

TEAMM Newsletter

Department of Mathematics, University of Massachusetts Dartmouth

June 2022



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1 Welcome!

Welcome to the first [TEAMM](#) (“Together Everyone Achieves More in Mathematics”) Newsletter.

The newsletter is intended to be a chatty, newsy, fun, informative publication, appearing approximately once a month, and in good times every two weeks. Exactly how often the newsletter appears depends to a large extent on what new information, from readers, the editors have to share.

The sort of things the editors are looking for are:

- Big deal happenings - acceptance into graduate school or a major program; an award or other recognition.
- Academic happenings - attendance at a conference, for example.
- Upcoming events - seminars, HS math club meetings, for example.
- Personal events - running a marathon, for example (yes, we’re thinking of you Yanlai).
- Interesting articles or books you’ve come across.
- Interesting puzzles or problems.



Gary Davis & Adriano Marzullo (editors)

2 Congratulations

To Dr. BiYong Luo, on his promotion to Senior Lecturer, effective September 1, 2022.

As Department Chair Dr. Saeja Kim stated:

“We all know that this promotion is a delayed and well-deserved recognition of Biyong’s dedication and contribution to our school.”



Figure 1: BiYong Luo

3 Who's doing what over summer?

- Sergei Artamoshin is teaching Calculus II from July 11 through August 12.
- Yanlai Chen is part of a team that is holding a reunion event of a national REU-type of program that was conducted fully online in 2020. He will also devote a lot of time working on the NSF-funded ACCOMPLISH program which will include a summer workshop with community colleges. On May 1, 2022 Yanlai ran the Providence Marathon, and while he has no race plans for Summer, doubtless he will be in training since he plans to run the Boston Marathon Patriot's Day 4/17/2023.



- Gary Davis is going on a cruise (his first!) with partner Diane Mahoney starting in Barcelona and finishing in Rome, July 23-30. Otherwise he is working on a course on data visualization and communicating with data.
- Fanta Diawara, Mathematics major, has an internship with Dell Technologies on the Global Marketing Internship Project: a 10-week hybrid process, with some interns in Austin, Texas and some - including Fanta - who are remote.
- Alfa Heryudono says his summer is most likely just like previous summers: full of weekly research meetings and discussions. Alfa is keeping an eye on whether the visa on arrival status in Indonesia will be open, because he really hopes to visit his mom for 10 days.
- Shawn Koohy, Mathematics major, is working on numerical solutions to high-dimensional stochastic differential equations, led by Guangming Yao, at [Clarkson University's Summer REU program](#), May 23 - July 15.
- Angeliki Kouma is teaching Fundamentals of Statistics, June 13 through July 29.
- Sokratis Koumis is teaching Finite Mathematics June 13 through July 29.
- Biyong Luo is teaching Calculus III June 6 through July 8 and Differential Equations, July 11 through August 12.
- McCord Murray, Data Science major, Mathematics minor, is at the [Columbia Summer Institute for Training in Biostatistics and Data Science](#) May 30 - July 15.
- Adriano Marzullo is teaching Calculus I online for 4 weeks, June 6 through July 8, College Algebra June 6 through July 8, and Precalculus July 11 through August 12.

- Douglas Richard, a recent mathematics graduate, plans to take a couple trips to New Hampshire, as part of his plan to hike all the 4000+ footers in New England and New York, checking them off his list one by one. He has a scratch off map of the mountains to track his progress.

Some background on the 4000+ footers just in New Hampshire from [Wikipedia](#):

“Four-thousand footers (sometimes abbreviated 4ks) are a group of forty-eight mountains in New Hampshire at least 4,000 feet (1,200 m) above sea level. To qualify for inclusion a peak must also meet the more technical criterion of topographic prominence important in the mountaineering sport of peak-bagging. The White Mountains Four Thousand Footers List is established (and revised from time to time) by the Appalachian Mountain Club.”

With 48 4000+ footers in New Hampshire, let alone the rest of New England and New York, seems Douglas has his work cut out.



