ARTIFICIAL INTELLIGENCE LABORATORY

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PHYSICS OF COMPUTATION SEMINAR

Date: Wednesday, October 14, 1998
Time: Talk at **4pm**
Refreshments after the talk
Place: NE43, 8th-floor AI Playroom

A silicon-based nuclear spin quantum computer

Bruce Kane
University of New South Wales

Quantum computers exploit the superposition and entanglement of quantum states to achieve dramatic speedup at certain tasks compared to their conventional counterparts. I will describe an architecture for a quantum computer which encodes information onto nuclear spins on donors in silicon. 10 nm-scale metallic surface gates are used to perform logical operations and to measure single spin states. I will discuss specific devices that will be fabricated at the UNSW Semiconductor Nanofabrication Facility in the next few years to test these ideas, as well as the formidable technological obstacles which will need to be overcome in order to integrate these devices into a true quantum computer.

Host: David Cory

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."