

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.

Contents

1	Introduction	3
2	User's guide	3
2.1	Installation	3
2.2	Invocation and options	5
2.3	Topmatter commands	7
2.4	Algorithms	18
2.5	Figures and tables	18
2.6	Theorems	20
2.7	Online-only and offline-only material	20
2.8	Note about anonymous mode	20
2.9	Acknowledgments	21
2.10	Bibliography	22
2.11	Colors	24
2.12	Other notable packages and typographic remarks	24
2.13	A note for wizards: <code>acmart-preload-hook.tex</code>	25
3	Implementation	26
3.1	Identification	26
3.2	Preload	26
3.3	Options	26
3.4	Setting switches	29

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3.5	Loading base class and package	30
3.6	Paper size and paragraphing	37
3.7	Fonts	40
3.8	Floats	41
3.9	Lists	42
3.10	Top matter data	44
3.11	Concepts system	56
3.12	Copyright system	56
3.13	Typesetting top matter	61
3.14	Headers and Footers	75
3.15	Sectioning	79
3.16	TOC Lists	81
3.17	Theorems	81
3.18	Acknowledgments	84
3.19	Conditional typesetting	84
3.20	Additional bibliography commands	85
3.21	End of Class	85

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>
- *xstring*, <http://www.ctan.org/pkg/xstring>

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
<code>manuscript</code>	A manuscript. This is the default
<code>acmsmall</code>	Small single column format, used for CIE, CSUR, JACM, JDIQ, JEA, JERIC, JETC, PACMPL, 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.
<code>acmlarge</code>	Large single column format, used for IMWUT, JOCCH, PACMHCI, POMACS, TAP, including special issues.
<code>acmtog</code>	Large double column format, used for TOG, including special issues.
<code>sigconf</code>	Proceedings format for most of ACM conferences (with the exceptions listed below) and all ICPS volumes.
<code>siggraph</code>	As of March 2017, this format is no longer used. Please use <code>sigconf</code> for SIGGRAPH conferences.
<code>sigplan</code>	Proceedings format for SIGPLAN conferences.
<code>sigchi</code>	Proceedings format for SIGCHI conferences.
<code>sigchi-a</code>	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 BIB_{TeX} 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
PACMHCI	PACM on Human-Computer Interaction
PACMPL	PACM on Programming Languages
POMACS	PACM on Measurement and Analysis of Computing Systems
TAAS	ACM Transactions on Autonomous and Adaptive Systems
TACCESS	ACM Transactions on Accessible Computing
TACO	ACM Transactions on Architecture and Code Optimization
TALG	ACM Transactions on Algorithms
TALLIP	ACM Transactions on Asian and Low-Resource Language Information Processing
TAP	ACM Transactions on Applied Perception
TCPS	ACM Transactions on Cyber-Physical Systems
TEAC	ACM Transactions on Economics and Computation
TECS	ACM Transactions on Embedded Computing Systems
TIIS	ACM Transactions on Interactive Intelligent Systems
TISSEC	ACM Transactions on Information and System Security
TIST	ACM Transactions on Intelligent Systems and Technology
TKDD	ACM Transactions on Knowledge Discovery from Data
TMIS	ACM Transactions on Management Information Systems
TOCE	ACM Transactions on Computing Education
TOCHI	ACM Transactions on Computer-Human Interaction
TOCL	ACM Transactions on Computational Logic
TOCS	ACM Transactions on Computer Systems
TOCT	ACM Transactions on Computation Theory
TODAES	ACM Transactions on Design Automation of Electronic Systems
TODS	ACM Transactions on Database Systems
TOG	ACM Transactions on Graphics
TOIS	ACM Transactions on Information Systems
TOIT	ACM Transactions on Internet Technology
TOMACS	ACM Transactions on Modeling and Computer Simulation
TOMM	ACM Transactions on Multimedia Computing, Communications and Applications
TOMPECS	ACM Transactions on Modeling and Performance Evaluation of Computing Systems
TOMS	ACM Transactions on Mathematical Software
TOPC	ACM Transactions on Parallel Computing
TOPLAS	ACM Transactions on Programming Languages and Systems
TOPS	ACM Transactions on Privacy and Security
TOS	ACM Transactions on Storage
TOSEM	ACM Transactions on Software Engineering and Methodology
TOSN	ACM Transactions on Sensor Networks
TRETS	ACM Transactions on Reconfigurable Technology and Systems
TSAS	ACM Transactions on Spatial Algorithms and Systems
TSC	ACM Transactions on Social Computing
TSLP	ACM Transactions on Speech and Language Processing
TWEB	ACM Transactions on the Web

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

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

name: the name of the conference *or* the name of the book as set by the editor.

date: the date(s) of the conference.

venue: the place of the conference.

Examples:

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

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

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

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

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

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

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

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

`\author` The basic commands are `\author`, `\orcid` (for the researchers registered with 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 \LaTeX `\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 , ...). 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 \LaTeX), we allow `\thanks` only *outside* of commands `\title` and `\author`. Example:

```

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

```

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

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

```

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

```

Please never use `\footnotes` inside `\author` or `\title` commands, since this confuses metadata extraction software (actually these commands now produce errors).

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

```

\author{A. U. Thor}
\authornote{Both authors contributed equally to the paper}
...

```

```
\author{A. N. Other}
\authornotemark[1]
```

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

`\acmVolume` The macros `\acmVolume`, `\acmNumber`, `\acmArticle`, `\acmYear` and `\acmMonth` are
`\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 numer-
`\acmYear` ical, including `\acmMonth`, for example,
`\acmMonth`

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

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

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

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

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

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

```
\acmPrice{25.00}
```

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

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

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

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

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

It is normally set by the typesetter.

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

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

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

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

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

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

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

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

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.

```

<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: 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 L^AT_EX.

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

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

`\settopmatter` Some information in the top matter is printed for certain journals or proceedings and suppressed for others. You may override these defaults using the command `\settopmatter{<settings>}`. The settings and their meanings are listed in Table 5. For example,

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

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

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

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

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

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

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)
<code>authorsperrow</code>	numeric	Number of authors per row for title page in conference proceedings formats

`\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 tables 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\\
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`
`\grantnum` All the financial support *must* be listed using the commands `\grantsponsor` and `\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}
\end{acks}

```

```

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_T_EX 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_T_EX 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_T_EX entries and fields in ACM style `ACM-Reference-Format.bst` you may want to be aware of.

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

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

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

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

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

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

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

```

month =      mar,
lastaccessed = "March 2, 2005",
}

```

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

There are two ways to enter video and audio sources in the 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 [2017/05/14 v1.39 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}
```

We use xstring to check whether user input is integer

```
31 \RequirePackage{xstring}
```

format The possible formats

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

\if@ACM@screen Whether we use screen mode

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

\if@ACM@review Whether we use review mode

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

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

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

\if@ACM@natbib@override

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

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

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

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

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

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

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

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

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

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

```

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

```

3.4 Setting switches

```

\if@ACM@manuscript Whether we use manuscript mode
116 \newif\if@ACM@manuscript

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

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

```

Setting up switches

```

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

```

3.5 Loading base class and package

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

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

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

```
176 \RequirePackage{totpages}
```

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

```
177 \RequirePackage{environ}
```

We use `setspace` for doublespacing

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

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

```
182 \if@ACM@natbib
183   \RequirePackage{natbib}
184   \renewcommand{\bibsection}{%
185     \section*{\refname}%
186     \phantomsection\addcontentsline{toc}{section}{\refname}%
187   }
```

```

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

```

```

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

```

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

```

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

```

`\bibstyle@acmnumeric` The default numeric format:

```

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

```

The default is numeric:

```

273 \if@ACM@natbib
274 \citestyle{acmnumeric}
275 \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:

```

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

```

```

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

```

```

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

```

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

```

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

```

```

375 \exp\newwrite\csname tf@#1\endcsname
376 \immediate\exp\openout\csname tf@#1\endcsname \jobname.#1\relax
377 \fi
378 \global\@nobreakfalse \endgroup
379 \addvspace{32\p@\@plus14\p@}%
380 }

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

\l@subsubsection Amsart has too large spacing
382 \def\l@subsubsection{\@tocline{2}{0pt}{1pc}{5pc}{}}

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

    Bibliography mangling.
415 \if@ACM@natbib
416 \let\cite\cite

```

```

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

```

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

```

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

```

Graphics and color

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

We define ACM colors according to [7]:

```

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

```

Author draft mode

```

450 \if@ACM@authordraft
451   \RequirePackage{draftwatermark}
452   \SetWatermarkFontSize{0.5in}
453   \SetWatermarkColor[gray]{.9}
454   \SetWatermarkText{\parbox{12em}{\centering
455     Unpublished working draft\
456     Not for distribution}}
457 \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>.

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

```

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

```

`\parindent` Paragraphing

```

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

```

`\normalparindent` `amsart` defines the `\normalparindent` length and initializes it to 12pt (the value of `\parindent` in `amsart`). It is later used to set the `\listparindent` length in the quotation environment and the `\parindent` length in the `\@footnotetext` command. We set `\normalparindent` to the value of `\parindent` as selected by `acmart` for consistent paragraph indents.

```
536 \setlength\normalparindent{\parindent}
```

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.

```
537 \def\copyrightpermissionfootnoterule{\kern-3\p@
538   \hrule \@width \columnwidth \kern 2.6\p@}

539 \RequirePackage{manyfoot}
540 \SelectFootnoteRule[2]{copyrightpermission}
541 \DeclareNewFootnote{copyrightpermission}
```

`\footnoterule` Tschichold's rules:

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

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

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

`\@makefnmark` We do not use indentation for footnotes

```
556 \def\@makefnmark{\noindent\@makefnmark}
```

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

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

`\@mpfootnotetext` We want the footnotes in minipages centered:

```
569 \long\def\@mpfootnotetext#1{%
570   \global\setbox\@mpfootins\vbox{%
571     \unvbox\@mpfootins
572     \reset@font\footnotesize
```

```

573 \hsize\columnwidth
574 \@parboxrestore
575 \protected@edef\@currentlabel
576     {\csname p@mpfootnote\endcsname\@thefnmark}%
577 \color@begingroup\centering
578     \@makefnmark{%
579         \rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
580 \color@endgroup}}

```

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

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

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

```
582 \def\@textbottom{\vskip \z@ \@plus 1pt}
583 \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.

```

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

```

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

```

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

```

We use Libertine throughout.

```

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

```

The SIGCHI extended abstracts are sans serif:

```
606 \if@ACM@sigchiamode
```

```

607 \renewcommand{\familydefault}{\sfdefault}
608 \fi

```

3.8 Floats

We use caption package

```

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

```

sidebar The sidebar environment:

```

637 \newfloat{sidebar}{}{sbar}
638 \floatname{sidebar}{Sidebar}
639 \renewenvironment{sidebar}{\Collect@Body\@sidebar}{}

```

\@sidebar The processing of the saved text

```

640 \long\def\@sidebar#1{\bgroup\captionsetup{type=sidebar}%
641   \marginpar{\small#1}\egroup}

```

marginfigure The marginfigure environment:

```

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

```

\@marginfigure The processing of the saved text

```

643 \long\def\@marginfigure#1{\bgroup\captionsetup{type=figure}%
644   \marginpar{\centering\small#1}\egroup}

```

```

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

\@margintable The processing of the saved text
646 \long\def\@margintable#1{\bgroup\captionsetup{type=table}%
647 \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
648 \newdimen\fulltextwidth
649 \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)
650 \if@ACM@sigchiamode
651 \def\@dblfloat{\bgroup\columnwidth=\fulltextwidth
652 \let\@endfloatbox\@endwidefloatbox
653 \def\@fpsaddefault{\def\@fps{tp}}%
654 \@float}
655 \fi

\end@dblfloat And the end. Just adding a \bgroup.
656 \if@ACM@sigchiamode
657 \def\end@dblfloat{%
658 \end@float\egroup}
659 \fi

\@endwidefloatbox This is the end of a wide box - we basically move everything to the left
660 \def\@endwidefloatbox{%
661 \par\vskip\z@skip
662 \@minipagefalse
663 \outer@nobreak
664 \egroup
665 \color@endbox
666 \global\setbox\@currbox=\vbox{\moveleft
667 \dimexpr(\fulltextwidth-\textwidth)\box\@currbox}%
668 \wd\@currbox=\textwidth
669 }

```

3.9 Lists

```

670 \ifcase\ACM@format@nr
671 \relax % manuscript
672 \or % acmsmall
673 \or % acmlarge
674 \or % acmtog
675 \or % sigconf

```

```

676 \or % siggraph
677 \or % sigplan
678 \def\labelenumi{\theenumi.}
679 \def\labelenumii{\theenumii.}
680 \def\labelenumiii{\theenumiii.}
681 \def\labelenumiv{\theenumiv.}
682 \or % sigchi
683 \or % sigchi-a
684 \fi

```

AMS uses generous margins for the lists. Note that `amsart` defines `\leftmargin` values for list levels at begin document, so we must redefine them in the same manner. Also, note that `amsart` redefines `enumerate` and `itemize` environments with a `\makelabel` command that uses `\llap`, so the `\labelwidth` value is (effectively) irrelevant; nonetheless, we follow `amsart` and set `\labelwidth` to `\leftmargin` minus `\labelsep`.

```

685 \newdimen\@ACM@labelwidth
686 \AtBeginDocument{%
687   \setlength\labelsep{4pt}
688   \setlength{\@ACM@labelwidth}{6.5pt}
689
690   %% First-level list: when beginning after the first line of an
691   %% indented paragraph or ending before an indented paragraph, labels
692   %% should not hang to the left of the preceding/following text.
693   \setlength\leftmargini{\z@}
694   \addtolength\leftmargini{\parindent}
695   \addtolength\leftmargini{2\labelsep}
696   \addtolength\leftmargini{\@ACM@labelwidth}
697
698   %% Second-level and higher lists.
699   \setlength\leftmarginii{\z@}
700   \addtolength\leftmarginii{0.5\labelsep}
701   \addtolength\leftmarginii{\@ACM@labelwidth}
702   \setlength\leftmarginiii{\leftmarginii}
703   \setlength\leftmarginiv{\leftmarginiii}
704   \setlength\leftmarginv{\leftmarginiv}
705   \setlength\leftmarginvi{\leftmarginv}
706   \@listi}
707 \newskip\listisep
708 \listisep\smallskipamount
709 \def\@listI{\leftmargin\leftmargini
710   \labelwidth\leftmargini \advance\labelwidth-\labelsep
711   \listparindent\z@
712   \topsep\listisep}
713 \let\@listi\@listI
714 \def\@listii{\leftmargin\leftmarginii
715   \labelwidth\leftmarginii \advance\labelwidth-\labelsep
716   \topsep\z@skip}
717 \def\@listiii{\leftmargin\leftmarginiii
718   \labelwidth\leftmarginiii \advance\labelwidth-\labelsep}
719 \def\@listiv{\leftmargin\leftmarginiv

```

```

720 \labelwidth\leftmarginiv \advance\labelwidth-\labelsep}
721 \def\@listv{\leftmargin\leftmarginiv
722 \labelwidth\leftmarginv \advance\labelwidth-\labelsep}
723 \def\@listvi{\leftmargin\leftmarginvi
724 \labelwidth\leftmarginvi \advance\labelwidth-\labelsep}
\descriptionlabel We do not use default colon as \amsart does:
725 \renewcommand{\descriptionlabel}[1]{\upshape\bfseries #1}

\description Make description environment indentation consistent with that of itemize and
enumerate environments.
726 \renewenvironment{description}{\list{}}{%
727 \labelwidth\@ACM\labelwidth
728 \let\makelabel\descriptionlabel}%
729 }{
730 \endlist
731 }
732 \let\enddescription=\endlist % for efficiency

```

3.10 Top matter data

We use keyval interface to define journal title and relevant information

```

733 \define@choicekey*+{ACM}{acmJournal}[\@journalCode\@journalCode@nr]{%
734 CIE,%
735 CSUR,%
736 IMWUT,%
737 JACM,%
738 JDIQ,%
739 JEA,%
740 JERIC,%
741 JETC,%
742 JOCCH,%
743 PACMHCI,%
744 PACMPL,%
745 POMACS,%
746 TAAS,%
747 TACCESS,%
748 TACO,%
749 TALG,%
750 TALLIP,%
751 TAP,%
752 TCPS,%
753 TEAC,%
754 TECS,%
755 TIIS,%
756 TISSEC,%
757 TIST,%
758 TKDD,%
759 TMIS,%

```

```

760 TOCE,%
761 TOCHI,%
762 TOCL,%
763 TOCS,%
764 TOCT,%
765 TODAES,%
766 TODS,%
767 TOG,%
768 TOIS,%
769 TOIT,%
770 TOMACS,%
771 TOMM,%
772 TOMPECS,%
773 TOMS,%
774 TOPC,%
775 TOPS,%
776 TOPLAS,%
777 TOS,%
778 TOSEM,%
779 TOSN,%
780 TRET,%
781 TSAS,%
782 TSC,%
783 TSLP,%
784 TWEB%
785 }{%
786 \ifcase\@journalCode@nr
787 \relax % CIE
788 \def\@journalName{ACM Computers in Entertainment}%
789 \def\@journalNameShort{ACM Comput. Entertain.}%
790 \def\@permissionCodeOne{1544-3574}%
791 \or % CSUR
792 \def\@journalName{ACM Computing Surveys}%
793 \def\@journalNameShort{ACM Comput. Surv.}%
794 \def\@permissionCodeOne{0360-0300}%
795 \or % IMWUT
796 \def\@journalName{Proceedings of the ACM on Interactive, Mobile,
797 Wearable and Ubiquitous Technologies}%
798 \def\@journalNameShort{Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.}%
799 \def\@permissionCodeOne{2474-9567}%
800 \or % JACM
801 \def\@journalName{Journal of the ACM}%
802 \def\@journalNameShort{J. ACM}%
803 \def\@permissionCodeOne{0004-5411}%
804 \or % JDIQ
805 \def\@journalName{ACM Journal of Data and Information Quality}%
806 \def\@journalNameShort{ACM J. Data Inform. Quality}%
807 \def\@permissionCodeOne{1936-1955}%
808 \or % JEA
809 \def\@journalName{ACM Journal of Experimental Algorithmics}%

```

```

810 \def\@journalNameShort{ACM J. Exp. Algor.}%
811 \def\@permissionCodeOne{1084-6654}%
812 \or % JERIC
813 \def\@journalName{ACM Journal of Educational Resources in Computing}%
814 \def\@journalNameShort{ACM J. Edu. Resources in Comput.}%
815 \def\@permissionCodeOne{1073-0516}%
816 \or % JETC
817 \def\@journalName{ACM Journal on Emerging Technologies in Computing Systems}%
818 \def\@journalNameShort{ACM J. Emerg. Technol. Comput. Syst.}%
819 \def\@permissionCodeOne{1550-4832}%
820 \or % JOCCH
821 \def\@journalName{ACM Journal on Computing and Cultural Heritage}%
822 \def\@journalName{ACM J. Comput. Cult. Herit.}%
823 \or % PACMHCI
824 \def\@journalName{Proceedings of the ACM on Human-Computer Interaction}%
825 \def\@journalName{Proc. ACM Hum.-Comput. Interact.}%
826 \def\@permissionCodeOne{2573-0142}%
827 \or % PACMPL
828 \def\@journalName{Proceedings of the ACM on Programming Languages}%
829 \def\@journalName{Proc. ACM Program. Lang.}%
830 \def\@permissionCodeOne{2475-1421}%
831 \or % POMACS
832 \def\@journalName{Proceedings of the ACM on Measurement and Analysis of Computing Systems}%
833 \def\@journalName{Proc. ACM Meas. Anal. Comput. Syst.}%
834 \def\@permissionCodeOne{2476-1249}%
835 \or % TAAS
836 \def\@journalName{ACM Transactions on Autonomous and Adaptive Systems}%
837 \def\@journalNameShort{ACM Trans. Autonom. Adapt. Syst.}%
838 \def\@permissionCodeOne{1556-4665}%
839 \or % TACCESS
840 \def\@journalName{ACM Transactions on Accessible Computing}%
841 \def\@journalNameShort{ACM Trans. Access. Comput.}%
842 \def\@permissionCodeOne{1936-7228}%
843 \or % TACO
844 \def\@journalName{ACM Transactions on Architecture and Code Optimization}%
845 \or % TALG
846 \def\@journalName{ACM Transactions on Algorithms}%
847 \def\@journalNameShort{ACM Trans. Algor.}%
848 \def\@permissionCodeOne{1549-6325}%
849 \or % TALLIP
850 \def\@journalName{ACM Transactions on Asian and Low-Resource Language Information Processing}%
851 \def\@journalNameShort{ACM Trans. Asian Low-Resour. Lang. Inf. Process.}%
852 \def\@permissionCodeOne{2375-4699}%
853 \or % TAP
854 \def\@journalName{ACM Transactions on Applied Perception}%
855 \or % TCPS
856 \def\@journalName{ACM Transactions on Cyber-Physical Systems}%
857 \or % TEAC
858 \def\@journalName{ACM Transactions on Economics and Computation}%
859 \or % TECS

```

