



## **Dr. Alberto Politi**

(University of Bristol)

### **Advances in Quantum Informaton with photonic structures**

Until recently, quantum photonic architecture comprised large-scale (bulk) optical elements, leading to severe limitations in miniaturization, scalability and stability. We developed the first integrated quantum optical circuitry, demonstrating high-fidelity silica-on-silicon integrated optical realizations of key quantum photonic circuits, including two-photon quantum interference and a controlled-NOT gate. We use these devices to demonstrate multi-photon effects relevant to quantum metrology and quantum information processing. We also show quantum experiments that take advantage of the unique properties of integrated photonics: we demonstrate non-classical interference in multi-mode interference (MMI) multi-port devices, and a quantum walk experiment with more than one particle which shows uniquely non-classical properties.

**3. December 2010, 14:00 Uhr**

**Universität Stuttgart, NWZII, Raum 2.136  
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