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出國報告（出國類別：國際學術會議）

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會議名稱：2012 年第八屆歐洲固體力學會議(ESMC 2012)

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服務機關：國立中興大學機械工程系
姓名職稱：陳定宇 教授

派赴國家：奧地利

出國期間：101/7/9 至 101/7/13

報告日期：101/7/25

摘要

2012 年第八屆歐洲固體力學會議於七月九至十三日在奧地利葛拉茲市舉行。此項會議每三年舉行一次，參與人數眾多。會議涵蓋七個大的主題，分別是連體力學、計算力學、動力學、實驗力學、材料力學、多領域問題和結構力學。除了這七大領域外，還有四十五個專門領域之議程，論文發表分為五天，每天三個時段同時進行十四場之論文發表，週三上午還加入海報發表，總共約有 1400 篇論文發表。所探討的主題涵蓋了固體力學的各個領域，從古典的固體力學到生醫相關之力學以及微奈米力學都有許多研究和應用成果發表。

目次

出國報告內容

一、目的

參加此次會議之主要目的是要瞭解固體力學近年來的最新發展趨勢和成果。由於本人多年來執行的國科會研究計畫與結構力學、設計方法、計算力學和計算機科學之應用有密切之關係，我們除了持續嘗試使用資料挖掘方法協助結構最佳化設計之進行，以提升計算效率和設計之品質，也同時進行許多拓樸最佳化之相關研究，例如如何建立適用於拓樸最佳化之有限元素網格，以及拓樸最佳化設計變數的最佳懲罰函數等。而此次會議中有許多有關最佳化設計之理論和應用之論文發表，這些都和我目前之研究有密切之關係，因此參加此一會議並且發表自己的研究成果，以達到學習和學術交流之效果。

二、會議過程

我於七月九日抵達會議場地，辦理會議註冊領取資料，並且認識論文發表場地和設備。我的論文發表時間訂在十一日上午十時十五分至下午一時四十五分，以海報張貼方式發表。本次大會的場地是葛拉茲市的會議中心，是一棟相當古典的建築，一樓是報到處以及提供上網之服務，很有趣的是該會議中心和賭場在同一棟建築物內，害我以為找錯地方，這和在美國拉斯維加斯、大西洋城等地辦演討會有異曲同工之妙。會議場地都集中在二樓，共有小型演講廳十四間，大型演講廳三間，海報發表會場在一樓大廳，場地設備和大小非常理想，是很好的會議場所。

本次會議每天上午都安排有一場主要演講在大會議廳舉行，週一、二的下午還

有另外二場主要演講，參與人數眾多，討論熱烈。這七場演講都是由固體力學領域中研究傑出之學者發表。第一場是哈佛大學的 J.R. Rice 教授發表，題目是探討快速冰層移動之力學行為；第二場是由加州大學的 R.M MacMeeking 教授發表，題目與鋰電池模型有關；第三場是由劍橋大學的 N.A. Fleck 教授發表，題目是晶格材料的力學行為；第四場是由義大利巴維爾大學的 F. Auricchio 教授發表，題目與形狀記憶合金和生醫應用有關；第五場是由加州理工學院的 M. Ortiz 教授發表，題目是最佳傳輸和變分法在計算力學之應用；第六場是由紐西蘭奧克蘭大學的 P.J. Hunter 教授發表，題目與生物力學相關；第七場是由劍橋大學的 J.R. Willis 教授發表，題目是裂紋導引波和相關現象之理論。

其中第一場為最主要之演講，Rice 教授選定兩個力學問題來探討，其一是格陵蘭冰湖上層冰溶解後形成表面湖之問題 ，其二是南極西方存在冰流之問題，這些都與地球環境變遷有一定之關係。第二場的鋰電池相關研究是建立個傳輸模型來瞭解在充放電過程中有哪些參數會影響應力的變化，解此來瞭解材料的破壞可能。應用的目標是如何設計出多孔性材料的為結構以方便快速的充放電，但是要排除各種機械性的損傷和可能的破壞以增進電池的可靠度。第三場的內容主要是回顧近年來晶格材料力學行為之進展，終極目的是想要以新的方法結合材料、拓樸和尺度來發展新組合的熱機械性質的材料，這些材料將可以在低密度下具有高強度和低的熱傳導係數，這些要求對新材料的開發是很有挑戰性的。第四場的 Auricchio 教授則是發展出形狀記憶合金之模擬模型，使得開發這種材料更加方便，並且也探討心臟瓣膜之模擬，對生醫工程有貢獻。第五場的 Ortiz 教授是使用最佳傳輸理論結合無網格技術和選點方法發展出最佳傳輸無網格近似方法，取代傳統的方法求解穿透之問題，並且用模擬影片展示研究成果，令人印象深刻。第六場的內容是建立起人體內十二種器官之模型，此一研究由歐盟委員會支助，這些生理模型用於探討多種物理過程，如纖維力學、電活動和流體之流動。他們的目的是雙重的，既可協助瞭解器官之物理功能和提供診斷之基礎也可建立病理學之知識，這些模型都是使用高階的有限元素來模擬，主要建模的目的是要利用計算模型去分析整合的生物功能。其成果將會變成一個生理學資料庫，包含細胞、組織、器官、和器官系統各個層次，這些資料都可上網取得。

我的論文題目是“探討不同的懲罰函數對結構拓璞最佳化之影響”，發表時間是十一日上午十時十五分至下午一時四十五分，以海報方式發表，地點在一樓大廳。探討的內容是想要發展出在結構拓樸最佳化執行過程中，是否有較常用的 SIMP 懲罰方式更好的函數。共有五種新的函數被提出，由結果顯示其中有一種略優於 SIMP 函數，另有二種互有優劣。由於結構拓璞最佳化是很熱門的研究題目，因此在三個半小時的發表期間陸續有一些相關之研究者提問討論和給予建議，使我獲益良多。附圖是張貼之海報。

同樣在海報法表區有一篇很有趣的論文由俄國科學院連續媒體力學研究所發表，光是這個單位的名稱就很稀有。發表的內容是使用紅外線影像分析癌症之風險，在醫療診斷上將會有幫助，作法是使用紅外線去量測乳房表面之溫度，正常的溫度和異常的溫度會有顯著之差距，而且他們得斜率也不相同，除此之外，相角也不相

同；正常狀況下，相角是非常混亂的，有病變時相角會呈現一定的模式這些結果是從四十六個病人中獲得，研究成果可應用於早期診斷乳癌之發生，對全世界婦女的健康有很好的貢獻。

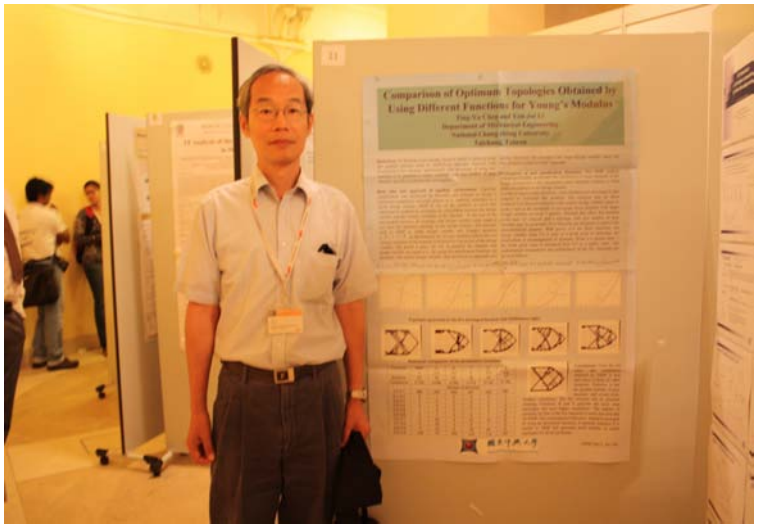
在其他與我研究有關之結構力學和計算力學方面，也有幾篇有趣和我研究接近之論文發表。其中由一篇由荷蘭得夫特科技大學發表，題目是使用模態分析於暫態熱傳問題。傳統的模態分析適用於對結構的自然振動頻率和振型之計算，該文將熱效應加入統御方程式後，可以得到熱模態和時間常數，將熱一定數量之模態和時間常數合成後可以得到暫態溫度的分佈，其計算的經度和使用的熱模態數量有關，數量越多，準確度越高。此一方法的優點在於可以縮小熱傳分析模型，因此可以快速得到結果，所以適用於及時的暫態響應分析。這個技術由於可以縮小分析模型，因此可將之用於設計最佳化，或是用於精密機械或是工具機之溫差所造成加工誤差或定位誤差之及時補償，是我們發展精密機械可以使用的一個技術。

在結構力學分項中另有一篇論文引起我的注意，他的題目是使用遺傳演算法進行最佳之水泥補強設計，由義大利杜林技術學院控制和計算工程系發表。他吸引我注意的原因是我打算使用類似的想法進行工具機結構之補強設計，該文所使用的方法和技巧與我所知到的大多一致，首先要確定設計的參數，然後選定設計的目標和各種限制條件。在結構設計中，一般而言結構安全會是限制條件或是目標，而結構重量通常被選為目標，並且要被最小化，該文也不例外，以最小化重量為目標，安全性為限制條件。該文教特殊處在於執行遺傳演算法計算時，家如一些過去的經驗於演算過程中，這些經驗都是針對補強結構建立的，因此可加速計算的過程和得到較可靠之結果。在使用遺傳演算法時，作者將親代的表現作為使用何種演化方法的考量；由於遺傳演算法中交配所產生的子帶可能會和親代有很大差異，因此作者將表現較差的親代進行交配過程，以其產生初步同於親代而有較好表現之子代。而對於表現較好之親代，使用突變之方式產生子代，其原因是遺傳演算法中突變是微小之改變，所以即使子代不如親代，其差距也不致過大，如此可維持下一代之整體品質。這個作法我倒是第一次見到，但是我有一些不同的看法，作者的著眼點是儘量保留好的個體，雖然這個想法沒錯也可較快收斂，但也可能因為過於保守而喪失了產生更好子代的機會，要有更多的計算模擬才可知道是否是一個對遺傳演算法的有價值的改良。

另有一篇論文和最佳化設計有關，題目是基於最小接觸應力變異之人體工學和舒適之形狀最佳化設計，由克羅埃西亞史不利大學電機機械和海軍建築系發表。該文之目的是要設計出一張座椅使乘坐者有最大之舒適感，由於舒適之定義無一統一之標準，因此作者以乘坐者與椅面各接觸點之應力與平均應力之最小化為最佳化之目標，進行的方式和大多數最佳化設計方法相同；首先用三維掃瞄的技術找出一張已有之椅子的初始節點位置，然後使用平滑曲線去表示椅面，並且將平滑曲線的控制點作為設計變數，使用有限元素法進行接觸分析和計算人體受到的應力，在利用演化是演算法進行最佳化搜尋得到最佳之椅面形狀。

生物醫學領域的研究近年來也發展迅速，其中許多都與固體力學和流體力學相關，此次會議也有許多相關之研究成果發表。其中有一篇論文是由史丹佛大學機械

系和生醫系共同發表，是探討建立一個計算模型去瞭解用光驅動之心率調節器之效能。由於最新之研究對於光可刺激某些細胞的瞭解，導引出了用光來取代電驅動之心率調節器之構想，其運作之原裡是當光照射到某些細胞時，由於光的刺激會產生一個陽離子通道，這個通道內會流過光電流而增加了細胞內鈉離子的濃度，由於濃度的改變產生了電流，這些電流流過心臟去激發其機械的收縮運動。這些過程被以一個偏微分方程來描述，此一方程被離散化後可運有限差分法和有限元素法求解，為了證實此一構想的可行性，某些光敏感的細胞被虛擬注射到人的心臟中的不同部位，然後觀察他們被激發之反應，細胞內的各種離子濃度也因此隨時間而不斷變化，此一研究成果未來將會有許多用途。



三、心得及建議

參加此次會議除了瞭解與結構最佳化之相關研究發展外，也同時了解到固體力學其他領域之最新研究成果，對未來研究題材和應用方向有很大的參考價值。我的論文所探討的方向似乎未見有類似之研究發表，應有一定之創新性。從此次會議發表之論文內容來看，其涵蓋面相當廣泛和均勻，並無集中在少數特定之領域，或是較新之微奈米科技。第一天下午有一場論文在大演講廳發表，演講者是一位資深的土木系教授，講題是隧道結構接縫處之強度和受到壓力之影響。這些研究都是針對歐洲許多鐵公路隧道進行之研究，其成果對隧道之安全性有直接之貢獻，可見國際之科學研究並未一窩蜂地追逐較新之領域，這點值得我們深思。科學研究除了要有前瞻性外更應該要著眼於解決目前所面對的許多問題，科學研究的成果如有一定比例可以協助產業之發展，其成果將更有價值。

四、攜回資料

1. ESMC2012 Programme 一本
2. ESMC2012 論文 CD 一片

五、議程表

ESMC-2012

8th European Solid Mechanics Conference

Institute of Biomechanics
Graz University of Technology
Austria

July 9-13, 2012

PROGRAMME

Edited by:

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Ray W. Ogden
University of Aberdeen, UK
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University of Glasgow, UK

Schedule: Thematic Order

Minisymposium MS-1

Adaptive and Smart Structures

Session	Day	Time	Room
MS-1.1	Thursday	16:00 – 18:00	K5
MS-1.2	Friday	10:15 – 12:15	K5

MS-1.1 Adaptive and Smart Structures K5	Thursday, 16:00 - 18:00 Chair: St. Vidoli, P.M. Weaver
16:00	*Reduced Models of Foppl-von Karman Shells* **Stefano Vidoli**
16:20	*Pseudo-Bistable Pre-Stressed Morphing Composites* Alex Brinkmeyer, **Matthew Santer**, Alberto Pirerra, Paul Weaver
16:40	*Refined Modelling of Multistable Paraboloidal Shells for Morphing Applications* Alberto Pirrera, Broderick Coburn, **Paul Weaver**
17:00	*Effect of the Enviroment on the Deformation Behaviour of Multistable 0/90 Unsymmetric Composite Plates* M. Gigliotti, **Yannick Pannier**, M. Minvervino, M.C. Lafarie-Frenot, J.C. Grandidier
17:20	*Computational Modeling of Prestressed Shape Memory Alloy Fiber – Matrix Composites* **Sven Klinkel**, Benedikt Kohlhaas
17:40	*Multi-Stability of Orthotropic Shells: Reduced Uniform-Curvature Models and Finite-Element Validation* Corrado Maurini, Stefano Vidoli, **Angela Vincenti**

