CLAREMONT CENTER
for MATHEMATICAL SCIENCES

C C M S C O L L O Q U I U M

Finite Quantum Chaos

by

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Abstract: Quantum chaos is in part the study of the statistics of energy levels of a quantum system; i.e., the eigenvalues of the Schrödinger operator. Thus physicists began to investigate the spectra of random large matrices. Similarly number theorists and geometers have investigated the statistics of spectra of Laplacians on Riemannian manifolds which is equivalent to studying the statistics of the zeros of the Selberg zeta function. Parallels with the statistics of the zeros of the Riemann zeta function quickly became evident. Here we consider finite analogs in which the zeta function is the Ihara zeta function of a graph (and zeros are replaced by poles). The picture in the PDF abstract file shows all poles but -1 of the Ihara zeta function for a random irregular graph with 80 vertices. In this context, the Riemann hypothesis says the poles lie outside the green circle. A reference for this talk is my book Zeta Functions of Graphs.

About the speaker: Audrey Terras earned a B.S. degree in mathematics from the University of Maryland, College Park in 1964, and M.A. and Ph.D. degrees from Yale University in 1966 and 1970, respectively. She joined the University of California at San Diego in 1972 and is currently a full professor there (emerita since 2010). She has published 3 books and about 60 research papers. She has had 25 Ph.D. students. She is a fellow of the American Association for the Advancement of Science, has served on the Council of the American Mathematical Society, and gave the 2008 Noether lecture of the Association for Women in Mathematics. 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 Selbergs trace formula.

Wednesday, October 19, 2011, at 4:15pm

Millikan Auditorium, Pomona College

Refreshments at 3:45 p.m. in Millikan Auditorium & wine and cheese after the talk in Harry's Room (Millikan 209)

The dinner will be hosted by Prof. Lenny Fukshansky.
Please contact Prof. Fukshansky if you are interested in attending the dinner