New Multibibliography Package*

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Abstract

The `nmbib` package is a rewrite of `multibiliography` package providing multiple bibliographies with different sorting. The new version offers a number of citation commands, streamlines the creation of bibliographies, ensures compatibility with the `natbib` package, and provides other improvements.

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1 Introduction

The list of cited works accompanying a scholarly work is not just a technical appendix or a subtle way to avoid accusations of plagiarism. Rather, it is an organic part of the work, telling the user a story about the field of study and showing why the given work is an organic part of it. There are several ways to tell the story, and accordingly there are several ways to organize the list of references. One can tell it accordingly to logical development of ideas, so the order of citations follows the order they are mentioned in the paper. This leads to the "unsorted" style of references, usual in physics and mathematics papers and books. Alternatively, one can choose to tell the story as the story of people behind the ideas, ordering the citations alphabetically by author names. This is the order used in humanities and other fields. Yet another possibility is to tell the story in the chronological order. The chronological order of citations is not widely used, with the important exception of resumes and CVs, but it has its own advantages.

In the times BC (Before Computers), difficulties in manual creation of reference lists discouraged presentation of more than one such list. Now we can easily have as many lists as we want. Accordingly we can have not one, but several lists of references, each telling a different story. The package `multibibliography` (Cohen et al., 2013a,b) provided just this: multiple bibliographies with the same references arranged in different orders, with hyperlinks between entries. However, this package had various limitations, including: the fixed format of typesetting citations in text, the limitation on the possible BibTEX styles. Also, it requires post-processing by a Perl script.

This package tries to lift these limitations. It provides the following improvements over the original `multibiliography`:

1. A Perl postprocessing is no longer needed: all processing is done by BibTEX.
2. The user can work with familiar `natbib` (Daly, 2009) commands `\citep`, `\citet`, `\citeauthor`, `\citeyear`, `\citenum`.
3. Any `natbib`-compatible `.bst` file can be used for formatting the bibliography provided that it has the right sorting of entries (note that the provided style gives `natbib`-compatible chronological ordering).
4. The style is much more customizable than that produced by `multibibliography`.
5. Hyperlinks between the entries are improved.

Note about the name. The letter n in the package name can be interpreted as

1. *N*ew multibibliography style, or
2. *N*atbib-compatible multibibliography style, or even
3. *N*-ordering multibibliography style, with N being a usual mathematical moniker for "many".

2 User Guide

2.1 Usage Summary

The simplest way to use the package is the following:

1. Add to the preamble of your `.tex` file

```
\usepackage{nmbib}
\multibibliography{FILE1, FILE2, ...}
\multibibliographystyle{timeline}{STYLE1}
\multibibliographystyle{sequence}{STYLE2}
\multibibliographystyle{authors}{STYLE3}
```

2. Use `natbib` commands such as `\cite`, `\citep`, `\citet`, `\citeauthor`, `\citeyear`, and `\citenum`. The command `\citeall` creates a "full citation", showing the author, year, and number of the citation.

3. Put in your document at the places where you want the bibliography the commands `\printbibliography{timeline}`, `\printbibliography{sequence}`, and `\printbibliography{authors}`.

4. Run `latex` on the `tex` file. This will create, besides the standard auxiliary file `FILE.aux`, three new files: `FILE-timeline.aux`, `FILE-sequence.aux` and `FILE-authors.aux`.

5. Run `bibtex` on each of the three auxiliary files mentioned above:

```
bibtex FILE-timeline
bibtex FILE-sequence
bibtex FILE-authors
```

6. Run `latex` on the `tex` file at least twice (this is a `natbib` requirement).

Below we discuss these commands in more detail as well as customization commands.

2.2 Options

The `nmbib` package internally uses `natbib` (Daly, 2009) for citation formatting. The options used for `nmbib` are sent to `natbib`.

2.3 Setting up

`\multibibliography` The list of BibTeX databases to be used for references is set by the command `\multibibliography{`⟨*bibfile1, bibfile2, ...*⟩`}`. Note that the similar command `\bibliography` in standard LaTeX performs *two* functions: it sets up the databases and prints the bibliography. The command `\multibibliography`, on the other hand, performs only one function: the setting up of the databases. The bibliographies themselves are printed by the command `\printbibliography`, discussed below. Therefore the `\multibibliography` command can be issued anywhere in the file, including the preamble.

`\multibibliographystyle` The standard `\bibliographystyle` command sets the bibliography style of the reference list. Since `nmbib` generates several bibliographies, the corresponding command is more versatile: `\multibibliographystyle{`⟨*type*⟩`}{`⟨*style*⟩`}`, where `type` is the type of the bibliography

timeline: Chronologically ordered list.

sequence: Sequentially ordered list.

authors: Alphabetic list, ordered according to authors' names.

and `{`⟨*style*⟩`}` is the corresponding BibTeX style. The style, of course, must sort the entries in the proper order.

The package can accommodate any `natbib` BibTeX style, including `unsrtnat`, `plainnat`, and `abbrvnat`. It may work with other styles, but success is not guaranteed. The BibTeX styles supplied with the package offer additional hyperlink features; if you do not use `hyperref` or do not care for the links between the different reference lists, you probably do not need these features.