MS-1.2 Adaptive and Smart Structures K5	Friday, 10:15 - 12:15 Chair: St. Vidoli, P.M. Weaver
10:15	*Morphing Composite Structure as a Piezoelectric Strain Amplifier* **Xavier Lachenal**, Paul Weaver
10:32	*A Free-Standing, Doubly-Curved Tristable Shell* **Evripides Loukaides**, Keith A. Seffen
10:49	*Compliant Shell Mechanisms* **V.R. Seereeram**, K.A. Seffen
11:06	*Inhomogeneous Pull-In in Dielectric Thin Films* **Domenico De Tommasi**, Giuseppe Puglisi, Giuseppe Zurlo

11:23	*Composite Dielectric Energy Harvesters* **Massimiliano Gei**
11:40	*Balanced Design of Resonant Shunted Piezoelectric Vibration Control* **Jan Høgsberg**, Steen Krenk
11:57	*Optimization of Electroviscoelastic Systems with External Electric Circuits* **Nataliya Alekseevna Yurlova**, Valeriy Pavlovich Matveenko, Evgeniy Petrovich Kligman, Maksim Aleksandrovich Yurlov

Minisymposium MS-2

Advanced Composite Materials

Session	Day	Time	Room
MS-2.1	Tuesday	10:15 – 12:15	AU3
MS-2.2	Tuesday	14:45 – 15:45	AU3
MS-2.3	Tuesday	16:00 – 17:30	AU3

MS-2.1 Advanced Composite Materials AU3	Tuesday, 10:15 - 12:15 Chair: P. Camanho, J. LLorca
10:15	*Non-Conventional Laminates: Expanding the Design Envelope and Improving the Structural Performance of Advanced Composites* (Keynote) **Cláudio S. Lopes**, Zafer Gurdal, Pedro P. Camanho
10:55	*Orientation Distribution of Fibres in Short-Fibre Reinforced Concrete: Evaluation and Introduction to Constitutive Relations* **Marika Eik**, H. Herrmann, Jari Puttonen
11:15	*Folding and Strain Softening of Carbon Fiber Composites with an Elastomeric Matrix* **Francisco López Jiménez**, Sergio Pellegrino
11:35	*Three-Dimensional Failure Criteria for Fiber-Reinforced Laminates* **Giuseppe Catalanotti**, Pedro P. Camanho

MS-2.2 Advanced Composite Materials AU3	Tuesday, 14:45 - 15:45 Chair: J. LLorca
14:45	*The Elasto-Viscoplasticity and Damage Behaviour of RTM6 Epoxy Resin* **Xavier P. Morelle**, Simon André, Maxime A. Melchior, Frédéric Lani, Christian Bailly, Thomas Pardoen
15:05	*Experimental Comparison of Friction in Four Different Thermoplastics During Thermo Forming* **Ulrich Sachs**, Sebastiaan P. Haanappel, Rene H. W. ten Thije, Remko Akkerman
15:25	*High-Strain-Rate Response of Titanium Matrix Composites Reinforced with Titanium Carbide Particles at Elevated Temperatures* **Weidong Song**, Jianguo Ning

MS-2.3 Advanced Composite Materials AU3	Tuesday, 16:00 - 18:00 Chair: P. Camanho, J. LLorca
16:00	*A Study on the Influence of Carbon Nanotubes on the Thermal and Mechanical Properties of Epoxy Nanocomposites* Ariful Rahaman, Gilles Lubineau, **Isaac Enrique Aguilar Ventura**
16:20	*A Study on the Development of Nanolayer HA-Ti Composite Coating t9hrough Superplastic Deformation Method for Implant Materials* Siti Nur Hasan, **Iswadi Jauhari**
16:40	*Improving CO2 Sorption Rate by a Ca(OH)2/nano-SiO2 Composite in a Fluidized Bed* J.M. Valverde, **Carlos Soria-Hoyo**, M.A.S. Quintanilla, F.J. Duran, F. Pontiga, H. Moreno, M.J. Espin
17:00	*Experimental Fatigue Damage Evaluation of Short Glass Fiber Reinforced Polyamide Composites* **Muhamad Fatikul Arif**, Fodil Meraghni, Nicolas Saintier, Joseph Fitoussi, Gilles Robert

Minisymposium MS-3

Advances in Applied Mechanics for Vehicle Concept Modelling

Session	Day	Time	Room
MS-3.1	Monday	16:00 - 18:00	Maybach
MS-3.2	Tuesday	10:15 - 12:15	Maybach
MS-3.3	Tuesday	14:45 - 15:45	Maybach

MS-3.1 Advances in Applied Mechanics for Vehicle Concept Mod. Monday, 16:00 - 18:00
Maybach Chair: H. Kühnelt, B. Pluymers

16:00 *Use of Beams, Joints and Panels for Vehicle Body Concept Modelling*
Giambattista Stigliano, Domenico Mundo, Tommaso Tamarozzi, Marco Gubitosa, Stijn Donders, Leonardo Pagnotta

16:20 *Surrogate-Based Optimization of the Global Static and Dynamic Performance of a Vehicle Body*
Pavlina Georgieva Mihaylova, Alessandro Pratellesi, Niccolò Baldanzini, Marco Pierini

16:40 *Energy Flow in Car Structure NVH Treatment*
Jakub Antoni Korta, Rosario Manlio Raniolo, Marco Danti, Tadeusz Uhl

17:00 *Car Body Concept Modeling for NVH Optimization in the Early Design Phase at BMW: a Critical Review and New Advanced Solutions*
Alessio Moroncini, Luc Cremers

17:20 *Concept Modelling Techniques for the Development of a Novel Energy Harvesting Device for Car Suspension Systems*
Tommaso Tamarozzi, Dieter Opheide, Jef Cambre, Luc Cremers, Wim Desmet

17:40 *Concept Modeling with the Use of Multi-Body Simulations of Suspension system for City Bus*
Izabela Kowarska, Krystian Kuczek, Tadeusz Uhl

MS-3.2 Advances in Applied Mechanics for Vehicle Concept Mod. Tuesday, 10:15 - 12:15
Maybach Chair: N. Baldanzini, St. Donders

10:15 *Finite Element Analysis on Solid-Shell Structures Using Enhanced Assumed Strain Method*
Nickil Srivatsan Mukunthamani, M.P.L. Parente, A.A. Fernandes, R.M. Natal Jorge

10:35 *Numerical Assessment of Crashworthiness and Occupants Injury in Rollover Crashes*
Rogerio Jose Marczak, Anderson Lima

10:55 *Occupant Safety and Crashworthiness Assessment of Paratransit Buses*
Bronislaw Gepner, **Jerry Wekezer**, Cezary Bojanowski, Leslaw Kwasniewski

11:15 *Design Assistance System (DASY)*
Sergii Bogomolov, Antonin Mikulec, Jan Macek

11:35 *Analysis of Stresses in Vehicle Driveline Systems Using a Flexible Multibody Approach*
Geoffrey Stéphane Virlez, Olivier Bruls, Nicolas Poulet, Emmanuel Tromme, Pierre Duysinx

11:55 *Derivation of a Conceptual Model for the Estimation of Vehicle Body Operational Excitation Profiles*
Marco Gubitosa, Jan Anthonis, **Stijn Donders**

MS-3.3 Advances in Applied Mechanics for Vehicle Concept Mod. Tuesday, 14:45 - 15:45
Maybach Chair: H. Kühnelt, B. Pluymers

14:45 *Assessment of Numerical Methodologies for Airborne Noise Prediction, Theoretical Approaches and Applications*
Michele De Gennaro, Helmut Kuehnelt

15:05 *Electric Vehicle Concept Model for Hardware-in-the-Loop Simulation. An Application Example: Battery Testing*
Riccardo Bartolozzi, Björn Haffke, Thomas Bruder

15:25 *Applied Eulerian-Lagrangian Spray Atomization Model to Simulate the Effects of In-Nozzle Cavitation on Fuel Atomization in High-Pressure Spray*
Dung Khuong-Anh, Sergio Hoyas, Xandra Margot, Frederic Ravet

Minisymposium MS-4

Advances in Numerical Methods for Flexible Multibody Mechanics

Session	Day	Time	Room
MS-4.1	Friday	10:15 - 12:15	K7

MS-4.1 Advances in Numerical Methods for Flexible Multibody Mech. Friday, 10:15 - 12:15 K7 Chair: A. Cardona, Jari Mäkinen	
10:15	*Contact and Wear Prediction in Internal Combustion Engine Valves* (Keynote) Federico Cavalieri, **Alberto Cardona**
10:55	*Conservative Time-Integration of Rigid Body Motion with Implicit Constraints by Quaternion Parameters* **Martin Bjerre Nielsen**, Steen Krenk
11:15	*Hydro-Mechanical Simulation Model of a Hydraulic Cylinder* **Heikki Marjamäki**, Jari Mäkinen, Antti Ylinen
11:35	*Collapse Simulations of Flexible Multibody Systems* **Jari Mäkinen**, Heikki Marjamäki

Minisymposium MS-5

Biomechanics from Cells to Tissues

Session	Day	Time	Room
MS-5.1	Monday	10:15 - 12:15	K1
MS-5.2	Monday	14:45 - 15:45	K1
MS-5.3	Monday	16:00 - 18:00	K1
MS-5.4	Tuesday	10:15 - 12:15	K1
MS-5.5	Tuesday	14:45 - 15:45	K1
MS-5.6	Tuesday	16:00 - 18:00	K1

MS-5.1 Biomechanics from Cells to Tissues K1	Monday, 10:15 - 12:15 Chair: P. Chabrand, D. Lacroix
10:15	*Mechanobiology of Bone Revisited: A Coupled Systems Biology-Micromechanical Approach* (Keynote) Stefan Scheiner, Peter Pivonka, **Christian Hellmich**, David Smith
10:55	*A Two-Solids Mixture Model for the Bio-Mechanical Interactions between Living Tissue and Bio-Resorbable Graft after Bone Reconstructive Surgery* Angela Madeo, Tomasz Lekszycki, **Francesco dell'Isola**
11:15	*An Anisotropic Discrete Fiber Model Based on a Generalized Strain Invariant with Application to Soft Biological Tissues* Cormac Flynn, **M.B. Rubin**
11:35	*Determination of the Soft Tissue Mechanical Properties Based on the Indentation Test* I. Goryacheva, A. Morozov, **Anastasia Lyubicheva**, Yu. Martynenko, F. Antonov
11:55	*Continuum Elasticity of Hydrating Collagen: a Multiscale Approach* **Claire Morin**, Peter Henits, Christian Hellmich

MS-5.2 Biomechanics from Cells to Tissues K1	Monday, 14:45 - 15:45 Chair: Ch. Hellmich
14:45	*Modeling of Stress-Softening in Collagenous Soft Tissues* **Thomas Schmidt**, Daniel Balzani, Gerhard A. Holzapfel
15:05	*In Vivo Mechanical Properties of Arteries: a Novel Identification Method Based on FEA and Image Registration* **Alexandre Franquet**, Stéphane Avril, Rodolphe Le Riche, Pierre Badel, Fabien Schneider, Christian Boissier, Jean-Pierre Favre

15:25 *Mechanical Response of the Human Aortic Arch: Experiments, Modelling and Simulation*
Claudio García-Herrera, Diego Celentano

MS-5.3 Biomechanics from Cells to Tissues	Monday, 16:00 - 18:00
K1	Chair: P. McGarry, K.W. Müller

16:00 *Theoretical and Experimental Investigation on Cell-Seeded Articular Cartilage Replacement Materials*
Jeong-Hun Yi, Marcus Stoffel, Sven Nebelung, Björn Rath

16:20 *Prestress Controls Forces of Adherent Cells and it is Dependent on the Extracellular Tissue Stiffness*
Sara Barreto, Cécile M. Perrault, Damien Lacroix

16:40 *Towards Modeling Mechanical Effects Arising During Cyclic Adenosine Monophosphate Release in Cells*
Luca Deseri, **Laura Lunghi**

17:00 *Computational Approach to the Simulation of the Viscoelastic Behaviour of the Cytoskeleton Using Finite Beam Elements*
Kei Wieland Müller, Christoph Meier, Christian C. Cyron, Andreas R. Bausch, Wolfgang A. Wall

17:20 *Simulating the Active Response of Cells to Cyclic Stretching*
Patrick McGarry, R.M. McMeeking, V.S. Deshpande

MS-5.4 Biomechanics from Cells to Tissues	Tuesday, 10:15 - 12:15
K1	Chair: St. Reiter, J. Stålhand

10:15 *Understanding the Multi-Scale Structure and Mechanical Behavior of Cortical Veins*
Mathieu Nierenberger, Rania Abdel Rahman, **Daniel George**, Daniel Baumgartner, Yves Rémond, Saïd Ahzi

10:35 *Association of Thrombus Age with the Dissection Properties of the Intraluminal Thrombus and the Thrombus-Covered Wall in Abdominal Aortic Aneurysms*
Jianhua Tong, Tina Cohnert, Peter Regitnig, Gerhard A. Holzapfel

10:55 *Effect of Perivascular Support on the In-Situ Mechanical Behavior of the Coronary Artery – An Experimental Investigation*
Ruoya Wang, Julia Raykin, Luke Brewster, Rudolph L. Gleason

11:15 *Coronary Atherosclerotic Plaque Rupture via an Inherent Pulsatile Fatigue Mechanism*
Steven Reiter, Rosaire Mongrain, Maria Abdelali, Jean-Claude Tardif

11:35 *Mathematical Modeling and Simulation of the Formation and Evolution of Plaques in Blood Vessels*
Yifan Yang, Maria Neuss-Radu

MS-5.5 Biomechanics from Cells to Tissues K1	Tuesday, 14:45 - 15:45 Chair: H. Weisbecker
14:45	*Layer-Specific Modeling of Damage Induced Softening in the Human Aorta and the Influence of Residual Stretches* **Hannah Weisbecker**, David M. Pierce, Gerhard A. Holzapfel
15:05	*Fibrous Cap Buckling in Atherosclerotic Plaque: Numerical and Analytical Studies* **Maria Abdelali**, Steven Reiter, Rosaire Mongrain, Michel Bertrand, Jean-Claude Tardif

