

Mathematics Department Graduate Student Early Orientation
August 13-16, 2024

Goals for the program:

The main activity for this week will be to read through a math paper collaboratively. Our goals for this week are:

- reviewing fundamental ideas in linear algebra,
- developing as independent readers of mathematics,
- developing mathematical collaboration skills,
- learning productive and effective ways to define/measure “success” in grad school,
- providing useful language for discussing struggles and failures,
- getting to know other new students in the graduate program, and
- gaining familiarity with campus.

To support this, ***read the following articles prior to the early orientation:***

- *What is talent – and can science spot what we will be best at?* by Scott Barry Kaufman, July 6, 2013, The Guardian
 - <https://www.theguardian.com/science/2013/jul/07/can-science-spot-talent-kaufman>
- *Advice to Young Mathematicians*. From the Princeton Companion to Mathematics.
 - https://assets.press.princeton.edu/releases/gowers/gowers_VIII_6.pdf
- *Living Proof: Stories of Resilience Along the Mathematical Journey*, Heinrich et al. (Eds.), 2019, MAA/AMS.
 - Read Chapters 1, 19, 30, 41
 - <https://www.ams.org/about-us/LivingProof.pdf>

Something to keep in mind for the program (and beyond):

From “The Rhythm of Great Performance” by Tony Schwartz, New York Times, Feb 28, 2015

1. Do your most challenging and important work as soon as possible after you wake up, when you have the most energy. (If your highest energy is in the evenings, and you have flexibility, save your hardest work for then.)
2. Focus in the most absorbed way possible when you are working and then take a break at least every 90 minutes to refuel your energy reservoir. Any activity — like deep breathing, reading a novel, talking with a friend or taking a run — can be effective. The key is choosing something you find restorative.
3. Always have lunch, preferably away from your desk.
4. If you can, take a nap no longer than 20 to 30 minutes between 1 and 4 p.m. It will give you a surge of energy — and potential productivity — for the rest of the afternoon. If a nap isn't possible, simply closing your eyes for a few minutes can still be a source of modest renewal.

Regarding locations for group work on campus:

Below are comments from previous graduate students regarding pros and cons of doing collaborative mathematical work at various locations on campus. Make sure to bring chalk and dry erase markers with you in case they are missing from the study rooms. You can get these from Rejeana or KT.

- POT 8th and 9th floor conference rooms - Pros: lots of board space, available most of the time. Cons: no windows
- POT 745 - Pros: Convenient, good amount of board space. Cons: It is used often by other people. No windows.
- POT 715 - Pros: a favorite for everyone. Cons: none given yet.
- Science Library - Pros: Projector is available, windows. Cons: Smaller rooms, not a lot of board space.
- Fine Arts Library - Pros: Projector is available, windows, lots of board space.
- Engineering lobby - Pros: Lots of board space, different type of environment. Cons: It is always freezing!
- Willy T Library basement and second floor - Pros: Good board space, snacks and drinks close. It is farther away which is a pro on a nice day. Cons: No windows in the basement.
- Math House - This is available to math graduate students most mornings and all day Friday and weekends. Please ask Rejeana for the code.
- Mathskeller - This is available in the evenings and (eventually) your University ID card should give you access.

Strategies for Group Work:

Here are a few strategies for working in groups when doing mathematics.

- Start by making a plan. Who is taking notes? Are you using the board? If so, who is taking photos before erasing? How will it get shared/stored? Who is the moderator/leader for the discussion?
- Don't go through the devilish details until you've looked over the paper as a whole. What are the main results? What is the structure of the paper? What are the fundamental objects being considered, and do you know the definitions required to start reading?
- Strive to reinforce pictures with symbols and reinforce symbols with pictures.
- When first getting to know each other and working styles, it is sometimes helpful to explicitly assign roles to people, i.e. someone works as an optimist, someone else works as a skeptic, someone else works to make sure that all statements/claims are clear and precise, etc.

Schedule:

Tuesday, August 13

1:30-4:30: POT 110 (Patterson Office Tower)

- 1:30-2:00: introductions, welcome to the program, discussion of main goals of week, discussion of schedule and learning outcomes for orientation
- 2:00-4:30: Mathematics activity and discussion of reading assignments

Wednesday, August 14

1:30-4:30 (take a break!): Science library study rooms (meet at 1:20PM in ground floor lobby of POT to walk over): Divide into groups for coached collaborative reading of the Amer. Math. Monthly paper by Marsli and Hall on Gersgorin disks

Thursday, August 15

9:00-11:30 (take a break!): Fine Arts library study room (meet at 8:50AM in ground floor lobby of POT to walk over): coached collaborative reading of the Marsli/Hall paper

11:30-1:30: lunch (not provided) and social time

1:30-4:30 (take a break!): Young Library 2nd floor whiteboard area (meet at 1:20PM in ground floor lobby of POT to walk over): coached collaborative reading of the Marsli/Hall paper

Friday, August 16

9:00-11:30 (take a break!): POT 110 (Patterson Office Tower): Complete and review our work on the Marsli and Hall paper. What did you learn? Where did you struggle? What were take-away lessons that you will apply to your studies in the fall? What did you like about the paper? What did you dislike?

11:30-3:30: lunch (not provided) and social time