



WPI

HAROLD J GAY LECTURE SERIES

PDEs and Fractals

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Changing Domains

and

Are Most Triangles Acute or Obtuse?

Tuesday, 4:00 pm

April 14, 2009

Salisbury Labs 105



ABSTRACT This talk has two separate parts, both about shapes. First, we ask how a change from circle to polygon affects the solution to a differential equation inside. Key examples are the eigenvalue problem for Laplace's equation, and Poisson's equation $u_{xx} + u_{yy} = 1$. The area between the circle and polygon becomes a crucial quantity and we ask how this leading term in the error might be removed—to improve the accuracy of the eigenvalues and the solution.

Part 2 is about an innocent question—Is a random triangle acute or obtuse? Everything depends on the meaning of “random.” Are the angles random or the sides? Is the distribution uniform or normal? New answers keep coming, and some are surprising.

Geometry with its applications has been at the heart of the development of partial differential equations and boundary value problems since the very beginning. In physics, biology, economics, and other applied fields, a variety of new problems are now emerging that display unusual geometrical, analytical and scaling features, possibly of fractal type. The objective of these lectures is to acquire the view of outstanding mathematicians on the subject of differential equations and fractals, and their developments and applications, in a broad perspective encompassing both classical highlights and contemporary trends.

Sponsored by WPI and hosted by the Department of Mathematical Sciences
Coffee and tea available one half hour before lecture time in Stratton Hall 107

Participation of faculty and students is most welcome

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