

Photonics

Ultrafast-Lasers-Enabled Photonics, Optics, and Waveguide Lasers

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Abstract: The investigation into ultrafast-laser-based photonics fabrication and integration represents multifaceted interdisciplinary research, intersecting applied physics, photonics, lasers, materials, and imaging. This presentation describes computational models and elucidates physical processes pertaining to the utilization of ultrafast lasers for the fabrication of optical, photonic, and laser components. Topics covered include the 3D writing of waveguides, waveguide lasers, and beam splitters in crystal and glass materials, as well as nanostructuring, shape correction, and the precision bonding of semiconductor and dielectric materials.



Biography: Dr. Jie Qiao is an associate professor at the Carlson Center for Imaging Science at the Rochester Institute of Technology. Her research at RIT focuses on ultrafast laser photonics, wavefront sensing and beam shaping. Prior to joining RIT, she was a laser system scientist at the Department -of-Energy-funded Laboratory for Laser Energetics, the University of Rochester. She led the demonstration of the world's first 1.5-meter coherently-phased-grating pulse compressor for the OMEGA EP kilojoule, petawatt lasers. She has worked on technology innovation of various ultrafast laser systems, photonics devices, optical imaging, and metrology systems for two photonic startups and one optics company. She was a Fulbright US research scholar and a visiting professor at the Center for Intense Lasers and Applications (CELIA), Université Bordeaux, France in the 2022 academic year. Dr. Qiao is an Optica Fellow and was an associate editor for Optics Express from 2018 to 2021. She is the General Chair for the 2024 and 2025 CLEO conference, the Application and Technology Program. She earned her doctoral degree from the Department of Electrical and Computer Engineering, University of Texas, Austin.

Hosted by: Mercedeh Khajavikhan