

# BAMA 6

School Year 2014–2015  
Join us for a free talk...

## Elwyn Berlekamp *The Game of Amazons*

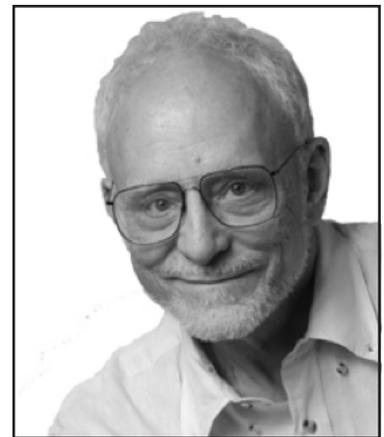
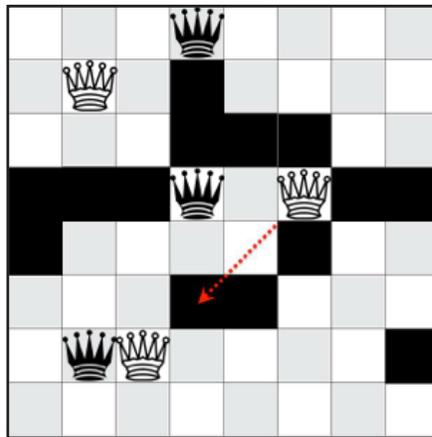
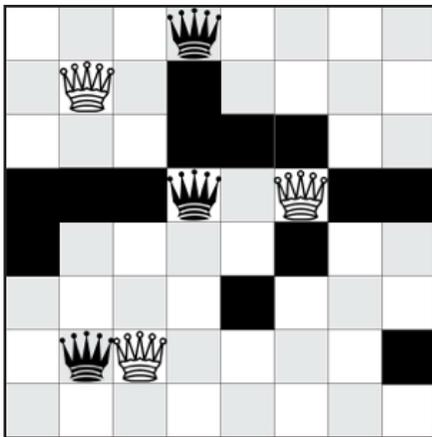


**Santa Clara University, Daly Science 207**

**7:30 pm, Friday, April 24, 2015**

Amazons is a board game in which each of the two players controls a few pieces called "Amazons". Traditional games begin with four Amazons of each color in a defined starting position on a 10 x 10 board; shorter games are sometimes played with each player having three Amazons on an 8 x 8 board. Each Amazon moves like a chess queen: any desired distance in a straight line in any of 8 directions. After landing on an empty square, the Amazon must complete her move by shooting a flaming arrow, which also moves in a straight line in any of the 8 directions. When the arrow lands, it burns that square off of the board. This is conventionally denoted placing an immobile Go stone on each burned-out square. Neither Amazons nor arrows can move onto or over burned-out squares. Eventually so many squares are burned out that some player, at his turn, is unable to move. The game then ends and that player loses.

In most games, the burned-out squares eventually partition the board into several disjointed regions. We show how combinatorial game theory allows us to evaluate each region, and to sum these values to determine optimal strategies for playing specific endgames.



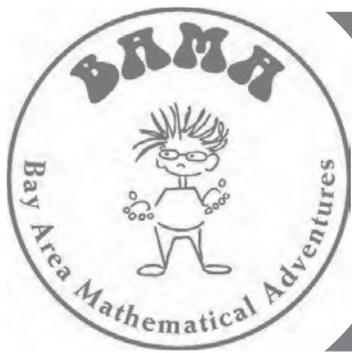
**Elwyn Berlekamp** has been Professor of Mathematics and of Electrical Engineering/Computer Science at UC Berkeley since 1971, half-time since 1983, and emeritus since 2002. He has also been active in several small companies in the sectors of computers-communications and finance. He is a member of the National Academy of Sciences, the National Academy of Engineering, and the American Academy of Arts and Sciences.

Berlekamp has 12 patented inventions (now all public domain), mostly dealing with algorithms and devices for error-correction and synchronization. Some of his algorithms for decoding Reed-Solomon codes are widely used on compact discs; others are NASA standards for deep space communications. He has more than 100 publications. With John Horton Conway and Richard K. Guy, he co-authored *Winning Ways for your Mathematical Plays*, leading to his recognition as one of the founders of combinatorial game theory. He has studied various games, including Dots and Boxes, Fox and Geese, and, especially, Go.

\* 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.

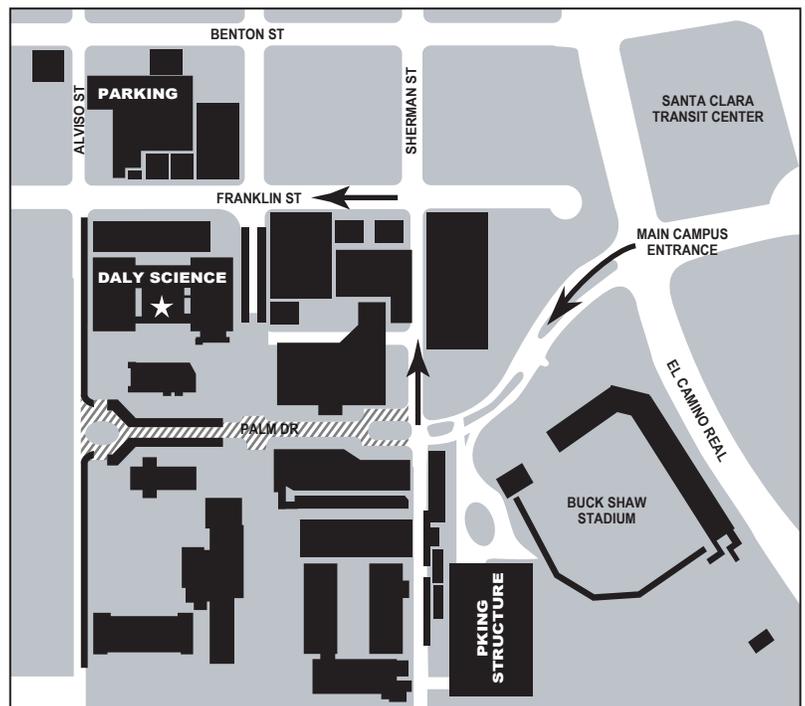
### WHEN?

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, you may enter a special code (available at our website) into the machine and the SCU Department of Mathematics and Computer Science will pay for your parking! Either way, you must display a valid permit on your dash.
- 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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Mathematical Sciences Research Institute

#### FOR MORE INFO:

<http://www.mathematicaladventures.org>

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