

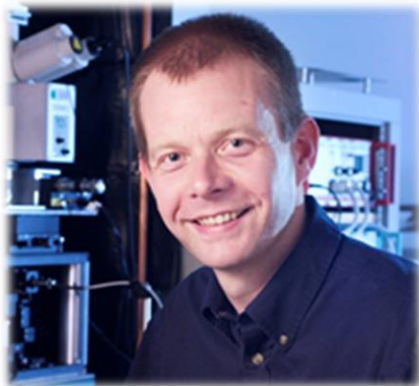
Nanoscale Photon Management for Solar Energy Harvesting

by Prof. Mark Brongersma

About the lecture:

Nanophotonics is an exciting new field of science and technology that is directed towards making the smallest possible structures and devices that can manipulate light. In this presentation, I will start by showing how semiconductor and metallic nanostructures can mold the flow of light in unexpected ways and well below the diffraction limit. I will then continue by illustrating how such nanostructures can be used to enhance our ability to harvest solar energy with solar cells and photoelectrochemical cells for generating solar fuel. In this part of the talk, it will become obvious how very different ways of photon management can be achieved by controlling the size and spacing (wavelength-scale/subwavelength-scale), shape, and spatial arrangement (periodic/aperiodic) of the nanostructures. I will conclude by showing how nanophotonics can also be used in the fabrication of critical components of solar energy harvesting devices.

Brief Biography of Prof. Mark Brongersma



Mark Brongersma is a Professor and Keck Faculty Scholar in the Department of Materials Science and Engineering at Stanford University. His most recent work has focused on Si-based light-emitting materials, light sources, modulators, detectors, and metallic nanostructures that can manipulate and actively control the flow of light at the nanoscale. Brongersma has given over 50 invited presentations in the last 5 years on the topic of nanophotonics and plasmonics. He has also presented 6 tutorials at International conferences on these topics. He has authored/co-authored over 130 publications, including papers in Science, Nature Photonics, Nature Materials, and Nature Nanotechnology.

He also holds a number of patents in the area of Si microphotronics and plasmonics. He received a National Science Foundation Career Award, the Walter J. Gores Award for Excellence in Teaching, the International Raymond and Beverly Sackler Prize in the Physical Sciences (Physics) for his work on plasmonics, and is a Fellow of the Optical Society of America, the SPIE, and the American Physical Society. Dr. Brongersma received his PhD in Materials Science from the FOM Institute in Amsterdam, The Netherlands, in 1998. From 1998-2001 he was a postdoctoral research fellow at the California Institute of Technology.

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