On Becoming an Expert...

Rutger de Jong, Subject Librarian Science | BSc MI

05-02-2020

Universiteit Leiden
The Netherlands

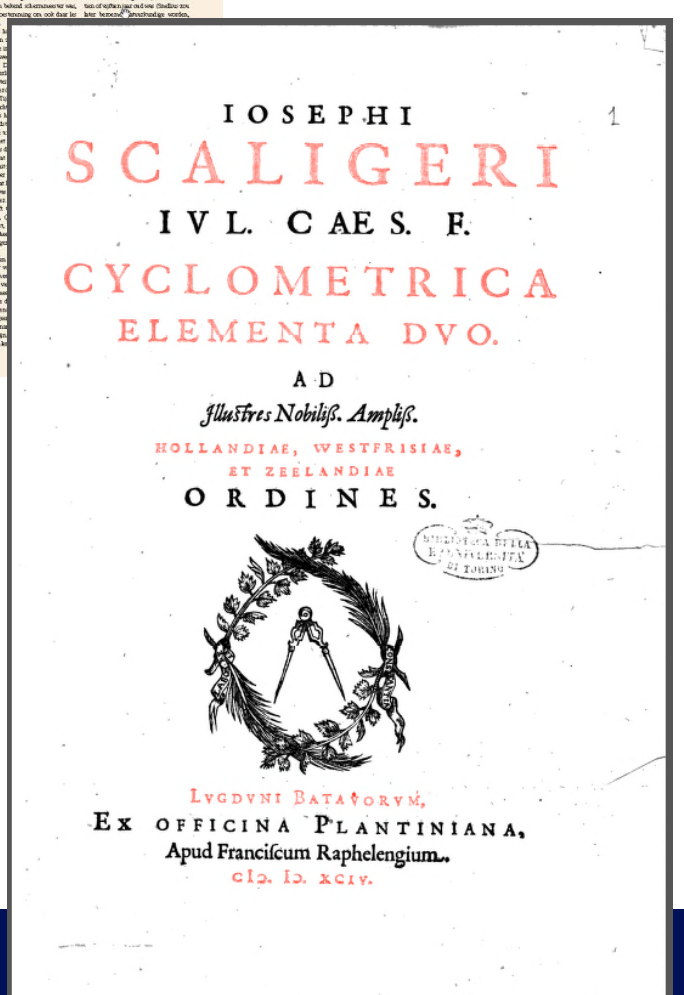
Discover the world at Leiden University

Program

- Introduction
- Scholarly communication
- Searching information in 5 steps
- Referencing

The University Library by Numbers

- Over 7 locations, desks in Jakarta and Rabat
- 120 fte
- Circa 2 million ebooks
- Over 5 million printed books
- Over 40.000 e-journals
- Over 600 databases
- Large collection of historically important materials


IOSEPHI
SCALIGERI
IVL. CAES. F.
CYCLOMETRICA
ELEMENTA DVO.
AD
Illustres Nobiliſs. Ampliſs.
HOLLANDIAE, WESTFRISIAE,
ET ZEELANDIAE
ORDINES.
LVGDVNI BATAVORVM,
EX OFFICINA PLANTINIANA,
Apud Franciſcum Raphelengium.
CIↃ. IↃ. XCIV.

Scaliger, J., Raphelengius, Franciscus, & Plantiniana, officina. (1594). Iosephi Scaligeri Ivl. Cæs. f. Cyclometrica elementa dvo : Ad illustres nobiliss, ampliss. Hollandiae, Westfrisiae, et Zeelandiae ordines. Lvgdvni Batavorvm: Ex officina Plantiniana, apud Franciscum Raphelengium.

Science & communication

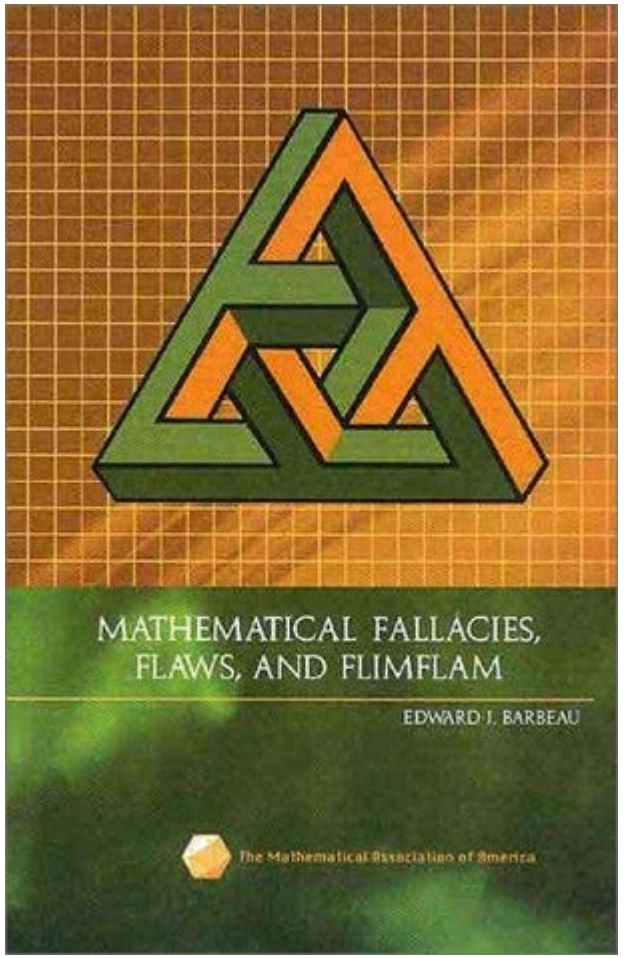
Non-scientific

- Magazines: popular/trade (Plus Magazine, Mathematics Magazine)
- Websites
- Encyclopedia
- Books

Scientific

- Conference proceedings
- Journal articles (peer-reviewed)
- Books
- Datasets

Wikipedia?



Dinosaurs of Eden, Ken Ham

Is any source good for Science?

Why (not) Wikipedia?

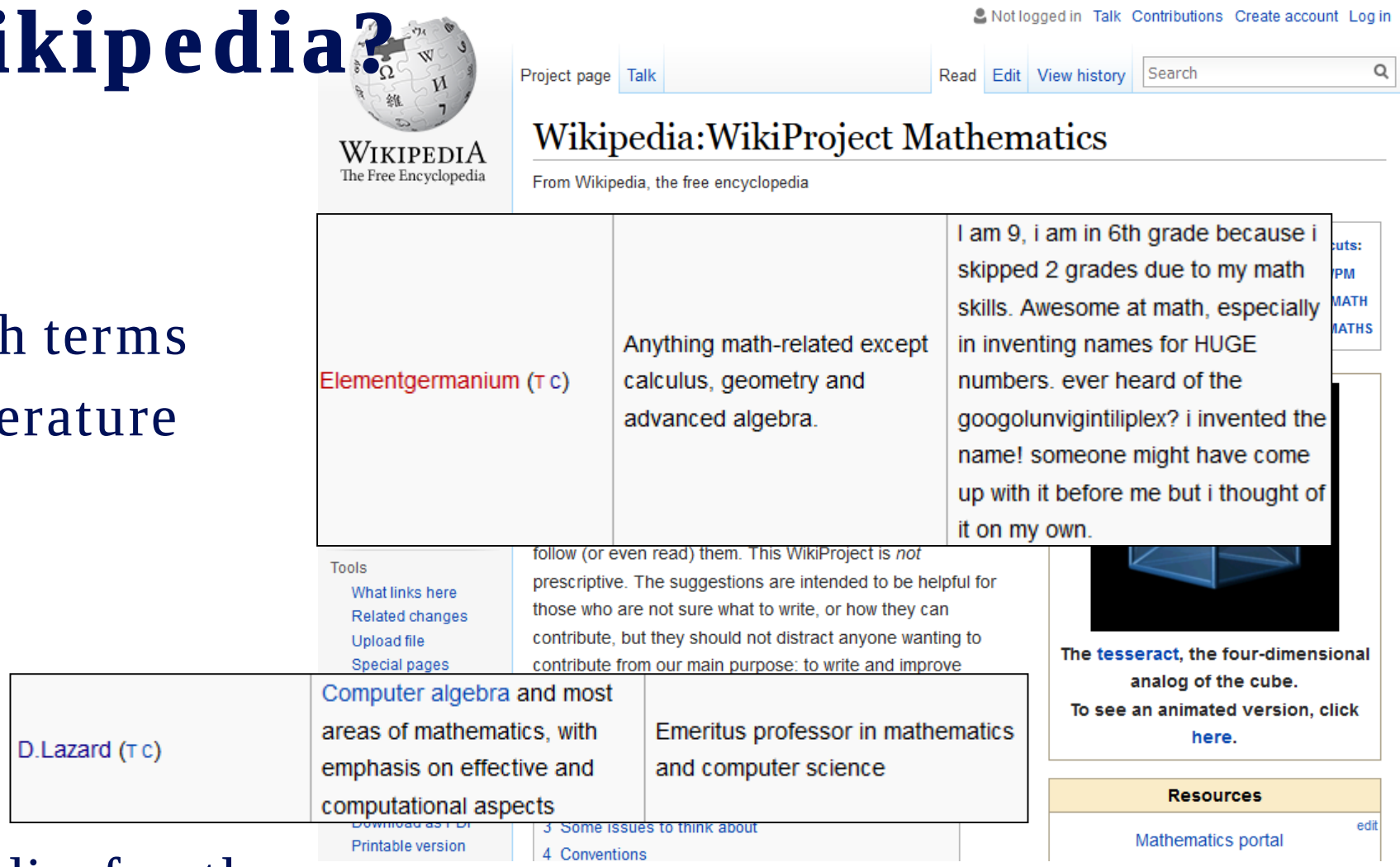
Use Wikipedia for:

- General knowledge
- Getting ideas for search terms
- Pointers to relevant literature

Not for:

- Scientific reference

Also of interest:
https://www.encyclopediaofmath.org



Anyone can edit!

How Publishing Works

I send in my paper and then...