```

860 \def\@journalName{ACM Transactions on Embedded Computing Systems}%
861 \def\@journalNameShort{ACM Trans. Embedd. Comput. Syst.}%
862 \def\@permissionCodeOne{1539-9087}%
863 \or % TIIS
864 \def\@journalName{ACM Transactions on Interactive Intelligent Systems}%
865 \def\@journalNameShort{ACM Trans. Interact. Intell. Syst.}%
866 \def\@permissionCodeOne{2160-6455}%
867 \or % TISSEC
868 \def\@journalName{ACM Transactions on Information and System Security}%
869 \def\@journalNameShort{ACM Trans. Info. Syst. Sec.}%
870 \def\@permissionCodeOne{1094-9224}%
871 \or % TIST
872 \def\@journalName{ACM Transactions on Intelligent Systems and Technology}%
873 \def\@journalNameShort{ACM Trans. Intell. Syst. Technol.}%
874 \def\@permissionCodeOne{2157-6904}%
875 \or % TKDD
876 \def\@journalName{ACM Transactions on Knowledge Discovery from Data}%
877 \def\@journalNameShort{ACM Trans. Knowl. Discov. Data.}%
878 \def\@permissionCodeOne{1556-4681}%
879 \or % TMIS
880 \def\@journalName{ACM Transactions on Management Information Systems}%
881 \def\@journalNameShort{ACM Trans. Manag. Inform. Syst.}%
882 \def\@permissionCodeOne{2158-656X}%
883 \or % TOCE
884 \def\@journalName{ACM Transactions on Computing Education}%
885 \def\@journalNameShort{ACM Trans. Comput. Educ.}%
886 \def\@permissionCodeOne{1946-6226}%
887 \or % TOCHI
888 \def\@journalName{ACM Transactions on Computer-Human Interaction}%
889 \def\@journalNameShort{ACM Trans. Comput.-Hum. Interact.}%
890 \def\@permissionCodeOne{1073-0516}%
891 \or % TOCL
892 \def\@journalName{ACM Transactions on Computational Logic}%
893 \def\@journalNameShort{ACM Trans. Comput. Logic}%
894 \def\@permissionCodeOne{1529-3785}%
895 \or % TOCS
896 \def\@journalName{ACM Transactions on Computer Systems}%
897 \def\@journalNameShort{ACM Trans. Comput. Syst.}%
898 \def\@permissionCodeOne{0734-2071}%
899 \or % TOCT
900 \def\@journalName{ACM Transactions on Computation Theory}%
901 \def\@journalNameShort{ACM Trans. Comput. Theory}%
902 \def\@permissionCodeOne{1942-3454}%
903 \or % TODAES
904 \def\@journalName{ACM Transactions on Design Automation of Electronic Systems}%
905 \def\@journalNameShort{ACM Trans. Des. Autom. Electron. Syst.}%
906 \def\@permissionCodeOne{1084-4309}%
907 \or % TODS
908 \def\@journalName{ACM Transactions on Database Systems}%
909 \def\@journalNameShort{ACM Trans. Datab. Syst.}%

```

```

910 \def\@permissionCodeOne{0362-5915}%
911 \or % TOG
912 \def\@journalName{ACM Transactions on Graphics}%
913 \def\@journalNameShort{ACM Trans. Graph.}%
914 \def\@permissionCodeOne{0730-0301}
915 \or % TOIS
916 \def\@journalName{ACM Transactions on Information Systems}%
917 \def\@journalName{ACM Transactions on Information Systems}%
918 \def\@permissionCodeOne{1046-8188}%
919 \or % TOIT
920 \def\@journalName{ACM Transactions on Internet Technology}%
921 \def\@journalNameShort{ACM Trans. Internet Technol.}%
922 \def\@permissionCodeOne{1533-5399}%
923 \or % TOMACS
924 \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
925 \def\@journalName{ACM Transactions on Modeling and Computer Simulation}%
926 \def\@journalNameShort{ACM Trans. Model. Comput. Simul.}%
927 \or % TOMM
928 \def\@journalName{ACM Transactions on Multimedia Computing, Communications and Applications}%
929 \def\@journalNameShort{ACM Trans. Multimedia Comput. Commun. Appl.}%
930 \def\@permissionCodeOne{1551-6857}%
931 \def\@permissionCodeTwo{0100}%
932 \or % TOMPECS
933 \def\@journalName{ACM Transactions on Modeling and Performance Evaluation of Computing Systems}%
934 \def\@journalNameShort{ACM Trans. Model. Perform. Eval. Comput. Syst.}%
935 \def\@permissionCodeOne{2376-3639}%
936 \or % TOMS
937 \def\@journalName{ACM Transactions on Mathematical Software}%
938 \def\@journalNameShort{ACM Trans. Math. Softw.}%
939 \def\@permissionCodeOne{0098-3500}%
940 \or % TOPC
941 \def\@journalName{ACM Transactions on Parallel Computing}%
942 \def\@journalNameShort{ACM Trans. Parallel Comput.}%
943 \def\@permissionCodeOne{1539-9087}%
944 \or % TOPS
945 \def\@journalName{ACM Transactions on Privacy and Security}%
946 \def\@journalNameShort{ACM Trans. Priv. Sec.}%
947 \def\@permissionCodeOne{2471-2566}%
948 \or % TOPLAS
949 \def\@journalName{ACM Transactions on Programming Languages and Systems}%
950 \def\@journalNameShort{ACM Trans. Program. Lang. Syst.}%
951 \def\@permissionCodeOne{0164-0925}%
952 \or % TOS
953 \def\@journalName{ACM Transactions on Storage}%
954 \def\@journalNameShort{ACM Trans. Storage}%
955 \def\@permissionCodeOne{1553-3077}%
956 \or % TOSEM
957 \def\@journalName{ACM Transactions on Software Engineering and Methodology}%
958 \def\@journalNameShort{ACM Trans. Softw. Eng. Methodol.}%
959 \def\@permissionCodeOne{1049-331X}%

```

```

960 \or % TOSN
961 \def\@journalName{ACM Transactions on Sensor Networks}%
962 \def\@journalNameShort{ACM Trans. Sensor Netw.}%
963 \def\@permissionCodeOne{1550-4859}%
964 \or % TRET
965 \def\@journalName{ACM Transactions on Reconfigurable Technology and Systems}%
966 \def\@journalNameShort{ACM Trans. Reconfig. Technol. Syst.}%
967 \def\@permissionCodeOne{1936-7406}%
968 \or % TSAS
969 \def\@journalName{ACM Transactions on Spatial Algorithms and Systems}%
970 \def\@journalNameShort{ACM Trans. Spatial Algorithms Syst.}%
971 \def\@permissionCodeOne{2374-0353}%
972 \or % TSC
973 \def\@journalName{ACM Transactions on Social Computing}%
974 \def\@journalNameShort{ACM Trans. Soc. Comput.}%
975 \def\@permissionCodeOne{2469-7818}%
976 \or % TSLP
977 \def\@journalName{ACM Transactions on Speech and Language Processing}%
978 \def\@journalNameShort{ACM Trans. Speech Lang. Process.}%
979 \def\@permissionCodeOne{1550-4875}%
980 \or % TWEB
981 \def\@journalName{ACM Transactions on the Web}%
982 \def\@journalNameShort{ACM Trans. Web}%
983 \def\@permissionCodeOne{1559-1131}%
984 \fi
985 \ClassInfo{\@classname}{Using journal code \@journalCode}%
986 }{%
987 \ClassError{\@classname}{Incorrect journal #1}%
988 }%

```

`\acmJournal` And the syntactic sugar around it

```

989 \def\acmJournal#1{\setkeys{ACM}{acmJournal=#1}}

```

The defaults:

```

990 \def\@journalCode@nr{0}
991 \def\@journalName{}%
992 \def\@journalNameShort{\@journalName}%
993 \def\@permissionCodeOne{XXXX-XXXX}%
994 \def\@permissionCodeTwo{}%

```

`\acmConference` This is the conference command

```

995 \newcommand\acmConference[4][{}]{%
996 \gdef\acmConference@shortname{#1}%
997 \gdef\acmConference@name{#2}%
998 \gdef\acmConference@date{#3}%
999 \gdef\acmConference@venue{#4}%
1000 \ifx\acmConference@shortname\empty
1001 \gdef\acmConference@shortname{#2}%
1002 \fi}

```

```

1003 \acmConference[Conference'17]{ACM Conference}{July 2017}{Washington,
1004   DC, USA}

\subtitle The subtitle macro
1005 \def\subtitle#1{\def\@subtitle{#1}}
1006 \subtitle{ }

\num@authorgroups The total number of “groups”. Each group is several authors with the same affiliations(s)
1007 \newcount\num@authorgroups
1008 \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
1009 \renewcommand\author[2][{}%
1010   \if@insideauthorgroup\else
1011     \global\advance\num@authorgroups by 1\relax
1012     \global\@insideauthorgrouptrue
1013   \fi
1014   \ifx\addresses\@empty
1015     \if@ACM@anonymous
1016       \gdef\addresses{\@author{Anonymous Author(s)}}%
1017       \gdef\authors{Anonymous Author(s)}%
1018     \else
1019       \gdef\addresses{\@author{#2}}%
1020       \gdef\authors{#2}%
1021     \fi
1022   \else
1023     \if@ACM@anonymous\else
1024       \g@addto@macro\addresses{\and\@author{#2}}%
1025       \g@addto@macro\authors{\and#2}%
1026     \fi
1027   \fi
1028   \if@ACM@anonymous
1029     \ifx\shortauthors\@empty
1030       \gdef\shortauthors{Anon.}%
1031     \fi
1032   \else
1033     \def\@tempa{#1}%
1034     \ifx\@tempa\@empty
1035       \ifx\shortauthors\@empty
1036         \gdef\shortauthors{#2}%
1037       \else
1038         \g@addto@macro\shortauthors{\and#2}%
1039       \fi
1040     \else
1041       \ifx\shortauthors\@empty
1042         \gdef\shortauthors{#1}%

```

```

1043     \else
1044         \g@addto@macro\shortauthors{\and#1}%
1045     \fi
1046 \fi
1047 \fi}

```

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

```

1048 \newcommand{\affiliation}[2][{}%
1049 \global\@insideauthorgroupfalse
1050 \if@ACM@anonymous\else
1051     \g@addto@macro\addresses{\affiliation{#1}{#2}}%
1052 \fi}

```

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

```

1053 \define@boolkey+{@ACM@affiliation@}{@ACM@affiliation@}{obeypunctuation}%
1054 [true]{\ClassError{\@classname}{obeypunctuation must be true or false}}

```

`\additionalaffiliation` Additional affiliations go to footnotes

```

1055 \def\additionalaffiliation#1{\authornote{\@additionalaffiliation{#1}}}

```

`@additionalaffiliation` Process additionalaffiliation inside `\authornote`

```

1056 \def\@additionalaffiliation#1{\bgroup
1057 \def\position##1{\ignorespaces}%
1058 \def\institution##1{##1\ignorespaces}%
1059 \def\department{\@ifnextchar[{\@department}{\@department[]}}%
1060 \def\@department[##1]##2{\unskip, ##2\ignorespaces}%
1061 \let\streetaddress\position
1062 \let\city\position
1063 \let\state\position
1064 \let\postcode\position
1065 \let\country\position
1066 Also with #1\unskip.\egroup}

```

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

```

1067 \renewcommand{\email}[2][{}%
1068 \if@ACM@anonymous\else
1069     \g@addto@macro\addresses{\email{#1}{#2}}%
1070 \fi}

```

`\orcid` Right now we do not typeset orcid's gobble

`@titlenotes` The titlenotes

```

1071 \def\@titlenotes{}

```

`\titlenote` Adding note to the title

```

1072 \def\titlenote#1{%
1073     \g@addto@macro\@title{\footnotemark}%

```

```

1074 \if@ACM@anonymous
1075   \g@addto@macro\@titlenotes{%
1076     \stepcounter{footnote}\footnotetext{Title note}}%
1077 \else
1078   \g@addto@macro\@titlenotes{\stepcounter{footnote}\footnotetext{#1}}%
1079 \fi}

\@subtitlenotes The subtitlenotes
1080 \def\@subtitlenotes{}

\subtitlenote Adding note to the subtitle
1081 \def\subtitlenote#1{%
1082   \g@addto@macro\@subtitle{\footnotemark}%
1083   \if@ACM@anonymous
1084     \g@addto@macro\@subtitlenotes{%
1085       \stepcounter{footnote}\footnotetext{Subtitle note}}%
1086   \else
1087     \g@addto@macro\@subtitlenotes{%
1088       \stepcounter{footnote}\footnotetext{#1}}%
1089   \fi}

\@authornotes The authornotes
1090 \def\@authornotes{}

\authornote Adding note to the author
1091 \def\authornote#1{%
1092   \if@ACM@anonymous\else
1093     \g@addto@macro\addresses{\@authornotemark}%
1094     \g@addto@macro\@authornotes{%
1095       \stepcounter{footnote}\footnotetext{#1}}%
1096   \fi}

\authornotemark Adding footnotemark to authors
1097 \newcommand\authornotemark[1][\relax]{%
1098   \ifx#1\relax\relax\relax
1099   \g@addto@macro\addresses{\@authornotemark}%
1100 \else
1101   \g@addto@macro\addresses{\@authornotemark{#1}}%
1102 \fi}

\acmVolume The current volume
1103 \def\acmVolume#1{\def\@acmVolume{#1}}
1104 \acmVolume{1}

\acmNumber The current number
1105 \def\acmNumber#1{\def\@acmNumber{#1}}
1106 \acmNumber{1}

```

`\acmArticle` The current article
1107 `\def\acmArticle#1{\def\@acmArticle{#1}}`
1108 `\acmArticle{1}`

`\acmArticleSeq` The sequence number
1109 `\def\acmArticleSeq#1{\def\@acmArticleSeq{#1}}`
1110 `\acmArticleSeq{\@acmArticle}`

`\acmYear` The current year
1111 `\def\acmYear#1{\def\@acmYear{#1}}`
1112 `\acmYear{\the\year}`

`\acmMonth` The current month
1113 `\def\acmMonth#1{\def\@acmMonth{#1}}`
1114 `\acmMonth{\the\month}`

`\@acmPubDate` The publication date
1115 `\def\@acmPubDate{\ifcase\@acmMonth\or`
1116 `January\or February\or March\or April\or May\or June\or`
1117 `July\or August\or September\or October\or November\or`
1118 `December\fi~\@acmYear}`

`\acmPrice` The price
1119 `\def\acmPrice#1{\def\@acmPrice{#1}}`
1120 `\acmPrice{15.00}`

`\acmSubmissionID` The submission id
1121 `\def\acmSubmissionID#1{\def\@acmSubmissionID{#1}}`
1122 `\acmSubmissionID{}`

`\acmISBN` The book isbn
1123 `\def\acmISBN#1{\def\@acmISBN{#1}}`
1124 `\acmISBN{978-x-xxxx-xxxx-x/YY/MM}`

`\acmDOI` The paper doi
1125 `\def\acmDOI#1{\def\@acmDOI{#1}}`
1126 `\acmDOI{10.1145/nnnnnnn.nnnnnn}`

`\if@ACM@badge` Whether to print badge. Note that either left or right badge triggers it:
1127 `\newif\if@ACM@badge`
1128 `\@ACM@badgefalse`

`\@ACM@badge@width` The width of the badge
1129 `\newlength\@ACM@badge@width`
1130 `\setlength\@ACM@badge@width{5pc}`

`\@ACM@title@width` The width of the badge
1131 `\newlength\@ACM@title@width`

`\@ACM@badge@skip` The space between the badge and the title
1132 `\newlength\@ACM@badge@skip`
1133 `\setlength\@ACM@badge@skip{1pc}`

`\acmBadgeR` Setting the right badge
1134 `\newcommand\acmBadgeR[2][\@ACM@badgetrue`
1135 `\def\@acmBadgeR@url{#1}%`
1136 `\def\@acmBadgeR@image{#2}}`
1137 `\def\@acmBadgeR@url{}`
1138 `\def\@acmBadgeR@image{}`

`\acmBadgeL` Setting the left badge
1139 `\newcommand\acmBadgeL[2][\@ACM@badgetrue`
1140 `\def\@acmBadgeL@url{#1}%`
1141 `\def\@acmBadgeL@image{#2}}`
1142 `\def\@acmBadgeL@url{}`
1143 `\def\@acmBadgeL@image{}`

`\startPage` The start page of the paper
1144 `\def\startPage#1{\def\@startPage{#1}}`
1145 `\startPage{}`

`\terms` Terms are obsolete, we use CCS now.
1146 `\def\terms#1{\ClassWarning{\@classname}{The command \string\terms} is`
1147 `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.
1148 `\def\keywords#1{\def\@keywords{#1}}`
1149 `\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
1150 `\renewenvironment{abstract}{\Collect@Body\@saveabstract}{}`

`\@saveabstract` And saving the abstract
1151 `\long\def\@saveabstract#1{\long\gdef\@abstract{#1}}`
1152 `\@saveabstract{}`

`\@empty` The long version of `\@empty` (to compare with `\@abstract`)
1153 `\long\def\@empty{}`

`\if@ACM@printccs` Whether to print CCS
1154 `\define@boolkey+{\@ACM@topmatter@}{\@ACM@}{printccs}[true]{%`
1155 `\if@ACM@printccs`
1156 `\ClassInfo{\@classname}{Printing CCS}%`
1157 `\else`
1158 `\ClassInfo{\@classname}{Suppressing CCS}%`
1159 `\fi}{\ClassError{\@classname}{printccs must be true or false}}`

```

\if@ACM@printacmref Whether to print ACM bib
1160 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printacmref}[true]{%
1161   \if@ACM@printacmref
1162     \ClassInfo{\@classname}{Printing bibformat}%
1163   \else
1164     \ClassInfo{\@classname}{Suppressing bibformat}%
1165   \fi}{\ClassError{\@classname}{printacmref must be true or false}}

\if@ACM@printfolios Whether to print folios
1166 \define@boolkey+{@ACM@topmatter@}[@ACM@]{printfolios}[true]{%
1167   \if@ACM@printfolios
1168     \ClassInfo{\@classname}{Printing folios}%
1169   \else
1170     \ClassInfo{\@classname}{Suppressing folios}%
1171   \fi}{\ClassError{\@classname}{printfolios must be true or false}}

\@ACM@authorssperrow The number of authors per row. 0 means use default algorithm.
1172 \define@cmdkey{@ACM@topmatter@}[@ACM@]{authorssperrow}[0]{%
1173   \IfInteger{#1}{\ClassInfo{\@classname}{Setting authorssperrow to
1174     #1}}{\ClassWarning{\@classname}{Parameter authorssperrow must be
1175     numerical. Ignoring the input #1}}\gdef\@ACM@authorssperrow{0}}

\settopmatter The usual syntactic sugar
1176 \def\settopmatter#1{\setkeys{@ACM@topmatter@}{#1}}

    Now the settings
1177 \settopmatter{printccs=true, printacmref=true}
1178 \if@ACM@manuscript
1179   \settopmatter{printfolios=true}
1180 \else
1181   \if@ACM@journal
1182     \settopmatter{printfolios=true}
1183   \else
1184     \settopmatter{printfolios=false}
1185   \fi
1186 \fi
1187 \settopmatter{authorssperrow=0}

