

## Everything in Its Right Place: Part II

### An Expert Guide to Searching with MathSciNet

*Edward Dunne*

This column is a continuation of the guide to searching with MathSciNet in last month's *Notices*. That article discussed some generalities, then focused on publication searches, including working with the results of publication searches. The two topics I discuss below are **Author Searches** and **Journal Searches**. Author searches lead to **Author Profile Pages**, while journal searches lead to **Journal Profile Pages**. The author profile pages have evolved over the years. The journal profile pages went through a major overhaul this year, so there is more to say about them.

#### Author Search

The second most common type of search in MathSciNet is an **Author Search**. Like many of the sciences, we often identify results with people.<sup>1</sup> Consequently, we often search for authors.

As of this writing, we have 954,984 authors in the database. We add more than 50,000 new author profiles each

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*Edward Dunne is the executive editor of Mathematical Reviews at the American Mathematical Society. His email address is [egd@ams.org](mailto:egd@ams.org).*

<sup>1</sup>Of course, we often get it wrong. In mathematics this is known as *Arnold's Principle*. But, following *Berry's Corollary*, it is also known as *Stigler's law of eponymy*. See [https://en.wikipedia.org/wiki/Stigler%27s\\_law\\_of\\_eponymy](https://en.wikipedia.org/wiki/Stigler%27s_law_of_eponymy).

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year. Our catalogers spend considerable time ensuring that the identification of an author on a paper corresponds to the appropriate author in the database. In 2018 our catalogers processed and verified 317,315 new and existing authors on more than 125,000 publications.

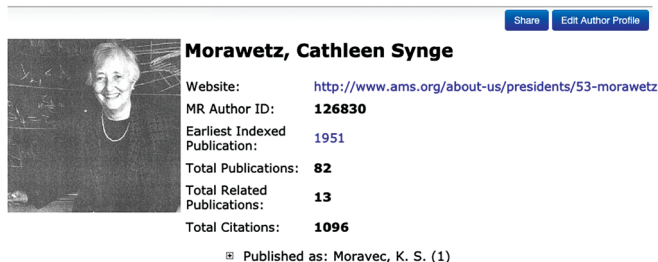
If you are trying to find a particular author, this is usually the best search to use. As you start typing a name, MathSciNet starts suggesting completions based on the names in our database. The suggestions are offered up based on a weighted sum of values, including how close the match is, number of papers by the suggested author, citations to the suggested author, and so on. Clicking on a suggestion will autofill the search box with that suggestion. In many cases, that sends you to a unique answer. However, sometimes you still have a few results to choose from, such as when typing "Wong" and then choosing "Wong K. K." from the suggestions. There are three authors who match that search. Or typing "Stein" and choosing the suggestion "Stein Erwin." There are two authors in the database with that name. Minor misspellings are overlooked in the autosuggest, such as "Ulenbeck" instead of "Uhlenbeck." That is to say, if you start typing "Ulenbeck," we will suggest "Uhlenbeck George E" and "Uhlenbeck Karen Keskulla," as well as "Klembeck Paul F." and others. However, if you type "Ulenbeck," then hit Enter, we will search against "Ulenbeck" with no fudge factors, resulting in no matches.

Often when you run a search on a name you may find yourself with too many results. MathSciNet helps you filter them. For a simple example, search for “Paul Smith.” There are twenty author results for that name, sorted alphabetically. Four are just “Smith Paul.” Others have middle names or middle initials supplied. For each author you can also see other names that the author has published under. For an extreme example, try searching for the name “Zhang.” There are more than 14,000 matches. Notice that many of them are listed as Chang, not Zhang. This is because we keep track of different spellings and transliterations of names that have been used. The author search is over all names under which the person has published a paper.

The matches are sorted by Profile Name by default. You can re-sort the matches by number of publications, number of citations, or reverse chronologically by earliest publication. You can also search within the results. This will add search terms to the author search. So, using this box to search for a topic, such as “Galerkin methods,” is not going to help. Adding an alternative spelling, such as “Chzhan,” or another part of the name, such as “Ming,” can pare down the list significantly.