Journal	First decision submission to first decision in weeks	Review speed submission to final decision in weeks	First online acceptance to citable online in weeks
Applied and Computational Harmonic Analysis ↗	15.70	20.83	1.02
Applied Mathematical Modelling ↗	25.30	33.15	2.73
Applied Mathematics and Computation ↗	28.08	30.86	4.42
Applied Mathematics Letters ↗	1.30	1.59	1.95
Applied Numerical Mathematics ↗	20.62	29.27	4.57
Computational Statistics and Data Analysis ↗	9.34	14.35	1.69
Computers and Mathematics with Applications ↗	6.06	7.83	3.74
Differential Geometry and its Applications ↗	16.09	17.70	3.26
Discrete Applied Mathematics ↗	25.32	32.67	3.58
Discrete Optimization ↗	14.35	26.19	3.88
Finite Fields and Their Applications ↗	15.55	21.62	4.96

Reasons for Delay: Peer Review

Review form: Reviewer 2

Is the manuscript scientifically sound in its present form?
Yes

Are the interpretations and conclusions justified by the results?
Yes

Is the language acceptable?
Yes

Is it clear how to access all supporting data?
It is clear.

Do you have any ethical concerns with this paper?
No

Have you any concerns about statistical analyses in this paper?
I do not feel qualified to assess the statistics

Recommendation?
Accept as is

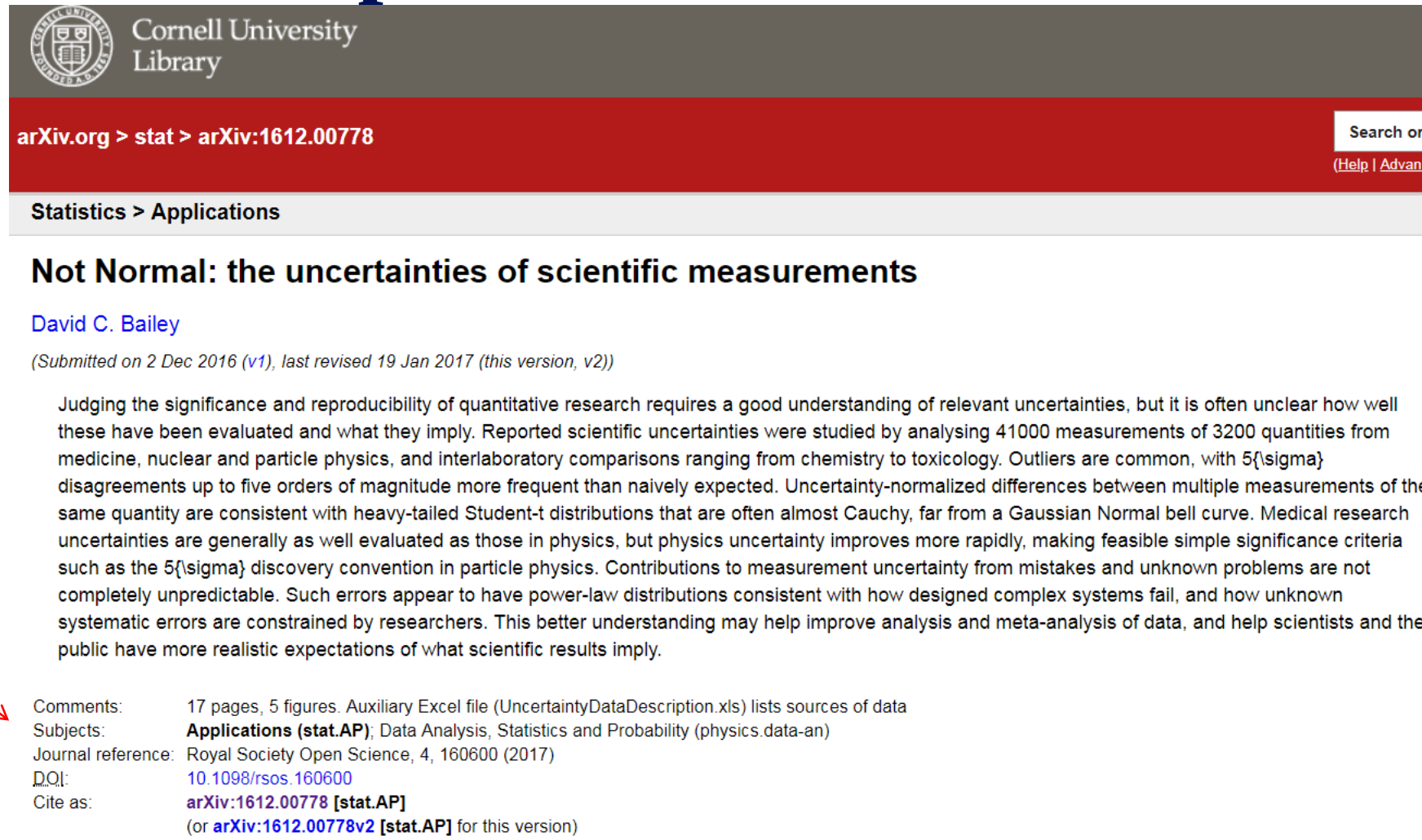
Comments to the Author(s)
Having read and re-read the manuscript I am unable to find fault with this it. The results are clear and fairly presented. The writing is solid, for the most part, concise.

I have not checked the calculations in section (d) of the discussion and section (e) comes across a bit speculative (or at least the connection is not made a concrete as this reviewer my like), but these are minor concerns.

I Just Can't Wait: Preprints

www.Arxiv.org

- Rough author's version
  - Pre-print: before peer-review
  - Post-print: after peer-review
- Follow trends
- Receive comments to incorporate in final manuscript
- Should mention if accepted/published
- If we do not have a subscription to an article, this will be a place to find a readable version



Cornell University Library

arXiv.org > stat > arXiv:1612.00778

Search or

(Help | Advan

Statistics > Applications

Not Normal: the uncertainties of scientific measurements

David C. Bailey

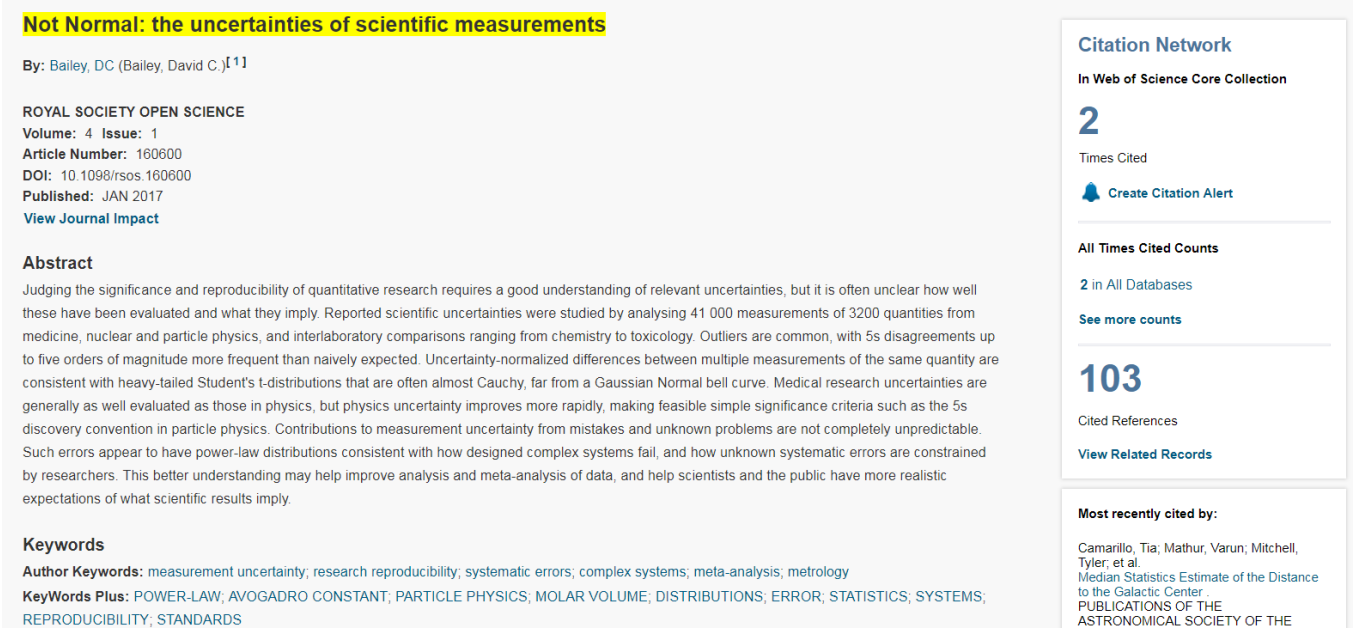
(Submitted on 2 Dec 2016 (v1), last revised 19 Jan 2017 (this version, v2))

Judging the significance and reproducibility of quantitative research requires a good understanding of relevant uncertainties, but it is often unclear how well these have been evaluated and what they imply. Reported scientific uncertainties were studied by analysing 41000 measurements of 3200 quantities from medicine, nuclear and particle physics, and interlaboratory comparisons ranging from chemistry to toxicology. Outliers are common, with 5{\sigma} disagreements up to five orders of magnitude more frequent than naively expected. Uncertainty-normalized differences between multiple measurements of the same quantity are consistent with heavy-tailed Student-t distributions that are often almost Cauchy, far from a Gaussian Normal bell curve. Medical research uncertainties are generally as well evaluated as those in physics, but physics uncertainty improves more rapidly, making feasible simple significance criteria such as the 5{\sigma} discovery convention in particle physics. Contributions to measurement uncertainty from mistakes and unknown problems are not completely unpredictable. Such errors appear to have power-law distributions consistent with how designed complex systems fail, and how unknown systematic errors are constrained by researchers. This better understanding may help improve analysis and meta-analysis of data, and help scientists and the public have more realistic expectations of what scientific results imply.

Comments:	17 pages, 5 figures. Auxiliary Excel file (UncertaintyDataDescription.xls) lists sources of data
Subjects:	**Applications (stat.AP)**; Data Analysis, Statistics and Probability (physics.data-an)
Journal reference:	Royal Society Open Science, 4, 160600 (2017)
DOI:	10.1098/rsos.160600
Cite as:	**arXiv:1612.00778 [stat.AP]**
	(or **arXiv:1612.00778v2 [stat.AP]** for this version)

Once I Get Published: Findability

- It may take >2 months before it appears in databases such as Web of Science or Google Scholar
- Send press releases, update profile
- Databases add value
  - Provide keywords
  - Classify in research field
  - Quality control (journal level)
  - Indexes references and citations
  - Add reviews (in mathematics)



Not Normal: the uncertainties of scientific measurements

By: Bailey, DC (Bailey, David C.)[1]

ROYAL SOCIETY OPEN SCIENCE
Volume: 4 **Issue:** 1
Article Number: 160600
DOI: 10.1098/rsos.160600
Published: JAN 2017
View Journal Impact

Abstract

Judging the significance and reproducibility of quantitative research requires a good understanding of relevant uncertainties, but it is often unclear how well these have been evaluated and what they imply. Reported scientific uncertainties were studied by analysing 41 000 measurements of 3200 quantities from medicine, nuclear and particle physics, and interlaboratory comparisons ranging from chemistry to toxicology. Outliers are common, with 5s disagreements up to five orders of magnitude more frequent than naively expected. Uncertainty-normalized differences between multiple measurements of the same quantity are consistent with heavy-tailed Student's t-distributions that are often almost Cauchy, far from a Gaussian Normal bell curve. Medical research uncertainties are generally as well evaluated as those in physics, but physics uncertainty improves more rapidly, making feasible simple significance criteria such as the 5s discovery convention in particle physics. Contributions to measurement uncertainty from mistakes and unknown problems are not completely unpredictable. Such errors appear to have power-law distributions consistent with how designed complex systems fail, and how unknown systematic errors are constrained by researchers. This better understanding may help improve analysis and meta-analysis of data, and help scientists and the public have more realistic expectations of what scientific results imply.

