

# 8<sup>th</sup> Users' Conference of IT4Innovations

4 – 5 November 2024

**Abhiram Bindu Ramanathan** (Czech Technical University in Prague): Fracture and failure mechanism in molybdenum disulfide: Insights from molecular simulations

**Aneta Hrádková** (University of Chemistry and Technology, Prague): Structural variability of peptide deformylase

**David Bayer** (Brno University of Technology): MATLAB Interface To The afft Library

**Elliot Perviz** (Czech Technical University): Design rules for doped transition metal dichalcogenide heterostructures

**Gabriela Nečasová** (Brno University of Technology): Advancing PDE Solvers: A Taylor Series Approach

**Gowtham Nirmal Jonnalagadda** (University of South Bohemia in České Budějovice): Protein Junction Conductance – Cytochrome b562

**Hugo McGrath** (University of Chemistry and Technology, Prague): Gating of the Ribosome Exit Tunnel

**Ievgeniia Korniienko** (IT4Innovations): Terahertz spin-based sensors design

**Ivana Mihalikova** (Czech Academy of Sciences): Electronic structure calculations of GaAs using a quantum computer simulator

**Jakub Šebesta** (IT4Innovations): Magnetoelastic Properties of Pt-based systems

**Jiri Klimes** (Charles University): Testing the reliability of theoretical methods for predicting cohesive properties of molecular crystals

**Jiří Tomčala** (IT4Innovations): Face Gender Recognition Using Quantum Machine Learning on NVIDIA CUDA Quantum Simulator

**Jun Terasaki** (Czech Technical University in Prague): Neutrinoless double- $\beta$  decay caused by Majorana neutrino

**Luigi Cigarini** (IT4Innovations): Effects of defected layers on the thermoelectric properties of scandium nitride thin films

**Marta Jaros** and **Ondřej Olšák** (Brno University of Technology): System for managing HPC-services and workflow executions

**Martin Mašek** (University of Chemistry and Technology, Prague): Exploring Ancestral Ribosome Models: Role of Protein Fragments and Evolutionary Significance

**Martin Melčák** (University of Chemistry and Technology, Prague): Molecular dynamics simulations of surface tension of hydrocarbon mixtures under high pressures

**Martin Niemczyk** and **Ondřej Vysocký** (IT4Innovations): Code continuous integration at IT4Innovations' systems

**Michal Ďuriška** (Czech Academy of Sciences): Quantum-mechanical study of the electronic structure of diamond-structure crystals

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**Michal Svatoš** (Czech Academy of Sciences): Submission system for ATLAS jobs used on LUMI HPC

**Miroslav Černý** (CEITEC, Brno University of Technology): Grain boundary segregation studied using machine-learned force fields

**Oliver Kuník** (Brno University of Technology): Acceleration of hybrid local decomposition on Multi-GPU Systems

**Ondřej Olšák** (Brno University of Technology): Investigating the Possibility of Using Pruned FFT in Ultrasound Wave Propagation Simulations

**Pavel Papež** (Czech Academy of Sciences): Ab initio study of spin-polarization, atomic ordering and charge transfer in the CoCrNi medium-entropy alloy

**Petr Sestak** (Brno University of Technology) and **Petr Sedlák** (Czech Academy of Sciences): AI based MD potential for NiTi shape memory alloy

**Petr Touš** (University of Chemistry and Technology, Prague): Crystal structure prediction methodology for ionic liquids: In search of the unknown

**Petra Čechová** (Czech Advanced Technology and Research Institute): From Fluidity to Rigidity: How Membrane Composition Influences Protein Conformation

**Reynaldo II Geronia** (University of Chemistry and Technology, Prague): Comparing DFT-D3 and DFT-D4 models in predicting the thermodynamic properties of heterocyclic organic semiconductor crystals

**Sergiu Arapan** (IT4Innovations): Calculating the Heisenberg exchange interactions via a supercell approach

**Svitlana Pastukh** (Czech Academy of Sciences): In-Depth First-Principles Analysis of Structural, Electronic, Magnetic, and Lattice Dynamical Characteristics of  $\text{Fe}_4(\text{P}_2\text{O}_7)_3$

**Thibault Derrien** (IT4Innovations): Polaritonic qubit design and quantum computing for physics and chemistry

**Valentína Berecová** (Czech Academy of Sciences): Quantum mechanical analysis of complex ferrimagnetic states in iron oxide nanoparticles