Politecnico di Torino

DIMEAS SEMINAR - SERIES AEROSEMINARS

INTRODUCTION TO THE LATTICE BOLTZMANN METHOD FOR ACCURATE AND PRACTICALLY RELEVANT FLOW SIMULATIONS

SPEAKER

Damiano Casalino

Chair of aeroacoustics in the aerospace faculty - Delft University of Technology

Friday 28 November at 11:30 a.m.

Sala Ferrari, II floor, DIMEAS - Politecnico di Torino

PROGRAM

Abstract

The seminar is intended to provide an introduction to the Lattice-Boltzmann-Method flow model and how turbulence modelling can be incorporated in the LBM framework. After a description of the very standard discretization schemes for low-speed flows, different strategies to extend the LBM usage to high-speed flows are outlined. Examples of supersonic flow simulations from the literature are presented and the associated challenges discussed

BIO

Damiano Casalino, PhD in fluid-dynamics (Turin Polytechnic) and acoustics (Ecole Centrale de Lyon) has research interests in aeroacoustics that cover frequency-domain CAA for duct acoustics and installation effects, sound propagation in sheared flows, integral methods, stochastic noise generation, advanced experimental techniques for space launcher noise, helicopter trajectory optimization, vortex-airfoil interaction noise, acoustic liners and porous treatments.

Damiano is currently R&D director at Dassault Systèmes and chair of aeroacoustics in the aerospace faculty of Delft University of Technology. His main focus is on the industrial exploitation of the lattice Boltzmann method for airframe and engine noise prediction. More recently, he has started developing methodologies for Urban/Advanced Air Mobility and Wind-Energy applications. His current research goal is to integrate computational aeroacoustics in system engineering frameworks for aircraft, rotorcraft and wind-turbine community noise prediction in realistic operational scenarios.

Damiano has co-authored about eighty archival journal publications in the field of aeroacoustics, co-authored several patents and has obtained the Aeroacoustics Award in 2023 from the Council of European Aerospace Societies.