

# MATH EM@TICS

“All the  $\nu$ 's fit to print”

Department of Mathematics | Ithaca College

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*This issue is dedicated to our graduating majors and minors in mathematics and in data science. Many of them have written for this newsletter memories of their studies at IC and plans for the future.*

*Congratulations, graduates! We are grateful for the time we have had together and the imprints you have left on us and our department over your time here.*

## $\nu_0$ : From the Desk of the Chair

Another academic year is coming to a close. Our graduating seniors (see the list below) have had, shall we say, a memorable four years. It was nice to finally see their faces in a classroom this spring. We will miss you and hope that you will stay in touch.

The department had numerous successes this academic year. We were able to bring back our high school math day, with 12 schools and 147 students attending. I do not think any other department runs such a large event for high school students and many of our math majors contribute to the event. Our regular math colloquium included alumni this year, with Walter Hannah ('06) giving a fantastic talk on his work related to modeling climate. I look forward to more alumni speaking in our colloquium; call it one positive of zoom. If you aren't on the math

alumni group on LinkedIn then what are you waiting for (<https://www.linkedin.com/groups/12567416/>).

We have various faculty that are part of three different NSF grants associated with the department. One of which is and REU that had nine students from various colleges working on projects this summer. Our endowment, which few academic departments have, that supports student experiential learning continues to grow with donations (feel free to donate at any time <https://alumni.ithaca.edu/mathematics-research-fund>). The Ithaca College Math Department is a place we are all proud of.

We are always interested in hearing from the IC math family so please drop me an email and say hello, [tpfaff@ithaca.edu](mailto:tpfaff@ithaca.edu), or simply stop by Williams 212C.

*Tom Pfaff, chair*

## $\nu_1$ : Hats off to our Graduates

**Emma Anderson** is a Math major from Wilsonville, Oregon. One of her favorite experiences from her time at Ithaca was when she got to participate in the Dynamical Systems REU over the summer of 2021. She can't decide what was more fun – making life-long friends, or studying fractal trees and learning about the process of mathematical research. After graduation, she'll be heading home to Oregon to start her Master of Arts in Teaching so that she can become a high school math teacher.

**Jacob Armstrong** is a senior Finance major with minors in both Data Science and Business Analytics from Kingston, MA. One of his good memories at IC was working with professor Pfaff on his independent study. Jacob utilized Monte Carlo simulations to determine if a contact hitter or power hitter is more valuable in the MLB. The simulation pitted historic players with a similar OPS against each other to determine which player adds more offensive value by viewing who would win more simulated games. Next year, Jacob hopes to be working in equity research.

**Sean Blackford** is a senior graduating with a Bachelor of Science in Computer Science with a Data Science minor from Howell, NJ. One of his favorite memories was walking into the first day of Calc II class and only three other students being in the class. The class was more engaging for him because of the small class size. When we needed help, he could still remember the times the whole class was at Professor Dan's office hours. He plans on going home and finding a software engineering job.

**Jake Brown** is a Math and Physics double major from Newfield, NY (not too far down the road from Ithaca). He has many fond memories of his time doing math at IC, but one of his favorites comes from professor Jim Conklin's numerical analysis class. He loved learning about how derivatives and integrals can be calculated numerically, so much so that he plans on continuing his numerical analysis studies in grad school. Like his father Dave, Jake will be pursuing a Ph.D. in math—this time in applied math at the University of Connecticut. As the saying goes, the apple falls within a distance  $\varepsilon$  of the tree.

**Colin Cody** is a Senior Cinema and Photography major with a minor in Mathematics. He has had an interest in math since high school and has taken several courses at Ithaca to pursue his minor. His favorite memories of mathematics are learning about fractals in Math Experimentation and digital compression via matrices in Linear Algebra, both of which were taught by Dr. Matt Thomas. In the future, he hopes to find himself in Los Angeles with a career in the film industry, while bringing his knowledge and skills of mathematics along with him.

