IMA INSTITUTE FOR MATHEMATICS AND ITS APPLICATIONS

University of Minnesota, East Bank

Lectures begin at 7:00 p.m.

2004-2005 Math Matters

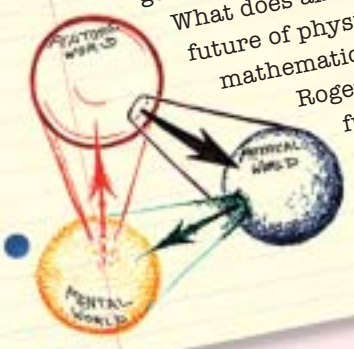
IMA Public Lecture Series

October 5, 2004
Tate Lab of Physics 150

Does Mathematics Rule the World?

Professor Sir Roger Penrose, FRS OM
Emeritus Rouse Ball Professor
University of Oxford

Is there something remarkable about the great precision and subtlety of the mathematical laws that appear to govern, in full detail, the behavior of the physical universe? Or do the perceived laws of physics merely reflect our own attempts to make some order out of the complication of observed physical action? Are all our own actions governed completely by mathematical laws? What does all this have to say about the future of physical theory? World famous mathematician, physicist, and author Roger Penrose will discuss these fundamental issues.



November 18, 2004
Smith Hall 100

The Marriage Equation:
A Practical Theory for Predicting Divorce and a Scientifically-Based Marital Therapy

James D. Murray
Emeritus Professor of Mathematical Biology, University of Oxford and
Emeritus Professor of Applied Mathematics, University of Washington

The rise in divorce rates in developed countries, including the US, is a widespread, important and poorly understood phenomenon. The distinguished mathematician James Murray will describe his interdisciplinary work with psychologist John Gottman which has led to a marital interaction theory based on key empirical findings from extensive observations of couples. The mathematical model, of similar genre to those widely applied in the biomedical sciences, characterizes differences between different types of stable couples whose marriages are likely to last from two types of unstable couples, and has been used to predict the longitudinal course of marital relationships with an accuracy of 94% and to help design new scientifically-based intervention strategies for troubled marriages.

February 9, 2005 Location TBA

Math Behind the Curtains
Dynamic Simulation at Pixar

David Baraff
Senior Animation Scientist
Pixar Animation Studios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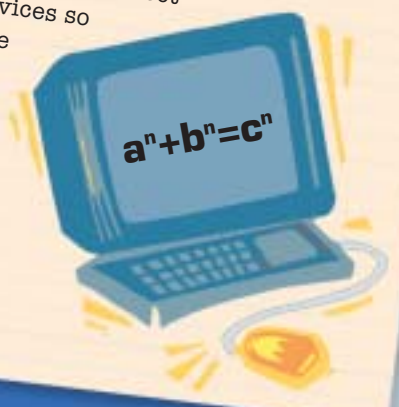
Pixar's movies (Monsters, Inc., Finding Nemo, and the 11/2004 release, The Incredibles) have relied heavily on a sophisticated mathematical technique called dynamic simulation to shape the final look and behavior of the movies' main characters. From the beginning, however, it has been set in stone that the use of dynamic simulation could not interfere in Pixar's traditional creative process. Senior animation scientist David Baraff will give a candid behind-the-scenes look at the core physical simulation technologies employed in Pixar's recent movies, describing the balancing of creative and technical needs due to simulation, and revealing the difficult effects that were easy, and the simple shots that were hard.

March 30, 2004 Location TBA

Computers and the Future of Mathematical Proof

Thomas C. Hales
Mellon Professor of Mathematics
University of Pittsburgh

Computers crash, hang, succumb to viruses, run buggy programs, and harbor spyware. By contrast, mathematics is free of all imperfection. Why are imperfect computational devices so vital for the future of mathematics?



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