

## UNDERGRADUATE MATH SEMINAR

The next math seminar on the term will be

**DATE:** **THURSDAY, April 13**

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

**Location:** **12:55** – **1:45** Seminar in **Bailey 207**

In this seminar, **Professor Rylan Gajek-Leonard** of the Union College math department will present the following talk.



Professor Rylan Gajek-Leonard

**Title:** *Is -1 Really Negative?*

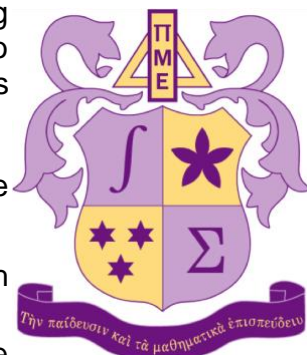
**Abstract:** We all have an intuitive notion for the 'distance' between two numbers. For example, we might say that the distance between the numbers 3 and 5 is 2, and the distance between -5 and 1 is 6. But what do we really mean by 'distance'? Are there other ways to measure numbers? It turns out that the answer is "yes!": for every prime number  $p$ , there is a way to measure numbers in terms of their divisibility by  $p$ . In doing this, we are led to the world of *p-adic numbers*, a strange place where all triangles are isosceles and where every point in a circle is its center. In this talk, we'll re-examine our intuition for the "size" of a number, and we'll show that, when measuring things correctly, -1 is equal to an infinite sum of powers of 2.

## Pi Mu Epsilon – Math Honors Society Accepting Applications

Pi Mu Epsilon (PME) is a national undergraduate math honors society. In Spring 2013, a chapter of PME was established at Union College. Now we are looking to induct new members who have demonstrated an ability and interest in mathematics consistent with PME's purpose and goals.

To be considered for membership into Union's chapter of PME, a student must have

- taken at least two math courses at the 200-level or above;
- a minimum campus-wide GPA of 3.0 and a minimum GPA of 3.0 in all math courses that can be used to fulfill a math major;
- a demonstrated engagement and involvement, while at Union College, in the promotion of mathematics at Union College and/or broader community, (examples include, active involvement in the Union College Math Club, in the Association of Women in Mathematics, in the Hudson River Undergraduate Mathematics Conference, in the Calculus Help Center, in math tutoring through the Kenney Center, in math problem solving training sessions and/or competitions, regular attendance at the Union College Math Department Seminar);
- an interest in joining PME, demonstrated by writing a few paragraphs/mini-essay in an email to **Professor Paul Friedman** ([friedmap@union.edu](mailto:friedmap@union.edu)) explaining your interest, your qualifications, and how you have supported and will continue to support the purpose and goals of PME. This email must be received by **noon on Friday, April 21**.



The national initiation fee for PME is \$30. This covers the cost of membership and also a one-year (two issue) subscription to the MPE Journal. Members of MPE can also purchase other PME items such as tassels for graduation, t-shirts, etc. For more information, go to the website [pme-math.org](http://pme-math.org).

## Pieces from Thesis – by Shizhe Li

**Shizhe** wrote his senior thesis this past fall and winter terms, supervised by **Professor Brenda Johnson**

In the past two terms, I wrote my thesis with Professor Brenda Johnson. My thesis subject was about intrinsically knotted (IK) graphs, which is an area in the intersection of knots and graphs. In my thesis, I show the Heawood graph is the only intrinsically knotted bipartite graph with 21 edges using the restoring methods. Throughout the two terms, I learned extensively about graph theory, knot theory, and basic topology.

In my thesis experience, I faced a lot of challenges. When I first started this project, my goal was to find invariants for IK graphs by building a simplicial complex. However, this approach was not fruitful. Then, I tried to prove the minimal edge requirement for a bipartite IK graph using double induction. Unfortunately, I realized my proof was wrong when I read other papers. I was not able to find a specific topic until the second term. However, the experience of reading different papers and trying different techniques really helped me a lot with my proof. I really advise my peers to be open-minded to explore and learn about different topic.

## Game Night this Wednesday!

The Union College chapter of the Association for Women in Mathematics (AWM) will be hosting a **game night** this **Wednesday, April 12** from **5:30 - 6:30 pm** in **Bailey 204**, the math department common room. Math games, snacks, and drinks will be provided - and, if you have your own game that you would like to bring and play with others, do so! All are welcome to this fun event!!

## Design the Next MAA T-Shirt, Win a Prize!

Are you graphically gifted? Do your friends often say you're the "punniest of them all"? Then this message is for you!

The MAA is looking for creative designs for the new MAA t-shirt! In the past, these shirts have been funny, mathematically sound, and worn with tremendous pride by our members. Past design winners have received a free shirt, recognition on MAA social media accounts, and royal bragging rights. This year's selected designer will also win a \$50 Amazon gift card! Additionally, the t-shirt will be sold at MAA MathFest 2023. Ready to submit your design?

[VIEW GUIDELINES AND SUBMIT NOW!](#)

For questions relating to the contest, contact [communities@maa.org](mailto:communities@maa.org).

Quiz Time!

### GUESS THE WORD

G \_ M E

N \_ G H \_

April 12  
5:30 - 6:30  
Bailey 204

SNACKS AND DRINKS INCLUDED!  
Professors are welcome!

Feel free to bring your own games!



## T-SHIRT DESIGN CONTEST

DESIGN THE NEXT MAA T-SHIRT!