



**The Center for Control, Dynamical Systems, and Computation
University of California at Santa Barbara
Winter 2007 Seminar Series
Presents**

An Interactive Environment for Combinatorial Supercomputing

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Abstract:

High-performance computing is being used to understand large data sets that are combinatorial rather than numerical in nature, in applications as diverse as sparse matrices, knowledge discovery, machine learning, search and information retrieval, and computational biology.

Compared to numerical supercomputing, the field of high-performance combinatorial computing is in its infancy. How can combinatorial methods be used by people who are not experts in discrete mathematics? How can supercomputers be used by people who need to explore huge discrete data sets interactively?

We are building a flexible, scalable interactive environment for high-performance computation on discrete structures that will be used both as a rapid-prototyping tool for exploring and experimenting with different approaches to analysis, and as a scalable system for performing analysis on real, dynamic, discrete data.

About the Speaker:

John R. Gilbert received his Ph.D. in Computer Science at Stanford in 1981. From 1981 to 1988 he was on the Computer Science faculty at Cornell. In 1988 he moved to Xerox PARC, where he performed and directed research in parallel computing, computational geometry, languages and compilers for high-performance computing, and mathematical algorithms and software. In 1997 he founded the Computation and Matter Area at PARC, whose projects included distributed data analysis for collaborating sensors, meso-scale MEMS for active surfaces, and modular robotics. In 2002, Dr. Gilbert joined the Computer Science Department and the Computational Science and Engineering program at the University of California, Santa Barbara, where he leads research in high-performance computing, interactive supercomputing, and combinatorial and sparse matrix algorithms for scientific computation. Dr. Gilbert has served on the Council of the Society for Industrial and Applied Mathematics, has chaired the SIAM Activity Group on Supercomputing and the ACM Special Interest Group on Numerical Mathematics, and has served as editor for several journals in computational science and applied mathematics.
