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Congratulations, Seniors!

It has been an exciting year in the Math and Stats Department -- we've had exciting guest lecturers, math competitions, departmental bananagrams contest, and classes taught by and taken with some of the coolest students and professors.

Our seniors will be graduating and heading out into the world in just a few short weeks. Spending four years with this year's graduates has been a truly wonderful experience. We send them congratulations from afar!

Take some time below to find out what some of this year's seniors have planned for life after graduation, their favorite memories with the department, and advice to future math or stats seniors. Congratulations on a job well done, seniors!

Plans Post-Graduation

"I will be working in Boston as a data analyst in the strategy department of Cogo Labs, a startup incubator specializing in website companies!" (Todd Johnson)

"After college I will be moving to Seattle to work as a software engineer at Amazon." (Adam Kral)

"Next fall, I will be starting a PhD in math at the University of Minnesota. I'll still be in the area so keep in touch!" (Aaron Li)

"Next year, I am going to be working as an economics research assistant at the University of Chicago before hopefully heading off to grad school!" (Ozzy Houck)

"Next year, I am doing a program called GreenCorps that is a year long training for environmental organizers. I plan to continue working in that field for the time being, although I eventually might want to go to grad school for ecology." (Jared Kannel)

"I'll be working as an analyst at Keyrus, a statistical consulting firm, in New York City." (Matt Thill)

"I will be going to MIT for a Master degree of Finance for 18 months." (Arthur Zhang)

"After graduation, I am planning on starting work at Foundry.ai as a Data Scientist in Washington, D.C." (Will Knospe)

"Next year, I'll be going to UCSD to pursue my PhD

"My plan after college is to work as a growth marketing analyst back home in the Bay Area. I hope to learn more about the tech industry and start a business of my own in the future." (Jay Na)

"I will be pursuing a PhD degree in natural language processing at CU Boulder." (Rosa Zhou)

"This summer, I'm doing one of the Social Justice Internships through the Chaplain's Office, at the Lakota Immersion Childcare Program on Pine Ridge Reservation (...via Zoom). I'll probably be working on math curriculum in Lakota and a web platform for the program, among other things. I'm super excited for that! After the summer, there's no plan, but I'd like to work on a farm, get involved with climate modeling and/or activism, and/or teach, eventually!" (Taylor Yeracaris)

"I will be working as a Product Analyst at Carrot Health in Minneapolis beginning in July." (Bryan Kim)

"I accepted a position with Open Systems International in MN. Role is an applications specialist, and I'll generally be doing data analysis on client energy usage and efficiency." (Andrew Roy)

"I am starting a PhD program in pure math at UMass, Amherst." (Brody Lynch)

"I will be working for Avanade in Minneapolis as a Advanced Analytics Consultant which will be close to a IT consultant." (Alyssa Akiyama)

"I will be doing a post-bac with an NIH biostatistics lab helping look at if/how demographic characteristics are associated with specific types of cancer." (Tanvi Mehta)

"I'm planning to start my Ph.D. program in biostatistics at the University of Washington this fall." (Nobu Masaki)

in computer science." (Sam Chen)

"Moving to D.C. and working as an analyst at Nasdaq." (Peter Keel)

"I'll be starting a cognitive science PhD at UC San Diego this fall. I'm going to miss spending time in CMC!" (Tyler Chang)

"This summer I will help my moms and little sister move down to Charlottesville, VA from Massachusetts. At the end of the summer, I will be moving to New York City to begin my role at StoneCastle Securities, LLC as an analyst on the Esoteric Credit Trading Team." (Joey Caradimitropoulo)

"Post-graduation, I plan to find employment working with data and making graphs. I also plan to garden." (J. Liralyn Smith)

"I plan to go to grad school one year after Carleton." (Yihuang Wu)

"I will be working in Colorado as a data strategist for a Tech Company called CableLabs that does Research and Development for the cable industry." (Katie Chavez)

"I'll be working at Optum next year in Minneapolis as a Software Engineer." (Paul Reich)

"I'll be pursuing a PhD in Computer Science at the University of Wisconsin." (Nathaniel Sauerberg)

"My plans for Post-Carleton are to live abroad for a few years doing service work before I go back to school. I was accepted to the Peace Corps this past winter, so I will be living in Kenya the next two years teaching math and working in education. After that I plan to move to the Middle East, most likely Cairo, to work in education/service and to continue my Arabic studies. I hope to live in the Middle East for a few years before pursuing graduate school possibly in mathematics or statistics (I haven't decided yet!)." (Will Thompson)

Favorite Memories!

