

## Generation and Robustness of Multicolor Entanglement

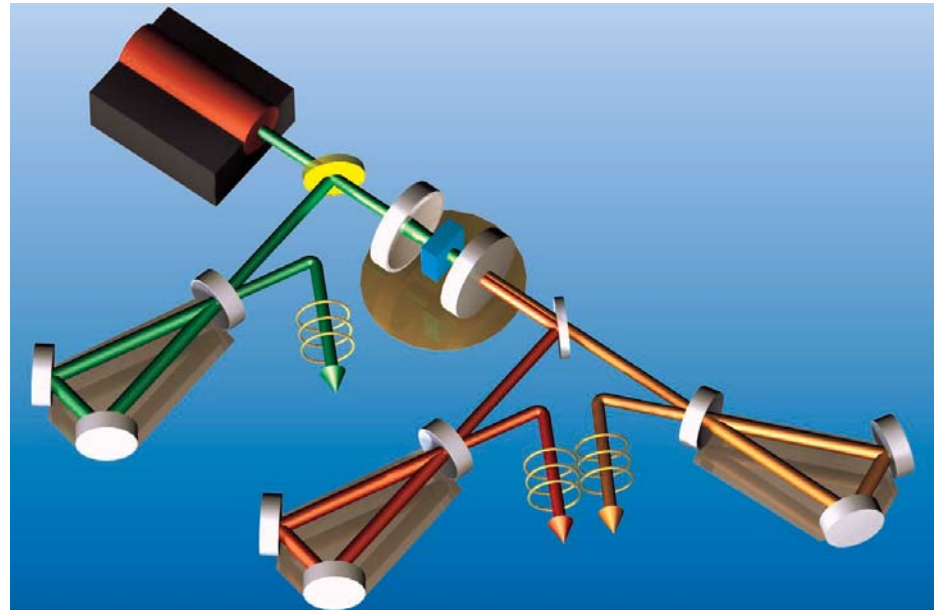


### **Professor Paulo Nussenzeig**

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In this talk I will discuss the generation of bright three-color entanglement, and the issue of communication losses and the possibility of complete disentanglement for partial losses, an effect reminiscent of entanglement sudden death.



**3:00 pm, Monday, Oct 4, 2010**

**Sloan Auditorium, Goergen 101**

**Refreshments provided.**

# Generation and Robustness of Multicolor Entanglement

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**Abstract:** Quantum Mechanics holds promise of more efficient processing, storage, and communication of information. In order for these dreams to come true, we will need to understand and master the subtle properties of quantum entanglement and the effects of the interaction of quantum systems with their noisy environments. At present, no single quantum hardware is known to possess all the necessary properties in order to build scalable quantum technologies. Thus, it is interesting to communicate information among different physical systems, which interact with light at different frequencies. Multicolor entangled light beams enable such quantum communication. In this talk, I will discuss the generation of bright three-color entanglement. Furthermore, we also address the issue of communication losses and the possibility of complete disentanglement for partial losses, an effect reminiscent of entanglement sudden death.

**Biography:** Paulo Nussenzveig received his undergraduate education in Brazil, at the Catholic University in Rio de Janeiro, where he also received a Master's degree. His doctorate was pursued in France, working on Microwave Cavity QED, in Serge Haroche's group at the Ecole Normale Supérieure. After leaving Paris, he did postdoctoral work on cold atom collisions, and then joined the faculty at the Physics Institute of the University of Sao Paulo, where he leads an experimental quantum optics and quantum information group. He is currently interested in quantum information with continuous variables of atoms and light.