

**Mathematics Department Graduate Student Pre-Orientation
Information and Schedule
August 8-12, 2016**

Activities and goals for the program:

The main activity for this week will be to read through two papers collaboratively. Our goals for this week include: reviewing fundamental ideas in linear algebra and analysis, developing as independent readers of mathematics, developing as mathematical collaborators, getting to know the students in the graduate program, and gaining familiarity with campus. To support this, *read the following articles prior to the orientation week* (some of these were recommended by current students).

- *Practice Alone Does Not Make Perfect, Studies Find*, by Scott Barry Kaufman, July 15, 2014, Scientific American
 - <http://blogs.scientificamerican.com/beautiful-minds/practice-alone-does-not-make-perfect-studies-find/>
- *Is Math a Gift? Beliefs That Put Females at Risk*, by Carol Dweck. In S.J. Ceci & W. Williams (Eds.) (2006); Why aren't more women in science? Top researchers debate the evidence. Washington, DC: American Psychological Association.
 - https://psychology.stanford.edu/sites/all/files/cdweckmathgift_0.pdf
- *Waking Up: Using Mindfulness Meditation in Graduate School*, by Michele Borynski
 - <http://www.psychologicalscience.org/index.php/uncategorized/waking-up-using-mindfulness-meditation-in-graduate-school.html>
- *Advice to Young Mathematicians*. From the Princeton Companion to Mathematics.
 - http://press.princeton.edu/chapters/gowers/gowers_VIII_6.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
<http://www.nytimes.com/2015/02/28/business/dealbook/the-rhythm-of-great-performance.html>

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.

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.

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 - Pros: Good board space, snacks and drinks close. It is farther away which is a pro on a nice day. Cons: No windows.

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 Sheri or Christine.

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.

Ideas for Evening Social Activities: Some options can be found at the events calendar for the Lexington Herald-Leader, <http://calendar.kentucky.com/>

Schedule:

Monday, August 8

Morning activities in POT 745

8:30-9:00: coffee and light breakfast

9:00-9:45: introductions, welcome to the program, discussion of main goals of week, discussion of schedule and learning outcomes for orientation

9:45-10:00: break

10:00-11:30: Mathematics activity and discussion of reading assignments

11:30-1:00: lunch (not provided) and social time

1:00-4:30 (take a break!): Science library study room: coached collaborative reading of the Amer. Math. Monthly paper by Marsli and Hall on Gersgorin disks

Tuesday, August 9

8:30-11:30 (take a break!): Fine Arts library study room (meet at 8:15AM in lobby of POT to walk over): coached collaborative reading of the College Math Journal paper by Kalman on six ways to sum a series

11:30-1:00: lunch (not provided) and social time

1:00-4:00 (take a break!): Young library study room (meet at 12:45PM in lobby of POT to walk over): coached collaborative reading of the Amer. Math. Monthly paper by Marsli and Hall on Gersgorin disks

4:00-4:30: review activities for the day, make a mathematical plan for Wednesday

Wednesday, August 10

8:30-11:30 (take a break!): location TBD: coached collaborative reading of the College Math Journal paper by Kalman on six ways to sum a series

11:30-1:00: lunch (not provided) and social time

1:00-4:00 (take a break!): location TBD: coached collaborative reading of the Amer. Math. Monthly paper by Marsli and Hall on Gersgorin disks

4:00-4:30: review activities for the day, make a mathematical plan for Thursday

Thursday, August 11

8:30-11:30 (take a break!): location TBD: coached collaborative reading of the College Math Journal paper by Kalman on six ways to sum a series

11:30-1:00: lunch (not provided) and social time

1:00-4:30 (take a break!): location TBD: coached collaborative reading of the Amer. Math. Monthly paper by Marsli and Hall on Gersgorin disks

- During the final 75 minutes of the afternoon, review the work of the week 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?

Friday, August 12

8:30-12:00 (take a break!): location TBD: coached collaborative reading of the College Math Journal paper by Kalman on six ways to sum a series

- During the final 75 minutes of the afternoon, review the work of the week on the Kalman 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?

12:00-1:30: lunch (not provided) and social time

1:30-3:00: POT 245: tie up loose ends from the week as much as possible, recap of activities, reflection on the learning goals for orientation, preview of fall semester courses.