"So much comes to mind! Hanging out at the Skills Center (specifically my junior spring) with great friends, department picnics, going to Imminent with the math/stats crew on Thursdays, hanging out with the department's faculty and staff, going to math conferences with friends, and a lot more. There was never a dull moment! I've met a lot of great people in this department (students, faculty, and staff) who have become my closest friends! These people are like family to me." (Fares Soufan)

"One of my favorite Carleton math/stats memories is of the pumpkin-carving contest this past fall. There is something magical about watching people carve pumpkins in the same room in which you once gave some very important presentations. Another favorite memory is of participating in the Bananagrams tournament last spring. I lost in the first round, but I don't think I'd ever had so much fun losing a game before. My absolute favorite memory, though, is of the first MathStats Picnic that I attended as a declared Statistics major. I don't know how to begin to describe it." (J. Liralyn Smith)

"When Mark Krusemeyer shouted "n" to wake up the whole linear algebra class after writing n factorial on the board." (Peter Keel)

"I have many fond memories of the math and stats departments at Carleton. Among my favorites are exploring the Baire Category Theorem with my comps group, laughing and doing homework in the math skills center with many friends, and doing my first proofs in structures with Gail." (Todd Johnson)

"One of my favorite memories are the math/stats picnics--talking to professors (and their kids!) as well as other students outside of class is a warm reminder of the math/stats community. A (close) second would be the nights in the stats lab before something was due where I would run into more of my classmates than expected--a less warm but equally comforting reminder of the math/stats community :)" (Tanvi Mehta)

"My favorite Carleton math/stats memory is probably taking Elliptic Curves, which was probably

"The community surrounding the Math Skills Center was one of my favorite parts of being a math major. I really enjoyed working there as a tutor and also just doing my work there and hanging out and playing bananagrams with other math-inclined people." (Brody Lynch)

"One of my favorite memories is when we "played" bananagrams with all the E's, S's, and T's removed. Brody was trying valiantly while the rest of us were just secretly putting together random strings of letters and intermittently shouting "peel!". He was so engrossed in his own board that he didn't notice anything was amiss until almost the end." (Aaron Li)

"When I (miraculously) beat Mark in bananagrams." (Nathaniel Sauerberg)

"My favorite memories include taking Combinatorics with Eric and having all the HW problems go from utterly baffling to making perfect sense each week, the bananagrams tournament, even though I lost in the first round, and knowing that whenever I needed help and wanted to go to the MSC, Fares would always be there to make us all a little less productive." (Jared Kannel)

"I really enjoyed taking combinatorial games with Eric in my Junior spring! Good game!" (Rosa Zhou)

"One of my favorite Carleton math/stats memories is participating in problem-solving competitions (NCS, Konhauser, ...). Trying out everything to solve difficult math problems is fulfilling and doing it with friends makes the experience even better." (Arthur Zhang)

"My favorite Carleton math memory is just hanging out in the Math Skills Center." (Adam Kral)

"Presenting my stats comps with Katie Chavez, Jay Na, Aaron Prentice, Jin Ruan, and Liralyn Smith. Honestly, I think all of us, including our advisor, Katie St. Clair, were just relieved that we got through it (somewhat?) smoothly." (Bryan Kim)

"Some of my favorite memories are of playing banangrams, working on Rob's puzzles with my research group, and just hanging out with people in the skills center!" (Milena Silva)

the most interesting class I got to take at Carleton." (Will Knospe)

"Data science was easily the Carleton class I use most frequently, both in academic/job settings and fun personal projects. Thanks to the Carleton stats department!" (Andrew Roy)

"My favorite math/stats experience might be Rob's Numerical Analysis class; I really enjoyed the theoretical and applied aspects of the mathematical tools we learned!" (Will Thompson)

"My favorite stats memory is probably the major declaration." (Yihuang Wu)

"Learning about new concepts in class." (Nobu Masaki)

"My favorite math/stats memory was going to SWiMS game nights and getting to know many of my fellow majors better!" (Sam Chen)

"My favorite math related memory at Carleton is watching soccer matches freshman year during office hours for a calculus class." (Matt Thill)

"I can't think of anything specific, but remember all of the nights I was hanging out with other math or stats majors in the Skills Center instead of working on a problem set that was due the next day." (Paul Reich)

"Sporcle Study Sessions before exams." (Aaron Prentice)

"Going to the middle school to run the Math Circle with my comps group mates was a lot of fun â€" especially when we had a topic that got the students excited and engaged. I also have many fond memories of putting off my homework and instead playing Bananagrams in the Math Skills Center! My favorite single memory, though, is probably of Eric Egge (in front of my whole comps group) very pointedly telling a story about a foolish past studentâ€¦ which I deserved :P" (Taylor Yeracaris)

