MATHEM@TICS

ν_0: From the Desk of the Chair

In the first newsletter last fall I said, "I'm always unsure what to say in my dedicated from the desk of the chair "column" for the newsletter. So, as a test to see if anyone reads this, please send me an email and tell me what you'd like to read in my newsletter notes. tpfaff@ithaca.edu"

I don't believe I had any emails asking me to say anything specific. I'll make an alternative request. What kind of content would you like to see in these newsletters, alumni? Additionally, if you're interested in speaking at our colloquium, being featured in one of our alumni spotlights, or have any other ideas on how to connect with us, drop me an email.

The first thing on my mind is to let you know that the math endowment has grown nicely during the past year. I'm excited to say that we are currently over $48,000, which is just about halfway to our goal of $100,000. This is not quite the $50 billion that Harvard has, but we are only getting started and don't need billions to have an influence on our students. I sincerely thank everyone who contributed, and if you are inspired to do so, here is the link: https://alumni.ithaca.edu/mathematics-research-fund

I hope you are impressed as you read this newsletter. Four of our students completed summer research projects or internships, our active faculty are engaged in a variety of exciting initiatives and collaborations, and our alumni spotlights continue to show that there are many different career options available to those with a math degree. We must somehow publicize this statement made by Jon: "A math major is a great basis for law." Ann, meanwhile, graduated with a master's in horn playing but wound up in math graduate school. Have fun reading their stories!

Tom Pfaff, chair

ν_1: Students Doing Summer Research and Internships

Ithaca College math students participated in a variety of math-related projects this past summer. Read about their projects here and talk with them about their experiences. Summer math opportunities are usually advertised during the winter; stay tuned for announcements through this newsletter and the department webpage, or talk with a professor about your interest.

Tommy Angel '24 spent his summer at a math camp for incoming 7th graders in Harlem NYC at City College of New York (CCNY). As part of the five-week program, Tommy worked as a counselor and teacher to the 92 enrolled students. The camp included courses on Cryptarithms, introduction to proofs, circuits and programming, and early algebra.

Other activities included completing 100 math problems before the final day and problem of the week, which gave students even more opportunities to complete different assignments! A highlight for Tommy was seeing how smart and motivated the group could be, as they raced to finish the 100-problem challenge at the end of the camp.

Madolyn Donaghy-Robinson '24 participated in the Ithaca College REU (Research Experience for Undergraduates) on dynamical systems. With mentorship from Prof. Dave Brown, Maddie worked with fellow students Haley Broadus (University of South Alabama) and Hope Steen (New College of Florida).

Their research focused on three dimensional fractal trees and various pruned sequences of these fractal trees. Maddie used various skills from Linear algebra, Calculus II, and coding in python and Mathematica. Maddie and her colleagues currently have a poster on the second floor of Williams Hall about their findings from the summer!

Lenley Akin '24 interned for Willis Towers Watson (WTW), a consulting firm for the insurance, pension, and retirement planning industries. Based in the Philadelphia, PA office, Lenley was able to work remotely from Pittsburgh as a Pension Analyst intern under the retirement line of business.

As part of her work, Lenley learned about the process of pension actuarial work, attended trainings, and worked on mock client work and client teams. The position of pension analyst involved the use of data analysis, probability, Excel work, and navigating the company's computing system, Quantify.

Earth Sonrod '25 participated in the Ithaca College H&S Summer Scholars program, with mentorship from Prof. Osman Yurekli. Together, they focused their research on the parametric version of the Fibonacci sequence—its combinatorial and geometric representations; and they plan to continue their research this year and present their work at 2024 International Fibonacci Conference.

Additionally, Earth presented work from another project, on integral transforms of a special function called Dawson's integral, at the 2023 Summer Scholars Showcase in July. Earth's multiple projects have drawn on his knowledge from Differential Equations, Calculus III, Combinatorics, Number Theory, Analysis, and plenty of visualizations in Mathematica.

