

New Jersey Institute of Technology
Department of Mathematical Science and CAMS, joint with the
Department of Physics, Institute for Teaching Excellence, and the
College of Science and Liberal Arts

Applied Mathematics Seminar

Cullimore Lecture Hall II
Friday, September 21, 11:30am

Street-fighting Mathematics for Better Teaching and Thinking



By Sanjoy Mahajan
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Abstract.

With traditional science and mathematics teaching, students struggle with fundamental concepts. For example, they cannot reason with graphs and have no feel for physical magnitudes. Their instincts remain Aristotelian: In their gut, they believe that force is proportional to velocity. With such handicaps in intuition and reasoning, students can learn only by rote. I'll describe these difficulties using mathematical and physical examples, and illustrate how street-fighting mathematics and science—the art of insight and approximation—can improve our thinking and teaching, the better to handle the complexity of the world.

BIO: Sanjoy Mahajan obtained his PhD in theoretical physics from the California Institute of Technology, after undergraduate degrees in mathematics from Oxford and in physics from Stanford. Inspired by wonderful teachers, he has devoted his career to improving STEM teaching and learning. He is the author of "Street-Fighting Mathematics: The Art of Educated Guessing and Opportunistic Problem Solving" and "The Art of Insight in Science and Engineering: Mastering Complexity" (both published by MIT Press).