Science AMA Series: I'm Michal Lipson, Lipson Nanophotonics Group at Columbia University, our group focuses on research areas where Nanophotonics has a big impact – both fundamentally and technologically. Ask Me Anything!

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Abstract

Michal Lipson, MacArthur Fellow, Eugene Higgins Professor Electrical Engineering at Columbia University Professor Michal Lipson joined the Electrical Engineering faculty at Columbia Universityhttp://lipson.ee.columbia.edu/home in July 2015. She completed her B.S., M.S., and Ph.D. degrees in Physics at the Technion in 1998 followed by a Postdoctoral position at MIT in the Materials Science Department until 2001. From there, Lipson joined the School of Electrical and Computer Engineering at Cornell University. She was named Cornell Given Foundation Professor of Engineering in 2013. Lipson was one of the main pioneers in the field of silicon photonics and is the inventor of several of the critical building blocks in the field including the GHz silicon modulator. She holds over 20 patents and is the author of over 200 technical papers. Professor Lipson's honors and awards include the MacArthur Fellow, Blavatnik Award, IBM Faculty Award, and the NSF Early Career Award. She is a fellow of OSA and IEEE. Since 2014, Lipson has been named by Thomson Reuters as a top 1% highly cited researcher in the field of Physics.

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MICHAL_LIPSON R/SCIENCE

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Hi there!

I'm curious about your work on breather solitons. I'm unfamiliar with "on chip" experiments, however. Are they conducted at helium temperatures?

Also, I wonder if silicon modulators are "in use" in communication fiber applications already.

helm

Hi Heim. All of our work is done at room temperature. These solitons are formed naturally due to the nonlinearities of the materials. The beauty of these optical structures is the fact that they enable one to tailor the dispersion of light over a very large bandwidth , since the modal dispersion (ie waveguide dispersion) is much larger than the material dispersion

Hi Dr. Lipson,

Do you have any experience working with organic polymers for photonics applications?

KCCO7913

yes, actually we are now working with "optical 3D printing" (two photon polymerization process) for

defining interesting 3D optical structures. I think this is a really new area with quite a lot of promise and could change the way photonics is done today (mostly in one single plane)