WPI

HAROLD J GAY

LECTURE SERIES

PDEs and Fractals

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.

Benoit Mandelbrot

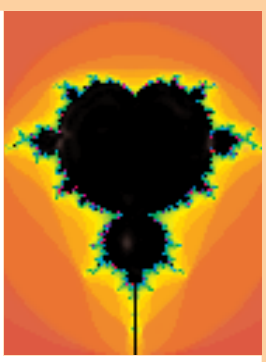
Yale and Pacific Northwest National Laboratory

Fractal Roughness

Beautiful, damn hard, and surprisingly useful

Friday, 3:00 pm
November 10, 2006
Olin Hall 107

ABSTRACT Some fractals imitate mountains, clouds, stock markets, and many other aspects of nature and culture. Others yield wild and wonderful new patterns that a child can draw but great masters struggle or fail to understand. All are shapes that look the same from any distance, far away or close by. Since time immemorial, some have been used by great artists. A hundred years ago, mathematicians called them monsters and an excuse to split from physics. Now—*especially since my 1975 term fractal*—they help heal this split. Fractal geometry helps mathematics and the sciences to cross a long avoided boundary between the smooth and the rough. Partial differential equations must allow very rough solutions. Man's basic sensation of roughness can now be measured intrinsically by fractal dimension, first step to being mastered. An introduction to fractal geometry with updates on some current developments including finance.



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Coffee and tea available one half hour before lecture time
Participation of faculty and students is most welcome

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