ν_2: Math Club

Are you looking for a chance to connect with fellow math students? Do you love "The Imitation Game" or a good board game? Do you want to share your love of mathematics with local kids?

Then Math Club is for you! Come meet and hang out with your fellow math enthusiasts; and enjoy the club's social and outreach events.

The first meeting of the year is

WEDNESDAY, 9/13 at 7:00 PM
in Williams 310.

Students will elect the academic year Math Club officers and plan activities for this semester.

ν_3: Thanks to Endowment Contributors

The Math Department thanks the following individuals for donating to the math endowment or the annual fund. Your support of the math department and our current students is greatly appreciated.

Carol Meshel ('65), Judith Magarian ('67), James Linsky ('74), John Cook ('76), Donna Herb ('76), Denis Blodgett ('83), Tom Pfaff ('90/fac), David Brown ('94/fac), Melissa Choi ('94), Dheeraj ('99) and Michele Verma, John ('04) and Lindsey White, Lindsay Noles ('04), Donny Tang ('05), Jonathan Mack ('06), Patrick Engle ('06), Denise Dyer ('08), Katherine Ulicky ('09), Megan Brown ('10), Cameron Scheible ('11), Elizabeth Frank ('12), Daniel Tjie ('17), Justin Moczynski ('21), Teresa Moore (fac), Anonymous.

ν_4: **Alumni Spotlight**

This issue continues our interviews with IC math alumni. If you are a current or future student, we hope these will give you some perspective on your studies at IC and some inspiration for the future. If you are an alum yourself, we hope these give you a chance to reconnect or further connect with other IC math alumni. (Also, we'd love to interview you! Please email the chair at mathchair@ithaca.edu if this is something you might be interested in.) We hope you enjoy hearing below from Jon Bancone '86 and Ann Stewart '94.

Interview with Jon Bancone

EW: *Hi, Jon. Welcome "back" to IC! (This interview is conducted by email, so the reunion is digital and asynchronous. . .) When did you graduate?*

JB: Great to be "back." I am Class of 1986.

EW: *What do you do now? How did you get from graduation to where you are now?*

JB: I am a Vice President, Assistant General Counsel at a large technology company. After graduating Ithaca, I attended Georgetown Law Center. Upon graduating from Georgetown, I joined a law firm in New York City for almost three years. The most important aspect of being a young attorney at a law firm is learning about attention to detail, which as one can imagine is crucial in the law. However, when working at a law firm you are typically hired by the clients transactionally (i.e., to work on a specific litigation or a specific deal).

As I wanted a more in-depth understanding of the technology industry, I moved to my current employer where I have been for more than thirty years. As an in-house lawyer you are a part of the business team. This creates, in my view, a much more interesting experience as you are not limited to providing legal advice, but also provide strategic insight, help set corporate policies, and provide advice on risk.

EW: *How did you wind up choosing to go to law school?*

JB: I did my summer internships at an investment bank and was advised that all of the senior people at the banks had law degrees. My real interest was number theory and, at the time, I looked at it as having not a lot of practical application (I was wrong!!). I had some interest in teaching, but I thought law would give me more options.

EW: *What kinds of skills do you use in your job? How has being a math major at IC helped you in your career?*

JB: There is a lot of negotiation and technical writing, but the key is to understand all sides of an issue and make a compelling case for your position. There is a lot more creativity in the law than people think. Typically, what happens in a transaction is that both parties have slightly different goals. The trick to being a good transactional lawyer is to provide creative advice to the business on how to address the goals of the other party without undermining your own goals. It is not always straight-forward.

The logical thinking required to be a math major is very helpful to a career in law. In fact, four of my five first year law professors at Georgetown were math majors. While that was a shock to me, it also gave me confidence to succeed as I was insecure about my writing skills.

EW: *Do you have a favorite memory as a math major at IC?*

JB: The first thing that comes to mind is presenting my honors thesis in front of the entire Math Faculty. I worked closely with Professor Glenn on the Bachet equation. I remember being nervous about trying to make sure I would be able to answer all of their questions. It was a big challenge being grilled by very sharp professors.

