

MASTERWORKS

Lecture Series



Wednesday, May 19, 2021

9:30 a.m.

WebEx

Dr. Keren Bergman
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Deeply Disaggregated High Performance Architectures with Embedded Photonics

Abstract:

High-performance systems are increasingly bottlenecked by the energy and communications costs of interconnecting numerous compute and memory resources. Integrated silicon photonics offer the opportunity of embedding optical connectivity that directly delivers high off-chip communication bandwidth densities with low power consumption. We review these advances and introduce the concept of embedded photonics for addressing data-movement

challenges in high-performance systems. Beyond alleviating the bandwidth/energy bottlenecks, embedded photonics can enable new disaggregated architectures that leverage the distance independence of optical transmission. We will discuss how the envisioned modular system interconnected by a unified photonic fabric can be flexibly composed to create custom architectures tailored for specific applications.

Bio:

Keren Bergman is the Charles Batchelor Professor of Electrical Engineering at Columbia University where she also serves as the Faculty Director of the Columbia Nano Initiative. Prof. Bergman received the B.S. from Bucknell University in 1988, and the M.S. in 1991 and Ph.D. in 1994 from M.I.T. all in Electrical Engineering. At Columbia, Bergman leads the Lightwave Research Laboratory encompassing multiple cross-disciplinary programs at the intersection of computing and photonics. Bergman serves on the Leadership Council of the American Institute of Manufacturing (AIM) Photonics leading projects that support the institute's silicon photonics manufacturing capabilities and Datacom applications. She is the recipient of the 2016 IEEE Photonics Engineering Award and is a Fellow of the Optical Society of America (OSA) and IEEE.