Keywords

Author Keywords: measurement uncertainty; research reproducibility; systematic errors; complex systems; meta-analysis; metrology
KeyWords Plus: POWER-LAW; AVOGADRO CONSTANT; PARTICLE PHYSICS; MOLAR VOLUME; DISTRIBUTIONS; ERROR; STATISTICS; SYSTEMS; REPRODUCIBILITY; STANDARDS

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Times Cited
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All Times Cited Counts
2 in All Databases
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103
Cited References
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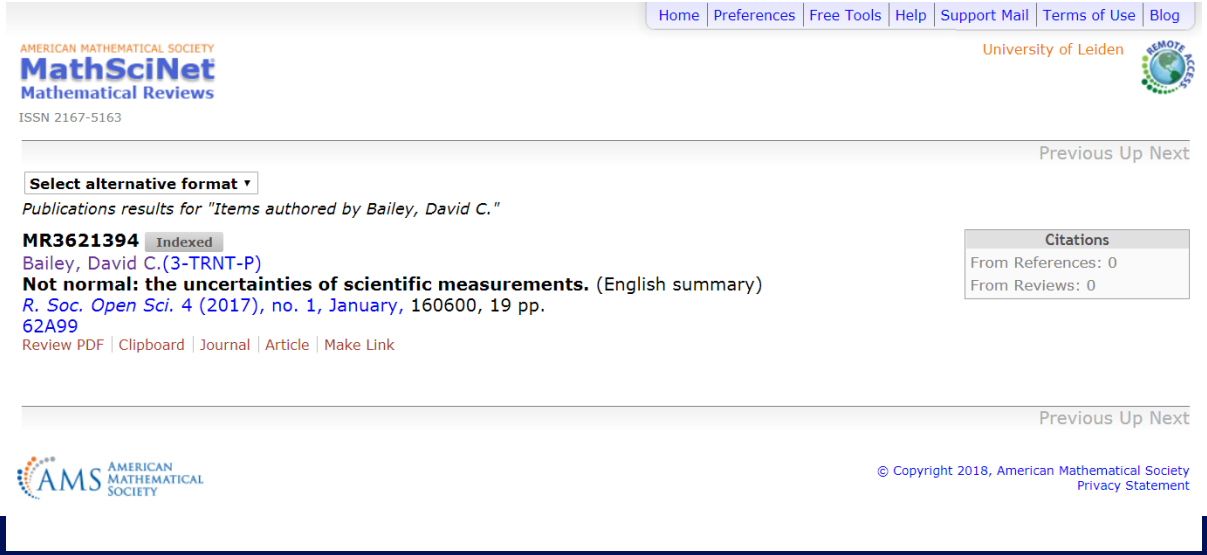
Most recently cited by:
Camarillo, Tia; Mathur, Varun; Mitchell, Tyler; et al.
Median Statistics Estimate of the Distance to the Galactic Center
PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF THE



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AMERICAN MATHEMATICAL SOCIETY
MathSciNet
Mathematical Reviews
ISSN 2167-5163

University of Leiden

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Publications results for "Items authored by Bailey, David C."

MR3621394 Indexed
Bailey, David C.(3-TRNT-P)
Not normal: the uncertainties of scientific measurements. (English summary)
R. Soc. Open Sci. 4 (2017), no. 1, January, 160600, 19 pp.
62A99
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Citations
From References: 0
From Reviews: 0

Previous Up Next

AMS AMERICAN MATHEMATICAL SOCIETY

Why Did My Publication Get Through QC

Criteria	
Intended audience	Scientists
Objectivity	Yes
Author and affiliation	Expert in the field
Recent publication	Yes
Publisher / Journal	Academic / high impact
References	Yes
Peer-reviewed	Yes
Primary or secondary research	First hand (p)

These criteria help you recognize scholarly articles/ and books

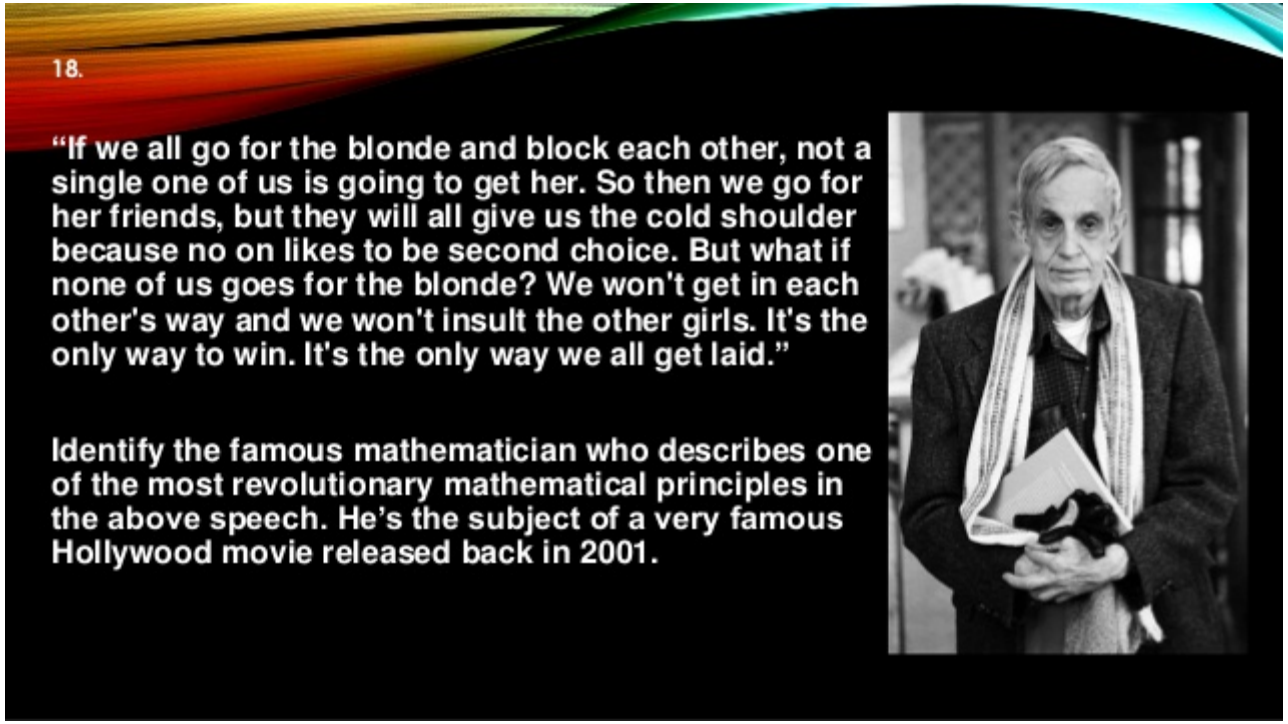
Finding information in 5 steps

- What information do I need?
- What information resources are available?
- How do I build a solid search strategy?
- How do I evaluate the results?
- How do I use the information in my research?

REX A.BUTCHER / SEBUN PHOTO / amanaimages / Universal Images Group

Step 1: Information Needs

- Do a broad search to get acquainted with the topic
- Decide what material is appropriate:
  - Books
  - Journal articles
  - Data



Nash equilibria

Step 2: Information Resources

UB Catalogue (books, databases)

Mathematical databases

MathSciNet
ZentralBlatt MATH

Project Euclid

When: looking for mathematical publications

Scientific databases

Arxiv.org (pre-print physics, mathematics and computer sciences)
Eric (education)
Google Scholar (general)
Web of Science (general)

When: looking for articles on mathematics and its applications

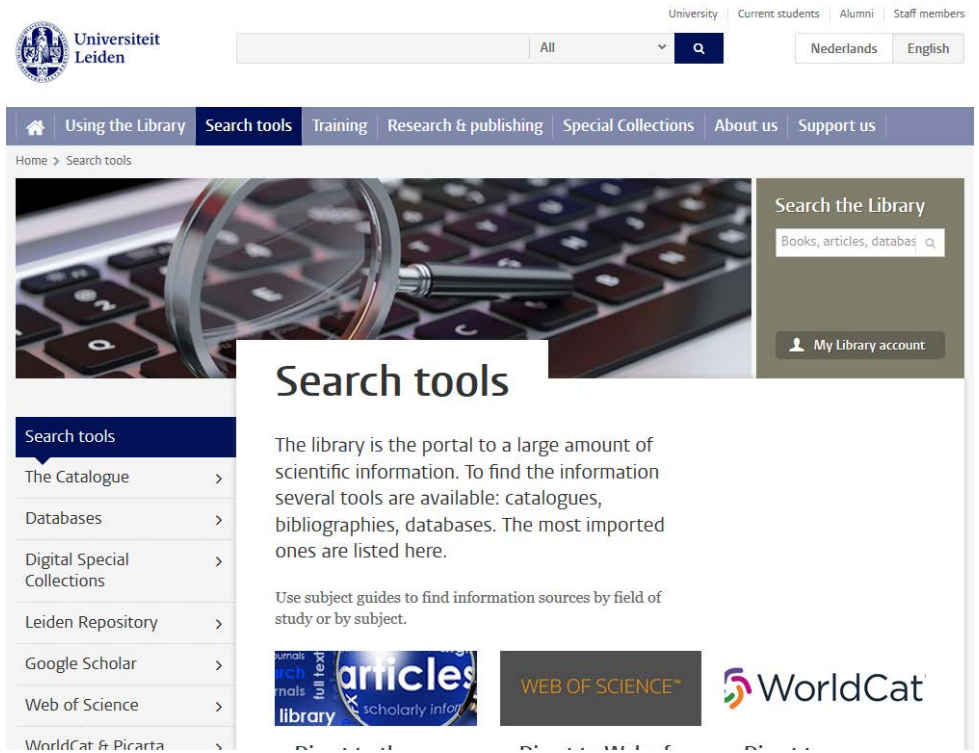
Collections/vendors

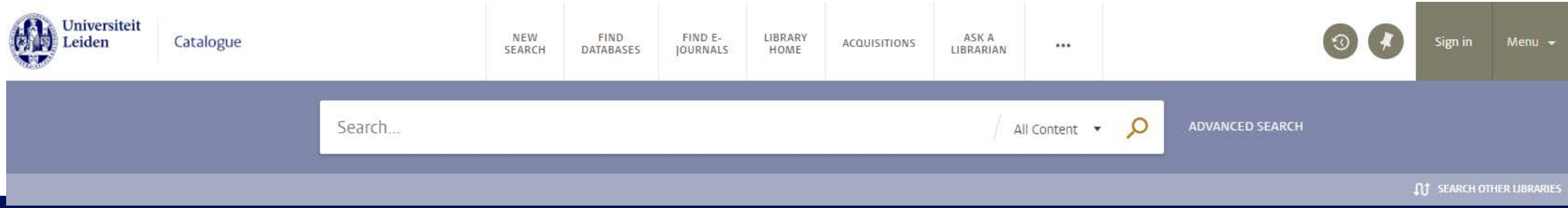
ACM
AMS
Ebsco
IEEE Computer Society Digital Library
SIAM
SpringerLink e-books
Turpion
Wiley
Etc.

