

29th International Conference on Composite Structures (ICCS29)

22–26 June 2026, Faculty of Architecture, University of Cagliari, Italy

NONLOCAL AND PERIDYNAMIC MODELLING OF COMPOSITES

Special Session organised by

Prof. Mehmet Dördüncü

Department of Mechanical Engineering, Izmir Institute of Technology, Turkey

Prof. Erkan Oterkus

Department of Naval Architecture, Ocean and Marine Engineering, University of Strathclyde,
UK

Session Overview

Nonlocal and peridynamic modelling approaches have emerged as powerful tools for describing the deformation, damage, and fracture behaviour of composite materials under complex mechanical and environmental conditions. Unlike classical continuum mechanics, these frameworks can naturally capture discontinuities, size effects, and microstructural interactions—providing a more unified description across multiple length scales.

This Special Session aims to bring together researchers developing theoretical formulations, computational implementations, and experimental validations of nonlocal and peridynamic models applied to composite structures. Contributions that highlight hybrid approaches coupling peridynamics with finite element, phase-field, or data-driven techniques are especially welcome.

Topics – but are not limited to:

- Nonlocal and peridynamic modeling of composite materials and structures
- Multiscale coupling and damage evolution in fiber- and particle-reinforced systems
- Fatigue, impact, and dynamic fracture analyses
- Integration of peridynamics with machine learning or digital twin frameworks
- Experimental validation and parameter identification for nonlocal models
- Computational implementations and parallel algorithms

Special Issue

Selected high-quality papers from this session will be considered for publication in a **Special Issue of the *Journal of Peridynamics and Nonlocal Modeling* (Springer)**.