
2102 \fancyhead[RO]{\@folioblob}%
2103 \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
2104 \or % acmlarge
2105 \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2106 \@acmNumber, Article \@acmArticle. Publication date:
2107 \@acmPubDate.}%
2108 \fancyhead[RO]{\@folioblob}%
2109 \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2110 \fancyhead[LO]{\ACM@linecountL}%
2111 \fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2112 \or % acmtog
2113 \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2114 \@acmNumber, Article \@acmArticle. Publication date:
2115 \@acmPubDate.}%
2116 \fancyhead[L]{\ACM@linecountL}%
2117 \fancyhead[R]{\ACM@linecountR}%
2118 \else % Conference proceedings
2119 \fancyhead[L]{\ACM@linecountL}%
2120 \fancyhead[R]{\ACM@linecountR}%

```

```

2121 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2122 \fi
2123 \if@ACM@timestamp
2124 \ifnum\ACM@format@nr=0\relax % Manuscript
2125 \fancyfoot[LO,RE]{\ACM@timestamp\quad
2126 \footnotesize Manuscript submitted to ACM}
2127 \else
2128 \fancyfoot[LO,RE]{\ACM@timestamp}
2129 \fi
2130 \fi
2131 }

```

3.15 Sectioning

Sectioning is different for different levels

```

2132 \renewcommand\section{\@startsection{section}{1}{\z@}%
2133 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2134 {.25\baselineskip}%
2135 {\@secfont}}
2136 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2137 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2138 {.25\baselineskip}%
2139 {\@subsecfont}}
2140 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{10pt}%
2141 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2142 {-3.5\p@}%
2143 {\@subsubsecfont\@adddotafter}}
2144 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
2145 {- .5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2146 {-3.5\p@}%
2147 {\@parfont\@adddotafter}}
2148 \renewcommand\part{\@startsection{part}{9}{\z@}%
2149 {-10\p@ \@plus -4\p@ \@minus -2\p@}%
2150 {4\p@}%
2151 {\@parfont}}

```

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

```

2152 \def\section@raggedright{\@rightskip\@flushglue
2153 \rightskip\@rightskip
2154 \leftskip\z@skip
2155 \parindent\z@}

```

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

```

\@subsecfont 2156 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeUppercase}
\@subsubsecfont 2157 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
\@parfont 2158 \def\@subsubsecfont{\sffamily\itshape}
2159 \def\@parfont{\itshape}
2160 \setcounter{secnumdepth}{3}
2161 \ifcase\ACM@format@nr

```

```

2162 \relax % manuscript
2163 \or % acmsmall
2164 \or % acmlarge
2165 \def\@secfont{\sffamily\large\section@raggedright\MakeUppercase}
2166 \def\@subsecfont{\sffamily\large\section@raggedright}
2167 \or % acmtog
2168 \def\@secfont{\sffamily\large\section@raggedright\MakeUppercase}
2169 \def\@subsecfont{\sffamily\large\section@raggedright}
2170 \or % sigconf
2171 \def\@secfont{\bfseries\Large\section@raggedright\MakeUppercase}
2172 \def\@subsecfont{\bfseries\Large\section@raggedright}
2173 \or % siggraph
2174 \def\@secfont{\bfseries\sffamily\Large\section@raggedright\MakeUppercase}
2175 \def\@subsecfont{\bfseries\sffamily\Large\section@raggedright}
2176 \or % sigplan
2177 \def\@secfont{\bfseries\Large\section@raggedright}
2178 \def\@subsecfont{\bfseries\section@raggedright}
2179 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2180   {-0.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2181   {.25\baselineskip}%
2182   {\@subsubsecfont}}
2183 \def\@subsubsecfont{\bfseries\section@raggedright}
2184 \renewcommand\paragraph{\@startsection{paragraph}{4}{\z@}%
2185   {-0.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2186   {-3.5\p@}%
2187   {\@parfont\@addspaceafter}}
2188 \def\@parfont{\bfseries\itshape}
2189 \renewcommand\subparagraph{\@startsection{subparagraph}{5}{\z@}%
2190   {-0.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2191   {-3.5\p@}%
2192   {\@subparfont\@addspaceafter}}
2193 \def\@subparfont{\itshape}
2194 \or % sigchi
2195 \setcounter{secnumdepth}{1}
2196 \def\@secfont{\bfseries\sffamily\section@raggedright\MakeUppercase}
2197 \def\@subsecfont{\bfseries\sffamily\section@raggedright}
2198 \or % sigchi-a
2199 \setcounter{secnumdepth}{0}
2200 \def\@secfont{\bfseries\sffamily\section@raggedright\MakeUppercase}
2201 \def\@subsecfont{\bfseries\sffamily\section@raggedright}
2202 \fi

```

\@adddotafter Add punctuation after the command

