MONDAY 25.9.2023.

9:00 – 10:00	**Welcome and Registration**
10:00 –10:30	**Opening Ceremony**
10:30 – 11:15	**Invited Lecture Olivier A. Bauchau: Configurational Forces in Variable-Length Beams for Flexible Multibody Dynamics** **Chair: Olivier Brüls**

MS – 1/1: Constitutive modelling for flexible slender structures
Chair: Olivier Brüls, Vanessa Dörlich

11:15 – 11:30	Finite element beams based on non-linear micropolar theory *L. Obrezkov, M. Matikainen, R. Kouhia*
11:30 – 11:45	On the number of congruent hinges of masonry arches at failure *A. Á. Sipos*
11:45 – 12:00	An Energy Stable Discontinuous Galerkin Approach for the Geometrically Exact Intrinsic Beam Model *C. Bleffert, L. Dreyer, M. Röhrig-Zöllner*
12:00 – 12:15	Constrained optimization for part-through crack computation *S.J. Michel, A. Á. Sipos*
12:15 – 12:30	Modelling the Mechanical Behaviour of Unshielded Twisted Pair Cables Including Frictional Contact *M. Hawwash, V. Dörlich, J. Linn*
12:30 – 12:45	Investigation of the influence of the inner structure on the stiffness of a cable under pure torsion *C. Tsegouog, P. Sharma, V. Dörlich, J. Linn, S. Diebels*

12:45 – 14:00	Lunch

14:00 – 14:45	**Invited Lecture Peter Betsch: Inverse Dynamics of Geometrically Exact Strings and Beams** **Chair: Elena Celledoni**

MS – 2/1: Contact and friction in mechanics of flexible slender structures
Chair: Johannes Gerstmayr, Yury Vetyukov

14:45 – 15:00	Numerical analysis of the rope-sheave contact interaction using the Arbitrary Lagrangian-Eulerian approach *J.L. Escalona*
15:00 – 15:15	A total Lagrangian Petrov-Galerkin SE(3) Cosserat rod finite element formulation *S.R. Eugster, J. Harsch, S. Sailer*
15:15 – 15:30	Rotation parametrization and interpolation strategies for Petrov-Galerkin rod finite elements – a family of Cosserat rod formulations *J. Harsch, S. R. Eugster*
15:30 – 15:45	An arbitrary Lagrangian-Eulerian geometrically exact beam formulation applied to reeving systems *O. Devigne, O. Brüls*
15:45 – 16:00	An Invariant Bézier FE-formulation for the Analysis of Slender Beams *L. Greco, M. Cuomo, D. Castello*

16:00 – 16:15	Towards a complete Riemannian metric on the space of elastic rods *P. Reiter, E. Döhrer, H. Schumacher*

16:15 – 16:45	Coffee Break

MS – 5: Advanced models and numerical formulations for the interaction of beams and the coupling of beams with solids
Chair: Simon Klarmann, Myung-Jin Choi

16:45 – 17:00	Nonlinear Dynamics of Complex 3D Rod Assemblies *R.E. Dickinson, A. Palmeri, T.I. Marjoribanks*
17:00 – 17:15	A note on modelling potential-based interactions between plane beams *A. Borković, M.H. Gfrerer, B. Marussig, R.A. Sauer*
17:15 – 17:30	Transitioning from solids to first-order shear deformable beams *S. Klarmann, J. Wackerfuß, S. Klinkel*
17:30 – 17:45	Coupling 1D beam elements with 3D solid elements for the modelling of fibre-reinforced composites *V. Poussard, C. Gandiolle, D. Durville*
17:45 – 18:00	A mixed-dimensional beam-to-solid interaction framework: From embedded fibers to contact *I. Steinbrecher, C. Meier, A. Popp*
18:00 – 18:15	A finite strain isogeometric solid beam element with assumed natural strain method *A. Shafqat, O. Weeger, B.X. Xu*
18:15 – 18:30	An isogeometric three-field mixed finite element formulation of nonlinear beam structures with extensible directors *M.J. Choi, R.A. Sauer, S. Klinkel*

TUESDAY 26.9.2023.

