// Society For Undergraduate Mathematics

Σ NEWSLETTER

SPRING 2.0.2.5.

// CONTENTS

// INTEGRATION BEE WINNER!

It's an average Monday evening in SAS hall with empty classrooms and full graduate student offices. Except, on the 24th of February, a crowd gathers to watch eight nerds contend with venom in math form written on a whiteboard: it is the playoffs of the fourth SUM club integration bee. The octet, who scored the highest on the preliminary exam one week earlier, battled in the circuit as each pair raced to solve a crafted integral before the other. Some fill the space with fury, baring their whole mind with chalk strokes. Others in meditative stillness keep their thoughts secret, answering only in sparse lines. As eight is halved twice by continuous sums the spectators hold only one axiom in certainty: the integration bee will not suffer a math major victory.

Shivsai Kura (he/him) , a biomedical engineering major, is our champion! Through the SUM club's humility, people of many disciplines are brought together in unity.

Scan this QR code for our previous newsletters!

EDITOR: Adelaide Nebeker (she/her)
LAYOUT/DESIGN: Apollo Dominguez (they/he)

ncsusumclub@ncsu.edu //

SUM SERIES RETURNS

A group of students laying down to spell “SUM”

This semester, Dr. Tye Lidman and the rest of the Dept. of Mathematics faculty in conjunction with SUM Club relaunched SUM Series, a series of informal talks on mathematical research topics given by faculty in their fields of interest. Until 2020, SUM Series had been a long-standing event allowing faculty to engage mathematics students over research and other topics in higher-level mathematics they otherwise might not find undergrad curricula. This relaunch marks its first return since the initial waves of the pandemic. The first SUM Series lecture, "Jack and Jill walked on a graph; They were random but worked in tandem; To avoid their better half”, was given by Dr. Erik Bates on a class of problems involving random walks in graph theory. The second, given by Drs. Zane Li, Chao Chen and Nathan Reading, was a three-part lecture on the mathematical facts that changed their lives.

SUM Club Community Coordinator Adelaide Nebeker (**AN**) interviewed Drs. Lidman (**TL**) and Bates (**EB**) via email about the relaunch, and what it was like to give the first lecture in almost half a decade.

SUM SERIES RETURNS

// INTERVIEW

- **AN** is Adelaide Nebeker
- **TL** is Dr. Lidman
- **IB** is Dr. Bates

AN: *Can you both say a bit about what brought you both back to SUM Series? For Dr. Lidman, what inspired you to relaunch the event, and for Dr. Bates, what made you want to kick it off?*

TL: When I first got to NC State in 2016 the SUM Series was a very active and exciting program. There were lectures basically every week by faculty or grad students and the room was bustling. My understanding was that it fell on the shoulders of just a few faculty who were willing to organize this, so with one faculty moving to another school, Covid hitting, etc it wasn't sustainable. Dr. Reading, who used to be one of the core organizers, suggested that the department's new "Success Committee", which focuses on advancing well-being, community, and success in the department, could be a sustainable way to revive the SUM Series. We thought this would be a great opportunity to build more connections between undergraduate students and faculty/graduate students, while also providing some exciting resources, whether it is cool math or professional development, such as the recent REU panel. I am especially excited to have the buy-in from SUM Club and to get to work with them planning these activities.

EB: Research seminars are a staple of academic life, but they are often not accessible (or even advertised) to undergraduates. The SUM Series is a response to this, seeking to expose exciting topics to undergraduates interested in math. The series also provides a space for discussing research-adjacent topics and opportunities that might help shape the career directions of our undergraduate students.

AN: *For Dr. Lidman, what should folks expect from a SUM Series lecture? For Dr. Bates, can you give us a bit of a recap of what your lecture was like?*

TL: We hope to have a mix of different formats, but the core will be a lecture on a topic or result you wouldn't normally come across in the standard undergraduate curriculum. This could mean some cool facts or applications of math or it could be a talk exposing you to someone's research area. We hope to have a mix of faculty/grad student speakers, maybe some undergraduate speakers; a couple events may be more focused on professional development activities like panels. And, pizza of course!

EB: I hope my lecture was fun! Because research is fun. Well, not all parts of it all the time. But the discovery of something no one else has known before–and the process of turning that discovery into knowledge that someone else can use–is utterly satisfying. The lecture also advertised several open problems that an undergraduate can potentially solve. In fact, most often the outcome of a successful research project is having more questions than when you started, and ideally a SUM Series talk demonstrates this as well.

