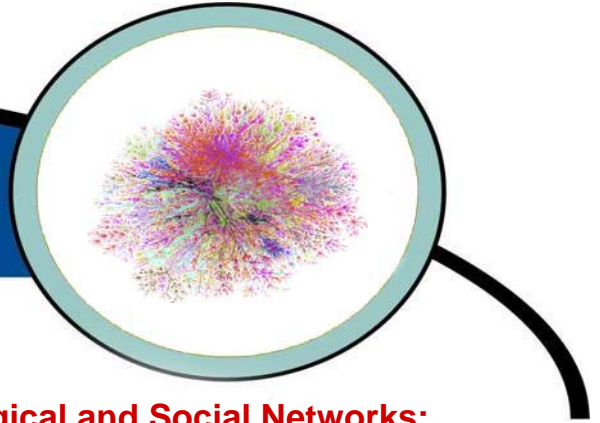# IMS Public Lecture

Epidemics in Technological and Social Networks: The Downside of Six Degrees of Separation

Speaker: **Professor Jennifer Chayes**
Microsoft Research

Date: **Friday, 9 Jun 2006**
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

FREE ADMISSION

Abstract

During the past decade, complex networks have become increasingly important in communication and information technology. Vast, self-engineered networks, like the Internet, the World Wide Web, and Instant Messaging Networks, have facilitated the flow of information, and served as a medium for social and economic interaction. In social networks, the ease of information flow goes by many names: the "small world" phenomenon, the "Kevin Bacon phenomenon," and "six degrees of separation" -- the claim that any two people on earth can be connected through a chain of acquaintances with at most five intermediaries. Unfortunately, many of the properties that facilitate information transmission also facilitate the spread of viruses in both technological and social networks. The speaker uses simple mathematical models to explain these epidemics and to examine strategies for their containment.

About the Speaker

Professor Jennifer Tour Chayes is an expert in the emerging field at the interface of mathematics, physics and theoretical computer science. Her current research focuses on phase transitions in combinatorics and computer science, structural and dynamical properties of self-engineered networks, and algorithmic game theory. She is the coauthor of over 80 scientific papers and the coinventor of 13 patents.

Professor Chayes is co-founder and co-manager of the Microsoft Theory Group, as well as Research Area Manager for Mathematics and Theoretical Computer Science at Microsoft Research. She also heads the new Algorithms, Computation and E-Commerce (ACE) subgroup of the Microsoft Theory Group. Professor Chayes is Affiliate Professor of Mathematics and Physics at the University of Washington, and was for many years Professor of Mathematics at UCLA. She serves on numerous institute boards, advisory committees and editorial boards, including the the Board of Trustees of the Mathematical Sciences Research Institute, the Scientific Board of the Fields Institute, the Advisory Boards of the Center for Discrete Mathematics and Computer Science and the Miller Institute for Basic Research in Science, the Communications Advisory Committee of the National Academies, the U.S. National Committee for Mathematics, the Association for Computing Machinery Advisory Committee on Women in Computing, the Leadership Advisory Council of the Anita Borg Institute, and the International Union of Pure and Applied Physics Commission on Statistical Physics. Professor Chayes is a past Chair of the Mathematics Section of the American Association for the Advancement of Science, and a past Vice-President of the American Mathematical Society.

Professor Chayes received her B.A. in biology and physics at Wesleyan University, where she graduated first in her class, and her Ph.D. in mathematical physics at Princeton. She did her postdoctoral work in the mathematics and physics departments at Harvard and Cornell. She is the recipient of an NSF Postdoctoral Fellowship, a Sloan Fellowship, and the UCLA Distinguished Teaching Award. She has twice been a member of the Institute for Advanced Study in Princeton, and she has been an invited speaker at the International Congress of Mathematicians. Professor Chayes is a Fellow of the American Association for the Advancement of Science, and a National Associate of the US National Academies.

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