

# IEEE Information Theory Society

Kitchener-Waterloo Chapter

## SEMINAR

### Diversity and Freedom: A Fundamental Tradeoff in Wireless Systems

*Speaker:*

**David Tse,  
Dept. of EECS, U.C. Berkeley**

*Date:* Wednesday, Sept. 24, 2003

*Time:* 10:30 am to 12:00 am

*Location:* DC 1302

**All Are Welcome!**

*For further information see the attached paper...*

Sponsors:



# IEEE Information Theory Society

## Kitchener-Waterloo Chapter

### Diversity and Freedom: A Fundamental Tradeoff in Wireless Systems

#### ABSTRACT:

The amount of diversity and the total number of degrees of freedom are two important resources in a wireless system. Traditionally they have been considered in isolation. We propose the point of view of describing the performance of communication schemes as a tradeoff between the amounts of these two resources actually utilized. The optimal tradeoff achievable by any scheme provides then a fundamental benchmark with respect to which actual schemes can be judged. We give several examples on which this framework can be applied: 1) point-to-point MIMO links, 2) multiple access MIMO channels; 3) cooperative relaying systems.

#### BIO:

**David Tse** received the B.A.Sc. degree in systems design engineering from University of Waterloo, Canada in 1989, and the M.S. and Ph.D. degrees in electrical engineering from Massachusetts Institute of Technology in 1991 and 1994 respectively. From 1994 to 1995, he was a postdoctoral member of technical staff at A.T. & T. Bell Laboratories. Since 1995, he has been at the Department of Electrical Engineering and Computer Sciences in the University of California at Berkeley, where he is currently a Professor. He received a 1967 NSERC 4-year graduate fellowship from the government of Canada in 1989, a NSF CAREER award in 1998, the Best Paper Awards at the Infocom 1998 and Infocom 2001 conferences, the Erlang Prize in 2000 from the INFORMS Applied Probability Society, the IEEE Communications and Information Theory Society Joint Paper Award in 2001, and the Information Theory Society Best Paper Award in 2003. He is currently an Associate Editor for the IEEE Transactions on Information Theory. His research interests are in information theory, wireless communications and networking.

*For further information contact [khandani@cst.uwaterloo.ca](mailto:khandani@cst.uwaterloo.ca)*

Sponsors:

