



Conference COMSOL MULTIPHYSICS 2025



22. - 23. 5. 2025

Wednesday (21.5.)

- 17:00 Registration and Arranged Personal Meetings
- 18:30 Dinner
- 20:00 Arranged Personal Meetings

Thursday (22.5.)

- 7:30 Breakfast until 9:30
- 8:30 Registration
- 9:30 Opening Remarks
Petr Byron, HUMUSOFT
- 9:40 News in COMSOL 6.3
Martin Kožíšek, HUMUSOFT
- 10:00 **Keynote: Meshing in CFD Models**
Nancy Bannach, COMSOL
- 10:30 **Keynote: Curvilinear Coordinates for Anisotropic Materials**
Nancy Bannach, COMSOL
- 11:00 Coffee Break, Digital Poster Session Day 1
- 11:30 Transport-Reaction Problems in the Barriers of a Deep Geological Spent Nuclear Fuel Repository
Milan Hokr, Technical University of Liberec
- 11:45 Simulations in Development of Onboard Chargers
Václav Kotek, KOSTAL Engineering CR
- 12:00 Numerical Modeling of Selected Electroheat Problems
Václav Kotlan, University of West Bohemia in Pilsen
- 12:15 Simulations for Satellite Engineering and Integration
Tomáš Tichý, HiLASE
- 12:30 Lunch
- 13:30 Digital Poster Session Day 1
- 14:00 **Keynote: Heat Transfers and Solid Mechanics in Microarchitected Materials using Periodic Homogenization**
Frédéric Viry, SIMTEC
- 14:30 **Keynote: Modelling the Heat Dissipation of a Head Lamp within COMSOL Multiphysics**
Frédéric Viry, SIMTEC
- 14:45 Movement in Electromagnetics: Motors, Actuators and Forces
Matouš Lorenc, HUMUSOFT
- 15:45 Random Vibrations in Structural Mechanics
Tomáš Vrbata, HUMUSOFT
- 16:30 Coffee Break, Digital Poster Session Day 1
- 17:00 **Keynote: From Material Characterization to Topology Optimization in Additive Manufacturing**
Giuseppe Petrone, BE CAE & Test

- 18:00 **Acoustic Metamaterials with Negative Stiffness: A Model of a Membrane Absorber**
Jana Vyslouchilová, Brno University of Technology
- 18:15 **Plasmonic Enhancements In Metal-Diamond Nanoparticle Complexes**
Bohuslav Rezek, Czech Technical University in Prague
- 18:30 **Simulation of NV Quantum Response**
Josef Souček, Hasselt University IMO IMOMEC
- 18:45 **Computing Hysteresis and Coupling AC Losses in Round High-Temperature Superconductor Cable**
Mykola Soloviov, Slovak Academy of Sciences
- 19:00 Dinner
- 20:30 Social Evening

Friday (23.5.)

- 7:30 Breakfast until 9:30
- 9:30 Introduction to Electric Discharge Module
Matouš Lorenc, HUMUSOFT
- 10:00 **Keynote: Thermo-Mechanical Optics Modelling for Laser-Driven Fusion**
Gavin Friedman, Focused Energy
- 10:45 Modeling of the Phase-Change Materials
Richard Slávik, Mendel University in Brno
- 11:00 Turbulent Fluid Flow in Auricula Sinistra
Matouš Brunát, Czech Technical University in Prague
- 11:15 Simulation of Fluid Flow around Aircraft Propeller
Jan Šimkovský, Czech Technical University in Prague
- 11:30 Coffee Break, Digital Poster Session Day 2
- 12:00 Topology Optimization of Electric Motors
Jan Kaska, University of West Bohemia in Pilsen
- 12:15 Eigenvalue Study for the Ignition of Self-sustaining Discharge with COMSOL Multiphysics
Filip Zmeko, University of West Bohemia in Pilsen
- 12:30 RANS Modeling of the Influence of the Blockage Effect in the Wind Tunnel
Blanka Ledvinková, Czech Academy of Sciences
- 12:45 Spin Coating Simulation of PMMA solution on the Surface of SME NiTi
Sneha Samal, Czech Academy of Sciences
- 13:00 Lunch
- 14:00 Digital Poster Session Day 2
- 15:00 Physics Informed Neural Networks: COMSOL and MATLAB
Martin Kožíšek, HUMUSOFT
- 16:00 Closing Remarks