When: looking for a specific book/book collection

Step 2: Information Resources

- Use the Catalogue as starting point
- Always ‘Sign In’ with ULCN account
- Books: ‘Leiden Collections’
- Find Databases (Web of Science, Google Scholar, etc.)
- Find e-Journals
- Do the Catalogue Tutorial to get started



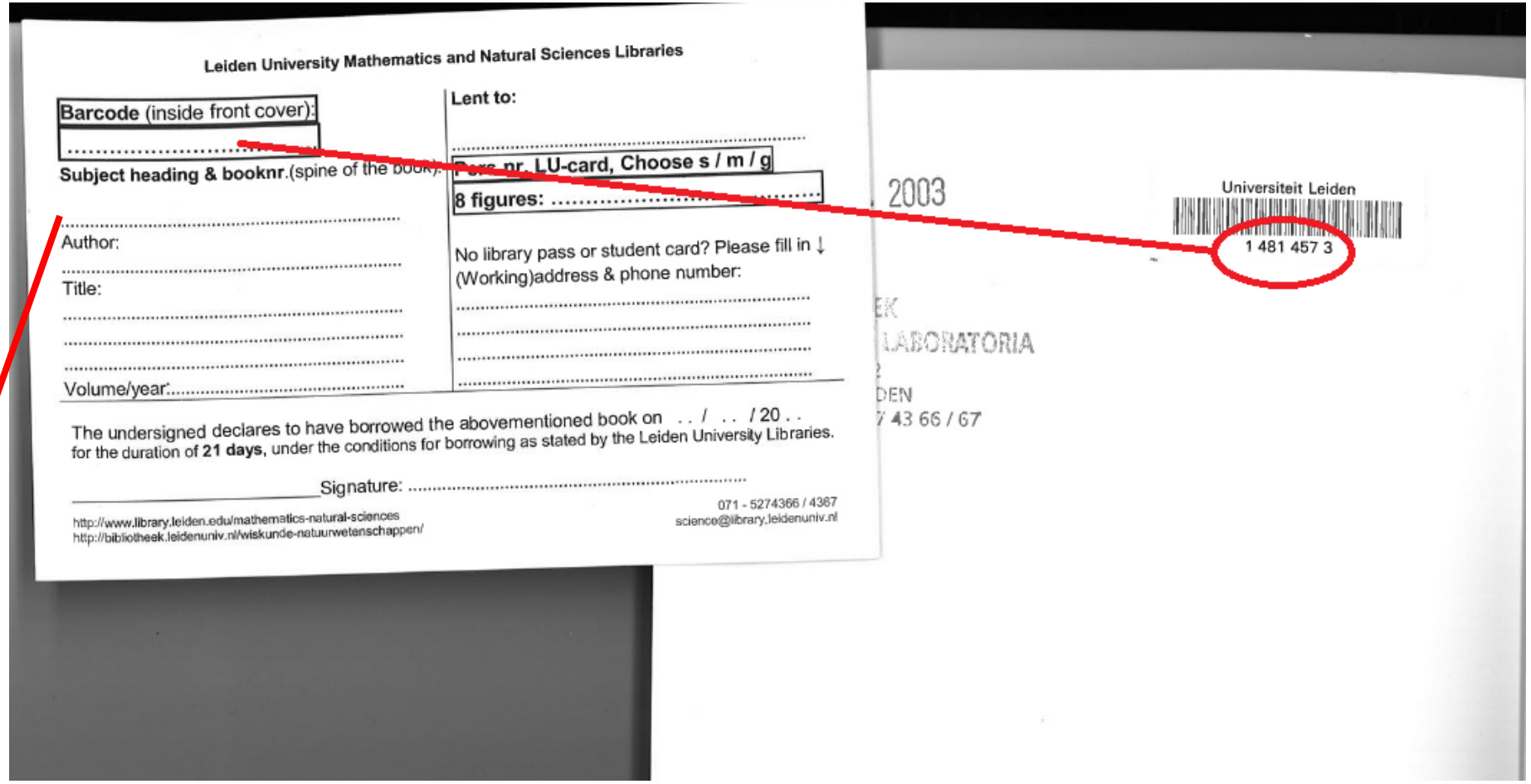


Step 2: Catalogue

http://catalogue.leidenuniv.nl

Step 2: Information Resources - Books

- Snellius: always use the lending form
- Fill in:
  - Student number
  - Barcode
  - Spine/body number (MSC + book number)
  - Etc.



Peculiarities of Mathematical Databases

	MathSciNet	Web of Science
Review	Usually a comment or short abstract of the publication	Overview of current research on a specific research subject. In mathematics look for books to get more similar content.
Classification	Mathematical Subject Classification	Broad subject areas such as statistics or applied mathematics
Impact	MCQ – based upon citations from mathematical journals only	Impact Factor – based upon all citations. For example also from applied fields such as chemistry.
Material	Many books, check catalogue as well as GetIt@Leiden	Mostly points to papers
Language	English, French, German, etc.	Abstract and title usually translated to English!

Mathematical Databases - MSC

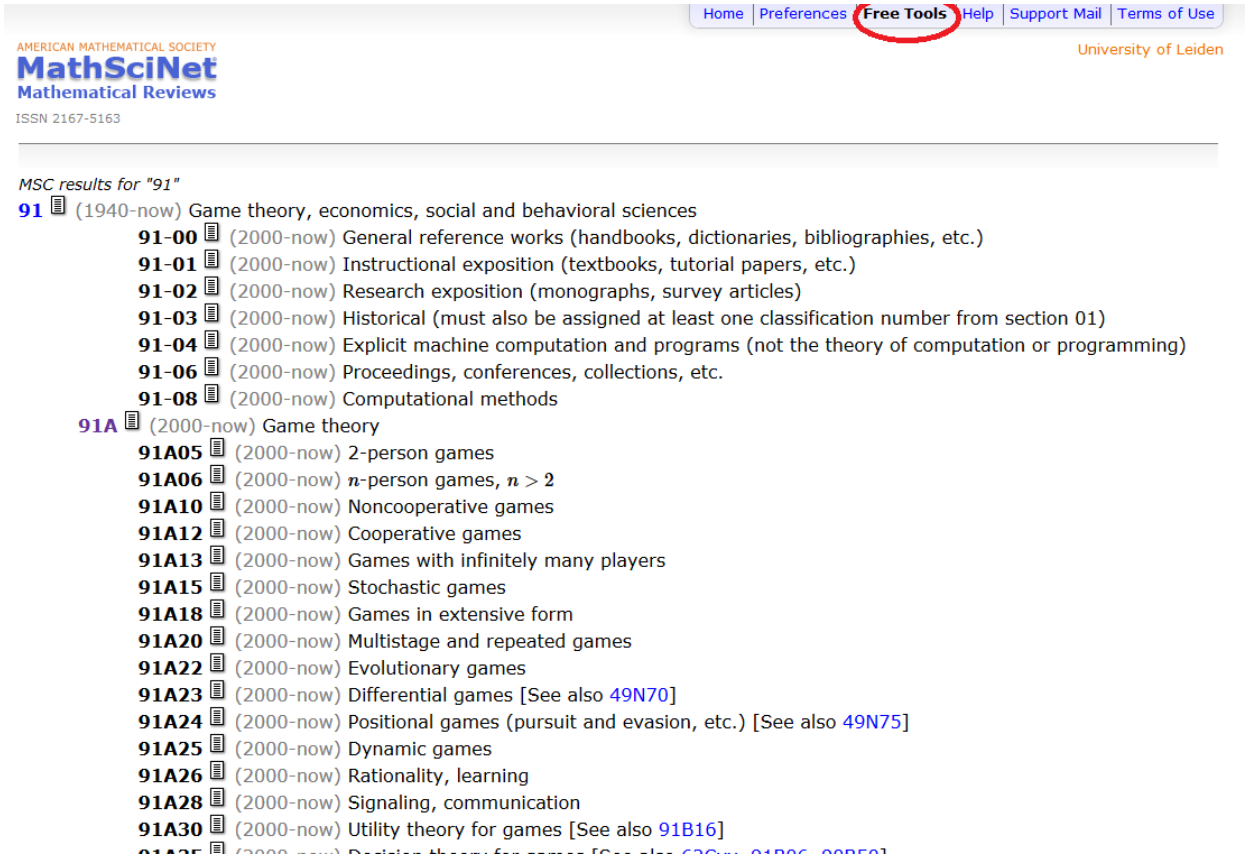
MSC: Mathematics Subject Classification

Classification in MathSciNet, Zentralblatt MATH, Arxiv and Snellius library!

