

# Database Reviews and Reports

## MathSciNet: Mathematical Reviews on the Web, a Review

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MathSciNet is one of a couple of databases (Zentralblatt für Mathematik und Ihre Grenzgebiete is the other one that comes to mind) whose focus is mathematical literature. MathSciNet consists of Mathematical Reviews and Current Mathematical Publications, which are products of the American Mathematical Society. However, the heart of MathSciNet is Mathematical Reviews. Mathematical Reviews first came on the scene in 1940 as the reviewing service for mathematics. That is, mathematicians provide signed reviews of math articles, conference proceedings, and books of mathematics research. Reviews are typically a few paragraphs long. These reviews are then organized and published as a collection. Also included are "Featured Reviews". These are commissioned reviews of books or articles that are considered especially important in their field. Although, initially, begun simply as a source of reviews of mathematical literature, but because of its extensive coverage, it also became a bibliographic tool of the discipline.

The other component of MathSciNet is Current Mathematical Publications. It is a subject index of bibliographic data for recent and forthcoming publications.

Facts and Figures:

- 38,632 items so far added in 2001;
- 1,799 journals covered;
- links to 161,150 original articles;
- 10,843 active reviewers;
- 360,731 authors indexed

## Search Features

MathSciNet provides excellent content with extremely useful search features. The toolbar offers several search and browse options. These include:

### Full Search

The MathSciNet Full Search allows you to construct searches using combinations of criteria, including Author/Related, Author, Title, Review Text, Journal, Institution Code, Series, Primary/Secondary Mathematics Subject Classification, Mathematical Review Number, Reviewer, Publication Year, or Anywhere. The field Author/Related searches for the authors of the original article plus editors, translators, etc. whereas the field Author searches for authors of the original article only. The default Author/Related feature will be confusing to users and is possible that some users type a subject or keyword term without realizing that they are in an Author/related field.

The use of the term 'Anywhere' for keyword searching does not appear to be user friendly. Although one can search by the Mathematics Subject Classification code (MSC), for new users, this can be intimidating. A Subject term search without understanding the classification system can be difficult.

Boolean searches (OR, AND, NOT) are easy to construct to find relevant articles. A Wildcard character (\*) can also be used while constructing search terms. Adjacency is assumed for multiple terms in a search field. Options to limit your searches by CMP (Current Mathematical Publications), MR (Mathematical Reviews) through 2001, by publication year and by document type (journals, books or proceedings) are also available. Search results are displayed as a list of bibliographic citations. Full Reviews can be selected from the citations retrieved.

The HELP function is very useful and easy to understand, however, for new users of the database, full names for abbreviations such as MR and CMP are difficult to find. Even in their 'HELP' page they are not mentioned in full. [Toolbar#](#) page explains these terms and other search options available.

## Basic Search

The MathSciNet Basic Search is a simplified version of the full search screen. Search fields available in the Pull down menu include Author/Related, Author, Title, Review Text, Journal, Institution Code, Series, Primary/Secondary Mathematics Subject Classification, MR Number, Reviewer, or Anywhere. As in the Full Search, the field Author/Related searches for the authors of the original article plus editors, translators, etc. whereas the field Author searches for authors of the original article only. The results are displayed the same as in Full search. Full Reviews can be selected from the citations retrieved. Boolean operators and wildcard characters can be used to obtain more relevant articles.

## Examples of Searches

Searching for robotic\* and Mechatronics in full search mode using the wild card \*, and Boolean operators results in six citations. Five are displayed below.

Matches for: Anywhere=robotic\* and Mechatronics - Microsoft Internet Explorer

Address: [LF&s6=robotic\\*+and+Mechatronics&arg1=1940&arg2=2005&tyop=eq&arg3=&dr=all&pg2=ET&s2=All&op2=OR&co2=AND&l=20&ln=130&r=1](#)

Display Multiple Reviews

Select format:  Retrieve Marked Retrieve All Unmark All

[1] 1 807:311 [Oaru, Cristian](#); [Yerga, Andras](#) Computation of general inner-outer and spectral factorizations. [IEEE Trans. Automat. Control](#) **45** (2000), no. 12, 2307--2325. [93B25 \(93B60\)](#)  
[Review in linked PDF](#) | [Add citation to clipboard](#) | [Doc. Deliv](#)

