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**Femtosecond Two-Photon Photopolymerization** NAYER ERADAT, Middle Tennessee State University, IAN MITCHELL MITCHELL, Middle Tennessee State University, CHELSEA BOND, YEON RIM, MTSU PHYSICS TEAM — We will report our progress on photo-polymerization of a new material system with electrical conductivity for photonics applications. Two-Photon polymerization is the process of making polymers from monomers using a high-power and ultra-short pulsed laser with the aid of photo-initiators. This laser light is tightly focused through a high numerical aperture microscopy objective to increase resolution to a scale of tens of nanometers. In the summer of 2004, we started a research program at Middle Tennessee State University. Our goal is to fabricate polymer microstructures with applications in photonics. During the last summer, we prepared an experimental setup for two-photon polymerization, and tested it with common material systems in the field. Our experimental setup uses tightly focused femtosecond laser light for a localized initiation of two-photon polymerization, as well as a system of high resolution travel stages for sample movement.

Ian Mitchell  
Middle Tennessee State University

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