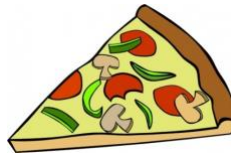## UNDERGRADUATE MATH SEMINAR

The next math seminar of the term will be

DATE: <mark>THURSDAY, September 28</mark>

Time & **12:30 –** Pizza in **Bailey 204**

Location: **12:50 – 1:45** Seminar in **Bailey 207**

In this seminar, **Professor Kirsten Hogenson** from the math department at Skidmore College, whose research interests include graph theory, discrete mathematics, and combinatorics, will present the following talk.

Professor Kirsten Hogenson

Title: Rainbow Static Mastermind

Abstract: The Rainbow static Mastermind is a game where a player tries to guess a secret sequence of n distinctly colored pegs. The player submits a list of guesses and they receive two pieces of feedback per guess: the number of correct colors in the correct positions and the number of correct colors in the wrong positions. To win, the player must correctly determine the secret code based on this feedback. Mastermind is a well-studied game with applications to artificial intelligence, data security, and bioinformatics. In the static version, researchers often seek a shortest list of questions which is sufficient to win the game. In this talk, we will discuss optimal question lists in the $n=2$ and $n=3$ cases. *This research was completed during June 2023 and supported by Skidmore College's Faculty-Student Summer Collaborative Research grant program.*

My Summer REU Experience, by Mayah Teplitskiy '24

This past summer I participated in the SMALL REU at Williams College, where I researched a potential approach to be able to construct local domains with any desired prime ideal structure. An REU, or a Research Experience for Undergraduates, is a program that runs for usually about 9 or 10 weeks over the summer that provides undergraduate students with the opportunity to get experience doing research. One of the main goals of an REU is to help undergraduates decide whether they have an interest in pursuing a research-based career.

Since I declared a math major, I've known that I'm interested in going to graduate school to study math, so an REU was just "the thing to do." At the end of the fall term last year, my advisor sent me a spreadsheet that had a list of all the REUs being offered and all the information I could want about them. I used that spreadsheet to figure out which REUs I wanted to apply to and then it was time to apply. The application process was very much like the college application process. I needed to write a personal statement and get letters of recommendation. Some REUs also asked for a research statement or a personal diversity statement. Early in the winter term, a professor from the SMALL REU reached out to me and asked for an interview. And then I was accepted!

At the REU this past summer, my group worked regular work hours (9:00am - 5:00pm). After work we would go on hikes, cook dinner together, have game nights, have movie nights. It was a great experience because it was really fun to be able to network and meet more people in the Math community outside of Union College. It was also really nice to be surrounded by other math majors who understood why I find math so interesting and were equally motivated and excited about what I was doing as I was.

I'm really happy that I was able to participate in this REU over the past summer and it helped reinforce my plan to go to graduate school. I also got to learn some really cool math, which is always a plus!

Some Math Faculty Summer Highlights

Continuing a feature from last week's newsletter, here are some more highlights of some activities of some of the math faculty this past summer.

From left to right: Banach, Friedman, and Nikodym chilling in Krakow.

- **Professor Paul Friedman** taught a calculus course as part of the Academic Opportunity Program (AOP). In addition, he worked on the math placements of the incoming students. Outside of these Union activities, his travels took him to Krakow, Poland for a few days. There he befriended the famous Polish mathematicians, Stefan Banach and Otto M. Nikodym, as he noshed on an obwarzanek krakowski …, the original bagel, on the park bench shown in last week's newsletter.

- **Professor Christina Tønnesen-Friedman** wrote: I gave talks at two European conferences this summer. The first conference was in June: *Sasakian manifolds, Riemannian foliations, and related topics* at Jagiellonian University, Kraków, Poland, and the second conference was in August: *Analytic Methods in Complex Geometry*, at WWU Münster, Germany.

  It was exciting to visit both places, meeting new as well as old friends in my research field. Two sweet (food!) highlights from the trips were paczki in Kraków and Herrenspeise in Münster. The rest of the summer included seeing family in Denmark, Long Island, Philadelphia, and Washington DC, as well as running many, many miles in the Niskayuna neighborhood in preparation for some fall ultramarathons.

Math Club

The math club had its kick-off meeting this past Thursday, welcoming new members and reconnecting with continuing members. President Livi Gwinnett led a discussion of ideas for math themed events that the entire Union community might enjoy. Discussions and planning will continue at the next math club meeting(s) – which are open to everyone!

Putnam Exam Preparation

The William Lowell Putnam Mathematical Competition, aka, The Putnam Exam, is an annual contest for undergraduate students across the United States and Canada. This six-hour 12-question contest is held on the first Saturday of December. To help Union participants prepare for this, a Putnam Exam Preparation squad will be meeting weekly. The (math) problem-solving sessions are open to everyone, regardless of interest in taking the actual Putnam Exam – it's just for fun!

To be put onto the Math Club's or Putnam Exam Preparation Squad's mailing list, scan the QR code and then provide your name and email address.

Putnam Exam Preparation: Mondays at 5:00
Math Club Meetings: Thursdays at 5:30

Location of Both: Math Common Room, Bailey 204