```
2203 \def\@adddotafter#1{#1\@addpunct{.}}
```

\@addspaceafter Add space after the command

```
2204 \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.

```
2205 \providecommand*\dotsep{4.5}
```

3.17 Theorems

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

```
2206 \def\acmplainbodyfont{\itshape}
```

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

```
2207 \def\acmplainindent{\parindent}
```

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

```
2208 \def\acmplainheadfont{\scshape}
```

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

```
2209 \def\acmplainnotefont{\@empty}
```

Customization of `acmplain` theorem style:

```
2210 \ifcase\ACM@format@nr
2211 \relax % manuscript
2212 \or % acmsmall
2213 \or % acmlarge
2214 \or % acmtog
2215 \or % sigconf
2216 \or % siggraph
2217 \or % sigplan
2218 \def\acmplainbodyfont{\itshape}
2219 \def\acmplainindent{\z@}
2220 \def\acmplainheadfont{\bfseries}
2221 \def\acmplainnotefont{\normalfont}
2222 \or % sigchi
2223 \or % sigchi-a
2224 \fi
```

`acmplain` The `acmplain` theorem style

```
2225 \newtheoremstyle{acmplain}%
2226 { .5\baselineskip\@plus.2\baselineskip
2227 \@minus.2\baselineskip}% space above
2228 { .5\baselineskip\@plus.2\baselineskip
2229 \@minus.2\baselineskip}% space below
2230 {\acmplainbodyfont}% body font
2231 {\acmplainindent}% indent amount
2232 {\acmplainheadfont}% head font
```



```

2233 {.}% punctuation after head
2234 {.5em}% spacing after head
2235 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont(#3)}}}% head spec

\@acmdefinitionbodyfont The font to typeset the acmdefinition theorem style body.
2236 \def\@acmdefinitionbodyfont{\normalfont}

\@acmdefinitionindent The amount to indent the acmdefinition theorem style.
2237 \def\@acmdefinitionindent{\parindent}

\@acmdefinitionheadfont The font to typeset the acmdefinition theorem style head.
2238 \def\@acmdefinitionheadfont{\itshape}

\@acmdefinitionnotefont The font to typeset the acmdefinition theorem style note.
2239 \def\@acmdefinitionnotefont{\@empty}

Customization of acmdefinition theorem style:
2240 \ifcase\ACM@format@nr
2241 \relax % manuscript
2242 \or % acmsmall
2243 \or % acmlarge
2244 \or % acmtog
2245 \or % sigconf
2246 \or % siggraph
2247 \or % sigplan
2248 \def\@acmdefinitionbodyfont{\normalfont}
2249 \def\@acmdefinitionindent{\z@}
2250 \def\@acmdefinitionheadfont{\bfseries}
2251 \def\@acmdefinitionnotefont{\normalfont}
2252 \or % sigchi
2253 \or % sigchi-a
2254 \fi

acmdefinition The acmdefinition theorem style
2255 \newtheoremstyle{acmdefinition}%
2256 {.5\baselineskip\@plus.2\baselineskip
2257 \@minus.2\baselineskip}% space above
2258 {.5\baselineskip\@plus.2\baselineskip
2259 \@minus.2\baselineskip}% space below
2260 {\@acmdefinitionbodyfont}% body font
2261 {\@acmdefinitionindent}% indent amount
2262 {\@acmdefinitionheadfont}% head font
2263 {.}% punctuation after head
2264 {.5em}% spacing after head
2265 {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmdefinitionnotefont(#3)}}}% head spec

The definitions for theorems:
2266 \theoremstyle{acmplain}
2267 \newtheorem{theorem}{Theorem}[section]

```

```

2268 \newtheorem{conjecture}[theorem]{Conjecture}
2269 \newtheorem{proposition}[theorem]{Proposition}
2270 \newtheorem{lemma}[theorem]{Lemma}
2271 \newtheorem{corollary}[theorem]{Corollary}
2272 \theoremstyle{acmdefinition}
2273 \newtheorem{example}[theorem]{Example}
2274 \newtheorem{definition}[theorem]{Definition}
2275 \theoremstyle{acmplain}

\@proofnamefont The font to typeset the proof name.
2276 \def\@proofnamefont{\scshape}

\@proofindent Whether or not to indent proofs.
2277 \def\@proofindent{\indent}

Customization of proof environment.
2278 \ifcase\ACM@format@nr
2279 \relax % manuscript
2280 \or % acmsmall
2281 \or % acmlarge
2282 \or % acmtog
2283 \or % sigconf
2284 \or % siggraph
2285 \or % sigplan
2286 \def\@proofnamefont{\itshape}
2287 \def\@proofindent{\noindent}
2288 \or % sigchi
2289 \or % sigchi-a
2290 \fi

proof We want some customization of proof environment.
2291 \renewenvironment{proof}[1][\proofname]{\par
2292 \pushQED{\qed}%
2293 \normalfont \topsep6\p@\@plus6\p@\relax
2294 \trivlist
2295 \item[\@proofindent\hskip\labelsep
2296 {\@proofnamefont #1\@addpunct{.}}]\ignorespaces
2297 }{%
2298 \popQED\endtrivlist\@endpefalse
2299 }

