Programme   **The XV Finnish Mechanics Days in association with IFME 2024 Forum**

October 2 - 4, 2024, Jyväskylä (Rajakatu 35, 40200 Jyväskylä, Finland)

Time	Place	Wednesday 2.10.			
9:00	F1/FP05	Registration & Coffee	F1 Lobby	FP05 Auditorium Valjakka lobby	
9:30	FP05	Opening words			
	Zoom	https://jamk.zoom.us/j/61634298323			
	Chair	Tero Tuovinen			
9:30		**Reijo Kouhia**	Chairman, Professor	The Finnish National Committee on Theoretical and Applied Mechanics	
9:35		**Anneli Kakko**	General Chair of IFMME	International Forum of Mechanical and Mechatronics Engineering	
9:40		**Petri Lakka**	Director	School of Technology, Jamk	
9:50		**Sami Kantanen**	Director	Institute of New Industry, Jamk	
10:00	FP05	Plenary 1: Rolf Stenberg			
	Zoom	https://jamk.zoom.us/j/61634298323			
	Title	Finite elements for elastic contact – Penalty and Nitsche			
	Chair	Tero Tuovinen			
10:45	FP05	Plenary 2: Fredrik Larsson			
	Zoom	https://jamk.zoom.us/j/61634298323			
	Title	On finite element procedures for efficient multiscale modeling in solid mechanic			
	Chair	Tero Tuovinen			
11:30	Rajakatu	Lunch	Ravintola Twist	Café Curve	
12:30		Parallel sessions			
	Place	D148	D149	F304	F305
	Zoom	https://jamk.zoom.us/j/63659435068	https://jamk.zoom.us/j/63653110988	https://jamk.zoom.us/j/61749467823	https://jamk.zoom.us/j/61899279522
	Chair(s)	Anneli Kakko and Silvia Satorres	Peter Råback	Tero Tuovinen	Timo Saksala / Elja Kallberg
	Session	**IFME 1: Industry, innovation and infrastructure**	**1: Finite element analysis 1**	**2: Digital twins and artificial intelligence**	**3: Computational fluid dynamics / 4: Thin structures**
12:30		**Anneli Kakko**: International Forum of Mechanical and Mechatronic Engineering (IFMME) and its network	**Kilwa Ärölä**: A simulation workflow to evaluate the wearing comfort of in-ear headphones	**Paula Tapaninaho**: Solution of Boundary Value Problems using Machine Learning	**Ashish Pawar**: Analysis of flow behavior of bioinks outside the 3D-Printing Nozzles
12:50		**Arturo López Riquelme**: Specular Zero: Towards a sustainable production in plastic injection industry	**Humberto Almeida Jr**: Multiscale modelling of high-performance thermoplastic composites in transverse tension and bending using the FE2 method	**Atte Koskinen**: Enhancing digital twin development: The role of large language models in advancing maturity levels	**Mohamed A. Sayed**: Optimizing 2D Stormwater filter design through parametric analysis of grain characteristics
13:10		**Gia-Khanh Pham**: Indentation Hardness of 3D-Printed Metals	Ole Kranzosch: Effects of gradient elasticity in coupled Cahn-Hilliard type of diffusion	**Oleg Rogov**: Modern Approaches to Autonomous Excavation: A Literature Survey	Jukka-Pekka Keskinen: Large Eddy Simulation of the Flow Over Turku with an Application to an Operational Air Quality System
13:30		**Francisca Guerrero-Villar**: 3D printing technique by stereolithography applied to make an injection mold with photopolymer resin	**Timo Manninen**: Computationally efficient finite element model for continuous annealing of stainless-steel strips	**Mihiran Galagedarage Don**: An Improved Lumped Segment Numerical Model for S.A. Agulhas II Propulsion Shaft Line Digital Twin	Esa Alakoski: Flexible thin film thermoelectric devices for use as an energy source for autonomous sensors
13:50		**Javier Aceituno**: Efficient Modeling of the effects of discrete supports in railway track dynamics	**Alexander Nemov**: Numerical simulation of the human Achilles tendon: challenges and solutions		**Federica Mancini**: Geometry characterisation and structural stress analysis of welding-induced distortions in large thin-walled structures
14:10		**Silvia Satorres Martinez**: Discussion about the future cooperation - word is free	**Timo Saksala**: Phase field method for brittle fracture implemented with polygonal finite elements		**Mika Malinen**: On the derivation of constant-coefficient partial differential equations for elastic shells
14:30	FP05	Coffee	F1 Lobby	FP05 Auditorium Valjakka lobby	
15:00	FP05	Round Table 1: Tutkimusyhteistyö – yliopistojen, tutkimuslaitosten ja yritysten roolit			
	Chair	Jarkko Niiranen			
	Zoom	https://jamk.zoom.us/j/61634298323			
16:00		End			
16:10		Bus to Ylistö	Rajakatu 35, D1 (main door)		
16:30	Ylistö	Optional: Tour to JYU laboratory	Survontie 9 D	The parking lot at the lower yard of the Department of Physics	
17:30		End of tour	Walk to Aalto2	Alvar Aallon katu 7	
17:30		Bus to Aalto2	Rajakatu 35, D1 (main door) / Hannikaisenkatu 35 (in front of the Original Sokos Hotel Alexandra)		
18:00	Aalto2	Welcome Cocktail and Tour at Aalto2	Aalto2 museum center	Alvar Aallon katu 7	
18:00		**Caius Forsberg**	Chairman of the Jyväskylä City Board	Greetings from the City of Jyväskylä	
18:05		Brief info about Aalto2 exhibitions and Alvar Aalto			
18:20		Cocktails and self-guided tours at exhibitions			
19:30		End	Bus to city centre/Rajakatu		
20:00		End	Bus to city centre/Rajakatu		

Time	Place	Thursday 3.10.			