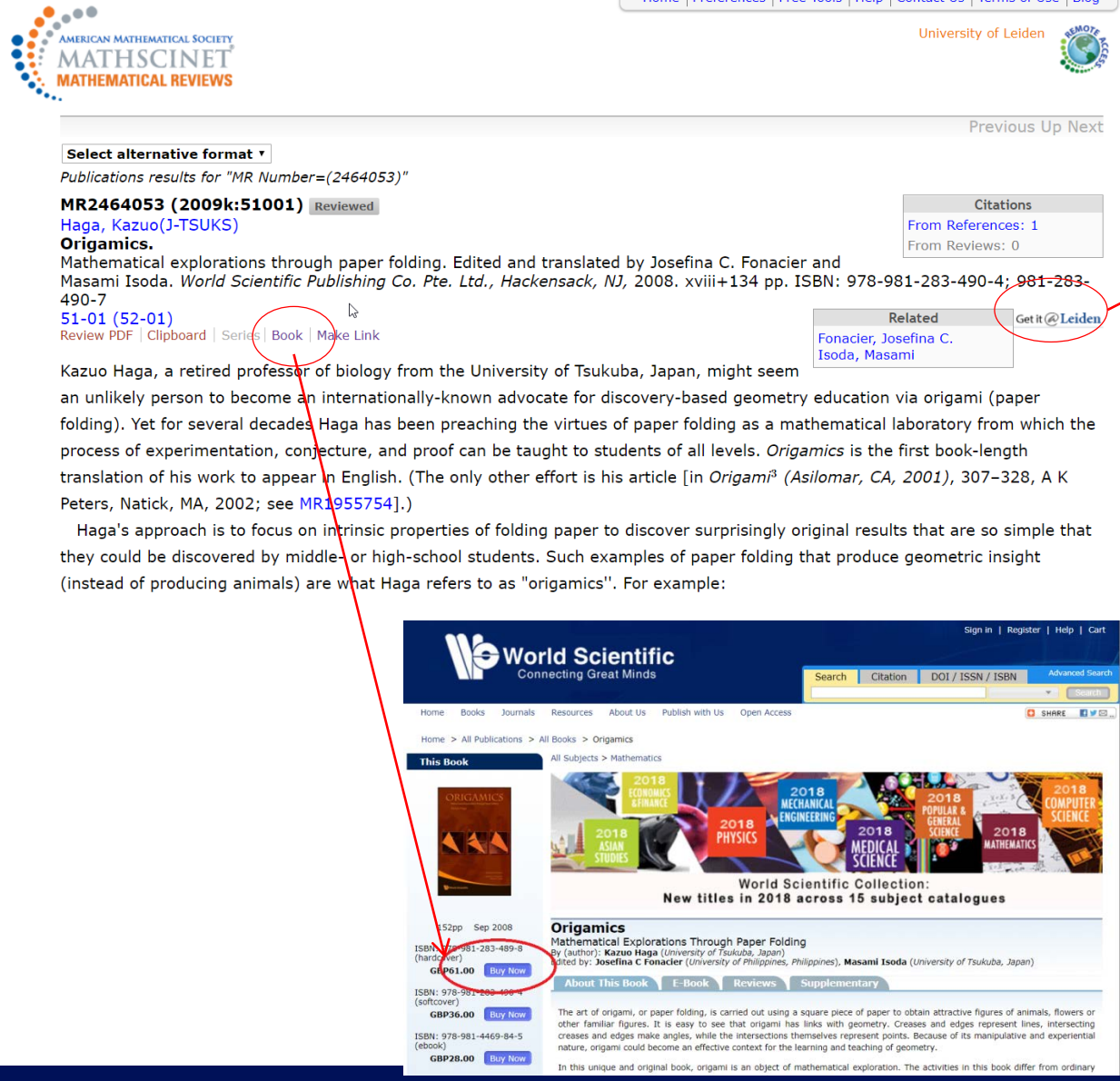
- MathSciNet: Free Tools
- http://www.ams.org/msc

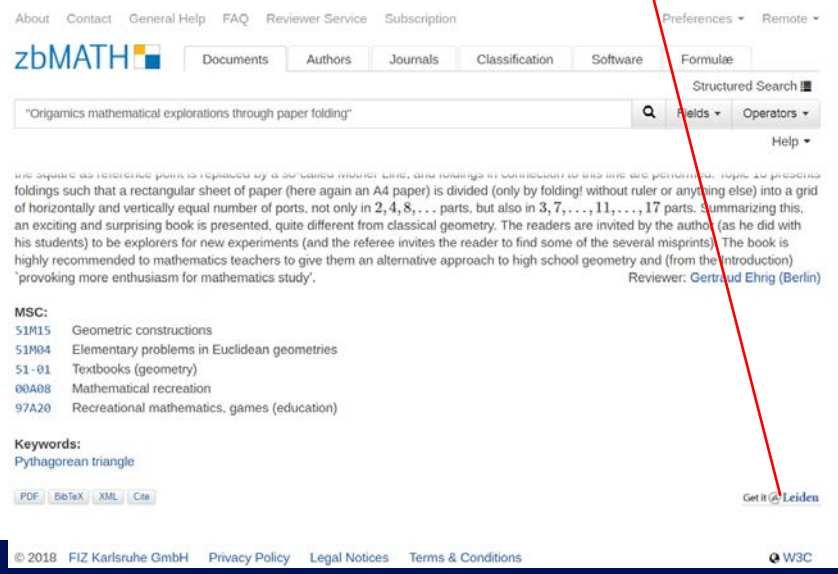
Tips:

- Use hierarchy
- Check the date!



Not Found => Check Catalogue

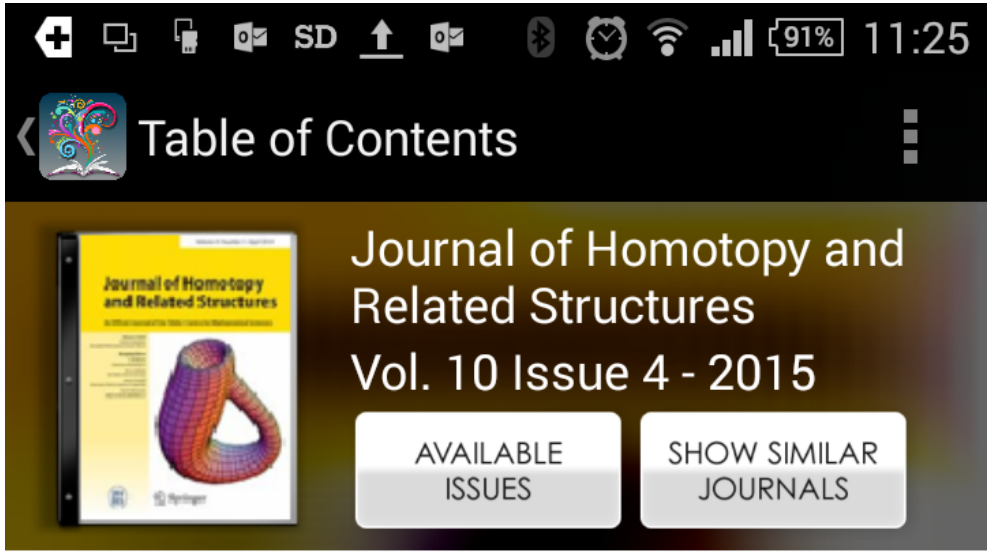


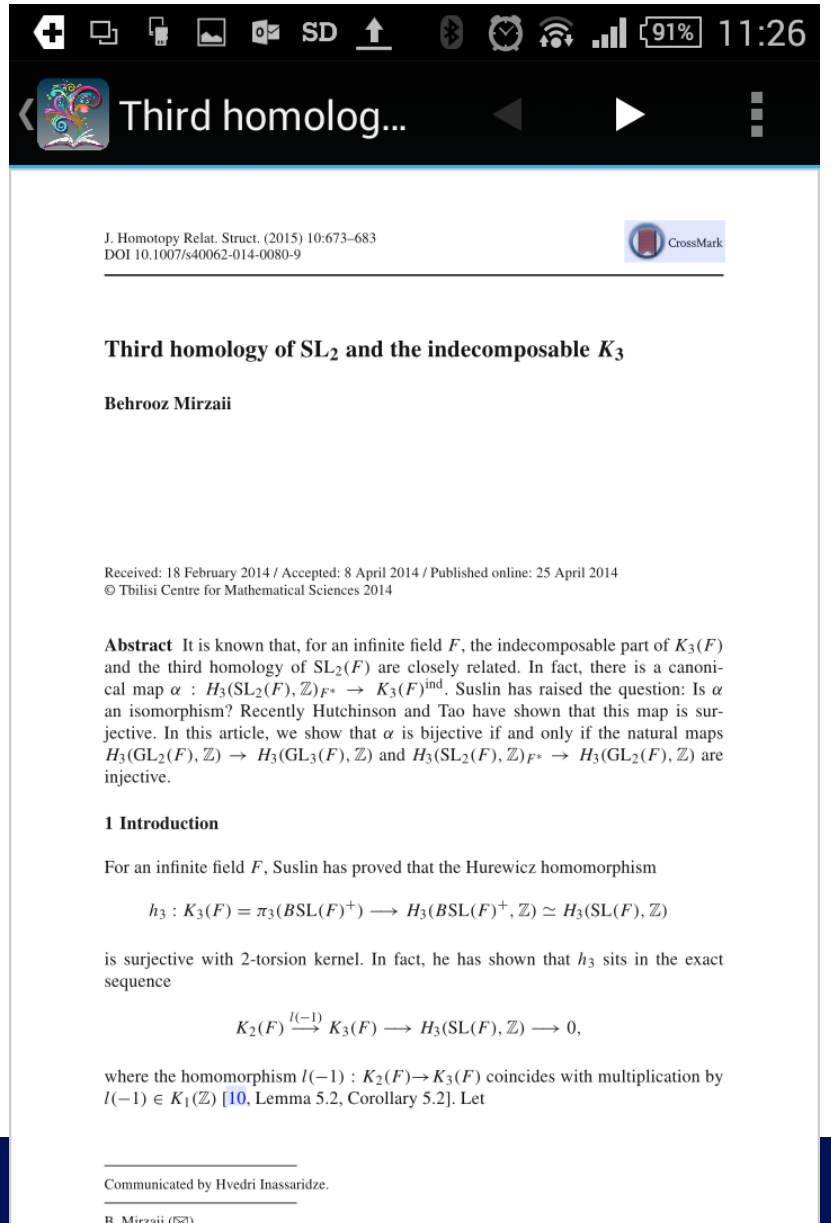


Step 2: Information Resources - Journals

Keep up with the latest trends on your topic by following specific journals.

Download Browzine on iOS or Android, login with your ULCN-account.