[2] 2001e:70023 [Mosterman, Pieter J.](#); [Biswas, Gautam](#) A comprehensive methodology for building hybrid models of physical systems. [Artificial Intelligence](#) **121** (2000), no. 1-2, 171--209. [70F99 \(68Q45 68T99 70F35 93A30\)](#)  
[Review in linked PDF](#) | [Add citation to clipboard](#) | [Doc. Deliv](#) | [Article](#)

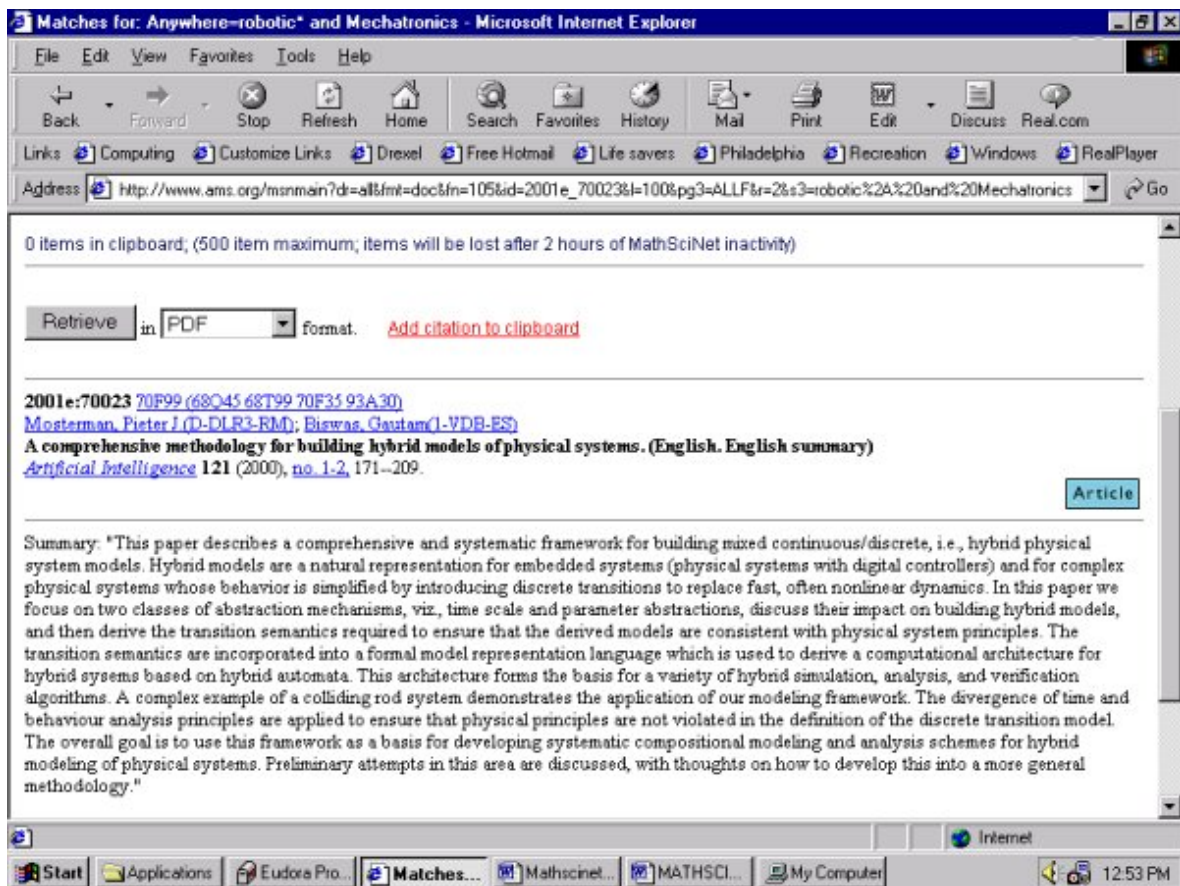
[3] 2000m:93104 [Julier, Simon](#); [Uhlmann, Jeffrey](#); [Durant-Whyte, Hugh E.](#) A new method for the nonlinear transformation of means and covariances in filters and estimators. [IEEE Trans. Automat. Control](#) **45** (2000), no. 3, 477--482. [93E11](#)  
[Review in linked PDF](#) | [Add citation to clipboard](#) | [Doc. Deliv](#)

