

NY CREATES Emerging Technologies Seminar Series

June 11th (Thursday), 2020: 11:30 am – 12:30 pm

Advance Zoom Registration Required at:

<https://us02web.zoom.us/meeting/register/tZYqfuusrTgqG9TYCtutxYowyUOtkgUXwn7x>

“Integrated Slow-Light Silicon Photonic Devices for Communication and Optical Computing Applications”

by: Prof. Z. Rena Huang

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Abstract: Significant advancements in the field of Si photonics have been achieved in the last two decades leading to the establishment of the AIM Photonics foundry in the U.S. Numerous photonic systems integrated on the Si platform have been demonstrated in many application areas such as bio-sensing, RF photonics, fiber optical communication, quantum computing and optical neuromorphic computing. Bragg grating based slow-light waveguide with enhanced light-matter interaction is an appealing building block for many passive and active photonic devices and systems as it could enable much reduced device/system dimensions. The physics, design and fabrication of Si slow-light devices and chip-scale integration of several photonic systems using the AIM Photonics foundry will be reported in this talk. An array of tunable slow-light true-time delay lines are used to construct tuning elements for beam steering in a phased array antenna. Slow-light incorporated electro-optic Si modulators have also been demonstrated using the AIM Photonic foundry. Lately, we

have explored slow-light incorporated neuromorphic computing systems, namely a true-time delay-line photonic reservoir computer and have demonstrated a number of computation tasks: sine/square wave classification, nonlinear channel equalization, speech recognition, respiratory motion prediction etc. We aim to produce a chip-scale integrated photonic reservoir computer using the AIM Photonics foundry.



Biography: Dr. Huang received her B.Sc. from Beijing Institute of Technology in 1991 and her Ph.D. in Electrical Engineering from Georgia Institute of Technology in 2003. Prior to joining RPI, she worked as a postdoctoral fellow at the NSF Microsystem Packaging Center at Georgia Institute of Technology in 2004 where she led the

effort of end-to-end optical interconnects on printed circuit boards. Dr. Huang now is an Associate Professor at the Electrical, Computer, and System Engineering Department at RPI. She has co-authored more than 60 journal articles and conference proceedings. She received the Best Poster PRC Award (2nd place) in 1999, Outstanding Poster Paper Award of 53th ECTC in 2003, Commendable Paper Award of IEEE Transaction in Advanced Packaging in 2004, and NSF RampUp Award in 2010.