

presents the

Quantum Science Distinguished Lecture Series

Diamond – Engineer’s best friend

Prof. Marko Lončar

Harvard School of Engineering and Applied Sciences

Lecture Theatre B, Building 46 (Physics)

Wednesday 18 March 2015, 5pm – 6pm. Refreshments served from 4.30pm

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

Abstract: Diamond possesses remarkable physical and chemical properties, and in many ways is the ultimate engineering material - “the engineer’s best friend!” For example, it has high mechanical hardness and large Young’s modulus, and is one of the best thermal conductors. Optically, diamond is transparent from the ultra-violet to infra-red, has a high refractive index ($n = 2.4$), strong optical nonlinearity and a wide variety of light-emitting defects. Finally, it is biocompatible and chemically inert, suitable for operation in harsh environment. These properties make diamond a highly desirable material for many applications, including high-frequency micro- and nano-electromechanical systems, nonlinear optics, magnetic and electric field sensing, biomedicine, and oil discovery. One particularly exciting application of diamond is in the field of quantum information science and technology, which promises realisation of powerful quantum computers capable of tackling problems that cannot be solved using classical approaches, as well as realisation of secure communication channels. At the heart of these applications are diamond’s luminescent defects—colour centres—and the nitrogen-vacancy (NV) colour centre in particular. This atomic system in the solid-state possesses all the essential elements for quantum technology, including storage, logic, and communication of quantum information.



Biography: Marko Lončar is Tiansai Lin Professor of Electrical Engineering at Harvard’s School of Engineering and Applied Sciences. He received his Diploma (1997) from University of Belgrade (Republic of Serbia) and his MS (1998) and PhD (2003) degrees from California Institute of Technology, all in electrical engineering. His recent research interests include optical nanocavities, diamond nanophotonics and quantum optics, nanoscale optomechanics, and cavity-based bio-chemical sensing. Dr. Loncar is recipient of NSF CAREER Award in 2009, and Alfred P. Sloan Fellowship in 2010. He is fellow of OSA and senior member of SPIE.