MS-5.6 Biomechanics from Cells to Tissues K1	Tuesday, 16:00 - 18:00 Chair: K.M. Myers, M.B. Rubin
16:00	*Coupling Cell Mechanics and Function in Traumatic Brain Injury* Julián Andrés García, Jose María Peña, **Antoine Jerusalem**
16:20	*Biomechanical and Microstructural Properties of Common Carotid Arteries in Fibulin-5 Null Mice During Maturation* William Wan, **Ruoya Wang**, Rudolph L. Gleason
16:40	*Model-Based Identification of Motion Sensor Placement for Tracking Propulsion and Elongation of the Tongue* Yikun K. Wang, Martyn P. Nash, Jules A. Kieser, **Oliver Röhrle**
17:00	*Modeling of Dispersed Fibers in Continua* **Andreas J. Reinisch**, Andreas J. Schriefl, Gerhard A. Holzapfel
17:20	*Indentation Response of Human Cervical Tissue* **Kristin M. Myers**, Michelle L. Oyen, Kyoko Yoshida

Minisymposium MS-6

Cardiac Mechanics

Session	Day	Time	Room
MS-6.1	Thursday	10:15 - 12:15	K5
MS-6.2	Thursday	14:15 - 15:45	K5

MS-6.1 Cardiac Mechanics K5	Thursday, 10:15 - 12:15 Chair: E. Kuhl, N. Trayanova
10:15	*Recruitment of Stretch-Activated Channels Suppresses Spiral Wave Breakup* Yuxuan Hu, Viatcheslav Gurev, Jason Constantino, **Natalia Trayanova**
10:35	*Mechanisms Underpinning the Changes in Regional Work Following Cardiac Resynchronization Therapy* **Steven Alexander Niederer**, Pablo Lamata, Gernot Plank, Matthew Ginks , Kawal Rhode, Aldo Rinaldi , Reza Razavi , Nic Smith
10:55	*Pacing Hearts with Light: Multiscale Modeling of the Photoelectrochemistry of Living Systems* Jonathan Wong, Oscar J. Abilez, **Ellen Kuhl**
11:15	*Mechano-Electric Model for the Study of Atrial Arrhythmias* Elena S. Di Martino, Alessandro Satriano, Chiara Bellini, **Edward J. Vigmond**
11:35	*Finite Element Analysis of the Beating Heart within the Pericardium: A Frictionless Contact Problem* **Thomas Fritz**, Olaf Dössel
11:55	*Mechanical Models of the Porcine Atria in Healthy Condition and After Ventricular Tachypacing* **Chiara Bellini**, Elena S. Di Martino, Salvatore Federico

MS-6.2 Cardiac Mechanics K5	Thursday, 14:15 - 15:45 Chair: G. Plank, E.J. Vigmond
14:15	*Application of Advanced Bidomain Solver Techniques to Cardiac Electromechanics* Christoph Augustin, Elena Hoetzl, Thomas S.E. Eriksson, Anton J. Prassl, Gerhard A. Holzapfel, Olaf Steinbach, **Gernot Plank**
14:33	*A Structurally Motivated Model for Myocardial Fiber and Sheet Disarray* **Thomas Eriksson**, Gernot Plank, Gerhard A. Holzapfel
14:51	*Finite Strain Modelling of Human Left Ventricle in Diastole* **Xiao Yu Luo**, H.M. Wang, H. Gao, Ray W. Ogden, Colin Berry, T.J. Wang

15:09 *An Orthotropic Active Strain Formulation in Cardiac Biomechanics*
Simone Rossi, Ricardo Ruiz-Baier, Luca Pavarino, Alfio Quarteroni

15:27 *Numerical Simulation of Biological Tissues Using Finite Element Tearing and Interconnecting Techniques*
Christoph Michael Augustin, Olaf Steinbach

Minisymposium MS-7

Computational Strategies for Waves in Solids: Direct and Inverse Problems

Session	Day	Time	Room
MS-7.1	Tuesday	16:00 - 18:00	AU1
MS-7.2	Wednesday	10:15 - 12:15	AU1
MS-7.3	Thursday	10:15 - 12:15	AU1

MS-7.1 Computational Strategies for Waves in Solids AU1	Tuesday, 16:00 - 18:00 Chair: G. Degrande, M. Schanz
16:00	*High-Order Long-Time Stable Absorbing Boundary Conditions for Elastodynamics* (Keynote) D. Baffet, J. Bielak, **Dan Givoli**, T. Hagstrom, D. Rabinovich
16:40	*On the Stability of Non-Convolutional Unsplit-Field Perfectly Matched Layers for Time Domain Elastodynamics* **Stijn François**, S. Kucukcoban, L.F. Kallivokas
17:00	*Wave Propagation in Fluid-Filled Open-Cell Foams* **Holger Steeb**, Erik H. Saenger, Ralf Jänicke, David Uribe, Oscar Ruiz
17:20	*On the Numerical Simulation of the Dispersion of Elastic Waves in MEMS* **Attilio Frangi**, P.T. Savadkoohi
17:40	*FEM-BEM Coupling for Poro-Elastodynamics with Non-matching Grids* **Franz Rammerstorfer**, Martin Schanz

MS-7.2 Computational Strategies for Waves in Solids AU1	Wednesday, 10:15 - 12:15 Chair: M. Bonnet, M. Schanz
10:15	*Formulation and Fast Evaluation of the Multipole Expansions of the Elastic Half-Space Fundamental Solutions* **Stéphanie Chaillat**, Marc Bonnet
10:35	*Fast Computations of Wave Propagation in Highly Heterogeneous Media* **Pierre-David Letourneau**, Eric Darve
10:55	*Solving the Lamé-Navier Equations Using the Convolution Quadrature Method and the Directional Fast Multipole Method* **Thomas Traub**, Martin Schanz

11:15	*The Use of H-Matrices in the Numerical Prediction of Railway Induced Vibrations and Re-Radiated Noise* Pieter Coulier, Stijn François, Geert Lombaert, **Geert Degrande**
11:35	*H-Matrix Approximation to Time-Domain BEM in Elastodynamics* **Bernhard Kager**, Martin Schanz
11:55	*Fast Solution of the Heat Equation with a Boundary Element Method* **Michael Messner**, Martin Schanz, Johannes Tausch

MS-7.3 Computational Strategies for Waves in Solids	Thursday, 10:15 - 12:15
AU1	Chair: M. Bonnet, G. Degrande
10:15	*Some Examples of the Use of a Spectral-Element Method for Forward and Inverse Problems in Solid or Fluid-Solid Media* **Dimitri Komatitsch**, Paul Cristini
10:35	*A Second Degree Newton Method in Inverse Scattering Problem for a Crack* **Kuo-Ming Lee**
10:55	*An Error in Constitutive Equation Approach for Transient Inverse Elastodynamics* **Wilkins Aquino**, Marc Bonnet
11:15	*Microelastic Wavefield Signatures and their Implications for Microstructural Identification* **Stefano Gonella**, M. Steven Greene, Wing Kam Liu
11:35	*Simulation of Railway Vibrations in Horizontally Layered Anisotropic Soil* **Holger Waubke**, Wolfgang Kreuzer, Georg Rieckh
11:55	*The Effects of Noise on Identification of Material Parameters by Magnetic Resonance Elastography* **Nathanael Connesson**, E.H. Clayton, P.V. Bayly, F. Pierron

Minisymposium MS-8

Constitutive Modelling of Articular Cartilage

Session	Day	Time	Room
MS-8.1	Wednesday	10:15 - 12:15	K1
MS-8.2	Thursday	14:15 - 15:45	K4

MS-8.1 Constitutive Modelling of Articular Cartilage K1	Wednesday, 10:15 - 12:15 Chair: D.M. Pierce, T. Ricken
10:15	*Large Deformation Model of Elasticity and Permeability of Articular Cartilage* Salvatore Federico, **Alfio Grillo**
10:35	*Importance of the Collagen and Proteoglycan Distribution for Cartilage Function in a Knee Joint* Rami K. Korhonen, Kimmo Halonen, Mika Mononen, **Jukka Sakari Jurvelin**
10:55	*Predicting the Sample-Specific Structural and Diffusional Response of Cartilage Using DT-MRI* **David M. Pierce**, Tim Ricken, Gerhard A. Holzapfel
11:15	*An Outline of Growth Phenomena Based on Structural Optimization* **Franz-Joseph Barthold**

MS-8.2 Constitutive Modelling of Articular Cartilage K4	Thursday, 14:15 - 15:45 Chair: D.M. Pierce, T. Ricken
14:15	*On Growth and Remodeling of Biological Tissue* **Tim Ricken**
14:35	*A Biphasic Transverse Isotropic FEM Model for Cartilage* **Daniel Albrecht**, Tim Ricken, David Pierce, Gerhard A. Holzapfel
14:55	*3D Quantitative Structural Analysis of Second Harmonic Generation Images of Cartilage* Elisabeth Inge Romijn, Catharina de Lange Davies, David M. Pierce, Gerhard A. Holzapfel, **Magnus Lilledahl**

Minisymposium MS-9

Contact and Adhesion: Cohesive Zone Model

Session	Day	Time	Room
MS-9.1	Monday	10:15 - 12:15	Casineum
MS-9.2	Monday	14:15 - 15:45	Casineum
MS-9.3	Monday	16:00 - 18:00	Casineum
MS-9.4	Tuesday	10:15 - 12:15	Casineum
MS-9.5	Tuesday	14:45 - 15:45	Casineum
MS-9.6	Tuesday	16:00 - 18:00	Casineum

MS-9.1 Contact and Adhesion: Cohesive Zone Model Casineum	Monday, 10:15 - 12:15 Chair: St. Roth, V. Tvergaard
10:15	*Adhesive Contact: a Survey and a Unified Formulation* **Michel R. Raous**, Gianpietro Del Piero
10:35	*Variational Formulation of a Dynamic Surface Interaction Problem in Viscoelasticity* **Marius Cocou**
10:55	*Derivation of an Asymptotic Model Describing the Non-Linear Mechanical Behaviour of Steel Reinforcements* **Martin David**, Jean-Jacques Marigo, Eric Lorentz, Sylvie Michel-Ponnelle
11:15	*Predicting Crack Velocity Instabilities with Rate-Dependent Cohesive-Zone Models* **Giulio Alfano**, Marco Musto
11:35	*Gradient of Damage Enhancement for Cohesive Interface Laws* **Nunziante Valoroso**, Michel Raous

MS-9.2 Contact and Adhesion: Cohesive Zone Model Casineum	Monday, 14:45 - 15:45 Chair: M. Raous, C. Sarrado
14:45	*Material Size Effects on Crack Growth along Patterned Wafer-Level Cu-Cu Bonds* **Viggo Tvergaard**, Christian F. Niordson, John W. Hutchinson
15:05	*Paris-Like Fatigue Laws and Cohesive Force Models* **Jean-Jacques Marigo**
15:25	*Simulation of Local Instabilities During Crack Propagation with Competing Damage Mechanisms* **Geralf Hütter**, Thomas Linse, Uwe Mühlich, Meinhard Kuna

MS-9.3 Contact and Adhesion: Cohesive Zone Model	Monday, 16:00 - 18:00
Casineum	Chair: G. Alfano, G. Hütter

16:00 *Robust Implementation of Non-Smooth Cohesive Laws in the X-FEM*
Guilhem Ferte, Patrick Massin, Nicolas Moës

16:20 *Some Numerical and Mechanical Issues when Using Intrinsic Cohesive Approaches*
Nawfal Blal, Loic Daridon, Yann Monerie, Stephane Pagano

16:40 *Implementation of the Discontinuous Galerkin Method in Abaqus to Tend Towards Initially Rigid Cohesive Zones*
Yann Charles

17:00 *Numerical Study on Interfacial Fatigue Crack Growth Modelled with Cohesive Zone Elements*
Stephan Roth, Meinhard Kuna

17:20 *A Cohesive Element Model for Mixed Mode Loading Applied to Meso-Scale Concrete Specimens*
Leonardo Snozzi, J.F. Molinari

MS-9.4 Contact and Adhesion: Cohesive Zone Model	Tuesday, 10:15 - 12:15
Casineum	Chair: N. Carrere, K.L. Nielsen

10:15 *Strength of Adhesively Joined Structures – an Integrated Approach*
Ulf Stigh

10:35 *Comparison of Cohesive Zone Model and Coupled Criterion to Predict the Onset of Failure – Application to Bonded Structures*
Nicolas Carrere, Azalia Moradi, Eric Martin, Dominique Leguillon

10:55 *Reliability of Cohesive Zone Models in Terms of Energy Dissipation during Mixed-Mode Delamination Growth*
Carlos Sarrado, I. Llanos, I. Urresti, A. Turon

11:15 *Proposition of a Framework for the Development of a Cohesive Zone Model Adapted to CFRP Laminates*
Thomas Vandellos, Nicolas Carrère, Cédric Huchette

11:35 *Numerical Study of the Fracture Behaviour of an Electron Beam Welded Steel Joint by Cohesive Zone Modeling*
Haoyun Tu, Siegfried Schmauder, Ulrich Weber

MS-9.5 Contact and Adhesion: Cohesive Zone Model	Tuesday, 14:45 - 15:45
Casineum	Chair: M. Cocou, J. Neggers

14:45 *Implementing Identification of Cohesive Interface Laws*
Nunziante Valoroso, **Roberto Fedele**, Salvatore Sessa

15:05 *Contact Behaviour of Adhesive Particles Including Viscous Damping*
Katja Mader, J. Tomas

15:25 *Analysis and Development of Cohesive Zone Models for Mixed Mode Separation and Overclosure*
Patrick McGarry, E. O'Mairtin, G. Parry, G.E. Beltz

MS-9.6 Contact and Adhesion: Cohesive Zone Model	Tuesday, 16:00 - 18:00
Casineum	Chair: U. Stigh, N. Valoroso

16:00 *A Novel Viscoelastic Cohesive-Zone Model: Formulation, Validation and Enrichment through Process-Zone Micromechanics*
Marco Musto, Giulio Alfano

16:20 *Analysis of Micro-Scale Dissipation Mechanisms of Ductile Interfaces*
Jan Neggers, Johan Hoefnagels, Olaf van der Sluis, Bart Vossen, Marc Geers

16:40 *A Novel Method to Measure Tensile Properties of Fibres*
Anders Biel

17:00 *Patterned Interface Adhesion for MEMS Encapsulation by Transferred Caps: Measurements and Modelling*
Coraly Cuminatto, G. Schelcher, M. Braccini, G. Parry

17:20 *Cohesive Traction-Separation Laws for Tearing of Ductile Metal Plates*
Kim Lau Nielsen, J.W. Hutchinson

