WPI

HAROLD J GAY LECTURE SERIES

PDEs and Fractals

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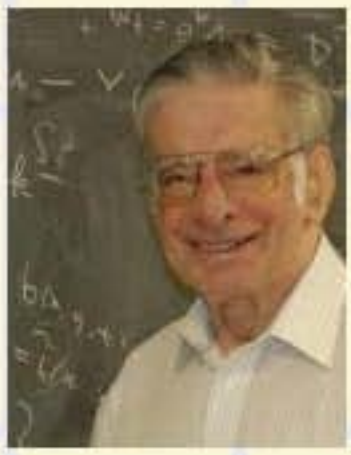

The Spreading of Invasive Species and Related Topics

Friday, October 8, 2010
3:00pm, Salisbury Labs 104

ABSTRACT In 1937 R. A. Fisher created a model for the spread of a fitter mutant into an established population of the same species. The model was a semilinear parabolic equation for the fraction of the advantaged population. Fisher conjectured that such an invasion spreads with a finite asymptotic speed, and that this speed is also the slowest speed of a nontrivial traveling wave. This conjecture was proved by Kolmogorov, Petrovsky, and Piscounov in the same year. Since then, such properties have been shown to be true of an extensive set of models in the physical and biological sciences. The models can take the form of partial differential equations, finite difference equations, discrete-time integro-difference equations, or of more general discrete-time recursions in one or more space dimensions. They can also involve interactions between two or more species. • This lecture will give an outline of old and new results in the study of spreading speeds and traveling waves for such models.

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 Salisbury Labs 104
Participation of faculty and students is most welcome

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