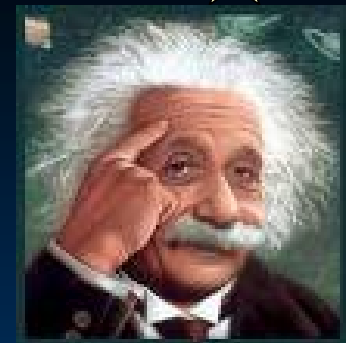




# CU Physics Department Colloquium

Monday, September 8, 2008 4:10 PM 428 Pupin Hall



## ALAIN ASPECT

ECOLE POLYTECHNIQUE, PARIS

# ★ ★ ★ "From Einstein intuitions to quantum bits : a new quantum age"

In 1935, with co-authors Podolsky and Rosen, Einstein discovered an amazing quantum situation, where particles in a pair are so strongly correlated that Schrödinger called them "entangled". By analyzing that situation, Einstein concluded that the quantum formalism had to be completed. Niels Bohr immediately opposed that conclusion, and the debate lasted until the death of these two giants of physics, in the 1950's. In 1964, John Bell produced his famous inequalities which would allow experimentalists to settle the debate, and to show that entanglement is indeed a revolutionary concept. Based on that concept, a new field of research has emerged, quantum information, where one uses entanglement between qubits to develop conceptually new methods for processing and transmitting information. Large scale practical implementation of such concepts might revolutionize our society, as did the laser, the transistor and integrated circuits, most striking applications of the first quantum revolution initiated at the eve of the XXth century.



Hosted by Andrew Millis

Co-Sponsored by Alliance at Columbia