Another great memory is working for what we called the "eternal light room". This was where any student could get help with any math questions. There was a different professor on duty every week so it really helped me get to know the professors as well. I did that for three years.

Finally, I have to mention Professor Maceli. I graded papers for him for three years. He was a great advisor to me personally and as a math student.

EW: *In terms of intellectual intrigue and growth, is there a math course you took at IC that stands out?*

JB: Professor Dennis' philosophy of Math. We started with Euclid - Euclid's elements was our initial text. Af-

ter that, each week he introduced us to something different, but math related. The thing I remember most about that class was that Professor Dennis wound up introducing me to my favorite author, Lewis Thomas. I read all of his books. It expanded my interest in math related topics like microbiology.

EW: *What other interests (e.g., another major/minor, team or club, etc.) did you engage in at IC?*

JB: I minored in economics and philosophy. I took all of the logic courses as part of my philosophy minor, and I think being facile with math makes economics a lot simpler.

I also ran track at Ithaca, which was a great experience. I specialized in the half-mile, but also competed in the other middle distance and relay events.

EW: *What advice would you have for a current student interested in doing what you do now?*

JB: I would say take some writing courses at Ithaca. That was a weakness I had to overcome when first starting out practicing law. There is a lot of technical writing whether you are a litigator or transactional lawyer. Being a competent writer also helps when taking law school exams!!

Interview with Ann Stewart

EW: *Hi, Ann. Welcome "back" to IC! (This interview is conducted by email, so the reunion is digital and asynchronous. . .) When did you graduate?*

AS: 1994.

EW: *What do you do now?*

AS: I am a professor of mathematics at Hood College, which is a small private college in Frederick, Maryland. This is my 17th year teaching at Hood.

EW: *How did you get from graduation to where you are now?*

AS: I graduated from IC with both a B.M. in Music Performance (horn) and a B.A. in Mathematics. My first stop after graduation was the San Francisco Conservatory of Music, where I completed a master's degree in horn performance. After several years of working an office job by day with a bit of freelancing at night, I decided to go to graduate school for mathematics.

My first year in the graduate program at the Johns Hopkins University was a bit rough after a five-year break from math classes! But, my job as a teaching assistant was going well, and so I stuck it out. I finished my Ph.D. in 2006, and after a year as a postdoc at the University of Maryland, College Park, I

joined the mathematics department at Hood College in 2007. I've been here ever since!

EW: *What kinds of skills do you use in your job? How has being a math major at IC helped you in your career?*

AS: I now teach much of the content I learned in my math classes at IC in the courses I teach at Hood. Although Hood is smaller than IC, the math class sizes are very similar and the professors are also very engaged, so the environment is very familiar! I also remember what it was like to be interested in lots of things in addition to math, so that helps me when I am advising students.

EW: *Do you have a favorite memory as a math major at IC?*

AS: I skipped a math class once and only once during my time at IC, because of Professor Shirley Hockett. One day, I decided it would be a good idea to skip her introduction to proofs class. But, the joy of free time was short-lived, since I had the misfortune of running into her in the Student Union, not too long after class was over. I tried to avoid eye contact, but there was nowhere to hide. She made it very clear that she noticed my absence and did not believe a word of the weak excuse I tried to make up on the spot. I was too terrified to skip class ever again! Now that I am a professor, I know that she must have cared deeply about her students to go to that effort to give me such a hard time!

EW: *In terms of intellectual intrigue and growth, is there a math course you took at IC that stands out?*

AS: Calculus III was an important course for me, since that class helped me decide to declare my math

major. It was also my first exposure to software like Mathematica. Calculus III is now one of my favorite classes to teach! Later, I took a lot of numerical analysis, also a class I teach regularly here at Hood. I love how it brings together topics learned in lots of different math classes within the common theme of approximation, and how it balances abstract and applied mathematics.

