

**BAMA 5**  
School Year 2018—2019  
Join us for a free talk...

**Andrew Bernoff**  
*An Introduction to Surface Tension*  
*(Or Why Raindrops are Spherical)*



**Santa Clara  
University**

**Santa Clara University, Daly Science 207**

**Friday, April 12, 2019, 7:30 pm**

A common misconception is that raindrops take the form of teardrops. In fact, they tend to be nearly spherical due to surface tension forces. This is an example of how at small scales the tendency of molecules to adhere to each other is the dominant effect driving a fluid's motion. In this talk we will explain how surface tension arises from intermolecular forces. We will examine some examples of the behavior that can occur at small scales due to the balance between fluid-fluid and fluid-solid forces, with applications as varied as understanding how detergents help clean clothes to designing fuel tanks in zero gravity environments. This talk is accessible to students of all ages, however audience members should be willing to perform a fluid dynamics experiment (materials will be provided) as part of the experience!!

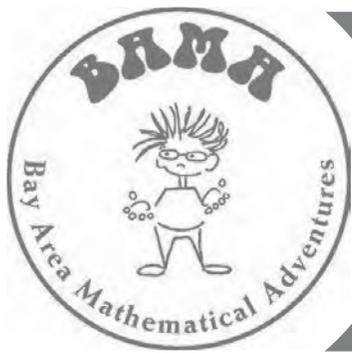
**Andrew Bernoff** is a Professor of Mathematics at Harvey Mudd College. His research specializes in bridging the gaps between mathematics, physics, biology and engineering with a particular emphasis on using dynamical systems methods to understand experiments and natural phenomena. Prof. Bernoff was an undergraduate at MIT where he received BS degrees in Mathematics and Physics. While an undergraduate, he founded the MIT Integration Bee. In 1978 he was awarded a Marshall Scholarship to pursue a PhD at the University of Cambridge in England. Prof. Bernoff spent time at Northwestern, Duke and the University of California at Berkeley before settling in at Harvey Mudd College, where he is the Diana and Kenneth Jonsson Professor of Mathematics. He is passionate about mentoring undergraduate research, coaching the Harvey Mudd College Putnam Team, and supporting Harvey Mudd College's Clinic Program, a year-long practicum in which teams of undergraduates work for industrial sponsors on real-world problems and applications. His research program centers on understanding the behavior of fluids at small scales and modeling the swarming of organisms, in particular locusts.



\* See back for map and directions.

Visit the Bay Area Mathematical Adventures (BAMA) at <http://mathematicaladventures.org>

To receive email notifications about BAMA talks, please contact Frank Farris at [ffarris@scu.edu](mailto:ffarris@scu.edu).



# BAMA

## Bay Area Mathematical Adventures

A series of presentations on diverse topics by remarkable mathematicians. All talks are free and open to the public.

### WHY?

BAMA aims to challenge and motivate students to think mathematically. Speakers will present real mathematics, and will share with the audience modern views of mathematics. Some talks will provide students with related problems, or will enable teachers to expand later on the topics with their students.

### WHO?

BAMA is aimed at bright high-school age students. However, all are welcome: younger or older students, teachers, parents, and the general public.

### WHEN?

Evening talks will be given approximately once a month between September and April. Each talk will be self-contained (speakers will not assume their audiences have attended previous talks).

### WHERE?

#### **Santa Clara University Daly Science, rm. 207**

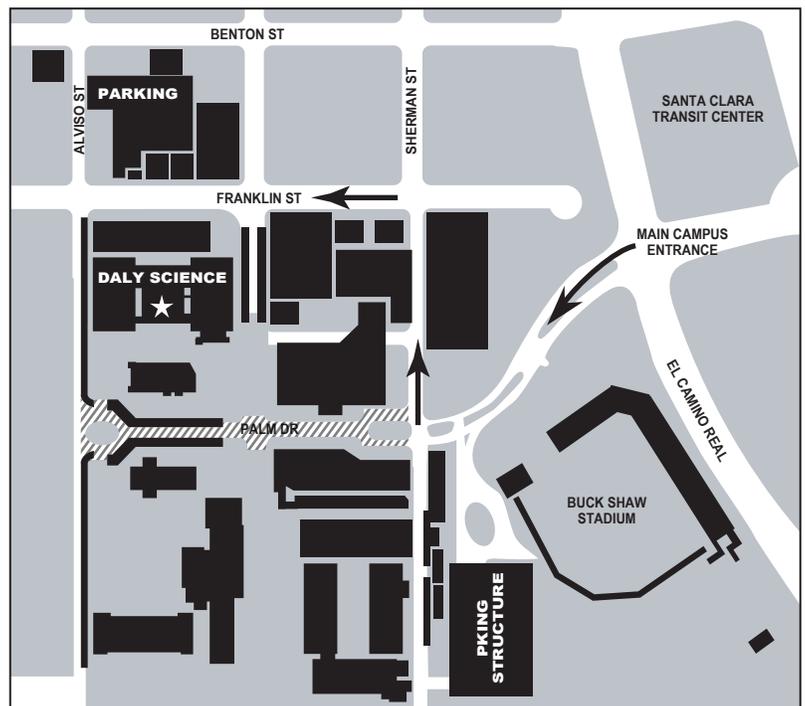
From US Highway 101, take the De La Cruz Blvd/Santa Clara exit and follow the signs to El Camino real and main campus entrance.

From I-280, take I-880 north toward Oakland to The Alameda exit. Turn left onto The Alameda (which becomes El Camino Real) to main campus entrance.

From I-880, take The Alameda exit, travel north (The Alameda becomes El Camino Real) to main campus entrance.

*Note:* If you arrive by car, you can go directly to the parking garage at Franklin and Alviso and purchase a permit at a self-serve kiosk. Alternatively, it is usually possible to find free street parking within a couple of blocks.

If you have a disability and require reasonable accommodation, please call anyone on the steering committee, or 1-800-735-2929 (TTY—California Relay) 24 hours in advance.



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College of Engineering

**Santa Clara University**  
Department of Mathematics and Computer Science  
American Institute of Mathematics  
Mathematical Sciences Research Institute

#### **FOR MORE INFO:**

<http://www.mathematicaladventures.org>

BAMA Organizers:

Tatiana Shubin  
Frank Farris

SJSU 408-924-5146  
SCU 408-554-4430