



## **ABSTRACT**

### **Date:**

December 2, 2004

### **Title**

Quantum measurement, control theory and nanophotonics in quantum information science

### **Speaker**

Hideo Mabuchi  
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### **Abstract**

New challenges from quantum information processing and quantum metrology provide compelling motivation for interdisciplinary research that draws together wide-ranging areas of science and engineering. In this talk I will describe two ongoing projects that pursue novel integrations of control theory and nanotechnology with atomic physics. In the first, we are utilizing tools from control theory to develop novel approaches to feedback-stabilized quantum state preparation and robust sub-shotnoise magnetometry with atoms. In the second, we are attempting to develop integrated quantum nodes for a quantum communication network that will combine chip-scale atom traps with photonic bandgap structures.