Minisymposium MS-10

Dynamics of Solid Systems with Friction

Session	Day	Time	Room
MS-10.1	Monday	16:00 - 18:00	AU1
MS-10.2	Tuesday	10:15 - 12:15	AU1
MS-10.3	Tuesday	14:45 - 15:45	AU1

MS-10.1 Dynamics of Solid Systems with Friction AU1	Monday, 16:00 - 18:00 Chair: A. Kireenkov, A. Steindl
16:00	*Numerical Calculation of Slip-Stick Rotating Waves Caused by Coulomb Friction* **Alois Steindl**
16:20	*Theory of the Multi-Component Dry Friction* (Keynote) **Alexey Albertovich Kireenkov**
17:00	*Thermoelastic Instabilities in Layered Structures: Semianalytical Modelling Strategy* **Matthias Graf**, Georg-Peter Ostermeyer
17:20	*Force and Moment of a Friction in the Case of Flat Elliptic Contact of a Body with a Supported Plane* **Mariya A. Munitsyna**
17:40	*A Finite Element Contact Implementation for Viscoelastic Solids on Rough Surfaces* **Thang Xuan Duong**, Roger Andrew Sauer

MS-10.2 Dynamics of Solid Systems with Friction AU1	Tuesday, 10:15 - 12:15 Chair: K.R. Hedrih, M.A. Munitsyna
10:15	*Main Landing Gear's Shimmy Models Based on Poly-Component Dry Friction* Sergey Igorevich Zhavoronok, **Anatoly Alexandrovich Zagordan**, Natalya Sergeevna Bernikova
10:35	*Free Nonlinear Dynamics of a Heavy Mass Particle along Rotating Rough Curvilinear Lines with Amontons-Coulomb* **Katica R. (Stevanovic) Hedrih**
10:55	*Free Puck on a Rough Horizontal Plane* **Tatiana Salnikova**, Dmitrii Treschev
11:15	*Walking Robot Dynamics on a Rough Inclined Cylinder* Yury Filippovich Golubev, **Elena Vadimovna Melkumova**

11:35	*On the Dynamics of a Homogeneous Circular Cylinder on an Inclined Plane with Friction* **Anna Rusinova**
11:55	*Dynamics of Sphere on a Horizontal Plane with Friction* **Olga Sentemova**

MS-10.3 Dynamics of Solid Systems with Friction	Tuesday, 14:45 - 15:45
AU1	Chair: A. Kireenkov, E.V. Melkumova

14:45	*On the Stability of the Motion of Railway Wheels with Dry Friction* **Grigoriy Markovich Rozenblat**
15:05	*Vibro-Impact System Based on Oscillator, with Two Heavy Mass Particles Moving along a Rough Circle* **Srdjan V. Jović**, Vladimir Raičević

Minisymposium MS-11

Experimental Micromechanics and Nanomechanics

Session	Day	Time	Room
MS-11.1	Tuesday	14:45 - 15:45	K8
MS-11.2	Tuesday	16:00 - 18:00	K8
MS-11.3	Thursday	10:15 - 12:15	K8
MS-11.4	Thursday	14:15 - 15:45	K8

MS-11.1 Experimental Micromechanics and Nanomechanics K8	Tuesday, 14:45 - 15:45 Chair: G. Dehm
14:45	*Variable Temperature, In-Situ Nanomechanical Testing Methods to Explore Fracture and Plastic Deformation Mechanisms of Semiconductors and Metals* (Keynote) J. Wheeler, R. Ghisleni, C. Niederberger, R. Raghavan, **Johann Michler**
15:25	*Effect of Tilt on the Micropillar Compression of Plastically Anisotropic Single-Crystals* R. Soler, **Jon M. Molina-Aldareguia**, J. Segurado, Javier LLorca

MS-11.2 Experimental Micromechanics and Nanomechanics K8	Tuesday, 16:00 - 18:00 Chair: J. Molina-Aldareguía, J.R. Greer
16:00	*Dislocation Source Strengthening of Sub-Micron Al Fibers* (Keynote) **Marc Legros**, Frédéric Mompiou, Daniel Caillard, Daniel S. Gianola, Andreas Sedlmayr, Oliver Kraft
16:40	*Size Effects on Plasticity in Hard Materials* **Sandra Korte**, W. J. Clegg
17:00	*SIZE MATTERS: Mechanical Properties of Hierarchical Materials – from Nano to Micro to Macro* **Julia R. Greer**, A.T. Jennings, D. Jang, J. Lian, S. Hutchens
17:20	*Twin Stability of Nanotwinned Cu Under Various Loading Conditions* **Andrea Maria Hodge**, Timothy A. Furnish, Carla Shute, Julia R. Weertman
17:40	*Influence of Grain Size to Surface Ratio on the Yield Stress of Micron-Sized Polycrystalline Copper Wires* Bo Yang, Christian Motz, **Gerhard Dehm**

MS-11.3 Experimental Micromechanics and Nanomechanics	Thursday, 10:15 - 12:15
K8	Chair: G. Dehm, J. Molina-Aldareguía

10:15	*On the Reversibility of Dislocation Pile-Ups at the Micron Scale: A Synchrotron µLaue Diffraction Study* **Christoph Kirchlechner**, Marlene W. Kapp, Christian Motz, Wolfgang Grosinger, Jean-Sebastien Micha, Olivier Ulrich, Gerhard Dehm
10:35	*Stress Evolution and Cracking of Crystalline Diamond Thin films on Ductile Titanium Substrate: Analysis by Micro-Raman Spectroscopy and Analytical Modelling* Furqan Ahmed, **Karsten Durst**
10:55	*Fracture Toughness Testing at the Nanoscale by Microcantilever Bend Tests and Bulge Tests on Thin Membranes* **Mathias Göken**, Karsten Durst, Benoit Merle, Farasat Iqbal, Johannes Ast
11:15	*High Temperature Micro-Mechanical Fracture Testing* **David Edward John Armstrong**, Steve G. Roberts, Angus J. Wilkinson
11:35	*Deformation of Metallic Glasses: Influence of Structural Inhomogeneities* **Oliver C. Franke**, Christopher A. Schuh, Horst Hahn, Andrea M. Hodge
11:55	*Low Temperature Deformation in Complex Metallic Alloys* **Claudia Walter**, Volker Schnabel, Joshua D. Weston, Sandra Korte, William J. Clegg

MS-11.4 Experimental Micromechanics and Nanomechanics	Thursday, 14:15 - 15:45
K8	Chair: Ch. Tromas

14:15	*Influence of Pre-Existing Dislocations on the Pop-In Phenomenon During Nanoindentation in MgO* **Christophe Tromas**, Alex Montagne, Valérie Audurier
14:33	*The Nanomechanics of Ion-Induced Grain Rotation in Thin Metal Films* **Ralph Spolenak**, Alla Sologubenko, Matteo Seita
14:51	*Towards Full-Field Stress and Strain Measurement in Structured Membranes* **Johan Hoefnagels**, Jan Neggers, Stephane Roux, Francois Hild, Marc Geers
15:09	*Micromechanical Characterization of Glass/Epoxy Interfaces during Hygrotermal Ageing* **Marco Lai**, John Botsis, Joel Cugnoni
15:27	*Deformation Mechanisms in Metallic Nanowires* Lisa Y. Chen, Daniel J. Magagnosc, Mo-rigen He, **Daniel S. Gianola**

Minisymposium MS-12

Generalized Models of Continuum Mechanics

Session	Day	Time	Room
MS-12.1	Thursday	10:15 - 12:15	K4
MS-12.2	Thursday	16:00 - 18:00	K4
MS-12.3	Friday	10:15 - 12:15	K4

MS-12.1 Generalized Models of Continuum Mechanics K4	Thursday, 10:15 - 12:15 Chair: C.B. Hirschberger, P. Steinmann
10:15	*Formulation and Computational Exploitation of Mixed Variational Principles for the Evolution Problem of Gradient-Extended Solids* (Keynote) **Christian Miehe**
10:50	*Porous Media as Microstructured Mixtures* **Vittorio Sansalone**, Salah Naili, Antonio DiCarlo
11:07	*Semi-Inverse Solutions for the Deformation of Porous Cylinders* **Ionel-Dumitrel Ghiba**
11:24	*Global and Local Approaches to Fracture: Convergence Through Non Local Damaging* **Paul Sicsic**, Jean-Jacques Marigo
11:41	*A Scale-Dependent Plasticity–Damage Theory for Hardening and Softening* **Ron H.J. Peerlings**, Leong Hien Poh, Marc G.D. Geers
11:58	*A Self-Similar Laplacian in n Dimensions and Some Applications to Dynamic Problems* **Thomas Michael Michelitsch**, Gérard A. Maugin, Andrzej F. Nowakowski, Franck C.G.A. Nicolleau, Shahram Derogar

MS-12.2 Generalized Models of Continuum Mechanics K4	Thursday, 16:00 - 18:00 Chair: D. Reddy, R.H.J. Peerlings
16:00	*On the Calculation of Geometrically Necessary Dislocation Densities in Gradient-Extended Crystal Plasticity* **Swantje Bargmann**, Magnus Ekh, Bob Svendsen
16:20	*An Extension of Korn's First Inequality to H(Curl) Motivated by Gradient Plasticity with Plastic Spin* **Patrizio Neff**, Dirk Pauly, Karl-Josef Witsch
16:40	*On Softening and Damage in Gradient-Based Multifield Formulations* **Heiko Clasen**, C. Britta Hirschberger

17:00	*An Asymptotic Second Gradient Reissner-Mindlin Plate Model* **Michele Serpilli**, Francoise Krasucki, Giuseppe Geymonat
17:20	*On the Computational Modelling of Multifield Single-Crystal Gradient Plasticity Formulations* **C. Britta Hirschberger**, B. Daya Reddy
17:40	*Variationally Consistent Homogenization of Subscale Gradient Plasticity Applied to Polycrystals* **Kenneth R. Runesson**, Magnus Ekh, Fredrik Larsson

MS-12.3 Generalized Models of Continuum Mechanics	Friday, 10:15 - 12:15
K4	Chair: S. Bargmann, K.R. Runesson
10:15	*Generalized Continua: a Cautionary Note* **Antonio DiCarlo**
10:35	*Diffeomorphism Invariance for Lagrangian Density: Applications to Gradient Continuum and Gravitation* **Lalaonirina Rakotomanana**, Nirmal Antonio Tamarasselvame
10:55	*Numerical Determination of Material Parameters for Cosserat Continua via Homogenization* **Dominik Branke**, Jörg Brummund, Georg Haasemann, Volker Ulbricht
11:15	*A Comparison of Atomistic and Enhanced Continuum Approaches for Modelling Surface Effects in Solids* **Denis Davydov**, Ali Javili, Andrew McBride, Paul Steinmann
11:35	*Wave Propagation in Micro Heterogeneous Materials by Extended Continuum Approaches* **Ralf Jänicke**, Holger Steeb
11:55	*Extended Seth–Hill Generalized Strain for Orthotropic Continua* **David Conrad Kellermann**, Mario M. Attard

Minisymposium MS-13

Growth and Remodelling of Soft Tissues: Theoretical Frameworks and Numerics

Session	Day	Time	Room
MS-13.1	Thursday	10:15 - 12:15	S2
MS-13.2	Thursday	14:15 - 15:45	S2

MS-13.1 Growth and Remodelling of Soft Tissues S2	Thursday, 10:15 - 12:15 Chair: G.A. Maugin, L. Yoshihara
10:15	*Thermo-Mechanics of Mass Diffusion and Biological Growth* P. Ciarletta, L. Preziosi, **Gerard A. Maugin**
10:35	*A Computational Approach for Transport in Biological Fluid-Structure-Systems as a Basis for Advanced Growth Modeling* **Lena Yoshihara**, Mirella Coroneo, Wolfgang A. Wall
10:55	*Growth and Remodeling of Arterial Tissue: One-Dimensional Constrained Mixture Theory* **Ganarupan Satha**, Stefan B. Lindström, Anders Klarbring
11:15	*Biomechanics and Mechanobiology of Growing Skin* Alexander M. Zöllner, Adrian Buganza Tepole, **Ellen Kuhl**

MS-13.2 Growth and Remodelling of Soft Tissues S2	Thursday, 14:15 - 15:45 Chair: I. Karšaj
14:15	*Interaction of Intraluminal Thrombus and Aortic Wall – 3-D Numerical Model* **Lana Virag**, Igor Karšaj, Jay D. Humphrey
14:35	*Theoretical and Numerical Study of Evolution Processes in Blood Vessels* **Pablo Saez**, Estefanía Peña, Miguel Ángel Martínez, Ellen Kuhl
14:55	*Successful Recapitulation of the Benninghoff Architecture in Tissue Engineered Cartilage is Predicted to Depend on Construct Composition at the Time of Implantation* **Thomas Nagel**, Daniel J. Kelly
15:15	*A 3-D Finite Element Constrained Mixture Model of Aortic Growth and Remodeling: Theoretical and Numerical Considerations* (Presented via Skype) **Arturo Valentín**, Jay D. Humphrey, Gerhard A. Holzapfel

Minisymposium MS-14

Homogenization Strategies for Multiphase Materials

Session	Day	Time	Room
MS-14.1	Monday	10:15 - 12:15	K8
MS-14.2	Monday	16:00 - 18:00	K8
MS-14.3	Tuesday	10:15 - 12:15	K8

MS-14.1 Homogenization Strategies for Multiphase Materials K8	Monday, 10:15 - 12:15 Chair: M. Geers, P.M. Suquet
10:15	*Size-Dependent Homogenization of Polycrystals* (Keynote) **Samuel Forest**, Nicolas Cordero, Esteban P. Busso
10:55	*Linear Elastic Trusses Leading to Continua with Exotic Mechanical Interactions* Jean-Jacques Alibert, **Francesco dell'Isola**, Pierre Seppecher
11:15	*Prolongation Conditions for FE^2-Analysis of Coupled Consolidation* **Fang Su**, Kenneth Runesson, Fredrik Larsson
11:35	*Multiscale Simulations of Composites with Non-Local Damage-Enhanced Mean-Field Homogenization* **Ling Wu**, Ludovic Noels, Laurent Adam, Issam Doghri
11:55	*A Micromechanical Modeling of Shear-Coupling Grain Boundary Migration in FCC Bi-Crystals* **Stephane Berbenni**, Bhasker Paliwal, Mohammed Cherkaoui