A sidebar offers top-level subject classes for faceted search. Choosing one of these will restrict the results to authors who have at least one paper in the database that has that class as Primary Class. In the search results for Zhang, filtering for *Partial differential equations* reduces the list from 14,000+ to 1,045. Since many authors have papers in various subject classes, you can iterate the filtering, now selecting, say, *Probability theory and stochastic processes* to reduce the list to 73 authors. Of course, you can change the sorting of results after any of these refinements.

When you find the person you are looking for, you will end up at their **Author Profile Page**. Here is the top of the author profile page for Cathleen Morawetz:



[Share](#) [Edit Author Profile](#)

**Morawetz, Cathleen Syngé**

Website: <http://www.ams.org/about-us/presidents/53-morawetz>  
 MR Author ID: **126830**  
 Earliest Indexed Publication: **1951**  
 Total Publications: **82**  
 Total Related Publications: **13**  
 Total Citations: **1096**

▣ Published as: Moravec, K. S. (1)

The top of the page begins with basic data: Author Name, MR Author ID, date of the earliest publication indexed in MathSciNet, total number of publications by the author in the MRDB, total number of related publications in the database, total number of citations, and a list of other names under which the author has published. Authors can supply certain supplements to the profile page: a photograph, an email address, the URL for a website, and the author's name in its native script, such as Chinese or Cyrillic. The main author name displayed is the name that is most useful for

cataloging purposes. If you make a significant change to your name, it is helpful if you let us know. Changing the Profile Name will help users identify your new papers and will help our catalogers find them too.

Related publications are items where the person's relation to the publication is something other than as an author, for example, editors, translators, and contributors who are not listed as authors. Related publications include items for which the person is the subject of the paper or book, such as when it is a biography, an obituary, a conference in honor of someone, or a Festschrift. Unlike the **Author or Related** search field in a publication search, the Related Publications count does not include items for which the person is an author.

The author profile page also has links to results in MathSciNet and to external sites. The **Publications** link takes you to a list of all items in MathSciNet authored by the person. The list is in the form of the results of a publication search, so the tools for working with such results are available here, as described in the first part of this column. The **Related Publications** link takes you to a list of all related items, as just described. Again, the list is in the form of the results of a publication search. If the person is a reviewer, then there is a **Reviews** link, which takes you to a list of all the items that the person has reviewed. It, too, is in the form of results of a publication search. **Refine Search** sets up a new publication search, but with the author already hard-coded into the search. The **Co-Authors** link takes you to the list of the person's co-authors, in the form of the results of an author search. The **Collaboration Distance** link takes you to a page where you can compute the distance from this author to another author, as measured by the number of co-authored papers. The Erdős number is a special case. Indeed, the Erdős number query is so popular, we have included a button from this page that will set you up for just that. The **Citations** link produces a list of the author's publications, sorted by the number of citations. The top of the page also gives the number of citations and the number of different authors who have cited the person's work. The external links on the author profile page are to the corresponding entries at the Mathematics Genealogy Project and the MacTutor History of Mathematics Archive, when available.

The author profile page also has three *word clouds*. One is of the person's co-authors, scaled by the number of collaborations. Clicking on a name brings you to a list of the papers co-authored with that author, presented in the form of the results of a publication search. There is also a word cloud of mathematics subject areas, scaled by the number of publications the person has in the area. Finally, there is a word cloud of subject areas scaled by number of citations to the person's papers and books in the subjects. Clicking on the name of a subject area brings you to a list of papers in the area (using primary MSCs only).

## Journal Search

The third primary search is a **Journal Search**: a query of our journals database. I will say a little about the searches themselves. But the real news is about the endpoints of such searches: the revamped Journal Profile Pages.<sup>2</sup> First, to state the obvious, journal searches will not match books, conference proceedings in book form, or book collections, nor will they match individual articles. They look for journals as a whole. You can search for the journal name (all or part), the journal abbreviation, or an ISSN. The result of one of these searches is either a journal profile page (if the search result is unique) or a list of journals by abbreviation and title.

