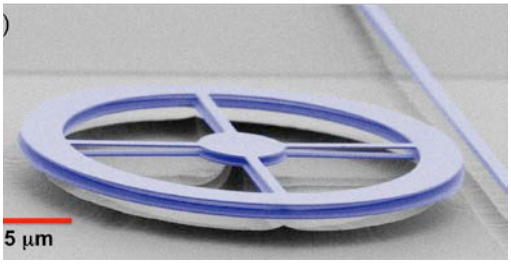
Silicon Photonics: The Optical Spice Rack

Michal Lipson

School of Electrical and Computer Engineering, Cornell University
Ithaca NY 14850

Silicon is evolving as a versatile photonic platform with multiple functionalities that can be seamlessly integrated. The tool box is rich starting from the ability to guide and amplify multiple wavelength sources at GHz bandwidths, to optomechanical MEMS and opto-fluidics devices. As an example of novel device capabilities, I will discuss the generation of strong optical forces in these ultra small light confining structures. We have recently shown that optical forces can enable controllable, static manipulation of photonic structures, an important step towards enabling recently proposed functionalities for optomechanical devices, such as self-aligning and optical corralling behaviour. These advances should enable future micro-optomechanical systems (MOMS) with novel and distinct functionalities.



Bio:
Michal Lipson is a Professor at the School of Electrical and Computer Engineering here at Cornell University. Her research focuses on novel on-chip Nanophotonics devices. She holds numerous patents on novel micron-size photonic structures for light manipulation, and is the author of over 150 technical papers in journals in Physics and Optics. She has pioneered several of the critical building blocks for silicon photonics including the GHz silicon modulators. Professor Lipson's honors and awards include the MacArthur Fellow, OSA Fellow, IEEE Fellow, IBM Faculty Award, and NSF Early Career Award.