UNDERGRADUATE MATH SEMINAR

The seminar this week will be back in its usual time slot.

DATE: <mark>Thursday, February 28</mark>

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

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

In this seminar, **Professor Jetjaroen (Jay) Klangwang** from the Department of Mathematics at **Union College** will present the following talk:

Professor Jetjaroen Klangwang

Title: Unexpected Groups

Abstract: *Exercise: Prove that the set of real matrices*

$$G = \left\{ \begin{bmatrix} a & a \\ a & a \end{bmatrix} : a \neq 0 \right\}$$

forms a group under the usual matrix multiplication.

This exercise guarantees an unease if we think that the question asks us to show that the given set is a *subgroup* of the multiplicative group of non-singular matrices.

The purpose of this talk is to give some examples of such groups, and to answer the question: *Which sets of singular matrices form groups under matrix multiplication?*

A Math Major's Term Abroad: Kallan Piconi '20 Checks in from Cambodia

As a math major at Union, there is no obvious study abroad program geared toward my major. Fortunately, it allowed me to choose any study abroad program regardless of course content. I ended up choosing the political science-oriented trip to Cambodia this winter. It enabled me to study new topics and immerse myself into the culture at the same time. Studying Buddhism, the Khmer language, environmental destruction, the Khmer Rouge, Cambodian family life, women in third world countries, and much more; I have gotten the chance to learn about Cambodian culture as a whole from the inside-out– an experience I never would have gotten otherwise. Additionally, the study abroad

Kallan Piconi, '20, second from left in the back row

program in Cambodia incorporates two NGO internships. Last month I interned for three weeks at a micro finance NGO which distributes interest-free microloans and free business training to female-run businesses primarily in the slums of Phnom Penh city. Currently I am teaching art classes to 4th and 5th graders outside of Siem Reap to inspire creativity in students who rarely get the chance to create something of their own otherwise. Through meeting locals and interacting with students I have experienced such a unique and giving culture. I would highly recommend that all students work to find time in their schedules to explore a new country and step out of their comfort zones.

Math and Physics Clubs Held Joint Dinner and Discussion with Professors,
By Math Club President, Emily Rosenlof '20

This past Wednesday, February 20, the Math Club and the Physics Club co-sponsored a Dinner and Discussion with Professors. The dinner went very well. We had a turn-out of about 15 people, including the three invited professors, **Professors Brenda Johnson** and **Jeff Jauregui** from Math, and **Professor Jef Wagner** from Physics. A lot of students who attended the event are involved with both subjects in some way. Chinese food was served. We talked about the research done by the three professors and how they became interested in their field (math or physics) over another field. We also discussed the differences in the languages of math and physics which make it difficult for a mathematician and a physicist to collaborate and/or read one another's work. Finally, we touched on the theorems and equations that are used in both math and physics but are referred to in completely different ways so it is hard to even understand that you are studying/talking about the same exact concept.

HRUMC – Saturday, March 23, 2019 at Smith College: Sign-up Now!

Interested in attending HRUMC? If you would like to go to this year's HRUMC, please email **Professor Paul Friedman** (friedmap@union.edu). Transportation to/from the conference might be limited, but we will do our best to accommodate all interested students. (There is **no charge** for attending the conference, and breakfast and lunch will be provided at the conference.)

The Ongoing Petitioning Process:

Don't forget to accept your petitions Tuesday, February 26th through Thursday, February 28th.

New York Space Grant Internship – Ursa Space Systems

The New York Space Grant Consortium anticipates funding undergraduate students for summer 2018 internships with various aerospace companies within NY State. To be eligible for NY Space Grant funding, a full-time student must be (1) a United States citizen, (2) a New York state resident or attend a New York college/university, and (3) majoring in a STEM (science, technology, engineering, or math) discipline. Additional eligibility requirements exist for each internship opportunity. Women and students from underrepresented groups are encouraged to apply.

Details and Deadlines: Apply by March 31, 2019 for NYSG internships at Ursa Space Systems in Ithaca, NY. More details can be found at https://www.nyspacegrant.org/2019-summer-internships/

Problem(s) of the Newsletter – February 25, 2019

Last week's problem: Congratulations to Hoang Tran for submitting a correct solution to last week's problem. You may view solutions to the problem at the newsletter sites in Bailey Hall.

This week's problem (from ASM): Pat, Shannon, and Fido (their dog) are on a circular path 100 feet around. Fido is very excited. Shannon starts walking around the path maintaining a speed of 1 foot per second, while Pat stays still. Fido begins racing back and forth between Pat and Shannon on the circular path along the section of the path Shannon has NOT walked on. What is Fido's overall average speed if he has just returned to Pat for the 5th time when Shannon gets to the halfway point? Assume Fido maintains a constant speed of 3 feet per second for his last run back to Pat. Also assume that Fido met Shannon at equally spaced moments in time (including the starting).

Professor Friedman (friedmap@union.edu) will accept solutions until midnight Friday, March 1.