We use the information in the database to help you enter the query with autosuggest. The suggestions are based on a weighted sum of how close the suggestion matches what you have typed, the number of citations to the journal, number of papers in the journal, whether the journal is still active, and other criteria. If you start entering “proc...,” the software begins suggesting “Proceedings of the London Mathematical Society,” “Stochastic Processes and their Applications,” and so on. When you select one of the suggestions the software enters it in the search box and executes the search. Thus, for instance, if you choose “Proceedings of the American Mathematical Society” as the completion for “proc...,” the result will be **both** the regular *Proceedings of the American Mathematical Society* and *Proceedings of the American Mathematical Society, Series B*, the Open Access mirror journal. We do not try to autocomplete ISSNs. If, instead, you type out “proceedings,” then hit return, you will receive a list of more than one hundred journals with the word “proceedings” in their titles. The list will include both current and historical journals.

Journal searches lead to journal profile pages. As hinted above, we have significantly updated the content on these pages. The new journal profiles still contain the basic bibliographic information, such as the publisher, the ISSN, and so on. There are still links to the publishers’ websites for the journals. But there is now much more. The Mathematical Reviews Database contains considerable information about the mathematics research literature, which has been used to create these pages.

The journal profile pages consist of several cards, each of which has related information. In what follows, I will use various journals as examples to highlight various features that don’t necessarily show up for every journal.

To start, the basic information is in the **Journal Details** card.

Journal Details		Recent Issues		
<b>Abbreviation</b>	Duke Math. J.	<b>Volume</b>	<b>Issue</b>	<b>Year</b>
<b>Publisher</b>	Duke Univ. Press	168	9	2019 <a href="#">View</a>
<b>Websites</b>	<a href="http://projecteuclid.org">projecteuclid.org</a>	168	8	2019 <a href="#">View</a>
<b>ISSN (Print)</b>	0012-7094	168	7	2019 <a href="#">View</a>
<b>ISSN (Online)</b>	1547-7398	<a href="#">List All Issues</a>		
<b>Frequency</b>	18 issues/vol./yr.	Concise History		
<b>Publications Listed</b>	<a href="#">6,296</a>	<b>Title</b>	<b>Start</b>	<b>End</b>
<b>Reference Lists</b>	Since 1997	Duke Mathematical Journal	1935	-
<b>Publications Cited</b>	4,992 (79.3% of publications)	<a href="#">Journal Title History</a>		
<b>Citations</b>	89,388 from 65,477 publications			
<b>Latest Issue</b>	<a href="#">2019, vol. 168, iss. 9</a>			
<b>Earliest Issue</b>	<a href="#">1935, vol. 1, iss. 1</a>			
<b>Coverage</b>	Cover-to-cover			

The title of the journal is at the top of the page. Some publisher information is at the top of the card, along with one or more links to the publisher’s website for the journal. The number after **Publications Listed** tells how many items (articles) from the journal have been included in the Mathematical Reviews Database and uploaded to MathSciNet. The number is actually a link that will take you to a listing of all 6,296 items, displayed as in the results of a MathSciNet publication search. The number for Publications Cited tells how many of the articles have been cited from the reference lists in MathSciNet. In this case, that number is 4,992, which is 79.3% of all the 6,296 articles we have from the journal in the database. The total number of citations in MathSciNet to *Duke Mathematical Journal* is 89,388. Apparently, some of the items are receiving a lot of multiple citations! These 89,388 citations come from 65,477 items (articles) in the database, as shown in the card. Since this number is smaller than 89,388, the pigeonhole principle tells us that some of these items are citing more than one article in *Duke Mathematical Journal*.

The **Journal Details** card includes information about the **Latest Issue** we have, including a link to the contents of that issue in MathSciNet. It also includes information about the **Earliest Issue** that we have in the database, including a link to the contents of that issue in MathSciNet. The earliest issue is from 1935, which is before *Mathematical Reviews* started. We received bibliographic data for the journal from Duke University Press that allowed us to backfill those years.

The **Recent Issues** card provides a quick way of seeing the contents of the three latest issues. Clicking **List All Issues** will do just that: list all the issues. Clicking on any entry in the list of issues will take you to a listing of the publications in that issue in MathSciNet. Of course, by the time this column is published, the number of Matches (Issues) is likely to have grown from the 546 shown here.