"I think one of my favorite stats/math memories is working with the Northfield Public Schools on their e-learning for snow days for the Statistical Consulting class. Being able to work with a group on a single project for a term helped me develop new skills to manage time and develop ways to analyze certain types of data." (Alyssa Akiyama)

"My favorite Carleton Math/Stats memory has to be when my comps group finished our final presentation. The entire process was such a grind so it was nice to wrap it up." (Katie Chavez)

"My favorite math/stat memories definitely involve the many hours spent working on assignments with my fellow majors. Through them, I have not only gotten to know many of my classmates on a more personal level, I've also been able to build several life-long relationships." (Jay Na)

Advice for Current or Future Math & Statistics Majors

"Ask tons of questions. Go to office hours. Start problem sets early. Keep track of all the projects you do here, employers will likely want to hear all about them. It's ok if you don't understand a particular concept right away, keep struggling with the material (but ask for help when you need a push

"Always seek for help and start problem sets / take-homes early!" (Arthur Zhang)

"Talk to your professors! It's something I definitely did not take full advantage of in my first few years. Carleton is pretty special in that the professors here would love for you to stop by and chat, even if you don't have any important questions. I really enjoyed getting to know my professors better and benefited from their advice throughout the grad school

in the right direction.) Collaborate on homework and check/discuss the answers you come up with your classmates. Ask yourself what you're interested in early on and keep asking yourself this same question as you explore new material. Enjoy your time here!" (Matt Thill)

"Go to office hours!" (Peter Keel)

"Consider applying for BSM." (Nathaniel Sauerberg)

"Work on homework with other people in your classes. It's a great way to learn different styles of approaching problems and to have fun at the same time. Also, if you identify as female or non-binary, you should join SWiMS+!" (Milena Silva)

"To all the future math/stats majors my only advice is to go outside your comfort zone in the math department and take classes even if you're nervous about the workload or the subject matter. It's pretty much worth it and eye opening every time." (Todd Johnson)

"Don't be afraid to take a math class because you think it will be difficult! I've often found that it's the most difficult classes that you learn and grow the most in." (Will Knospe)

"Don't let yourself be intimidated! Easier said than done, but we all come from different places and are on our own paths of learning math/stats. As long as you're moving forward on your path, you're making great progress :)" (Tanvi Mehta)

"Enjoy your time at Carleton and don't be afraid to take classes that excite you! Professors are always there to help you and there's no going wrong in the Stats/Math Department!" (Alyssa Akiyama)

"If I had any advice to give to future math and statistics majors, it would be to never shy away from asking for help. Carls really do help Carls!" (Jay Na)

"If you're stuck on a hw problem for a long time, it's okay to ask your friends or make use of resources at the CMC." (Nobu Masaki)

"You're never by yourself. Faculty, Lab Assistants and other classmates are always willing to help."

application process." (Aaron Li)

"Work with other people! Not because it will make doing homework a much better experience (although it will), but because you'll get to know how awesome many people in the department are." (Paul Reich)

"Your professors are cooler than you think so you should get to know them better! Ask them about their research, ask them about their hobbies, or just chat with them. You won't regret it!" (Fares Soufan)

"My biggest advice is to try other things (outside of STEM). Obviously, I think math is a great choice, since I'm a major! But I spent my first couple years focusing a lot on what was "useful," "practical," etc. in making my choices about what classes to take and what to major in, and I wish I hadn't. Grad school, a career, whatever---usually that can all happen later. The chance to discover a new passion in a setting like this will not come again. There is so much eye to be opened, flame to be lit---at least, there was for me, even though I poo-pooed it all at the beginning! So I encourage you to try it out. Also ---"those who can, and can also teach, teach." :) Trying out math teaching was one of the best choices I've made at Carleton, and I recommend it. (Talk to Deanna if you're interested!)" (Taylor Yeracaris)

"To any future math/stats majors, I would say that the department is fantastic with plenty of opportunities to build truly valuable skills and you should absolutely feel empowered to pursue mathematics no matter what!" (Will Thompson)

"If you ever need help or guidance in a stats course, don't be afraid to go into the Stats Lab (CMC 201). The lab assistants are more than happy to help you troubleshoot issues in R and answer any stats questions you have. Special shoutout to my co-workers this year: Sarah Grier, Jenna Korobova, Nobuaki Masaki, and Yihuang Wu!" (Bryan Kim)

"My advice for future Statistics majors is this: always check over your knitted document before you print it or submit it, always check your color

(Aaron Prentice)

"Use your classmates to figure out HW, you make great friends, still learn the material, and get to see how other people approach challenging problems. You'll have plenty of time to work on problems alone on tests." (Jared Kannel)

"Don't plan too hard, because 'life is what happens when you are busy making other plans.'" (Rosa Zhou)

"My advice would be just to take whatever classes sound fun and interesting." (Adam Kral)

"Russ and Sue, thank you for all you do for the math/stats community!"

palettes to make sure they work in grayscale, and work and play together with your classmates." (J. Liralyn Smith)

"Plan out your schedule two years in advance since many upper level electives are only offered once every two years." (Brody Lynch)

Goodbye to the Seniors!

