Swat Math/Stat Summer Opportunities

Summer 2026

Our Awesome Panelists!

- Ernesto Garza
- Lee Liu
- Derrick Nyaga
- Zoe Tang
- Hannah Zhang

How to use this document:

Faculty members in the math/stat department who may have summer research projects have each made a slide to give you a short overview of their work and potential ideas for what students could work on. Some have also included further reading and next steps for potential research assistants.

Take a look at the following slides, check out the linked resources, and reach out to any professors that you might be interested in working with!

The last slides have links to outside opportunities. If you know of more, let us know!

(Note: demand for math/stat summer research often far exceeds the supply of positions available, and most funding will be through the college's funding application, which happens in the spring semester)

Swarthmore Summer Scholars Program Math Mentor

As we have learned over the past 10 years, the Student Mentors are the ‘secret sauce’ to the S^{3}P recipe for a successful program. **The job is a combination of teaching assistant and resident assistant, and includes a full summer stipend.**

Two student Math Mentors will be hired (along with 4 others who will support other disciplines) and will work closely with Professor **Allison Miller** and Academic Support Coordinator **Laura Dandridge**. Math Mentors should ideally have completed Math 15 and Math 25 (but exceptions are possible) and do not need to be STEM majors or minors. Feel free to apply for Chemistry and/or Writing as well!

Strong candidates:

- have demonstrated knowledge in the subject area that they will support;
- have strong commitment to fostering diverse and inclusive communities at Swarthmore;
- are dependable team members with strong communication skills;
- are excited to build lasting mentoring relationships with incoming first generation and low-income students

Applications open January 20th, and are due on February 13th at 4pm.
Find more information about the application process on our website:
https://www.swarthmore.edu/summer-scholars-program/mentor-information

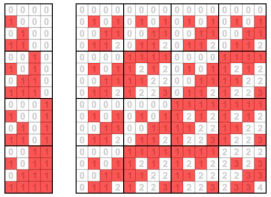
Please direct any questions to:
Kyra Harvey-Broughton
S^{3}P Assistant Director kharvey1@swarthmore.edu

Career Services can help too!

- Advising - schedule through Handshake
- Resumes, Cover Letters, Interviews, Make Connections
- Handshake - internships, jobs, employers, events and programs.
- SwatWorks - Micro-internships offered over Winter Break (paid)
- Summer Funding
  - Career Services options for paid internship experiences: SFEP and CSSS
  - Summer Opportunities Fair - Dec 3 and 4 (12:30-1:10pm) on Zoom
- Consortia - Fairs and Recruiting Days
  - TCCF - January 30, 2026
  - LAUNCH - January 4 (app deadline); January 15 & 16 (virtual interviews)
  - Government, Education, Non-Profit Fair - February 2026 (virtual fair)

Finite math! (proofs, games, probability, …) - Pat Devlin

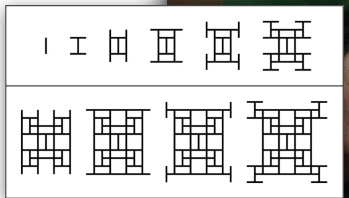
Flavor: I have a wide interest in anything proofy and finite including discrete math, graph theory, games, theoretical computer science, probability, enumeration, algebra, geometry, …



Ideal students: anyone with a taste for math-venture!

Pre-requisites: The most important thing is *excitement about proofs*. Ideally, students have seen at least one proof-based class (e.g, 28, 39, 63, …), and students who have seen more advanced topics will have more cool options. Students will choose from a range of projects to match their interests, goals, and background

More information: Happy to chat with you about projects or discuss whatever interests you. Email (pdevlin2@swarthmore.edu) or swing by my office any time



Applied Math and Network Dynamics– Victor Barranca

Overview:
I study the relationship between the structure of a network and its function, particularly for high dimensional systems with nonlinear dynamics. Much of my research uses mathematical approaches to investigate the neuronal computations underlying sensory processing and the role of neuronal network connectivity in facilitating brain function. More information can be found *here*.

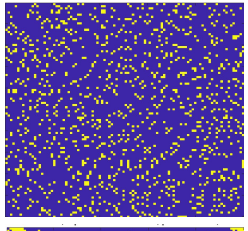
This year's project will likely study how to classify the regular vs. random structure of a network, and how this may be useful for identifying neurological disorders. Implications on network function may be explored too.

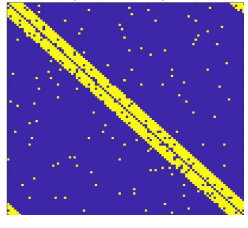
Projects Involve: *Nonlinear dynamics, modeling, signal processing, numerical computing, and network science*

Prerequisites: Differential Equations (Math 43/44) and Programming Ability (CS 21 or equivalent)

Helpful, But Not Required, Additional Coursework Includes any of the Following:
Modeling (Math 56), Probability (Stat 51), Stochastic and Numerical Methods (Math 66)
No neuroscience experience needed: only interest in applications of math to biology is required

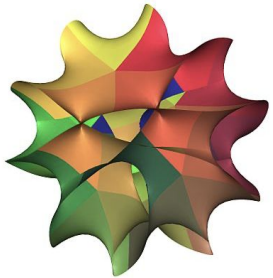
If Interested:
Contact Prof. Barranca at vbarran1@swarthmore.edu for more information. Please send along a short message explaining your interest in the research and relevant background.
Feel free to reach out with any questions!