Figure 2: White Mountains, New Hampshire

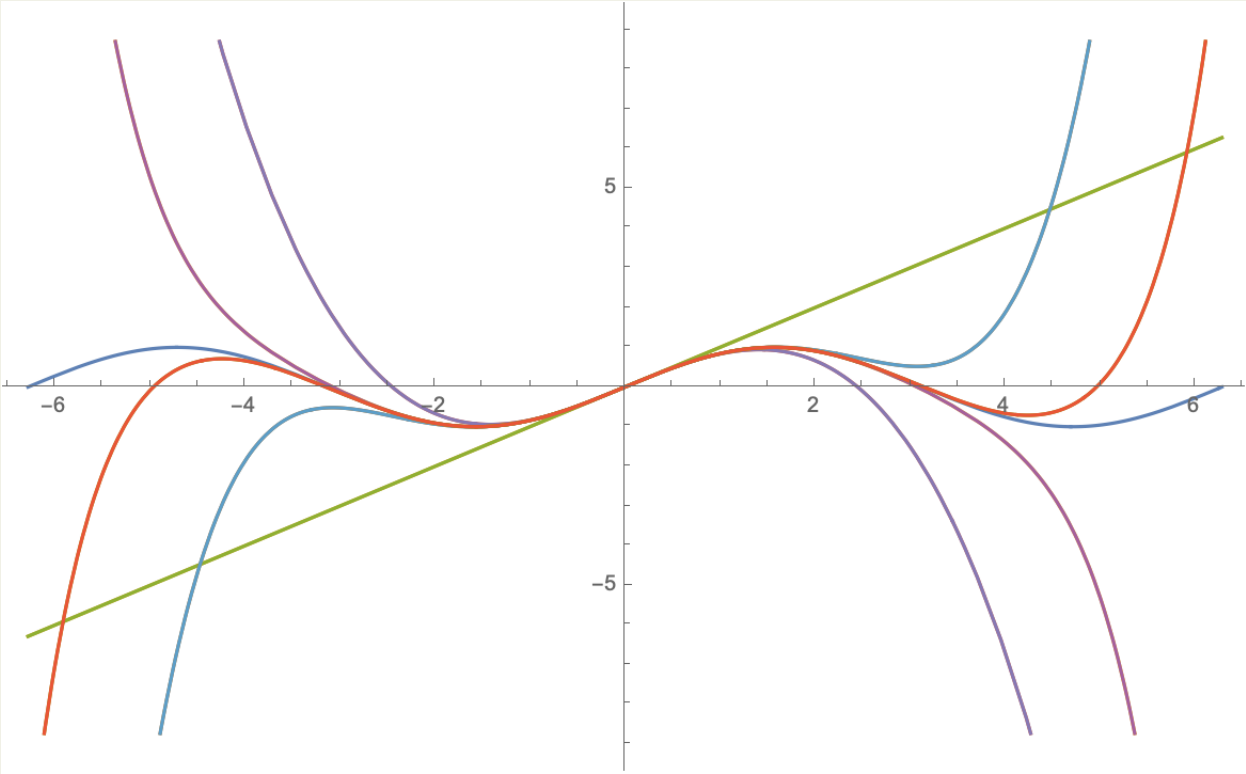
4 Riddles

Q. Why do mathematicians confuse Halloween and Christmas?



A. Because $31 \text{ Oct} = 25 \text{ Dec}$

Q. Why do truncated Maclaurin series fit the original function so well?



A. Because they are Taylor made.

5 Summer reading?

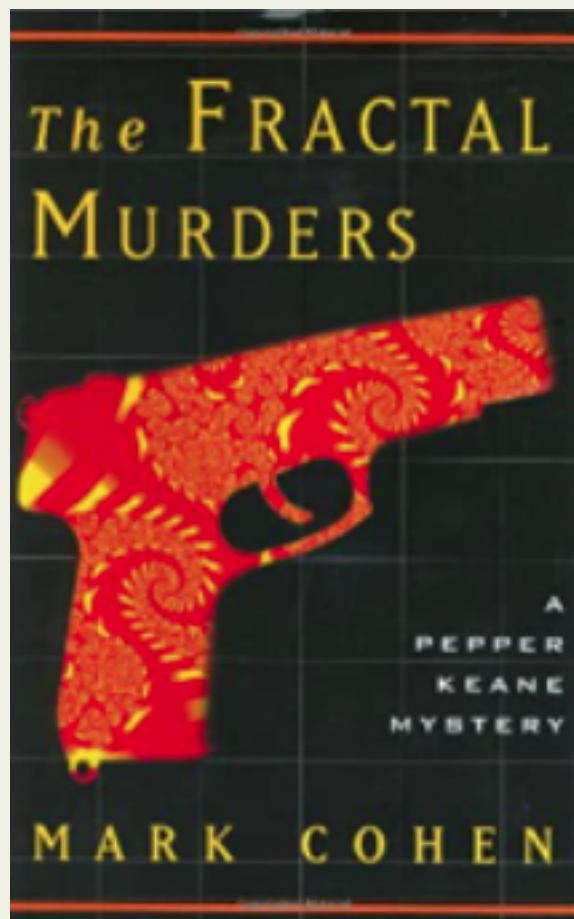
- [Alex Kontorovich](#), Professor of Mathematics at Rutgers NJ, has an [excellent expository article](#) on the far-reaching, influential Langlands Program in mathematics.



