



UNIVERSITY OF ROCHESTER

Department of Mathematics Colloquium Series

ABSTRACT

Fractals are examples of rough objects that nevertheless have a lot of structure. Although the usual definitions of derivatives do not apply to functions defined on fractals, it is possible for certain fractals, including the familiar Sierpinski gasket, to define the analog of a Laplacian (a kind of second derivative). Using this Laplacian, one can study the analogs of the basic differential equations of mathematical physics, such as the heat equation, wave equation, and the Schrodinger equations of quantum mechanics. The resulting theory has many surprising new features in comparison with standard smooth analysis.

The speaker will outline the construction of the Laplacian (due to Jun Kigami) and describe some features of the theory. He will also describe some recent work on analogs of the harmonic oscillator and hydrogen atom models in quantum mechanics. A lot of his work in this area has been done in collaboration with undergraduate students.

Professor Robert S. Strichartz

Department of Mathematics
Cornell University

*Differential Equations
and Quantum Mechanics on Fractals*

Thursday, October 18, 3:30–4:30 p.m.
Lander Auditorium