There are three citation styles provided with the package:

chronoplainnm: Similar to `plainnat`, but sorting entries in chronological order (using year, month and day if the latter two are available) and providing links to other lists from the body of the entries.

plainnm: Similar to `plainnat`, but providing links to other lists from the body of the entries. The sorting is alphabetical by authors' names, as in `plainnat`.

unsrtnm: Similar to `unsrtnat`, but providing links to other lists from the body of the entries. The order of entries is the order of citations, as in `unsrtnat`.

2.4 Citation commands

All citations commands defined in `natbib` can be used: `\cite`, `\citenum`, `\citealt`, `\citet`, `\Citet`, etc. The `nmbib` package adds a couple of new commands, described here.

`\citealn` The commands `\citealn{`⟨*keys*⟩`}` is the alternative `\citenum` command: it puts square brackets around its argument.

`\citeall` The command `\citeall{`⟨*keys*⟩`}` produces citations with authors' names, years, and sequence numbers, similar to that produced by the `\cite` command in the `multibibliography` package. To reproduce the behavior of that package, just put in the preamble of your document

```
\let\cite\citeall
```

The starred command `\citeall*` is similar to `\citeall` with the following difference: if `\citeall` prints the shortened author list for papers with multiple authors ("Jones et. al."), `\citeall*` prints the full list ("Jones, Smith, and Brown").

2.5 Printing the bibliographies

`\printbibliography` The command `\printbibliography{`⟨*type*⟩`}` prints the bibliography. The argument is the type of bibliography— `timeline`, `sequence`, or `authors` (see the explanation above).

You can put this command anywhere in your file; the corresponding bibliography will be printed in this place. You can use all three possible lists, any two, or even one. The only limitation is that the "base type" list must be included. (See Section 2.7 for the discussion of base type.)

2.6 Hyperlinks

The nmbib package tries to fully exploit features of hyperref package (Rahtz and Oberdiek, 2012). Links from and between citations should work "smartly": links from authors' names go into the alphabetic list, links from the publication years go into the chronological list, and links from the citation numbers go into the sequential list.

\nmbibRedirectLinks Of course, the user might include only some of the three possible lists. In this case some links become "dangling." The command \nmbibRedirectLinks {⟨*source_type*⟩} {⟨*target_type*⟩} redirects the links that otherwise go to the list {⟨*source_type*⟩} to the list {⟨*source_type*⟩}. For example, if a chronological list is not included, the command \nmbibRedirectLinks{timeline}{authors} makes the links from the publication year go into the alphabetical list of publications.

\nmbibLink The clickable links themselves are created with the help of the command \nmbibLink{⟨*citation*⟩}{⟨*type*⟩}{⟨*text*⟩}. This command is available to the user, which enables constructions like

```
The idea was proposed by \citet{Thor10}.  Note the assumption of
differentiability in \nmbibLink{Thor10}{authors}{his paper}.
```

In this example "his paper" becomes a hyperlink to the paper in the alphabetical list.

The links created with \nmbibLink respect the redirections set by the command \nmbibRedirectLinks.

2.7 Advanced customization

\timelinerefname \sequencerefname \authorsrefname \timelinebibname \sequencebibname \authorsbibname The commands \refname (for article-like classes) and \bibname (for book-like classes) retain the names of the bibliography. The nmbib package defines three macros \TYPErefname and three commands \TYPEbibname, TYPE being timeline, sequence, or authors. These macros can be redefined with the usual \renewcommand. For example, for a German article, one might use

```
\renewcommand{\timelinerefname}{Chronologische Referenzliste}
\renewcommand{\sequencerefname}{Sequenzielle Referenzliste}
\renewcommand{\authorsrefname}{Alphabetische Referenzliste}
```

\multibibliographyfilename By default the package creates three auxillary files with the following file names: FILE-timeline.aux, FILE-sequence.aux, and FILE-authors.aux. The command \multibibliograpyfilename{⟨*type*⟩}{⟨*name*⟩} changes this default. Here {⟨*type*⟩} is timeline, sequence, or authors, and {⟨*name*⟩} is the file name. The default setting is equivalent to

```
\multibibliograpyfilename{timeline}{\jobname-timeline}
\multibibliograpyfilename{sequence}{\jobname-sequence}
\multibibliograpyfilename{authors}{\jobname-authors}
```

This command may be present only in the preamble of a document.

\nmbibBasetype Suppose an author published several works in the same year. They need to be distinguished in the text and bibliography. In the standard author-year styles this is done by adding a suffix after the year: if we want to cite three works by A. U.

Thor published in 2013, they are respectively cited as Thor (2013a), Thor (2013b), and Thor (2013c). When we have only one reference list, the choice of suffixes is simple: the first work becomes 2013a, the second 2013b, etc. But how should we deal with the situation of several subbibliographies? The order of these references in different lists could be different, so the same work could get different labels in different lists.

To prevent this confusion, only one reference list is used to construct the labels. We call the corresponding list type the *base type*. By default it is `sequence`, but this might be changed (and should be chaged if the user does not include sequential list) with the command `\nmbibBasetype{`⟨*type*⟩`}`, with `{`⟨*type*⟩`}` being `timeline`, `sequence`, or `authors`. The list chosen as a base type must be included with the `\printbibliography` macro.

