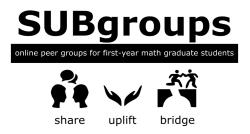# SUBgroups

Online peer groups for first-year math graduate students (gradsubgroups.org)

Nelson Niu, Katie Waddle, Marquia Williams and Yufei Zhang

SUBgroups

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share   uplift   bridge

The beginning of graduate school can be an isolating, confusing, and overwhelming experience. SUBgroups are online peer support groups that bring together first-year math graduate students, primarily from U.S. institutions. Participants meet biweekly over video conferencing platforms during the first semester of their master's or PhD programs. Established in 2019 and running two cohorts per year, SUBgroups has now supported hundreds of students to navigate these first difficult months.

Beginning as a student in a math graduate program creates new challenges along several axes simultaneously. We will describe four of these challenges and then say how SUBgroups peer groups work to address them. First, students are likely moving to a new city far from their support networks, and setting up a new home, finding a new grocery store, and figuring out a new commute. Students may be in a new country and navigating a language they speak but have not had to use full-time before. Most graduate programs are in large universities with byzantine logistical obstacle courses involving visas, health insurance, and payroll systems. A graduate program likely has intricate requirements, often involving a series of difficult tests, coursework, and finding an advisor.

While most U.S. graduate programs are structured so that a group of students matriculate in a cohort, these cohorts can be small, and it is common for people with minoritized identities to be extremely isolated. Women, people of color, queer folks, etc. often arrive in a graduate program to find they are one of a small handful, and people who have multiple of these identities can find themselves completely alone. Support across difference can be affirming, and allyship is essential for continuing to move towards a more diverse math community. At the same time, being able to talk about what you are experiencing with someone who shares your identity is sometimes essential. And while many of us have supportive friends and family that share our identities, they are often unfamiliar with the world of higher mathematics.

The early years of math graduate programs can feel siloed. Often students are not yet attending conferences or summer schools, and may not yet know many students in other programs. Without knowledge of what exists elsewhere, self-advocacy is difficult. For example, students in one program may struggle through a particularly difficult high-stakes qualifying exam process, while students in another are allowed to use course grades to show proficiency. Without knowing about other systems and realities, students normalize and accept unnecessary hardship.

A final challenge is the hierarchical nature of academia. In those first few semesters, students are not yet attached to an advisor, or see them infrequently. In contrast to high school or college where you hear from mentors frequently and (hopefully) receive positive feedback often, in the first few months of graduate school most students do not yet have anyone championing their success. Professors are over-worked and have little time for students before they pass their initial qualifying exams. In a time when students are taking the most challenging courses they have ever taken, or embarking on real math research for the first time, they are also receiving few signals that they are heading in the right direction.

Graduate programs can and should work to alleviate some of these challenges, and many are already aware of them and do excellent work to combat the isolation students feel. But there is still much room for improvement, and some of these challenges are impossible for a single graduate program to solve on their own. One attempt to work on these problems outside the auspices of a single graduate program is our initiative SUBgroups. In 2019 Drs. Marissa Loving and Justin Lanier established SUBgroups with the goal of bringing together students from different math graduate programs to share the experience of their first semester. The goal of SUBgroups is to leverage the scale of the larger math graduate school community to combat the isolation and siloization of individual programs.

Challenge #1: Navigating a stressful transition. SUBgroups was designed around the U.S. academic schedule. We coordinate two cohorts of students per year, one that starts meeting in September and another in October (while many schools in the U.S. start their year in late August, some schools begin in late September). The goal is to provide just-in-time support for students as they are beginning their new lives as graduate students. Students may be wondering where to go for academic or emotional support, how to decide which classes to take, how to think about possible advisor options, or be teaching for the first time. In SUBgroups students meet every other week with a group of students facing the same challenges. Group members can share resources, pass along good advice, and act as a sounding board. Most importantly, as a group of sympathetic peers, a SUBgroup can offer moral support during a stressful and potentially emotional time.

We have designed SUBgroups to alleviate the stress, not add to it. We know this is a busy time for students, so we make the application and group setup process as simple as possible. We do not require any essays or letters of recommendation, the application is a short survey that gives us enough information to put together groups that will hopefully have interesting things to talk about. Setting up the group meetings is as simple as using an online tool to find a workable time-slot and setting up a plan for video conferencing. We compose groups with participants who have similar time availability to make coordination easier. Groups only meet once every other week, since the first semester can be so overwhelming, and it can be difficult to find times that work for folks in different time zones with different schedules.

Challenge #2: Isolation of folks with minoritized identities. Our main approach in combating isolation is to cast a broad net, and then leverage our size. We advertise broadly, by reaching out to graduate program directors, putting notices in the AMS Headlines and Deadlines e-newsletter, and posting on Facebook and Twitter both to make use of our networks and to reach underrepresented people. We are as inclusive as possible, and welcome future academics as well as people intending to go on to teach or to work in industry, folks in statistics, and students in bridge-to-PhD programs. A single graduate program may be too small, but there is power in numbers.

To form groups, we collect demographic information in our application process, and ask participants what they are hoping to get out of the experience. Students say things like "I'd really like to connect with other non-traditional students,[1] I feel very

alone in my cohort in that sense" or "It would be awesome to have peers who are also trans or nonbinary, or (more broadly) identify as queer." We use this information to put together groups of four to six participants, often that share aspects of their identity. Our recent September cohort included a group of people who identify as queer, a group of Latino students, and a group of students who are first in their families to go to graduate school and wanted to talk to others in a similar situation. To make up for a lack of diversity in small graduate cohorts, SUBgroups can do the legwork to connect folks facing similar challenges across programs.