\@received The container for the paper history
1188 \def\@received{}

\received The \received command
1189 \newcommand\received[2][\def\@tempa{#1}%
1190   \ifx\@tempa\@empty
1191     \ifx\@received\@empty
1192       \gdef\@received{Received #2}%
1193     \else
1194       \g@addto@macro{\@received}{; revised #2}%
1195     \fi

```

```

1196 \else
1197 \ifx\@received\@empty
1198 \gdef\@received{#1 #2}%
1199 \else
1200 \g@addto@macro{\@received}{; #1 #2}%
1201 \fi
1202 \fi}
1203 \AtEndDocument{%
1204 \ifx\@received\@empty\else
1205 \par\bigskip\noindent\small\normalfont\@received\par
1206 \fi}

```

3.11 Concepts system

We exclude CCSXML stuff generated by the ACM system:

```

1207 \RequirePackage{comment}
1208 \excludecomment{CCSXML}

```

\@concepts This is the storage macro for concepts

```

1209 \let\@concepts\@empty

```

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

```

1210 \newcommand\ccsdesc[2][100]{%
1211 \ccsdesc@parse#1~#2~}

```

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

```

1212 \RequirePackage{textcomp}
1213 \def\ccsdesc@parse#1~#2~#3~{%
1214 \expandafter\ifx\csname CCS@#2\endcsname\relax
1215 \expandafter\gdef\csname CCS@#2\endcsname{\textbullet\ \textbf{#2}\textrightarrow\ }%
1216 \g@addto@macro{\@concepts}{\csname CCS@#2\endcsname}\fi
1217 \expandafter\g@addto@macro\expandafter{\csname CCS@#2\endcsname}{%
1218 \ifnum#1>499\textbf{#3}; \else
1219 \ifnum#1>299\textit{#3}; \else
1220 #3; \fi\fi}}

```

3.12 Copyright system

This is from acmcopyright.sty

\if@printcopyright A flag whether to print copyright symbol

```

1221 \newif\if@printcopyright
1222 \@printcopyrighttrue

```

\if@printpermission Whether to print permission block

```

1223 \newif\if@printpermission
1224 \@printpermissiontrue

```

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

```
1225 \newif\if@acmowned
1226 \@acmownedtrue
```

Keys:

```
1227 \define@choicekey*{ACM@}{acmcopyrightmode}[%
1228   \acm@copyrightinput\acm@copyrightmode]{none,acmcopyright,acmlicensed,%
1229   rightsretained,usgov,usgovmixed,cagov,cagovmixed,%
1230   licensedusgovmixed,licensedcagovmixed,othergov,licensedothergov}{%
1231   \@printpermissiontrue
1232   \@printcopyrighttrue
1233   \@acmownedtrue
1234   \ifnum\acm@copyrightmode=0\relax % none
1235     \@printpermissionfalse
1236     \@printcopyrightfalse
1237     \@acmownedfalse
1238   \fi
1239   \ifnum\acm@copyrightmode=2\relax % acmlicensed
1240     \@acmownedfalse
1241   \fi
1242   \ifnum\acm@copyrightmode=3\relax % rightsretained
1243     \@acmownedfalse
1244     \acmPrice{}%
1245   \fi
1246   \ifnum\acm@copyrightmode=4\relax % usgov
1247     \@printpermissiontrue
1248     \@printcopyrightfalse
1249     \@acmownedfalse
1250     \acmPrice{}%
1251   \fi
1252   \ifnum\acm@copyrightmode=6\relax % cagov
1253     \@acmownedfalse
1254   \fi
1255   \ifnum\acm@copyrightmode=8\relax % licensedusgovmixed
1256     \@acmownedfalse
1257   \fi
1258   \ifnum\acm@copyrightmode=9\relax % licensedcagovmixed
1259     \@acmownedfalse
1260   \fi
1261   \ifnum\acm@copyrightmode=10\relax % othergov
1262     \@acmownedtrue
1263   \fi
1264   \ifnum\acm@copyrightmode=11\relax % licensedothergov
1265     \@acmownedfalse
1266   \fi}
```

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

```
1267 \def\setcopyright#1{\setkeys{ACM@}{acmcopyrightmode=#1}}
1268 \setcopyright{acmcopyright}
```

`\@copyrightowner` Here is the owner of the copyright

```
1269 \def\@copyrightowner{%
1270   \ifcase\acm@copyrightmode\relax % none
1271   \or % acmcopyright
1272   Association for Computing Machinery.
1273   \or % acmlicensed
1274   Copyright held by the owner/author(s). Publication rights licensed to
1275   Association for Computing Machinery.
1276   \or % rightsretained
1277   Copyright held by the owner/author(s).
1278   \or % usgov
1279   \or % usgovmixed
1280   Association for Computing Machinery.
1281   \or % cagov
1282   Crown in Right of Canada.
1283   \or %cagovmixed
1284   Association for Computing Machinery.
1285   \or %licensedusgovmixed
1286   Copyright held by the owner/author(s). Publication rights licensed to
1287   Association for Computing Machinery.
1288   \or %licensedcagovmixed
1289   Copyright held by the owner/author(s). Publication rights licensed to
1290   Association for Computing Machinery.
1291   \or % othergov
1292   Association for Computing Machinery.
1293   \or % licensedothergov
1294   Copyright held by the owner/author(s). Publication rights licensed to
1295   Association for Computing Machinery.
1296   \fi}
```

`\@formatdoi` Print a clickable doi

```
1297 \def\@formatdoi#1{\url{https://doi.org/#1}}
```

`\@copyrightpermission` The canned permission block.

```
1298 \def\@copyrightpermission{%
1299   \ifcase\acm@copyrightmode\relax % none
1300   \or % acmcopyright
1301   Permission to make digital or hard copies of all or part of this
1302   work for personal or classroom use is granted without fee provided
1303   that copies are not made or distributed for profit or commercial
1304   advantage and that copies bear this notice and the full citation on
1305   the first page. Copyrights for components of this work owned by
1306   others than ACM must be honored. Abstracting with credit is
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1308   redistribute to lists, requires prior specific permission
1309   and\hspace*{.5pt}/or a fee. Request permissions from
1310   permissions@acm.org.
1311   \or % acmlicensed
1312   Permission to make digital or hard copies of all or part of this
```

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1315 advantage and that copies bear this notice and the full citation on
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1328 honored. For all other uses, contact the
1329 owner\hspace*{.5pt}/author(s).
1330 \or % usgov
1331 This paper is authored by an employee(s) of the United States
1332 Government and is in the public domain. Non-exclusive copying or
1333 redistribution is allowed, provided that the article citation is
1334 given and the authors and agency are clearly identified as its
1335 source.
1336 \or % usgovmixed
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1348 \or % cagov
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1359 otherwise, distribute, republish, or post, requires prior specific
1360 permission and\hspace*{.5pt}/or a fee. Request permissions from
1361 permissions@acm.org.
1362 \or % cagovmixed

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1398 retains a nonexclusive, royalty-free right to publish or reproduce
1399 this article, or to allow others to do so, for Government purposes
1400 only.
1401 \fi}

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

```
1402 \def\copyrightyear#1{\def\@copyrightyear{#1}}
1403 \copyrightyear{\@acmYear}
```

\@teaserfigures The teaser figures container

```
1404 \def\@teaserfigures{}
```

teaserfigure The teaser figure

```
1405 \newenvironment{teaserfigure}{\Collect@Body\@saveteaser}{}{}
```

```

\@saveteaser Saving the teaser
1406 \long\def\@saveteaser#1{\g@addto@macro\@teaserfigures{\@teaser{#1}}}

\thanks We redefine amsart \thanks, so the anonymous key works
1407 \renewcommand{\thanks}[1]{%
1408   \@ifnotempty{#1}{%
1409     \if@ACM@anonymous
1410       \g@addto@macro\thankses{\thanks{A note}}%
1411     \else
1412       \g@addto@macro\thankses{\thanks{#1}}%
1413     \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]`.

```
1414 \newbox\mktitle@bx
```

`\maketitle` The (in)famous `\maketitle`. Note that in sigchi-a mode authors are *not* in the title box. Another note: there is a subtle difference between author notes, title notes and thankses. The latter refer to the paper itself, and therefore belong to the copyright/permission block. By the way, this was the default behavior of the old ACM classes.

```

1415 \def\maketitle{%
1416   \if@ACM@anonymous
1417     % Anonymize omission of \author-s
1418     \ifnum\@authorgroups=0\author{}\fi
1419   \fi
1420   \begingroup
1421   \let\@footnotemark\@footnotemark@nolink
1422   \let\@footnotetext\@footnotetext@nolink
1423   \renewcommand\thefootnote{\@fnsymbol\c@footnote}%
1424   \global\@topnum\z@ % this prevents floats from falling
1425                       % at the top of page 1
1426   \global\@botnum\z@ % we do not want them to be on bottom either
1427   \hsize=\textwidth
1428   \def\@makefnmark{\hbox{\@textsuperscript{\@thefnmark}}}%
1429   \@mktitle\if@ACM@sigchiamode\else\mkauthors\fi\mkteasers
1430   \@printtopmatter
1431   \if@ACM@sigchiamode\mkauthors\fi
1432   \setcounter{footnote}{0}%
1433   \def\@makefnmark{\hbox{\@textsuperscript{\normalfont\@thefnmark}}}%
1434   \@titlenotes
1435   \@subtitlenotes
1436   \@authornotes
1437   \let\@makefnmark\relax \let\@thefnmark\relax
1438   \let\@makefntext\noindent
1439   \ifx\@empty\thankses\else

```

```

1440 \footnotetextcopyrightpermission{%
1441 \def\par{\let\par\@par}\parindent\z@\setthanks}%
1442 \fi
1443 \footnotetextcopyrightpermission{%
1444 \if@ACM@authordraft
1445 \raisebox{-2ex}[\z@][\z@]{\makebox[0pt][l]{\large\bfseries
1446 Unpublished
1447 working draft. Not for distribution}}%
1448 \color[gray]{0.9}%
1449 \fi
1450 \parindent\z@\parskip0.1\baselineskip
1451 \if@ACM@authorversion\else
1452 \if@printpermission\@copyrightpermission\par\fi
1453 \fi
1454 \if@ACM@manuscript\else
1455 \if@ACM@journal\else % Print the conference information
1456 {\itshape \acmConference@shortname, \acmConference@date, \acmConference@venue}\par
1457 \fi
1458 \fi
1459 \if@printcopyright
1460 \copyright\ \@copyrightyear\ \@copyrightowner\
1461 \else
1462 \@copyrightyear.\
1463 \fi
1464 \if@ACM@manuscript
1465 Manuscript submitted to ACM\
1466 \else
1467 \if@ACM@authorversion
1468 This is the author's version of the work. It is posted here for
1469 your personal use. Not for redistribution. The definitive Version
1470 of Record was published in
1471 \if@ACM@journal
1472 \emph{\@journalName}%
1473 \else
1474 \emph{Proceedings of \acmConference@name, \acmConference@date}%
1475 \fi
1476 \ifx\@acmDOI\@empty
1477 .
1478 \else
1479 , \@formatdoi{\@acmDOI}.
1480 \fi\
1481 \else
1482 \if@ACM@journal
1483 \@permissionCodeOne/\@acmYear/\@acmMonth-ART\@acmArticle
1484 \ifx\@acmPrice\@empty\else\ $\@acmPrice\fi\
1485 \@formatdoi{\@acmDOI}%
1486 \else % Conference
1487 ACM~ISBN~\@acmISBN
1488 \ifx\@acmPrice\@empty.\else\dots\$\@acmPrice\fi\
1489 \@formatdoi{\@acmDOI}%

```

```

1490         \fi
1491         \fi
1492     \fi}
1493 \endgroup
1494 \setcounter{footnote}{0}%
1495 \@mkabstract
1496 \if@ACM@printccs
1497     \ifx\@concepts\@empty\else\bgroup
1498         {\@specialsection{CCS Concepts}%
1499         \@concepts\par}\egroup
1500     \fi
1501     \fi
1502     \ifx\@keywords\@empty\else\bgroup
1503         {\if@ACM@journal
1504         \@specialsection{Additional Key Words and Phrases}%
1505         \else
1506         \@specialsection{Keywords}%
1507         \fi
1508         \@keywords}\par\egroup
1509     \fi
1510 \andify\authors
1511 \andify\shortauthors
1512 \global\let\authors=\authors
1513 \global\let\shortauthors=\shortauthors
1514 \if@ACM@printacmref
1515     \@mkbibcitation
1516 \fi
1517 \hypersetup{pdfauthor={\authors},
1518     pdftitle={\@title}, pdfkeywords={\@concepts}}%
1519 \@printendtopmatter
1520 \@afterindentfalse
1521 \@afterheading
1522 }

```

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

```

1523 \def\@specialsection#1{%
1524     \ifcase\ACM@format@nr
1525     \relax % manuscript
1526     \par\medskip\small\noindent#1: %
1527     \or % acsmall
1528     \par\medskip\small\noindent#1: %
1529     \or % acmlarge
1530     \par\medskip\small\noindent#1: %
1531     \or % acmtog
1532     \par\medskip\small\noindent#1: %
1533     \or % sigconf
1534     \section*{#1}%
1535     \or % siggraph
1536     \section*{#1}%
1537     \or % sigplan

```

```

1538 \paragraph*{#1}%
1539 \or % sigchi
1540 \section*{#1}%
1541 \or % sigchi-a
1542 \section*{#1}%
1543 \fi}

```

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

```

1544 \def\@printtopmatter{%
1545 \ifx\@startPage\@empty
1546 \gdef\@startPage{1}%
1547 \else
1548 \setcounter{page}{\@startPage}%
1549 \fi
1550 \thispagestyle{firstpagestyle}%
1551 \noindent
1552 \ifcase\ACM@format@nr
1553 \relax % manuscript
1554 \box\mktitle@bx\par
1555 \noindent\hrulefill\par
1556 \or % acmsmall
1557 \box\mktitle@bx\par
1558 \noindent\hrulefill\par
1559 \or % acmlarge
1560 \box\mktitle@bx\par
1561 \noindent\hrulefill\par
1562 \or % acmtog
1563 \twocolumn[\box\mktitle@bx]%
1564 \or % sigconf
1565 \twocolumn[\box\mktitle@bx]%
1566 \or % siggraph
1567 \twocolumn[\box\mktitle@bx]%
1568 \or % sigplan
1569 \twocolumn[\box\mktitle@bx]%
1570 \or % sigchi
1571 \twocolumn[\box\mktitle@bx]%
1572 \or % sigchi-a
1573 \par\box\mktitle@bx\par\bigskip
1574 \if@ACM@badge
1575 \marginpar{\noindent
1576 \ifx\@acmBadgeL@image\@empty\else
1577 \href{\@acmBadgeL@url}{%
1578 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}%
1579 \hskip\@ACM@badge@skip
1580 \fi
1581 \ifx\@acmBadgeR@image\@empty\else
1582 \href{\@acmBadgeR@url}{%
1583 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}%

```

```

1584         \fi}%
1585     \fi
1586 \fi
1587 }

\@mktitle The title of the article
1588 \def\@mktitle{%
1589     \ifcase\ACM@format@nr
1590     \relax % manuscript
1591     \@mktitle@i
1592     \or % acsmall
1593     \@mktitle@i
1594     \or % acmlarge
1595     \@mktitle@i
1596     \or % acmtog
1597     \@mktitle@i
1598     \or % sigconf
1599     \@mktitle@iii
1600     \or % siggraph
1601     \@mktitle@iii
1602     \or % sigplan
1603     \@mktitle@iii
1604     \or % sigchi
1605     \@mktitle@iii
1606     \or % sigchi-a
1607     \@mktitle@iv
1608     \fi
1609 }

\@titlefont The font to typeset title
1610 \def\@titlefont{%
1611     \ifcase\ACM@format@nr
1612     \relax % manuscript
1613     \LARGE\bfseries\sffamily
1614     \or % acsmall
1615     \LARGE\bfseries\sffamily
1616     \or % acmlarge
1617     \LARGE\bfseries\sffamily
1618     \or % acmtog
1619     \Huge\sffamily
1620     \or % sigconf
1621     \Huge\sffamily\bfseries
1622     \or % siggraph
1623     \Huge\sffamily\bfseries
1624     \or % sigplan
1625     \Huge\bfseries
1626     \or % sigchi
1627     \Huge\sffamily\bfseries
1628     \or % sigchi-a
1629     \Huge\bfseries

```

```

1630 \fi}

\@subtitlefont The font to typeset title
1631 \def\@subtitlefont{\normalsize
1632 \ifcase\ACM@format@nr
1633 \relax % manuscript
1634 \mdseries
1635 \or % acmsmall
1636 \mdseries
1637 \or % acmlarge
1638 \mdseries
1639 \or % acmtog
1640 \LARGE
1641 \or % sigconf
1642 \LARGE\mdseries
1643 \or % siggraph
1644 \LARGE\mdseries
1645 \or % sigplan
1646 \LARGE\mdseries
1647 \or % sigchi
1648 \LARGE\mdseries
1649 \or % sigchi-a
1650 \mdseries
1651 \fi}

\@mktitle@i The version of \mktitle for most journals
1652 \def\@mktitle@i{\hsize=\textwidth
1653 \@ACM@title@width=\hsize
1654 \ifx\@acmBadgeL@image\@empty\else
1655 \advance\@ACM@title@width by -\@ACM@badge@width
1656 \advance\@ACM@title@width by -\@ACM@badge@skip
1657 \fi
1658 \ifx\@acmBadgeR@image\@empty\else
1659 \advance\@ACM@title@width by -\@ACM@badge@width
1660 \advance\@ACM@title@width by -\@ACM@badge@skip
1661 \fi
1662 \setbox\mktitle@bx=\vbox{\noindent\@titlefont
1663 \ifx\@acmBadgeL@image\@empty\else
1664 \raisebox{- .5\baselineskip}{\z@}{\href{\@acmBadgeL@url}{%
1665 \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1666 \hskip\@ACM@badge@skip
1667 \fi
1668 \parbox[t]{\@ACM@title@width}{\raggedright
1669 \@titlefont\noindent
1670 \@title
1671 \ifx\@subtitle\@empty\else
1672 \par\noindent{\@subtitlefont\@subtitle}
1673 \fi}%
1674 \ifx\@acmBadgeR@image\@empty\else
1675 \hskip\@ACM@badge@skip

```

```

1676   \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1677     \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1678   \fi
1679   \par\bigskip}}%

```

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

`\@mkttitle@iii` The version of `\mkttitle` 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.

```

1680 \def\@mkttitle@iii{\hsize=\textwidth
1681   \setbox\mkttitle@bx=\vbox{\@titlefont\centering
1682     \@ACM@title@width=\hsize
1683     \if@ACM@badge
1684       \advance\@ACM@title@width by -2\@ACM@badge@width
1685       \advance\@ACM@title@width by -2\@ACM@badge@skip
1686       \parbox[b]{\@ACM@badge@width}{\strut
1687         \ifx\@acmBadgeL@image\@empty\else
1688           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeL@url}{%
1689             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeL@image}}}%
1690           \fi}%
1691       \hskip\@ACM@badge@skip
1692     \fi
1693     \parbox[t]{\@ACM@title@width}{\centering\@titlefont
1694       \@title
1695       \ifx\@subtitle\@empty\else
1696         \par\noindent{\@subtitlefont\@subtitle}
1697       \fi
1698     }%
1699     \if@ACM@badge
1700       \hskip\@ACM@badge@skip
1701       \parbox[b]{\@ACM@badge@width}{\strut
1702         \ifx\@acmBadgeR@image\@empty\else
1703           \raisebox{-.5\baselineskip}[\z@][\z@]{\href{\@acmBadgeR@url}{%
1704             \includegraphics[width=\@ACM@badge@width]{\@acmBadgeR@image}}}%
1705           \fi}%
1706     \fi
1707     \par\bigskip}}%

```

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

```

1708 \def\@mkttitle@iv{\hsize=\textwidth
1709   \setbox\mkttitle@bx=\vbox{\raggedright\leftskip5pc\@titlefont
1710     \noindent\leavevmode\leaders\hrule height 2pt\hfill\kern0pt\par
1711     \noindent\@title
1712     \ifx\@subtitle\@empty\else
1713       \par\noindent\@subtitlefont\@subtitle
1714     \fi
1715     \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.

