"Department of Physics and Astronomy" Colloquium, and
"Engineering Platforms for Exploring Cellular and Molecular Processes" Seminar Series

Manipulating Light on Chip

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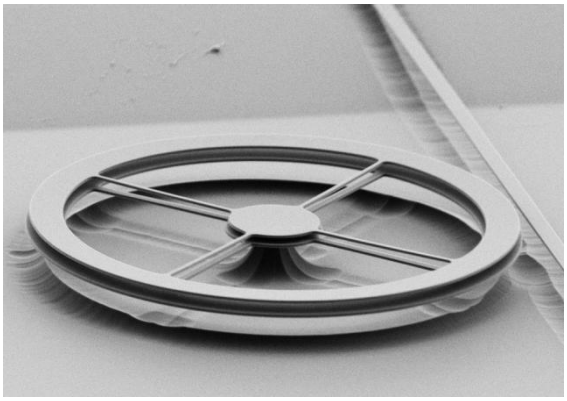
Natural Science Building, Room 112

Photonics on chip could enable a platform for monolithic integration of optics and microelectronics for applications of optical interconnects in which high data streams are required in a small footprint. This approach could alleviate some of the current bottlenecks in traditional microelectronics. In this talk I will review the challenges and achievement in the field of Silicon Nanophotonics and present our recent results. Using highly confined photonic structures, much smaller than the wavelength of light, we have demonstrated ultra-compact passive and active silicon photonic components that enhance the electro-optical, mechanical and non-linear properties of Silicon. Based on the ability to dynamically modulate light on the same time scale as the time of flight, we have demonstrated novel GHz structures for a variety of applications including all-optical synchronized RF oscillators and optical isolators on a silicon chip.



RF oscillator based on a silicon photonic structure

Dr. Michal Lipson is an Associate Professor at the School of Electrical and Computer Engineering at Cornell University, Ithaca NY. Her research focuses on novel on-chip Nanophotonics devices. She has pioneered several of the critical building blocks for silicon photonics including the GHz silicon modulators. Professor Lipson's honors and awards include 2010 MacArthur fellow, NYAS Blavatnik award, OSA Fellow, IBM Faculty Award, and NSF Early Career Award. More information on Professor Lipson can be found at nanophotonics.ece.cornell.edu.