```

3.18 Acknowledgments

```

\acks This is a comment-like structure
2300 \specialcomment{acks}{%
2301 \begin{group}
2302 \section*{Acknowledgments}
2303 \phantomsection\addcontentsline{toc}{section}{Acknowledgments}
2304 }{%

```

```

2305 \endgroup
2306 }

```

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

```

2307 \def\grantsponsor#1#2#3{#2}

```

`\grantnum`

```

2308 \newcommand\grantnum[3][{}]{#3%
2309 \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}

```

3.19 Conditional typesetting

We use the comment package for conditional typesetting:

```

2310 \if@ACM@screen
2311 \includecomment{screenonly}
2312 \excludecomment{printonly}
2313 \else
2314 \excludecomment{screenonly}
2315 \includecomment{printonly}
2316 \fi
2317 \if@ACM@anonymous
2318 \excludecomment{anonsuppress}
2319 \excludecomment{acks}
2320 \else
2321 \includecomment{anonsuppress}
2322 \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/>).

```

2323 \newcommand\showeprint[2][arxiv]{%
2324 \def\@tempa{#1}%
2325 \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
2326 \def\@tempb{arxiv}%
2327 \ifx\@tempa\@tempb
2328 arXiv:\href{http://arxiv.org/abs/#2}{#2}\else arXiv:#2%
2329 \fi}

```

3.21 End of Class

```

2330 \normalsize\normalfont\frenchspacing
2331 </class>

```

References

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Change History

v1.00	General: First released version	26	v1.05	General: Added processing doi numbers for acmsiggraph and doi numbers for sigproc.bib	26
v1.01	General: Changed hyperref colors in screen mode (closes https://github.com/borisveytsman/acmart/issues/1)	26		Patched \setcitestyle command; closes https://github.com/borisveytsman/acmart/issues/19	26
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	Set headheight to 1pc for all formats (closes https://github.com/borisveytsman/acmart/issues/5)	26		\@ACM@title@width: Added macro	52
v1.02	General: Added TOPS and TSC (closes https://github.com/borisveytsman/acmart/issues/12)	26		\@mktitle@i: Added processing badges	65
	Documentation changes (closes https://github.com/borisveytsman/acmart/issues/13)	26		Made generic	65
v1.03	\@formatdoi: Added macro	57		\@mktitle@ii: Now this macro is obsolete	65
	\if@ACM@authorversion: Added macro	27		\@mktitle@iii: Added processing badges	65
	\maketitle: Added special case of authorversion	59		Made more generic	65
	General: Added anon suppress environment	26		\@mktitle@iv: Made more generic	66
	Added authorversion option (closes https://github.com/borisveytsman/acmart/issues/9)	26		\@printtopmatter: Added processing badges	62
v1.04	\acmArticleSeq: Name change by Matthew Fluet	51		\@subtitlefont: Added macro	64
	\acmDOI: Name change by Matthew Fluet	52		\@titlefont: Added macro	64
	\acmISBN: Name change by Matthew Fluet	52		\acmBadgeL: Added macro	52
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				\if@ACM@badge: Added macro	52
			v1.07	\maketitle: Corrected a bug with abstract footnotes	59
				Corrected a bug with permission and footnotes order	59
			v1.08	General: SIGPLAN reformatting by Matthew Fluet	26
				Typos corrected (Tobias Pape)	26
			v1.09	General: Revert SIGPLAN caption rules	26
			v1.10	\maketitle: Corrected a bug with doi in manuscript and author version, https://github.com/borisveytsman/acmart/issues/36	59

General: Changes of ‘licensedothergov’ wording	55	v1.14 \bibstyle@acmauthoryear: Moved def of \bibstyle@acmauthoryear before use	32
standardpagestyle: Reversed folios location	75	\bibstyle@acmnumeric: Moved def of \bibstyle@numeric before use . .	32
v1.11 General: Customization of ACM theorem styles and proof environment by Matthew Fluet . .	26	General: \citestyle updates (Matthew Fluet)	26
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\@marginfigure: Now centering by default	41	v1.15 \@ACM@addtoaddress: Added macro	66
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\copyrightpermissionfootnoterule: Added macro	38	\@shortauthors: Introduced macro .	74
\descriptionlabel: Redefined	43	\@typeset@author@bx: Moved to separate macro	69
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