Figure 3: Alex Kontorovich

- In case you haven't read it yet and want a good math-focused murder mystery, give [The Fractal Murders](#) a try:

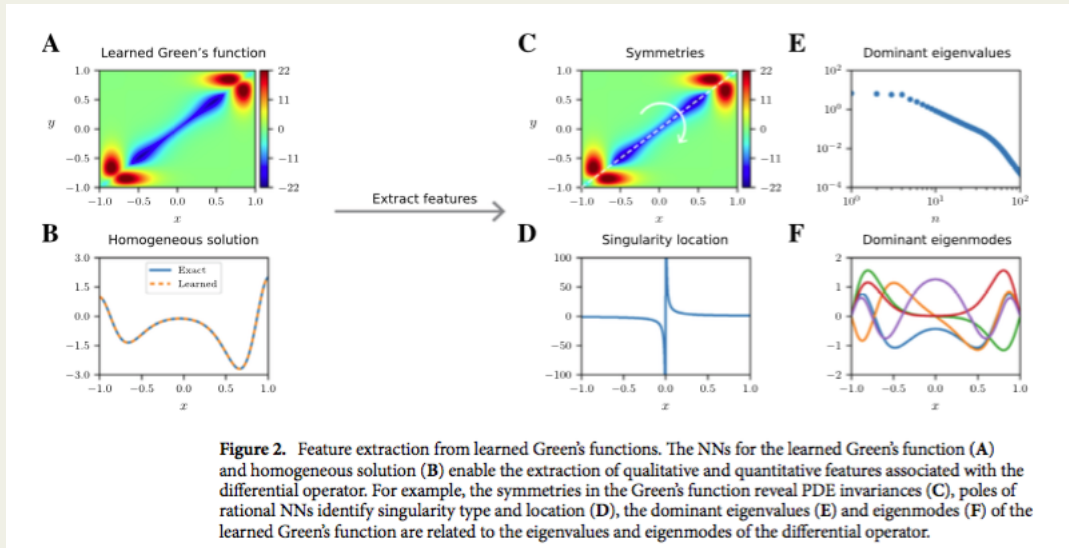
“This clever mystery pits a private eye against a murderer who is systematically slaying top American mathematicians. The link? The victims are all proponents of fractal geometry, the discipline that analyzes geometric shapes to identify patterns and predict behaviors in complex systems.”



6 New and noteworthy

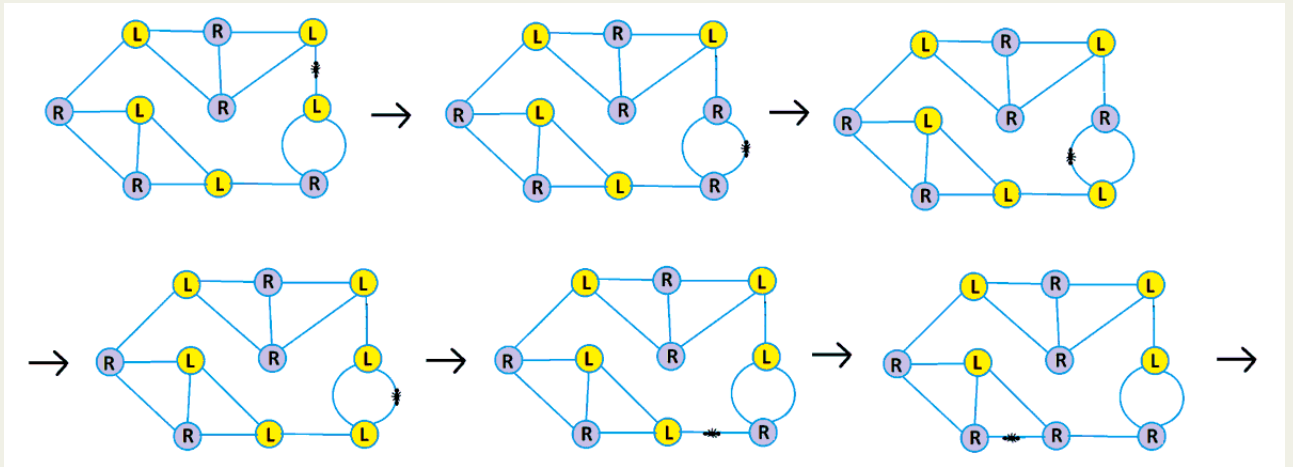
Boullé, N., Earls, C. J., & Townsend, A. (2022). [Data-driven discovery of Green’s functions with human-understandable deep learning](#). *Scientific reports*, 12(1), 1-9.

“There is an opportunity for deep learning to revolutionize science and technology by revealing its findings in a human interpretable manner. ... By collecting physical system responses under excitations drawn from a Gaussian process, we train rational neural networks to learn Green’s functions of hidden linear partial differential equations. These functions reveal human- understandable properties and features, such as linear conservation laws and symmetries, along with shock and singularity locations, boundary effects, and dominant modes.”



7 Ant walks: a summer mathematical problem

An ant walks along the trail system shown:



When the ant gets to an L node, it turns left and changes L to an R. When the ant gets to an R node, it turns right and changes R to an L.

Does the ant visit each node?

For which initial pattern of Ls & Rs does the ant *not* visit each node?

The trail system shown us an example of a labeled connected graph. Explore which [well known connected graphs](#) can be labeled with Ls and Rs so that the ant can visit each node of the graph, turning left at L nodes and changing them to R, and vice versa with R nodes.

Thanks to [James Tanton](#) for this problem, who created it in honor of [Christopher Langton](#).

