

# SEMINAR



# SERIES

北京大学工学院

力学与工程科学系

湍流与复杂系统国家重点实验室

## Topological design to Fracture Resistance

报告人：达代聪 博士

时 间：6月5日 周一 下午 14:00

地 点：工学院 1号楼 210室

主持人：刘珂 研究员



### 报告内容摘要：

Heterogeneous materials and structures represent the future of engineering materials with unprecedented mechanical performance. The architecture in which the constitutive materials are arranged is the key determinant of their performance. Designing a heterogeneous material for extreme conditions such as failure and fracture resistance remains a huge challenge not only because of the complexity of fracture modeling, but also the infinite possible architectures and combinations of materials. These difficulties in practice necessitate powerful and efficient design approaches. This talk will present key findings from my research on design for fracture resistance of heterogeneous materials. Approaches vary from strength-oriented optimization to control the whole fracture process from damage initiation, multiple crack propagation and ultimately to failure. I will summarize the qualities of biomimetic, gradient-free, and gradient-optimized architectures for enhancing mechanical fracture performance. New results on leveraging reduced-order modeling and data-driven algorithms will be demonstrated.

### 报告人简介：

Dr. Daicong Da obtained his Ph.D. from the Université Paris-Est, France, and subsequently held postdoctoral positions at the University of Wisconsin-Madison and Northwestern University, USA. His primary research focuses on the mechanics of materials, design optimization, and data-driven approaches, with particular applications in advanced manufacturing, soft robotics, and multifunctional materials and structures. He has authored the book "Topological Design Optimization of Heterogeneous Materials and Structures," which was published by John Wiley & Sons.

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