SUM SERIES RETURNS

// CONTINUED

AN: *What would you both say to someone who was curious about attending a SUM Series lecture but nervous it might go over their heads?*

TL: I have a few pieces of advice here:

1. Ask questions! If the talk is over your head, there's a good chance others are confused or that the speaker didn't pitch it at the right level. Asking a question early on as you lose the thread can help to sort out some lack of clarity.
2. There's an unfortunate thing that math is so heavy in jargon/background that there might be things in a specific talk you haven't seen before or can be hard to follow along even if someone explains the definition. One contentious way to approach this is as follows. Have your laptop out and write down the first three things you didn't know before (definition, example, theorem, etc). If you are totally lost in the talk, then look up those things you wrote down, work out the example for yourself, etc. Even if you can't follow the whole talk, you'll still have learned some new things! You can even ask the lecturer after the talk about what you learned. If you can learn 3 things in every talk, that will add up to a lot of knowledge in the aggregate! Remember, you are going to the talk so *you* can learn something, so do what you need to do to get something out of it. In the worst case, you can always quietly work on homework if you get totally lost as long as it's not distracting others. It doesn't really do anyone any good to just stare blankly if you don't know what's going on.
3. Another important thing is that the talks won't build on each other, so if you didn't understand one, it doesn't mean you won't be able to enjoy the others. Please keep coming back!

EB: There is free pizza. Also, a seminar is a lot different from class: you are not expected to understand everything! Everyone is welcome.

> Keep your eyes peeled for more SUM Series announcements for the rest of Spring and for Fall ‘25! <

UPCOMING FALL 2025 EVENTS

Read all about the regular events hosted by SUM Club, and look forward to the events for Fall '25!

// AUGUST & SEPTEMBER

General Interest Meeting: Join us for an introduction to SUM Club! Meet new people, learn about upcoming events, and participate in exciting math-related activities this semester. Pizza, card games, conversation, and perhaps some entertaining math problems will be provided.

Proofs with Pizzazz: It happens to all of us. One minute, math is all about working through numbers and the comfort of the equals sign. Then, all of a sudden, your professors want you to write…words? Well, we're here to help! Join us for a workshop on the often untaught stylistic aspects of proofreading.

Game Night: Whether you're a board game enthusiast or enjoy mathematical puzzles, we'll have something for you! Come by and play some games.

Two SUM club members engaged in a game of chess in a packed undergrad math lounge.

// OCTOBER

A group of students playing cards at a table

LaTeX Intro Workshop: LaTeX is an essential typesetting tool in math. Attend SUM Club's LaTeX Boot Camp and learn to create professional mathematical documents easily! Master typesetting equations, homework, and papers and preparing presentations for future projects!

Shopping Cart Night: Are you taking classes next spring? Come to Shopping Cart Night to get all the good advice, bad advice, and course recommendations that you need to plan for next semester!

UPCOMING FALL 2025 EVENTS

// NOVEMBER

A picture of students on a hike with Dr. Duca!

Fake vs. Real Math Terms: How well do you know your math vocabulary? Come test your skills as we distinguish between real and made-up math terms!

MIC Night: Want to learn about the math you only get from a special topics class but don't have time for all that homework? Come to Open MIC Night! More of a guest lecture series than a true "open mic," the title pays homage to the series' origins in State's now (sadly) shuttered Math Insights Club.

// EXTRA EVENTS

End of Semester Celebration: Celebrate the end of a great semester with a relaxed movie night and hang-out session. Grab some snacks, unwind, and enjoy good company with fellow math lovers!

Dr. Duca + SUM Club Firepit: Escape from classes and campus with hikes and fire pit nights featuring math professor and SUM Club advisor Dr. Duca. Join us for a cozy and casual firepit gathering with Dr. Duca and the SUM Club! Warm up by the fire, chat about math, and enjoy a chill weekend evening with friends.

SUM club members in their natural habitat, gathered together in the math lounge

SPECIAL TOPICS: FALL 2025 CLASSES

// MA 493-001 Mathematical Foundations of Data Science II

Instructor: Dr. Ryan Murray

Course Description: This is a new course that will be a continuation of MA 326 and will be a central part of the data science concentration in the applied mathematics major. The course covers foundational mathematical concepts fundamental to data science. It builds upon the basic concepts in MA 326 and develops theory for a range of central data science techniques. The course includes the following topics: Optimization algorithms, neural networks, graph-based models, and generative learning. These algorithms will be explored computationally using Python and practical data sets.