```

1716 \newbox\@ACM@commabox
1717 \def\@ACM@addtoaddress#1{%
1718   \ifvmode\else
1719     \if@ACM@affiliation@obexpunctuation\else
1720     \setbox\@ACM@commabox=\hbox{, }%
1721     \unskip\cleaders\copy\@ACM@commabox\hskip\wd\@ACM@commabox
1722   \fi\fi
1723   #1}

```

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

```

\city            1724 \if@ACM@journal
\state           1725 \let\position\@gobble
\postcode        1726 \def\institution#1{#1\ignorespaces}%
\country         1727 \newcommand\department[2][0]{}%
                 1728 \let\streetaddress\@gobble
                 1729 \let\city\@gobble
                 1730 \let\state\@gobble
                 1731 \let\postcode\@gobble
                 1732 \let\country\@gobble
                 1733 \else
                 1734 \def\position#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
                 1735 \def\institution#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
                 1736 \newcommand\department[2][0]{\if@ACM@affiliation@obexpunctuation
                 1737   #2\else#2\par\fi}%
                 1738 \def\streetaddress#1{\if@ACM@affiliation@obexpunctuation#1\else#1\par\fi}%
                 1739 \let\city\@ACM@addtoaddress
                 1740 \let\state\@ACM@addtoaddress
                 1741 \def\postcode#1{\if@ACM@affiliation@obexpunctuation#1\else\unskip\space#1\fi}%
                 1742 \let\country\@ACM@addtoaddress
                 1743 \fi

```

\@mkauthors Typesetting authors

```

1744 \def\@mkauthors{\begingroup
1745   \hsize=\textwidth
1746   \ifcase\ACM@format@nr
1747   \relax % manuscript
1748   \@mkauthors@i
1749   \or % acsmall
1750   \@mkauthors@i
1751   \or % acmlarge

```

```

1752 \mkauthors@i
1753 \or % acmtog
1754 \mkauthors@i
1755 \or % sigconf
1756 \mkauthors@iii
1757 \or % siggraph
1758 \mkauthors@iii
1759 \or % sigplan
1760 \mkauthors@iii
1761 \or % sigchi
1762 \mkauthors@iii
1763 \or % sigchi-a
1764 \mkauthors@iv
1765 \fi
1766 \endgroup
1767 }

```

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

```

1768 \def\@authorfont{\Large\sffamily}

```

\@affiliationfont Font for affiliations

```

1769 \def\@affiliationfont{\normalsize\normalfont}

```

Adjusting fonts for different formats

```

1770 \ifcase\ACM@format@nr
1771 \relax % manuscript
1772 \or % acmsmall
1773 \def\@authorfont{\large\sffamily}
1774 \def\@affiliationfont{\small\normalfont}
1775 \or % acmlarge
1776 \or % acmtog
1777 \def\@authorfont{\LARGE\sffamily}
1778 \def\@affiliationfont{\large}
1779 \or % sigconf
1780 \def\@authorfont{\LARGE}
1781 \def\@affiliationfont{\large}
1782 \or % siggraph
1783 \def\@authorfont{\normalsize\normalfont}
1784 \def\@affiliationfont{\normalsize\normalfont}
1785 \or % sigplan
1786 \def\@authorfont{\Large\normalfont}
1787 \def\@affiliationfont{\normalsize\normalfont}
1788 \or % sigchi
1789 \def\@authorfont{\bfseries}
1790 \def\@affiliationfont{\mdseries}
1791 \or % sigchi-a
1792 \def\@authorfont{\bfseries}
1793 \def\@affiliationfont{\mdseries}
1794 \fi

```

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

```
1795 \def\@typeset@author@line{%
1796   \andify\@currentauthors\par\noindent
1797   \@currentauthors\def\@currentauthors{}%
1798   \ifx\@currentaffiliations\@empty\else
1799     \andify\@currentaffiliations
1800     \unskip, {\@currentaffiliations}\par
1801   \fi
1802   \def\@currentaffiliations{}}
```

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

```
1803 \def\@mkauthors@i{%
1804   \def\@currentauthors{}%
1805   \def\@currentaffiliations{}%
1806   \global\let\and\@typeset@author@line
1807   \def\@author##1{%
1808     \ifx\@currentauthors\@empty
1809       \gdef\@currentauthors{\@authorfont\MakeUppercase{##1}}%
1810     \else
1811       \g@addto@macro{\@currentauthors}{\and\MakeUppercase{##1}}%
1812     \fi
1813     \gdef\and{}}%
1814   \def\email##1##2{%
1815     \def\@tempa{##2}\ifx\@tempa\@empty\else
1816       \ifx\@currentaffiliations\@empty
1817         \gdef\@currentaffiliations{%
1818           \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1819           \setkeys{@ACM@affiliation@}{##1}%
1820           \@affiliationfont##2}%
1821         \else
1822           \g@addto@macro{\@currentaffiliations}{\and
1823             \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1824             \setkeys{@ACM@affiliation@}{##1}##2}%
1825         \fi
1826       \fi
1827     \global\let\and\@typeset@author@line}%
1828   \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par\medskip
1829     \noindent\addresses\@typeset@author@line
1830     \par\medskip}%
1831   \par\medskip}%
1832 }
```

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

`\author@bx` The box to put individual author to

```
1833 \newbox\author@bx
```

`\author@bx@wd` The width of the author box
1834 `\newdimen\author@bx@wd`

`\author@bx@sep` The separation between the author boxes
1835 `\newskip\author@bx@sep`
1836 `\author@bx@sep=1pc\relax`

`\@typeset@author@bx` Typesetting the box with authors. Note that in SIGCHI-A the box is not centered.
1837 `\def\@typeset@author@bx{\bgroup\hsize=\author@bx@wd\def\and{\par}%`
1838 `\global\setbox\author@bx=\vtop{\if@ACM@sigchiamode\else\centering\fi`
1839 `\@authorfont\@currentauthors\par\@affiliationfont`
1840 `\@currentaffiliation}\egroup`
1841 `\box\author@bx\hspace{\author@bx@sep}%`
1842 `\gdef\@currentauthors{}`
1843 `\gdef\@currentaffiliation{}}`

`\@mkauthors@iii` The sigconf version. Here we use centered design with each author in a separate box.
1844 `\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.
1845 `\author@bx@wd=\textwidth\relax`
1846 `\advance\author@bx@wd by -\author@bx@sep\relax`
1847 `\ifnum\@ACM@authorsperrow>0\relax`
1848 `\divide\author@bx@wd by \@ACM@authorsperrow\relax`
1849 `\else`
1850 `\ifcase\@num@authorgroups`
1851 `\relax % 0?`
1852 `\or % 1=one author per row`
1853 `\or % 2=two authors per row`
1854 `\divide\author@bx@wd by \@num@authorgroups\relax`
1855 `\or % 3=three authors per row`
1856 `\divide\author@bx@wd by \@num@authorgroups\relax`
1857 `\or % 4=two authors per row (!)`
1858 `\divide\author@bx@wd by 2\relax`
1859 `\else % three authors per row`
1860 `\divide\author@bx@wd by 3\relax`
1861 `\fi`
1862 `\fi`
1863 `\advance\author@bx@wd by -\author@bx@sep\relax`
Now, parsing of `\addresses`:
1864 `\gdef\@currentauthors{}`
1865 `\gdef\@currentaffiliation{}`
1866 `\def\@author##1{\ifx\@currentauthors\@empty`
1867 `\gdef\@currentauthors{\par##1}%`
1868 `\else`
1869 `\g@addto@macro\@currentauthors{\par##1}%`

```

1870 \fi
1871 \gdef\and{}}%
1872 \def\email##1##2{\ifx\@currentaffiliation\@empty
1873   \gdef\@currentaffiliation{\nolinkurl{##2}}%
1874 \else
1875   \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
1876 \fi}%
1877 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
1878   \gdef\@currentaffiliation{%
1879     \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1880     \setkeys{@ACM@affiliation@}{##1}##2}%
1881 \else
1882   \g@addto@macro\@currentaffiliation{\par
1883     \setkeys{@ACM@affiliation@}{obeypunctuation=false}%
1884     \setkeys{@ACM@affiliation@}{##1}##2}%
1885 \fi
1886 \global\let\and\@typeset@author@bx
1887 }%

```

Actual typesetting is done by \and macro:

```

1888 \hspace=\textwidth
1889 \global\setbox\mktitle@bx=\vbox{\noindent
1890   \box\mktitle@bx\par\medskip\leavevmode
1891   \lineskip=1pc\relax\centering\hspace*{-1em}%
1892   \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, unless overridden.

```
1893 \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 $(\text{columnwidth} - \text{author@bx@sep})/N - \text{author@bx@sep}$, where N is the number of boxes per row.

```

1894 \author@bx@wd=\columnwidth\relax
1895 \advance\author@bx@wd by -\author@bx@sep\relax
1896 \ifnum\@ACM@authorsperrow>0\relax
1897   \divide\author@bx@wd by \@ACM@authorsperrow\relax
1898 \else
1899   \ifcase\@num@authorgroups
1900     \relax % 0?
1901     \or % 1=one author per row
1902     \else % 2=two authors per row
1903       \divide\author@bx@wd by 2\relax
1904   \fi
1905 \fi
1906 \advance\author@bx@wd by -\author@bx@sep\relax

```

Now, parsing of \addresses:

```
1907 \gdef\@currentauthors{}}%
```

```

1908 \gdef\@currentaffiliation{}%
1909 \def\@author##1{\ifx\@currentauthors\@empty
1910   \gdef\@currentauthors{\par##1}%
1911 \else
1912   \g@addto@macro\@currentauthors{\par##1}%
1913 \fi
1914 \gdef\and{}}%
1915 \def\email##1##2{\ifx\@currentaffiliation\@empty
1916   \gdef\@currentaffiliation{\nolinkurl{##2}}%
1917 \else
1918   \g@addto@macro\@currentaffiliation{\par\nolinkurl{##2}}%
1919 \fi}%
1920 \def\affiliation##1##2{\ifx\@currentaffiliation\@empty
1921   \gdef\@currentaffiliation{%
1922     \setkeys{@ACM@affiliation@}{obexpunctuation=false}%
1923     \setkeys{@ACM@affiliation@}{##1}##2}%
1924 \else
1925   \g@addto@macro\@currentaffiliation{\par
1926     \setkeys{@ACM@affiliation@}{obexpunctuation=false}%
1927     \setkeys{@ACM@affiliation@}{##1}##2}%
1928 \fi
1929 \global\let\and\@typeset@author@bx}%
1930 %

```

Actual typesetting is done by \and macro

```

1931 \bgroup\hsize=\columnwidth
1932 \par\raggedright\leftskip=\z@
1933 \lineskip=1pc\noindent
1934 \addresses\let\and\@typeset@author@bx\and\par\bigskip\egroup}

```

- \@authornotemark Adding footnote mark to authors. This version adds “normal” footnote mark.


```

1935 \def\@authornotemark{\g@addto@macro\@currentauthors{\footnotemark\relax}}

```
- \@@authornotemark Adding footnote mark to authors with the given number


```

1936 \def\@@authornotemark#1{\g@addto@macro\@currentauthors{\footnotemark[#1]}}

```
- \@mkteasers Typesetting teasers


```

1937 \def\@mkteasers{%
1938   \ifx\@teaserfigures\@empty\else
1939     \def\@teaser##1{\par\bigskip\bgroup
1940       \captionsetup{type=figure}##1\egroup\par}
1941     \global\setbox\mktitle@bx=\vbox{\noindent\box\mktitle@bx\par
1942       \noindent\@teaserfigures\par\medskip}%
1943     \fi}

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


```

1944 \def\@setaddresses{}

```
- \@mkabstract Typesetting abstract

```

1945 \def\@mkabstract{\bgroup
1946   \ifx\@abstract@empty\else
1947   {\phantomsection\addcontentsline{toc}{section}{Abstract}%
1948    \if@ACM@journal
1949     \small\noindent
1950    \else
1951     \section*{Abstract}%
1952    \fi
1953   \ignorespaces\@abstract\par}%
1954 \fi\egroup}

```

\@mkbibcitation Print bibcitation format

```

1955 \def\@mkbibcitation{\bgroup
1956   \def\footnotemark{}}%
1957   \def\{\unskip}\ignorespaces}%
1958   \def\footnote{\ClassError{\@classname}{Please do not use footnotes
1959     inside \string\title{} or \string\author{} command! Use
1960     \string\titlenote{} or \string\authornote{} instead!}}%
1961   \par\medskip\small\noindent{\bfseries ACM Reference format:}\par\nobreak
1962   \noindent\authors. \@acmYear. \@title.
1963   \if@ACM@journal
1964     \textit{\@journalNameShort}
1965     \@acmVolume, \@acmNumber, Article~\@acmArticle\ (\@acmPubDate),
1966     \ref{TotPages}~pages.
1967   \else
1968     In \textit{Proceedings of \@acmConference@name}, \@acmConference@venue,
1969     \@acmConference@date
1970     \ifx\@acmConference@name\@acmConference@shortname\else
1971       \ (\@acmConference@shortname)\fi
1972     ,} \ref{TotPages}~pages.
1973   \fi\par
1974   \noindent\@formatdoi{\@acmDOI}
1975 \par\egroup}

```

\@printendtopmatter End the top matter

```

1976 \def\@printendtopmatter{\par\medskip
1977   \ifcase\ACM@format@nr
1978   \relax % manuscript
1979   \noindent\hrulefill\par\medskip
1980   \or % acsmall
1981   \noindent\hrulefill\par\medskip
1982   \or % acmlarge
1983   \noindent\hrulefill\par\medskip
1984   \or % acmtog
1985   \par\bigskip
1986   \or % sigconf
1987   \par\bigskip
1988   \or % siggraph
1989   \par\bigskip
1990   \or % sigplan

```

```

1991 \par\bigskip
1992 \or % sigchi
1993 \par\bigskip
1994 \or % sigchi-a
1995 \fi
1996 }

```

\setthanks We redefine \setthanks using \long

```

1997 \def\setthanks{\long\def\thanks##1{\par##1\@addpunct.}\thankses}

```

3.14 Headers and Footers

We use fancyhdr for our headers and footers:

```

1998 \RequirePackage{fancyhdr}

```

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

```

1999 \if@ACM@review
2000 \newsavebox{\ACM@linecount@bx}
2001 \newlength\ACM@linecount@bxht
2002 \newcount\ACM@linecount
2003 \ACM@linecount\@ne\relax
2004 \def\ACM@mk@linecount{%
2005 \savebox{\ACM@linecount@bx}[4em][t]{\parbox[t]{4em}{%
2006 \setlength{\ACM@linecount@bxht}{-\baselineskip}%
2007 \loop{\color{ACMRed}\scriptsize\the\ACM@linecount}\
2008 \global\advance\ACM@linecount by \@ne
2009 \addtolength{\ACM@linecount@bxht}{\baselineskip}%
2010 \ifdim\ACM@linecount@bxht<\textheight\repeat}}
2011 \fi

```

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

```

2012 \def\ACM@linecountL{%
2013 \if@ACM@review
2014 \ACM@mk@linecount
2015 \begin{picture}(0,0)%
2016 \put(-26,-22){\usebox{\ACM@linecount@bx}}%
2017 \end{picture}%
2018 \fi}

```

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

```

2019 \def\ACM@linecountR{%
2020 \if@ACM@review
2021 \ACM@mk@linecount
2022 \begin{picture}(0,0)%
2023 \put(20,-22){\usebox{\ACM@linecount@bx}}%
2024 \end{picture}%
2025 \fi}

```

\ACM@timestamp The timestamp system

```
2026 \if@ACM@timestamp
2027 % Subtracting 30 from \time gives us the effect of rounding-down despite
2028 % \numexpr rounding to nearest
2029 \newcounter{ACM@time@hours}
2030 \setcounter{ACM@time@hours}{\numexpr (\time - 30) / 60 \relax}
2031 \newcounter{ACM@time@minutes}
2032 \setcounter{ACM@time@minutes}{\numexpr \time - \theACM@time@hours * 60 \relax}
2033 \newcommand\ACM@timestamp{%
2034   \footnotesize%
2035   \the\year-\two@digits{\the\month}-\two@digits{\the\day}{ }%
2036   \two@digits{\theACM@time@hours}:\two@digits{\theACM@time@minutes}{ }%
2037   page\thepage\ (pp. \@startPage-\pageref*{TotPages})%
2038   \ifx\@acmSubmissionID\@empty\relax\else
2039     ~Submission~ID: \@acmSubmissionID
2040   \fi
2041 }
2042 \fi
```

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

```
2043 \def\@shortauthors{\if@ACM@anonymous Anon.\else\shortauthors\fi}
```

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

```
2044 \def\@headfootfont{%
2045   \ifcase\ACM@format@nr
2046   \relax % manuscript
2047   \sffamily
2048   \or % acmsmall
2049   \sffamily
2050   \or % acmlarge
2051   \sffamily
2052   \or % acmtog
2053   \sffamily
2054   \or % sigconf
2055   \sffamily
2056   \or % siggraph
2057   \sffamily
2058   \or % sigplan
2059   \sffamily
2060   \or % sigchi
2061   \sffamily
2062   \or % sigchi-a
2063   \sffamily
2064   \fi}
```

standardpagestyle The pagestyle for all pages but the first one

```
2065 \fancypagestyle{standardpagestyle}{%
2066   \fancyhf{}}
```

```

2067 \renewcommand{\headrulewidth}{\z@}%
2068 \renewcommand{\footrulewidth}{\z@}%
2069 \ifcase\ACM@format@nr
2070 \relax % manuscript
2071 \fancyhead[LE]{\ACM@linecountL\if@ACM@printfolios\thepage\fi}%
2072 \fancyhead[RO]{\if@ACM@printfolios\thepage\fi}%
2073 \fancyhead[RE]{\@shortauthors}%
2074 \fancyhead[LO]{\ACM@linecountL\shorttitle}%
2075 \fancyfoot[RO,LE]{\footnotesize Manuscript submitted to ACM}%
2076 \or % acmsmall
2077 \fancyhead[LE]{\ACM@linecountL\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2078 \fancyhead[RO]{\@headfootfont\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2079 \fancyhead[RE]{\@headfootfont\@shortauthors}%
2080 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2081 \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2082 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2083 \or % acmlarge
2084 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2085 \@acmArticle\if@ACM@printfolios:\thepage\fi\quad\textbullet\quad\@shortauthors}%
2086 \fancyhead[LO]{\ACM@linecountL}%
2087 \fancyhead[RO]{\@headfootfont
2088 \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi}%
2089 \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2090 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2091 \or % acmtog
2092 \fancyhead[LE]{\ACM@linecountL\@headfootfont
2093 \@acmArticle\if@ACM@printfolios:\thepage\fi\quad\textbullet\quad\@shortauthors}%
2094 \fancyhead[LO]{\ACM@linecountL}%
2095 \fancyhead[RE]{\ACM@linecountR}%
2096 \fancyhead[RO]{\@headfootfont
2097 \shorttitle\quad\textbullet\quad\@acmArticle\if@ACM@printfolios:\thepage\fi\ACM@linecountR}%
2098 \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2099 \@acmNumber, Article \@acmArticle. Publication date: \@acmPubDate.}%
2100 \else % Proceedings
2101 \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2102 \fancyhead[LO]{\ACM@linecountL\@headfootfont\shorttitle}%
2103 \fancyhead[RE]{\@headfootfont\@shortauthors\ACM@linecountR}%
2104 \fancyhead[LE]{\ACM@linecountL\@headfootfont\acmConference@shortname,
2105 \acmConference@date, \acmConference@venue}%
2106 \fancyhead[RO]{\@headfootfont\acmConference@shortname,
2107 \acmConference@date, \acmConference@venue\ACM@linecountR}%
2108 \fi
2109 \if@ACM@sigchiamode
2110 \fancyheadoffset[L]{\dimexpr\marginparsep+\marginparwidth}%
2111 \fi
2112 \if@ACM@timestamp
2113 \fancyfoot[LO,RE]{\ACM@timestamp}
2114 \fi
2115 }
2116 \pagestyle{standardpagestyle}

