

HFSS 2025

2nd International Conference on Highly Flexible Slender Structures

Detailed Programme

Please note: The programme and specific times may be subject to changes. Updated on 15/09/2025.

Monday, 22 nd September 2025											
8.30	Welcome & Registration										
10.00	Opening of Conference										
10.30	Invited Lecture Hamiltonian Generative Adversarial Network <i>Christine Allen-Blanchette</i> Chair: S. Leyendecker										
11.15	MS-2/1: Contact and Friction in Mechanics of Flexible Slender Structures Chair: Y. Vetyukov <table border="0" style="margin-top: 10px;"> <tr> <td style="vertical-align: top; padding-right: 10px;">2.2</td><td>Simulation of the Dynamics of Two-Motor Elevator Systems with the Arbitrary Lagrangian-Eulerian Finite Element Method Considering Guide Contact <i>J. Escalona</i></td></tr> <tr> <td style="vertical-align: top; padding-right: 10px;">2.4</td><td>Large Deformations of Rods Deforming on Flexible Shells: An Arbitrary Lagrangian-Eulerian Framework <i>S. J. Michel, Y. Vetyukov</i></td></tr> <tr> <td style="vertical-align: top; padding-right: 10px;">2.6</td><td>Exact Computation of Contact Regions for Nonlinear Beams with Cubic Interpolation <i>L. Radman, R. Winkler, M. Pieber, J. Gerstmayr</i></td></tr> <tr> <td style="vertical-align: top; padding-right: 10px;">2.7</td><td>Three-Dimensional Configurations of an Elastic Whisker Touching a Plane Wall <i>E. L. Starostin, V. G. A. Goss</i></td></tr> <tr> <td style="vertical-align: top; padding-right: 10px;">2.8</td><td>Contact Modelling of Shells for Roll Forming Simulations <i>M. Strondl, J. Scheidl, Y. Vetyukov</i></td></tr> </table>	2.2	Simulation of the Dynamics of Two-Motor Elevator Systems with the Arbitrary Lagrangian-Eulerian Finite Element Method Considering Guide Contact <i>J. Escalona</i>	2.4	Large Deformations of Rods Deforming on Flexible Shells: An Arbitrary Lagrangian-Eulerian Framework <i>S. J. Michel, Y. Vetyukov</i>	2.6	Exact Computation of Contact Regions for Nonlinear Beams with Cubic Interpolation <i>L. Radman, R. Winkler, M. Pieber, J. Gerstmayr</i>	2.7	Three-Dimensional Configurations of an Elastic Whisker Touching a Plane Wall <i>E. L. Starostin, V. G. A. Goss</i>	2.8	Contact Modelling of Shells for Roll Forming Simulations <i>M. Strondl, J. Scheidl, Y. Vetyukov</i>
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12.30	Lunch										
14.00	Invited Lecture A Journey Through the World of Frictionless Sliding Sleeves Systems <i>Francesco Dal Corso</i> Chair: Y. Vetyukov										
14.45	MS-6/1: Nonlinear Dynamics of Slender Structures Chair: J. Scheidl <table border="0" style="margin-top: 10px;"> <tr> <td style="vertical-align: top; padding-right: 10px;">6.1</td><td>Non-Material Poincaré Equations for the Sliding of Geometrically Exact Rods with Illustrative Examples <i>F. Boyer, S. Zhang, V. Lebastard</i></td></tr> <tr> <td style="vertical-align: top; padding-right: 10px;">6.14</td><td>Stick-Slip Dynamics of a Flexible Rod Sliding in a Rigid Sleeve with Friction <i>Y. Vetyukov</i></td></tr> <tr> <td style="vertical-align: top; padding-right: 10px;">6.2</td><td>A Multiscale Approach to Simulate the Interaction between Air Jets and Hairy Yarns <i>A. Bral, L. Daelemans, J. Degroote</i></td></tr> </table>	6.1	Non-Material Poincaré Equations for the Sliding of Geometrically Exact Rods with Illustrative Examples <i>F. Boyer, S. Zhang, V. Lebastard</i>	6.14	Stick-Slip Dynamics of a Flexible Rod Sliding in a Rigid Sleeve with Friction <i>Y. Vetyukov</i>	6.2	A Multiscale Approach to Simulate the Interaction between Air Jets and Hairy Yarns <i>A. Bral, L. Daelemans, J. Degroote</i>				
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15.30	Coffee Break										

