

# MSCS MESS

Department of Mathematics, Statistics, and Computer Science  
St. Olaf College, Northfield, MN 55057  
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## Monday's Colloquium

Title: Why Diophantus Liked  
Rational Numbers and Why  
You Should Too  
Speaker: Prof. Tyler Billingsley  
Date: **Monday, November 1**  
Time: 3:30pm  
Location: RNS 310

**About the talk:** Diophantus of Alexandria, a famed Greek mathematician who lived around 250 AD, made significant contributions to the field of algebra. He studied solutions to equations in integers and fractions (rational numbers) in a way that no one had before, giving birth to the subfield of number theory now known as "Diophantine Equations." In this talk, after some remarks on the life, works and legacy of Diophantus, we will take a look at two specific Diophantine equations and some of their solutions. The solutions will highlight some beautiful connections between number theory and other areas of mathematics. Students who have taken or are currently enrolled in Math 252 are especially encouraged to attend, though parts of the talk will be accessible to all students. An invitation to next semester's seminar course Math 382: Intro to Elliptic Curves will be given toward the end.

**About the speaker:** Tyler Billingsley received his BS in Mathematics with a minor in Computer Science from Purdue University Calumet in May 2013. He continued on to Purdue University's main campus for graduate school and earned

his PhD in mathematics in August 2020. His primary research area is number theory, more specifically the arithmetic aspects of the theory of elliptic curves and surfaces such as finding rational solutions to cubic equations. In his free time, he enjoys biking around the trails near Bloomington and playing video games, particularly platformers and RPGs.

## Next Week's Seminar

Title: Crystal Isomorphisms and  
Recent Applications  
Speaker: Prof. Adam Schultze  
Date: **Friday, November 5**  
Time: 3:30pm  
Location: RNS 204

**About the talk:** In this second part of Prof. Schultze's talk, we recall the two combinatorial models from last week and then construct an explicit isomorphism between them. The process of mapping from the Tableau model to the quantum alcove model leads to a method which greatly simplifies the calculation of the crystal energy function, a statistic which was classically defined recursively on the vertices of the crystal but can now be calculated locally.

**About the speaker:** Adam Schultze recently received his Ph.D. in mathematics from SUNY University at Albany. His research area is algebraic combinatorics, a field where abstract mathematical structures, often pertaining to certain symmetries, are broken down into discrete models.

## Summer Research in MSCS: REU's

Are you interested in being paid to collaborate on a research project with students from around the country off campus this summer? **Research Experiences for Undergraduates (REU's)** can give you this opportunity! You can visit **reufinder.com** to look through the different programs available. Each REU will research some-

thing different, so no matter what you're interested in, there's probably a program out there for you! Most of them include **stipends around \$4,000**. Applications will open in November, and most are due late January to early February. Be sure to read the eligibility for each REU, and to start looking into these sooner rather than later! Feel free to reach out to **Prof. Schultze** if you have any questions.

*To submit an article, event, or anything else for publication in the Mess, email mcgowa2@stolaf.edu; to receive the Mess digitally each Friday, email habero1@stolaf.edu; visit <http://wp.stolaf.edu/mscs/mscs-mess/> for a digital archive of previous MSCS Mess issues.*

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