

UNDERGRADUATE MATH SEMINAR

The next math seminar of the winter term will be

DATE: **Thursday, January 23**

Time & **12:30 pm** – Pizza and drinks in Bailey 204

Location: **1:00 pm** – Seminar in **Bailey 207**



Professor Emeritus
Susan Niefield

This week's seminar is themed to tie in to Union's yearlong celebration of the 50th anniversary of co-education at Union.

Making Our Mark: Women in Mathematics, at Union and Beyond

Abstract: In conjunction with our celebration of the 50th anniversary of co-education at Union College, we invite you all to a special celebration of women in mathematics in our upcoming math seminar. We will hear from Professor Susan Niefield about her experience as a mathematician and as the first woman who joined the math department faculty at Union. We will then briefly introduce some professional organizations that focus on making the mathematical community more inclusive. In particular, members of The Association for Women in Mathematics Chapter at Union will share their stories and talk about their events and resources. Finally, we will watch a short film "Journeys of Women in Mathematics", that shows the difficulties and triumphs of three women mathematicians from three different continents: Neela Nataraj from India, Aminatou Pecha from Cameroon, and Carolina Araujo from Brazil.

**Joint AWM and Math Club meeting (after the seminar):
Thursday, January 23, 2:00, Math Common Room, Bailey 204**

Learn to Typeset Math Like A Pro: LaTeX

Ever wonder how complicated math symbols and beautiful equations are typeset to look so good? They are usually produced using "LaTeX" (or a variant of it). Many math and science Union students use LaTeX to type their thesis, research, or even problem set solutions. If you would like to learn how to use LaTeX, Jillian Guthrie, a senior math and physics major, and the **Society of Physics Students** are holding a LaTeX workshop **Monday, January 20 at 6:30pm** in **ISEC 018**.

$$\int_a^b f(x) dx = \lim_{n \rightarrow \infty} \sum_{k=1}^n f(x_k^*) \Delta x$$

This was typeset using LaTeX.

Upcoming: Mathematical Contest in Modeling

Get ready for the 34th annual Mathematical Contest in Modeling (MCM). This international contest challenges teams of students to clarify, analyze, and propose solutions to open-ended real world problems. It is a *100 hour* affair that runs from **Thursday, February 13 at 5pm** to **Monday, February 17 at 8pm**.

In this contest, teams of three students will choose one of several problems to work on over a long weekend (on campus), ultimately producing a solution/report for online submission to MCM. To do this, they may use any resources they want! Past problems include stunt-person landing, water strategy, radio propagation, eradicating Ebola, cooperation between self-driving cars, and many others.

Professor Jue Wang (wangji@union.edu, Bailey 208C) is coordinating Union's participation in the MCM. If you are intrigued and/or would like to participate, please contact her.

Visit <https://www.comap.com/undergraduate/contests/> for more information and past contest problems.

Summer Opportunity: Research Experiences for Undergraduates (REUs) in Math

The National Science Foundation (NSF) sponsors many Research Experience for Undergraduates (REUs) in mathematics at colleges and universities throughout the country. These are summer programs that last 6-8 weeks in which undergraduates are given the opportunity to learn new mathematics and to perform some mathematical research – and get paid for it (~\$3000-4000).

The range of research available to students among the programs is wide and the topics are varied. For example, there are REUs in: algebra, algebraic geometry, analysis (real or complex), combinatorics, computational mathematics, differential equations, differential geometry, discrete math, dynamical systems, fractals, geometry and physics on graphs, graph theory, knot theory, mathematical biology, mathematical physics, matrix analysis, number theory, probability, statistics, wavelets, and more! No matter what the field, the projects are designed to be accessible to undergraduate math majors.

Some universities put a twist on their summer program and have students take some specially designed, usually advanced undergraduate, coursework to help prepare students for graduate school. Cornell University does this, as do some others. Additionally, some programs target a specific audience, usually groups that are underrepresented in mathematics (women and certain minorities).

Who should apply? Math majors, typically in their junior or sophomore year, though some programs accept applications from current seniors (for the summer after graduation). Most applicants to REUs are considering going to graduate school in math or a related discipline and would like to see what math research is about. As REUs are generally funded by the US government through the NSF, these programs generally require participants to be US citizens or permanent residents. In terms of coursework, most programs require participants to have had multivariable calculus through Math 117, a course similar to Math 199, and/or a course beyond Math 199 that requires proof-writing.

What are the options and how does one apply? The primary source listing REUs is the website for the American Mathematical Society (AMS): <http://www.ams.org/programs/students/emp-reu>. Most of the REU programs listed there handle their applications through MathPrograms.org, a link on the AMS page above. **Be aware** that some programs start before Union's spring trimester finishes, so you might not be able to participate in them. **Act soon!** Most of the application deadlines to REUs are in February or early March. They typically require a personal statement describing your math background and your interests in math. They also require **letters-of-recommendation**, so you will need to plan NOW so that your letter-writers have time to write on your behalf.

What now? Go to the AMS website, browse through the different programs, and get excited by the opportunities. Also, feel free to contact **Professor Jeff Hatley** (hatleyj@union.edu, Bailey 206A), the math department's REU contact to discuss the different programs and your options.

Problem of the Newsletter – January 20, 2020

Last week's problem: Congratulations to **Tzu-Ruei Huang '22** for solving last week's problem. You can see his winning solution posted at the newsletter sites in Bailey Hall.

This week's problem:

Problem. For $n \geq 1$ call a finite sequence (a_1, a_2, \dots, a_n) of positive integers **divvy** if $a_i < a_{i+1}$ and a_i divides a_{i+1} for all $1 \leq i \leq n - 1$. Find the number of divvy sequences such that the sum of the terms in the sequence is equal to 360.

Professor Friedman (friedmap@union.edu) will accept solutions until noon on Friday, January 24.