16.00	MS-8: Textiles and Other Macroscopic Structures, Built of Flexural 1D Objects Chair: J. Orlik
8.1	Compression of Textile Cords in an Elastomer Matrix: Highlighting the Helical Buckling Mechanism <i>G. Auteri, J. Neggers, S. Charpin, K. G-D. Agniman, D. Durville</i>
8.5	Modelling of Nonsmooth Frictional Yarn-to-Mandrel Contact Interactions for Braiding Simulation <i>I. Patil, O. Bröls</i>
8.4	Homogenization, Dimension Reduction and Simulation of Textiles <i>J. Orlik, M. Krier, D. Neusius, K. Steiner</i>
8.2	Asymptotic Analysis of Composite Plates with Stiff Inclusions <i>A. Chakraborty, G. Griso, J. Orlik</i>
8.3	Asymptotically Based Simulation and Optimization of Flow-Induced Deformation of Textile Filters <i>M. Krier, J. Orlik, R. Pinnau</i>
17.30	Welcome Reception

End: 19.00

Tuesday, 23 rd September 2025	
8.30	Registration
9.00	MS-2/2: Contact and Friction in Mechanics of Flexible Slender Structures Chair: J. Escalona 2.1 A Quasi-Static ALE-Frictional Formulation for Soft Robotics Applications <i>O. Devigne, O. Bröls</i> 2.3 Beam-to-Beam Frictional Contact Formulation with Small Sliding for Overhead Conductors Undergoing Large Rotations <i>P.-A. Guidault, K. Aït Ammar, P.-A. Boucard, J. Said, F. Hafid</i> 2.5 Noether Symmetries and Conserved Quantities for Elastic Rods with Contact <i>S. Neukirch, F. Bertails-Descoubes</i> 2.9 Advanced Modeling of Nonsmooth Contact Dynamics between Rigid and Deformable Bodies <i>K. Tutić, T. Mudrić, N. Čeh, M. Arnold</i>
10.00	Invited Lecture Embedding Slender Structures in Continua: Theory, Numerical Methods, and Applications <i>Ignacio Romero</i> Chair: O. Bröls
10.45	Coffee Break
11.15	MS-9: Advanced Models and Numerical Formulations for the Interaction of Beams and the Coupling of Beams with Solids Chair: I. Steinbrecher 9.1 Geometric Algebra: A New Language for Flexible Multibody Dynamics and Robotics <i>O. A. Bauchau</i> 9.2 Finding Indicators for the Influence of Constraints Induced by Kinematic Assumptions Using the Example of the Euler-Bernoulli Hypothesis <i>J. Bounghard, J. Wackerfuß</i> 9.3 A Mixed Finite Element Formulation for Nonlinear Elastodynamic Beam Structures with Extensible Directors: Energy-Momentum Consistent Scheme <i>M.-J. Choi, S. Klinkel, S. Klarmann, R. A. Sauer</i> 9.4 Coupling of Solid and Beam Elements with Heterogeneous Cross-Sections <i>S. Klarmann, J. Wackerfuß, S. Klinkel</i> 9.5 Modelling of Fibre-Matrix Bonding in Cable-Reinforced Elastomer Composites <i>V. Poussard, D. Durville</i>
12.45	Lunch
14.15	MS-1: Constitutive Modelling for Flexible Slender Structures Chairs: O. Bröls, V. Dörlich 1.1 Hysteretic Bending Response of Slack Metallic Cables <i>F. Foti, S. Corazza, L. Martinelli</i> 1.4 Prandtl-Ishlinskii Operators as Inelastic Constitutive Model in the Framework of Cosserat Rods for Cable Simulation <i>D. Manfredi, V. Dörlich, J. Linn, M. Arnold</i> 1.5 Physics-Augmented Neural Network Constitutive Models for Structural Elements <i>J. O. Schommartz, D. K. Klein, J. C., Alzate Cobo, F. Gruttmann, O. Weeger</i>

1.7	Enhanced Constitutive Behaviour of Cables under Bending Loads <i>M. Stavole, D. Manfredi, T. Zhao, F. Schneider-Jung</i>
1.2	Coupled Loading of Cable-Like Structures <i>M. Hawwash, V. Dörlich, F. Schneider-Jung, J. Linn</i>
1.3	Deformation Effects in Pressurized, Fiber-Reinforced and Preformed Hoses: From 3D Continuum Simulations to Experiments <i>Q. Hoesch, M. Roller, F. Schneider-Jung, J. Linn, R. Müller</i>
1.6	Hybrid Analytical-Numerical Model for Accurate and Efficient Simulation of Adhesive Debonding in Beam-Like Specimens <i>L. Škec, D. Jurković, G. Alfano</i>