Challenge #3: Siloization. In some ways our participants are very similar to each other. They are all beginning math graduate programs, almost all at large universities in the U.S., and they are taking courses, exploring their math interests, and beginning the search for an advisor. Before each week of SUBgroups meetings we send out an email with a few suggested prompts. These prompts start by asking participants to share the basic structure of their program—what classes and exams are required, which classes are they taking the first semester, etc. We move on in future weeks to ask about how they are managing the added workload of graduate school, connections they are making with their cohort and classmates, and with faculty. Towards the end of the semester when groups have gotten to know each other, we ask about personal well-being—how they are doing and what strategies they are using to manage the stresses of their new life. Many of our participants comment in our feedback forms that they are grateful to hear that others are experiencing the same things as them. Not only the same types of tasks and hurdles to overcome, but the same stresses and doubts as well.

Sharing these commonalities also helps to reveal differences in helpful ways. For example, one of the authors, Katie, was trying to find community through her school's chapter of the Association for Women in Math, but finding one-hour events in the middle of the day lacking in depth. After talking with a member of her SUBgroup whose AWM chapter was hosting occasional happy hours, Katie went back to her own chapter and suggested an evening event that turned out to be much more personal. From small things like finding out about funding sources, to big structural things like learning that other schools have options to pass coursework instead of exams, learning how things are done elsewhere can be invaluable.

Challenge #4: Positive feedback. One of our hopes for SUBgroups is that it can be a support for students that might not have one otherwise. At the beginning of graduate school in the U.S. system you are not yet attached to an advisor, and so no one is yet invested in your success. First-year graduate courses are extremely challenging, but often no one is checking in to see if you are doing ok. We all need a pat on the back, a gold star, and the encouragement to keep going, and math graduate programs are often not set up to provide that positive feedback. In seeing the same people every

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[1] The term "non-traditional student" in the U.S. usually means a student with a less common path to doctoral study. They may have completed two years of community college before transferring to a four-year undergraduate institution, or have worked for a number of years before pursuing graduate studies. It also may mean they have extra responsibilities, such as care-taking for children or parents.

other week, the hope is that this small group can cheerlead each other through the first semester. Whereas a cohort at an individual university may feel disconnected, or worse, competitive, we invite SUBgroups to simply be a small group with a shared understanding about what they are going through that cares about each other's success. Of course graduate program cohorts can provide this support and often do; SUBgroups is a place to seek that support if it is lacking.

The future of SUBgroups. When Marissa and Justin formed SUBgroups in 2019, their intention was to create a sustainable program that was efficient and effective. As they moved on in their careers, they transitioned leadership to the authors, all former SUBgroups participants, who run the program as a service to the math community. While SUBgroups should remain a peer support community of grad students supporting grad students, we would welcome institutional support to help manage logistics.

As a leadership team, we are always trying to learn about and improve SUBgroups, and we try to incorporate feedback regularly. In addition to sending out surveys partway through and at the end of the program, we reach out to some minoritized participants directly to make sure that we are meeting the needs we set out to address.

There are a couple areas we are looking to improve next year. We hope to continue to streamline the logistics of setting up groups at the beginning of the semester—our biggest point of group collapse is still at the initial setup stage when groups fail to find a common time to meet, or somebody drops the ball on communication. We do not have moderators in the groups, because we believe that small groups of peers are the most effective unit to provide the kind of support we are trying to give. But this can be a challenge, as we do not know what exactly is happening in each group, and occasionally we hear only later about uncomfortable group dynamics. We continue to think about how to give participants tools to facilitate effective conversations that feel safe and comfortable for everyone to share.

Finally, SUBgroups has primarily been a U.S.-focused program, and expansion beyond the U.S. comes with new challenges. In par-ticular, the U.S. is highly coordinated around an academic year that starts in late August or late September, and around five to six years long PhD programs that include challenging coursework before students find an advisor. We would be excited to talk to people interested in starting a similar program in Europe that is adjusted to a European academic calendar and European-structured master's and PhD programs. A huge component of SUBgroups is the support of talking to people experiencing something very similar to what you are experiencing, and we have found that folks in the United States and in European graduate programs have a harder time finding commonalities across the many differences. In a different direction, a group of junior physicists has replicated the SUBgroups model with a similar program called SU(5), which is aimed at supporting first-year physics and astronomy graduate students. Their success suggests potential to expand to other fields of study, as needed. We would be interested to hear about any similar initiatives elsewhere, or ideas and suggestions for further developing SUBgroups.

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Nelson Niu is a PhD student studying category theory and algebraic topology at the University of Washington, and an organizer with their local graduate student union.

nsniu@uw.edu

Katie Waddle is a fourth year PhD student studying algebraic combinatorics at the University of Michigan and working towards greater gender equity in the math community.

waddle@umich.edu

Marquia Williams is a PhD student studying at the State University of New York at Albany.

marquiaw1@gmail.com

Yufei Zhang is a fourth year PhD student studying enumerative combinatorics at the University of Notre Dame.

yzhang43@nd.edu