8:30 – 9:15	**Invited Lecture Valentin Sonneville: Using the Special Euclidean Group to Model Flexible Multybody Systems** **Chair: Martin Arnold**

MS – 6/1: Slender beam-like structures with scientific passion – mini-symposium in honour of prof. Miran Saje
Chair: Dejan Zupan, Gordan Jelenić

9:15 – 9:30	On solving the kinematical equations of Cosserat beams *D. Zupan, E. Zupan, A. Ogrin*
9:30 – 9:45	Rough and sharp estimates of extensional and transverse shear strains for equilibrium configurations of elastic Cosserat rods *J. Linn, F. Schneider-Jung, M. Roller, T. Hermansson*
9:45 – 10:00	On the convergence of nonconforming finite element solutions to the unique solution of Reissner's Elastica *R. Flajs, M. Saje*
10:00 – 10:15	Interdependence of helicoidal and fixed-pole interpolation in linear elasticity with linked interpolation, and application in FE modelling of Cosserats' continuum *L. Grbac, G. Jelenić*

10:15 – 10:30	A review of beam formulations with consistent equilibrium in a cross-section *P. Češarek*
10:30 – 10:45	Buckling of slender layered composite columns with incomplete interaction between the layers *S. Schnabl, M. Saje, I. Planinc, G. Turk, G. Jelenić*

10:45 – 11:15	Coffee Break

MS – 2/2: Contact and friction in mechanics of flexible slender structures
Chair: Christoph Meier, Johannes Gerstmayr

11:15 – 11:30	Investigating the compaction of open ring stacks through real and numerical experiment *T. Métivet, E. Hohnadel, T.G. Sano, T. Kawata, F. Bertails-Descoubes*
11:30 – 11:45	Accurate contact detection and response in fibre assemblies with friction *E. Hohnadel, O. Crespel, T. Métivet, F. Bertails-Descoubes*
11:45 – 12:00	Untangling the physics of self-locking in tight knots *A. Teixeira da Silva, T. Métivet, V. Gramegna, M. Skouras, F. Bertails-Descoubes*
12:00 – 12:15	Sliding flexible rods: non-material finite elements and configurational forces *Y. Vetyukov, A. Humer*
12:15 – 12:30	On the Evaluation of the Tangential Slip Increment in Quasi-static Beam-to-Beam Contact Problems *O. Brüls, A. Bosten*
12:30 – 12:45	Optimal Control for locomotion of contractile slender bodies on frictional bodies *J. Muñoz, A.Bijalwan*

12:45 – 14:00	Lunch

14:00 – 20:00	Conference Trip

WEDNESDAY 27.9.2023.

8:30 – 9:15	**Invited Lecture Christoph Meier: Generalized Interaction Potentials in the Geometrically Exact Beam Theory** **Chair: Johannes Gerstmayr**

MS – 2/3: Contact and friction in mechanics of flexible slender structures
Chair: José Escalona, Johannes Gerstmayr

9:15 – 9:30	Unbiased line-to-line contact method for static frictionless beam-to-beam contact *J. Tomec, G. Jelenić*
9:30 – 9:45	A numerical bending study of sandwiched beams with a mortar line-to-line contact formulation *A.V. Kulkarni, A. Bosten, V. Dörlich, O. Brüls, J. Linn*
9:45 – 10:00	Coupling of bending and axial motion in highly flexible axially moving beams modelled with ALE *K. Ntarladima, J. Gerstmayr*

10:00 – 10:15	Real-time co-simulation of wire-rope systems *N. Mohammadi, A. Rouvinen, P. Korkealaakso, J.L. Escalona*
10:15 – 10:30	Geometrically exact beam-to-beam contact interactions embedded in a finite volume-based discretisation framework *S. Bali, Ž. Tuković, P. Cardiff, A. Ivanković, V. Pakrashi*
10:30 – 10:45	Efficient simulation of ropeway systems with multibody systems *J. Gerstmayr, K. Ntarladima*

10:45 – 11:15	Coffee Break

11:15 – 12:00	**Invited Lecture Vanessa Dörlich: Experiments and Constitutive Models for Cable Structures in the Automotive Industry** **Chair: Joachim Linn**

MS – 1/2: Constitutive modelling for flexible slender structures
Chair: Olivier Brüls, Vanessa Dörlich

