LABORATORY FOR COMPUTER SCIENCE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PHYSICS OF COMPUTATION SEMINAR

Date: Friday, May 6, 1994
Time: Refreshments at 4:00pm
Talk at **4:15pm**
Place: 6-120

Trying to Clone Quantum Information

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One of the distinguishing features of quantum information (as opposed to classical information) is that it cannot be copied. Suppose, for example, that one is presented with a single photon and is told only that the photon's polarization is either vertical or right-circular. Without knowing which of these states is actually the case, one cannot possibly generate a second photon having exactly the same polarization as the first. But how well can one do? What are the theoretical limits on the clonability of quantum systems? The question is important for quantum cryptography, where an eavesdropper would like to copy a quantum signal as it goes past. It may also be important for formulating a quantitative definition of the concept of quantum information itself.

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. This series is being sponsored by the MIT Information Mechanics Group (Lab for Computer Science), in conjunction with the MIT Physics and Media Group (Media Lab), the MIT Porous Flow Project (Earth, Atmospheric and Planetary Sciences), and the Mathematical Sciences Research Group at Thinking Machines Corporation. If you would like to receive electronic notice of these seminars, send email to "poc@im.lcs.mit.edu."