The Environmental Fluid Dynamics Lecture Series
Presents a Seminar

The morphodynamics of interacting bedforms

Gianluca Blois
Research Assistant Professor
Aerospace and Mechanical Engineering
Hessert Aerospace Research Center
Notre Dame

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Gianluca Blois received his PhD in Civil Engineering from Politecnico di Milano University, Italy. He then moved to the Departments of Geology and Mechanical Engineering at the University Illinois, Urbana-Champaign, where he has been holding the Jackson Postdoctoral Fellowship. Dr. Blois has recently joined the Department of Aerospace and Mechanical Engineering at University of Notre Dame as a Research Assistant Professor. His research interests include a number of environmental problems with focus on bedform morphodynamics and multiphase flow through porous media. He has been leading the development of a large-scale Refractive Index Matching (RIM) facility to investigate geophysical flow problems, including bedforms dynamics.

ABSTRACT
Migration and evolution processes of naturally occurring bedforms are controlled by the overlying flow through complex feedback mechanisms involving sediment transport. We use physical modelling to detail the flow fields associated with interacting bedforms and examine the implications of turbulence on their formative and evolution processes. Shear layer interactions, downstream bedform stalling and leeside erosion are confirmed to be the key aspects of the interaction processes. The implications of our findings on 3D bedforms are complemented by mobile-bed experiments involving 2D bedforms. Simultaneous measurements of evolving morphology and flow fields during bedform amalgamation augment current theory to interpret and predict bedding structures.