Welcome to the Math Department Newsletter

Welcome to the new members of the Union family!

The math department publishes a weekly newsletter to inform its readership about events in the math department (for example, seminars, math club activities, math contests), resources and opportunities for students interested in math (for example, Research Experiences for Undergraduates (REUs), internships, and jobs suited for math students) and news from the greater mathematical community. The newsletter is distributed via email and is also posted on the math department's website, https://www.union.edu/mathematics under the Activities tab. A direct link to bookmark is

https://www.union.edu/mathematics/newsletters

If you would like to contribute to the newsletter, or you have ideas for the newsletter, or you would like to be added to our mailing list, please email **Professor Paul Friedman** at friedmap@union.edu.

UNDERGRADUATE MATH SEMINAR

During each academic term, the Math Department runs an Undergraduate Mathematics Seminar. This fall, **Professors Louisa Catalano** and **Phanuel Mariano** will be coordinating the seminar, a weekly series of ~45-minute talks about math – current research, famous older problems, interesting topics from fields outside of the standard curriculum, etc. The seminars will be announced in the newsletter, via email, and online on the math department's website under the Activities tab, or directly at https://www.union.edu/mathematics/upcoming-student-seminar-talks.

The first seminar of the fall term is

DATE: **THURSDAY, September 23**

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

Location: **1:00 – 1:45** Seminar in **Bailey 201**

In this seminar, Union College Professor of Mathematics, Emeritus, **Julius Barbanel** will present the following talk.

Professor Julius
Barbanel

Title: How to Cut a Cake

Abstract: Suppose that you and I are given a cake that we wish to divide between the two of us. We may value pieces of cake differently. For example, maybe I like the chocolate filling best, but you like the icing best, so a piece of cake that I value as half the cake, you might value as a third of the cake. What would constitute a "good" division of the cake? We shall consider two sorts of criteria, namely "fairness" and "efficiency". Fairness involves such questions as "Did I get at least half?" or "Did I get at least as much as you?" Efficiency involves questions such as "Is this the best way to divide the cake or is there a way to divide the cake that would make each of us happier?" We will see that there are interesting mathematical ideas and revealing geometric pictures associated with these issues. We will also consider what happens when we wish to divide the cake among more than two people.

Calculus Help Center – open for business!

The math department runs a Calculus Help Center (CHC) that offers *free, drop-in, tutoring* in calculus courses through Math 117. It is open Sunday through Thursday nights 7:30-10:00pm and is located in the SORUM HOUSE seminar room.

What We Did this Summer

When the academic year ends in June and students leave campus for the summer, the faculty take the opportunity to continue their research activity, visiting collaborators and colleagues (in-person or via Zoom), attending and speaking at conferences (again, in-person or via Zoom!), as well as preparing themselves for the upcoming academic year.

Here are some bullet point highlights of some of the activities of some of the math faculty this past summer. *There will be more such reports in the next newsletter.*

- **Professor Paul Friedman** was happy to be able to teach calculus in the AOP (Academic Opportunity Program, in-person and unmasked (during the lull in COVID-19). In addition, he worked on the math placements of the incoming students. Outside of this, he was glad to finally be able to visit family in-person and to take a few day trips around the beautiful Capitol Region.

- **Professor Jeff Jauregui** was invited to a conference at the Oberwolfach Mathematical Research Institute in Germany. Due to COVID, he opted to stay in Schenectady and attend the conference (and give a talk) virtually. Some of the talks started at 4:30am New York time, so it made for a long week but was a great experience! By not attending in person, he unfortunately missed out on the "Schwarzwälder Kirschtorte" -- Black Forest cake -- that is famous in the region.

Professor Kathryn Lesh enjoying some time in the Adirondacks (above) after working on some beautiful mathematics (below).

- **Professor Kathryn Lesh** hosted a month-long visit by a research collaborator from her Women in Topology research team. With an insight provided by another colleague, they were able to prove two theorems they had previously conjectured but found inaccessible. The paper was submitted at the end of the summer (yay!), and fingers are crossed for its acceptance for publication. The visit was punctuated by a hike in the Adirondacks, and by kayaking with **Professor Brenda Johnson.**