10:00	F1/FP05	**Registration & Coffee**	F1 Lobby	FP05 Auditorium Valjakka lobby	
10:30	FP05	**Plenary 3: Marcelo Dias**			
	Title	Is Fracture Failure or Function? The Two Sides of Meta-materials			
	Chair	Jarkko Niiranen			
	Zoom	https://jamk.zoom.us/j/61634298323			
11:30	Rajakatu	**Lunch**	Ravintola Twist	Café Curve	
12:30		**Parallel sessions**			
	Place	D148	D149	F304	F305
	Zoom	https://jamk.zoom.us/j/63659435068	https://jamk.zoom.us/j/63653110988	https://jamk.zoom.us/j/61749467823	https://jamk.zoom.us/j/61899279522
	Chair(s)	Anneli Kakko and Ciprian Lapusan	Antti Niemi	Sven Bossuyt and Mikko Hokka	Tero Frondelius
	Session	**IFME 2: Education in the digital age and applied research**	**5: Fracture, damage and wear**	**MS1: Imaging and image-based methods in experimental mechanics**	**MS2: Industry cases**
12:30		**Ciprian Lapusan**: Promoting Engineering Education Excellence - the NextGEng Project	**Akseli Leraillez**: Fracture toughness of hierarchical lattices	**Sven Bossuyt**: Optimizing patterns for DIC	**Sami Kreivi**: Transient thermal stress FE-analysis method development
12:50		**Petri Luosma and Tarja Moilanen**: Experiences of international co-teaching in a European higher education context	**Ville Vanhala**: Fretting Safety Factor	**Guilherme Corrêa Soares**: Micromechanical testing inside the scanning electron microscope: leveraging image-based methods to enhance materials research	**Ville Tuura**: Experimental study to determine static coefficient of friction
13:10		**Silvia Satorres Martinez and Anneli Kakko**: Cases of Experiential Learning projects: A successful model for HEI student-company cooperation	**Sulata Dhakal**: A continuum material model for concrete	**Ville Björklund**: High throughput tensile testing for characterization of static strain aging	**R. Arturo Rubio Ruiz**: Numerical analysis of mechanical integrity of marine engine components operating with zero- carbon fuels
13:30		**Steffen Greuling**: Experimental and numerical strength assessment of a plate with a notch subjected to uniaxial loading – A lab based approach in undergraduate mechanical engineering education	**Maliheh Jahanbakhsh**: Computer vision framework for crack detection and prediction of air leakage through concrete cracks in buildings	**Mikko Hokka**: X-Ray phase contrast imaging of dynamic compressive fracture of fiber reinforced polymer composite and granitic rocks	**Antti-Jussi Vuotikka**: Impact-induced leaking of fuel line
13:50		**Ciprian Rad**: Forward kinematics and assembly modes analysis of 3-RPS parallel manipulators by using Sylvester's dialytic elimination method	**Guijia Li**: Application of a linear-transformation-based anisotropic fracture model in quenching and partitioning steels	**Hossein Moghanni**: Simultaneous X-Ray diffraction, infrared and DIC measurements during tension tests of metastable austenite containing steels	**Eero Ikäheimo**: Reaaliaikainen termisten ja sähkömekaanisten systeemien dynaaminen monikappale rinnakkais-simulaatio pyöräkuormaajamallissa
14:10		**Ciprian Lapusan**: Discussion about the future cooperation – word is free		**Mikko Hokka**: Virtual mechanics laboratory based on DIC	**Eetu Autio**: AI-Empowered MODSIM for Design Exploration
14:30	FP05	**Coffee**	F1 Lobby	FP05 Auditorium Valjakka lobby	
15:00	FP05	**Round Table 2: Advancing researcher training in advanced manufacturing: innovative educational and collaborative models in Finland**			
	Zoom	https://jamk.zoom.us/j/61634298323			
	Chair	Heidi Piili			
16:00		End			
16:30	Rajakatu	Optional: Tour to Jamk laboratory			
17:30		End of tour			
Open until 18:00		Optional: the Natural History Museum of Central Finland	Ihantolantie 5, at the street level		
Open until 22:00		Optional: the Vesilinna observation tower	Ihantolantie 5, at the tower		
19:00	Vesilinna	**Dinner**	Café & Restaurant Vesilinna	Ihantolantie 5	
22:30		End			

Time	Place	Friday 4.10.		
