



**IMA** INSTITUTE FOR MATHEMATICS  
AND ITS APPLICATIONS

2003-2004  
**Public Lecture Series**

All lectures begin at 7:00 p.m.

Smith Hall, Room 100, 207 Pleasant Street SE, University of Minnesota, East Bank

September 15, 2003

**After the Human Genome Project:**  
*Systems Biology and Predictive, Preventive and Personalized Medicine*

**Leroy Hood**  
President, Institute for Systems Biology

The Human Genome Project has catalyzed the emergence of a new approach to biology termed systems biology. Systems biology analyzes all the interrelationships of the elements in a biological system, rather than studying them one at a time, as has been the modus operandi in biology for the past 30 years. Based on his view of biology as an informational science with powerful new tools for capturing and analyzing information, but still facing great mathematical and computational challenges, one of the pioneers of systems biology will explain how it will totally transform the way medicine is practiced in the years to come.

January 7, 2004

**Sync:**  
*The Emerging Science of Spontaneous Order*

**Steven H. Strogatz**  
Professor of Applied Mathematics, Cornell University

What caused hundreds of Japanese children to fall into seizures while watching an episode of the cartoon show Pokemon? Why do women roommates sometimes find that their menstrual periods occur in sync? The tendency to synchronize is one of the most mysterious and pervasive drives in all of nature. Every night along the tidal rivers of Malaysia, thousands of fireflies flash in silent, hypnotic unison; the moon spins in perfect resonance with its orbit around the Earth; the intense coherence of a laser comes from trillions of atoms pulsing together. All these astonishing feats of synchrony occur spontaneously—almost as if the universe had an overwhelming desire for order. Steven Strogatz, author of *Sync: The Emerging Science of Spontaneous Order* and a gifted communicator, will discuss how these seemingly unrelated phenomena are all connected by the same mathematical theme: self-organization, the spontaneous emergence of order out of chaos.

November 20, 2003

**Math at Top Speed**

**Richard Tapia**  
Noah Harding Professor of Computational and Applied Mathematics, Rice University

Besides being a prominent mathematician and educator, Richard Tapia has been involved with various aspects of drag racing throughout his life. In this lecture Tapia will use his mathematical training to probe some of the myths and beliefs that have grown around dragster speed and acceleration. How fast are dragsters really going? What is the maximum acceleration achieved by today's dragsters? Several lively videos will illustrate the presentation.



March 30, 2004

**Behavioral Finance—**  
*The Closed End Fund Puzzle*

**Stephen Ross**  
Franco Modigliani  
Professor of Finance and  
Economics, Massachusetts  
Institute of Technology



Frustrated by difficulties in explaining seemingly aberrant financial market behavior using contemporary methods of financial economics, a new school of behavioral finance has arisen that mixes psychology and economics. Despite the superficial appeal of this multi-disciplinary approach, Stephen Ross, the inventor of arbitrage pricing theory, will critique behavioral finance by using the analytic tools of option pricing theory to solve a canonical puzzle of behavioral finance—the closed end fund discount.

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