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AUTHORS

Dr. Gašper Vuga began his studies at the Faculty of Mechanical Engineering in Ljubljana in 2013. He began working on strong-form meshless methods in the Laboratory for Fluid Dynamics and Thermodynamics as a student under the supervision of Prof. Dr. Božidar Šarler, where he continues to work today. During that time, he received his bachelor's degree with the thesis Simulation of the Mechanical Properties of Porous Castings Based on a Meshless Method, his master's degree with the thesis Development of a Meshless Numerical Method for Solving Three-dimensional Elasto-plastic Problems, and in January 2025 he defended his doctoral thesis entitled Modelling of Thermomechanics of Continuous Casting of Steel by a Meshless Numerical Method. His research interests include the development of strong-form local meshless methods applied to solid mechanics problems. His work primarily focuses on developing, implementing, and applying meshless numerical methods to thermo-mechanical processes in the steel production industry. Additionally, his work also includes phase-field modelling of fracture mechanics with meshless methods. To date, he has co-authored seven scientific papers, four of which he has authored as the first author. In 2023 and 2024, he received the Faculty Award for Outstanding Research Achievements for employees under 35 years old.

Dr. Boštjan Mavrič holds bachelor's and master's degrees in physics from the University of Ljubljana and a PhD in physics from the University of Nova Gorica (2017), where he worked in material modelling as a young researcher at the Institute of Metals and Technology (IMT). His PhD focused on thermomechanical modelling of direct-chill casting of aluminium alloys using the meshless local radial basis function collocation method. A major outcome was a flexible software library for strong-form meshless methods, which he subsequently expanded to solidification and fluid flow in direct-chill casting, continuous casting of steel, two-phase microfluidics, and dendritic growth, resulting in publications in leading journals. He supervised three PhD students and several master's and bachelor's students working with these methods. In 2020 he spent three months at Uppsala University on postdoctoral training in parallelisation of meshless methods for HPC. He later secured a researcher position there (Department of Information Technology, Division of Scientific Computing) in 2021, working on oversampled strong-form meshless methods for nonlinear solid mechanics in biophysical applications. He returned to IMT and the University of Ljubljana in 2023, where he had been elected assistant professor of mechanical engineering in 2022, and resumed work on his awarded two-year project on advanced meshless methods for materials processing and fracture modelling. He has received several distinctions, including the 2019 and 2023 awards for exceptional research achievements from the Faculty of Mechanical Engineering, University of Ljubljana, and co-authored contributions awarded at international conferences in 2018 and 2019.

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Dr. Tadej Dobravec completed his BSc (2012) and MSc (2016) in Physics at the University of Ljubljana, specialising in computational physics. In the same year, he enrolled in Graduate school at the University of Nova Gorica in the III. cycle degree in Physics. In 2021, he finished his doctoral dissertation, »Numerical modelling of dendritic solidification based on the phase field formulation and adaptive meshless solution procedure«, under the supervision of Prof. Dr Božidar Šarler. In 2016, he began working as an assistant at the Institute of Metals and Technology's Laboratory for Simulation of Materials and Processes. In 2020, he began working as a researcher in the Faculty of Mechanical Engineering at the University of Ljubljana. He participated in the development of a meshless numerical model for the prediction of heat transfer in the framework of the simulation system for the continuous casting of steel and in the development of a meshless numerical model for the prediction of microstructure evolution on millimetre (point automata method) and micrometre (phase field method) scale in the framework of the simulation systems for continuous casting of steel and direct-chill casting of aluminium alloys. He participated in the following projects: Simulation of industrial processes of solidification under the influence of electromagnetic fields, Advanced modelling and simulation of liquid-solid processes with free boundaries, Materials and technologies for new applications, etc. From 2022 to 2025, he led the postdoctoral project titled "Advanced meshless modelling and simulation of microstructure evolution for top-quality metal products."

