

Invitation to the Vienna Physics Colloquium

Dirk Englund

Jamieson Career Development Professor at MIT

Quantum Information Processing with Spins and Photons in Semiconductor Circuits

The field of quantum optics offers new ways to compute, communicate, and measure with quantum states. Recent advances in quantum control and semiconductor nanofabrication now open the prospect for scalable quantum technologies using solid-state quantum systems. In particular, photonic integrated circuits (PICs) now allow us to route photons with high precision and low loss, and atom-like systems in semiconductors enable spin-based quantum memories that can be coupled to photons. The first part of this talk will review our recent progress in adapting one of the leading PIC architectures—silicon photonics—for various quantum secure communications protocols. The second part of the talk will consider how PIC technology, integrated with quantum memories, can extend the reach of quantum communications using quantum repeater networks.

Dirk Englund received his BS in Physics from Caltech in 2002. Following a year at TU Eindhoven as a Fulbright Fellow, he earned his MS in EE and PhD in Applied Physics at Stanford in 2008. He was a postdoctoral fellow at Harvard University until 2010, when he became Assistant Professor of E.E. and Applied Physics at Columbia University. He moved to MIT in 2013 as Assistant Professor in EECS and a member of RLE and MTL. Recent recognitions include the 2011 Presidential Early Career Award for Scientists and Engineers, the 2011 Sloan Research Fellowship in Physics, the 2012 DARPA Young Faculty Award and IBM Faculty Award, and a 2016 R&D100 award.

Monday, 9 January 2017, 17:30

(Get together from 17:00 onwards with coffee and snacks)

University of Vienna
Lise Meitner Lecture hall
Strudlhofgasse 4, 1st floor
Vienna

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