Time: 1:30 pm - 2:45 pm
When: Tuesdays and Thursdays
Location: SAS Hall, room 1108
Prerequisites: MA 326

// MA 493-002 Introduction to Financial Mathematics

Instructor: Dr. Dominykas Norgilas

Course Description: This course is an introduction to financial mathematics at the undergraduate level. The objective is to familiarize students with the basics of derivatives pricing. Topics include Binomial Tree pricing, Arbitrage Theory, Geometric Brownian motion, and the Black-Scholes model for pricing call and put options. The material in this course is heavily dependent on probability, so it is recommended that students already have taken MA/ST 421.

Time: 11:45 am - 1:00 pm
When: Tuesdays and Thursdays
Location: Withers Hall, room 135
Prerequisites: MA/ST 421 recommended

PROGRAMS // SCHOLARSHIPS

// HONORS PROGRAM

The **Math Honors Program** began in the mid-1960s to encourage excellent undergraduates to pursue a program that would challenge their abilities and better prepare them for their postgraduate careers. Since then, the program has grown from four to five participants, with one to two completing the program each year, to an average now of about 35–40 participants, with 10–14 students completing the program each year. More than half of the participants are double majoring in math and other areas such as physics, computer science, math education, chemistry, engineering, or a foreign language.

More information can be found at:
https://math.sciences.ncsu.edu/undergraduate/undergraduate-programs/math-honors-program/

// SCHOLARSHIPS

All scholarships below have a deadline of **June 1st, 2025**!

- **Carey G. Mumford Scholarship**
  - Awards for students majoring in Mathematics. Must maintain a "B" average.
  - https://ncsu.academicworks.com/opportunities/170910
- **Charles F. and Ethel E. Lewis Scholarship**
  - This is for students in the COS with outstanding academic records. Preference for students studying mathematics.
  - https://ncsu.academicworks.com/opportunities/172539
- **Dr. Rebecca R. Bullock Memorial Scholarship Award**
  - For students majoring in Mathematics. Preference for students also majoring in English. This is a merit-based scholarship.
  - https://ncsu.academicworks.com/opportunities/168781
- **Charles Noel Anderson Scholarship**
  - This is for rising sophomores in mathematics who have completed at least 28 credit hours at NCSU. Merit-based, however, if students of equal merit are eligible, preference is for the student with the greatest financial need.
  - https://ncsu.academicworks.com/opportunities/170459

Find more Scholarships with PACK ASSIST: https://ncsu.academicworks.com/

STUDENT ORGANIZATIONS

SUM CLUB

The **Society for Undergraduate Mathematics** (SUM Club) is a student organization for students passionate about mathematics. We connect math undergrads and provide students with academic and professional development, leadership, and service opportunities. This is accomplished through social and outreach activities, presentations at meetings, career events, and other college and university-wide involvement. Open to any student, math major or otherwise, we meet on Thursdays at 6 pm to get to know one another, do math puzzles, play games, learn together, and perform outreach.

We would love to have more people involved! Email us at ncsusumclub@ncsu.edu with any questions or to be added to our email list.

ASSOCIATION FOR WOMEN IN MATHEMATICS

The purpose of the **Association for Women in Mathematics** at NC State is to encourage women to study and have active careers in the mathematical sciences and to promote equal opportunity and treatment of women in the mathematical sciences. We host monthly lunches and meetups, as well as Sonia Kovalesky Day, a high school outreach program that will be held on April 12th this year!

For more information, join GroupMe via the QR code or email womeninmath-org@ncsu.edu.

STUDENT ORGANIZATIONS

STAT CLUB

The **Stat Club** aims to expose people to the endless applications of statistics and what a career in statistics looks like by bringing in guest speakers from industry and academia. This is also a great way for members to network with industry professionals, NCSU faculty, and other statistics majors. Our meetings also consist of workshops to hone your marketability when applying for internships and opportunities. You should join if you are interested in statistics or related professions or want to meet and socialize with other statistics lovers.

If you have any questions or want to be added to the mailing list, please email us at statistics-club@ncsu.edu. We hope to see you all soon!

SPORTS ANALYTICS CLUB

The **Sports Analytics Club at NC State** is a student-run organization committed to the quantitative analysis of sports strategy and management. This club is open to all students and faculty members of NCSU.