Dr. Umut Hanoglu was born in January 1983 in Ankara, Turkey. In 2006, he obtained his bachelor's degree in Mechatronic Engineering from Sabanci University in Istanbul. In 2015, he obtained his PhD from the University of Nova Gorica in the field of computational solid mechanics. His PhD work focused on simulating the hot shape rolling of steel using a meshless method. His PhD work was later used as the basis for creating an industrial application for rolling simulations. He has developed several computer codes for numerical simulations with user-friendly interfaces in the C# programming language. In 2009, he began working as a young researcher at the University of Nova Gorica, under the supervision of Prof. Dr. Božidar Šarler. After graduation, he began working at the Institute of Metals and Technology as a postdoctoral researcher. In 2018, he was elected Research Associate. Since the beginning of 2025, he has been working at the Laboratory for Fluid Dynamics and Thermodynamics, Faculty of Mechanical Engineering, University of Ljubljana, as an assistant.

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Izaz Ali completed his bachelor's degree in Mechanical Engineering in 2016 from the University of Engineering and Technology, Peshawar, Pakistan. After completing his BSc, he started working as a Management Trainee Engineer at Bestway Cement Limited, Chakwal, Pakistan. In 2020, he completed his master's degree in Mechanical Engineering Modelling at the Budapest University of Technology and Economics, availing himself of a Stipendium Hungaricum Scholarship sponsored by the Tempus Public Foundation. In October 2020, he was selected for a PhD position. Currently, he is carrying out his duties as a Young Researcher on the project titled "Numerical simulation of casting defects throughout the steel production path" at the Laboratory for Fluid Dynamics and Thermodynamics, Faculty of Mechanical Engineering, University of Ljubljana, since February 2021. He successfully published four scientific papers on the modelling of phase field fracture mechanics using strong form meshless methods.

Prof. Dr. Božidar Šarler

Professor Božidar Šarler conferred a BSc in physics from the University of Ljubljana and a PhD in engineering from the University of Maribor, Slovenia. He chairs the Department for Fluid Dynamics and Thermodynamics, Faculty of Mechanical Engineering, University of Ljubljana. He worked abroad cumulative for more than four years as a researcher in the Centre of Nuclear Studies, France; University Erlangen-Nürenberg, Germany; Argonne National Laboratories, USA and as a visiting professor or scientist at the University of Nevada, USA; University Pierre and Marie Curie, France; University of Central Florida, USA; Polish Academy of Sciences, Poland and the City University of Hong Kong. In 2011, he was appointed Adjunct Professor at the University of Southern Queensland's Computational Engineering and Science Research Centre in Australia, and in 2013, he was selected as a 100-Talent Plan Professor at Taiyuan University of Technology in China. He is giving courses as a visiting professor at the University of Naples "Parthenope" in Italy (meshless methods), Yanshan University in China (fluid dynamics), and Hohai University in China (multiphase systems).

His research interest is focused on multiscale and multiphysics simulations of multiphase systems. He has pioneered the development of a local strong form meshless method based on radial basis functions for solids and fluids. The achievements of his team are used today in the topmost technologies' simulation systems, such as the world's largest casts or microfluidic sample delivery systems for synchrotrons and free-electron lasers.

He published over 200 journal papers. He has managed several international projects within various EU frameworks, as well as collaborations with NATO, the National Academies of the USA, the Research Grants Council of Hong Kong, the Chinese Academy of Sciences, and the Helmholtz Association in Germany, among others.

He has organised several international conferences on moving boundary problems, electromagnetic processing of materials, meshless methods and thermofluids, such as Eurotherm 2024, held at Lake Bled from June 10 to 13, 2024, with 350 participants from 35 countries.

He received the following awards and recognitions: 2025 Associate Member of the Slovenian Academy of Engineering, 2020 Recognition of Association of Fluid Control Engineering of the Chinese Society of Theoretical and Applied Mechanics, 2018 Distinguished Fellow of ICCES, 2016 Žiga Zois award - Slovenian state award for science, 2014 Emerald Literati Best Paper Award, 2013 prestigious Chinese award for foreign professors Hundred Talent Plan, 2006 Janez Puh award - Slovenian state award for technology, best paper awards at several international conferences. He has been listed on the “Stanford/Elsevier Top 2% Scientists List” since 2020.
He serves on the European Union's ESFRI Energy Working Group and the Eurotherm Committee.