Computations in Mirror Symmetry- Prof. Ralph R. Gomez

Research Project: The universe might very well be 10 dimensional (4 space-time plus 6 extra dimensions) although there is not yet any experimental evidence for this. However, there is a fascinating symmetry associated to these 6-dimensional spaces. That symmetry is called *mirror symmetry*. I would like to use some computational techniques and ideas from mirror symmetry to explore the creation of new mathematical spaces in odd dimensions for which the curvature of these spaces is very specific. We will likely specialize to dimensions five, seven and nine.



Background: A course in multivariable calculus (34 or 35) and if possible an upper level proof-based math class. No physics background needed!

Contact: Please email me at rgomez1@swarthmore.edu if you are interested or stop by my office if you have any questions!

Applied mathematics and auditory neuroscience with Prof. Joshua Goldwyn

The sense of hearing relies on fascinating dynamics in neurons and brain areas.

Research project this summer:

* construct and train neural network models to study how the brain may process and categorize sounds

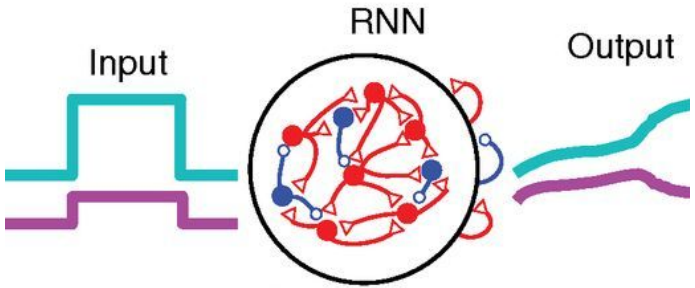
Mathematical topics:

* differential equations: modeling and analysis
* numerical simulations and machine learning

Relevant (BUT NOT REQUIRED) coursework: any of Math 27, 44, 56, 66

* familiarity with Python is preferred
* no required background in biology & neuroscience, but you should find it *interesting*

Additional information on my website:
https://www.swarthmore.edu/joshua-goldwyn/summer-projects

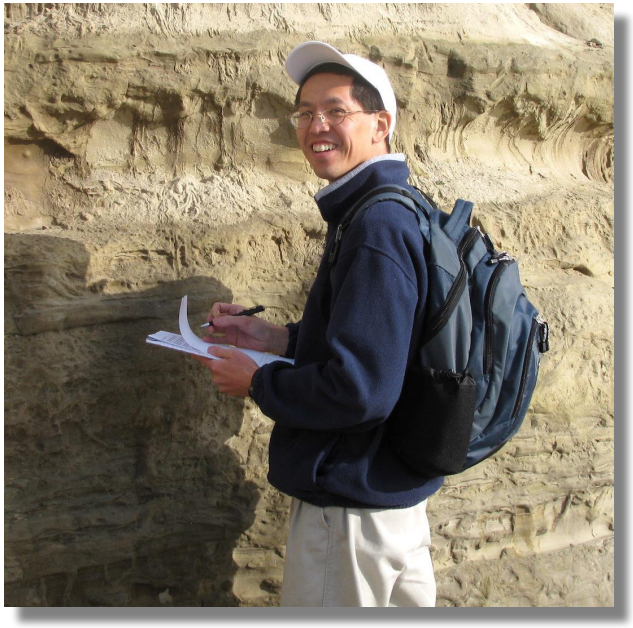


(Ehrlich et al. 2020)

Email me with questions and interest,
or to discuss your own ideas for summer research in applied mathematics:
jgoldwyn@swarthmore.edu

Statistical Paleontology — Prof. Steve Wang

I develop statistical methods for analyzing data from paleontology, mass extinctions, evolution, and conservation biology.



I am not yet sure what specific projects we'll be working on this summer, but you can read brief descriptions of work by previous students here: http://paleo.domains.swarthmore.edu/personnel.html

The most important qualities I am looking for are curiosity, persistence, perseverance, attention to detail, and skill in debugging. My work mainly involves computer programming, so you should have taken CS 21 or the equivalent. (CS 35 is helpful but not necessary.) The ideal statistical preparation would be Stat 51, but Stat 11 could work as well. No experience in paleontology is expected.

If you're interested, please send a resume/CV to swang1@swarthmore.edu.

You can find more information on my research here: http://paleo.domains.swarthmore.edu/research.html

Feel free to ask if you have any questions!

External Math/Stat Research Opportunities

The NSF funds a number of REU's in the mathematical sciences and other fields across the US. (Note that NSF-funded positions are restricted to US citizens or permanent residents). The AMS also has a list of possible summer programs: https://www.ams.org//opportunities.

Students have told us they have found the following links helpful for finding REUs:

- https://sites.google.com/view/mathreu,
- https://reufinder.com/ or
- https://www.mathprograms.org/db/program

Summer@ICERM program at Brown University

The Summer Institute in Biostatistics and Data Science is an NIH-funded program across six different universities

Stanford Population Health Summer Research Program is a virtual program for under-represented and historically excluded students in the health sciences with a focus on quantitative methods for population health

The Division of Biostatistics at the University of Minnesota will be hosting a 10-week Summer Research Experience for Undergraduates

** Feel free to leave a comment with any other opportunities, and I will add them to the document 😊