The club encourages and enables students to share ideas and complete research projects on any topic related to sports statistics. We meet weekly on Wednesdays at 6 pm in SAS Hall Room 2229. We host statistical programming tutorials, trivia, and guest speakers from throughout the industry, all while collaborating on personal projects to share at the end of the semester.

Email sportsanalytics@ncsu.edu if you would like to join our email list.

STUDENT ORGANIZATIONS

PUTNAM CLUB

The **Putnam Competition Club** is a weekly problem-solving club based around preparation for the prestigious William Lowell Putnam undergraduate math competition. The Putnam Competition is hosted once annually in December, and the top scorers have included several respected researchers. Achieving a good score is often a resume booster! During the Putnam Competition Club meetings, we are motivated by solving interesting competition problems and developing problem-solving skills and mathematical knowledge. A typical meeting involves everyone working on trying to solve a problem -- either collaboratively or on their own -- and writing up solutions for practice. No prior competition experience or significant mathematical knowledge is necessary to participate and succeed, as the club is built around developing the necessary skills!

Email SUM Club at ncsusumclub@ncsu.edu if you would like to learn more.

OSTEM

oSTEM is a semi-professional organization for LGBT individuals majoring in STEM. We prepare and support each other through challenges specific to our community, provide networking opportunities with companies and alumni, and host social events to build the strength of our community. We generally meet every other Thursday in the LGBT Pride Center (on the top floor of Talley) unless otherwise specified.

If you want to learn more, either reach out to us at ostemchapter@ncsu.edu or go.ncsu.edu/ostem-contact-form

STUDENT ORGANIZATIONS

ACTUARIAL SCIENCE CLUB

The **Actuarial Science Club at NC State** is looking for individuals interested in developing their understanding of financial concepts and the field of risk management. Our focus this semester is building resumes tailored to actuarial positions, making study plans for the preliminary examinations, and to hosting companies both locally and across the country. We hope to support you in your actuarial journey while enrolled at NC State, and two of our members have passed examinations since joining the club!

Meetings will occur weekly on Mondays from 7:15-8:00 pm in SAS Hall Room 1220. If interested, email actuarial_science-org@ncsu.edu to join or to learn more!

THE NORTH CAROLINA COUNCIL OF TEACHERS OF MATHEMATICS (NCCTM)

The **Kappa Student Chapter of the North Carolina Council for Teachers of Mathematics at NCSU** hosts various social events, professional development opportunities, and chances to network! Whether you are in education or enjoy meeting others who love math, this organization is for you! This year, we have hosted a Spooky Social, STEM ED Breakfast, and a Teacher Panel, to name a few!

If you want to receive updates for NCCTM happenings, check out our Instagram @ncctm_kappa, join our NCCTM Groupme, or fill out our Email form. We look forward to seeing you soon!

GroupMe: https://groupme.com/join_group/86322719/HyVIOYTv
Email Form: https://forms.gle/m8KrKP7FPSmHorjH7

