

UNDERGRADUATE MATHEMATICS SEMINAR

The next seminar of the winter term will be:

DATE: **MONDAY, February 22nd**

Time & **4:15pm** – Refreshments in the Math Common Room, **Bailey 204**

Location: **4:30pm** – Seminar in **Bailey 207**

In this seminar, **Professor Mike Hill** of the **University of Virginia** will deliver a talk that will introduce some of the concepts in a 45-year old conjecture, now a theorem, that he, along with two collaborators, proved recently. For more information about this development, see https://simonsfoundation.org/news/-/asset_publisher/bo1E/content/mathematicians-solve-45-year-old-kervaire-invariant-puzzle

TITLE: The Kervaire Invariant of Immersions

ABSTRACT: I'll show how basic sketches of surfaces in space can link topology with abstract algebra.

Where Are They Now? An Update from Margaret Callahan, '09

Margaret Callahan graduated as a math major last year and is currently working as a teacher in Kenya for the Peace Corps. She is maintaining a blog about her experiences at <http://callaham.xanga.com/> and has also contributed the following piece to the newsletter:

Already, three months have passed since I left the familiarity of home behind and set off for the great unknown. Each day since arriving in Kenya has provided fresh challenges, as well as endless opportunities to learn about the culture of which I am now a part.

At the beginning of January, myself and 24 other math/science and deaf education trainees completed our two months of training in Loitokitok, a beautiful town situated at the base of Mt. Kilimanjaro. It was a fast-paced two months full of days that started early, ended late, and were packed full of more information than our brains could hold. We learned either Kiswahili or Kenyan Sign Language, we studied Kenyan education and culture, and we were trained to maintain our health and safety. Though exhausting at times, the support of my host family and fellow trainees, as well as the view of the mountains from my bedroom window, made training worth every minute. Now, after having been at site for over a month, I am able to fully appreciate the difficulty of training future Peace Corps Volunteers when an infinite number of possible obstacles and experiences await them.

After being officially sworn in as volunteers at the American Ambassador's residence in Nairobi, we set off for our sites. I am stationed in a small town near Kakamega in the Western Province. I teach mathematics and Life Skills/Youth Development at a very tiny, mixed secondary school. I have my own little house on a compound owned by a local pastor and his family, only a quick two-minute walk from the school. Electricity has not yet made it from the village to our neck of the woods; I'm told, however, that the school (and hopefully my house!) will have it by the middle of this year. That translates to sometime next year in "Wakati wa Kenya," or "Kenyan time."

During my first week at site, my largest challenges were coping with the sudden lack of familiar faces, and the presence of a large number of monstrous, brown spiders in my house. Now that I have somewhat adjusted to life on my own, teaching has become a challenge the size of Mt. Kilimanjaro itself. I struggle daily against various obstacles brought about by mere differences in culture. The students here live in a very different world; their priorities differ from those of the average American student, and, often, from the priorities we (their teachers) believe they should have; they respond to very different forms of discipline. Plus, every school, without exception, has a uniform; usually, girls are expected to shave their heads, and are punished severely should they dare to paint their nails. I am always able to recognize my students from afar on account of the purple button-down shirts.

As in America, it is, of course, difficult to teach students of varying degrees of ability, especially in math and science. The difference is that all Kenyan students will claim that they understand and say, "Yes madam!" when you ask "Tukopamoja?" or "Are we together?" even when they have no clue what you've just said. Even the most reserved American students are more willing to express confusion and ask questions. I believe that this has something to do with the fact that Kenyan students fear their teachers far beyond the usual, slightly intimidated respect felt by students in America. This doesn't surprise me, however, as Kenyan students are still subject to beatings if they misbehave, even though the practice has been made illegal in Kenya. Caning starts in primary school, where it is practiced frequently, and often takes place in the home as well. I leave the staff room as quickly as possible when students are brought in a told to kneel. The other teachers laugh at me; caning is something they have grown up with, and they hit the students unflinchingly. Not only is it a terrible thing to witness, but since students have been raised to respond to this sort of punishment, they respond to little else, and definitely not my stern recommendations that they study hard so they can pass their next Cumulative Assessment Test (CAT). This has been a major challenge. How can I get them to respond to a different form of punishment? What is worse than being beaten?

In American secondary schools, students fear detention, being reprimanded by their parents, even failure, perhaps, if they are ambitious. In Kenya, no one has even heard of the phenomenon of "detention." Parents, if present, often do not care how their children do in school, not having been raised to view education as a priority themselves. Plus, frankly, they have other things to worry about, like feeding their families. Some students at my school get only one meal a day, the "githeri," a mixture of maize and beans, which they receive for lunch at school. Finally, few students seem to see a future for themselves in academia, especially the girls, and hence are less willing to try.

One thing that Kenyan and American students have in common is their hatred of math. They find it challenging and give up quickly. Students here do consistently poorly in math and the sciences. Often, in Life Skills, I ask my students what their favorite subject in school is, and they almost always say math – a downright lie – just to please me. When this happens, I smile and say "No, really, what's your favorite subject?" On this second try, I usually get a straight answer: "Kiswahili, madam."

Regardless of the challenges, I enjoy teaching very much. I look forward to going to school each day, to getting to know the students, to talking with the other teachers about the differences between Kenya and America, about culture and religion, about the fact that the power is out yet again in the village. We take tea and laugh and complain about the heat. Life here is simple and pleasant, apart from the constant war I wage against the insects in my home. But this is Africa, after all, and there are certain things you just have to embrace. ☺

Share your Knowledge – Give a Talk at HRUMC, Steinmetz

Two major spring conferences for Union College math students, the Hudson River Undergraduate Mathematics Conference (HRUMC) and the Steinmetz Symposium, have their abstract submission deadlines rapidly approaching. Contact your thesis/research advisor for more information.

Conference	Location	Dates	Abstract Submission Deadline
Steinmetz	Union	May 7-8	Thursday, Feb 25
HRUMC	Keene State, NH	April 17	Monday, March 8

Problem of the Newsletter: February 19, 2010

Congratulations to **Schuyler Smith** for submitting an outstanding solution to last week's Problem of the Newsletter. You can view this winning solution on the bulletin boards around Bailey Hall.

Here is this week's problem: Show that there are only finitely many triples (a, b, c) of positive integers satisfying the equation $abc=2009(a+b+c)$.

Professor Friedman will accept solutions to this problem until 12:00 noon Thursday, February 25th. Email your solution to him (friedmap@union.edu) or put it in his mailbox in the Math office in Bailey Hall.