Package `natbib` defines citation aliases: you can use "Paper I" or "Paper II" as aliases for some papers. Normally hyperlinks from aliases go into the alphabetic list; however, you can change it with the special type `alias` in `\nmbibRedirectLinks`, for example,

```
\nmbibRedirectLinks{alias}{timeline}
```

`\nmbibSetCiteall` The format of the `\citeall` and `\citeall*` macros can be changed by the command `\nmbibSetCiteall{`⟨*pattern*⟩`}`, where `{`⟨*pattern*⟩`}` sets the citation format. The pattern can use any punctuation, `\nmbibLink` command and the special tokens `\nmbibKEY`, `\nmbibNAME`, `\nmbibDATE` and `\nmbibNUM`, which are substituted by the citation information. For example, the default format is established by the command

```
\nmbibSetCiteall{\nmbibLink{\nmbibKEY}{authors}{\nmbibNAME}
  (\nmbibLink{\nmbibKEY}{timeline}{\nmbibDATE})
  [\nmbibLink{\nmbibKEY}{sequence}{\nmbibNUM}]}
```

which produces the following result: Daly (2009) [3].

`\nmbibSetBiblabel` The command `\nmbibSetBiblabel{`⟨*type*⟩`}`pattern is used to set the format of the label in the reference list of the given type. The `{`⟨*pattern*⟩`}` parameter uses the same tokens as `\nmbibSetCiteall`. The default is

```
\nmbibSetBiblabel{timeline}{[\nmbibDATE:
  \nmbibLink{\nmbibKEY}{authors}{\nmbibNAME};
  \nmbibLink{\nmbibKEY}{sequence}{\nmbibNUM}]}
\nmbibSetBiblabel{authors}{[\nmbibNAME\
  (\nmbibLink{\nmbibKEY}{timeline}{\nmbibDATE});
  \nmbibLink{\nmbibKEY}{sequence}{\nmbibNUM}]}
\nmbibSetBiblabel{sequence}{[\nmbibNUM:
  \nmbibLink{\nmbibKEY}{authors}{\nmbibNAME}
  (\nmbibLink{\nmbibKEY}{timeline}{\nmbibDATE})]}
```

To suppress the label for any type, use an empty pattern: `\nmbibSetBiblabel{authors}{}`. To use numerical labels only for a sequential list, issue `\nmbibSetBiblabel{sequence}{[\nmbibNUM]}` etc.

`nmbibYearSuffixOff` `nmbibYearSuffixOn` If there are several works with the same authors and year, the package adds suffixes to the year numbers, like 2003a and 2003b. By default these suffixes are

printed both in the labels *and* in the bibliographic entries themselves. The command `\nmbibYearSuffixOff` deletes these suffixes from the bibliography entries (but not from labels). The command `\nmbibYearSuffixOff` restores them.

2.8 Auxillary script

To integrate the package with IDEs like TEXShop, we provide a simple script `nmbibtex` which compiles all bibliographies. Its usage is very simple:

```
nmbibtex FILE
```

where `FILE` is the file name without prefixes.

3 Implementation

3.1 Declarations

We start with declaration, who we are:

```
⟨style⟩\NeedsTeXFormat{LaTeX2e}
⟨*gobble⟩
\ProvidesFile{nmbib.dtx}
⟨/gobble⟩
⟨style⟩\ProvidesPackage{nmbib}
⟨*style⟩
[2015/07/27 v1.04 Multibibliography support for LaTeX]
```

3.2 Loading packages

We send all options to `natbib`

```
\DeclareOption*{\PassOptionsToPackage{\CurrentOption}{natbib}}
\ProcessOptions\relax
```

and call `natbib`

```
\RequirePackage{natbib}
```

3.3 Preliminary Definitions and opening aux files

`\NMBIB@types` The comma-separated collection of types: right now we have three of them.

```
\def\NMBIB@types{timeline,sequence,authors}
```

`\multibibliographyfilename` Defining the names for bibliography files

```
\def\multibibliographyfilename#1#2{%
  \expandafter\edef\csname NMBIB@#1@filename\endcsname{#2}}
\@onlypreamble{\multibibliographyfilename}
```

`\NMBIB@@timeline@filename` The file names for aux files (without `.aux` extension)
`\NMBIB@@sequence@filename`
`\NMBIB@@authors@filename`

```
\@for\@tempa:=\NMBIB@types\do{%
  \expandafter\multibibliographyfilename{\@tempa}{\jobname-\@tempa}}
```

`\NMBIB@timeline@aux` We introduce the output streams
`\NMBIB@sequence@aux`
`\NMBIB@authors@aux`

```
\@for\@tempa:=\NMBIB@types\do{%
  \expandafter\newwrite\csname NMBIB@\@tempa @aux\endcsname}
```

We open and close them at the beginning and end of the document

```
\AtBeginDocument{%
  \if@filesw
  \@for\@tempa:=\NMBIB@types\do{%
    \immediate\openout\csname NMBIB@\@tempa @aux\endcsname
    \csname NMBIB@\@tempa @filename\endcsname.aux
    \immediate\write\csname NMBIB@\@tempa @aux\endcsname{\relax}}%
  \fi}
\AtEndDocument{%
  \if@filesw
  \@for\@tempa:=\NMBIB@types\do{%
    \immediate\closeout\csname NMBIB@\@tempa @aux\endcsname}%
  \fi}
```