MS-14.2 Homogenization Strategies for Multiphase Materials K8	Monday, 16:00 - 18:00 Chair: I. Doghri, P.P. Castañeda
16:00	*Different Strategies to Model Microstructural Effects on the Dilatational Plastic Behavior of Porous Polycrystalline Materials* (Keynote) **Ricardo Lebensohn**
16:40	*Yield Surfaces of a Hosford Material Containing a Hollow Sphere* **Georg Falkinger**
17:00	*A Two-Scale Approach for the Transition from Homogenization to Localization in Multi-Phase Materials* (Keynote) **Marc Geers**, Erica Coenen, Emanuela Bosco, Varvara Kouznetsova
17:40	*A Study on Ductile Failure Using nonlinear Homogenization Models for Porous Materials* **Kostas Danas**, Pedro Ponte Castañeda, Nick Aravas

MS-14.3 Homogenization Strategies for Muliphase Materials K8	Tuesday, 10:15 - 12:15 Chair: S. Forest, P.M. Suquet
10:15	*Constitutive Models for Magneto-Elastic Composites at Finite Strains: The Effects of Particle Shape and Anisotropy* (Keynote) **Pedro Ponte Castañeda**, Evan Galipeau
10:50	*Effective Response and Field Statistics in Elasto(visco)plastic Composites under Complex Loadings* **Pierre M. Suquet**, N. Lahellec
11:07	*Self-Consistent Estimates of 3-Phases Non Ageing Linear Viscoelastic Heterogeneous Media Formulated as an Internal Variables Formulation* **Renaud Masson**, V. Blanc
11:24	*Effects of Grain Size Distribution and Stress Heterogeneity on the Yield Stress of Polycrystals: A Numerical Approach* Francis Lavergne, **Renald Brenner**, Karam Sab
11:41	*Microstructural-Based Three-Dimensional Homogenization Modeling of Deformation in as-Soldered and Aged SnAgCu Lead-Free Solder* Milad Maleki, **Joel Cugnoni**, John Botsis
11:58	*A Multiscale Damage Model for Fiber-Reinforced Polymer Materials* **Johannes Spahn**, Heiko Andrae, Ralf Müller

Minisymposium MS-15

Mechanics of Biological Membranes

Session	Day	Time	Room
MS-15.1	Thursday	14:15 - 15:45	K1
MS-15.2	Thursday	16:00 - 18:00	K1

MS-15.1 Mechanics of Biological Membranes K1	Thursday, 14:15 - 15:45 Chair: L. Deseri
14:15	*Biomembrane Structural Model* **Gerald Rolf Kress**, Raoul Hopf, Arabella Mauri, Edoardo Mazza
14:33	*Homogenized Mechanical Properties of Biomembranes Considering Cauchy and Cosserat Equivalent Continua* **Jean-François Ganghoffer**, Mohamed Assidi, Francisco Dos Reis
14:51	*Modeling the Mechanical Behavior of Fetal Membranes* **Edoardo Mazza**, Wilfried Bürzle, Claudia Haller, Martin Ehrbar
15:09	*Experimental Investigations of Fetal Membrane Mechanics* **Wilfried Bürzle**, Edoardo Mazza, Claudia Haller, Martin Ehrbar
15:27	*Construction of a Damage Model for a Fibrous Membrane – Identification on Human Liver Capsule* Aline Brunon, **Michel Coret**, Karine Bruyère-Garnier, Alain Combescure

MS-15.2 Mechanics of Biological Membranes K1	Thursday, 16:00 - 18:00 Chair: J.-F. Ganghoffer, E. Mazza
16:00	*Finite Indentation of Curved Biological Membranes, Modelling and Comparison to Experiments* **Simon Peter Pearce**, John R. King
16:20	*Robust Identification of Soft Tissues Constitutive Law Using Digital Image Correlation* **Jean Gillibert**, Muriel Braccini, Guillaume Parry, Julien Rethore, Rafael Estevez
16:40	*Membranal Effects During Cyclic Adenosine Monophosphate Pathway in Human Trophoblast Cells* **Luca Deseri**, Laura Lunghi
17:00	*Membrane Fusion Based on the Stalk Model* **Mariana Tsvetanova Hadzhilazova**, Jean-Francois Ganghoffer, Ivailo Milachkov Mladenov
17:20	*Biological Membranes from the Perspective of Smart Materials – A Theoretical Study* **Lior Atia**, Sefi Givli

Minisymposium MS-16

Mechanics of Biomedical Implants and Devices and their Interaction with Tissues and Cells

Session	Day	Time	Room
MS-16.1	Thursday	14:15 - 15:45	K3
MS-16.2	Thursday	16:00 - 18:00	K3

MS-16.1 Mechanics of Biomedical Implants and	Thursday, 14:15 - 15:45
K3	Chair: J.M. García-Aznar
14:15	*Stress Intensity on Crack Tip in Carbon Nanotube Reinforced Bone Tissue* **Kaveh PourAkbar Saffar**, Leszek J. Sudak, Salvatore Federico
14:33	*Bone Remodeling Simulation of the Scapula* Carlos Quental, **João Folgado**, Paulo Fernandes, Jacinto Monteiro
14:51	*Multiobjective Optimization of Scaffolds For Bone Tissue Engineering* Marta R. Dias, **Paulo Rui Fernandes**, Jose Miranda Guedes, Scott J. Hollister
15:09	*Moving Boundary-Type Bone Formation During Endosseous Healing* **Pavel Prokharau**, Fred Vermolen, Jose Manuel García-Aznar
15:27	*A Non-Linear Biphasic Model for the Periodontal Ligament: Modeling and Simulation* **Marco Favino**, Rolf Krause, Christoph Bourauel, Marcel Drolshagen

MS-16.2 Mechanics of Biomedical Implants and	Thursday, 16:00 - 18:00
K3	Chair: P. McGarry, C.A. Sweeney
16:00	*Experimental Determination of Circumferential Mechanical Properties of Fresh and Frozen Carotid Plaques* **John Joseph Mulvihill**, Michael T. Walsh
16:20	*Reconstruction of Stent Induced Loading Forces on the Aortic Valve Complex* **Raoul Michael Hopf**, M. Gessat, V. Falk, E. Mazza
16:40	*Micromechanical Modelling of Fatigue Damage and Crack Nucleation in Cardiovascular Stents* **Caoimhe A. Sweeney**, Peter E. McHugh, Sean B. Leen
17:00	*Size Effects and Biodegradation in Metals for Coronary Stent Applications* **J.A. Grogan**, S.B. Leen, Peter McHugh
17:20	*Mechanical Biocompatibility of Medical Mesh Implants* **Barbara Röhrnbauer**, Gerald Kress, Edoardo Mazza

Minisymposium MS-17

Mechanics of Granular Media

Session	Day	Time	Room
MS-17.1	Monday	10:15 - 12:15	Blauer Salon
MS-17.2	Monday	14:45 - 15:45	Blauer Salon
MS-17.3	Monday	16:00 - 18:00	Blauer Salon
MS-17.4	Tuesday	10:15 - 12:15	Blauer Salon
MS-17.5	Tuesday	14:45 - 15:45	Blauer Salon
MS-17.6	Tuesday	16:00 - 18:00	Blauer Salon
MS-17.7	Wednesday	10:15 - 12:15	Blauer Salon
MS-17.8	Thursday	10:15 - 12:15	Blauer Salon

MS-17.1 Mechanics of Granular Media — Monday, 10:15 - 12:15
Blauer Salon — Chair: J.D. Goddard, P.-Y. Hicher

10:15 *Particle Size Segregation in Poly-Disperse Granular Flows* (Keynote)
John Mark Nicholas Timm Gray

10:55 *Hopper Flow Predicted Using a Constitutive Model with Microstructure Evolution*
Jin Sun, Sankaran Sundaresan

11:15 *A Model for the Crestline Dynamics of Dunes*
Hiraku Nishimori, Hirofumi Niiya, Akinori Awazu

11:35 *Characteristics of Sandpile Formed in Water*
Jidong Zhao, Tong Shan

11:55 *Nonharmonicity in Vibrated Granular Solids*
Carl Schreck, Thibault Bertrand, Corey OHern, Mark Shattuck

MS-17.2 Mechanics of Granular Media — Monday, 14:45 - 15:45
Blauer Salon — Chair: A. Dyskin, N. Kruyt

14:45 *Dissipation Potentials in the Visco-Plasticity of Granular Media*
Joe D. Goddard

15:05 *A Novel Elasto-Plastic Model for the Deformation and Flow of Granular Materials*
David Harris

15:25 *On Shear Strength and Fabric of Granular Materials*
Niels Kruyt, L. Rothenburg

MS-17.3 Mechanics of Granular Media — Monday, 16:00 - 18:00
Blauer Salon — Chair: J.M.N.T. Gray, C. Schreck

16:00 *Incremental Response of a Model Granular Material*
Francesco Froiio, **Jean-Noel Roux**

16:20 *Insight into the Strength of Granular Materials from Particle Scale*
Xia Li, Hai-Sui Yu

16:40 *Micromechanics of Dilatancy, Critical State and Shear Bands in Dense Granular Materials*
Sinisa Mesarovic, Jagan M. Padbidri, Balasingam Muhunthan

17:00 *Bifurcation in Rolling of Non-Spherical Grains and Fluctuations in Macroscopic Friction*
Arcady Dyskin, Elena Pasternak

17:20 *DEM-Simulation of Zeolite 4A Granules*
Peter Mueller, Juergen Tomas

17:40 *Mechanics of a Crushable Pebble Assembly Using Discrete Element Method*
Ratna Kumar Annabattula, Yixiang Gan, Marc Kamlah

MS-17.4 Mechanics of Granular Media — Tuesday, 10:15 - 12:15
Blauer Salon — Chair: E. Pasternak, A. Tordesillas

10:15 *A Multi-Scale Approach for Modelling Internal Erosion Effects in Soils* (Keynote)
Pierre-Yves Hicher, Luc Scholtès, Luc Sibille

10:55 *Size Effects Due to Grain Crushing in Granular Materials*
Etienne Frossard, **Carlos Ovalle**, Li Gang, Wei Hu, Christophe Dano, Pierre-Yves Hicher, Siegfried Maiolino

11:15 *Multiscale Characterisation of Diffuse Granular Failure*
Antoinette Tordesillas, Sebastian Pucilowski, Luc Sibille, Francois Nicot, Felix Darve

MS-17.5 Mechanics of Granular Media — Tuesday, 14:45 - 15:45
Blauer Salon — Chair: C. Ovalle, A. Singh

14:45 *A 2D Constitutive Model with Anisotropy for Granular Materials*
Vanessa Magnanimo, Stefan Luding

15:05 *Simple Shear of Granular Matter*
Diego Berzi

15:25 *Analysis of the Components of a Hypoplastic Constitutive Model*
Nishant Kumar, Fatih Goncu, Vanessa Magnanimo, Stefan Luding

MS-17.6 Mechanics of Granular Media Blauer Salon	Tuesday, 16:00 - 18:00 Chair: K. Bagi, St. Luding
16:00	*From Particles Towards Continuum Theory: Dilatancy and Anisotropy* **A. Singh**, T. Weinhart, V. Magnanimo, Stefan Luding
16:20	*A Virtual Experimental Investigation of Shear Localization in Granular Media* **Wenxiong Huang**, Liya Huang
16:40	*Investigation of Grain Crushing of an Ensemble of Randomly Shaped Particles Using the Discrete Element Method* **Imre Laufer**, Katalin Bagi, Erich Bauer
17:00	*Characterization of the Influence of Relative Humidity on the Behavior of Granular Media* **Iñaki Gomez Arriaran**, Irene Ippolito, Ricardo Chertcoff, Rosario De Schant, J.A. Millán
17:20	*Mirco-Scale Study on Specimen Size Effect in Discrete Element Simulations of Granular Assemblies* **Xin Huang**, Catherine O'Sullivan, Fiona C.Y. Kwok

MS-17.7 Mechanics of Granular Media Blauer Salon	Wednesday, 10:15 - 12:15 Chair: P. Guo, D. Harris
10:15	*Density Waves in Tapped, Monodisperse Granular Systems* **Anthony D. Rosato**, Denis L. Blackmore, Xavier Tricoche, Vishagan Ratnaswamy
10:35	*Micromechanics of Seismic Wave Propagation in Granular Materials* **John O'Donovan**, George Marketos, Catherine O'Sullivan
10:55	*Transient Dynamics of a Finite Harmonic Atomic Chain Modelled from an Accurately Derived Enhanced Continuum* **Miguel Charlotte**
11:15	*On a Possibility of Reconstruction of Cosserat Moduli in Particulate Materials Using Long Waves* **Elena Pasternak**, Arcady Dyskin
11:35	*Anisotropic Effect of Capillary Suction on the Shear Strength of Sand* **Peijun Guo**
11:55	*Influence of the Grain Size Distribution on Critical State of Granular* **Gang Li**, Christophe Dano, Carlos Ovalle, Pierre-Yves Hicher

MS-17.8 Mechanics of Granular Media Blauer Salon	Thursday, 10:15 - 12:15 Chair: R. Conti, W. Huang
10:15	*Study of the Behavior of the Internally Unstable Soils Using DEM* **Abbas Soroush**, Mojtaba Farahnak Langroudi
10:35	*Viscous Regularization for Cam-Clay Plasticity: How to Handle Subcritical Softening* **Riccardo Conti**, Claudio Tamagnini, Antonio DeSimone
10:55	*The Influence of the Degradation of the Solid Hardness on Pressure Dependent Limit Void Ratios* **Erich Bauer**
11:15	*Cyclic Elasto-Viscoplastic Constitutive Model for Soils Considering the Nonlinear Kinematic Hardening Rules and Strain-Induced Degradation* Sayuri Kimoto, B. Shahbodaghkha, M. Mirjalili, **Fusao Oka**

Minisymposium MS-18

Mechanics of Nanoindentation

Session	Day	Time	Room
MS-18.1	Monday	10:15 - 12:15	K7
MS-18.2	Monday	14:45 - 15:45	K7
MS-18.3	Monday	16:00 - 18:00	K7
MS-18.4	Tuesday	10:15 - 12:15	K7
MS-18.5	Tuesday	16:00 - 18:00	K7