[4] 2000g:93017 [Ha, O. P.](#); [Rye, D. C.](#); [Durant-Whyte, H. F.](#) Robust sliding mode control with application. [Internat. J. Control](#) **72** (1999), no. 12, 1087--1096. (Reviewer: Keigo Watanabe) [93B12 \(93C42 93D09\)](#)  
[Review in linked PDF](#) | [Add citation to clipboard](#) | [Doc. Deliv](#) | [Journal](#)

[5] 98k:70001 [Schiehle, W.](#) Multibody system dynamics: roots and perspectives. [Multibody Syst. Dyn.](#) **1** (1997), no. 2, 149--188. [70B15 \(34A09 70-08 70E15\)](#)  
[Review in linked PDF](#) | [Add citation to clipboard](#) | [Doc. Deliv](#) | [Journal](#)

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Clicking on the MR number for citation 2 above, results in the review. The review can also be viewed in PDF format.



The full text of the original article is retrieved by clicking on the [Article](#) icon. It clearly illustrates how a full text article from ScienceDirect is retrieved by searching in MathSciNet.

**Volume 121, Issues 1-2**  
**August 2000**  
 Pages 171-209

**Abstract**  
[Abstract + References](#)  
[Journal Format-PDF \(689 K\)](#)  
[Cited By](#) | [Save as Citation Alert](#)  
[Export Citation](#)

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**A comprehensive methodology for building hybrid models of physical systems**

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## Additional Services

## Searching Combined Membership List

The Combined Membership List (CML) is a directory of current addresses (postal and e-mail, as supplied) of members of the American Mathematical Society (AMS), Mathematical Association of America (MAA), Society of Industrial and Applied Mathematics (SIAM), and the American Mathematical Association of Two-Year Colleges (AMATYC). This is to allow searchers to quickly identify current address information.

## Mathematics Subject Classification

The Mathematics Subject Classification code (MSC) is a unique system used to categorize items covered by Mathematical Reviews and Current Mathematical Publications. The user can link to an html version of the MSC that allows keyword searching to find the relevant code. The Mathematics Subject Classification Code consists of five characters signifying major and minor divisions of the subject classification system used by Mathematical Reviews (MR) and Current Mathematical Publications (CMP). For example, for citation 2 in the above search example, Primary MSC is 70F99.

This can be interpreted as

### Primary Classification

- 70** Mechanics of particles and systems
- 70F** Dynamics of a system of particles, including celestial mechanics
- 70F99** None of the above, but in this section

### Secondary Classification Example

- 68** Computer science
- 68Q** Theory of computing
- 68Q45** Formal languages and automata

For more information on MSC, See [MSC Primary/Secondary System](#).

## Other Services



In addition to the above services, other searching options include author database, journal database, and Mathematical Subject Classification scheme. The user can also browse using current books and current journals. The author database is an extremely useful tool since it helps to identify different versions of author names. The journals database covers all journals indexed by Mathematical Reviews and Current Mathematical Publications since 1985. The user can search the journals database by entering a journal name or abbreviation, or the ISSN.


The user needs to be cautious while searching for conference proceedings, since some of them are treated like a book or monograph, with the table of contents in the review field. Therefore, it is recommended that the author or title of a conference paper be searched in the Keyword field.

The new Clipboard feature now allows users to collect citations from multiple searches onto one file for download or display in ASCII or BibTeX format. The citations can be downloaded in BibTeX format. The use of the Clipboard feature requires the use of cookies.

