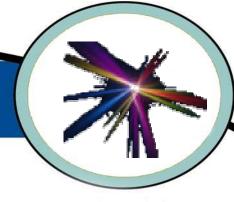# IMS Public Lecture

The Romance of Hidden Components

Speaker: **Professor David Donoho**
Stanford University
Date: **Wednesday, 25 August 2004**
Time: **6:30 p.m. – 7:30 p.m.**
Venue: **LT 31(Faculty of Science Auditorium)**
Blk S16, Level 3, 3 Science Drive 2
National University of Singapore
Singapore 117543

Abstract

Perhaps the most romantic and seductive idea in all of science is that, hiding behind the enormously complex structures we see in the world around us, there are hidden components that are on the one hand very simple and even elegant and on the other hand easily combine to generate all the variety we see about us. Classical examples include Newton and the spectrum of light, Eugenecists and the idea of IQ; modern examples include wavelets and quarks. The speaker will review some of the classical ideas of hidden components, starting from principal components or even before, and describe some of the most recent notions, such as independent components analysis, sparse components analysis, nonnegative matrix factorizations, and cumulant components. He will try to keep things at an elementary level, communicating the attractiveness of these ideas to scientists and engineers outside of statistics, the wide-ranging impact these ideas are having from high-tech industry to neuroscience and astronomy, and describing what he thinks is the much greater role that statisticians should be playing in developing and deploying these methods.

FREE
ADMISSION

About the Speaker

David Donoho is one of the most distinguished statistical scientists in the world. His ground-breaking research in data analysis and reconstruction is widely used. This work finds application in a number of different areas ranging from medical imaging to seismology and astronomy. His recent work used wavelets and other novel mathematical tools to help scientists get sharper signals and images.

He earned his bachelor's degree from Princeton in 1978 and his doctorate from Harvard in 1984. He joined the faculty at the University of California-Berkeley in 1984, moved to Stanford in 1990, and is currently Professor of Statistics and the Anne and Robert Bass Professor of Humanities and Sciences at Stanford University.

Honored for his fundamental work in statistical sciences, he was elected to the American Academy of Arts and Sciences in 1992 and the National Academy of Sciences USA in 1998. He was awarded the prestigious MacArthur Fellowship in 1991-1996, the Presidents' Award of the Committee of Presidents of Statistical Sciences in 1994, and the John von Neumann Prize by the Society for Industrial and Applied Mathematics in 2001. He was a plenary speaker at the International Congress of Mathematicians 2002.

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