Congratulations to Steven P. Galovich Prize Winners

Each year the Mathematics and Statistics Department awards the Steven P. Galovich Prize to the graduating senior or seniors who best embody the personal qualities of the former faculty member for whom the award is named. Steve Galovich taught in this department from 1974 to 1991, and he brought to his work enthusiasm for and love of mathematics, a zestful joy of life, a great sense of humor, and compassion for others. The Galovich Prize was endowed by an alumnus, William Lang '74, who was affected by Steve's teaching and mentorship. This year the department is pleased to name Elisa Loy and Fares Soufan the co-winners of the Galovich Prize. Congratulations Fares and Elisa!

Job, Internship, and Other Opportunities

National Security Agency - Mathematics Internships

The NSA has several opportunities for undergraduate and graduate students majoring in mathematics or statistics. Applications for summer 2021 are now open for the Directors Summer Program, Cryptanalysis and Signals Analysis Summer Program, and Graduate Mathematics Program. These 12 week paid internships provide students with the opportunity to work directly with NSA Mathematicians on mission-critical problems and experience the excitement of the NSA mathematics community. Find details at https://www.intelligencecareers.gov/nsa/nsastudents.html.

While next summer is a ways away, we do encourage early applications as every participant must obtain a security clearance. Completed applications must be submitted no later than Oct. 15, 2020. Please note that U.S. citizenship is required.

Applications can be found via www.intelligencecareers.gov/nsa.

Teal Internships

This internship is a seat on a social enterprise design team dedicated to constructing wearables intended to remake the world of work to advance pro-social values, purposefulness and trust within organizations. Our work spreads forward-thinking ideas related to work, entrepreneurship, human centered design, business development and social change. You will collaborate in building a not-for-profit business model using enterprise tools such as Agile, Business Canvas and Lean Manufacture. Interns will use the medium of fashion and wearables to co-design a suite of prototypes that communicate progressive messages. Open to remote work, depending on public health directives. Find details and apply at https://carleton-csm.symplicity.com/students/app/jobs/detail/56ed9a547a72355fb4f7b861b670afad.

City Internships

City internships still has open summer programs and internship placements. Find more information and apply at https://www.city-internships.com/.

Problems of the Summer

Because this is the last *Gazette* before the summer and the starting date of fall term is uncertain at this writing, I'm not in a position to give you a "deadline" for the problems below. However, if you are a graduating senior who would like to try to collect a final item from the Big Box O' Prizes before you graduate, please get your solution(s) in by noon on Tuesday, June 9.

1. Recall that for an infinite series $\sum_{n=1}^{\infty} a_n$ to converge, the partial sums, which are given by $s_n = a_1 + a_2 + \cdots + a_n$, must have a limit s (the sum of the series). If this happens, then $\lim_{n \to \infty} (s - s_n) = 0$, and so it is possible, but not certain, that the series $\sum_{n=1}^{\infty} (s - s_n)$ will converge also. Let's define the series $\sum_{n=1}^{\infty} a_n$ to be *superconvergent* if it converges with sum s and $\sum_{n=1}^{\infty} (s - s_n)$ converges as well. It's not too hard to see that if a geometric series converges, then that series is actually superconvergent. How about for p-series? That is, for which values of p is $\sum_{n=1}^{\infty} \frac{1}{n^p}$ superconvergent?

2. Suppose you draw a regular pentagon that is inscribed in a circle, and then you draw the diagonals of the pentagon and erase the pentagon itself, so that you end up with a pentagram inscribed in the circle. What is the ratio of the area inside the pentagram to the area inside the circle? In particular, a rough sketch suggests that the ratio might be reasonably close to 1/3, so is it actually less than, equal to, or greater than 1/3?

The first problem posed May 15 was solved by Sebastian Vander Ploeg Fallon, who should consult with me about getting a prize from the B.B.O.P.; also by "Auplume", and by John Snyder. John solved the second problem as well. Best wishes to all *Gazette* readers, as we approach a summer with more than the usual uncertainties; in particular, congratulations and best of luck to the graduating seniors, and good luck on "virtual" projects and finals to all students. Be and stay well!

- Mark Krusemeyer

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