MS-18.1 Mechanics of Nanoindentation K7	Monday, 10:15 - 12:15 Chair: B. Derby, A.S. Schneider
10:15	*Nanoindentation Versus Microcompression: How Loading Geometry Affects Size Effects* **Erica Lilleodden**
10:35	*The Hardness and Strength of Metal Tribofilms: an Apparent Contradiction between Nanoindentation and Pillar Compression* Corbett C. Battaile, **Brad L. Boyce**, Christopher R. Weinberger, Somuri V. Prasad, Joseph R. Michael, Blythe G. Clark
10:55	*Revealing Nanoindentation Deformation Mechanisms by Advanced Characterization and In-Situ Methods* **Daniel Kiener**, Megan J. Cordill
11:15	*Dislocation Nucleation and Size Effects for Indentations in CaF2 Single Crystals: Quantification of Dislocation Structure and Molecular Dynamics Simulations* **Karsten Durst**
11:35	*Micro and Nanomechanical Testing under Simulated Environmental Conditions* **Afrooz Barnoush**

MS-18.2 Mechanics of Nanoindentation K7	Monday, 14:45 - 15:45 Chair: A.S. Schneider
14:45	*Modulus Mapping – State Of The Art* **Ude Dirk Hangen**, Syed Asif, Oden Warren
15:05	*Using Nano-Indentation Technique to Measure the Out-of-Plane Young's Moduli of Laminated Fibrous Composites* **Luoyu Roy Xu**, R. Martinez

15:25 *Failure Analysis of Materials Subjected to Indentation by Means of ADLO*
Sebastian Bauer, Roman Lackner

MS-18.3 Mechanics of Nanoindentation	Monday, 16:00 - 18:00
K7	Chair: K. Durst, E. Lilleodden

16:00 *Indentation Characterization of Hydrated Gels and Tissues*
Michelle L. Oyen

16:20 *Asymptotic Solution of the Frictionless Contact Problem for a Punch with a Small Cylindrical Probe: Implications for Improvement of the Arthroscopic Micro- and Nano-Indentation Technique*
Ivan Argatov

16:40 *Temperature Dependent Visco-Elastic Properties of Polymer Thin Films Using Nanoindentation*
Diana Courty, Ralph Spolenak

17:00 *Experimental Challenges Related to Nanoindentation of Soft Materials*
Marc Farine, Jiri Nohava, Philippe Kempe, Edoardo Mazza

17:20 *Anisotropic Elastic Viscoplastic Damage Model for Simulation of Nanoindentation in Bone Tissue*
Johann Jakob Schwiedrzik, Philippe Kurt Zysset

17:40 *Sensibility Analysis of the Identification of Elastoplastic Parameters Using a Finite Element Simulation of the Instrumented Indentation Test*
Julie Marteau, Benjamin Hagege, Salima Bouvier

MS-18.4 Mechanics of Nanoindentation	Tuesday, 10:15 - 12:15
K7	Chair: A. Barnoush, M. Oyen

10:15 *Combining AFM Nanoindentation and Acoustic Wave Velocity Measurement to Determine the Stiffness of Cells*
Brian Derby, Nadja Njenhuis, Christoph Ballestrem

10:35 *Modelling the Elastic and Plastic Response in Confined Metal Layers Tested by Nanoindentation*
Steve Bull

10:55 *TEM Investigations of Martensite Formation during Nanoindentation of a NiTi Shape Memory Alloy*
Janine Pfetzing-Micklich, Nikolai Wieczorek, Tobias Simon, Burkhard Maaß, Gunther Eggeler

11:15 *One-Way and Two-Way Shape-Memory Effects Induced by Vickers Indentation in Austenitic Matrix NiTi*
Andreas Simon Schneider, Enwei W. Qin, Mareike Frensemeier, Carl P. Frick, Eduard Arzt

11:35 *High Temperature Nanoindentation Behavior of Al/SiC Nanoscale Multilayers*
S. Lotfian, J.M. Molina-Aldareguía, K.E. Yazzie, **Javier LLorca**, N. Chawla

MS-18.5 Mechanics of Nanoindentation	Tuesday, 16:00 - 18:00
K7	Chair: D. Kiener, B.L. Boyce

16:00 *The Indentation Size Effect and Its Relation to Other Length Scale Phenomena*
Andy Bushby

16:20 *Nanoindentation Long-Term Creep and Strain-Rate Jump Tests for the Determination of Time- and Temperature-Dependent Materials Behavior*
Verena Maier, Benoit Merle, Mathias Göken, Karsten Durst

16:40 *Experimental Determination of the Effective Indenter Shape and Epsilon Factor for Nanoindentation*
Benoit Merle, Verena Maier, Mathias Göken, Karsten Durst

17:00 *Beyond the Limits – Alternative Testing Concepts in Nano Mechanics*
Holger Pfaff, Jennifer Hay

17:20 *Elevated Temperature Nanoindentation for Non-Noble Metals*
Oliver Franke, Andrea Maria Hodge, Juergen Biener, Monika Biener

Minisymposium MS-19

Mechanics of (Nano)Porous, Fibrous and Cellular Materials

Session	Day	Time	Room
MS-19.1	Monday	10:15 - 12:15	K2
MS-19.2	Monday	14:45 - 15:45	K2
MS-19.3	Monday	16:00 - 18:00	K2
MS-19.4	Tuesday	10:15 - 12:15	K2
MS-19.5	Tuesday	14:45 - 15:45	K2
MS-19.6	Tuesday	16:00 - 18:00	K2
MS-19.7	Wednesday	10:15 - 12:15	K2

MS-19.1 Mechanics of (Nano)Porous, Fibrous and Cellular Materials Monday, 10:15 - 12:15 K2 Chair: K. Bertoldi, Ch. Santangelo	
10:15	*Mechanical Modelling of Hollow-Tube Stackings: from the Microscopic Scale to the Macroscopic One* **Vincent Marcadon**, Alexandre Iltchev, Alain Rafray, Serge Kruch
10:35	*Modelling of Auxetic Materials with Periodic Microstructures* **Justin Dirrenberger**, Samuel Forest, Dominique Jeulin
10:55	*Dispersion and Band Gaps in Binary Ordered Structures* **Fatih Goncu**, Stefan Luding, Katia Bertoldi
11:15	*Mechanics of Structured Shells* **Katia Bertoldi**
11:35	*Collective Mechanical Behavior of Multilayer Colloidal Arrays of Hollow Nanoparticles* **Jie Yin**, Markus Retsch, Edwin L. Thomas, Mary C. Boyce
11:55	*Experimental and Numerical Investigation of Quasi-Static and Dynamic Response of Micro-Structured Truss Materials* **Zuhal Ozdemir**, Everth Hernández Nava, Andrew Tyas, Terry Bennett, Harm Askes

MS-19.2 Mechanics of (Nano)Porous, Fibrous and Cellular Materials	Monday, 14:45 - 15:45
K2	Chair: M. Demkowicz
14:45	*Rolling and Folding from Composite Polymer Gels* Jungwook Kim, James Hanna, Myunghwan Byun, Ryan Hayward, **Christian Santangelo**
15:05	*In Silico Characterization of Constrained Swelling in Materials at Two Length Scales: Relevance for the Performance of Natural/Artificial Water Driven Actuators* **Lorenzo Guiducci**, Marco G. Mazza, Martin Schoen, John W.C. Dunlop, Peter Fratzl, Yves J.M. Brechet
15:25	*New Variational Estimates for the Effective Behavior of Viscoplastic Porous Media* **Michalis Agoras**, Pedro Ponte Castañeda

MS-19.3 Mechanics of (Nano)Porous, Fibrous and Cellular Materials	Monday, 16:00 - 18:00
K2	Chair: St. Luding, D. Poquillon
16:00	*Quantification of the Effects of Process Induced Anisotropy on the Mechanical Behavior of a Cross-Linked Network of Fibers* **Dominique Poquillon**, Guillaume Kerviel, Christophe Bouvet
16:20	*Aramid Nanofiber Networks with Tailored Hierarchical Nanostructure* **Keqin Cao**, Carlos Pons Siepermann, Ming Yang, Anthony M. Waas, Nicholas A. Kotov, M.D. Thouless, Ellen Arruda
16:40	*Discrete Element Method Simulation of the Mechanics of Fibrous Entangled Materials* **David Rodney**, Carine Barbier, Benjamin Gadot, Rémy Dendievel
17:00	*Mechanical Properties of Monofilament Entangled Materials* **Loic Courtois**, Eric Maire, Michel Perez, Yves Brechet, David Rodney
17:20	*Crack Propagation in Random Fibrous Networks* **Ching Theng Koh**, Michelle L. Oyen
17:40	*Elasticity of Complex Networks* **H.C. Bastiaan Florijn**, Henk Imthorn, Martin van Hecke

MS-19.4 Mechanics of (Nano)Porous, Fibrous and Cellular Materials	Tuesday, 10:15 - 12:15
K2	Chair: D. Rodney, J.F. Rodríguez
10:15	*Protein Biopolymers: Nature's Designer Soft Materials* **Baldomero Alonso-Latorre**
10:35	*Modeling Inelastic Effects in Reconstituted Crosslinked F-Actin Networks* **Jose Felix Rodríguez**, Horacio Lopez-Menendez
10:55	*Strain-Stiffening in Actin Networks: Where Statistical Mechanics and Solid Mechanics Meet* Goran Zagar, **Patrick Onck**, Erik Van der Giessen
11:15	*Semi-Flexible Filament Networks Viewed as Fluctuating Beam Frames* **Prashant Kishore Purohit**, Tianxiang Su

11:35 *Mechanosensing: from a Discrete to a Continuum Approach*
Jose Manuel García-Aznar, Carlos Borau, TaeYoon Kim, Roger D. Kamm

MS-19.5 Mechanics of (Nano)Porous, Fibrous and Cellular Materials Tuesday, 14:45 - 15:45
K2 Chair: Ch. Linder

14:45 *The Maximal Advance Path Constraint for the Elastic Homogenization of Soft Matter*
Christian Linder, Mykola Tkachuk

15:05 *Sensitivity Study for Void Closure relative to Macroscopic Mechanical Loadings, Using Finite Element Simulations at a Meso-Scale*
Michel Saby, Marc Bernacki, Pierre-Olivier Bouchard, Emile Roux

MS-19.6 Mechanics of (Nano)Porous, Fibrous and Cellular Materials Tuesday, 16:00 - 18:00
K2 Chair: K. Bertoldi, D. Poquillon

16:00 *Relation between Morphology and Mechanical Behavior of Nanoporous Metal Foams*
Antonia Antoniou, Yuan Li, Ran Liu

16:20 *Coarsening by Network Restructuring in Model Nanoporous Gold*
Kedarnath Kolluri, **Michael Demkowicz**

16:40 *Monte Carlo Simulation of Au/Ag Electrochemical Dealloying*
Oleksandr Zinchenko, H. De Raedt, E. Detsi, P. Onck, J. De Hosson

17:00 *The Charge-Induced Actuation of Nanoporous Metals*
Siva Shankar Reddy Saane, Patrick R. Onck

17:20 *Influence of Morphology on the Mechanical Properties of Nanoporous Gold*
Kodanda Ram Mangipudi, E. Epler, S. Jagsch, Lorenz Holzer, C.A. Volkert

17:40 *Universal Scaled Strength of Metallic Nanopillars and Nanoporous Metals*
Brian Derby, **Rui Dou**

MS-19.7 Mechanics of (Nano)Porous, Fibrous and Cellular Mater. Wednesday, 10:15 - 12:15
K2 Chair: P. Onck, P.K. Purohit

10:15 *Predicting the Transversely Isotropic Behaviour of Closed-Cell Foam Subjected to Compressive Loading*
Qusai Jebur, Philip Harrison, Zaoyang Guo

10:35 *Elastic Behaviour of Cellular Polyurethane Materials: Experimental and Modelling Work*
Bart Buffel, Frederik Desplentere, Kris Bracke, Maarten Moesen, Ignaas Verpoest

10:55 *Crushing of Open-Cell Random Foams*
Stavros Gaitanaros, Stelios Kyriakides, Andrew Kraynik

11:15 *Effect of Contact and Boundary Conditions on the Large Strain Compression of Random Cellular Structures*
Jafar Alsayednoor, Philip Harrison, Zaoyang Guo

11:35 *Synthesis of Two-Dimensional Lattices Free of Stress Concentrators*
Sajad Arabnejad Khanoki, Ehsan Masoumi Khalil Abad, **Damiano Pasini**

Minisymposium MS-20

Mechanics of Textile Composite Reinforcements and Fibrous Materials

Session	Day	Time	Room
MS-20.1	Tuesday	16:00 - 18:00	AU2
MS-20.2	Wednesday	10:15 - 12:15	AU2
MS-20.3	Thursday	10:15 - 12:15	AU2
MS-20.4	Thursday	16:00 - 18:00	AU2

MS-20.1 Mechanics of Textile Composite Reinforcements AU2	Tuesday, 16:00 - 18:00 Chair: Ph. Harrison, St. Lomov

16:00 *3D In Situ Observation of the Bending of a Fibre Bundle* (Keynote)
Pierre Latil, Sabine Rolland du Roscoat, **Laurent Orgéas**, Chrisitan Geindreau, Pierre J.J. Dumont, Steven Le Corre

16:40 *Finite Element Modelling of Textile and Fibrous Materials at Microscopic Scale*
Damien Durville

17:00 *Transverse Mechanics of Fibrous Materials: from the Fiber to Linear Assemblies*
Stephane Fontaine, Christiane Wagner-Kocher, Salsabil Jeguirim

17:20 *Geometrical and Mechanical Modelling of Braided and Warp Knitted Multifilament Structures*
Yordan Kyosev

MS-20.2 Mechanics of Textile Composite Reinforcements AU2	Wednesday, 10:15 - 12:15 Chair: Ph. Boisse, V. Carvelli

10:15 *Modelling the Shear-Tension Coupling of Engineering Fabrics*
Farag Abdiwi, Philip Harrison, Woong-Ryeol Yu, Zaoyang Guo

10:35 *A Constitutive Model for the Tensile Behavior of Nonwovens*
Alvaro Ridruejo, Carlos Gonzalez, Javier LLorca

10:55 *Mesoscopic Finite Elements for Woven Fabrics: which Model for which Application – From 3D Fine to Coarse Shell Modelling*
Emmanuelle Vidal-Salle, Audrey Wendling, Andrea Bareggi

11:15 *Virtual Stitches in Formability Studies of NCF Preforms*
Daniel Leutz, Francois Dumont, Maximilian Kluepfel, Alexane Margossian, Christian Weimer, Roland Hinterhoelzl, Sylvain Bel

11:35	*Normalisation of Biaxial Bias-Extension Test Results Considering Shear-Tension Coupling* **Philip Harrison**
11:55	*Finite Element Modeling of a Scaffold for Anterior Cruciate Ligament Tissue Engineering: from Cellular to Physiological Scale* Cédric P. Laurent, Damien Durville, Rachid Rahouadj, **Jean-François Ganghoffer**

