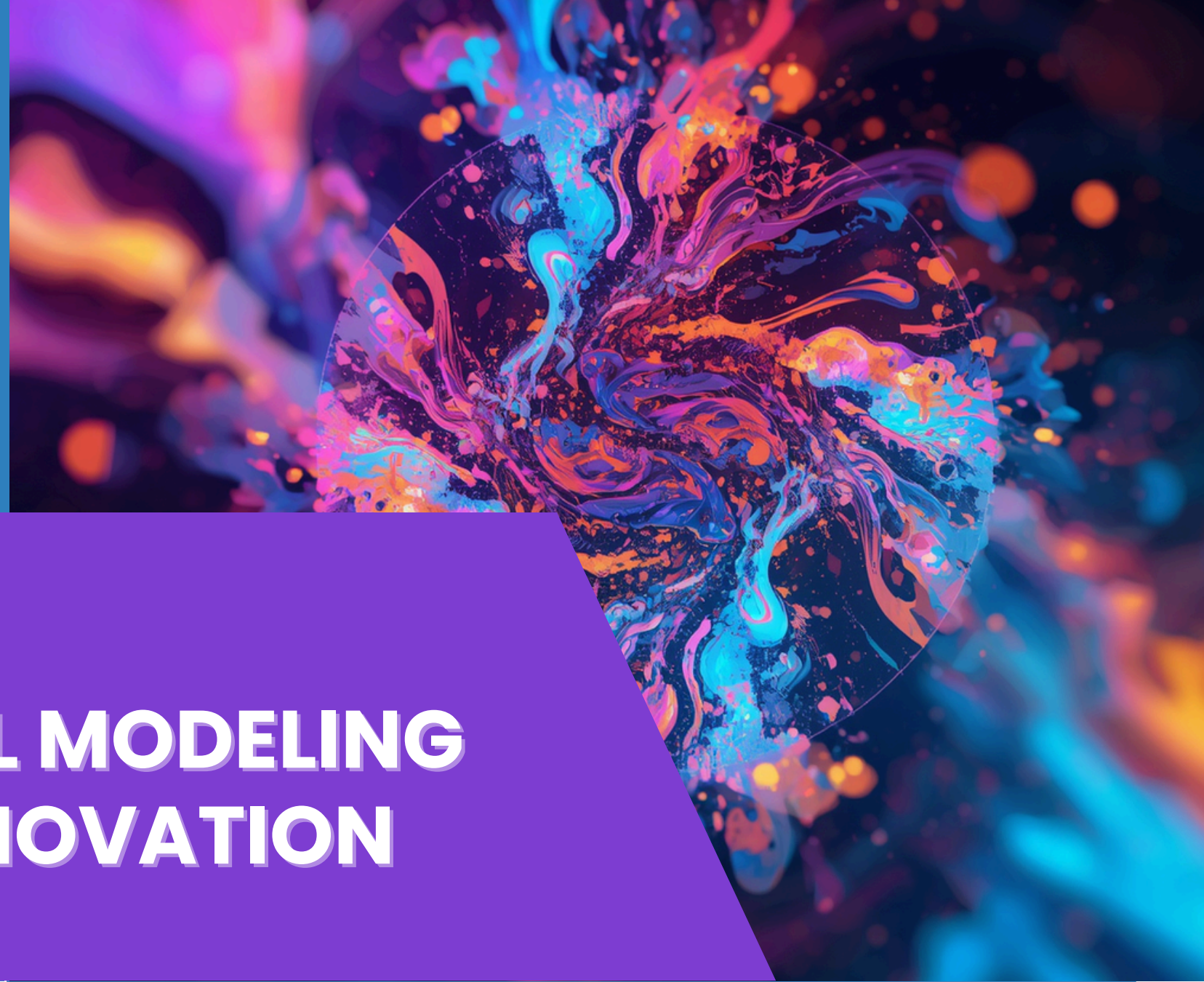




**Politecnico
di Torino**

Dipartimento
di Ingegneria Meccanica
e Aerospaziale



DIMEAS SEMINAR

HOW HPC AND PHYSICAL MODELING ENABLES INDUSTRIAL INNOVATION

SPEAKER



Joel Guerrero
Leonardo Labs



**July 16,
10,30 am**



**Sala Ferrari, II floor,
DIMEAS – Politecnico di Torino**

Abstract

In today's digital era, industries such as aerospace, automotive, and energy are transforming how they design and build products, thanks to the power of High-Performance Computing (HPC) and physics-based modeling. This presentation explores how these technologies help companies innovate faster, smarter, and more sustainably.

With HPC, engineers and scientists can run highly complex simulations that once took weeks or were simply intractable due to limited computing power and time, in just a few hours or days. These simulations allow teams to test ideas virtually, explore design alternatives, and solve problems before anything is physically built. When combined with multi-physics simulations and physics-based modeling, companies can accurately predict how products will perform under various conditions, improving safety, efficiency, and reliability. We'll also explore how these tools support virtual prototyping and digital twins, and how artificial intelligence (AI) is transforming the way data is consumed and used to guide design decisions.

BIO

Joel Guerrero is an aeronautical engineer and Multiphysics simulations specialist with a PhD from the University of Genoa (Italy) and a Master's degree from ISAE-SUPAERO (France). He is passionate about aviation, CFD, turbulence, multiphysics, optimization, and advanced simulation technologies. He currently serves as Principal Investigator of the Digital Twin and Advanced Simulation Research Unit at Leonardo Labs. Until 2023 he was an assistant professor at the University of Genoa, where he taught turbulence modeling, computational fluid dynamics, optimization and practical CFD using OpenFOAM and Fluent. He is also a co-founder of Wolf Dynamics, a University of Genoa spin-off. With over 10 years of experience across aerospace, automotive, energy, naval, and biomedical industries, he combines research, innovation, and engineering practice. Joel Guerrero is also a YouTube creator, sharing STEM and finance knowledge with a community of more than 120,000 subscribers.