<sup>2</sup>In June 2019, I posted information about the new profile pages to the *Mathematical Reviews / MathSciNet* blog Beyond Reviews. There is a lot of repetition between this column and that post. See <https://blogs.ams.org/beyondreviews/2019/06/10/journal-profile-pages>.



The publishing history of the *Duke Mathematical Journal* is rather straightforward, meaning there isn't much to show in the **Concise History** card.<sup>3</sup> Let's look, instead, at the famous journal Успехи математических наук, known colloquially as Uspekhi, but known for cataloging purposes as *Rossiiskaya Akademiya Nauk. Moskovskoe Matematicheskoe Obshchestvo. Uspekhi Matematicheskikh Nauk*.

Concise History			
Title	Start	End	
Rossiiskaya Akademiya Nauk. Moskovskoe Matematicheskoe Obshchestvo. Uspekhi Matematicheskikh Nauk	1992	-	
Akademiya Nauk SSSR i Moskovskoe Matematicheskoe Obshchestvo. Uspekhi Matematicheskikh Nauk	1982	1991	
Akademiya Nauk SSSR i Moskovskoe Matematicheskoe Obshchestvo. Uspekhi Matematicheskikh Nauk	N/A	N/A	

[Journal Title History](#)

At a minimum, you can see that the title of the journal has changed three times. Around 1991 the title changed from being a publication of the USSR Academy of Sciences to a publication of the Russian Academy of Science. From a cataloging perspective, these are three different journals. We have collected them into a single group. Clicking on **Journal Title History** provides more detail.

1992 to 2019 - Uspekhi Mat. Nauk	
<a href="#">Journal</a>	<a href="#">Related</a>
<b>Title</b>	Rossiiskaya Akademiya Nauk. Moskovskoe Matematicheskoe Obshchestvo. Uspekhi Matematicheskikh Nauk <i>(formerly Akademiya Nauk SSSR i Moskovskoe Matematicheskoe Obshchestvo. Uspekhi Matematicheskikh Nauk)</i>
<b>ISSN</b>	2305-2872
<b>(Online)</b>	<i>(formerly N/A)</i>

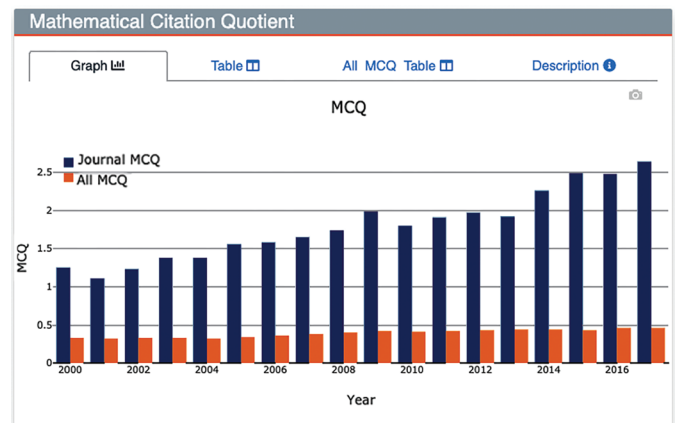
The first card inside the **Journal Title History** page tells you about the most recent version of the journal. The grey and italicized text tells you what is different from the previous version. Besides the title change already mentioned, the journal also picked up an ISSN. The link **Journal** provides more detailed bibliographic information about this version of the journal. **Related** has information about related journals, in this case, about the English translation,

<sup>3</sup>The actual founding of the journal is an interesting story, which you can find on the Duke University Press's website: [https://www.dukeupress.edu/Assets/Downloads/Notes\\_on\\_the\\_Founding\\_of\\_DMJ.pdf](https://www.dukeupress.edu/Assets/Downloads/Notes_on_the_Founding_of_DMJ.pdf).

*Russian Math Surveys*. Finally, **Issues** takes you to a listing of the issues of the journal.