Digital Posters Sessions

Digital Poster Session Day 1

Consultation Opportunity: Heat Transfer, CFD, Chemical Reactions, and Making of Applications
Nancy Bannach, COMSOL

Comparison of Experimental Data and a Numerical Model of Diffusion in an Agarose Hydrogel
Darya Zhurauliová, Brno University of Technology

Heat Models for a Deep Geological Repository
Petr Rálek, Technical University of Liberec

Digital Poster Session Day 2

Consultation Opportunity: High-Performance Computing Workstations HeavyHorse
Jiří Šusta, HUMUSOFT

Optimization of Initial Condition Topologies for Enhanced Parameter Estimation in FRAP Experimental Techniques
Štěpán Papáček, Czech Academy of Sciences

GPU Computations
Cyril Fischer, Czech Academy of Sciences

Hotel Galant Lednice

21. dubna 657, 691 44, Lednice

Conference Fee:

Customers with COMSOL License: Free

Guests on the invitation list: Free

Other guests: 1000 CZK

Are you interested in COMSOL software?

Let us know, we will add you on the invitation list.

This event takes place in person only!

www.humusoft.cz/comsol-2025

Keynote Speakers

Frédéric Viry, SIMTEC, France

Frédéric is a modelling expert at SIMTEC. He daily uses COMSOL Multiphysics to efficiently build numerical models and deliver valuable results to his industrial clients. He also develops multi-scale modelling methods for industry specific needs.

Giuseppe Petrone, BeCAE&Test, Italy

Giuseppe Petrone is a co-founder and the sole director of the company BE CAE & Test. He earned a degree in Mechanical Engineering from the University of Catania (Italy) in 2001, followed by a Ph.D. in Energetics and Process Engineering from the University of Paris Est (France) in 2004. He then worked as a contract researcher at the same institution until 2005, before continuing his academic career as a researcher at the University of Catania (Italy) from 2006 to 2012 and later at the University of Florence (Italy) from 2013 to 2014. Since 2014, he has overseen more than 100 technical and industrial projects at BE CAE & Test, collaborating with clients who are global leaders in their respective fields. Over the years, he has gained extensive expertise in numerical modeling, particularly in multiphysics applications using COMSOL software, which he has been working with for over 20 years.

Nancy Bannach, COMSOL, Germany

Nancy Bannach is an accomplished developer at COMSOL, with a focus on porous media flow and transport. Additionally, she brings extensive expertise in Computational Fluid Dynamics (CFD), chemical engineering, and developing customized COMSOL apps aimed at improving engineering solutions. Prior to her current role, Nancy began her journey at COMSOL in 2009 as a technical sales engineer, later diversifying her experience in applications and technical marketing. Before joining COMSOL Germany in 2009, Nancy earned a Diploma in Geophysics from Göttingen University in the same year, focusing on numerical simulations to analyze convection within the Earth's outer core.

Gavin Friedman, Focused Energy, Germany/USA

Gavin Friedman is the Head of Optical Modelling at Focused Energy, creating simulation tools to develop novel laser sources to enable fusion power as a viable energy source. He has over 15 years of experience in thermo-mechanical modelling and is an industry expert on creating minimally-invasive cooling systems for large laser systems. He has been a key contributor on simulations for energy sector products as well as R&D lasers for high-field physics at US/EU national laboratories, including a recent role at ELI-Beamlines in Prague.