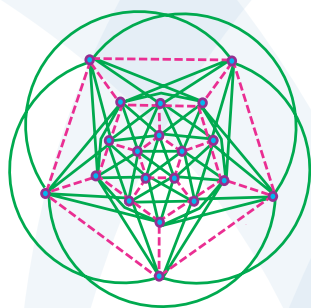
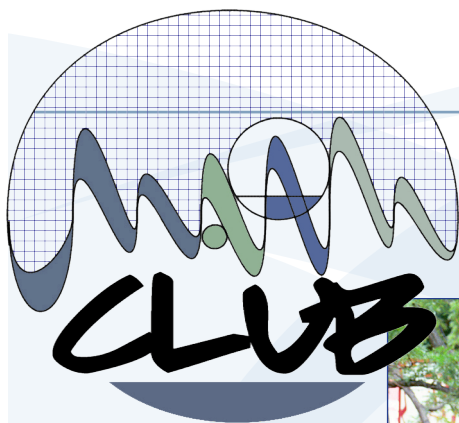


NEWSLETTER

FALL 2008



Professor Audrey Terras

AUDREY TERRAS received her B.S. degree in Mathematics from the University of Maryland, College Park in 1964, where she was inspired by the lectures of Sigekatu Kuroda to become a number theorist. She was particularly impressed by the use of analysis (in particular using zeta functions) to derive algebraic results. She received her M.A. (1966) and Ph.D. (1970) from Yale University. In 1972 she became an assistant professor of mathematics at the University of California, San Diego. Now she is a full professor at U.C.S.D. where she has had 24 Ph.D. students. She is a fellow of the American Association for the Advancement of Science, and has served on the Council of the American Mathematical Society. She has published 3 books and lots of research papers. Her research interests include number theory, harmonic analysis on symmetric spaces and finite groups (including applications), special functions, algebraic graph theory, especially zeta functions of graphs, arithmetical quantum chaos, and Selberg's trace formula.

109: The Portal to Upper Division

Math 109, Mathematical Reasoning, is the course that begins many math majors on their journey into upper division math courses. It introduces the rigorous world of proofs, teaching many different techniques such as proof by induction and equivalence relations. Every math major is required to take the course so grab that pencil and paper and head on into the new and exciting world of upper division!

The UCSD Math Club is honored to conduct an interview with Professor Audrey Terras. On Thursday 10/30/08, Professor Terras held a Professor Talk for the Math Club, where many undergraduate students attended, and were able to hear about her area of specialization and current research.

Math Club How did you decide to study Mathematics?

Audrey Terras The U.S. government paid me! And not much! It was the time of Sputnik, so we needed to produce more mathematicians, and when I was deciding between Math and History, they weren't paying me to do history, they were paying me to do math. And when you keep studying it, you get good at it. So by the end of my undergraduate years, I was addicted to math. And in the 60s, it was very easy to get a fellowship, paying 4 years of graduate school.

I came from a family that didn't go to college, so it never occurred to me to be a mathematician. In high school, math was always something I had to do, and the all the joy of math is in the proofs. A small elegant proof, where you say "ahh..." That's why people do math.

MC What led you to choose your research area?

AT I decided on my specialization area when I was an undergrad. I had a professor, Kuroda, from Japan. He gave beautiful lectures on number theory and that's when I decided that's what I wanted. I wanted him to be my advisor and to stay at University of Maryland, but other faculty recommended that I go to a different school for graduate school, to learn a different perspective. I read an article in Math Monthly which said that Tamagawa was the best young number theorist, and he was at Yale, and so I decided to go to Yale.

(continued on page 3)



Mathematical Beauty in Rome

There is a common idea that engineers and math majors cannot study abroad. Whether the loads of work, course material, or social issues, it is very unusual to hear about a study abroad opportunity in the areas of math and engineering. For the past two years at UCSD, I was set on studying abroad. Due to my rigorous class schedule and extracurricular activities, the only available time was during the summer. I had looked into programs for months, but there was nothing with an engineering or math emphasis until I found the Mathematical Beauty in Rome program.

