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Quantum Science Distinguished Lecture Series

Quantum Frequency Conversion of Single Photon States

Dr Kartik Srinivasan

National Institute for Standards and Technology (NIST), USA

Monday 16 March 2015, 5pm – 6pm. B34, 3001 (Education)

Refreshments served from 4.30pm (downstairs in B34/2003)

Register your place: <http://quantumscience-srinivasan.eventbrite.co.uk>

Abstract: Control of the wavelength and temporal profile of quantum states of light is an important resource in the development of photonic quantum information technology, where it can be used to interface disparate physical systems, overcome fabrication-induced inhomogeneity, and allow for more optimal detection. In this talk, I will discuss such quantum frequency conversion from two different perspectives. First, I will review proof-of-principle experiments using single photon states and well-developed frequency conversion technology in nonlinear crystals, where we convert telecom photons to the visible, produce identical photons from initially spectrally distinct sources, and modify the temporal shape of the photon wavepackets. I will then discuss our recent efforts to develop new types of frequency conversion technology in a scalable, chip-based platform, using both material nonlinearities (four-wave-mixing) and engineered nonlinearities based on radiation pressure coupling between photons and phonons (cavity optomechanics).



Short biography: Kartik Srinivasan is a Project Leader at the NIST Center for Nanoscale Science and Technology (CNST). He received B.S., M.S., and Ph.D. degrees in Applied Physics from the California Institute of Technology, where his graduate research was supported by a Fannie and John Hertz Foundation Fellowship. At the CNST, he leads projects in the field of nanophotonics, with a current focus on topics in photonic quantum information science and optical sensors. He has been awarded the NIST Sigma Xi Young Scientist Award, the Presidential Early Career Award for Scientists and Engineers, and the US Department of Commerce Bronze Medal.

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