**Brady Elster** is a Physics major with a Mathematics minor from Auburn, NY. One of his favorite memories at IC was in Aaron Weinberg's Calc I class, when the class was collectively confused by the lack of number crunching needed for each problem. Professor Weinberg addressed the class by simply saying, "We're training you to be mathematicians, not calculators". That sentiment stuck with Brady ever since. For him, college math is a radical shift in thinking from high school math; it forces you to be creative and stay curious. He encourages all math students to keep following their passions. In the fall, Brady will be attending Auburn University to pursue a Ph.D. in Physics.

**Thu Thu Hlaing** is a graduating senior Mathematics major with a minor in Finance. One of her favorite memories has been when she and a fellow math ma-

ior Joan Mattle wrote over a 50-page research project in Math Experimentation about Iterating Non-Linear Functions. It was the first official research paper that she had written, and she felt a sense of accomplishment being able to discuss difficult math concepts and her results. It was also then that she realized she wanted to keep doing research in the future. She has also loved all the times she would go to the Math Help room and office hours because she was able to grow close with her professors. Everyone in the math department, from the professors to classmates, was extremely supportive and kind, and she has felt lucky to be a part of it. She looks back fondly at all the relationships she has with her professors and classmates, and she will deeply miss the mathematics department after graduation. Next year, she will be entering a Ph.D. program at the Florida Institute of Technology in Applied Mathematics and buying lots of sunscreen!

**Sainabou Jallow** is a senior Biology major and Mathematics major from Gambia. Her favorite activity she did with the math department was going to the National Math Festival in D.C., where she helped make geometric shapes for kids. Sainabou will be attending the School of Medicine at Georgetown University starting this fall to pursue becoming a doctor. She'll be working in a lab at Cornell University this summer prior to heading to Georgetown.

**Lucy Loukes** is a Mathematics major from Lincoln, New Hampshire, with minors in Business Analytics and Data Science. One of her favorite memories was the first in person class after being completely virtual, when it was just her and Dave Brown in the room, because everyone else was still on zoom. It reminded her how much fun solving problems face to face with others, and the joy of math. She is grateful for all the math majors and minors she met along the way. After graduation Lucy will be moving to Portland, Maine to work for Collaborative Solutions, applying everything she has learned in the Math department at Ithaca College.

**Joan Mattle** is a senior Mathematics student with minors in Economics, Data Science, and Finance. After taking Calculus II her first semester, Joan decided to pursue math. She is thankful to the amazing faculty that pushed her to be her best and made every class fun. Her favorite math course was discrete mathematics with Osman. She loved problem-solving and writing out long proofs on the whiteboard. She will miss studying for hours in with library with Thu Thu for Calc III, desperately trying hard to understand

level curves. After graduation, Joan will start working at Excellus Blue Cross Blue Shield as an analyst in the actuarial department.

**Daniella Mulvey** is a senior Architectural Studies major and a Math minor. She is also a part of the Varsity Softball team here at IC. One of her favorite math memories is when she took linear algebra in the fall of 2019. She remembers feeling like she was learning math in a different language and was nervous she wouldn't figure it out. But with hard work and perseverance she ended up with an A- in the course and proved herself wrong. This summer Daniella will begin her journey at UPenn to gain her Masters of Architecture.

**Antara Sen** is a Physics and Math double-major from India and Malaysia. One of their favorite IC Math memories is taking Calc III their first semester with Prof. Dan Visscher. Antara was a nervous freshman but making friends while doing dot products and cross products made Antara feel like they fit right in! Another class that Antara is sure to remember forever is Calc IV with Prof. Jim Conklin and all of Antara's Physics friends — the divergence theorem has never been cooler. As Antara heads off to Northwestern University to pursue a Ph.D. in Applied Physics, they will look back fondly on their time at the IC Math department and the time they spent with all the wonderful people here. They would like to extend a warm thanks to all their math professors and friends.

