

About the Journal

Aim and Scope. The primary goal of the *Columbia Journal of Undergraduate Mathematics* is to provide undergraduate readers with high-quality, accessible articles on challenging topics, or novel approaches to teaching more familiar concepts. Articles published are purely expository; we do not accept research papers. Most are under 20 pages in length, with the primary exceptions being senior theses written by students at Columbia and other universities alike. The journal also accepts and publishes mathematical artwork with clear pedagogical value.

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Letter from the Editors

While forming the *Columbia Journal of Undergraduate Mathematics* in order to fill the lack of options for publishing undergraduate expository work, we were acutely aware that one of the most common forms of expository writing done by undergraduates at Columbia University is a senior thesis. However, as capstone projects to an entire undergraduate education, these theses are generally too lengthy, too niche, and too advanced to fit in the same editorial process as our general issue. Thus, we decided to create a separate annual *thesis issue* highlighting some of the best mathematical thesis work from Columbia in the past year. Of course, for the reasons enumerated above, it would be unreasonable to expect this issue to meet the accessibility standards of our general issue. As editors-in-chief, we set a different goal for this issue: for it to serve as an archive of mathematical thesis work, and specifically for it to be a resource to undergraduates in math hoping to write their own senior thesis. Specifically, we wanted the theses in question to be excellent models of what a senior thesis can be in terms of choice of topic, quality of writing, and extensiveness and organization of the survey, so that students reading the issue may both model their own theses after them, as well as use them as a jumping-off point if planning on writing a thesis.

We are confident that the two theses we selected to publish meet this criteria and will be an excellent read for advanced undergraduates interested in their contents, using them as inspiration for a thesis of their own, or both. “On Manifold Dimension Estimation” asks, if given a sample of points from a low-dimensional manifold inside of high-dimensional Euclidean space, can one determine the dimension of the manifold? The thesis provides background on manifolds, reviews a variety of estimation methods, and compares the difficulty of the statistical problems present. The topic is a fascinating mixture of statistics and topology, and the editors find this to be an excellent example of a thesis balancing depth and rigor with brevity. “Generating The Mapping Class Group” describes minimal generating sets of mapping class groups of surfaces with beautiful diagrams and plenty of historical context for the field of research.

Now as the editors-in-chief of this inaugural thesis issue, we want to highlight our wonderful team of content editors, copy editors, and graduate student editors for all the time and effort they have put into making this first issue. We would also like to acknowledge the support from the Columbia Libraries and Department of Mathematics, who were the technical and financial backbone to make this project come to life.

Sincerely,

Zachary Lihn, Lisa Faulkner Valiente, and Elizabeth Frost

Masthead

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