MS-20.3 Mechanics of Textile Composite Reinforcements AU2	Thursday, 10:15 - 12:15 Chair: J.-F. Ganghoffer, Y. Kyosev
10:15	*Mechanics of Cross-Linked and Entangled Semiflexible Random Fiber Networks* (Keynote) **Catalin Picu**
10:55	*Modeling Compression of a Random Assembly of Carbon Nanotubes* **Stepan Lomov**, Larissa Gorbatikh, Ignaas Verpoest
11:15	*Generation of Voxel-FE Models for Complex 3D Composite Architectures* **Gaetan Hello**, Julien Schneider, Zoheir Aboura
11:35	*Automated Modelling of Textile Composites With Application of Boundary Conditions Resulting Truly from Periodicity and other Generic Symmetries* **Laurent F.C. Jeanmeure**, Shuguang Li
11:55	*Shear Behavior of a Non-Crimp 3D Orthogonal Weave E-Glass Composite Reinforcement* J. Pazmino, **Valter Carvelli**, S.V. Lomov, I. Verpoest

MS-20.4 Mechanics of Textile Composite Reinforcements AU2	Thursday, 16:00 - 18:00 Chair: G. Hivet, P. Potluri
16:00	*Numerical Modelling of 3D Woven Preform Deformations* **Steven Daniel Green**, Andrew C. Long, Stephen R. Hallett
16:17	*Simulation of Forming and Wrinkling of Textile Composite* **Philippe Boisse**, Nahiene Hamila, Peng Wang, Pierre Pineau
16:34	*Characterization and Forming Simulation of PP Wood Composites* Hong-Ling Yin, **Xiongqi Peng**, Xue Liu
16:51	*From the Mechanical Behaviour to the Forming of Textiles* **Gilles Hivet**, Samir Allaoui, Pierre Ouagne, Damien Soulat, Chistophe Tephany, Sylvain Chatel
17:08	*Simulation of the Bend-Over-Sheave Behaviour of Braided Synthetic Ropes* **Thanh Do Vu**, Damien Durville, Peter Davies
17:25	*Shell Element Based Homogenization of Textile Composites* **Jakob Gager**, Heinz E. Pettermann
17:42	*Modeling Yarn Sliding in the Weave Continuum* Ethan Moore Parsons, **Simona Socrate**

Minisymposium MS-21

Metal Forming

Session	Day	Time	Room
MS-21.1	Tuesday	10:15 - 12:15	S2
MS-21.2	Tuesday	16:00 - 18:00	S2

MS-21.1 Metal Forming S2	Tuesday, 10:15 - 12:15 Chair: R. Valente, P. Van Houtte
10:15	*Material Characterization and FSW Process Optimization Using Neural Networks* **Carlos Agelet de Saracibar**, Roberto López, Michele Chiumenti, Bruno De Meester
10:35	*Numerical Simulation and Experimental Validation of Sheet Laser Forming Processes Using Single S-Shape Scanning Paths* **Diego Celentano**, Geoffroy Kieffer, Jorge Ramos-Grez, Magdalena Walczak
10:55	*Influence of Hydrostatic Pressure on Porosity of Die-Cast Mg Alloys: Experimental and Numerical Studies* **Ana María Fernández**, Federico Sket, Jon M. Molina-Aldareguia, M. Teresa Pérez-Prado, Antoine Jerusalem
11:15	*An Algorithm to Determine a Suitable Friction Coefficient for Numerical Deep Drawing Simulations* **Sascha Döhler**, Kai Uwe Schröder, Martin Schagerl, Thomas Waltenberger

MS-21.2 Metal Forming S2	Tuesday, 16:00 - 18:00 Chair: C. Agelet de Saracibar, D. Celentano
16:00	*Hierarchical Multi-Scale Modelling of the Heterogeneous Evolution of Texture and Anisotropy in Metal Forming* **Paul Van Houtte**, Jerzy Gawad, Philip Eyckens, Albert Van Bael, Giovanni Samaey, Dirk Roose
16:20	*Temperature-Induced Phase Transformations in Finite-Strain Plasticity Applied to Wear Resistant Coatings* **Reza Kebriaei**, Ivaylo Vladimirov, Jan Frischkorn, Stefanie Reese
16:40	*A New Shell-Solid and Solid-Shell Concept Using Full 3D Constitutive Laws* B. Bassa, **Francis Sabourin**, Michel Brunet
17:00	*Application of a Tensorial Framework for Ductile Damage to the Analysis of Metal Forming Processes* **Maksim Zapara**, Nikolai Tutyshkin, Wolfgang H. Müller, Ralf Wille

17:20	*Experiment and Simulation of Inner Fracture Defect in Drawing of Carbon Steels for Machine Structural Use* **Kazutake Komori**
17:40	*Enhanced Formability of Dual Phase 980 Steels by Controlled Local Softening Using Laser Heating Technology* **Constantin Chiriac**, Changquin Du, Dajun Zhou, Ching-Kuo Hsiung

Minisymposium MS-22

Methods to Predict the Structural and Mechanical Properties of Dense Granular Media

Session	Day	Time	Room
MS-22.1	Monday	10:15 - 12:15	S1
MS-22.2	Monday	14:45 - 15:45	S1
MS-22.3	Monday	16:00 - 18:00	S1
MS-22.4	Tuesday	10:15 - 12:15	S1
MS-22.5	Tuesday	14:45 - 15:45	S1
MS-22.6	Tuesday	16:00 - 18:00	S1
MS-22.7	Wednesday	10:15 - 12:15	S1

MS-22.1 Methods to Predict the Properties of Dense Granular Media Monday, 10:15 - 12:15
S1 Chair: L. Kondic, W. Losert

10:15 *Sheared Granular Materials near Jamming*
Robert P. Behringer, Dapeng Bi, Jie Zhang, Bulbul Chakraborty

10:35 *Experimental Study of Silo Collapse in Static and Discharging States*
Ramon Peralta-Fabi, Eric Clément, Gustavo Gutiérrez, Francisco Melo

10:55 *A Local View on Dilatancy Onset in Sheared Granular Media*
Annika Döring, Jean-Francois Métayer, Mario Scheel, **Matthias Schröter**

11:15 *Measuring the Mechanical Properties of a Sedimenting Granular Suspension*
Chih-Wei Peng, Matthias Schröter

11:35 *Probing Deformations of a Granular Material with Diffusive Wave Spectroscopy: Application to the Formation of Shear Band*
Axelle Amon, Van Bau Nguyen, Ary Bruand, **Jérôme Crassous**, Eric Clément

MS-22.2 Methods to Predict the Properties of Dense Granular Media Monday, 14:45 - 15:45
S1 Chair: St. Luding, P. Umbanhowar

14:45 *Shear Thickening and Migration in Granular Suspensions*
Abdoulaye Fall, **Anaël Lemaître**, François Bertrand

15:05 *GSH: Elasto-Plastic Rheology of Granular Media*
Mario Liu

15:25	*Particle-Based Continuum Theory: Stress-Strain-Anisotropy Relations for Shear-Bands, Jamming and Dilatancy* **Stefan Luding**

MS-22.3 Methods to Predict the Properties of Dense Granular Media	Monday, 16:00 - 18:00
S1	Chair: B. Chakraborty, O. Sano

16:00	*Frontal Dynamics of Powder Snow Avalanches* **Michel Y. Louge**, Cian S. Carroll, Barbara Turnbull
16:20	*Onset of Reversibility in Cyclic Shear of Granular Packings* **Wolfgang Losert**, Mitch Mailman, Steven Slotterback
16:40	*Impact, Drag, and the Granular Critical State* **Paul B. Umbanhowar**, Nick Gravish, Daniel I. Goldman
17:00	*Wavelength Selection of Ripples in Vertically Vibrating Thicker Granular Layer due to Density Wave Refraction* **Osamu Sano**
17:20	*New Insights into Shear Failure of Crushable Granular Soils by DEM* **Jianfeng Wang**, Haibin Yan
17:40	*A DEM-Based Study on the Uniaxial Deformation of Frictional Polydisperse Spheres* **Olukayode Isaiah Imole,** Nishant Kumar, Vanessa Magnanimo, Stefan Luding

MS-22.4 Methods to Predict the Properties of Dense Granular Media	Tuesday, 10:15 - 12:15
S1	Chair: R. Behringer, R. Blumenfeld

10:15	*Vortex Structures and Macroscopic Response in Dense Granular Shear* **Amy Rechenmacher**, Andres Orlando
10:35	*Creep Response of Nearly Isostatic Spring Networks* **Brian P. Tighe**
10:55	*Geometrical and Physical Interpretations of the Properties of Disordered Granular Packings* **Gary William Delaney**, James E. Hilton, Paul W. Cleary
11:15	*On Microstructure of Particulate Matter Exposed to Impact and Compression* **Lou Kondic**, Arnaud Goullet, Miroslav Kramar, Konstantin Mischaikow, Robert Behringer
11:35	*The Dynamics of Granular Material* **Miroslav Kramar**, Konstantin Mischaikow, Lou Kondic, Arnaud Goullet, Robert Behringer
11:55	*Computing Persistence Diagrams* Miroslav Kramar, **Konstantin Mischaikow**, Vidit Nanda

MS-22.5 Methods to Predict the Properties of Dense Granular Media	Tuesday, 14:45 - 15:45
S1	Chair: R. Behringer

14:45	*How External Vibration Affects Stick-Slip Dynamics in Sheared Granular Layers: the Micro- and Meso-Mechanics of Dynamic Earthquake Triggering* Michele Griffa, **Behrooz Ferdowsi**, J. Carmeliet, E.G. Daub, R.A. Guyer, P.A. Johnson, C. Marone
15:05	*Geometrically Cohesive Granular Materials* **Scott Victor Franklin**
15:25	*Local and Nonlocal Continuum Modeling for Dense Granular Flow* **Ken Kamrin**, Georg Koval

MS-22.6 Methods to Predict the Properties of Dense Granular Media	Tuesday, 16:00 - 18:00
S1	Chair: A. Lemaître, M.Y. Louge

16:00	*Shear-Jammed States: Stress-Induced Nematic Ordering in Force Space* **Bulbul Chakraborty**, Dapeng Bi
16:20	*Response Theory of Sheared Granular Particles around a Nonequilibrium Steady State* **Hisao Hayakawa**, Kuniyasu Saitoh
16:40	*Density of Vibrational Modes in Partially Crystalline Granular Packings* **Thibault Bertrand**, Carl F. Schreck, Corey S. OHern, Mark D. Shattuck
17:00	*Characterization of Basin Volumes in Mechanically Stable Packings* **Mark D. Shattuck**, S.S. Ashwin, Jerzy Blawzdziewicz, Corey S. OHern

MS-22.7 Methods to Predict the Properties of Dense Granular M.	Wednesday, 10:15 - 12:15
S1	Chair: M. Liu, M.D. Shattuck

10:15	*Statistical Mechanical Characteristics of Dense Planar Granular Matter* Rebecca Hihinashvili, **Raphael Blumenfeld**
10:35	*The Glass Transition in a Driven Granular Fluid* **Till Kranz**, A. Fiege, I. Gholami, Matthias Sperl, Annette Zippelius
10:55	*Elementary Volumes Distribution and Cell Structural Stability in 2D Granular Assemblies* **Takashi Matsushima**, Raphael Blumenfeld
11:15	*Secondary Flows and Supported Steady States for Channeled Granular Flows with Flat Frictional Surfaces* Nicolas Brodu, **Renaud Delannay**, Patrick Richard

Minisymposium MS-23

Modelling and Computation of Inelastic Microstructures

Session	Day	Time	Room
MS-23.1	Thursday	14:15 - 15:45	AU1
MS-23.2	Thursday	16:00 - 18:00	AU1

MS-23.1 Modelling and Computation of Inelastic Microstructures Thursday, 14:15 - 15:45 AU1 Chair: K. Hackl, B. Svendson	
14:15	*Construction of Statistically Similar RVEs for 3D Microstructures* **Daniel Balzani**, Joerg Schroeder, Lisa Scheunemann, Dominik Brands
14:35	*A Micromechanical Model for Creep and Microstructure Evolution of Single Crystal Superalloys* **Bach Tuyet Trinh**, Klaus Hackl
14:55	*Full Field Multiscale Simulation of the Local Behaviour and Failure Accounting for Dwell Effect in Ti Alloys* Konstantin A. Kuzmenkov, Farida Azzouz, **Georges Cailletaud**
15:15	*To the Optimization in Fatigue of the Microstructure of a Nickel Base Superalloy for Turbine Disc Application* **Franck Gallerneau**, G. Boittin, P. Kanouté, D. Locq, Georges Cailletaud

MS-23.2 Modelling and Computation of Inelastic Microstructures Thursday, 16:00 - 18:00 AU1 Chair: K. Hackl, B. Svendson	
16:00	*Analytical and Numerical Aspects of Relaxation in Finite Crystal Plasticity* **Georg Dolzmann**
16:20	*A Viscosity-Limit Approach to the Evolution of Microstructures in Finite Plasticity* **Christina Günther**, Klaus Hackl
16:40	*Rate Variational Thermodynamic Formulation And Application of Models for Non-Convex Twinning and Dislocation Glide in TWIP Steels* **Bob Svendsen**, Benjamin Klusemann
17:00	*Microstructure-Based Study of Boundary Effects in FCC Crystals Using a Dislocation Based Continuum Model* **Katrin Schulz**, Stefan Sandfeld, Peter Gumbsch
17:20	*Dislocation Emission from Nanovoids under Tension at Finite Temperature in Copper* **Pilar Ariza**, M. Ponga, I. Romero, Michael Ortiz

Minisymposium MS-24

Modelling and Simulation of Aneurysm Mechanics

Session	Day	Time	Room
MS-24.1	Monday	10:15 - 12:15	AU2
MS-24.2	Monday	14:45 - 15:45	AU2
MS-24.3	Monday	16:00 - 18:00	AU2
MS-24.4	Tuesday	10:15 - 12:15	AU2
MS-24.5	Tuesday	14:45 - 15:45	AU2