**Chris Weil** is an Applied Physics major and minors in both Computer Science and Data Science from

Ithaca, NY. One of his favorite memories is taking Linear Algebra and Calc III with Professor Stanley Seltzer. Professor Seltzer had a joke or wrestling analogy that made the class fun to be in and his sound effects for describing vectors will always be entertaining. In the coming years, Chris hopes to work in software engineering, and is planning on going to graduate school after a year or two working to further increase his qualifications for that industry.

**Jamie Woodworth** is a Mathematics and Physics dual major from Malone, NY. They used to dread doing proofs, but that began to change once they took Graph Theory & Combinatorics with Professor Martinez. Being able to do proofs by induction made Jamie feel immensely powerful, and has been a very useful skill in their subsequent research projects. Next year Jamie will begin pursuing a Ph.D. in Physics at the University of Kentucky.

**Muhtasim Hossain**, Applied Physics major, Math minor

**Nicholas Isaacs**, Computer Science major, Math minor

**Rel Klein**, Cinema and Photography major, Math minor

**Kyle Lambert**, Business Administration and Finance major, Data Science minor

**Megan Plummer**, Environmental Science major, Outdoor Pursuits minor, Math minor

**Amanda Reynoso Lizarraga**, Theater Arts Management major, Math minor

**Morgan Ziegler**, Computer Science major, Math minor

## $\nu_2$ : Math in the News

A few recent articles about math in the news.

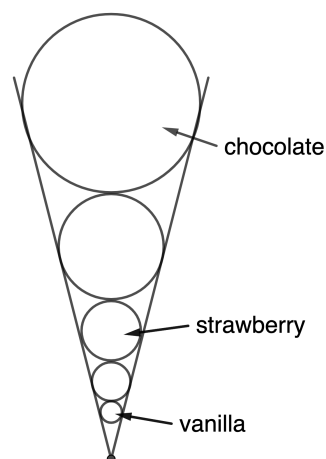
IC News: [Math Beyond the Classroom](#)

Scientific American: [Math in 3-D: Q&A with Abel Prize Winner Dennis Sullivan](#)

New York Times: [You Hear the Musical Saw. These Mathematicians Heard Geometry.](#)

### $\nu_3$ : What's the Problem... with Professor Brown

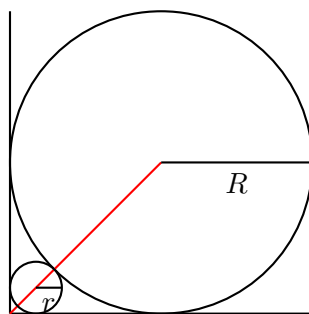
Our Department Chair has an uncanny ability to scoop perfect spheres of ice cream to fit his colossal homemade cones. He first adds a scoop of vanilla ice cream with a 64-millimeter radius. This is followed by scoops of pistachio, then strawberry, then black raspberry, and finally a scoop of chocolate ice cream with a 100-millimeter radius. Each of the scoops is tangent to the next scoop and to the cone. What is the radius of the scoop of strawberry ice cream?



Send complete answers to Professor Brown at [dabrown@ithaca.edu](mailto:dabrown@ithaca.edu). Those submitting correct answers will have their names printed in the following newsletter. People who correctly solve all problems from Volume 3 of the newsletter will receive a special prize at the end of the year.

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*Solution to Prof. Brown's previous problem:*



On one hand, the length of the (red) segment from the origin through  $(r, r)$  to  $(R, R)$  is  $r\sqrt{2} + r + R$ . On the other hand, its length is  $R\sqrt{2}$ . So,

$$r\sqrt{2} + r + R = R\sqrt{2} \implies R(\sqrt{2} - 1) = r(\sqrt{2} + 1) \implies \frac{R}{r} = \frac{\sqrt{2} + 1}{\sqrt{2} - 1}$$

*Honor role* (solvers from Issue 3): Austin Ruffino (current student), Earth Sonrod (current student), Teresa Moore (current faculty)