```

```

\@folio@wd Folio blob width, height, offsets and max number
\@folio@ht 2117 \newdimen\@folio@wd
\@folio@voffset 2118 \@folio@wd=\z@
\@folio@max 2119 \newdimen\@folio@ht
2120 \@folio@ht=\z@
2121 \newdimen\@folio@voffset
2122 \@folio@voffset=\z@
2123 \def\@folio@max{1}
2124 \ifcase\ACM@format@nr
2125 \relax % manuscript
2126 \or % acmsmall
2127 \@folio@wd=45.75pt\relax
2128 \@folio@ht=1.25in\relax
2129 \@folio@voffset=.2in\relax
2130 \def\@folio@max{8}
2131 \or % acmlarge
2132 \@folio@wd=43.25pt\relax
2133 \@folio@ht=79pt\relax
2134 \@folio@voffset=.55in\relax
2135 \def\@folio@max{10}
2136 \fi

\@folioblob The macro to typeset the folio blob.
2137 \def\@folioblob{\@tempcnta=\@acmArticleSeq\relax
First, we calculate \@acmArticleSeq modulo \@folio@max
2138 \loop
2139 \ifnum\@tempcnta>\@folio@max\relax
2140 \advance\@tempcnta by - \@folio@max
2141 \repeat
2142 \advance\@tempcnta by -1\relax
2143 \@tempdima=\@folio@ht\relax
2144 \multiply\@tempdima by \the\@tempcnta\relax
2145 \advance\@tempdima by -\@folio@voffset\relax
2146 \begin{picture}(0,0)
2147 \makebox[\z@]{\raisebox{-\@tempdima}{%
2148 \rlap{%
2149 \raisebox{-0.45\@folio@ht}[\z@][\z@]{%
2150 \rule{\@folio@wd}{\@folio@ht}}}%
2151 \parbox{\@folio@wd}{%
2152 \centering
2153 \textcolor{white}{\LARGE\bfseries\sffamily\@acmArticle}}}}
2154 \end{picture}}
2155

firstpagestyle The pagestyle for the first page only.
2156 \fancypagestyle{firstpagestyle}{%
2157 \fancyhf{}%
2158 \renewcommand{\headrulewidth}{\z@}%

```

```

2159 \renewcommand{\footrulewidth}{\z@}%
2160 \ifcase\ACM@format@nr
2161 \relax % manuscript
2162   \fancyhead[L]{\ACM@linecountL}%
2163   \fancyfoot[RO,LE]{\if@ACM@printfolios\small\thepage\fi}%
2164   \fancyfoot[RE,LO]{\footnotesize Manuscript submitted to ACM}%
2165 \or % acmsmall
2166   \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2167   \@acmNumber, Article \@acmArticle. Publication date:
2168   \@acmPubDate.}%
2169   \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2170   \fancyhead[LO]{\ACM@linecountL}%
2171   \fancyhead[RO]{\@folioblob}%
2172   \fancyheadoffset[RO,LE]{0.6\@folio@wd}%
2173 \or % acmlarge
2174   \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2175   \@acmNumber, Article \@acmArticle. Publication date:
2176   \@acmPubDate.}%
2177   \fancyhead[RO]{\@folioblob}%
2178   \fancyhead[LE]{\ACM@linecountL\@folioblob}%
2179   \fancyhead[LO]{\ACM@linecountL}%
2180   \fancyheadoffset[RO,LE]{1.4\@folio@wd}%
2181 \or % acmtog
2182   \fancyfoot[RO,LE]{\footnotesize \@journalName, Vol. \@acmVolume, No.
2183   \@acmNumber, Article \@acmArticle. Publication date:
2184   \@acmPubDate.}%
2185   \fancyhead[L]{\ACM@linecountL}%
2186   \fancyhead[R]{\ACM@linecountR}%
2187 \else % Conference proceedings
2188   \fancyhead[L]{\ACM@linecountL}%
2189   \fancyhead[R]{\ACM@linecountR}%
2190   \fancyfoot[C]{\if@ACM@printfolios\footnotesize\thepage\fi}%
2191 \fi
2192 \if@ACM@timestamp
2193   \ifnum\ACM@format@nr=0\relax % Manuscript
2194   \fancyfoot[LO,RE]{\ACM@timestamp\quad
2195   \footnotesize Manuscript submitted to ACM}
2196   \else
2197   \fancyfoot[LO,RE]{\ACM@timestamp}
2198   \fi
2199 \fi
2200 }

```

3.15 Sectioning

Sectioning is different for different levels

```

2201 \renewcommand\section{\@startsection{section}{1}{\z@}%
2202 {- .75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2203 {.25\baselineskip}%

```

```

2204 {\@secfont}}
2205 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
2206 {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2207 {.25\baselineskip}%
2208 {\@subsecfont}}
2209 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{10pt}%
2210 {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2211 {-3.5\p@}%
2212 {\@subsubsecfont\@adddotafter}}
2213 \renewcommand\paragraph{\@startsection{paragraph}{4}{\parindent}%
2214 {-.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2215 {-3.5\p@}%
2216 {\@parfont\@adddotafter}}
2217 \renewcommand\part{\@startsection{part}{9}{\z@}%
2218 {-10\p@ \@plus -4\p@ \@minus -2\p@}%
2219 {4\p@}%
2220 {\@parfont}}

```

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

```

2221 \def\section@raggedright{\@rightskip\@flushglue
2222 \rightskip\@rightskip
2223 \leftskip\z@skip
2224 \parindent\z@}

```

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

```

\@subsecfont 2225 \def\@secfont{\sffamily\bfseries\section@raggedright\MakeUppercase}
\@subsubsecfont 2226 \def\@subsecfont{\sffamily\bfseries\section@raggedright}
\@parfont 2227 \def\@subsubsecfont{\sffamily\itshape}
2228 \def\@parfont{\itshape}
2229 \setcounter{secnumdepth}{3}
2230 \ifcase\ACM@format@nr
2231 \relax % manuscript
2232 \or % acmsmall
2233 \or % acmlarge
2234 \def\@secfont{\sffamily\large\section@raggedright\MakeUppercase}
2235 \def\@subsecfont{\sffamily\large\section@raggedright}
2236 \or % acmtog
2237 \def\@secfont{\sffamily\large\section@raggedright\MakeUppercase}
2238 \def\@subsecfont{\sffamily\large\section@raggedright}
2239 \or % sigconf
2240 \def\@secfont{\bfseries\Large\section@raggedright\MakeUppercase}
2241 \def\@subsecfont{\bfseries\Large\section@raggedright}
2242 \or % siggraph
2243 \def\@secfont{\bfseries\sffamily\Large\section@raggedright\MakeUppercase}
2244 \def\@subsecfont{\bfseries\sffamily\Large\section@raggedright}
2245 \or % sigplan
2246 \def\@secfont{\bfseries\Large\section@raggedright}
2247 \def\@subsecfont{\bfseries\section@raggedright}
2248 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
2249 {-.75\baselineskip \@plus -2\p@ \@minus -.2\p@}%

```

```

2250   {.25\baselineskip}%
2251   {\@subsubsecfont}}
2252   \def\@subsubsecfont{\bfseries\section@raggedright}
2253   \renewcommand\paragraph{\@startsection{paragraph}{4}{\z@}%
2254     {-1.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2255     {-3.5\p@}%
2256     {\@parfont\@addspaceafter}}
2257   \def\@parfont{\bfseries\itshape}
2258   \renewcommand\subparagraph{\@startsection{subparagraph}{5}{\z@}%
2259     {-1.5\baselineskip \@plus -2\p@ \@minus -.2\p@}%
2260     {-3.5\p@}%
2261     {\@subparfont\@addspaceafter}}
2262   \def\@subparfont{\itshape}
2263   \or % sigchi
2264   \setcounter{secnumdepth}{1}
2265   \def\@secfont{\bfseries\sffamily\section@raggedright\MakeUppercase}
2266   \def\@subsecfont{\bfseries\sffamily\section@raggedright}
2267   \or % sigchi-a
2268   \setcounter{secnumdepth}{0}
2269   \def\@secfont{\bfseries\sffamily\section@raggedright\MakeUppercase}
2270   \def\@subsecfont{\bfseries\sffamily\section@raggedright}
2271   \fi

```

`\@adddotafter` Add punctuation after the command
2272 `\def\@adddotafter#1{#1\@addpunct{.}}`

`\@addspaceafter` Add space after the command
2273 `\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.
2274 `\providecommand*\@dotsep{4.5}`

3.17 Theorems

`\@acmplainbodyfont` The font to typeset the `acmplain` theorem style body.
2275 `\def\@acmplainbodyfont{\itshape}`

`\@acmplainindent` The amount to indent the `acmplain` theorem style.
2276 `\def\@acmplainindent{\parindent}`

`\@acmplainheadfont` The font to typeset the `acmplain` theorem style head.
2277 `\def\@acmplainheadfont{\scshape}`

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

```
2278 \def\@acmplainnotefont{\@empty}
```

Customization of acmplain theorem style:

```
2279 \ifcase\ACM@format@nr
2280 \relax % manuscript
2281 \or % acmsmall
2282 \or % acmlarge
2283 \or % acmtog
2284 \or % sigconf
2285 \or % siggraph
2286 \or % sigplan
2287 \def\@acmplainbodyfont{\itshape}
2288 \def\@acmplainindent{\z@}
2289 \def\@acmplainheadfont{\bfseries}
2290 \def\@acmplainnotefont{\normalfont}
2291 \or % sigchi
2292 \or % sigchi-a
2293 \fi
```

`acmplain` The acmplain theorem style

```
2294 \newtheoremstyle{acmplain}%
2295   {.5\baselineskip\@plus.2\baselineskip
2296     \@minus.2\baselineskip}% space above
2297   {.5\baselineskip\@plus.2\baselineskip
2298     \@minus.2\baselineskip}% space below
2299   {\@acmplainbodyfont}% body font
2300   {\@acmplainindent}% indent amount
2301   {\@acmplainheadfont}% head font
2302   {.}% punctuation after head
2303   {.5em}% spacing after head
2304   {\thmname{#1}\thmnumber{ #2}\thmnote{ {\@acmplainnotefont( #3)}}}% head spec
```

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

```
2305 \def\@acmdefinitionbodyfont{\normalfont}
```

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

```
2306 \def\@acmdefinitionindent{\parindent}
```

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

```
2307 \def\@acmdefinitionheadfont{\itshape}
```

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

```
2308 \def\@acmdefinitionnotefont{\@empty}
```

Customization of acmdefinition theorem style:

```
2309 \ifcase\ACM@format@nr
2310 \relax % manuscript
```

```

2311 \or % acmsmall
2312 \or % acmlarge
2313 \or % acmtog
2314 \or % sigconf
2315 \or % siggraph
2316 \or % sigplan
2317 \def\@acmdefinitionbodyfont{\normalfont}
2318 \def\@acmdefinitionindent{\z@}
2319 \def\@acmdefinitionheadfont{\bfseries}
2320 \def\@acmdefinitionnotefont{\normalfont}
2321 \or % sigchi
2322 \or % sigchi-a
2323 \fi

```

acmdefinition The acmdefinition theorem style

```

2324 \newtheoremstyle{acmdefinition}%
2325  {.5\baselineskip\@plus.2\baselineskip
2326   \@minus.2\baselineskip}% space above
2327  {.5\baselineskip\@plus.2\baselineskip
2328   \@minus.2\baselineskip}% space below
2329  {\@acmdefinitionbodyfont}% body font
2330  {\@acmdefinitionindent}% indent amount
2331  {\@acmdefinitionheadfont}% head font
2332  {.%} punctuation after head
2333  {.5em}% spacing after head
2334  {\thmname{#1}\thmnumber{ #2}\thmnote{ \@acmdefinitionnotefont{#3}}}% head spec

```

The definitions for theorems:

```

2335 \theoremstyle{acmplain}
2336 \newtheorem{theorem}[Theorem][section]
2337 \newtheorem{conjecture}[theorem]{Conjecture}
2338 \newtheorem{proposition}[theorem]{Proposition}
2339 \newtheorem{lemma}[theorem]{Lemma}
2340 \newtheorem{corollary}[theorem]{Corollary}
2341 \theoremstyle{acmdefinition}
2342 \newtheorem{example}[theorem]{Example}
2343 \newtheorem{definition}[theorem]{Definition}
2344 \theoremstyle{acmplain}

```

\@proofnamefont The font to typeset the proof name.

```

2345 \def\@proofnamefont{\scshape}

```

\@proofindent Whether or not to indent proofs.

```

2346 \def\@proofindent{\indent}

```

Customization of proof environment.

```

2347 \ifcase\ACM@format@nr
2348 \relax % manuscript
2349 \or % acmsmall

```

```

2350 \or % acmlarge
2351 \or % acmtog
2352 \or % sigconf
2353 \or % siggraph
2354 \or % sigplan
2355 \def\@proofnamefont{\itshape}
2356 \def\@proofindent{\noindent}
2357 \or % sigchi
2358 \or % sigchi-a
2359 \fi

```

proof We want some customization of proof environment.

```

2360 \renewenvironment{proof}[1][\proofname]{\par
2361 \pushQED{\qed}%
2362 \normalfont \topsep6\p@\@plus6\p@\relax
2363 \trivlist
2364 \item[\@proofindent\hskip\labelsep
2365 \quad\@proofnamefont #1\@addpunct{.}]\ignorespaces
2366 }{%
2367 \popQED\endtrivlist\@endpfalse
2368 }

```

3.18 Acknowledgments

\acks This is a comment-like structure

```

2369 \specialcomment{acks}{%
2370 \begingroup
2371 \section*{Acknowledgments}
2372 \phantomsection\addcontentsline{toc}{section}{Acknowledgments}
2373 }{%
2374 \endgroup
2375 }

```

\grantsponsor We just typeset the name of the sponsor

```

2376 \def\grantsponsor#1#2#3{#2}

```

\grantnum

```

2377 \newcommand\grantnum[3][]{#3%
2378 \def\@tempa{#1}\ifx\@tempa\@empty\else\space(\url{#1})\fi}

```

3.19 Conditional typesetting

We use the comment package for conditional typesetting:

```

2379 \if@ACM@screen
2380 \includecomment{screenonly}
2381 \excludecomment{printonly}
2382 \else
2383 \excludecomment{screenonly}

```

```

2384 \includecomment{printonly}
2385 \fi
2386 \if@ACM@anonymous
2387 \excludecomment{anonsuppress}
2388 \excludecomment{acks}
2389 \else
2390 \includecomment{anonsuppress}
2391 \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/>).

```

2392 \newcommand\showeprint[2][arxiv]{%
2393 \def\@tempa{#1}%
2394 \ifx\@tempa\@empty\def\@tempa{arxiv}\fi
2395 \def\@tempb{arxiv}%
2396 \ifx\@tempa\@tempb
2397 arXiv:\href{http://arxiv.org/abs/#2}{#2}\else arXiv:#2%
2398 \fi}

```

3.21 End of Class

