SPIE Visiting Lecturer

Prof. Marko Lončar

"New Opportunities with Old Optical Materials"

Marko Loncar is Tiantsai Lin Professor of Electrical Engineering at Harvard's John A Paulson School of Engineering and Applied Sciences. Loncar is expert in nanophotonics and nanofabrication, and his current research interests include quantum and nonlinear nanophotonics, quantum optomechanics, high-power optics, and nanofabrication.

Abstract: Lithium niobate (LN) is an "old" material with many applications in optical and microwave technologies, owing to its unique properties that include large second order nonlinear susceptibility, large piezoelectric response, and wide optical transparency window. Conventional LN components, including modulators and periodically polled frequency converters, have been the workhorse of the optoelectronic industry. They are reaching their limits, however, as they rely on weakly guiding ion-diffusion defined optical waveguides in bulk LN crystal. I will discuss our efforts aimed at the development of integrated LN platform, featuring sub-wavelength scale light confinement and dense integration of optical and electrical components, that has the potential to revolutionize optical communication networks and microwave photonic systems, as well as enable realization of quantum photonic circuits.

Diamond is another "old" material with remarkable properties! It is transparent from the ultra-violet to infrared, has a high refractive index, strong optical nonlinearity and a wide variety of light-emitting defects of interest for quantum communication and computation. In my talk, I will summarize our efforts towards the development of integrated diamond quantum photonics platform aimed at realization of efficient photonic and phononic interfaces for diamond spin qubits.

Tuesday, April 9, BRK 2001 @ 1:30 PM

and a student lunch @ 12:30 PM

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