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FRONTIERS IN PHASE-FIELD FRACTURE MODELING

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ABSTRACT

In the 26 years since its inception, the phase-field approach to fracture has established itself as a staple of computational fracture mechanics. Indeed, owing to its ease of implementation, the original framework has served as the computational basis for a plethora of extended, damage-like models that incorporate diverse physical mechanisms. These developments have taken different and often diverging conceptual paths, particularly regarding the connection to sharp-crack theories and the variational structure of the original formulation.

This invited session offers a platform to present and discuss current trends and developments in phase-field fracture modeling. General areas of interest include, but are not limited to the following:

- theoretical foundations,
- energy decompositions,
- nucleation/strength criteria,
- cohesive fracture,
- inelasticity,
- fatigue,
- dynamics,
- multiphysics and multiscale processes.

Contributions that critically examine the foundations, limitations, and future directions of phase-field fracture methods are especially welcome.