16.00	Coffee Break
16.30	MS-6/2: Nonlinear Dynamics of Slender Structures Chair: Y. Vetyukov
6.4	Closed Catenary Loops: Lariat Chain, String Shooter, and Heavy Elastica <i>A. R. Dehadrai, J. A. Hanna</i>
6.10	Contact Problems in Elastic Rods <i>H. Singh, K. Suryanarayanan, A. K. Pathak, P. A. Patel</i>
6.5	Dynamics of a Total Lagrangian Mixed Petrov–Galerkin Cosserat Rod <i>M. Herrmann, S. R. Eugster</i>
6.12	A Space-Time Finite Element Formulation for Geometrically Exact Shear Deformable Beams <i>I. Steinbrecher, A. Humer</i>
6.9	Simulation Models for Large Vibrations of an Axially Moving Suspension Cable of Variable Length in a Vertical Transport System <i>J. Scheidl, Y. Vetyukov</i>
6.3	Nonlinear Dynamics of Anchoring Elements for Submerged Floating Tunnels subject to Hydrodynamic Loads <i>S. Corazza, F. Foti, L. Martinelli, V. Denoël</i>

Wednesday, 24 th September 2025		
8.30	Registration	
9.00	MS-7/1: Multiphysics Coupled Problems in Slender Structures Chair: P. Gupta	
	7.1	A Finite Swelling 3D Beam Model with Axial and Radial Diffusion <i>J. C. Alzate Cobo, X.-L. Peng, B.-X. Xu, O. Weeger</i>
	7.3	Hydraulically Actuated Asymmetric Flexible Hinge: A Bio-Inspired Design Principle <i>V. G. A. Goss, E. L. Starostin</i>
	7.8	Modelling Coupled Fluid and Mooring Line Interactions in Floating Body Simulations <i>A. Taran, S. Bali, Ž. Tukovic, V. Pakrashi, P. Cardiff</i>
	7.2	Magnetoelastic Modeling of Planar Ferromagnetic Rods and Ribbons <i>G. R. K. C. Avatar, V. Dabade</i>
10.00	Invited Lecture Advanced Material Modeling for 3D Beams <i>Oliver Weeger</i> Chair: J. Linn	
10.45	Coffee Break	
11.15	MS-3: Machine Learning Based Geometrically Consistent Simulation Methods Chairs: S. Leyendecker, S. Ober-Blöbaum	
	3.1	Automated Constitutive Modeling of Dielectric Elastomer Actuators (DEAs) – Towards Realistic Modeling of Artificial Muscles <i>G. Amer, D. Martonová, S. Leyendecker</i>
	3.2	Symplectic Model Order Reduction with Autoencoders and Transformers <i>B. Brantner, M. Kraus</i>
	3.4	AI-Based Methods for Accelerating the Simulation of Flexible Structures <i>V. Holfeld, M. Burger, J. Fiedler, J. Linn, M. Roller, F. Schneider-Jung</i>
	3.5	Learning Dynamics and Symmetry <i>D. Martín de Diego, M. Vaquero</i>
	3.6	Error Analysis of Higher Order Integration Schemes in the Context of Neural Network Based Modelling <i>F. Mest, M. Arnold</i>
	3.3	Stability of Discretized Flows on Riemannian Manifolds <i>M. Ghirardelli, B. Owren, E. Celledoni</i>
12.45	Lunch	
14.15	Invited Lecture Geometric Numerical Integration for Data-Driven System Identification <i>Christian Offen</i> Chair: S. Ober-Blöbaum	
16.00	Social Programme	
19.00	Conference Dinner	

End: 22.00

Thursday, 25 th September 2025	
8.30	Registration
9.00	MS-10/1: Industrial Application of Simulation Methods for Flexible Slender Structures and Their Challenges Chair: J. Linn
10.4	3D Form Board in the Loop: Interactive 3D Flattening in the Automotive Wiring Harness Development Process <i>M. Koch, D. Dengel, C. Loris, O. Hermanns</i>
10.5	Enhancing Cable Simulation with Flexible Clips and Mountings <i>S. Kusuma Chandrashekhara, F. Schneider-Jung, M. Roller, J. Linn</i>
10.7	Feasibility Study for Preliminary Design of Dynamic Submarine Power Cables <i>K. Ntarladima, N. Mavrodontis, S. Koumlis</i>
10.10	Efficient NVH Analysis for Cables and Hoses <i>F. Schneider-Jung, M. Roller, J. Linn</i>
10.00	Invited Lecture Parametric Model Order Reduction in the Multi-Scale Material Setting <i>Karen Veroy-Grepl</i> Chair: C. Lestringant
10.45	Coffee Break and Exhibition flexStructures
11.15	MS-6/3: Nonlinear Dynamics of Slender Structures Chair: F. Dal Corso
6.15	Dynamic Analysis of a Moving Particle on a Non-Linear Three-Dimensional Beam <i>D. Zupan, E. Zupan</i>
6.6	Mixed Modal Planar Oscillations of a Cantilevered Pipe with an End Mass <i>K. Katsura, Y. Kuroyanagi, K. Yamashita</i>
6.7	Nonlinear Vibrations of an Elastica at its Post-Buckled Configurations <i>H. Kibach, A. T. Savadkoohi</i>
6.8	Experimental and Numerical Investigation of Flexible Wing Flutter <i>F. Maetz, B. Chouvion, F. Renaud, A. Leroy, J.-L. Dion, O. Montagnier</i>
6.13	Dynamic Shape Morphing of Slender Structures by Modulation of Intrinsic Curvature <i>P. L. Várkonyi, A. F. Guerra Riaño</i>
6.11	About the Soft Impact of a Rod-Like Missile on a Robust Target <i>A. A. Sipos, G. Károlyi</i>
12.45	Lunch and Exhibition flexStructures
14.15	MS-7/2: Multiphysics Coupled Problems in Slender Structures Chair: P. Gupta
7.6	Mathematical Modeling of Chemo-Elastic Special Cosserat Rod <i>A. Parida, P. Gupta</i>
7.4	A Flexoelectric Special Cosserat Rod under the Follower Load <i>P. Gupta, P. Mishra</i>
7.5	Finite Element Modeling of Flexoelectric Special Cosserat Rods <i>P. Mishra, P. Gupta</i>
7.7	Theoretical and Experimental Studies of a Flexoelectric Actuator <i>K. Saiprasad, R. Ramadurai, P. Gupta</i>
7.9	A Soft Robotic Gripper with Flexoelectric Effects <i>V. K. Yadav, P. Gupta</i>