12:00 – 12:15	Experimentally validated conservatice nonlinear modes of highly flexible structures by phase resonance testing and effect of damping *O. Thomas, M. Debeurre, C. Giraud-Audine, A. Grolet, S. Benacchio*
12:15 – 12:30	Vibrations of an inclined cable with a lumped mass *M. Patreider, M. Wenin, T. Furtmüller, C. Adam*
12:30 – 12:45	Simulation and Parametrization of Nonlinear Elastic Behaviour of Cables *T. Zhao, F. Schneider-Jung, J. Linn, R. Müller*

12:45 – 14:00	Lunch

14:00 – 14:45	**Invited Lecture Melvin Leok: Group-Equivariant and Cochain Projection Based Variational Discretizations of Lagrangian PDEs** **Chair: Sigrid Leyendecker**

MS – 1/3: Constitutive modelling for flexible slender structures
Chair: Olivier Brüls, Vanessa Dörlich

14:45 – 15:00	Homogenised stiffness coefficients of unloaded endoscope shafts *M. Stavole, R.T. Sato Martin de Almagro, V. Dörlich, S. Leyendecker*
15:00 – 15:15	On the bending of spiral strands *M.A. Saadat, D. Durville*
15:15 – 15:30	Static and dynamic analysis of geometrically and materially nonlinear spatial frame like structures *S. Kusuma Chandrashekhara, D. Zupan*
15:30 – 15:45	Inelastic Constitutive Behaviour and Hysteresis Operators – Modelling and Simulations for 2D Cosserat Rods *D. Manfredo, V. Dörlich, J. Linn, M. Arnold*
15:45 – 16:00	Nonlinear computation of cable structures with anisotropic plasticity using high-order elements *A. Hildebrandt-Raj, P. Sharma, S. Diebels, A. Düster*

16:00 – 16:30	Coffee Break

MS – 3: Geometric integration methods for non-linear structural dynamics
Chair: Sina Ober-Blöbaum, Brynjulf Owren

16: 30 – 16:45	Energy-momentum conserving time integrator for geometrically exact beam dynamics *J. Tomec, G. Jelenić*
16:45 – 17:00	Implementation and Stability Issues of Lie Group Integrators for Cosserat Rod Models with Constraints *D. Tumiotto, M. Arnold*
17:00 – 17:15	Lie group integrators for mechanical systems and their stability *E. Çokaj, M. Arnold, E. Celledoni, A. Leone, D. Murarui, B. Owren, D. Tumiotto*
17:15 – 17:30	Machine learning applications for mechanical systems *A. Leone, E. Celledoni, D. Murari, B. Owren*
17:30 – 17:45	2D Euler elastica in constrained environments *M. Stavole, R.T. Sato Martin de Almagro, S. Leyendecker*
17:45 – 18:00	Higher order fractional variational integrators *K. Hariz-Belgacem, F. Jiménez, S. Ober-Blöbaum*
18:00 – 18:15	Computing normal forms of quadratic differential algebraic equations *A. Grolet, A. Vizzaccaro, M. Debeurre, O. Thomas*
18:15 – 18:30	Test equations for Lie group time integration *M. Arnold*

THURSDAY 28.9.2023.

8:30 – 9:15	**Invited Lecture Florence Bertails-Descoubes: *Simulating fibre assemblies: from Hollywood illusions to physical predictions*** **Chair: José Escalona**

General Programme
Chair: Marko Čanađija, Sébastien Neukirch

9:15 – 9:30	Thermo- and Chemoelastic 3D Beam Modelling and Simulation with Isogeometric Collocation Methods *J.C. Alzate Cobo, O. Weeger*
9:30 – 9:45	An efficient isogeometric analysis formulation for geometrically exact beam structures with complex shape and topology *D. Ignesti, G. Ferri, E. Marino*
9:45 – 10:00	Indirect shape adaptation of compliant arches using active supports *P. Várkonyi, A.Á. Sipos*
10:00 – 10:15	Elastic Ribbons: the missing link between rods and plates *S. Neukirch, B. Audoly, F. Bertails-Descoubes, R. Charrondiere, V. Romero*
10:15 – 10:30	Towards realistic modelling of nanotrusses: coupling MD, ML and FEM *M. Čanađija, V. Košmerl, M. Zlatić*
10:30 – 10:45	Physical Validation for the Simulation of Flexible Slender Structures *B. Bauer, A. Bosten, M. Roller, M. Hawwash, O. Brüls, J. Linn*