### Mathematical Citation Quotient (MCQ)

The **Mathematical Citation Quotient (MCQ)** for a given year is defined as the number of times the items published in the journal in the previous five years were cited by items in reference list journals published in the given year, divided by the number of articles the journal published in that same five-year period. The **All MCQ** is the MCQ computed as if every item (every journal article, proceedings article, book, and thesis) had been published in one big journal. It provides a benchmark by which to understand the MCQ of a journal. In the new journal profile pages, the MCQ for each year can be seen graphically all at once, along with the **All MCQ** for each year. (Note that we don't compute MCQs before the year 2000.) Here is the graphical representation of the MCQ data for the *Duke Mathematical Journal*.



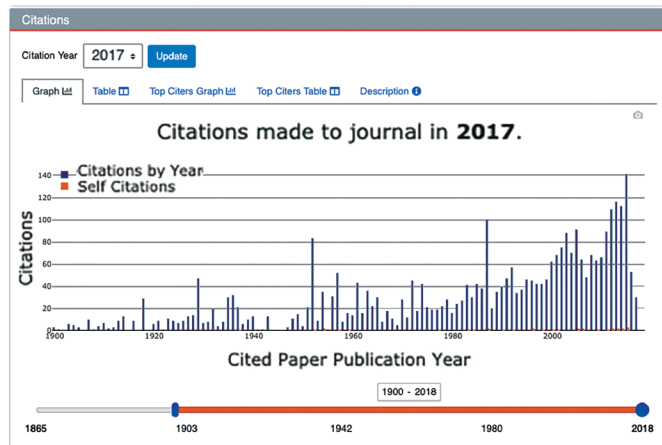
If you prefer numbers, clicking on the table tab provides the yearly MCQ data for the journal: the MCQ, the number of relevant citations, and the number of relevant publications in the journal. You can also see the table for the MCQ via its tab.

**Pro Tip:** In the bar graphs, clicking the small camera icon in the upper right-hand corner will download a PNG image of the graph to your desktop. For the tables, you can highlight the table to copy and paste to a text document or a spreadsheet.

### Citations

This card presents data on the citations to the journal. The first tab shows a bar graph of the citations, broken down by the publication year of the cited papers. You can choose whether the citing articles have been published in a particular year or look at the data over all time. The default is to use all time. Change it by selecting a year from the **Citation Year** box and clicking **Update**. The horizontal axis shows the publication years for the particular journal. The default range of years is from 1990 to the present. However, if the journal started publishing after 1990, the graph is adjusted accordingly. There is a slider below the graph that allows

you to adjust the left and right endpoints of the year range being displayed. Here is the bar graph for citations from articles published in 2017 to articles in the *Proceedings of the London Mathematical Society* in the year range 1900 to 2018:



We use orange to count self-citations, that is, citations from the journal to itself. If you want to see the data in tabular form, just click **Table**. Here are the top few rows of the tabular form of the data in the above bar graph:

Year	Citations by Year	Self Citations	Total Publications	% of Pub. Cited
2017	30	0	67	77.6%
2016	53	0	59	86.4%
2015	141	3	89	93.3%
2014	112	2	95	94.7%
2013	116	2	86	96.5%
2012	109	2	78	96.2%
2011	89	1	64	98.4%
2010	66	0	56	92.9%
2009	63	1	55	100%
2008	68	0	53	98.1%
2007	48	0	51	96.1%
2006	64	2	55	96.4%
2005	91	2	52	100%

The last column tells you what percentage of the articles in that year of the journal have been cited in MathSciNet. You can have a year like 2015 where there are more citations than papers published in the journal but still have 6.7% of the papers uncited. Clearly this means that some articles have multiple citations. The entries in the second and fourth columns are links. The links in the second column

take you to the citing papers as listed in MathSciNet. When you click through to citing papers and continue to particular items citing the journal, the relevant citations are boxed:

- Gutman, Y.: Embedding topological dynamical systems with periodic points in cubical shifts. *Ergodic Theory Dynam. Systems*, available on CJO. doi:10.1017/etds.2015.40 (2015) [MR3614036](#)
- Gutman, Y.: Mean dimension and Jaworski-type theorems. *Proc. Lond. Math. Soc.* **111**(4), 831–850 (2015) [MR3407186](#)
- Higson, N.: Counterexamples to the coarse Baum–Connes conjecture. Unpublished note (1999)

You may encounter a list of fewer items than the number of citations in the table, since it is possible for one paper to cite more than one article in the journal. In the results list, those papers are noted with the phrase *Multiple citations from this item to Proc. Lond. Math. Soc.* (using the abbreviated name of the journal in question). **Note:** The link specifies a particular publication year for the journal; citations to a different year of the journal will not be boxed.

