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# EMERGING TOPOLOGY AND SHAPE OPTIMIZATION TECHNIQUES IN COMPUTATIONAL DESIGN OF MATERIALS AND STRUCTURES

*Ahmad Najafi*[*1], Kai James[2] and Graeme Kennedy[2]*

*[1]Drexel University*

*[2]Georgia Institute of Technology*

## MINISYMPOSIUM

Motivated by key advances in manufacturing techniques, the tailoring of materials with desired macroscopic properties has been the focus of active research in engineering and materials science over the past decade. For materials architected at length scales that can be controlled by the manufacturing process, the goal is to determine the optimal spatial layout of one or more constituent materials to achieve a desired macroscopic constitutive response. Topology and shape optimization methods provide a systematic means to achieve this goal. The objective of this symposium is to bring together researchers working on state-of-the-art topology and shape optimization techniques with direct application in materials design to exchange ideas, present novel developments, and discuss recent advances. Topics of interest concern shape and topology optimization techniques, and they include, but are not limited to:

- New topology and shape optimization algorithms
- Topology and shape optimization for additive manufacturing
- Machine learning-assisted, data-driven, and surrogate-based topology and shape optimization
- Multiscale, multifunctional, multi-objective design of materials and structures
- Multiphysics and multidisciplinary optimization
- Stress-constrained topology optimization
- Reduced-order multiscale modeling for design
- Simultaneous material and structure optimization
- Optimization under uncertainty
- Design of architected materials
- Design of nonlinear materials
- Bioinspired design of composites
- Design of metamaterials
- Smart material design
- Software