```

2399 \normalsize\normalfont\frenchspacing
2400 </class>

```

References

- [1] UK T_EX Users Group. UK list of T_EX frequently asked questions. <http://www.tex.ac.uk>, 2016.
- [2] Michael Downes and Barbara Beeton. *The amsart, amsproc, and amsbook document classes*. American Mathematical Society, August 2004. <http://www.ctan.org/pkg/amslatex>.
- [3] Christophe Fiorio. *algorithm2e.sty—package for algorithms*, October 2015. <http://www.ctan.org/pkg/algorithm2e>.
- [4] Rogério Brito. *The algorithms bundle*, August 2009. <http://www.ctan.org/pkg/algorithms>.
- [5] Carsten Heinz, Brooks Moses, and Jobst Hoffmann. *The Listings Package*, June 2015. <http://www.ctan.org/pkg/listings>.
- [6] Simon Fear. *Publication quality tables in L^AT_EX*, April 2005. <http://www.ctan.org/pkg/booktabs>.
- [7] Association for Computing Machinery. *ACM Visual Identity Standards*, 2007. <http://identitystandards.acm.org>.
- [8] Axel Sommerfeldt. *The subcaption package*, April 2013. <http://www.ctan.org/pkg/subcaption>.
- [9] Boris Veytsman, Bern Schandl, Lee Netherton, and C. V. Radhakrishnan. *A package to create a nomenclature*, September 2005. <http://www.ctan.org/pkg/nomencl>.
- [10] Nicola L. C. Talbot. *User Manual for glossaries.sty v4.25*, June 2016. <http://www.ctan.org/pkg/subcaption>.

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
	Defined ACM colors	26	v1.06	\@ACM@badge@skip: Added macro	54
	Explicitly put draft option (closes https://github.com/borisveytsman/acmart/issues/4)	29		\@ACM@badge@width: Added macro	53
	Set headheight to 1pc for all formats (closes https://github.com/borisveytsman/acmart/issues/5)	26		\@ACM@title@width: Added macro	53
v1.02	General: Added TOPS and TSC (closes https://github.com/borisveytsman/acmart/issues/12)	26		\@mktitle@i: Added processing badges	66
	Documentation changes (closes https://github.com/borisveytsman/acmart/issues/13)	26		Made generic	66
v1.03	\@formatdoi: Added macro	58		\@mktitle@ii: Now this macro is obsolete	67
	\if@ACM@authorversion: Added macro	27		\@mktitle@iii: Added processing badges	67
	\maketitle: Added special case of authorversion	61		Made more generic	67
	General: Added anonsuppress environment	26		\@mktitle@iv: Made more generic	67
	Added authorversion option (closes https://github.com/borisveytsman/acmart/issues/9)	26		\@printtopmatter: Added processing badges	64
v1.04	\acmArticleSeq: Name change by Matthew Fluet	53		\@subtitlefont: Added macro	66
	\acmDOI: Name change by Matthew Fluet	53		\@titlefont: Added macro	65
	\acmISBN: Name change by Matthew Fluet	53		\acmBadgeL: Added macro	54
	General: Updated bibliography for siggraph	26		\acmBadgeR: Added macro	54
				\if@ACM@badge: Added macro	53
			v1.07	\maketitle: Corrected a bug with abstract footnotes	61
				Corrected a bug with permission and footnotes order	61
			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	61

General: Changes of	v1.14
‘licensedothergov’ wording	57
standardpagestyle: Reversed folios	
location	76
v1.11	
General: Customization of ACM	
theorem styles and proof	
environment by Matthew Fluet . . .	26
v1.12	
\@marginfigure: Now centering by	
default	41
\@marginable: Now centering by	
default	42
\@parfont: Moved to	
\section@raggedright	80
\copyrightpermissionfootnoterule:	
Added macro	39
\descriptionlabel: Redefined	44
\footnoterule: Made shorter	39
\if@ACM@natbib@override: Added	
macro	27
\if@ACM@newfonts: Added macro . . .	40
\maketitle: Moved thanks to	
copyrightpermission box	61
\section@raggedright: Introduced	
macro	80
General: Added graceful behavior	
when libertine fonts are absent . .	40
Documentation updates	26
v1.13	
\@mpfootnotetext: Made minipage	
footnotes centered	39
\bibliographystyle: Redefined	
macro	36
\bibstyle@acmauthoryear: Added	
macro	32
\bibstyle@acmnumeric: Added	
macro	32
\if@ACM@printfolios: Added macro . .	55
General: Font adjustments for	
acmsmall	69
Increased font size for ACM Large	
Print bibliographic information by	
default for the proceedings	55
standardpagestyle: Added headers	
for sigs	76
Expanded headers for sigchi-a . . .	76
Suppressed folios if sig	76
\bibstyle@acmauthoryear: Moved	
def of \bibstyle@acmauthoryear	
before use	32
\bibstyle@acmnumeric: Moved def of	
\bibstyle@numeric before use . . .	32
General: \citestyle updates	
(Matthew Fluet)	26
Patched \citestyle	30
v1.15	
\@ACM@addtoaddress: Added macro . .	67
\@mkauthors@iii: New authors	
system	71
\@shortauthors: Introduced macro . .	76
\@typeset@author@bx: Moved to	
separate macro	71
\acks: Added macro	84
\affiliation: Added code for author	
groups	51
\author: Added code for author	
groups	50
\city: Added macro	68
\country: Added macro	68
\department: Added macro	68
\grantnum: Added macro	84
\grantsponsor: Added macro	84
\if@insideauthorgroup: Introduced	
macro	50
\institution: Added macro	68
\num@authorgroups: Renamed	50
\orcid: Introduced macro	51
\position: Added macro	68
\postcode: Added macro	68
\state: Added macro	68
\streetaddress: Added macro	68
standardpagestyle: Better handling	
of anonymous mode	76
v1.16	
\@headfootfont: Added macro	76
General: Formatting header/footer	
(Matthew Fluet)	26
standardpagestyle: Customize	
header/footer text font	76
v1.17	
\@makefnmark: Redefined	40
\@mkauthors: TOG now uses the same	
authors block as other journals . .	68
\@mkauthors@ii: Deleted	70
\@mkbibcitation: Added \nobreak	
Changed format for sigs	74

\acmArticle: The default is now numerical	53	v1.25	General: Updated PACMPL	44
\acmMonth: The default must be numerical. Closes #50.	53	v1.26	General: Corrected \shortcite bug	26
\acmNumber: The default is now numerical	52		Documentation typos fixed (thanks to Stephen Spencer)	26
\acmVolume: The default is now numerical	52	v1.27	\if@ACM@printccs: Typo corrected	54
\acmYear: The default is now numerical	53	v1.28	\ccsdesc@parse: Change from \to to \textrightarrow (Matteo Riondato)	56
\description: Decreased indent	44		General: Corrected option natbib behavior	32
\grantnum: Added url	84		Got rid of warnings in pdf keywords	35
\grantsponsor: Renamed	84			
\if@ACM@printacmref: Renamed from \if@ACM@printbib	55	v1.29	\@mkabstract: Removed spurious indentation (John Wickerson)	73
General: Slightly decreased margins for sigs	37		\ccsdesc@parse: Add spacing after bullet and around rightharrow; semicolon separators no longer in bold/italic (John Wickerson)	56
standardpagestyle: Added paper title to sigs	76		General: Increased head to 13pt	37
v1.18			standardpagestyle: Corrected printfolios (Matthew Fluet)	76
\@mkauthors@i: Now we andify affiliations	70	v1.30	\department: Added optional parameter	68
\@typeset@author@line: Added macro	70		General: Added \frenchspacing	85
General: Natbib is now the default for all formats	26		Bibtex style now recognizes https:// in doi	26
v1.19			Switched to T1: looks like libertine has problems with \l in OT1	40
\@mkabstract: Include 'Abstract' in PDF bookmarks (Matthew Fluet)	73		Updated IMWUT and PACMPL	44
\acks: Include 'Acknowledgements' in PDF bookmarks (Matthew Fluet)	84	v1.31	\@additionalaffiliation: Added macro	51
General: Include 'Abstract', 'Acknowledgements', and 'References' in PDF bookmarks (Matthew Fluet)	26		\@mkbibcitation: Disabled linebreak	74
Include 'References' in PDF bookmarks (Matthew Fluet)	30		\@startsection: Added \tochangmeasure	32
v1.20			Redefined macro	34
\@mkabstract: Deleted spurious space	73		\@textbottom: Redefined	40
General: Bug fixes for bst	26		\acmMonth: The default now is the current month (Matteo Riondato)	53
v1.21			\acmYear: The default now is the current year (Matteo Riondato)	53
\showeprint: Added macro	85		\additionalaffiliation: Added macro	51
v1.22			\l@section: Redefined macro	35
General: More bibliography changes for Aptara	26		\l@subsection: Redefined macro	35
v1.23				
General: Add PACMPL journal option	26			
v1.24				
General: Add IMWUT journal option	44			

General: Documentation changes . . .	26	BibTeX comma before articleno bug corrected	26
v1.32		BibTeX crossref bug corrected . . .	26
\@formatdoi: New doi format	58	BibTeX numpages bug corrected . .	26
General: Added POMACS journal option	26	Documentation updates	26
Format siggraph is now obsolete . .	26	Moved \citenam definition for non-natbib bibliography, so a package may redefine it	35
v1.33		Switched to Type 1 fonts for libertine even if OTF-capable engine is used (Kai Mindermann) .	40
\@ACM@addtoaddress: Added obexpunctuation code	67	firstpagestyle: Added right linecount for two column formats	78
\@mkauthors@i: Added obexpunctuation code	70	Added timestamp (Michael D. Adams)	78
\@mkauthors@iii: Added obexpunctuation code	71	standardpagestyle: Added right linecount for two column formats	76
\@mkauthors@iv: Added obexpunctuation code	72	Added timestamp (Michael D. Adams)	76
\@subtitledfont: Added \normalsize	66	v1.34	
\ACM@linecountL: Renamed macro .	75	\@mkbibcitation: Deleted DOI from doi numbers	74
\ACM@linecountR: Added macro . . .	75	\ACM@linecount@bx: Rulers now are continuous	75
\ACM@timestamp: Added current page number	76	\ACM@linecountL: Rulers now are continuous	75
Added macro (Michael D. Adams) .	76	\ACM@linecountR: Rulers now are continuous	75
Added submission id	76	\maketitle: Added date to the bibstrip in conf proceedings	61
\acmSubmissionID: Added macro . .	53	Deleted 'DOI' from doi numbers .	61
\@city: Added obexpunctuation code	68	Rearranged bibstrip	61
\@country: Added obexpunctuation code	68	The \terms command is now obsolete	61
\@department: Added obexpunctuation code	68	\terms: The \terms command now just produces a warning	54
\@if@ACM@affiliation@obexpunctuation: Added macro	51	v1.35	
\@if@ACM@authordraft: Added macro	28	\@bibstyle@acmauthoryear: Square brackets for author-year style . . .	32
\@if@ACM@natbib@override: Deleted macro	27	General: BibTeX bug fixed: et al. . . .	26
\@if@ACM@timestamp: Added macro (Michael D. Adams)	28	If the copyright is set to usgov or rigtsretained, the price is suppressed	57
\@institution: Added obexpunctuation code	68	v1.36	
\@maketitle: Fixed the bug with figures on top and bottom of the title page, thanks to David Epstein	61	\@ACM@authorsperrow: Added macro	55
\@position: Added obexpunctuation code	68	\@mkauthors@iii: Added authorsperrow override	71
\@postcode: Added obexpunctuation code	68	\@mkauthors@iv: Added authorsperrow override	72
\@state: Added obexpunctuation code	68		
\@streetaddress: Added obexpunctuation code	68		
General: Added acmart-preload-hook	26		
Added cmap and glyphtounicode .	40		

\if@ACM@authordraft: Corrected typo, thanks to bargteil	28	\normalparindent (Matthew Fluet)	38
General: Added PACMHCI journal options	44	General: Reduce list indentation (Matthew Fluet)	43
Added the possibility to adjust number of author boxes per row in conference formats	26	Set \normalparindent; Reduce list indentation (Matthew Fluet)	26
v1.37		v1.38	
\description: Reduce list indentation (Matthew Fluet)	44	General: Increase default font size for SIGPLAN	26, 30
\descriptionlabel: Reduce list indentation (Matthew Fluet)	44	v1.39	
\normalparindent: Set		\@@authornotemark: Added macro . .	73
		\authornotemark: Added macro . . .	52

Index

Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in *roman* refer to the code lines where the entry is used.

Symbols	
\\$	1484, 1488
\@	1375, 1382, 1395
\@authornotemark	1101, <u>1936</u>
\@@par	305, 362
\@ACM@addtoaddress	<u>1716</u> , 1739, 1740, 1742
\@ACM@authorsperrow	<u>1172</u> , 1847, 1848, 1896, 1897
\@ACM@badge@skip	<u>1132</u> , 1579, 1656, 1660, 1666, 1675, 1685, 1691, 1700
\@ACM@badge@width	<u>1129</u> , 1578, 1583, 1655, 1659, 1665, 1677, 1684, 1686, 1689, 1701, 1704
\@ACM@badgefalse	1128
\@ACM@badgetrue	1134, 1139
\@ACM@commabox	1716, 1720, 1721
\@ACM@journalfalse	140, 142, 144, 146, 148
\@ACM@journaltrue	132, 134, 136, 138
\@ACM@labelwidth	685, 688, 696, 701, 727
\@ACM@manuscriptfalse	127
\@ACM@manuscripttrue	125
\@ACM@newfontfalse	594, 596, 599
\@ACM@newfontstrue	591
\@ACM@reviewtrue	101
\@ACM@sigchiamodefals	129
\@ACM@sigchiamodetrue	149
\@ACM@timestamptrue	100
\@ACM@title@width	<u>1131</u> , 1653, 1655, 1656,
	1659, 1660, 1668, 1682, 1684, 1685, 1693
\@DeclareACMFormat	38, 39, 40, 41, 42, 43, 44, 45, 46, 47
\@M	305, 344, 362, 371
\@abstract	1151, 1946, 1953
\@acmArticle	1107, 1110, 1483, 1965, 2077, 2078, 2082, 2085, 2088, 2090, 2093, 2097, 2099, 2153, 2167, 2175, 2183
\@acmArticleSeq	1109, 2137
\@acmBadgeL@image	1141, 1143, 1576, 1578, 1654, 1663, 1665, 1687, 1689
\@acmBadgeL@url	1140, 1142, 1577, 1664, 1688
\@acmBadgeR@image	1136, 1138, 1581, 1583, 1658, 1674, 1677, 1702, 1704
\@acmBadgeR@url	1135, 1137, 1582, 1676, 1703
\@acmDOI	1125, 1476, 1479, 1485, 1489, 1974
\@acmISBN	1123, 1487
\@acmMonth	1113, 1115, 1483
\@acmNumber	1105, 1965, 2082, 2090, 2099, 2167, 2175, 2183
\@acmPrice	1119, 1484, 1488
\@acmPubDate	<u>1115</u> , 1965, 2082, 2090, 2099, 2168, 2176, 2184
\@acmSubmissionID	1121, 2038, 2039
\@acmVolume	1103, 1965, 2081, 2089, 2098, 2166, 2174, 2182
\@acmYear	1111, 1118, 1403, 1483, 1962
\@acmdefinitionbodyfont	<u>2305</u> , 2317, 2329
\@acmdefinitionheadfont	<u>2307</u> , 2319, 2331
\@acmdefinitionindent	<u>2306</u> , 2318, 2330
\@acmdefinitionnotefont	<u>2308</u> , 2320, 2334
\@acmownedfalse	1237, 1240, 1243, 1249, 1253, 1256, 1259, 1265
\@acmownedtrue	1226, 1233, 1262
\@acmplainbodyfont	<u>2275</u> , 2287, 2299
\@acmplainheadfont	<u>2277</u> , 2289, 2301
\@acmplainindent	<u>2276</u> , 2288, 2300
\@acmplainnotefont	<u>2278</u> , 2290, 2304
\@adddotafter	2212, 2216, <u>2272</u>
\@additionalaffiliation	1055, <u>1056</u>
\@addpunct	1997, 2272, 2273, 2365
\@addspaceafter	2256, 2261, <u>2273</u>
\@affiliationfont	<u>1769</u> , 1774, 1778, 1781, 1784, 1787, 1790, 1793, 1821, 1839
\@afterheading	336, 1521
\@afterindentfalse	282, 1520
\@afterindenttrue	280
\@author	1016, 1019, 1024, 1807, 1866, 1909
\@authorfont	<u>1768</u> , 1773, 1777,

	1780, 1783, 1786,	\@dblarg 291	\@hangfrom 304, 361
	1789, 1792, 1809, 1839	\@dblfloat 650	\@headfootfont
\@authornotemark . . .	. . . 1093, 1099, 1935	\@depart . . . 1059, 1060	2044, 2077, 2078,
\@authornotes . . . . .	. . . 1090, 1094, 1436	\@dotsep 2274	2079, 2080, 2084,
\@auxout 439		\@empty 151,	2087, 2092, 2096,
\@begindocumenthook 435		295, 1000, 1014,	2102, 2103, 2104, 2106
\@botnum 1426		1029, 1034, 1035,	\@ifnextchar 1059
\@citestyle 214		1041, 1190, 1191,	\@ifnotempty 1408
\@classname . . . 25, 27,		1197, 1204, 1209,	\@ifnum 228, 230
35, 51, 53, 54, 59,		1439, 1476, 1484,	\@ifstar 289
61, 62, 67, 69, 70,		1488, 1497, 1502,	\@iiiparbox 555
75, 77, 78, 83, 85,		1545, 1576, 1581,	\@input 373
86, 91, 93, 94, 99,		1654, 1658, 1663,	\@insideauthorgroupfalse
103, 104, 115, 120,		1671, 1674, 1687,	. . . . . 1049
173, 592, 595, 597,		1695, 1702, 1712,	\@insideauthorgrouptrue
985, 987, 1054,		1798, 1808, 1816,	. . . . . 1012
1146, 1156, 1158,		1817, 1866, 1872,	\@journalCode . . 733, 985
1159, 1162, 1164,		1877, 1909, 1915,	\@journalCode@nr . . .
1165, 1168, 1170,		1920, 1938, 2038,	. . . . . 733, 786, 990
1171, 1173, 1174, 1958		2278, 2308, 2378, 2394	\@journalName
\@clubpenalty 350		\@endfloatbox 652	. . . 788, 792, 796,
\@concepts 1209,		\@endpfalse 2367	801, 805, 809, 813,
1216, 1497, 1499, 1518		\@endwfloatbox 652, 660	817, 821, 822, 824,
\@copyrighowner . . .		\@finalstrut . . . 566, 579	825, 828, 829, 832,
. 1269, 1460		\@float 654	833, 836, 840, 844,
\@copyrightpermission		\@flushglue 2221	846, 850, 854, 856,
. 1298, 1452		\@fnsymbol 1423	858, 860, 864, 868,
\@copyrightyear		\@folio@ht	872, 876, 880, 884,
. . . 1402, 1460, 1462		2117, 2143, 2149, 2150	888, 892, 896, 900,
\@currbox . . . 666, 667, 668		\@folio@max 2117, 2139, 2140	904, 908, 912, 916,
\@currentaffiliation		\@folio@voffset 2117, 2145	917, 920, 924, 925,
1840, 1843, 1865,		\@folio@wd 2117,	928, 933, 937, 941,
1872, 1873, 1875,		2150, 2151, 2172, 2180	945, 949, 953, 957,
1877, 1878, 1882,		\@folioblob . . . 2137,	961, 965, 969, 973,
1908, 1915, 1916,		2169, 2171, 2177, 2178	977, 981, 991, 992,
1918, 1920, 1921, 1925		\@footnotemark . 383, 1421	1472, 2081, 2089,
