

Responsible Scholarship in Mathematics

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“Responsible scholarship is essential for everyone involved in the discovery, application and dissemination of knowledge.”

General resources:

- ▶ [Responsible Scholarship at KU](#) (source of above quote)
- ▶ [American Mathematical Society \(AMS\) Policy Statement on Ethical Guidelines](#)
- ▶ [AMS Policy Statements and Guidelines](#) (See in particular “Information Statements of the AMS Committee on the Profession”)
- ▶ [American Statistical Association \(ASA\) Ethical Guidelines for Statistical Practice](#)
- ▶ [Prof. Weishi Liu's 2019 RS presentation](#) (reproduced by permission)

- ▶ How do you write a research paper? (Well...)
- ▶ What goes into a paper? (abstract, introduction, definitions, theorems, proofs, bibliography)
- ▶ Collaboration: senior vs. junior coauthors, presumption of equality of authors (unlike other fields!), alphabetical rule

- ▶ Mathematical writing: \LaTeX , Knuth–Larrabee–Roberts, Lee, Bertsekas, Su, ...
- ▶ Literature searches: MathSciNet, arXiv, Google Scholar, library search, MathOverflow
- ▶ Managing bibliographies: BibTeX, Zotero, ...

- ▶ **A paper is not “official” until it is accepted for publication by a peer-reviewed journal.**
- ▶ Before submitting: [arXiv](#), share privately with trusted experts
- ▶ Journals vary: general/specialist, selective/less selective, commercial/society, print/electronic. Consult senior mathematicians.
- ▶ Avoid unscrupulous “predatory” journals (warning signs include: author charges; not indexed in MathSciNet; promises of turn-around within weeks; editorial boards without experts)
- ▶ No double submission!
- ▶ OK to inquire if you do not hear back in ~ 6 months
- ▶ Rejections happen; keep trying!

Plagiarism (DON'T DO IT)

- ▶ *cite sources*, consult experts, do not lift large chunks of text without attribution (when in doubt, better to cite than to not cite)
- ▶ R. Neidinger, “Avoiding Plagiarism in Mathematics”, Math Horizons, 23 (2016) no. 4, 16-17 [[local copy](#)]
- ▶ [Authorial Integrity in Scientific Publication \(SIAM\)](#)
- ▶ [Council of Science Editors \(CSE\): White Paper on Publication Ethics](#)
- ▶ [“Avoiding Plagiarism, Self-plagiarism, and Other Questionable Writing Practices: A Guide to Ethical Writing”](#) by Miguel Roig (DHHS Office of Research Integrity:)

All reputable journals, by definition, require manuscripts to undergo peer review before publication.

- ▶ *Editor*: receives submissions, decides which merit peer review, finds referee(s), gives guidance to referee about standards to apply (often depends on journal), intermediary for all correspondence, makes final decision to accept or reject
- ▶ *Referee*: independent expert responsible for evaluating the merits of a paper (correctness, importance, clarity, appropriate citations), making suggestions for improvement, submitting written recommendation (accepts/revise/reject) to editor; often involved in reviewing subsequent revisions; *does not communicate directly with author*
- ▶ All parties (editor, referee, author) should behave professionally: keep the focus on the merits of the manuscript; use neutral and impersonal language when pointing out errors or disagreeing over revisions.

- ▶ Typical time frame for review: 4–6 months (varies greatly; much slower in mathematics than most other fields)
- ▶ Most mathematics journals use *single-blind review* (referee knows who author is, but not vice versa).
 - ▶ Referees must not base their evaluation on the identity of the author(s)
 - ▶ Referees must disclose any conflicts of interest to editor
 - ▶ Referees must not misuse their knowledge of the results of the paper
 - ▶ Referees may count their work as professional service; OK to list journals but not individual papers
- ▶ [Best Current Practices for Journals](#) (IMU Committee on Electronic Information and Communication, 2011)
- ▶ [How Mathematics Research Journals Select Articles](#), Notices of the AMS **65** (2018), no. 1, 62–64

Grant Proposal Preparation

- ▶ *Major funding agencies:* NSF, NSA, AIM, national labs, Simons, institutes (MSRI, SAMSI, ICERM); [UIUC list of funding sources](#)
- ▶ *Categories of funding:* summer salary; support for proposer's ("PI's") graduate students; travel for PI, students, visitors; conference hosting
- ▶ Many proposals have two parts:
 - ▶ **Scientific merit:** What do you plan to accomplish? What methods will you use? How will it advance mathematical knowledge?
 - ▶ **Broader impact:** How will your work benefit society? (Solve real-world problems, contribute to education, support diversity and equity. . .)
- ▶ *Preparation/budgeting:* consult sponsored research office ([KUCR](#))
- ▶ *Publication:* Mathematics grants typically encourage you to publish results stemming from the research; always acknowledge sponsor
- ▶ [More resources from COGA](#)

Conflicts of Interest

“A conflict of interest is a set of circumstances that creates a risk that professional judgement or actions regarding a primary interest will be unduly influenced by a secondary interest.”¹

- ▶ **Examples** of COIs that can arise for academics. Also:
- ▶ Other examples: nepotism, conflict of commitment, inappropriate use of professional position, . . .
- ▶ Avoid not just COIs, but also the *appearance* of a COI
- ▶ Prevention:
 - ▶ **remove yourself** from situations where you may have a conflict
 - ▶ if in doubt, **disclose the conflict** to the person in charge (chair, grant officer, editor-in-chief, etc.)
- ▶ **KU policies on COIs**
- ▶ **Mathematical Association of America (MAA) policy on COIs**

¹Lo and Field, *Conflict of Interest in Medical Research, Education, and Practice*, National Academic Press, 2009

Maintenance of Confidentiality

Most online sources about confidentiality in research focus on methods to keep confidential the identity of participants in research studies — typically not an issue in mathematics. However, confidentiality is important in many contexts:

- ▶ As author/coauthor (consult coauthors before disseminating research)
- ▶ As advisor (guard student research and concerns)
- ▶ As student (materials and communications shared by advisor)
- ▶ As colleague (respect privacy of personal communications)
- ▶ As teacher (do not distribute student work)
- ▶ As referee (communicate only with editor)

Ask before disseminating

Student-Mentor Relations and Responsibilities

- ▶ [Graduate Student Mentoring Guide: A Guide for Students](#) (U. Michigan Graduate School)
- ▶ [Mentoring: A guide for Faculty](#) (KU COGA, drawing on a document developed at U. Washington)
- ▶ [Sample faculty/student mentoring agreement](#)

- ▶ [Advice to a Young Mathematician](#) by Atiyah, Bollobás, Connes, McDuff, Sarnak
- ▶ [Advice for New Doctoral Advisors](#), AMS blog on Teaching and Learning Mathematics
- ▶ [The Professor/Grad Relationship](#)
- ▶ [PhD Comics](#)