\multibibliographystyle Define the bibliographystyle for the corresponding list. Note the trick with \@begindocumenthook, which allows us to write the files only after the files are opened.

```
\def\multibibliographystyle#1#2{%
    \ifx\@begindocumenthook\@undefined\else
      \expandafter\AtBeginDocument
    \fi
    {\if@filesw
      \immediate\write\csname NMBIB@#1@aux\endcsname{%
        \string\bibstyle{#2}}%
     \fi}}
```

\multibibliography Writing bibliography data to the aux files

```
\def\multibibliography#1{%
    \ifx\@begindocumenthook\@undefined\else
      \expandafter\AtBeginDocument
    \fi
    {\if@filesw
      \@for\@tempa:=\NMBIB@types\do{%
        \immediate\write\csname NMBIB@\@tempa @aux\endcsname
        {\string\bibdata{#1}}}%
      \fi}}
```

\nmbibBasetype The macro \nmbibBasetype sets the type that is used for the citation command:

\NMBIB@bibcite@type

```
\def\nmbibBasetype#1{\gdef\NMBIB@bibcite@type{#1}}
\nmbibBasetype{sequence}
```

\NMBIB@timeline@cite@suffix The macro \NMBIB@TYPE@cite@suffix keeps the suffix added to the hyperlink cite:

\NMBIB@sequence@cite@suffix

\NMBIB@authors@cite@suffix

\NMBIB@alias@cite@suffix

```
\@for\@tempa:=\NMBIB@types\do{%
  \expandafter\edef\csname NMBIB@\@tempa
  @cite@suffix\endcsname{\@tempa}}
\def\NMBIB@alias@cite@suffix{authors}
```

\nmbibRedirectLinks The macro \nmbibRedirectLinks{⟨*from*⟩}{⟨*to*⟩} redefines the suffix:

```
\def\nmbibRedirectLinks#1#2{%
  \expandafter\edef\csname NMBIB@#1@cite@suffix\endcsname{#2}}
```

3.4 Citation commands

\NAT@set@cites The command \NAT@set@cites is used by natbib to set up citation styles. It is added to the begindocument hook, so we need to disable it here:

```
\def\NAT@set@cites{}
\let\@cite\NAT@cite
\let\@citex\NAT@citex
\let\@biblabel\NAT@biblabel
\let\@bibsetup\NAT@bibsetup
\let\NAT@space\NAT@spacechar
\let\NAT@penalty\@empty
\renewcommand\NAT@idxtxt{\NAT@name\NAT@spacechar\NAT@open\NAT@date\NAT@close}
\def\natexlab#1{#1}
```

\ifNMBIB@printyearsuffix Whether to print the year suffix

```
\newif\ifNMBIB@printyearsuffix
\NMBIB@printyearsuffixtrue
```

\nmbibYearSuffixOn Switching on the suffixes

```
\def\nmbibYearSuffixOn{\NMBIB@printyearsuffixtrue}
```

\nmbibYearSuffixOff Switching off the suffixes

```
\def\nmbibYearSuffixOff{\NMBIB@printyearsuffixfalse}
```

\NAT@sort@cites The command \NAT@sort@cites sorts the citations and writes them to the aux file. We want to write them to another file instead.

```
\renewcommand\NAT@sort@cites[1]{%
  \let\NAT@cite@list\@empty
  \@for\@citeb:=#1\do{\expandafter\NAT@star@cite\@citeb\@@}%
  \if@filesw
    \@for\@tempa:=\NMBIB@types\do{%
      \expandafter\immediate\expandafter\write\expandafter
      \csname NMBIB@\@tempa @aux\endcsname
      \expandafter{\expandafter\string\expandafter\citation\expandafter{\NAT@cite@list}}}%
  \fi
  \@ifnum{\NAT@sort>\z@}{%
    \expandafter\NAT@sort@cites@\expandafter{\NAT@cite@list}%
  }{}%
}%
```

\nmbibcitenumber This command is written to the main aux file and contains the number of the citation (since different lists may produce different numbers). We store the number in the macro \nmbib@num@KEY\@extra@binfo. We also use natbib warnings about multiple citations.

```
\def\nmbibcitenumber#1#2{%
  \@ifundefined{nmbib@num@#1\@extra@binfo}{\relax}{%
    \NAT@citemultiple
    \PackageWarningNoLine{natbib}{Citation `#1' multiply defined}%
  }%
  \global\@namedef{nmbib@num@#1\@extra@binfo}{#2}}
\AtEndDocument{\let\nmbibcitenumber\NMBIB@testnum}
```

\NMBIB@testnum Testing whether citation number have been changed.

```
\newcommand\NMBIB@testnum[2]{%
  \def\NAT@temp{#2}%
  \expandafter \ifx \csname nmbib@num@#1\@extra@binfo\endcsname\NAT@temp
  \else
    \ifNAT@swa \NAT@swafalse
      \PackageWarningNoLine{natbib}{%
        Citation(s) may have changed.\MessageBreak
        Rerun to get citations correct%
      }%
    \fi
  \fi
}%
```

`\NAT@parse` The `natbib` command `\NAT@parse` parses the `\bibcite` arguments and stores them in the corresponding macros. However, the citation number may be wrong since it might be taken from a wrong list. Therefore we use the number from `\nmbibcitenumber` instead.

```
\let\NAT@parse@orig=\NAT@parse\relax
\renewcommand\NAT@parse[1]{\NAT@parse@orig{#1}%
  \@ifundefined{nmbib@num@#1\@extra@binfo}{\def\NAT@num{0}}{%
    \edef\NAT@num{\csname nmbib@num@#1\@extra@binfo\endcsname}}}
```