\@currentaffiliations		\@footnotemark@nolink	2098, 2166, 2174, 2182
. 1798,		. . . . . 383, 1421	\@journalNameShort .
1799, 1800, 1802,		\@footnotetext . . . . .	. . . 789, 793, 798,
1805, 1817, 1818, 1823		. . . . . 384, 557, 1422	802, 806, 810, 814,
\@currentauthors . . .		\@footnotetext@nolink	818, 837, 841, 847,
. . . . 1796, 1797,		. . . . . 384, 1422	851, 861, 865, 869,
1804, 1808, 1809,		\@for 190	873, 877, 881, 885,
1811, 1839, 1842,		\@formatdoi . . . 1297,	889, 893, 897, 901,
1864, 1866, 1867,		1479, 1485, 1489, 1974	905, 909, 913, 921,
1869, 1907, 1909,		\@fps 653	926, 929, 934, 938,
1910, 1912, 1935, 1936		\@fpsaddefault . . . 653	942, 946, 950, 954,
\@currentlabel . . 561, 575		\@gobble 212,	958, 962, 966, 970,
		256, 1725, 1728,	974, 978, 982, 992, 1964
		1729, 1730, 1731, 1732	\@keywords 1148, 1502, 1508

<code>\@latex@error</code>	258	<code>\@parboxrestore</code>	574	<code>\@shortauthors</code>	
<code>\@lempty</code>	<u>1153</u> , <u>1946</u>	<code>\@parfont</code>	<u>2216</u> , <u>2220</u> , <u>2225</u>	. . . . .	<u>2043</u> , <u>2073</u> ,
<code>\@listI</code>	709, 713	<code>\@permissionCodeOne</code>			2079, 2085, 2093, 2103
<code>\@listi</code>	706, 713	. . . . .	790, 794,	<code>\@sidebar</code>	<u>639</u> , <u>640</u>
<code>\@listii</code>	714		799, 803, 807, 811,	<code>\@specialsection</code>	
<code>\@listiii</code>	717		815, 819, 826, 830,		<u>1498</u> , <u>1504</u> , <u>1506</u> , <u>1523</u>
<code>\@listiv</code>	719		834, 838, 842, 848,	<code>\@sssect</code>	<u>290</u> , <u>356</u>
<code>\@listv</code>	721		852, 862, 866, 870,	<code>\@startPage</code>	<u>1144</u> ,
<code>\@listvi</code>	723		874, 878, 882, 886,		<u>1545</u> , <u>1546</u> , <u>1548</u> , <u>2037</u>
<code>\@m</code>	293		890, 894, 898, 902,	<code>\@startsection</code>	
<code>\@makefnmark</code>	556,		906, 910, 914, 918,	. . . . .	<u>276</u> , <u>368</u> , <u>2201</u> ,
	<u>581</u> , <u>1428</u> , <u>1433</u> , <u>1437</u>		922, 930, 935, 939,		<u>2205</u> , <u>2209</u> , <u>2213</u> ,
<code>\@makefntext</code>			943, 947, 951, 955,		<u>2217</u> , <u>2248</u> , <u>2253</u> , <u>2258</u>
.	<u>556</u> , <u>565</u> , <u>578</u> , <u>1438</u>		959, 963, 967, 971,	<code>\@starttoc</code>	<u>368</u>
<code>\@marginfigure</code>	<u>642</u> , <u>643</u>		<u>975</u> , <u>979</u> , <u>983</u> , <u>993</u> , <u>1483</u>	<code>\@subparfont</code>	<u>2261</u> , <u>2262</u>
<code>\@marginable</code>	<u>645</u> , <u>646</u>	<code>\@permissionCodeTwo</code>			<u>2208</u> , <u>2225</u>
<code>\@minipagefalse</code>	<u>552</u> , <u>662</u>	. . . . .	<u>931</u> , <u>994</u>	<code>\@subsecfont</code>	<u>2212</u> , <u>2225</u>
<code>\@minus</code>	<u>2202</u> , <u>2206</u> ,	<code>\@plus</code>	<u>371</u> , <u>379</u> , <u>582</u> ,	<code>\@subsubsecfont</code>	<u>2212</u> , <u>2225</u>
	<u>2210</u> , <u>2214</u> , <u>2218</u> ,		<u>2202</u> , <u>2206</u> , <u>2210</u> ,	<code>\@subtitle</code>	<u>1005</u> ,
	<u>2249</u> , <u>2254</u> , <u>2259</u> ,		<u>2214</u> , <u>2218</u> , <u>2249</u> ,		<u>1082</u> , <u>1671</u> , <u>1672</u> ,
	<u>2296</u> , <u>2298</u> , <u>2326</u> , <u>2328</u>		<u>2254</u> , <u>2259</u> , <u>2295</u> ,	<code>\@subtitelfont</code>	<u>1695</u> , <u>1696</u> , <u>1712</u> , <u>1713</u>
<code>\@mkabstract</code>	<u>1495</u> , <u>1945</u>		<u>2297</u> , <u>2325</u> , <u>2327</u> , <u>2362</u>		<u>1631</u> , <u>1672</u> , <u>1696</u> , <u>1713</u>
<code>\@mkauthors</code> <u>1429</u> , <u>1431</u> , <u>1744</u>		<code>\@printcopyrightfalse</code>		<code>\@subtitlenotes</code>	
<code>\@mkauthors@i</code>	<u>1748</u>,	. . . . .	<u>1236</u> , <u>1248</u>		<u>1080</u> , <u>1084</u> , <u>1087</u> , <u>1435</u>
	<u>1750</u> , <u>1752</u> , <u>1754</u> , <u>1803</u>	<code>\@printcopyrighttrue</code>		<code>\@svsec</code>	<u>295</u> , <u>298</u> , <u>304</u> , <u>319</u>
<code>\@mkauthors@ii</code>	<u>1833</u>	. . . . .	<u>1222</u> , <u>1232</u>	<code>\@svsechd</code>	<u>317</u> , <u>345</u> , <u>365</u>
<code>\@mkauthors@iii</code>	<u>1756</u> ,	<code>\@printendtopmatter</code>		<code>\@teaser</code>	<u>1406</u> , <u>1939</u>
	<u>1758</u> , <u>1760</u> , <u>1762</u> , <u>1844</u>	. . . . .	<u>1519</u> , <u>1976</u>	<code>\@teaserfigures</code>	<u>1404</u> , <u>1406</u> , <u>1938</u> , <u>1942</u>
<code>\@mkauthors@iv</code> <u>1764</u> , <u>1893</u>		<code>\@printpermissionfalse</code>			<u>190</u> ,
<code>\@mkbibcitation</code> <u>1515</u> , <u>1955</u>		. . . . .	<u>1235</u>	<code>\@tempa</code>	<u>191</u> , <u>193</u> , <u>195</u> , <u>197</u> ,
<code>\@mkteasers</code>	<u>1429</u> , <u>1937</u>	<code>\@printpermissiontrue</code>			<u>199</u> , <u>201</u> , <u>203</u> , <u>205</u> ,
<code>\@mktitle</code>	<u>1429</u> , <u>1588</u>	. . . . .	<u>1224</u> , <u>1231</u> , <u>1247</u>		<u>207</u> , <u>209</u> , <u>211</u> , <u>213</u> ,
<code>\@mktitle@i</code>	<u>1591</u> ,	<code>\@printtopmatter</code>			<u>215</u> , <u>217</u> , <u>219</u> , <u>221</u> ,
	<u>1593</u> , <u>1595</u> , <u>1597</u> , <u>1652</u>	. . . . .	<u>1430</u> , <u>1544</u>		<u>223</u> , <u>225</u> , <u>227</u> , <u>229</u> ,
<code>\@mktitle@ii</code>	<u>1680</u>	<code>\@proofindent</code>			<u>231</u> , <u>233</u> , <u>235</u> , <u>238</u> ,
<code>\@mktitle@iii</code>	<u>1599</u>,	. . . . .	<u>2346</u> , <u>2356</u> , <u>2364</u>		<u>240</u> , <u>242</u> , <u>244</u> , <u>246</u> ,
	<u>1601</u> , <u>1603</u> , <u>1605</u> , <u>1680</u>	<code>\@proofnamefont</code>			<u>248</u> , <u>1033</u> , <u>1034</u> ,
<code>\@mktitle@iv</code>	<u>1607</u> , <u>1708</u>	. . . . .	<u>2345</u> , <u>2355</u> , <u>2365</u>		<u>1189</u> , <u>1190</u> , <u>1816</u> ,
<code>\@mpargs</code>	555	<code>\@received</code>	<u>1188</u> , <u>1191</u> ,		<u>2378</u> , <u>2393</u> , <u>2394</u> , <u>2396</u>
<code>\@mparswitchfalse</code>	519	. . . . .	<u>1192</u> , <u>1194</u> , <u>1197</u> ,	<code>\@tempb</code>	<u>191</u> , <u>193</u> ,
<code>\@mpfootins</code>			<u>1198</u> , <u>1200</u> , <u>1204</u> , <u>1205</u>		<u>195</u> , <u>197</u> , <u>199</u> , <u>201</u> ,
	<u>547</u> , <u>548</u> , <u>550</u> , <u>570</u> , <u>571</u>	<code>\@rightskip</code>	<u>2221</u> , <u>2222</u>		<u>203</u> , <u>205</u> , <u>207</u> , <u>209</u> ,
<code>\@mpfootnotetext</code>	<u>569</u>				<u>211</u> , <u>213</u> , <u>215</u> , <u>217</u> ,
<code>\@ne</code>	<u>216</u> , <u>220</u> , <u>224</u> ,	<code>\@saveabstract</code> <u>1150</u> , <u>1151</u>			<u>219</u> , <u>221</u> , <u>223</u> , <u>225</u> ,
	<u>226</u> , <u>425</u> , <u>2003</u> , <u>2008</u>	<code>\@saveteaser</code>	<u>1405</u> , <u>1406</u>		<u>227</u> , <u>229</u> , <u>231</u> , <u>233</u> ,
<code>\@nil</code>	235	<code>\@secantformat</code>	<u>298</u> , <u>355</u>		<u>238</u> , <u>240</u> , <u>242</u> , <u>244</u> ,
<code>\@nobreakfalse</code>	<u>338</u> , <u>378</u>	<code>\@secfont</code>	<u>2204</u> , <u>2225</u>		<u>246</u> , <u>248</u> , <u>2395</u> , <u>2396</u>
<code>\@noskipsecfalse</code>	<u>342</u>	<code>\@secpenalty</code>	<u>287</u>	<code>\@tempboxa</code>	555
<code>\@noskipsectrue</code>	<u>339</u>	<code>\@sect</code>	<u>291</u> , <u>292</u>		
<code>\@par</code>	<u>1441</u>	<code>\@setaddresses</code>	<u>1944</u>		
		<code>\@setthanks</code>	<u>1441</u> , <u>1997</u>		

<code>\@tempc</code> . 236, 237, 239, 241, 243, 245, 247, 249	<code>\acm@copyrightinput</code> 1228	<code>\acmConference@shortname</code> 996, 1000, 1001, 1456, 1970, 1971, 2104, 2106
<code>\@tempcnta</code> 2137, 2139, 2140, 2142, 2144	<code>\acm@copyrightmode</code> 1228, 1234, 1239, 1242, 1246, 1252, 1255, 1258, 1261, 1264, 1270, 1299	<code>\acmConference@venue</code> 999, 1456, 1968, 2105, 2107
<code>\@tempdima</code> 2143, 2144, 2145, 2147	<code>\ACM@fontsize</code> <u>107</u> , 151, 154, 156, 158, 160, 162, 164, 166, 168, 170, 173, 174	<code>\acmdefinition</code> <u>2324</u>
<code>\@tempskipa</code> 279, 281, 282, 287, 300, 301, 332, 333, 335, 347, 348, 357, 358	<code>\ACM@format</code> 32, 115	<code>\acmDOI</code> 14, <u>1125</u>
<code>\@textbottom</code> <u>582</u>	<code>\ACM@format@nr</code> .. 32, 115, 119, 124, 130, 152, 393, 459, 524, 618, 670, 1524, 1552, 1589, 1611, 1632, 1746, 1770, 1977, 2045, 2069, 2124, 2160, 2193, 2230, 2279, 2309, 2347	<code>\acmISBN</code> 14, <u>1123</u>
<code>\@textsuperscript</code> 581, 1428, 1433	<code>\ACM@linecount</code> 2002, 2003, 2007, 2008	<code>\acmJournal</code> 7, <u>989</u>
<code>\@texttop</code> 583	<code>\ACM@linecount@bx</code> <u>1999</u> , 2016, 2023	<code>\acmMonth</code> 14, <u>1113</u>
<code>\@thefnmark</code> . 562, 576, 581, 1428, 1433, 1437	<code>\ACM@linecount@bxht</code> 2001, 2006, 2009, 2010	<code>\acmNumber</code> 14, <u>1105</u>
<code>\@title</code> ... 1073, 1518, 1670, 1694, 1711, 1962	<code>\ACM@linecountL</code> <u>2012</u> , 2071, 2074, 2077, 2080, 2084, 2086, 2092, 2094, 2102, 2104, 2162, 2169, 2170, 2178, 2179, 2185, 2188	<code>\acmplain</code> <u>2294</u>
<code>\@titlefont</code> <u>1610</u> , 1662, 1669, 1681, 1693, 1709	<code>\ACM@linecountR</code> 2019, 2095, 2097, 2103, 2107, 2186, 2189	<code>\acmPrice</code> 14, <u>1119</u> , 1244, 1250
<code>\@titlenotes</code> <u>1071</u> , 1075, 1078, 1434	<code>\ACM@mk@linecount</code> 2004, 2014, 2021	<code>\acmSubmissionID</code> 14, <u>1121</u>
<code>\@tochangmeasure</code> 309, <u>322</u>	<code>\ACM@timestamp</code> <u>2026</u> , 2113, 2194, 2197	<code>\acmVolume</code> 14, <u>1103</u>
<code>\@toclevel</code> 293	<code>\acmArticle</code> 14, <u>1107</u>	<code>\acmYear</code> 14, <u>1111</u>
<code>\@tocline</code> 381, <u>382</u>	<code>\acmArticleSeq</code> . 14, <u>1109</u>	<code>\addcontentsline</code> 186, 311, 324, 1947, 2372
<code>\@topnum</code> 1424	<code>\acmBadgeL</code> 15, <u>1139</u>	<code>\additionalaffiliation</code> <u>10</u> , <u>1055</u>
<code>\@typeset@author@bx</code> <u>1837</u> , 1886, 1892, 1929, 1934	<code>\acmBadgeR</code> 15, <u>1134</u>	<code>\addpenalty</code> 287
<code>\@typeset@author@line</code> <u>1795</u> , 1806, 1828, 1830	<code>\acmConference</code> ... 9, <u>995</u>	<code>\addresses</code> . 1014, 1016, 1019, 1024, 1051, 1069, 1093, 1099, 1101, 1830, 1892, 1934
<code>\@undefined</code> 435	<code>\acmConference@date</code> 998, 1456, 1474, 1969, 2105, 2107	<code>\addtolength</code> ... 694, 695, 696, 700, 701, 2009
<code>\@width</code> 538, 543	<code>\acmConference@name</code> 997, 1474, 1968, 1970	<code>\addvspace</code> 287, 379
<code>\@xp</code> 375, 376		<code>\advance</code> 710, 715, 718, 720, 722, 724, 1011, 1655, 1656, 1659, 1660, 1684, 1685, 1846, 1863, 1895, 1906, 2008, 2140, 2142, 2145
<code>\@xsect</code> 330, 331, 367		<code>\affiliation</code> 9, <u>1048</u> , 1815, 1877, 1920
<code>\@z</code> 222		<code>\and</code> .. 1024, 1025, 1038, 1044, 1806, 1811, 1813, 1823, 1828, 1837, 1871, 1886, 1892, 1914, 1929, 1934
<code>\@</code> 455, 1460, 1465, 1480, 1484, 1488, 1957, 2007		<code>\andify</code> 1510, 1511, 1796, 1799
<code>\{</code> 198		<code>anonsuppress</code> (environ- ment) 20
<code>\}</code> 198		
<code>_</code> ... 1215, 1460, 1462, 1484, 1965, 1971, 2037		
A		
<code>\abstract</code> <u>1150</u>		
<code>abstract</code> (environment) <u>17</u>		
<code>\acks</code> <u>2369</u>		
<code>acks</code> (environment) 21		

<code>\AtBeginDocument</code> . . .	<code>\bibfont</code>	<code>\ClassInfo</code> 115, 173, 985,
. 428, 436, 686	<code>\bibfont</code>	1156, 1158, 1162,
<code>\AtEndDocument</code> 1203	<code>\bibliographystyle</code> . 434	1164, 1168, 1170, 1173
<code>\author</code> 9,	<code>\bibsection</code>	<code>\ClassWarning</code>
<u>1009</u> , 1417, 1418, 1959	<code>\bibstyle</code> 212, 214, 256, 439	. . . 27, 120, 592,
<code>\author@bx</code> 1833, 1838, 1841	<code>\bibstyle@acmauthoryear</code>	595, 597, 1146, 1174
<code>\author@bx@sep</code> . . . . .	. . . . . 262	<code>\cledaders</code> 1721
. 1835, 1841,	<code>\bibstyle@acmnumeric</code> 268	<code>\clubpenalty</code> . . . 344, 350
1846, 1863, 1895, 1906	<code>\bigskip</code>	<code>\CodelineIndex</code> 17
<code>\author@bx@wd</code>	1205, 1573, 1679,	<code>\Collect@Body</code> . . 639,
. 1834, 1837,	1707, 1715, 1892,	642, 645, 1150, 1405
1845, 1846, 1848,	1934, 1939, 1985,	<code>\color</code> 1448, 2007
1854, 1856, 1858,	1987, 1989, 1991, 1993	<code>\color@begingroup</code> 564, 577
1860, 1863, 1894,	<code>\box</code> 667, 1554, 1557, 1560,	<code>\color@endbox</code> 665
1895, 1897, 1903, 1906	1563, 1565, 1567,	<code>\color@endgroup</code>
<code>\authornote</code>	1569, 1571, 1573,	. . . . . 553, 567, 580
. 13, 1055, <u>1091</u> , 1960	1829, 1841, 1890, 1941	<code>\columnwidth</code> . . . 538,
<code>\authornotemark</code> . 13, <u>1097</u>		573, 651, 1894, 1931
<code>\authors</code>	C	<code>\contentsnamefont</code> . . 372
1017, 1020, 1025,	<code>\c@footnote</code> 1423	<code>\copy</code> 1721
1510, 1512, 1517, 1962	<code>\c@secnumdepth</code>	<code>\copyright</code> 1460
	294, 308, 312, 321, 325	<code>\copyrightpermissionfootnoterule</code>
B	<code>\captionsetup</code> . . . . .	. . . . . 537
<code>\baselineskip</code> . . . . .	. . . 610, 612, 614,	<code>\copyrightyear</code> . 16, <u>1402</u>
1450, 1664, 1676,	616, 625, 627, 630,	<code>\country</code> . . . 11, 1065, <u>1724</u>
1688, 1703, 2006,	633, 640, 643, 646, 1940	<code>\csname</code>
2009, 2202, 2203,	<code>\ccsdesc</code> 15, <u>1210</u>	256, 307, 309, 313,
2206, 2207, 2210,	<code>\ccsdesc@parse</code> 1211, <u>1212</u>	320, 322, 326, 355,
2214, 2249, 2250,	CCSXML (environment) . . 15	375, 376, 562, 576,
2254, 2259, 2295,	<code>\centering</code> 372, 454, 577,	1214, 1215, 1216, 1217
2296, 2297, 2298,	644, 647, 1681,	<code>\CurrentOption</code> . 108,
2325, 2326, 2327, 2328	1693, 1838, 1891, 2152	109, 110, 111, 112, 113
<code>\begin</code> . 20, 2015, 2022, 2146	<code>\cite</code> . . . 416, 417, 429, 433	D
<code>\begingroup</code>	<code>\citeA</code> 423	<code>\day</code> 2035
302, 345, 359, 368,	<code>\citealt</code> 422	<code>\DeclareNewFootnote</code> 541
424, 1420, 1744, 2370	<code>\citeANP</code> 418	<code>\DeclareOptionX</code>
<code>\bfseries</code> . . 725, 1445,	<code>\citeauthor</code> 418	. . . . . 38, 108,
1613, 1615, 1617,	<code>\citeN</code> 416	109, 110, 111, 112, 113
1621, 1623, 1625,	<code>\citename</code> 430	<code>\DeclareRobustCommand</code> 423
1627, 1629, 1789,	<code>\citeNN</code> 419	<code>\def</code> 25, 38, 107,
1792, 1961, 2153,	<code>\citeNP</code> 422	154, 156, 158, 160,
2225, 2226, 2240,	<code>\citep</code> 417	162, 164, 166, 168,
2241, 2243, 2244,	<code>\citestyle</code> . . . 22, 254, 274	170, 191, 193, 195,
2246, 2247, 2252,	<code>\citeyear</code> . . . 420, 421, 433	197, 199, 201, 203,
2257, 2265, 2266,	<code>\citeyearNP</code> 420	205, 207, 209, 211,
2269, 2270, 2289, 2319	<code>\citeyearpar</code> . . . 419, 421	213, 215, 216, 217,
<code>\bgroup</code> 640, 643,	<code>\city</code> 11, 1062, <u>1724</u>	218, 219, 220, 221,
646, 651, 1056,	<code>\ClassError</code>	222, 223, 224, 225,
1497, 1502, 1837,	. . . 35, 987, 1054,	227, 229, 231, 233,
1931, 1939, 1945, 1955	1159, 1165, 1171, 1958	

234, 238, 240, 242,	1033, 1055, 1056,	2278, 2287, 2288,
244, 246, 248, 276,	1057, 1058, 1059,	2289, 2290, 2305,
292, 317, 331, 355,	1060, 1071, 1072,	2306, 2307, 2308,
356, 365, 368, 381,	1080, 1081, 1090,	2317, 2318, 2319,
382, 387, 388, 389,	1091, 1103, 1105,	2320, 2345, 2346,
390, 434, 537, 542,	1107, 1109, 1111,	2355, 2356, 2376,
544, 556, 558, 569,	1113, 1115, 1119,	2378, 2393, 2394, 2395
581, 582, 640, 643,	1121, 1123, 1125,	<code>\define@boolkey</code> 49, 57,
646, 651, 653, 657,	1135, 1136, 1137,	65, 73, 81, 89, 97,
660, 678, 679, 680,	1138, 1140, 1141,	1053, 1154, 1160, 1166
681, 709, 714, 717,	1142, 1143, 1144,	<code>\define@choicekey</code> ..
719, 721, 723, 788,	1146, 1148, 1151,	..... 32, 733, 1227
789, 790, 792, 793,	1153, 1176, 1188,	<code>\define@cmdkey</code> 1172
794, 796, 798, 799,	1189, 1213, 1267,	<code>\definecolor</code>
801, 802, 803, 805,	1269, 1297, 1298,	... 442, 443, 444,
806, 807, 809, 810,	1402, 1404, 1406,	445, 446, 447, 448, 449
811, 813, 814, 815,	1415, 1428, 1433,	<code>\department</code> . 11, 1059, 1724
