

QUANTUM COMPUTING IN MECHANICS

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ABSTRACT

We propose an Invited Session exploring quantum computing applications in mechanical analysis and design, focusing on computational mechanics, material science, and more broadly computational engineering in general. This session will demonstrate how quantum computing can enhance efficiency in optimization, analysis, and system dynamics of complex mechanical problems.

Our goal is to foster interdisciplinary collaboration and advance the integration of quantum computing in mechanics. Topics will include:

- Quantum algorithms for computational mechanics and scientific computing
- Quantum-enhanced simulation techniques
- Foundational algorithms for gate-based and annealing-based quantum computers
- Applications in mechanical design, optimization, system dynamics and machine learning

By bringing together researchers and engineers, we aim to advance the integration of quantum computing in mechanics and discuss both challenges and opportunities in this emerging field.