

## ALGORITHMIC AND SOFTWARE ADVANCES IN COUPLING METHODS FOR CLIMATE MODELS

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### ABSTRACT

Earth System Models (ESM) involve a large number of constituent components operating at different temporal and spatial scales and having different mathematical properties [1]. Such complex multiphysics models rely on multiple spatial and temporal discretization techniques, ranging from spectral elements and finite differences, to conservative mimetic schemes on polygonal grids. Stable and accurate coupling of these diverse discretizations presents significant challenges for the currently dominant algorithmic and software approaches based on a hub-and-spoke model supporting loosely coupled components.

This session will bring together numerical analysts, computational scientists and climate modeling experts working on a broad spectrum of algorithmic and software design issues relevant to Earth System Models including but not limited to conservative online and offline remapping [2], improved coupling and time integration strategies [3] and new, task-based parallelism approaches to the design of the ESM coupler.

### REFERENCES

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