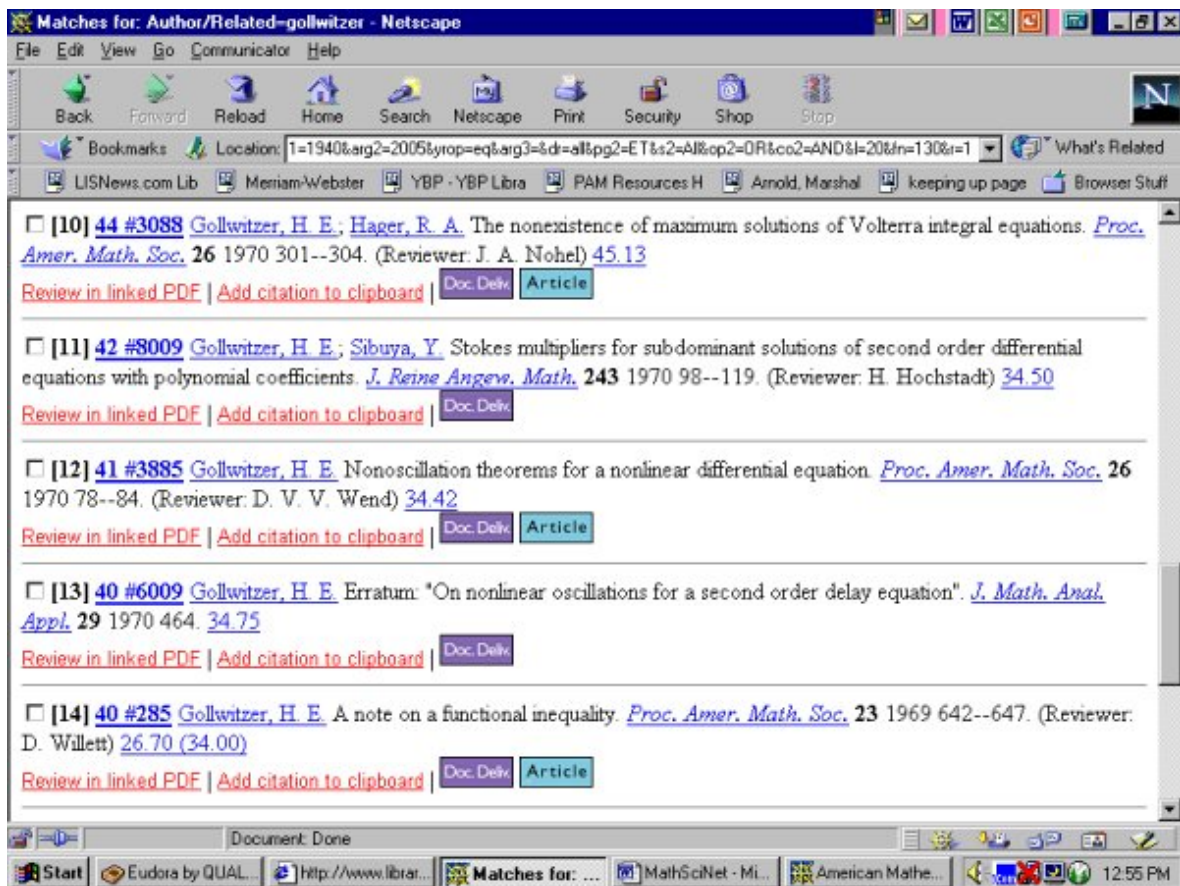
## Linking to Articles

Although, MathSciNet provides the full text of its reviews, it does not contain the full text of the articles under review. They do provide active links from reviews to the full text of more than 161,000 online articles, with new links added daily. The links take you directly to the online article, which may be at the publisher's or journal's Web site or at the Web site of a service such as [JSTOR](#). Access to full articles may be dependent on having a subscription to that journal or service.

From search results each review has two options to view the review in HTML or as a PDF image, followed by icons for retrieving the original article. The icon  designates an active link to the article. Where links to articles are not available, there is often a link to the home page of the online journal, designated by . As a

default for all articles, the icon  will link to a request form for document delivery from NRC's Canada Institute for Scientific and Technical Information (CISTI). Registration with CISTI is required.

In any record, authors of original articles may be linked. The number, for example, 45.13 that follows each record, is the Mathematical Reviews primary subject classification code applied to the content of the article. An example below shows a typical search result:



## Access Restrictions

The subscription to MathSciNet is subject to a License Agreement allowing its online access to the authorized users, for example, to faculty, students and staff for an academic library subscribing to MathSciNet. Remote access to authorized users is available by setting up a proxy. The authentication for the Institutional subscribers is achieved by IP filtering.

## Conclusions

MathSciNet is a unique database of a scholarly nature of more utility to faculty and graduate students than to undergraduate students. It has an excellent coverage of current mathematics literature providing signed reviews of math articles, conference proceedings and books of mathematics research. It is a database which is useful not only to mathematicians but to science and engineering faculty also. The search example given above clearly illustrates this fact. We recommend that more efforts should be directed towards promoting MathSciNet to science and engineering oriented disciplines so that faculty and students start benefiting from it.

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