### Top Citing Publications

You can also see the journals that are citing this journal most frequently, either in a bar graph or in a table. Clicking on the name of the journal takes you to its Journal Profile Page. Here is the table for the *Proceedings of the London Mathematical Society* for the citing year 2017:

Publication	Citations
<a href="#">J. Algebra</a>	102
<a href="#">Adv. Math.</a>	100
<a href="#">J. Math. Anal. Appl.</a>	59
<a href="#">Trans. Amer. Math. Soc.</a>	53
<a href="#">Proc. Amer. Math. Soc.</a>	49
<a href="#">Comm. Algebra</a>	48
<a href="#">Int. Math. Res. Not. IMRN</a>	41
<a href="#">Math. Z.</a>	38
<a href="#">J. Number Theory</a>	37
<a href="#">J. Funct. Anal.</a>	31

### Classifications

It is possible to see the distribution of MSCs (Mathematics Subject Classifications) in the journal using either a three-year window or over all time. By default, just the top ten classes are displayed, but clicking **Show All** displays all of them. Here are the top ten for the *Proceedings of the London Mathematical Society* over all time:

Classifications		
Last 3 Years		
All Time		
MSC*	Description	Count
	Other	2464
20	Group theory and generalizations	542
11	Number theory	279
46	Functional analysis	278
14	Algebraic geometry	230
10	Number theory	170
30	Functions of a complex variable	155
16	Associative rings and algebras	154
47	Operator theory	133
58	Global analysis, analysis on manifolds	111

[Show All](#)

\*MSC= Mathematics Subject Classification

Notice that **Other** is the most common class that occurs. The Mathematics Subject Classification has not existed for as long as the *Proceedings of the London Mathematical Society* has been publishing. Indeed, the journal began publishing papers in 1865, before there was an American Mathematical Society and long before there was a *Mathematical Reviews*! We received bibliographic data from the journal that allowed us to backfill those years. The items that come from the contributed data do not have classes attached to them and are marked as **Other**. Clicking on the two-digit MSC brings you to a full description of the subject class. Clicking on the number in the **Count** column takes you to a listing of all the items in the journal with that class as primary class from the time period selected.

### Authors

The last feature I want to point out is the table of the authors most frequently appearing in the journal. As with the MSCs, you can look either at the most recent three years or over all time. Here is the table for the *Proceedings of the London Mathematical Society* over all time.

Top Authors	
Last 3 Years	All Time
Name	Papers
<a href="#">Hardy, Godfrey Harold</a>	65
<a href="#">Littlewood, John Edensor</a>	42
<a href="#">Titchmarsh, Edward Charles</a>	28
<a href="#">Liebeck, Martin W.</a>	16
<a href="#">Huxley, Martin N.</a>	15
<a href="#">Rogers, C. Ambrose</a>	15
<a href="#">Davenport, Harold</a>	14
<a href="#">Fröhlich, Albrecht</a>	14
<a href="#">Edge, William Leonard</a>	14
<a href="#">Praeger, Cheryl E.</a>	13

[Show All](#)

Clicking on the author's **Name** takes you to his or her Author Profile Page in MathSciNet. Clicking on the number in the **Papers** column takes you to the MathSciNet listing of the author's papers in the journal.

There is more that could be said about any of these searches, but the best way to learn more from this point is to try things out.



Edward Dunne

### Credits

Author photo is courtesy of the author.

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We had a prototype of the Journal Profile Pages at the Joint Mathematics Meetings in Baltimore (January 2019). We received valuable suggestions from quite a few mathematicians, librarians, and publishers at the JMM. Some of the librarians, especially Lauren Gala and Anya Bartelmann, took extraordinarily close looks at the prototype and provided insightful comments. We are especially grateful for the time they devoted to helping improve the pages.