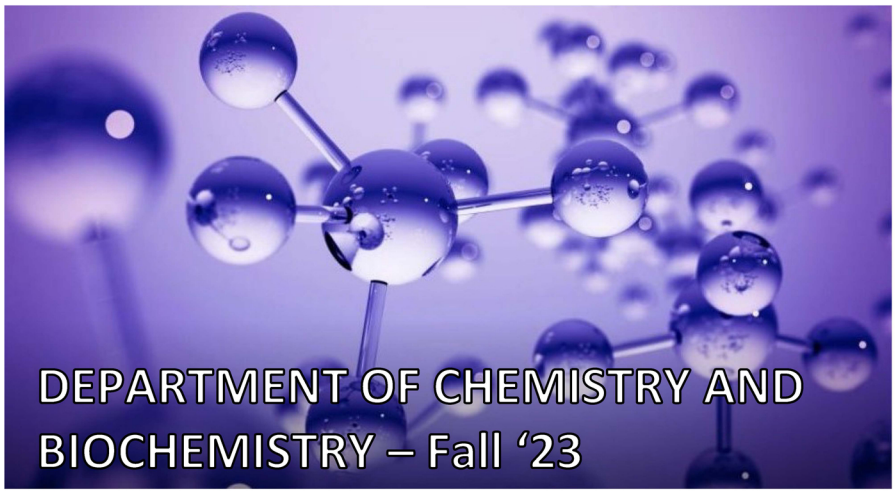

THE SALZBERG CHEMISTRY SEMINAR SERIES

The City College of New York

CREST IDEALS PHASE II

Monday, October 23, 2023 @ 12:00 noon – MR1027

Analog Information Processing at the Speed of Light with Universal Photonic Integrated Circuits

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Abstract: Programmable photonic integrated circuits represent an emerging technology that amalgamates photonics and electronics, paving the way for light-based information processing at high speeds and low power consumption. In this talk, I will present a novel architecture for efficient integrated photonic implementation of arbitrary matrix-vector multiplications, as one of the most fundamental mathematical operations which paves the way for a wide range of applications. This architecture is built on interlacing fractional Fourier transform layers with programmable phase shifter arrays and can be realized with the existing photonic material platforms including the well-established silicon photonics process of open-access foundries. Furthermore, we have proven that these universal circuits show resilience to fabrication imperfections and can be calibrated post-fabrication. I will delve into the core attributes of this architectural design and discuss its practical applications in the realm of analog information processing.

Biography: Mohammad-Ali Miri is an Associate Professor of Physics at Queens College and the Graduate Center of the City University of New York. He earned his Ph.D. in Optics from CREOL, the Center for Optics and Photonics, at the University of Central Florida in 2014. His research interests are in the broad areas of optics and photonics, nonlinear optics, optical computing, and integrated photonics. He has authored and co-authored more than 100 publications in peer reviewed journals and conference proceedings, including several highly cited articles on the theory and applications of non-Hermitian photonic systems. Miri is a recipient of the 2022 Young Investigator Research Program (YIP) award of the Air Force Office of Scientific Research (AFOSR) and the 2022 CUNY Junior Faculty Award funded by the Alfred P. Sloan Foundation.

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