ARTIFICIAL INTELLIGENCE LABORATORY

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

# PHYSICS OF COMPUTATION SEMINAR

**Date:** Monday, May 12, 1997
**Time:** Talk at **3:30pm**
Refreshments after the talk
**Place:** NE43, 8th-floor AI Playroom

## Quantum Telecomputation

Lov K. Grover
AT&T Bell Labs

Quantum mechanics permits certain kinds of non-local effects. This talk demonstrates how these can be used for distributed computation with minimal communication between various processors. The problem considered is that of estimating the mean of $N$ items to a certain precision. First a serial quantum mechanical algorithm for this is presented that is faster than any classical algorithm. Next it is shown how this can be efficiently parallelized with quantum mechanical processors that are remotely located. These processors consist of coupled EPR particles. Each processor has just to communicate one bit of classical information to a central location at the end of its local computation.

**Host:** Norm Margolus

*This talk is part of a seminar series on adapting computers and computations to the constraints of, and opportunities afforded by, microphysics; and on the development and application of the physical theory of computation and information. If you would like to receive electronic notice of these seminars, send email to "poc@mit.edu."*