I was initially scared to embark on this 5 week journey. I have never been out of the country, nor have I ever traveled outside of the west coast of the US. But, from arriving in the airport to the last dinner, I can honestly say it was one of the greatest adventures of my life thus far.

Educationally, I saw the mathematical concepts in Roman architecture first hand. This is something that you can't just learn in a textbook. It's one thing to read about the Pantheon, it's another thing to see it and experience the Italian culture surrounding it. I gained a greater appreciation for these engineering marvels, while learning Italian culture and touring sites all through Italy.

So was it worth it? Definitely. I have returned from my trip with a new perspective of mathematics and engineering, a new perspective of American and Italian culture, and most of all, 15 amazing colleagues with whom I shared the experience of a lifetime and continue to share experiences with today.

WINTER QUARTER EVENTS

Come on by and see what is going on for the Winter Quarter! Dates for the events listed below are to be announced so come on by to a GBM or add your email to the list serve by going to <http://math.ucsd.edu/~mathclub/join.php> and filling out a form to join.

- Career Seminar
- Professor Talk / Ice Cream Social
- High School Talk
- (Pi)-1 Day: This event will be held on the Friday before actual Pi-day. Times and more information about this event is to be announced.

ATTENTION ARTISTS!



Can you do better than this? Submit your design for the new Math Club T-Shirt in pdf form and forward any questions to:

hmilesle@ucsd.edu

(continued from page 1)

MC What kind of life is it, being a mathematician?

AT Unusual. It is hard, especially for women. I wanted to wait for tenure before having kids, but then it didn't work out. It requires devoting most of your time to your job. There is a lot of traveling. You get to see the world and meet many interesting people. My family never traveled much.

MC Is there anything you wish you did differently?

AT I would not have specialized so much early on. I would have become more of an applied mathematician. I would not change the grad school that I went to. But for me, graduate school at Yale was a shocking experience. It was frightening to go from a large public school to a small private school where there were no women undergraduates, few women graduate students, and no women faculty. There were few or no women (and minorities) in most Ivy League schools at that time. For example, Linda Rothschild and I applied to Princeton and we were rejected solely because we are women. By the 70s though, things began to change. Segregation became illegal and the Ivy League schools began to admit women. Now Yale and Princeton have women undergrads. Princeton has perhaps changed much more than Yale. There are 2 women tenured faculty in the Princeton math dept. I don't think Yale has any.

MC What is a current research project you are working on?

AT I am looking at the Riemann hypothesis for the Ihara zeta functions of graphs. Surprisingly there are graphs for which it is true and graphs for which it is false. The questions I ask include: What if the graph is a random irregular graph? What if it is a graph obtained as a Galois covering of a finite group? And how does the RH connect to applications, especially computer science. At the moment I am doing a lot of computer experiments.

MC What is your advice for aspiring mathematicians?

AT I gave the following 5 rules as part of a panel discussion for the Association for Women in Mathematics at the 1997 annual meeting of the various math. societies that was held in San Diego. They were addressed to women faculty but most rules apply to all math. people.

1. Don't (EVER) give up.

Mathematics is hard to do. Progress can be slow. Patience is necessary. It is important to keep working. When stuck on a problem, start writing up the proofs of the things you have already done. Heisenberg said: "You just have to be able to drill in very hard wood ... and keep thinking beyond the point where thinking begins to hurt."

2. Keep learning and teaching.

Keep a notebook (like Ramanujan) with a list of problems you are working on. Keep reading books and papers. Keep writing, including expository papers. Give and go to seminars and colloquia. Give courses on a wide range of subjects. Work hard on making your lectures understandable. Give lots of examples. Write up lecture notes. Become a reviewer for Math. Reviews and Zentralblatt.

3. Network (go to meetings, give talks, collaborate).

Seek out supportive and friendly people. Not all mathematicians will fall into this category. In particular, keep in touch with your letter writers. Whenever asking for letters, be sure that you send your letter writers copies of your CV, recent works, and address labels. This is not only polite, but it helps to get up to date and timely letters. Do not get a secretary to mail out old letters. Write up short summaries of your works to help your letter writers cope with a giant stack of papers.

Always support other women and all underrepresented groups. Make a particular effort to include them in your network. Try to be a good friend, mentor, advisor to your students and colleagues.

4. Do useful mathematics, but "do your kind of mathematics."

Be flexible. Expand your area of expertise. Do beneficial applications if possible. If not, at least connect with other parts of mathematics. As a number theorist, for example, I find it both useful and inspirational to make connections with graph theory, Fourier analysis, matrix groups. Applications of number theory in computer science and signal and image processing are actually a stimulant to thought.

5. Have a (good) life.

Brains get tired and need rest or change. Often the solution to that problem that has been bugging you for weeks comes during a vacation. Do not let the life take over, however. I find that it is like any kind of sport. You must keep exercising the math muscles. I don't have any children, but this doesn't mean I don't have a life apart from mathematics. Yes, I like cats, gardening, music, netsurfing, sudoku, travel, hiking, reading mysteries and science fiction, and photography.

A special thanks goes out to everyone who helped put this together. This first issue of the Math Club Newsletter could not have come out without you. But remember, future ones will still need help and suggestions! If you have any suggestions or would like to be a part of the creation of next quarter's newsletter, send an email to hmilesle@ucsd.edu. Thanks for reading!

-Hayley

MATHEMATICAL MERRIMENT

Issue #01

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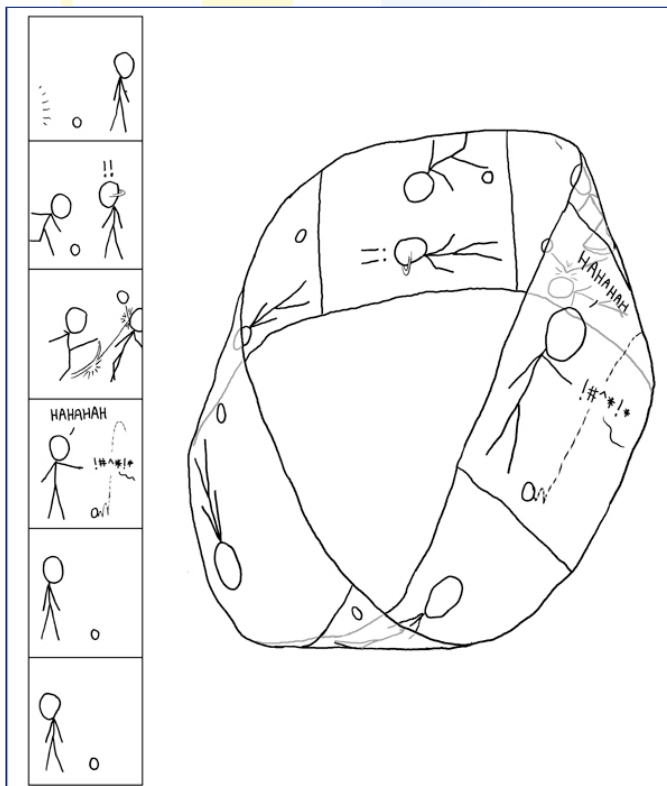
Fall 2008



Welcome Week



General Meeting



Who Owns the Snake?

There are five houses in a row, each a different color and each inhabited by a person of different nationality. Each person has a different pet, each has a different profession, and each likes to play a different game. Additional information concerning the people is as follows:

- 1) The tan houses is immediately to the left of the orange house.
- 2) The florist lives in the middle house.
- 3) The Egyptian owns the cat.
- 4) Chess is played in the house next to the house where the goldfish is kept.
- 5) The Brazilian plays Monopoly.
- 6) The Australian lives in the green house.
- 7) The domino player in the magician.
- 8) The botanist lives in the orange house.
- 9) The Greek is a physician.
- 10) The solitaire player has a pet rabbit.
- 11) The Canadian lives next to the brown house.
- 12) Chess is played in the white house.
- 13) The snake is not the zoologist's pet.
- 14) The person who plays backgammon lives in the house next to the person with a ferret.
- 15) The Canadian lives in the house furthest from the right.

Match the order number of house (starting from right to left), color of house, profession, game played, and pet of each person's nationality.