Discover the wor

Step 3: Search Strategy

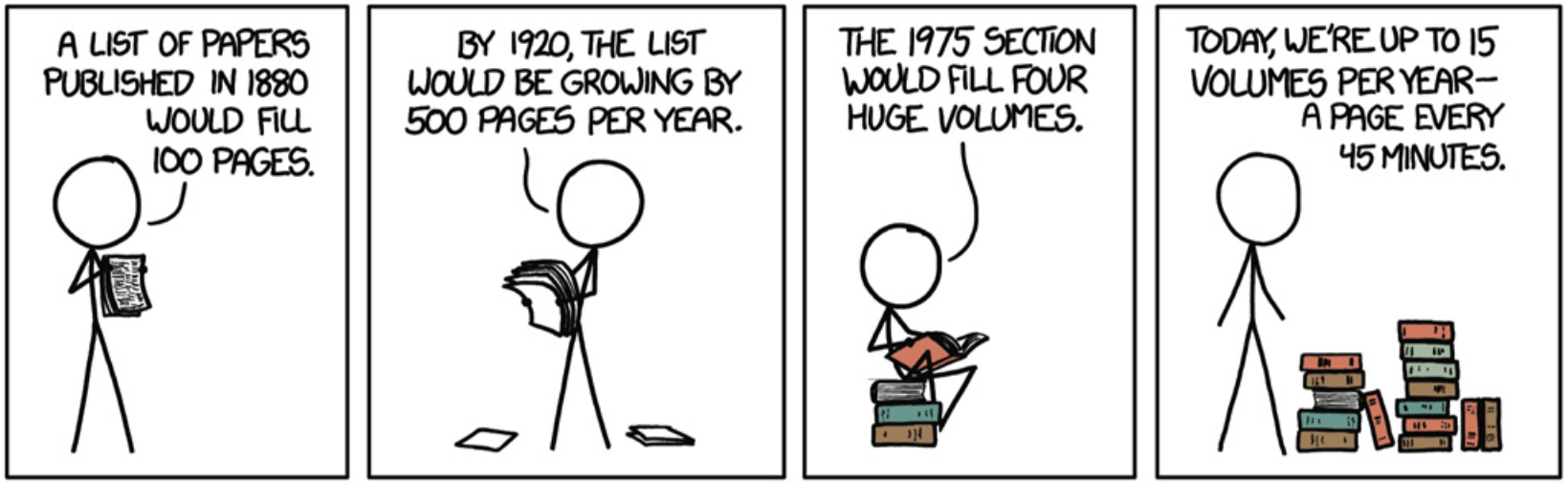
Original Research is:

1. Go where no one has gone before
2. Builds upon existing scientific foundations

ReSearch

Information overload

1. Strategy: define what you are looking for
2. Search efficiently and effectively



Step 3: Search Strategy – Snowball/Citations

Starting point:

- Excellent article
- Book

Search engines:

- Google Scholar
- Web of Science
- MathSciNet
- Zentralblatt MATH

Science and Society Museum/ Universal Images Group

Step 3: Search Strategy – MathSciNet

- Citation Database
- American Mathematical Society
- 3 million+ references
- Reviews
- Search within references
- Filter on
  - MSC
  - Publication type
  - Author

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MathSciNet 75 1940-2015
Mathematical Reviews
ISSN 2167-5163

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Select alternative format

Publications results for "Citations of 2349551"

MR3161382 Reviewed
Holst, Lars(S-RIT)
Probabilistic proofs of Euler identities. (English summary)
J. Appl. Probab. 50 (2013), no. 4, 1206–1212.
11M06 (01A50 33B10 60E05)
PDF | Clipboard | Journal | Article | Make Link

Citations
From References: 1
From Reviews: 0

In this paper, the author gives an alternative proof for Euler's exact sum for the Basel problem. Also the author proves Euler's infinite product formula for the sine using the hyperbolic secant distribution.

Reviewed by İnci Ege

References

1. Baten, W. D. (1934). The probability law for the sum of n independent variables, each subject to the law $(1/(2h))\mathrm{sech}(\pi x/(2h))$. *Bull. Amer. Math. Soc.* **40,** 284–290. MR1562838
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3. Bradley, R. E., D'Antonio, L. A. and Sandifer, C. E. (eds) (2007). *Euler at 300. An Appreciation.* Mathematical Association of America, Washington, DC. MR2349551
4. Chapman, R. (2003). Evaluating $\zeta(2)$. Preprint. Available at http://www.uam.es/personal_pdi/ciencias/cillerue/Curso/zeta2.pdf
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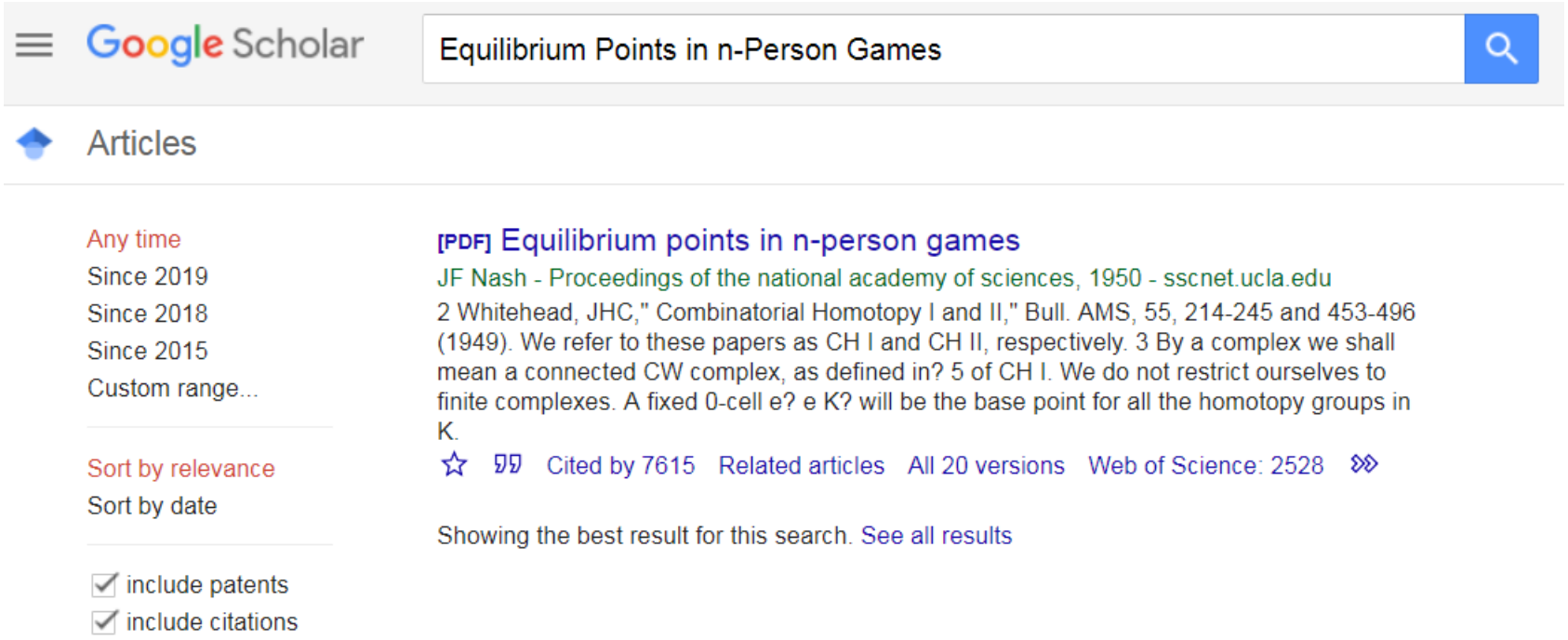
6. Feller, W. (1966). *An Introduction to Probability Theory and Its Applications,* Vol. 2. John Wiley, New York. MR0210154
7. Gordon, L. (1994). A stochastic approach to the gamma function. *Amer. Math. Monthly* **101,** 858–865. MR1300491
8. Harkness, W. L. and Harkness, M. L. (1968). Generalized hyperbolic secant distributions. *J. Amer. Statist. Assoc.* **63,** 329–337.

MathSciNet

Google Scholar - citations



Step 3: Search Strategy – Formulating

- Be specific
- Ask questions:
  - What? – Nash Equilibria
  - Who? –
  - Why? – Want to discover how to make people spend in my supermarket
  - How? – By changing the prizing
  - When? – Not relevant
  - Where? – in the supermarket
- Formulate as topic or question

OR

Example:

How can I maximize my supermarket profits using Nash equilibria?

Step 3: Search Strategy – Search Tools

- First split up your question in concepts
- Use many synonyms (from broad searches, www.thesaurus.com, etc.)
- Use different languages! (tip: Wikipedia in different languages, database Van Dale)

How can I maximize my supermarket profits using Nash equilibria?

Concept	Synonym 1	Synonym 2
Nash equilibria	Équilibre de Nash	
Profit	Loss	
Supermarket		

Step 3: Search Strategy – Search Tools

Use wildcards. They are database specific. For Web of Science:

$ = zero or one (colo$r => colour, color)

? = one (m?n => man, men)

* = zero or more (carbon* => carbon, carbonate)

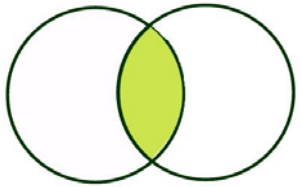
MathSciNet and Zentralblatt MATH just have * for all differences!

“Nash equilibri*” => “Nash equilibria” / “Nash equilibrium”

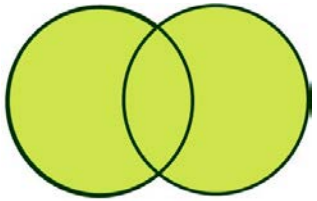
Step 3: Search Strategy – Search Tools

Couple your synonyms and concepts with booleans:

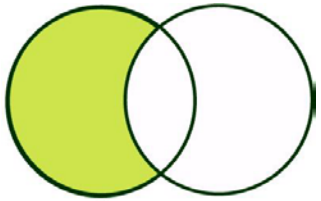
AND



OR



NOT



Concept	Synonym 1
Nash equilibria	
Profit	Discount
Supermarket	Retail

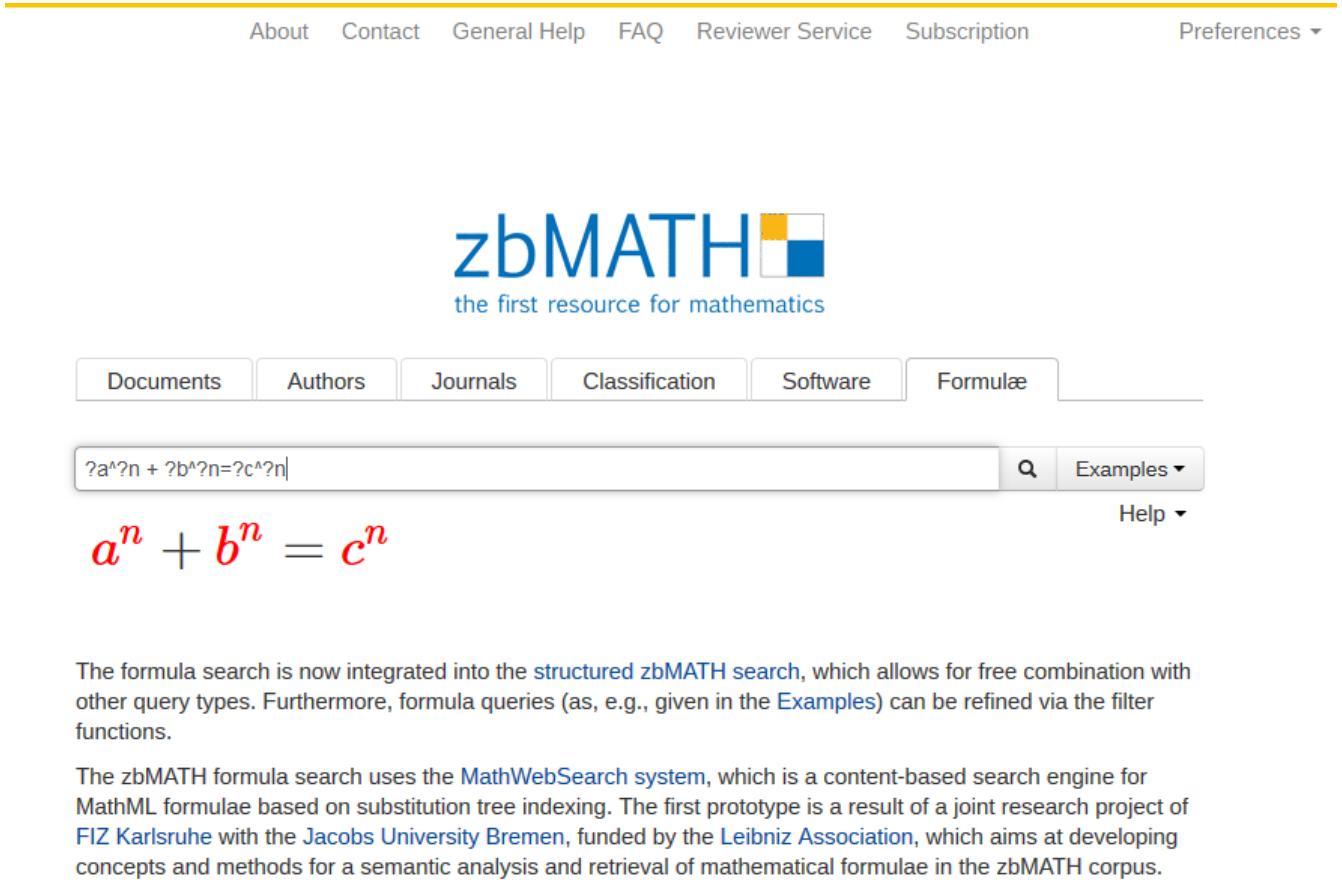
OR

AND / NOT

"Nash equilibri*" AND (profit OR discount) AND (supermarket OR retail)
"Nash equilibri*" & (profit | discount) & (supermarket | retail)

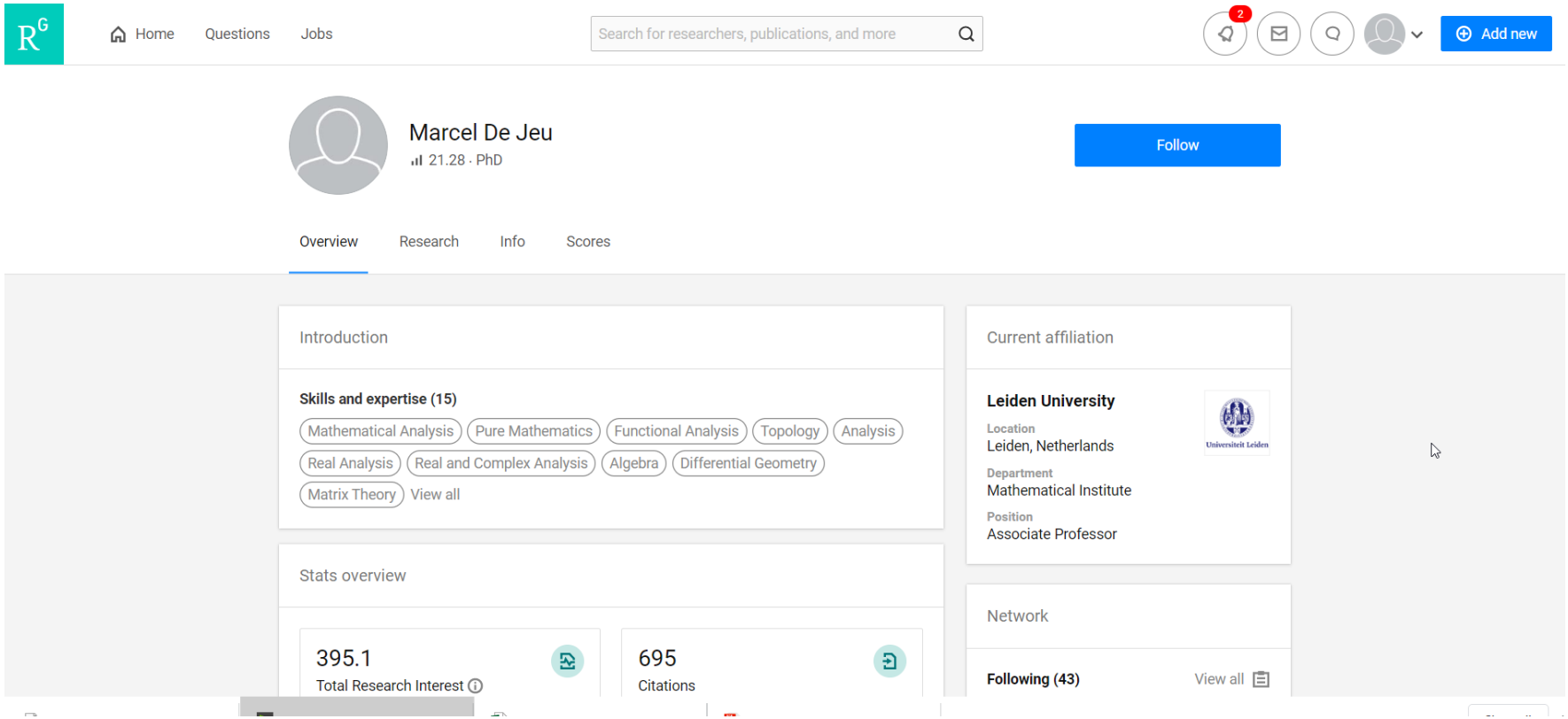
Step 3: Search – Zentralblatt MATH

- Citation Database
- 3 million+ references
- Reviews (from Zentrallblatt)
- European – oldest database
- Filter on
  - MSC
  - Publication type
  - Author
  - Formula!



Researchgate.net: Social for Scientists

- Follow a scientists output
- Read publications
- Ask questions
- Get research job suggestions

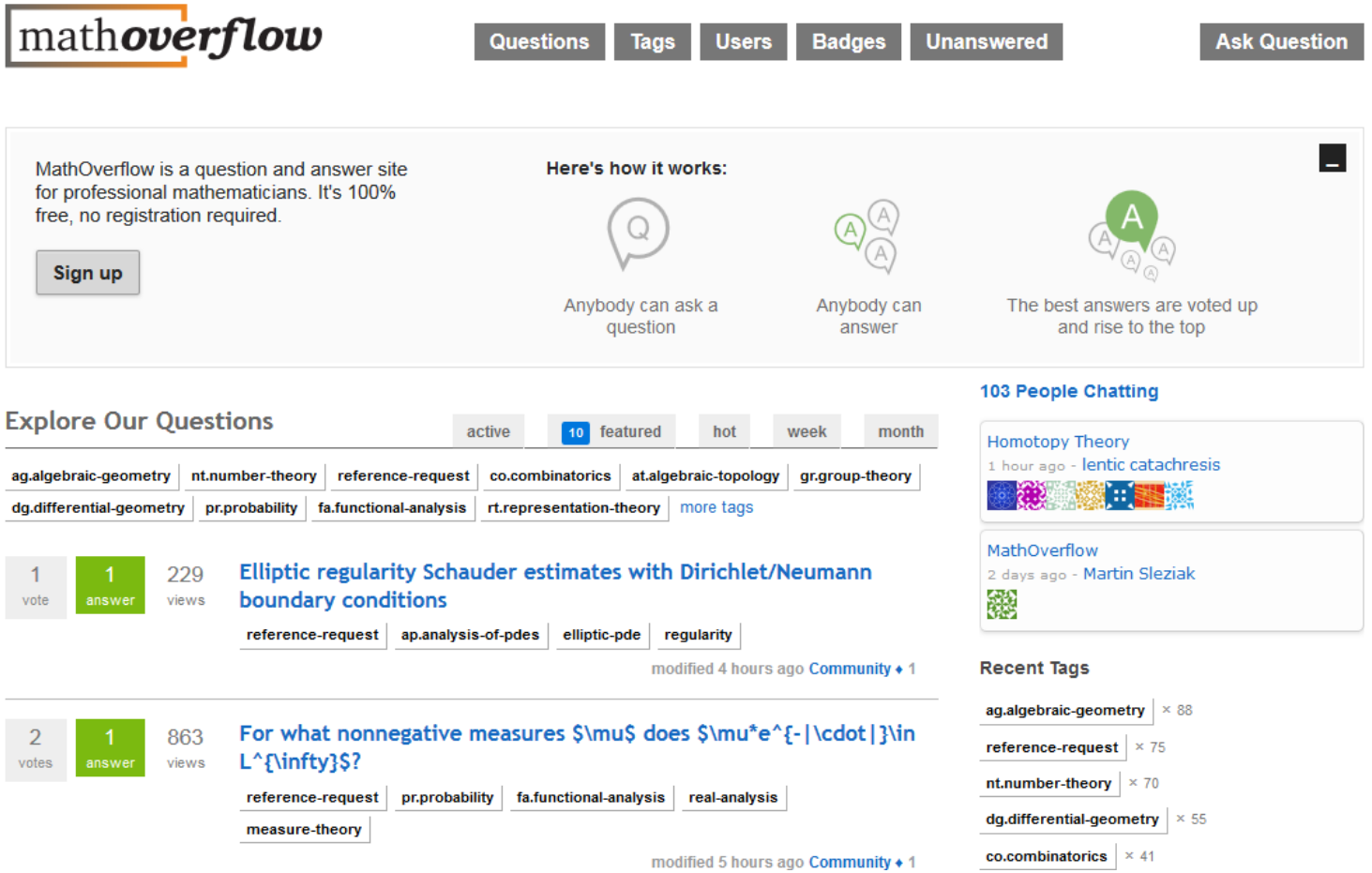


MathOverFlow: Crowdsourced Answers

- Questions on mathematical topics
- Quality control: up and down voting
- Be nice: don't just ask, answer as well

Can't find the right reference for a theory, see the tag:

Reference-request



Step 4: Evaluating information

Read the abstracts and titles of the first pages

- Relevance to research question
- Age of the article
- Does it meet our quality criteria (peer review, references, etc)

Not relevant, too few or too many?