817, 818, 819, 821,	1441, 1523, 1544,	<code>\description</code> 726
822, 824, 825, 826,	1588, 1610, 1631,	<code>\descriptionlabel</code> 725, 728
828, 829, 830, 832,	1652, 1680, 1708,	<code>\dimexpr</code> .. 649, 667, 2110
833, 834, 836, 837,	1717, 1726, 1734,	<code>\divide</code> 1848, 1854, 1856,
838, 840, 841, 842,	1735, 1738, 1741,	1858, 1860, 1897, 1903
844, 846, 847, 848,	1744, 1768, 1769,	<code>\do</code> 190
850, 851, 852, 854,	1773, 1774, 1777,	<code>\DocInput</code> 21
856, 858, 860, 861,	1778, 1780, 1781,	<code>\documentclass</code> 9
862, 864, 865, 866,	1783, 1784, 1786,	<code>\dots</code> 1488
868, 869, 870, 872,	1787, 1789, 1790,	
873, 874, 876, 877,	1792, 1793, 1795,	E
878, 880, 881, 882,	1797, 1802, 1803,	<code>\edef</code> 108, 109, 110, 111, 293
884, 885, 886, 888,	1804, 1805, 1807,	<code>\egroup</code> 554,
889, 890, 892, 893,	1814, 1815, 1816,	641, 644, 647,
894, 896, 897, 898,	1837, 1844, 1866,	658, 664, 1066,
900, 901, 902, 904,	1872, 1877, 1893,	1499, 1508, 1840,
905, 906, 908, 909,	1909, 1915, 1920,	1934, 1940, 1954, 1975
910, 912, 913, 914,	1935, 1936, 1937,	<code>\else</code> 52, 60,
916, 917, 918, 920,	1939, 1944, 1945,	68, 76, 84, 92, 102,
921, 922, 924, 925,	1955, 1956, 1957,	126, 236, 257, 286,
926, 928, 929, 930,	1958, 1976, 1997,	293, 296, 308, 312,
931, 933, 934, 935,	2004, 2012, 2019,	316, 321, 325, 337,
937, 938, 939, 941,	2043, 2044, 2123,	349, 364, 412, 427,
942, 943, 945, 946,	2130, 2135, 2137,	433, 435, 547, 615,
947, 949, 950, 951,	2221, 2225, 2226,	1010, 1018, 1022,
953, 954, 955, 957,	2227, 2228, 2234,	1023, 1032, 1037,
958, 959, 961, 962,	2235, 2237, 2238,	1040, 1043, 1050,
963, 965, 966, 967,	2240, 2241, 2243,	1068, 1077, 1086,
969, 970, 971, 973,	2244, 2246, 2247,	1092, 1100, 1157,
974, 975, 977, 978,	2252, 2257, 2262,	1163, 1169, 1180,
979, 981, 982, 983,	2265, 2266, 2269,	1183, 1193, 1196,
989, 990, 991, 992,	2270, 2272, 2273,	1199, 1204, 1218,
993, 994, 1005,	2275, 2276, 2277,	1219, 1411, 1429,

1439, 1451, 1454,	teaserfigure	17	636, 655, 659, 684,
1455, 1461, 1466,	\everypar	285, 340, 351	984, 1002, 1013,
1473, 1478, 1481,	\excludecomment	1208,	1021, 1026, 1027,
1484, 1486, 1488,	2381, 2383, 2387, 2388		1031, 1039, 1045,
1497, 1502, 1505,	\ExecuteOptionsX		1046, 1047, 1052,
1547, 1576, 1581,	. . . . .	48, 56,	1070, 1079, 1089,
1654, 1658, 1663,	64, 72, 80, 88, 96, 106		1096, 1102, 1118,
1671, 1674, 1687,	\expandafter		1159, 1165, 1171,
1695, 1702, 1712,	. . . . .	235, 237, 436,	1185, 1186, 1195,
1718, 1719, 1733,	555, 1214, 1215, 1217		1201, 1202, 1206,
1734, 1735, 1737,			1216, 1220, 1238,
1738, 1741, 1798,			1241, 1245, 1251,
1810, 1816, 1822,	F		1254, 1257, 1260,
1838, 1849, 1859,	\familydefault	607	1263, 1266, 1296,
1868, 1874, 1881,	\fancyfoot	2075,	1401, 1413, 1418,
1898, 1902, 1911,	2081, 2089, 2098,		1419, 1429, 1431,
1917, 1924, 1938,	2101, 2113, 2163,		1442, 1449, 1452,
1946, 1950, 1967,	2164, 2166, 2174,		1453, 1457, 1458,
1970, 2038, 2043,	2182, 2190, 2194, 2197		1463, 1475, 1480,
2100, 2187, 2196,	\fancyhead	2071, 2072,	1484, 1488, 1490,
2378, 2382, 2389, 2397	2073, 2074, 2077,		1491, 1492, 1500,
\email	2078, 2079, 2080,		1501, 1507, 1509,
9,	2084, 2086, 2087,		1516, 1543, 1549,
1067, 1814, 1872, 1915	2092, 2094, 2095,		1580, 1584, 1585,
\emph	2096, 2102, 2103,		1586, 1608, 1630,
1472, 1474	2104, 2106, 2162,		1651, 1657, 1661,
\EnableCrossrefs	2169, 2170, 2171,		1667, 1673, 1678,
19	2177, 2178, 2179,		1690, 1692, 1697,
\end	2185, 2186, 2188, 2189		1705, 1706, 1714,
22, 2017, 2024, 2154	\fancyheadoffset		1722, 1734, 1735,
\end@dblfloat . . . . .	. . . . .	2110, 2172, 2180	1737, 1738, 1741,
656	\fancyhf	2066, 2157	1743, 1765, 1794,
\end@float	\fancypagestyle	2065, 2156	1801, 1812, 1826,
658	\fi	54, 62, 70, 78, 86, 94,	1827, 1838, 1861,
\endcsname	104, 123, 128, 150,		1862, 1870, 1876,
255,	171, 172, 181, 192,		1885, 1904, 1905,
256, 307, 309, 313,	194, 196, 198, 200,		1913, 1919, 1928,
320, 322, 326, 355,	202, 204, 206, 208,		1943, 1952, 1954,
375, 376, 562, 576,	210, 212, 214, 216,		1971, 1973, 1995,
1214, 1215, 1216, 1217	218, 220, 222, 224,		2011, 2018, 2025,
\enddescription	226, 228, 230, 232,		2040, 2042, 2043,
732	234, 239, 241, 243,		2064, 2071, 2072,
\endgroup	245, 247, 249, 250,		2077, 2078, 2085,
306, 345, 363,	259, 261, 275, 277,		2088, 2093, 2097,
378, 1493, 1766, 2374	283, 288, 293, 299,		2101, 2108, 2111,
\endlist	310, 314, 323, 327,		2114, 2136, 2163,
730, 732	329, 352, 353, 366,		2190, 2191, 2198,
\endminipage	377, 405, 414, 431,		2199, 2271, 2293,
544	433, 437, 440, 457,		2323, 2359, 2378,
\endtrivlist	521, 535, 551, 568,		2385, 2391, 2394, 2398
2367	588, 605, 608, 635,		
\enspace			
2273			
environments:			
abstract			
17			
acks			
21			
anonsuppress			
20			
CCSXML			
15			
marginfigure			
20			
marginable			
20			
printonly			
20			
screenonly			
20			
sidebar			
20			

<code>\ifdim</code>	281, 301, 333, 358, 2010	<code>\institution</code>	11, 1058, 1724	<code>\leftmarginiv</code>	.....
<code>\ifFileExists</code>	592, 595, 597	<code>\interfootnotelinepenalty</code>	.....	703, 704, 719, 720	
<code>\ifInteger</code>	..... 1173	<code>\interlinepenalty</code>	..... 560	<code>\leftmarginv</code>	.....
<code>\ifNAT@numbers</code>	.... 433	<code>\interlinepenalty</code>	..	704, 705, 721, 722	
<code>\ifnum</code>	119, 124, 293, 294, 308, 312, 321, 325, 1218, 1219, 1234, 1239, 1242, 1246, 1252, 1255, 1258, 1261, 1264, 1418, 1847, 1896, 2139, 2193	<code>\item</code>	..... 2364	<code>\leftmarginvi</code>	705, 723, 724
<code>\ifPDFTeX</code>	..... 585	<code>\itshape</code>	.. 1456, 2227, 2228, 2257, 2262, 2275, 2287, 2307, 2355	<code>\leftskip</code>	. 1709, 1932, 2223
<code>\ifvmode</code> 1718	J			<code>\let</code> 212, 214, 226, 228, 230, 256, 295, 383, 384, 416, 417, 418, 419, 420, 421, 422, 425, 429, 583, 652, 713, 728, 732, 1061, 1062, 1063, 1064, 1065, 1209, 1421, 1422, 1437, 1438, 1441, 1512, 1513, 1725, 1728, 1729, 1730, 1731, 1732, 1739, 1740, 1742, 1806, 1828, 1886, 1892, 1929, 1934
<code>\ifvoid</code>	..... 547	<code>\jobname</code>	..... 373, 376	<code>\lineskip</code>	..... 1891, 1933
<code>\ifx</code>	. 151, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 238, 240, 242, 244, 246, 248, 435, 1000, 1014, 1029, 1034, 1035, 1041, 1098, 1190, 1191, 1197, 1204, 1214, 1439, 1476, 1484, 1488, 1497, 1502, 1545, 1576, 1581, 1654, 1658, 1663, 1671, 1674, 1687, 1695, 1702, 1712, 1798, 1808, 1816, 1817, 1866, 1872, 1877, 1909, 1915, 1920, 1938, 1946, 1970, 2038, 2378, 2394, 2396	K			<code>\listparindent</code> 711
<code>\ignorespaces</code>	..... ... 354, 566, 579, 1057, 1058, 1060, 1726, 1953, 1957, 2365	<code>\kern</code>	537, 538, 542, 543, 1710	<code>\LoadClass</code>	..... 174
<code>\immediate</code>	..... 376, 439	<code>\keywords</code>	..... 15, 1148	<code>\long</code>	..... 558, 569, 640, 643, 646, 1151, 1153, 1406, 1997
<code>\includecomment</code> 2380, 2384, 2390	L			<code>\loop</code> 2007, 2138
<code>\includegraphics</code>	... .... 1578, 1583, 1665, 1677, 1689, 1704	<code>\l@subsection</code>	..... 381	M	
<code>\indent</code>	..... 2346	<code>\l@subsubsection</code>	... 382	<code>\makebox</code>	..... 1445, 2147
<code>\input</code>	..... 586	<code>\labelenumi</code>	..... 678	<code>\makelabel</code>	..... 728
<code>\InputIfFileExists</code>	.. 26	<code>\labelenumii</code>	..... 679	<code>\maketitle</code>	.... 18, 1415
		<code>\labelenumiii</code>	..... 680	<code>\MakeUppercase</code>	..... .... 1809, 1811, 2225, 2234, 2237, 2240, 2243, 2265, 2269
		<code>\labelenumiv</code>	..... 681	<code>\marginfigure</code>	..... 642
		<code>\labelsep</code>	..... 687, 695, 700, 710, 715, 718, 720, 722, 724, 2364	<code>marginfigure (environ- ment)</code>	..... 20
		<code>\labelwidth</code>	. 710, 715, 718, 720, 722, 724, 727	<code>\marginpar</code>	..... 558, 641, 644, 647, 1575
		<code>\LARGE</code>	..... 1613, 1615, 1617, 1640, 1642, 1644, 1646, 1648, 1777, 1780, 2153	<code>\marginparsep</code>	.. 649, 2110
		<code>\Large</code>	1768, 1786, 2240, 2241, 2243, 2244, 2246	<code>\marginparwidth</code>	. 649, 2110	
		<code>\large</code>	..... 1445, 1773, 1778, 1781, 2234, 2235, 2237, 2238	<code>\margintable</code>	..... 645
		<code>\lastbox</code>	..... 343	<code>margintable (environ- ment)</code>	..... 20
		<code>\leaders</code>	..... 1710		
		<code>\leavevmode</code>	277, 1710, 1890			
		<code>\leftmargin</code>	.... 709, 714, 717, 719, 721, 723		
		<code>\leftmargini</code>	... 693, 694, 695, 696, 709, 710			
		<code>\leftmarginii</code>	.. 699, 700, 701, 702, 714, 715			
		<code>\leftmarginiii</code>	.... ... 702, 703, 717, 718		

<code>\mbox</code>	234	<code>\newcommand</code> .	262, 268,	1850, 1854, 1856, 1899
<code>\mdseries</code>			432, 995, 1048,	<code>\number</code>
	1634, 1636, 1638,		1097, 1134, 1139,	<code>\numberline</code>
	1642, 1644, 1646,		1189, 1210, 1727,	313, 326
	1648, 1650, 1790, 1793		1736, 2033, 2377, 2392	<code>\numexpr</code> .
<code>\medskip</code>		<code>\newcount</code>	1007, 2002	2028, 2030, 2032
	1526, 1528, 1530,	<code>\newcounter</code> . . .	2029, 2031	O
	1532, 1829, 1831,	<code>\newdimen</code> . . .	648, 685,	<code>\onehalfspacing</code>
	1890, 1942, 1961,		1834, 2117, 2119, 2121	180
	1976, 1979, 1981, 1983	<code>\newenvironment</code>		<code>\openout</code>
<code>\mktitle@bx</code>	1414,		642, 645, 1405	376
	1554, 1557, 1560,	<code>\newfloat</code>	637	<code>\or</code>
	1563, 1565, 1567,		116, 117, 118, 590,	133, 135,
	1569, 1571, 1573,	<code>\newif</code>	1127, 1221, 1223, 1225	137, 139, 141, 143,
	1662, 1681, 1709,	<code>\newlength</code>		145, 147, 155, 157,
	1829, 1889, 1890, 1941		1129, 1131, 1132, 2001	159, 161, 163, 165,
<code>\month</code>	1114, 2035	<code>\newsavebox</code>	2000	167, 169, 395, 396,
<code>\moveleft</code>	666	<code>\newskip</code>	707, 1835	397, 398, 399, 400,
<code>\multiply</code>	2144	<code>\newtheorem</code>		402, 403, 463, 470,
			2336, 2337, 2338,	477, 484, 491, 498,
			2339, 2340, 2342, 2343	505, 512, 526, 527,
		<code>\newtheoremstyle</code> . . .		528, 530, 531, 532,
			2294, 2324	533, 534, 620, 621,
		<code>\newwrite</code>	375	622, 623, 624, 626,
		<code>\nobreak</code>	334, 1961	629, 632, 672, 673,
		<code>\noindent</code>		674, 675, 676, 677,
			556, 1205, 1438,	682, 683, 791, 795,
			1526, 1528, 1530,	800, 804, 808, 812,
			1532, 1551, 1555,	816, 820, 823, 827,
			1558, 1561, 1575,	831, 835, 839, 843,
			1662, 1669, 1672,	845, 849, 853, 855,
			1696, 1710, 1711,	857, 859, 863, 867,
			1713, 1796, 1829,	871, 875, 879, 883,
			1830, 1889, 1933,	887, 891, 895, 899,
			1941, 1942, 1949,	903, 907, 911, 915,
			1961, 1962, 1974,	919, 923, 927, 932,
			1979, 1981, 1983, 2356	936, 940, 944, 948,
		<code>\nolinkurl</code>		952, 956, 960, 964,
			1873, 1875, 1916, 1918	968, 972, 976, 980,
		<code>\normalcolor</code>	549	1115, 1116, 1117,
		<code>\normalfont</code>	581, 1205,	1271, 1273, 1276,
			1433, 1769, 1774,	1278, 1279, 1281,
			1783, 1784, 1786,	1283, 1285, 1288,
			1787, 2290, 2305,	1291, 1293, 1300,
			2317, 2320, 2362, 2399	1311, 1322, 1330,
		<code>\normalparindent</code> . . .	536	1336, 1348, 1362,
		<code>\normalsize</code>	1631, 1769,	1374, 1381, 1388,
			1783, 1784, 1787, 2399	1394, 1527, 1529,
		<code>\num@authorgroups</code> . .		1531, 1533, 1535,
			1007, 1011, 1418,	1537, 1539, 1541,
				1556, 1559, 1562,
				1564, 1566, 1568,
				1570, 1572, 1592,
				1594, 1596, 1598,

1600, 1602, 1604,	<code>\pagestyle</code> 2116	<code>\protected@edef</code>
1606, 1614, 1616,	<code>\par</code> 278, 334, 370,	. . . . . 298, 561, 575
1618, 1620, 1622,	545, 661, 1205,	<code>\providecommand</code>
1624, 1626, 1628,	1441, 1452, 1456,	. . . . . 426, 430, 2274
1635, 1637, 1639,	1499, 1508, 1526,	<code>\ProvidesClass</code> 5
1641, 1643, 1645,	1528, 1530, 1532,	<code>\ProvidesFile</code> 3
1647, 1649, 1749,	1554, 1555, 1557,	<code>\pushQED</code> 2361
1751, 1753, 1755,	1558, 1560, 1561,	<code>\put</code> 2016, 2023
1757, 1759, 1761,	1573, 1672, 1679,	
1763, 1772, 1775,	1696, 1707, 1710,	Q
1776, 1779, 1782,	1713, 1715, 1734,	<code>\qed</code> 2361
1785, 1788, 1791,	1735, 1737, 1738,	<code>\quad</code> 355, 2085,
1852, 1853, 1855,	1796, 1800, 1829,	2088, 2093, 2097, 2194
1857, 1901, 1980,	1831, 1837, 1839,	
1982, 1984, 1986,	1867, 1869, 1875,	R
1988, 1990, 1992,	1882, 1890, 1892,	<code>\raggedright</code>
1994, 2048, 2050,	1910, 1912, 1918,	. . . 1668, 1709, 1932
2052, 2054, 2056,	1925, 1932, 1934,	<code>\raisebox</code>
2058, 2060, 2062,	1939, 1940, 1941,	1445, 1664, 1676,
2076, 2083, 2091,	1942, 1953, 1961,	1688, 1703, 2147, 2149
2126, 2131, 2165,	1973, 1975, 1976,	<code>\received</code> 17, 1189
2173, 2181, 2232,	1979, 1981, 1983,	<code>\RecordChanges</code> 18
2233, 2236, 2239,	1985, 1987, 1989,	<code>\ref</code> 1966, 1972
2242, 2245, 2263,	1991, 1993, 1997, 2360	<code>\refname</code> 185, 186
2267, 2281, 2282,	<code>\paragraph</code> 1538, 2213, 2253	<code>\refstepcounter</code> 297
2283, 2284, 2285,	<code>\parbox</code> 454, 1668, 1686,	<code>\relax</code> 119,
2286, 2291, 2292,	1693, 1701, 2005, 2151	124, 131, 153, 235,
2311, 2312, 2313,	<code>\parindent</code> . . 522, 536,	236, 279, 298, 300,
2314, 2315, 2316,	694, 1441, 1450,	304, 318, 332, 347,
2321, 2322, 2349,	2213, 2224, 2276, 2306	357, 365, 376, 394,
2350, 2351, 2352,	<code>\parskip</code> 522, 1450	460, 525, 583, 619,
2353, 2354, 2357, 2358	<code>\part</code> 2217	671, 787, 1008,
<code>\orcid</code> 9, 1071	<code>\PassOptionsToClass</code>	1011, 1097, 1098,
<code>\outer@nobreak</code> 663	. . . . . 112, 113	1214, 1234, 1239,
	<code>\pdfgentounicode</code> . . . 587	1242, 1246, 1252,
P	<code>\pdfstringdefDisableCommands</code>	1255, 1258, 1261,
<code>\p@</code> 379,	. . . . . 386	1264, 1270, 1299,
522, 529, 537, 538,	<code>\phantomsection</code>	1437, 1525, 1553,
542, 543, 2202,	. . . . 186, 1947, 2372	1590, 1612, 1633,
2206, 2210, 2211,	<code>\popQED</code> 2367	1747, 1771, 1836,
2214, 2215, 2218,	<code>\position</code> 11,	1845, 1846, 1847,
2219, 2249, 2254,	1057, 1061, 1062,	1848, 1851, 1854,
2255, 2259, 2260, 2362	1063, 1064, 1065, 1724	1856, 1858, 1860,
<code>\PackageError</code> . . . 54,	<code>\postcode</code> . . . 11, 1064, 1724	1863, 1891, 1894,
62, 70, 78, 86, 94, 104	<code>printonly</code> (environment) 20	1895, 1896, 1897,
<code>\PackageInfo</code> 51, 53, 59,	<code>\ProcessOptionsX</code> . . . 114	1900, 1903, 1906,
61, 67, 69, 75, 77,	<code>\proof</code> 2360	1935, 1978, 2003,
83, 85, 91, 93, 99, 103	<code>\proofname</code> 2360	2030, 2032, 2038,
<code>\PageIndex</code> 16	<code>\protect</code> 313, 326	2046, 2070, 2125,
<code>\pageref</code> 2037		2127, 2128, 2129,

<code>\theoremstyle</code>	546, 1060, 1066,	241, 243, 245, 247, 249
... 2335, 2341, 2344	1721, 1741, 1800, 1957	
<code>\thepage</code> .. 2037, 2071,	<code>\unvbox</code> 550, 555, 571	Y
2072, 2077, 2078,	<code>\upshape</code> 725	<code>\year</code> 1112, 2035
2085, 2088, 2093,	<code>\url</code> 1297, 2378	
2097, 2101, 2163, 2190	<code>\urlstyle</code> ... 392, 401, 404	Z
<code>\thispagestyle</code> 1550	<code>\usebox</code> 2016, 2023	<code>\z@</code> 218,
<code>\thmname</code> 2304, 2334	<code>\usepackage</code>	281, 301, 333, 343,
<code>\thmnote</code> 2304, 2334	. 10, 11, 12, 13, 14, 15	358, 371, 523, 566,
<code>\thmnumber</code> 2304, 2334		579, 582, 613, 617,
<code>\thr@</code> 230	V	628, 693, 699, 711,
<code>\time</code> 2027, 2030, 2032	<code>\vbox</code> 570,	1424, 1426, 1441,
<code>\title</code> 9, 1959	666, 1662, 1681,	1445, 1450, 1664,
<code>\titlenote</code> .. 13, 1072, 1960	1709, 1829, 1889, 1941	1676, 1688, 1703,
<code>\topsep</code> ... 712, 716, 2362	<code>\vskip</code> 335, 370, 548, 582, 661	1932, 2067, 2068,
<code>\trivlist</code> 2363	<code>\vtop</code> 1838	2118, 2120, 2122,
<code>\tw@</code> 228		2147, 2149, 2158,
<code>\two@digits</code> ... 2035, 2036	W	2159, 2201, 2205,
<code>\twocolumn</code> 1563,	<code>\wd</code> 668, 1721	2217, 2224, 2248,
1565, 1567, 1569, 1571	<code>\write</code> 439	2253, 2258, 2288, 2318
U	X	<code>\z@skip</code> 370, 661, 716, 2223
<code>\unskip</code> 346, 387,	<code>\xdef</code> 239,	