9:30	F1/FP05	**Registration & Coffee**	F1 Lobby	FP05 Auditorium Valjakka lobby
10:00		**Parallel sessions**		
	Place	D148	D149	F304
	Zoom	https://jamk.zoom.us/j/63659435068	https://jamk.zoom.us/j/63653110988	https://jamk.zoom.us/j/61749467823
	Chair	Anneli Kakko and Gia-Khanh Pham	Tero Frondelius and Reijo Kouhia	Pekka Neittaanmäki
	Session	**IFME 3: Industry, innovation and infrastructure**	**MS3: Fatigue-analysis, experiments and design**	**6: Vibration and stability**
10:00		**Kati Valpe-Ojala**: gH2ADDVA – Adding Value by Clean Hydrogen production	**Reijo Kouhia**: Some new developments in the continuum-based fatigue modelling approach	**Jussi Jalkanen**: Wind-induced vibration control in high-rise buildings
10:20		**Stefan Lampenscherf**: Simulation of Hydrogen Induced Failure in High-Strength Steel	**Joona Vaara**: On crack initiation and non-propagation	**Zeinab Soleimani Javid**: Numerical analysis of in-Plane static and dynamic behavior of triangular lattices in a curved beam structure
10:40		**Francisco Moral-Pulido**: Oscillating viscous flow around a circular cylindrical post confined between two parallel plates	**Kimmo Kärkkäinen**: The effect of over- and underloads on fatigue life	**Samuli Rytömaa**: Design of a non-linear wire-rope tuned mass damper; linearized model based approach
11:00		**Anneli Kakko**: Announcement IFM2E 2025 & Closing IFM2E 2024	**Saana Bergman**: Bayesian approach to uncertainty quantification in ultrasonic non-destructive testing	
11:30	Rajakatu	**Lunch**	**Ravintola Twist**	**Café Curve**
12:30		**Parallel sessions**		
	Place	D148	D149	F304
	Zoom	https://jamk.zoom.us/j/63659435068	https://jamk.zoom.us/j/63653110988	https://jamk.zoom.us/j/61749467823
	Chair	Tero Tuovinen	Heidi Piili	Reijo Kouhia
	Session	**7: Finite element analysis 2**	**8: Additive manufacturing**	**9: Analysis**
12:30		**Tomi Kankkunen**: Design space exploration of manufacturability and mechanical performance of foldable Miura-ori origami structures	**Juha Jeronen**: Fundamental Thermoelastic Behavior Modeling for L-PBF Additive Manufacturing	**Qiang Cheng**: Natural Flame Spectral Analysis and Chemi-luminescence Imaging of Diesel Spray Combustion
12:50		**Youqi Zhang**: Damage Updating in Finite Element Models by Using Computer Vision and Phase Field Method	**Mohammaderfan Khodabakhshi**: 3D chiral metamaterial unit cell capable of two deformation mechanisms under compression	**Jarkko Niiranen**: Buckling and post-buckling of twisted strips
13:10		**Milad Omidi**: Engineering the micro-architecture of triangular lattice improving the resistance against crack propagation	**Matti Kurki**: LPBF Additive Manufacturing; Modeling and Material Test Results	**Pekka Neittaanmäki**: Kokemuksiani tutkijakoulutuksesta
13:30	FP05	**Coffee**	F1 Lobby	FP05 Auditorium Valjakka lobby
14:00	FP05	**Plenary 4: Giovanni Meneghetti**		
	Zoom	https://jamk.zoom.us/j/61634298323		
	Title	The Peak Stress Method for the automated FEA-assisted design of welded structures subjected to constant and variable amplitude multiaxial fatigue loads		
	Chair	Reijo Kouhia		
14:45	FP05	**Closing words**		
		Jarkko Niiranen	Editor-in-chief, Associate Professor	Journal of Structural Mechanics
15:00		End of the XV Finnish Mechanics Days		