

# AFRL

## STRUCTURED OPTICAL MATERIALS AND PROCESSING RESEARCH TEAM

The Structured Optical Materials Research Team uses recent developments in structured optics, machine learning, deposition, and patterning in capabilities to demonstrate new technologies and materials for controlling light.

### What is SOMPR?T?

The Structured Optical Materials and Processing Research Team (SOMPR) develops novel optical materials and processing methods to enable and enhance optical performance of Air Force capabilities. We synthesize, grow, characterize, and model external stimulus-induced responses in electromagnetic materials. We have pervasive modeling and simulation capabilities across all thrusts (e.g., atomic, classical electromagnetic, and multiscale) to predict optical responses and performance impacts.

Members of the Structured Optical Materials Team have expertise ranging from materials science to electro-optics. A number of world-class laser, chemistry, and characterization facilities support the vision of our multidisciplinary team. Such unique teaming and capabilities enable us to publish in top tier journals and develop technology for the advanced warfighter.

### How Does the Team Achieve Their Discoveries?

The Structured Optical Materials Team works through a combination of academic collaborations, joint projects with Department of Defense research labs, industrial investment, and international partnerships. We push technology development and provide novel capabilities to customers through peer-reviewed publications, intellectual property development, and technology maturation programs to buy down transition risk.

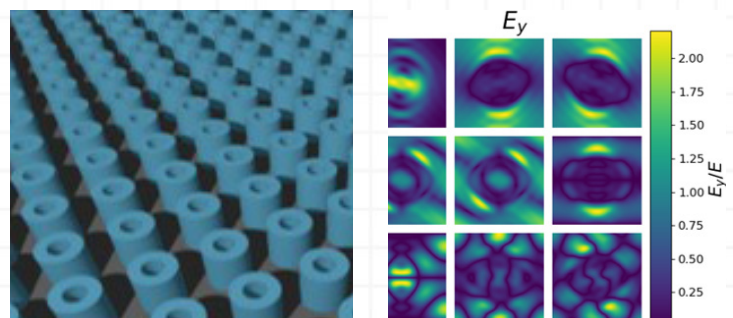
While the majority of in-house research is focused on late-fundamental to early-applied concepts, research is done with an eye towards applications and customer pull while leaving room for exploratory high-risk/high-reward efforts.

### Research Focus Areas

- Structured Optical Media
- Novel Inks for Optofluidic Devices
- Stimuli Responsive Optical Materials
- Additive and Subtractive Manufacturing of Optical Components
- Laser/Material Interactions
- Rapid Optical Design Discovery

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(Left) Schematic representation open cylinder silicon / air metasurface and (right) related mode profiles.

THE AIR FORCE RESEARCH LABORATORY

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