Adjust your search!

Step 5: Using Information - fulltext

- Download the articles via GetIt@Leiden / Full text
- Lookup the book in the Library
- Use our plugin or bookmarklet @home

UBL has no access?

- Book: search on title in Catalogue
- Is a printed version available?
- Search for the article on Google Scholar
- Request from author
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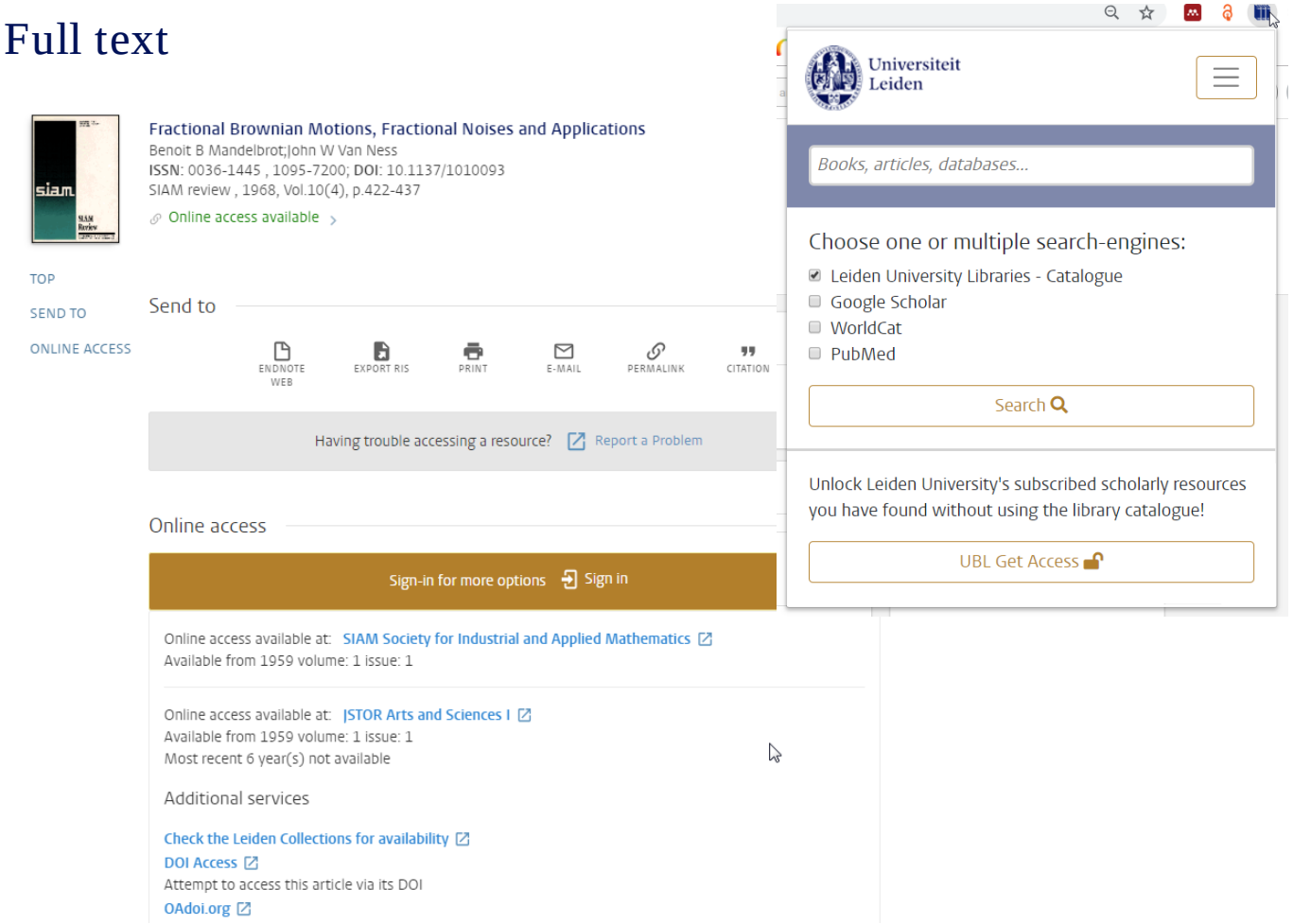

Step 5: Using Information

When citing:

- Between quotes for literal citation
- Paraphrase – in your own words
- Always attribute
- Websites are no exception
- Turnitin software checks for plagiarism

Why?

Do your research

- Papers can be retracted if you did not do a proper literature search and gave due credits!
- Google couldn't find it is no excuse!

www.retractionwatch.com

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MR2969055 (Review) 20M10
Wu, Chong-Yih (RC-NPIC-GED)
On right congruences of semigroups having no proper essential right congruences. (English summary)
Semigroup Forum **85** (2012), *no. 2,* 369–380.

A (right) congruence ρ on a semigroup S is essential if the intersection of ρ with any non-identity (right) congruence is not the identity congruence. The main result of this paper is the characterization of the semigroups, with an identity and without proper essential right congruences, whose lattice of right congruences is a distributive lattice. This result was previously published in a posthumous paper by R. H. Oehmke [Hadronic J. **27** (2004), no. 4, 459–471; MR2123090 (2005m:20147)] that appeared in a journal that is difficult to find and quite unusual for papers on semigroups. *Alessandra Cherubini*

References

1. Clifford, A.H., Preston, G.B.: The Algebraic Theory of Semigroups vol. 1. Am. Math. Soc., Providence (1961) MR0132791 (24 #A2627)
2. Dean, R.A., Oehmke, R.H.: Idempotent semigroups with distributive right congru-

Step 5: Using information: How to Find

Aust, & Buscher. (2012). Vertical cooperative advertising and pricing decisions in a manufacturer–retailer supply chain: A game-theoretic approach. *European Journal of Operational Research*, *223*(2), 473-482. doi: 10.1016/j.ejor.2012.06.042

Step 5: Using Information - Referencing

Reference Management:

- Keep track
- Annotate legibly
- Insert citations in correct format
- Share literature

Managers:

- EndNote, Mendeley, Zotero

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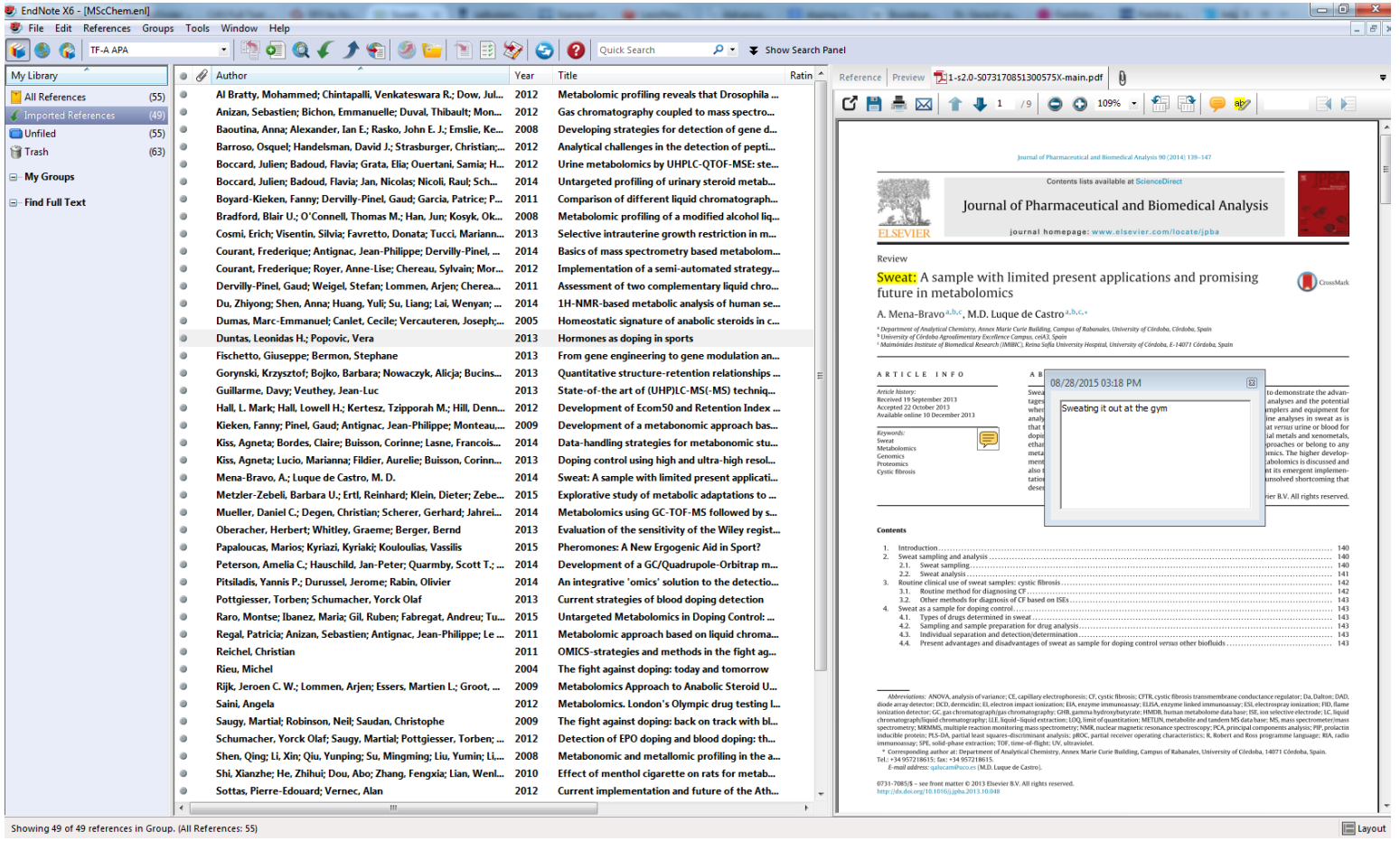

Assignments

- Do the exercises provided on the hand-out.

Questions?

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Step 5: Using Information - Problems

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