10:45 – 11:15	Coffee Break

MS – 4: Teaching the science of modelling and simulation of slender flexible structures for application in industry: A curriculum for early stage researchers
Chair: Olivier Thomas

11:15 – 11:30	Teaching small and large deformation flexible multibody dynamics *J.L. Escalona*
11:30 – 11:45	Preparing students for a PhD position in application-oriented research on flexible slender structures *J. Linn, V. Dörlich*
11:45 – 12:00	THREAD—Numerical modelling of highly flexible structures for industrial applications. Design of a training programme *E. Celledoni, S. Leyendecker, B. Owren*

MS – 8: Modelling beam-like layered structures with compliant interfaces
Chair: Leo Škec

12:00 – 12:15	An inverse approach treating large rotations to simulate composite single-layer peeling-based disassembly *M. Becker, M. Imbert, M. May*
12:15 – 12:30	Finite Element Model for Simulation of Complex Delamination in Three-Dimensional Composite Beams *D. Lolić, M. Brojan, D. Zupan*
12:30 – 12:45	Experimental validation of a novel numerical model for rate-dependent mode-I failure of adhesive joints *L. Škec, G. Alfano*
12:45 – 14:00	Lunch
14:00 – 15:30	**ESR workshop on writing research grant proposals**
15:30 – 17:00	**ESR workshop on preparation of job applications**
17:00 – 18:30	**THREAD Supervisory Board Meeting**
19:00 – 22:00	**Conference dinner**

FRIDAY 29.9.2023.

8:30 – 9:15	**Invited Lecture Michel Géradin: How Relaxation of Compatibility in Time can Simplify the Floating Frame of Reference Formulation in Flexible Multibody Dynamics** **Chair: Martin Arnold**

MS – 7: Modelling and simulation of textile and fibrous materials
Chair: Damien Durville

9:15 – 9:30	Modelling a braiding process as a constrained multibody system with frictional contacts *I.K. Patil, A. Cosimo, O. Brüls*

9:30 – 9:45	Study of Frictional Contact Interactions within Jacquard Harness in Weaving Process for 3D Interlock Fabrics *S. E. Mermouli, D. Durville, P. del Sorbo, B. Tranquart, D. Coupé*
9:45 – 10:00	Technological and modelling aspects of the fiber level modelling of textile yarns *Y. Kyosev, A.M. Schmidt*
10:00 – 10:15	Modelling the friction between yarns within a laid-strand synthetic ropes by hyperelastoplasticity in finite deformation *G. Bles, L. Civier, N. Hamila, P. Davs, Y. Marco*
10:15 – 10:30	Characterizing a yarn's mechanical behaviour on microscale level using a high-fidelity geometrical fiber model *A. Bral, L. Daelemans, J. Degroote*
10:30 – 10:45	Finite element analysis of textile cords in rubber-cord composites under compressive loadings: a filament scale approach *G. Auteri, M. Chassagne, D. Durville, J. Neggers*

10:45 – 11:15	Coffee Break

MS – 6/2: Slender beam-like structures with scientific passion – mini-symposium in honor of prof. Miran Saje

Chair: Dejan Zupan, Gordan Jelenić

11:15 – 11:30	Nonlinear dynamics of highly flexible beam structures: frequency domain-based finite element computation of the nonlinear modes *M. Debeurre, A. Grolet, O. Thomas*
11:30 – 11:45	Low-order analytical solution for vibration of tensioned cables *A. de M. Wahrhaftig, E. M. de O. Lopes, G. R. do Amaral, J. M. Balthazar, K.M.M. Ribeiro*
11:45 – 12:00	Kinematically exact beam with embedded discontinuity *P. Češarek, M. Saje*
12:00 – 12:15	Overview of numerical models for mechanical analysis of beam elements in fire developed by Chair of mechanics at UL FGG *A. Ogrin, R. Pečenko, S. Bratina, T. Hozjan*
12:15 – 12:30	Enhanced finite-element performance in high-curvature micropolar pure-bending *S. Grbčić Erdelj, G. Jelenić, A. Ibrahimbegović*
12:30 – 12:45	Challenges in dynamics of non-linear beams *D. Zupan, P. Češarek, E. Zupan, M. Gams*

12:45 – 14:00	Lunch

14:00 – 14:30	**Closing Ceremony**

17:00 – 22:00	**European Researchers' Night**