`\nmbibLink` The command `\nmbibLink{`⟨*key*⟩`}{`⟨*type*⟩`}{`⟨*text*⟩`}` is like `\NAT@hyper@`, but on the user level:

```
\def\nmbibLink#1#2#3{%
  \hyper@natlinkstart{#1\@extra@b@citeb-\csname
    NMBIB@#2@cite@suffix\endcsname}#3\hyper@natlinkend}
```

`\NAT@citexnum` We use `\NAT@citexnum` to cite numbers:

```
\def\NAT@citexnum[#1][#2]#3{%
  \NAT@reset@parser
  \NAT@sort@cites{#3}%
  \NAT@reset@citea
  \@cite{\def\NAT@num{-1}\let\NAT@last@yr\relax\let\NAT@nm\@empty
    \@for\@citeb:=\NAT@cite@list\do
    {\@safe@activestrue
     \edef\@citeb{\expandafter\@firstofone\@citeb\@empty}%
     \@safe@activesfalse
     \@ifundefined{b@\@citeb\@extra@b@citeb}{%
       {\reset@font\bfseries?}
        \NAT@citeundefined\PackageWarning{natbib}%
       {Citation `\@citeb' on page \thepage \space undefined}}%
     {\let\NAT@last@num\NAT@num\let\NAT@last@nm\NAT@nm
      \NAT@parse{\@citeb}%
      \ifNAT@longnames\@ifundefined{bv@\@citeb\@extra@b@citeb}{%
        \let\NAT@name=\NAT@all@names
        \global\@namedef{bv@\@citeb\@extra@b@citeb}{}}{}%
      \fi
      \ifNAT@full\let\NAT@nm\NAT@all@names\else
        \let\NAT@nm\NAT@name\fi
      \ifNAT@swa
       \@ifnum{\NAT@ctype>\@ne}{%
        \@citea
        \NMBIB@hyper@{alias}{\@ifnum{\NAT@ctype=\tw@}{\NAT@test{\NAT@ctype}}{\NAT@alias}}%
       }{%
        \@ifnum{\NAT@cmprs>\z@}{%
         \NAT@ifcat@num\NAT@num
          {\let\NAT@nm=\NAT@num}%
          {\def\NAT@nm{-2}}%
         \NAT@ifcat@num\NAT@last@num
          {\@tempcnta=\NAT@last@num\relax}%
          {\@tempcnta\m@ne}%
         \@ifnum{\NAT@nm=\@tempcnta}{%
          \@ifnum{\NAT@merge>\@ne}{}{\NAT@last@yr@mbox}%
         }{%
           \advance\@tempcnta by\@ne
```

```
            \@ifnum{\NAT@nm=\@tempcnta}{%
              \ifx\NAT@last@yr\relax
                \def@NAT@last@yr{\@citea}%
              \else
                \def@NAT@last@yr{--\NAT@penalty}%
              \fi
            }{%
              \NAT@last@yr@mbox
            }%
          }%
        }{%
         \@tempswatrue
         \@ifnum{\NAT@merge>\@ne}{\@ifnum{\NAT@last@num=\NAT@num\relax}{\@tempswafalse}{}}{}%
         \if@tempswa\NAT@citea@mbox\fi
        }%
       }%
       \NAT@def@citea
      \else
        \ifcase\NAT@ctype
          \ifx\NAT@last@nm\NAT@nm \NAT@yrsep\NAT@penalty\NAT@space\else
            \@citea \NAT@test{\@ne}\NAT@spacechar\NAT@mbox{\NAT@super@kern\NAT@@open}%
          \fi
          \if*#1*\else#1\NAT@spacechar\fi
          \NAT@mbox{\NMBIB@hyper@{sequence}{{\citenumfont{\NAT@num}}}}%
          \NAT@def@citea@box
        \or
          \NMBIB@hyper@citea@space{sequence}{\NAT@test{\NAT@ctype}}%
        \or
          \NAT@hyper@citea@space{sequence}{\NAT@test{\NAT@ctype}}%
        \or
          \NAT@hyper@citea@space{alias}{\NAT@alias}%
        \fi
      \fi
     }%
    }%
      \@ifnum{\NAT@cmprs>\z@}{\NAT@last@yr}{}%
      \ifNAT@swa\else
        \@ifnum{\NAT@ctype=\z@}{%
          \if*#2*\else\NAT@cmt#2\fi
        }{}%
        \NAT@mbox{\NAT@@close}%
      \fi
  }{#1}{#2}%
}%
```

`\NMBIB@hyper@` This is the replacement for `\NAT@hyper@`

```
\def\NMBIB@hyper@#1#2{%
 \nmbibLink{\@citeb}{#1}{#2}}
```

`\NMBIB@hyper@citea` This is the replacement for `\NAT@hyper@citea`:

```
\def\NMBIB@hyper@citea#1#2{%
 \@citea
 \NMBIB@hyper@{#1}{#2}%
 \NAT@def@citea
```

```
}%
```

`\NMBIB@hyper@citea@space` The replacement for `\NAT@hyper@citea@space`

```
\def\NMBIB@hyper@citea@space#1#2{%
 \@citea
 \NMBIB@hyper@{#1}{#2}%
 \NAT@def@citea@space
}%
```