There is also a class that stands out for me because I didn't take it and I definitely regretted it later – statistics! I now teach lots of sections of introductory statistics, but my first time through I was just a few steps ahead of my students when we covered confidence intervals and hypothesis tests.

EW: *What was your favorite non-math course at IC? Why?*

AS: I spent a lot of time in classes in Ford Hall, which I believe is now the Whalen Center for Music. My favorite classes were the ensembles, especially the Wind Ensemble and the Orchestra, and music theory.

EW: *What other interests (e.g., another major/minor, team or club, etc.) did you engage in at IC?*

AS: I also had a part-time job, which was working weekends in the dish room of the Terraces dining hall. It was messy work, but it was also the highest paying student job on campus!

EW: *What advice would you have for a current student interested in doing what you do now?*

AS: Take as many statistics, data science and computer science classes as you can. Don't be afraid to apply for REUs or other summer opportunities and try to attend a math conference, either local or national.

ν_5: Faculty Summer Highlights

As summer rolls around, and our students head out for new adventures, our faculty use the time to connect with colleagues, dig deep into projects, and enjoy Ithaca's summer bounty. Here are some summer highlights:

In the third year of their National Science Foundation-funded REU (Research Experience for Undergraduates), **Dave Brown**, **Ted Galanthay**, and **Dan Visscher** worked with nine undergraduate students from across the country (including Maddie Donaghy-Robinson from IC!) on three different projects in dynamical systems. In their project on mathematical billiards, Dan's team took a shot at reflecting on billiards from a new angle and cued up some math from scratch. Ted's summary of the summer: Eureka!

Jim Conklin enjoyed multiple collaborations with colleagues across campus: with Susan Swensen Witherup (Biology) concerning competition between a native and an invasive plant species; and with William Kolberg (Economics) concerning a model for consumer demand in the face of a variety of choices. Jim also did some prep work for his "next chapter"– the IC transition to retirement program–with a couple of camping/hiking trips in New Mexico and western Colorado.

Megan Martinez presented at the *Bridges Math & Art Conference* in Halifax, Novia Scotia. Along with co-author Amanda Lipnicki (Alfred University), Megan shared their work automating the generation of cro-chet patterns and exhibited some of the finished products.

Teresa Moore had the chance to work with IC colleague Chee Ng (Finance and International Business), developing connections between internal rate of return cash flows and properties of polynomials. Teresa was also able to make her annual trip to the Tennessee mountains with her family.

Tom Pfaff brought to publication the textbook *Calculus with R*, a culmination of his many years' work in

our introductory calculus classes.

Aaron Weinberg began a new collaboration (with colleagues from Oklahoma State and University of Central Arkansas) on a research project to understand how students productively navigate feelings of confusion when working on math problems. He also learned how to play pickleball. (Shout-out to volleyball coach Camryn Bancroft, who organized the IC summer league.)

Emilie Wiesner began analysis of new data for an ongoing project investigating students' textbook use from a literacy perspective (with Ellie Fitts Fulmer, Education, and Aaron Weinberg). Her garden also had a stellar year. (It was a hot, rainy summer in Ithaca!)
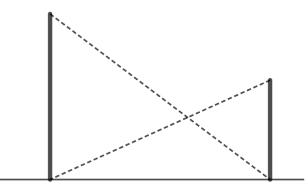

ν_7: **What's the Problem... with Professor Brown**

Zipline Ithaca consists of two towers, one that is 1000 feet high and the other is 600 feet high. A zipline runs from the top of each tower to the base of the other tower. At what height do the ziplines cross? Include an explanation of your answer.

Send complete answers to Professor Brown at dabrown@ithaca.edu. Those submitting correct answers will have their names printed in the following newsletter. People who correctly solve all problems from Volume 4 of the newsletter will receive a special prize at the end of the year.

I don't have any particular recipe. It is the reason why doing research is challenging as well as attractive. It is like being lost in a jungle and trying to use all the knowledge that you can gather to come up with some new tricks, and with some luck, you might find a way out.

—Maryam Mirzakhani (2014, on winning the Fields Medal)