CLAREMONT CENTER
for MATHEMATICAL SCIENCES

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

NATURAL BOUNDARIES AND SPECTRAL THEORY

by

Barry Simon

California Institute of Technology

Abstract: This talk describes joint work with Jonathan Breuer. The last ten years has seen considerable understanding of the spectrum of general Jacobi matrices in terms of its right limits due to work of Last-Simon and especially Remling. We have discovered that analogs of these ideas can be used to understand when a power series (with bounded Taylor coefficients) has a natural boundary on the unit circle. One recovers and (within the class of bounded coefficients) improves many classical results. The main theorem depends on little more than the notions of right limit and reflectionless double power series (that we carry over from the theory of Jacobi matrices) and a clever lemma proven by M. Riesz in 1916 (using the maximum principle). This will be a colloquium-level talk that should be accessible to anyone with a good complex variables course.

About the speaker: Barry Simon is an eminent American mathematical physicist and the IBM Professor of Mathematics and Theoretical Physics at Caltech, known for his prolific contributions in spectral theory, functional analysis, and nonrelativistic quantum mechanics (particularly Schrödinger operators), including the connections to atomic and molecular physics. He has authored close to 400 publications on mathematics and physics, including 16 books and monographs. Simon became a Putnam Fellow in 1965 at 19 years old. He received his A.B. in 1966 from Harvard College and his Ph.D. in Physics at Princeton University in 1970. From 1970 through 1981 he held a professorship at Princeton, after which moved to his current position at Caltech. Professor Simon is on the editorial boards of numerous journals, and has received many honors and awards for his work, including Sloane and Guggenheim fellowships. He was an invited speaker at the International Congress of Mathematicians in 1974 and has been elected a Fellow of the American Academy of Arts and Sciences in 2005.

Wednesday, November 30, 2011, at 4:15pm

Millikan Auditorium, Pomona College

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

The dinner will be hosted by Prof. Lenny Fukshansky.