`\def@NAT@last@yr` Another `natbib` macro to redefine

```
\def\def@NAT@last@yr#1{%
 \protected@edef\NAT@last@yr{%
  #1%
  \noexpand\mbox{%
   \noexpand\hyper@natlinkstart{\@citeb\@extra@b@citeb-\NMBIB@sequence@cite@suffix}%
   {\noexpand\citenumfont{\NAT@num}}%
   \noexpand\hyper@natlinkend
  }%
 }%
}%
```

`\NAT@citea@mbox` This is used in numerical citations

```
\def\NAT@citea@mbox{%
 \@citea\mbox{\NMBIB@hyper@{sequence}{{\citenumfont{\NAT@num}}}}%
}%
```

`\NMBIB@citex` And now the heart of `natbib`...

```
\def\NMBIB@citex%
  [#1][#2]#3{%
  \NAT@reset@parser
  \NAT@sort@cites{#3}%
  \NAT@reset@citea
  \@cite{\let\NAT@nm\@empty\let\NAT@year\@empty
    \@for\@citeb:=\NAT@cite@list\do
    {\@safe@activestrue
     \edef\@citeb{\expandafter\@firstofone\@citeb\@empty}%
     \@safe@activesfalse
     \@ifundefined{b@\@citeb\@extra@b@citeb}{\@citea%
       {\reset@font\bfseries ?}\NAT@citeundefined
                  \PackageWarning{natbib}%
       {Citation `\@citeb' on page \thepage \space undefined}\def\NAT@date{}}%
     {\let\NAT@last@nm=\NAT@nm\let\NAT@last@yr=\NAT@year
      \NAT@parse{\@citeb}%
      \ifNAT@longnames\@ifundefined{bv@\@citeb\@extra@b@citeb}{%
        \let\NAT@name=\NAT@all@names
        \global\@namedef{bv@\@citeb\@extra@b@citeb}{}}{}%
      \fi
     \ifNAT@full\let\NAT@nm\NAT@all@names\else
       \let\NAT@nm\NAT@name\fi
     \ifNAT@swa\ifcase\NAT@ctype
       \if\relax\NAT@date\relax
         \@citea\NMBIB@hyper@{authors}{\NAT@nmfmt{\NAT@nm}}%
         \NMBIB@hyper@{timeline}{\NAT@date}%
       \else
```

```
        \ifx\NAT@last@nm\NAT@nm\NAT@yrsep
           \ifx\NAT@last@yr\NAT@year
             \def\NAT@temp{{?}}%
             \ifx\NAT@temp\NAT@exlab\PackageWarningNoLine{natbib}%
              {Multiple citation on page \thepage: same authors and
              year\MessageBreak without distinguishing extra
              letter,\MessageBreak appears as question mark}\fi
             \NMBIB@hyper@{timeline}{\NAT@exlab}%
           \else\unskip\NAT@spacechar
             \NMBIB@hyper@{timeline}{\NAT@date}%
           \fi
        \else
          \@citea\NMBIB@hyper@{authors}{%
            \NAT@nmfmt{\NAT@nm}%
            \hyper@natlinkbreak{%
              \NAT@aysep\NAT@spacechar}{\@citeb\@extra@b@citeb
            }}%
            \NMBIB@hyper@{timeline}{\NAT@date
          }%
        \fi
      \fi
    \or\@citea\NMBIB@hyper@{authors}{\NAT@nmfmt{\NAT@nm}}%
    \or\@citea\NMBIB@hyper@{timeline}{\NAT@date}%
    \or\@citea\NMBIB@hyper@{alias}{\NAT@alias}%
    \fi \NAT@def@citea
    \else
      \ifcase\NAT@ctype
       \if\relax\NAT@date\relax
         \@citea\NMBIB@hyper@{authors}{\NAT@nmfmt{\NAT@nm}}%
       \else
        \ifx\NAT@last@nm\NAT@nm\NAT@yrsep
           \ifx\NAT@last@yr\NAT@year
             \def\NAT@temp{{?}}%
             \ifx\NAT@temp\NAT@exlab\PackageWarningNoLine{natbib}%
              {Multiple citation on page \thepage: same authors and
              year\MessageBreak without distinguishing extra
              letter,\MessageBreak appears as question mark}\fi
             \NMBIB@hyper@{timeline}{\NAT@exlab}%
           \else
             \unskip\NAT@spacechar
             \NMBIB@hyper@{timeline}{\NAT@date}%
           \fi
        \else
          \@citea\NMBIB@hyper@{authors}{%
            \NAT@nmfmt{\NAT@nm}%
            \hyper@natlinkbreak{\NAT@spacechar\NAT@@open\if*#1*\else#1\NAT@spacechar\fi}%
              {\@citeb\@extra@b@citeb}}%
            \NMBIB@hyper@{timeline}{\NAT@date
          }%
        \fi
       \fi
      \or\@citea\NMBIB@hyper@{authors}{\NAT@nmfmt{\NAT@nm}}%
      \or\@citea\NMBIB@hyper@{timeline}{\NAT@date}%
      \or\@citea\NMBIB@hyper@{alias}{\NAT@alias}%
```

```
        \fi
        \if\relax\NAT@date\relax
          \NAT@def@citea
        \else
          \NAT@def@citea@close
        \fi
      \fi
      }}\ifNAT@swa\else\if*#2*\else\NAT@cmt#2\fi
      \if\relax\NAT@date\relax\else\NAT@@close\fi\fi}{#1}{#2}}
\let\@citex\NMBIB@citex
```

