



Quantum Optics on Photonic Chips

Wednesday April 4, 2012, Babbio 122, 11am

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Nanoscale optical structures open a way to control the interaction of photons with single emitters in solids, such as semiconductor quantum dots or color centers. I will describe how this controlled light matter interaction can be used to construct basic components for quantum information science, a field that exploits quantum mechanical effects to process and exchange information in ways that cannot be achieved classically. I will discuss recent work on cavity-enhanced generation of single photons; nonlinear optical interactions at the single photon level; nonclassical state generation by photon blockade and tunneling; and some early directions on cavity-enhanced optical interactions with long-lived spin qubits in diamond.

Professor Dirk Englund holds a BS in Physics from the California Institute of Technology and an MS in Electrical Engineering and PhD in Applied Physics from Stanford University. After postdoctoral work in the Physics Department at Harvard University, he joined the Electrical Engineering Department of Columbia University as an Assistant Professor, with a secondary appointment in the Department of Applied Physics and Applied Mathematics.

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