15.30	Coffee Break and Exhibition fleXstructures
16.00	MS-5: Slender Structures with Highly Deformable Cross-Sections: Beyond Kirchhoff Equations Chairs: C. Lestringant, H. Le Clézio
5.2	Twisting Instabilities in Elastic Ribbons with Inhomogeneous Pre-Stress <i>M. Gomez, P. M. Reis, B. Audoly</i>
5.3	Pure 2D Bending of a Hyperelastic Strip – First Integral of Equilibrium and Integrability Conditions <i>G. Jelenić</i>
5.5	Morphorods: A Modelling Framework for Active Slender Structures <i>D. E. Moulton, A. Goriely, H. Oliveri, B. Kaczmariski, E. Kuhl</i>
5.6	1D Kinematically Enriched Ribbon Model for Simulation of REBCO Tapes <i>M. A. Saadat, A. Torre, D. Durville</i>
5.7	Geometric Mechanics of Curve-Fold Origami with Vertices <i>Z. Wen, F. Feng, H. Duan</i>
5.1	Asymptotic Expansion Method for Curved and Variable Beams <i>M.-K. Ferradi</i>

Friday, 26th September 2025

8.30	Registration
9.00	General Programme Chair: G. Jelenić
	GP.1 On Convolution Based Variational Integrators for Fractional Lagrangians <i>K. Hariz, F. Jiménez, S. Ober-Blöbaum</i>
	GP.2 Arbitrary Lagrangian–Eulerian Method and its Numerical Stability in Flexible Tether Deployment and Retrieval <i>R. Kuzuno, K. Makihara, K. Otsuka</i>
	GP.3 Inverse Size Effect Explained Through the Cosserat Theory of Elasticity <i>E. Papa Dukić, G. Jelenić</i>
	GP.4 The Normal Skeleton <i>E. L. Starostin, V. G. A. Goss</i>
10.00	Invited Lecture 1D Models for Slender Hyperelastic Structures Based on a Two-Scale Approach <i>Claire Lestringant & Helen Le Clézio</i> Chair: S. Neukirch
10.45	Coffee Break
11.15	MS-10/2: Industrial Application of Simulation Methods for Flexible Slender Structures and Their Challenges Chair: F. Schneider-Jung
	10.9 Fiber Dynamics Simulation in Nonwovens Production Processes <i>A. Schmeißer</i>
	10.3 Impact of Air Drag and Turbulence on Fiber Elongation in Melt Blowing <i>M. Ettmüller</i>
	10.1 Modeling and Simulation of the Winding Process for Electric Motor Rotors <i>G. Crippa, D. Durville</i>
	10.2 SE(3)-Based Shape and Deformation Representations for Adaptive Control of Deformable Objects <i>L. Dehaybe, O. Bröls</i>
	10.6 Simulation of Spot Welded Assemblies Using Nonlinear Shell Theory <i>S. Lorin, E. Börjesson, L. Lindkvist, K. Wärmefjord, R. Söderberg, F. Edelvik</i>
	10.8 Interactive Simulation of Flexible Surface-Like Parts as a Digital Support Function for Assembly Planning in the Automotive Pre-Series Centre <i>M. Roller, J. Linn, M. Hawwash, J. Ljunglunde, C. Cromvik</i>
12.45	Lunch
14.00	Closing of Conference