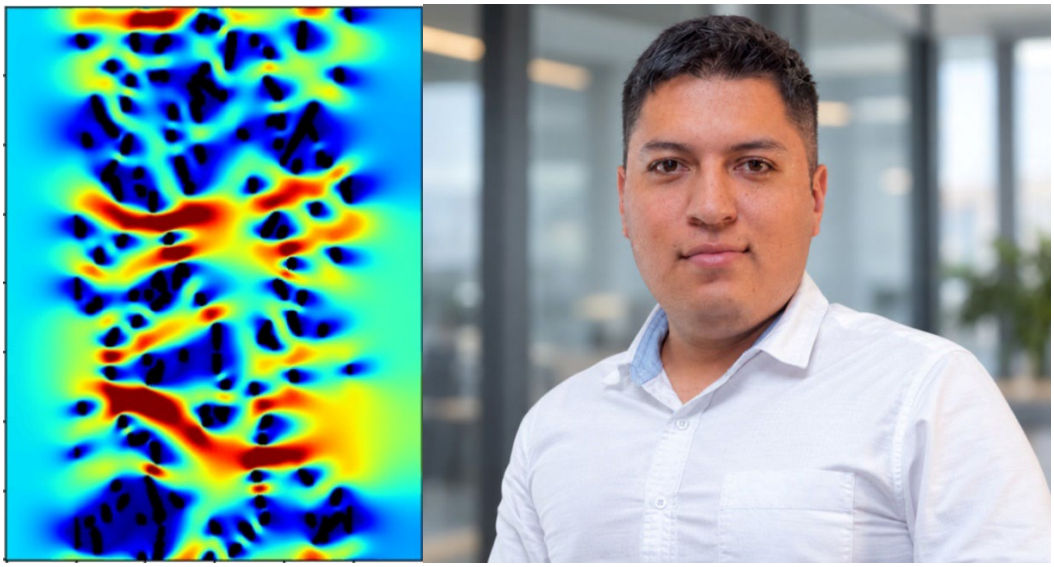
FAKULTA STROJNÍHO INŽENÝRSTVÍ

invites to the lecture:

Lattice Boltzmann Modeling of Transport in Complex Porous Media for PEM Fuel Cells

Gas diffusion layers play a critical role in the transport processes occurring within Proton Exchange Membrane Fuel Cells (PEMFCs), where their complex porous microstructure directly influences fluid distribution and overall cell performance. This work presents a computational approach based on the Lattice Boltzmann Method (LBM) to investigate momentum transport through digitally generated gas diffusion layer microstructures. Three-dimensional porous domains with different porosity levels are reconstructed and analyzed to explore the relationship between microstructural characteristics, particularly porosity and tortuosity, and the resulting flow behavior. The methodology combines digital porous-media generation with numerical flow simulation, providing a framework for connecting microstructural design with transport performance in fuel-cell components.



held by **Brayan Gabriel Ordonez Saca** from **ESPOL, Ecuador** on **19 November** at **10:00 AM** in conference room of **D3** (Heat Transfer and Fluid Flow Laboratory, details on email: jan.bohacek@vut.cz)

Brayan Gabriel Ordóñez-Saca received his bachelor's degree in Mechanical Engineering in 2022 and his Master of Science in Mechanical Engineering, with a specialization in Thermofluid Systems, in 2026, from Escuela Superior Politécnica del Litoral (ESPOL), Ecuador. He is currently a Ph.D. student in Engineering at ESPOL, where he also serves as a researcher and lecturer in the areas of Advanced Mechanics of Solids and Computational Fluid Dynamics. His current research interests focus on complex porous media, the optimization of porous structures using artificial intelligence and machine learning, and numerical simulation using the Lattice Boltzmann Method. Additionally, he serves as an editor for the Sixth Congress of Research, Development, and Innovation in Renewable Energies (CIDiER 2026), held in Guayaquil, Ecuador.