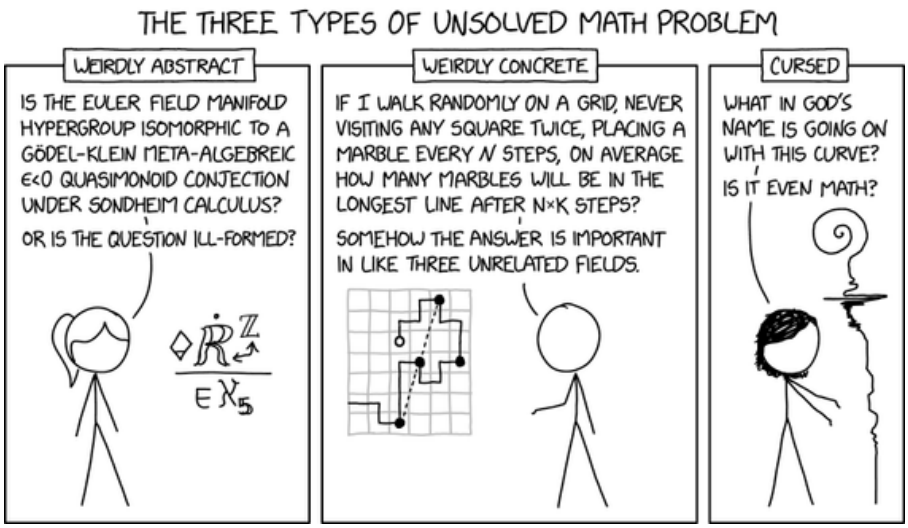
DATA SCIENCE CLUB

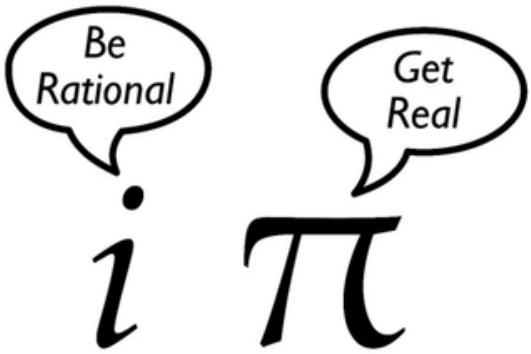
The **Data Science Club at NCSU** highlights interdisciplinary applications of data science. Supported by the Data Science Academy, the club hosts a variety of programming for students with an interest in data from all majors and skill levels. Coming up, we have a series of DataFest prep workshops and an externship at Red Hat!

Register through GetInvolved to find out what we are up to next.

DataFest: https://datascienceacademy.ncsu.edu/programs/datafest-nc-state/
Externship: https://careers.dasa.ncsu.edu/gain-experience/externship-program/
GetInvolved: https://getinvolved.ncsu.edu/organization/dsc

THE SILLIES (PUZZLES, JOKES, ETC.)





Credit: xkcd

MATHEMAGICAL TIMES

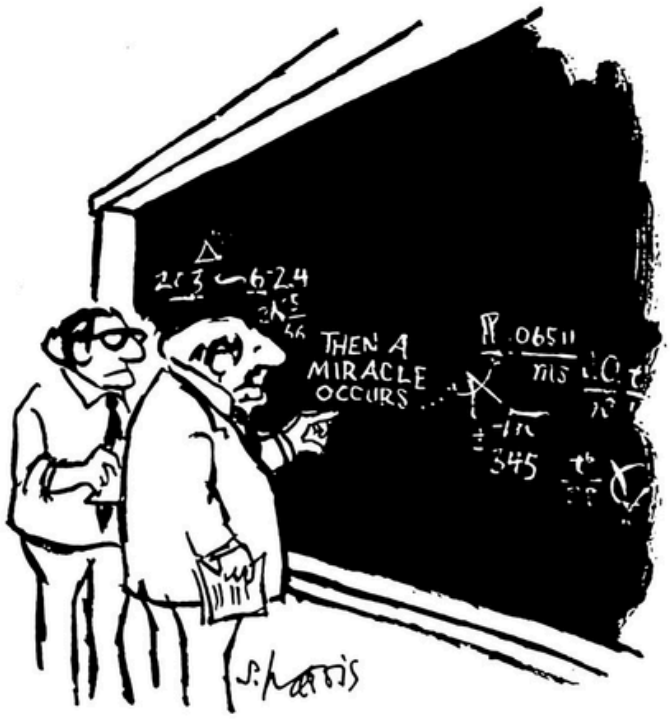
LIGHTER SIDE OF LOGIC

- **PARROT LEARNS TO SAY 'THIS IS TRIVIAL,', EARNS MATH DEGREE**

In a stunning display of mimicry and minimal effort, a parrot has been awarded a mathematics degree after repeatedly saying "this is trivial" with great confidence, Faculty noted that the parrot's voice "sounded eerily like a tenured professor," and its final thesis consisted of squawks, QED."

OTHER NEWS IN THE WORLD OF MATH:

- **π FINALLY CRACKS UNDER PRESSURE, BECOMES RATIONAL**
  After centuries of irrational behavior, pi has reportedly "had enough."
- **LOCAL GEOMETRY STUDENT ACCIDENTALLY PROVES PYTHAGOREAN THEOREM USING PIZZA SLICES**
  "I was just hungry," says the student. "Then suddenly–boom—right triangles."
- **ALGEBRA STUDENT FAILS TO FIND *x*, BUT FINDS INNER PEACE INSTEAD**
  "Turns out x was within me all along," they reflected.
- **NEW EQUATION DISCOVERED, SCIENTISTS NOW OFFICIALLY 'OUT OF VARIABLES'**
  Conference devolves into chaos after someone suggests using emoji.
- **ZERO DECLARES BANKRUPTCY, CLAIMS TO HAVE NOTHING LEFT**



"I THINK YOU SHOULD BE MORE EXPLICIT HERE IN STEP TWO."

Credit: Sidney Harris

// Thus, the Spring 2025 newsletter is complete. Q.E.D.