

## TOPOLOGY OPTIMIZATION FOR ADVANCED STRUCTURES AND MATERIALS

### 1300 - INVERSE PROBLEMS, OPTIMIZATION AND DESIGN

WEIHONG ZHANG <sup>1</sup>, PIOTR BREITKOPF <sup>2</sup>, XIAODONG HUANG <sup>3</sup>,  
JUNJI KATO <sup>4</sup>, JIHONG ZHU <sup>5</sup>, MINGDONG ZHOU <sup>6</sup>, LIANG XIA <sup>7</sup>

<sup>1</sup> Northwestern Polytechnical University, Xi'an 710072, China  
[zhangwh@nwpu.edu.cn](mailto:zhangwh@nwpu.edu.cn)

<sup>2</sup> Université de Technologie de Compiègne, Compiègne 60200, France  
[piotr.breitkopf@utc.fr](mailto:piotr.breitkopf@utc.fr)

<sup>3</sup> Swinburne University of Technology, Victoria 3122, Australia  
[xhuang@swin.edu.au](mailto:xhuang@swin.edu.au)

<sup>4</sup> Nagoya University, Nagoya 464-8603, Japan  
[junjikato@nagoya-u.jp](mailto:junjikato@nagoya-u.jp)

<sup>5</sup> Northwestern Polytechnical University, Xi'an 710072, China  
[jh.zhu@nwpu.edu.cn](mailto:jh.zhu@nwpu.edu.cn)

<sup>6</sup> Shanghai Jiao Tong University, Shanghai 200240, China  
[mdzhou@sjtu.edu.cn](mailto:mdzhou@sjtu.edu.cn)

<sup>7</sup> Huazhong University of Science and Technology, Wuhan 430074, China  
[xialiang@hust.edu.cn](mailto:xialiang@hust.edu.cn)

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## ABSTRACT

Over the past decades, topology optimization has undergone a remarkable development in both academic researches and industrial applications. Topology optimization has been recognized as one of the most efficient design methods for the design of lightweight, innovative and multi-functional structures. In recent years, the fast development on numerical methods and manufacturing brings new opportunities and challenges to the topology optimization community. On the one hand, the constant increase of computing capabilities enables numerical investigation of structures and materials with detailed geometrical and physical modelling; on the other hand, the advance of novel manufacturing techniques such as additive manufacturing, allows for the fabrication of structures and microstructures of almost arbitrary geometry complexity to an unprecedented extent.

This session is dedicated to bringing together researchers to present their novel developments and recent advances on topology optimization methods for advanced structures and materials with the increased computing power and the manufacturing freedom. Topics of interest include, but are not limited to:

- New developments on topology optimization method
- Data-driven or surrogate-assisted design and optimization
- Design of multiscale/hierarchical and multiphysics problems
- Topology optimization for the design of metamaterials
- Reduced order modeling for topology optimization
- High performance computing for topology optimization
- Topology optimization considering material or geometrical nonlinearities
- Topology optimization of smart structures and materials
- Topology optimization with artificial intelligence
- Topology optimization considering manufacturing constraints
- Industrial applications of topology optimization
- Application of topology optimization for additive manufacturing