`\citealn` Alternative numerical citation command:

```
\newcommand\citealn[1]{[\citenum{#1}]}
```

`\nmbibSetCiteall` Setting the format of `\citeall`

```
\def\nmbibSetCiteall#1{\def\NMBIB@citeallformat{#1}}
\nmbibSetCiteall{\nmbibLink{\nmbibKEY}{authors}{\nmbibNAME} %
  (\nmbibLink{\nmbibKEY}{timeline}{\nmbibDATE}) %
  [\nmbibLink{\nmbibKEY}{sequence}{\nmbibNUM}]}
```

`\citeall` The full cite command

```
\DeclareRobustCommand\citeall
{\begingroup\@ifnextchar*{\NAT@fulltrue\@citeall}{\NAT@fullfalse\@citeall*}}
\def\@citeall#1{\@ifnextchar[{\@@citeall}{\@@citeall[]}}
\def\@@citeall[#1]{\@ifnextchar[{\@@@citeall[#1]}{\@@@citeall[][#1]}}
\def\@@@citeall[#1][#2]#3{%
  \NAT@reset@parser
  \NAT@sort@cites{#3}%
  \NAT@reset@citea
  \@cite{%
    \@for\@citeb:=\NAT@cite@list\do
    {\@safe@activestrue
     \edef\@citeb{\expandafter\@firstofone\@citeb\@empty}%
     \@safe@activesfalse
     \@ifundefined{b@\@citeb\@extra@b@citeb}{\@citea%
       {\reset@font\bfseries ?}\NAT@citeundefined
                  \PackageWarning{natbib}%
       {Citation `\@citeb' on page \thepage \space undefined}\def\NAT@date{}}%
     {\NAT@parse{\@citeb}%
       \ifNAT@full\let\NAT@nm\NAT@all@names\else
         \let\NAT@nm\NAT@name\fi
       \edef\nmbibKEY{\@citeb}%
       \edef\nmbibDATE{\NAT@date}%
       \edef\nmbibNAME{\NAT@nm}%
       \edef\nmbibNUM{\NAT@num}%
       \@citea\NMBIB@citeallformat
       \def\@citea{; }%
     }}\if*#2*\else\NAT@cmt#2\fi}{#1}{#2}}
```

3.5 Processing bibliography

`\timelinerefname` Reference list for chrono ordering

```
\providecommand{\timelinerefname}{Chronological List of References}
```

\timelinebibname Reference list for chrono ordering

```
\providecommand{\timelinebibname}{Chronological Bibliography}
```

\sequencerefname Reference list for sequential ordering

```
\providecommand{\sequencerefname}{Sequential List of References}
```

\sequencebibname Reference list for sequential ordering

```
\providecommand{\sequencebibname}{Sequential Bibliography}
```

\authorsrefname Reference list for alph ordering

```
\providecommand{\authorsrefname}{Alphabetic List of References}
```

\authorsbibname Reference list for alph ordering

```
\providecommand{\authorsbibname}{Alphabetic Bibliography}
```

\ifNMBIB@writenumber The switch whether to write the citation number to the aux file. Should be true for sequence, false otherwise.

```
\newif\ifNMBIB@writenumber
\NMBIB@writenumberfalse
```

\NMBIB@setup@authors Set up alphabetical-style reference list

```
\def\NMBIB@setup@authors{%
  \NMBIB@writenumberfalse}
```

\NMBIB@setup@timeline Timeline reference list looks like alhpabetical

```
\let\NMBIB@setup@timeline\NMBIB@setup@authors
```

\NMBIB@setup@sequence Sequential citations are numerical

```
\def\NMBIB@setup@sequence{%
  \NMBIB@writenumbertrue}
```

\printbibliography The actual printing of the bibliography of the given type. Note that we need to reset \natexlab afterwards—just in case it is used outside the bibliography.

```
\def\printbibliography#1{%
  \def\NMBIB@current@type{#1}%
  \def\@biblabel{\csname NMBIB@#1@biblabel\endcsname}
  \edef\NMBIB@current@cite@suffix{\csname NMBIB@#1@cite@suffix\endcsname}%
  \csname NMBIB@setup@#1\endcsname
  \ifx\NMBIB@current@type\NMBIB@bibcite@type
    \def\natexlab@real##1{##1}%
  \else
    \def\natexlab@real##1{\NAT@exlab}%
  \fi
  \edef\refname{\csname #1refname\endcsname}%
  \edef\bibname{\csname #1bibname\endcsname}%
  \@input@{\csname NMBIB@#1@filename\endcsname.bbl}%
  \def\natexlab##1{##1}}
```

\bibitem Normally \bibitem is defined as \@lbibitem. We want first to calculate the biblabel

```
\def\bibitem{\@ifnextchar[{\@@lbibitem}{\@@lbibitem[]}}%
```

\@@lbibitem The macro \@@lbibitem calculates \NAT@exlab and calls \@lbibitem:

```
\def\@@lbibitem[#1]#2{%
  \let\natexlab\natexlab@real
  \NAT@parse{#2}%
  \def\nmbibKEY{#2}%
  \edef\nmbibDATE{\NAT@date}%
  \edef\nmbibNAME{\NAT@name}%
  \edef\nmbibNUM{\NAT@num}%
  \@lbibitem[#1]{#2}%
  \ifNMBIB@printyearsuffix\else\def\natexlab##1{}\fi}
```

