

## UNDERGRADUATE MATH SEMINAR

This week's math seminar will be back at its usual location in Bailey Hall.

**DATE:** **THURSDAY, October 3**

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

**Location:** **12:50 – 1:45 Seminar in Bailey 207**



Professor Grant Moles

This seminar, **Professor Grant Moles**, an algebraist in the Union College math department will present the following talk

### Kummer's Proof of Fermat's Last Theorem: Pulling Questions from the Jaws of Defeat

**Abstract:** Fermat's Last Theorem is a simple statement: there are no nontrivial integer solutions to the equation  $x^n + y^n = z^n$  for any integer  $n \geq 3$ . When Fermat first scribbled this statement in the margins of a book he was reading in 1637, he claimed to have a proof that just didn't fit in the margins. After he died without publishing his (likely incorrect or nonexistent) proof, mathematicians struggled for centuries to prove this statement. It wasn't until the 1990s that Andrew Wiles finally put the matter to bed, proving Fermat's Last Theorem using elliptical curves, a technique far beyond what Fermat could ever have imagined.

But was this really the first correct proof? In this talk, we'll discuss a proof by Ernst Kummer from 1847 that, at first glance, certainly seems convincing. As it turns out, his work made a crucial error – an error that eventually gave birth to the field of Algebraic Number Theory. In particular, we'll hone in on how abstract math can force us to challenge even our most fundamental of assumptions and how mathematical inquiry and proof don't "fail" – they simply raise more questions.

## More Internship/Job Opportunities

**Leah Murphy** (née Ziamandanis), math major '07, a Managing Director at Deloitte Services wanted to share that Deloitte is making available local Government and Public Services Consulting openings to Union students. They bring six to eight interns each summer in Albany and have about the same number of campus hire openings for full-time positions each year. Also, Deloitte's team in Albany hires one to two actuaries every year. For more details, see the [online posting](#). Be aware applications for summer 2025 openings are due **October 13<sup>th</sup>**.

## More Summer Highlights

Continuing the popular feature from last week's newsletter, we provide some more bullet point highlights of the summer activities of some math faculty.

- **Professor Phaniel Mariano:** During the week of June 17 to June 21, he attended a workshop entitled "Symmetry-breaking of Optimal Shapes" at the American



Professor Mariano at a conference in California – he is fourth from the left. Institute of Mathematics (AIM) in Pasadena, California, which is housed at the Caltech campus.

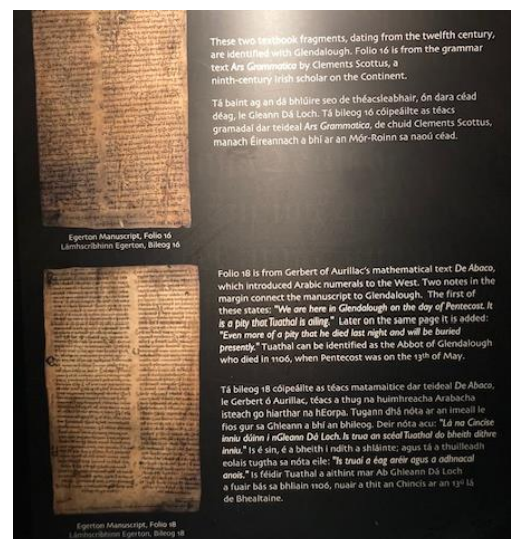
Turn to page to read of more summer highlights and upcoming math activities!

- Professor Christina Tønnesen-Friedman** gave talks at two international math conferences this summer. The first one was at the conference “Current Trends in Kähler Metrics with Special Curvature Properties” at UQAM, the University of Quebec at Montreal, June 17-21. After that, Professor Tønnesen-Friedman went to the island of Corsica, France, to give a talk at the conference “Bridges Meeting” in “Gauge Theory, Extremal Structures and Stability” held June 25<sup>th</sup>- July 5<sup>th</sup>.



Professor Tønnesen-Friedman, bottom left, at a conference in Corsica

- Professor Emeritus Bill Zwicker** spent about one month in Europe, visiting three countries. He reported that his first stop was Ireland - 4 days of leisure travel: Glendalough monastery (see picture to the right) and three different superb botanical gardens. This was followed by a week of work in Cork with two economist co-authors: Conal Duddy and Ashley Piggins. His middle stop was Paris for the biennial meeting of the Society for Social Choice and Welfare. Professor Zwicker was recently elected to the council for this society! His third stop was Vienna, Austria, where he worked with Jiehua Chen, a computer scientist and co-author.



## Math Clubbing!

- Association for Women in Mathematics (AWM).** At its last meeting, the AWM recognized its two new co-Presidents, **Audrey Benson** ([bensona@union.edu](mailto:bensona@union.edu)) and **Frankie Morone** ([moronef@union.edu](mailto:moronef@union.edu)).

The next meeting of this student chapter of AWM will be **Thursday, October 3 at 9:15 am** in the **Math Common Rom, Bailey 204**. All are welcome! If you are interested AWM but cannot attend the meeting, email one/both of the presidents, or one of the faculty advisors, **Professor Ellen Gasparovic** ([gasparoe@union.edu](mailto:gasparoe@union.edu)) or **Professor Fanhui Xu** ([xuf2@union.edu](mailto:xuf2@union.edu))

- Math Club.** Congratulations to the new leadership of the math club: President: **Henry Howe**, co-Treasurers **Izzy Peterson** and **Mukundan Thanigaivelan**, co-PR People: **Izzy Peterson** and **Vanessa Jorgensen**. The club is planning on holding its elections at its next meeting, **Friday, October 4, at 1:00 in the Math Common Room, Bailey 204**.
- Putnam Exam Preparation.** The Union “PEP” squad will continue to meet to work on fun and challenging math problems on **Thursdays at 4pm in Bailey 102**.

The display at the Glendalough monastery ruins shows “Folio 18” from Gerbert of Aurillac mathematical text *De Abaco* which introduced Arabic numerals to the west.