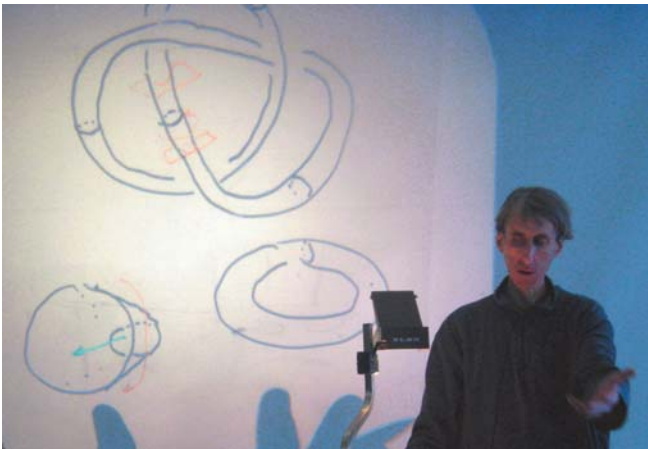


Report on the 2010 Meeting at USF

On Saturday February 27, 2010, right in the heart of the Bay Area, the section enjoyed a full day of mathematical adventures of all sorts. Multi-time speaker at the International Congress of Mathematicians and winner of the Veblen and Clay prizes, **Dr. Clifford Taubes** of Harvard University began the day with a look at the mysteries of 4-dimensional manifolds. Why is dimension 4 so hard to understand compared with both smaller and larger dimensions? It is curious indeed that our own universe of space-time has this same mysterious dimension.



**Clifford Taubes reaching out to us
from the fourth dimension**

At our business meeting we voted on the issue of whether we would become the Golden Section. This was approved by a wide margin of 50 to 6. The national board of MAA governors made this official for the section at Math-Fest in Pittsburgh this last August. Our web page has the latest bylaws but also look for changes in our graphics in the months ahead.

After the business meeting we had an excellent variety of student posters to examine. The topics involved were the following. Three posters on combinatorics and geometry – **Matthew Vicksell** from UC Davis studied the container problem for regular polyhedra; **Victor Garcia** from Santa Clara University looked at tetranomial coefficients and Pascal's simplex; and **Jeff Decker** of UC Berkeley along with **Carolina Benedetti** and **Frederico Ardila** of San Francisco State University (SFSU) studied volume calculations for matroid polytopes. One game theory poster by **Erin Kelly**, **Michael Mazella**, and **Josh Politz** of Cal Poly San Luis Obispo (POLY) looked at shell games as applied to infinite groups. **Jon Yaggie** of SFSU looked at the computation of enumerating homomorphisms between algebras that preserve certain subalgebras. There were two posters involving knot theory – **Andrew**

Smith from CSU East Bay examined the computation of minimum bridge numbers for knots, and, in a combined medical knot theory poster, **Juliet Portillo**, **Trevor Blackstone**, **Rob Scharein**, and **Mariel Vasquez** of SFU looked at the DNA unknotting of type II Topoisomerases. There were two other medical posters – **Megan Evans** and **Emilie DeShon** of POLY looked at the dynamics of T-cell response to the Epstein Barr virus in acute infectious mononucleosis – a virus for which there is no cure. **Alex Pankov** of SFSU studied differences in genomic signatures as a method for determining appropriate breast cancer treatment. There were two forensic posters from POLY involved with predicting the next target of a serial killer – **Erin Kelly**, **Jeremy Kun**, and **Molly Stites** combined geographical and predatory models including prey density, and **Alex Eames**, **Kevin Lamb**, and **Troy Lewis** used game theory and Criminal Geographic Targeting for an entirely different set of approaches to this issue. **Tuan Le** of Fairmont High School in Anaheim (supervised by **Zair Ibragimov** of Cal State Fullerton) presented two trigonometric solutions to a previously unsolved inequality involving roots.

Just before lunch, **Estelle Basor**, deputy director of the American Institute of Mathematics (AIM), told us about Toeplitz Matrices. These are square matrices where each diagonal is constant. They have many applications in physics, engineering, probability and analysis. There are some striking asymptotic patterns for the eigenvalues of sequences of these matrices that grow in size. The linear algebra was presented in an accessible and very engaging manner.



**Estelle Basor (AIM) and Tatiana Shubin (San
Jose State University)**

Our luncheon speaker was 2001 section teaching award winner **Wade Ellis**, now retired from West Valley College. Wade has an impressive history of using