\NAT@exlab Before the package is loaded, \NAT@exlab should not give an error:

```
\providecommand\NAT@exlab{}
```

\NAT@wrout The original \NAT@wrout writes to aux file the information from the bbl file. Here we check whether we need to do this and whether to write the number:

```
\renewcommand\NAT@wrout[5]{%
\if@filesw
  \ifx\NMBIB@current@type\NMBIB@bibcite@type
      {\let\protect\noexpand\let~\relax
       \immediate
       \write\@auxout{\string\bibcite{#5}{{#1}{#2}{{#3}}{{#4}}}}}\fi
  \ifNMBIB@writenumber
      {\let\protect\noexpand\let~\relax
       \immediate
       \write\@auxout{\string\nmbibcitenumber{#5}{#1}}}\fi
\fi
\ignorespaces}
```

\NAT@anchor The command \NAT@anchor{⟨*KEY*⟩}{⟨*text*⟩} creates a hyperlink if the package hyperref is loaded. Here we redefine it to create cites in the style KEY-TYPE:

```
\def\NAT@anchor#1#2{%
 \hyper@natanchorstart{#1\@extra@b@citeb-\NMBIB@current@cite@suffix}%
  \def\@tempa{#2}\@ifx{\@tempa\@empty}{}{\@biblabel{#2}}%
 \hyper@natanchorend
}%
```

\nmbibSetBiblabel Setting biblabel for the list

```
\def\nmbibSetBiblabel#1#2{%
  \expandafter\def\csname NMBIB@#1@biblabel\endcsname##1{#2}}
```

\NMBIB@timeline@biblabel The default labels
\NMBIB@sequence@biblabel
\NMBIB@authors@biblabel

```
\nmbibSetBiblabel{timeline}{[\nmbibDATE:
  \nmbibLink{\nmbibKEY}{authors}{\nmbibNAME};
  \nmbibLink{\nmbibKEY}{sequence}{\nmbibNUM}]}
\nmbibSetBiblabel{authors}{[\nmbibNAME\
  (\nmbibLink{\nmbibKEY}{timeline}{\nmbibDATE});
  \nmbibLink{\nmbibKEY}{sequence}{\nmbibNUM}]}
\nmbibSetBiblabel{sequence}{[\nmbibNUM:
  \nmbibLink{\nmbibKEY}{authors}{\nmbibNAME}
  (\nmbibLink{\nmbibKEY}{timeline}{\nmbibDATE})]}
```

3.6 Ending the Style

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Sequential List of References

[1: Cohen et al. (2013a)] Michael Cohen, Yannis Haralambous, and Boris Veytsman. *The Multibiliography package*, March 2013. http://www.ctan.org/pkg/multibibliography.

[2: Cohen et al. (2013b)] Michael Cohen, Yannis Haralambous, and Boris Veytsman. The multibibliography package. *TUGboat*, 34(3):340–343, 2013. https://www.tug.org/members/TUGboat/tb34-3/tb108cohen.pdf.

[3: Daly (2009)] Patrick W. Daly. *Natural Sciences Citations and References (Author-Year and Numerical Schemes)*, February 2009. http://mirrors.ctan.org/macros/latex/contrib/natbib.

[4: Rahtz and Oberdiek (2012)] Sebastian Rahtz and Heiko Oberdiek. *Hypertext Marks in LaTeX: a Manual for Hyperref*, November 2012. http://mirrors.ctan.org/macros/latex/contrib/hyperref.

Alphabetic List of References

[Cohen et al. (2013a); 1] Michael Cohen, Yannis Haralambous, and Boris Veytsman. *The Multibiliography package*, March 2013. http://www.ctan.org/pkg/multibibliography.

[Cohen et al. (2013b); 2] Michael Cohen, Yannis Haralambous, and Boris Veytsman. The multibibliography package. *TUGboat*, 34(3):340–343, 2013. https://www.tug.org/members/TUGboat/tb34-3/tb108cohen.pdf.

[Daly (2009); 3] Patrick W. Daly. *Natural Sciences Citations and References (Author-Year and Numerical Schemes)*, February 2009. http://mirrors.ctan.org/macros/latex/contrib/natbib.

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[2009: Daly; 3] Patrick W. Daly. *Natural Sciences Citations and References (Author-Year and Numerical Schemes)*, February 2009. http://mirrors.ctan.org/macros/latex/contrib/natbib.

[2012: Rahtz and Oberdiek; 4] Sebastian Rahtz and Heiko Oberdiek. *Hypertext Marks in LaTeX: a Manual for Hyperref*, November 2012. http://mirrors.ctan.org/macros/latex/contrib/hyperref.

[2013b: Cohen et al.; 2] Michael Cohen, Yannis Haralambous, and Boris Veytsman. The multibibliography package. *TUGboat*, 34(3):340–343, 2013. https://www.tug.org/members/TUGboat/tb34-3/tb108cohen.pdf.

[2013a: Cohen et al.; 1] Michael Cohen, Yannis Haralambous, and Boris Veytsman. *The Multibiliography package*, March 2013. http://www.ctan.org/pkg/multibibliography.

Change History

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