MS-24.1 Modelling and Simulation of Aneurysm Mechanics AU2	Monday, 10:15 - 12:15 Chair: A. Robertson, P. Watton
10:15	*Abdominal Aortic Aneurysms: Assessment of Structural and Fluid-Structure Interaction Simulation Strategies* **Alessandro Satriano**, Elena S. Di Martino
10:35	*Computational Analysis of Flow and Stress Patterns in Patient Specific Thoracic Aortic Aneurysm Models* **Alessandro Borghi**, F.P.P. Tan, N.B. Wood, R.H. Mohiaddin, X.Y. Xu
10:55	*Towards New Aortic Tissues Analogue Materials: Micro-Mechanical Modelling and Experiments* **Lucie Bailly**, Audrey Lemercier, Christian Geindreau, Laurent Orgéas, Valérie Deplano
11:15	*On Modeling Failure of Soft Anisotropic Materials* **Konstantin Volokh**
11:35	*Mathematical Modelling of Aortic Dissection* **Nicholas A. Hill**, Steven Roper, Xiaoyu Luo, Beibei Li, Lei Wang
11:55	*A Thick-Walled Fluid-Solid-Growth Model of Abdominal Aortic Aneurysm Evolution* **Andrii Grytsan**, Paul N. Watton, Gerhard A. Holzapfel

MS-24.2 Modelling and Simulation of Aneurysm Mechanics AU2	Monday, 14:45 - 15:45 Chair: P. Watton
14:45	*Interactive Decomposition and Mapping of Saccular Cerebral Aneurysms Using Harmonic Functions with Applications in 'Patient-Specific' Computational Fluid Dynamics (CFD) Simulations* **Jingfeng Jiang**, Charles Strother

15:05 *PIV Measurement of Inflow through Cerebral Aneurysmal Neck of PVA-H Biomodel with Compliant Wall*
Shuya Shida, **Makoto Ohta**

15:25 *Hemodynamics in Cerebral Arteries before Aneurysm Formation: Influence of Flow Input Waveform Shapes*
Yuji Shimogonya, Hiroshige Kumamaru, Kazuhiro Itoh

MS-24.3 Modelling and Simulation of Aneurysm Mechanics — Monday, 16:00 - 18:00
AU2 — Chair: A. Brawanski, N. Hill

16:00 *Detailed Modeling of Abdominal Aortic Stent Grafts: from Device to Computational Mechanics*
Sander De Bock, F. Iannaccone, M. De Beule, F. Vermassen, B. Verhegghe, P. Segers

16:17 *A New Rupture Potential Index for Abdominal Aortic Aneurysms Based on Patient-Specific Wall Strength and Thickness Distribution*
Andreas Maier, Michael W. Gee, Sebastian Kehl, Christian Reeps, Hans-Henning Eckstein, Wolfgang A. Wall

16:34 *Uncertainty Quantification in Patient Specific Assessment of AAA Rupture Risk*
Jonas Biehler, Michael W. Gee, Wolfgang A. Wall

16:51 *Development of a Porous Biomaterial for the Treatment of Intracranial Aneurysms*
Jonathan Pieter Vande Geest, Greg Johnson, P. Daniel Warren, Robert Slazas

17:08 *A Novel Thin Film NiTi (TFN) Device for Cerebral Aneurysm Treatment*
Youngjae Chun, Daniel S. Levi, K.P. Mohanchandra, Colin P. Kealey, Haithem Babiker, David Frakes, Soojung C. Hur, Allan W. Tulloch, David A. Rigberg, Dino Di Carlo, Fernando Vinuela, Gregory P. Carman

17:25 *Investigating the Haemodynamic Environment Prior to Aneurysm Formation: Novel Methodology and Study of 22 Clinical Cases*
Haoyu Chen, Yiannis Ventikos, Paul Nicholas Watton

17:42 *Growth and Remodelling Hypotheses for Patient-Specific Models of Cerebral Aneurysm Evolution*
Alisa Selimovic, Yiannis Ventikos, Paul Nicholas Watton

MS-24.4 Modelling and Simulation of Aneurysm Mechanics — Tuesday, 10:15 - 12:15
AU2 — Chair: J. Bernsdorf, M. Ohta

10:15 *Is Aspect Ratio Sufficient to Classify Intra-Aneurysmal Hemodynamics?*
Michael J. Durka, **Anne M. Robertson**

10:35 *A Mechanism for the Rapid Development of Intracranial Aneurysms: A Case Study*
Christian Doenitz, Karl-Michael Schebesch, Roland Zoephel, **Alexander Brawanski**

10:55 *Towards Multiscale Simulation of Early Stage Aneurysm Formation*
Joerg Bernsdorf, Jiaxing Qi, Sabine Roller

11:15 *The Design Characteristics Extracted from an Optimal Flow Diverter in an Ideal Side-Wall Aneurysm Using Lattice Boltzmann Method*
Hitomi Anzai, Jean-Luc Falcone, Bastien Chopard, Makoto Ohta

11:35 *Modelling Intracranial Aneurysms Treated with Flow Diverters: Correlation of Intra-Aneurysm Sac Flow Dynamics with Thrombus Evolution*
Daniel Zajarias-Fainsod, K. Spranger, E. Holland, A. Selimovic, H. Chen, M. Ngoepe, T. Peach, T. Baptista, A. Chiarini, J. Penrose, J. Byrne, P.N. Watton, Y. Ventikos

MS-24.5 Modelling and Simulation of Aneurysm Mechanics — Tuesday, 14:45 - 15:45
AU2 — Chair: A. Robertson

14:45 *Database of Intracranial Aneurysms Using Patient-Specific Geometries and Inlet Conditions*
Akira Takahashi, Shin-ichiro Sugiyama, Teiji Tominaga

15:05 *AIMA: A Planning Software Suite for Intracranial Aneurysms Treatment with Flow Diverters*
Alessandro Chiarini

15:25 *Clinical Utility of Computational Modelling for Treatment of Cerebral Aneurysms – The Road from Virtual to Reality*
Paul Nicholas Watton, H. Ho, P.J. Hunter, A.M. Robertson

Minisymposium MS-25

Multiphase Models for Concrete and Soils

Session	Day	Time	Room
MS-25.1	Monday	10:15 - 12:15	AU3
MS-25.2	Monday	16:00 - 18:00	AU3

MS-25.1 Multiphase Models for Concrete and Soils AU3	Monday, 10:15 - 12:15 Chair: G. Hofstetter, T. Jefferson
10:15	*Modeling Chemical Degradation of Cement Based Materials with Mechanics of Multiphase Porous Media* **Dariusz Gawin**, Francesco Pesavento, Marcin Koniorczyk, Witold Grymin
10:35	*Modeling Damage of Concrete Caused by Corrosion of Reinforcement* **Josko Ozbolt**, Filip Orsanic, Gojko Balabanic
10:55	*Computational Modeling of Hydraulic Fracturing in Partially Saturated Porous Materials Using X-FEM* Dirk Leonhart, **Günther Meschke**
11:15	*Multiphase Modeling and Experimental Validation of the Behavior of Concrete Structures Subjected to Combined Thermal and Mechanical Loading* **Thomas Ring**, Matthias Zeiml, Roman Lackner
11:35	*Numerical Predictions of Autogenous Drying in Concrete* **Tony Jefferson**, Adriana Chitez, Paul Lyons
11:55	*Comparison of Different Approaches for Modeling Shrinkage of Concrete* **Matthias Aschaber**, Günter Hofstetter

MS-25.2 Multiphase Models for Concrete and Soils AU3	Monday, 16:00 - 18:00 Chair: G. Hofstetter, T. Jefferson
16:00	*Definition of Stress in Constitutive Modelling of Partially Saturated Soils and Granular Media* **Wojciech Tomasz Sołowski**, Scott W. Sloan
16:20	*Thermo-Elasto-Plastic Consolidation Analysis with Water Phase Change* **Lorenzo Sanavia**, Loris Luison, Lyesse Laloui
16:40	*A Hysteretic Water Retention Model for Deformable Porous Materials* **Domenico Gallipoli**

17:00 *A 3D Numerical Model for Simulating the Effect of Orthotropic Permeability on Hydraulic Fracturing Processes*

Han Wang, H. Liu, H.A. Wu, X.X. Wang

Minisymposium MS-26

Multiscale Mechanics of Interfaces

Session	Day	Time	Room
MS-26.1	Thursday	10:15 - 12:15	S3
MS-26.2	Thursday	14:15 - 15:45	S3
MS-26.3	Thursday	16:00 - 18:00	S3

MS-26.1 Multiscale Mechanics of Interfaces S3	Thursday, 10:15 - 12:15 Chair: M. Geers, S. Schmauder
10:15	*Polymer Adhesion: How to Extract a Cohesive Law from MD Simulations* (Keynote) Mathieu Solar, **Erik Van der Giessen**
10:55	*Influence of Microcracking on the Interface Crack in FGM/Homogeneous Bimaterials Subjected to Thermal and Mechanical Loading* **Vera Petrova**, Siegfried Schmauder
11:15	*Length Scale Effects in Generalised Continuum Crystal Plasticity* **Esteban P. Busso**, Nicolas Cordero, Samuel Forest
11:35	*Interface Controlled Plastic Flow Modeled by Strain Gradient Plasticity Theory* **Thomas Pardoen**, Thierry J. Massart
11:55	*New Insight into Crack Formation during Corrosion in Zirconium-Based Metal-Oxide Systems* **Natasha Vermaak**, Rafael Estevez, Guillaume Parry

MS-26.2 Multiscale Mechanics of Interfaces S3	Thursday, 14:15 - 15:45 Chair: E.P. Busso, W.A. Curtin
14:15	*Mixed Mode Cohesive Laws Derived from Potential Functions* (Keynote) **Bent F. Sørensen**
14:51	*Discretisation and Model Error Estimation within 3D Multiscale XFEM for Cracks* **Corinna Prange**, Stefan Loehnert, Peter Wriggers
15:11	*Size Effect in the Damage Behaviour of Short Fibre Reinforced Composites – Insights in the Interface Design of Materials* **Norbert Huber**, Ingo Scheider, Yongjun Chen, Jörn Mosler
15:29	*Multi-Scale Modeling of Layered Materials with Damaging Interfaces* **Andrea Bacigalupo**, Luigi Gambarotta

MS-26.3 Multiscale Mechanics of Interfaces S3	Thursday, 16:00 - 18:00 Chair: V. Petrova, Th. Pardoen
16:00	*Dislocation Shielding and Crack-Tip Decohesion at the Atomic Scale* (Keynote) **William A. Curtin**, J. Song
16:40	*In-Situ Experimental-Numerical Characterization of Interface Delamination* **Johan Hoefnagels**, Murthy Kolluri, Hans Dommelen van, Marc Geers
17:00	*On the Relation between Interface Roughening and Damage in Metal-Polymer Laminates* **Jeroen van Beeck**, Piet J.G. Schreurs, Marc G.D. Geers
17:20	*Modelling the Micromechanics of Fibrillation in Copper-Rubber Interfaces* **Bart Vossen**, Piet Schreurs, Olaf van der Sluis, Marc Geers
17:40	*Consistent Computational Homogenisation with Reference to Triaxiality Effects in Cohesive Fracture* **Joris J.C. Remmers**, Clemens V. Verhoosel, René de Borst

Minisymposium MS-27

Multiscale Mechanics of Smart Material Systems and Structures

Session	Day	Time	Room
MS-27.1	Thursday	13:45 - 15:45	AU3
MS-27.2	Thursday	16:00 - 18:00	K8

MS-27.1 Multiscale Mech. of Smart Material Systems and Structures Thursday, 13:45 - 15:45
AU3 Chair: M. Kamlah, Y. Shindo

13:45 *Dynamic Fatigue of Three-Point Bending PZT Ceramics with a Crack under AC Electric Fields*
Yasuhide Shindo, Fumio Narita, Yu Morikawa

14:05 *Effective Electric Permittivity of Cracks in Piezoelectric Ceramics*
Peter Neumeister, Martin Jurisch, Hans A. Jelitto, Andrea R. Engert, Gerold A. Schneider, Herbert Balke

14:25 *Computational Modelling of Ferroelectric Polycrystals with Three-Dimensional Polygonal Finite Elements*
Jayabal Kaliappan, **Andreas Menzel**

14:45 *Variational Scale Bridging in Dissipative Electro-Mechanics*
Dominic Zäh, Christian Miehe

15:05 *Multiscale Modeling of Magnetoactive Composite Materials*
Christian Spieler, Markus Kästner, Joseph Goldmann, Jörg Brummund, Volker Ulbricht

15:25 *Bio-Inspired Microfluidic Propulsion through Magnetic Artificial Flagella*
Sandeep K. Namdeo, S.N. Khaderi, J.M.J. den Toonder, P.R. Onck

MS-27.2 Multiscale Mech. of Smart Material Systems and Structures Thursday, 16:00 - 18:00
K8 Chair: A. Benjeddou, M. Kamlah

16:00 *Finite Element Characterization of d15 Shear Piezoelectric Macro-Fibre Composites Poled in Longitudinal Direction*
Burkhard Kranz, Benoit Gajewski, Ayech Benjeddou, Welf-Guntram Drossel

16:20 *Characterization and Analysis of the Nonlinear Behaviour of Piezoelectric Macro-Fibre Composites*
Marcelo A. Trindade, Ayech Benjeddou

16:40	*Static and Dynamic Response of Smart Composite Structures with Piezoelectric d15 Shear-Response-Based Torsion Actuation* **Michael Krommer**, Pelin Berik, Yury Vetyukov, Ayech Benjeddou
17:00	*Fatigue Lifetime Study of Piezoceramic Patch Transducers* **Monika Gall**, Bärbel Thielicke
17:20	*Experimental and Theoretical Studies on Non-Linear Characterization of 1-3 Piezocomposites* **Jayendiran Raja**, Arockiarajan Arunachalakasi
17:40	*Experimental Study on Tunable Magno-Reological LCD System to Vibration Mitigation of Structures* **Hsien Hua Lee**, C.-W. Cheng, Y.-Z. Lo

Minisymposium MS-28

Multiscale Modelling of Bones

Session	Day	Time	Room
MS-28.1	Friday	10:15 - 12:15	K6

MS-28.1 Multiscale Modelling of Bones K6	Friday, 10:15 - 12:15 Chair: J.-M. Crolet , J.P. McGarry
10:15	*Bone Remodeling: A New Law from the Sinupros Model* **Jean Marie Crolet**, M. Racila
10:35	*A Bone Remodelling Model Including Mechano-Chemical Coupling* **Vaclav Klika**, Maria Angeles Perez, František Maršík, Manuel Doblaré, José Manuel García-Aznar
10:55	*A Two-Scale Approach for Finite Element Method Cancellous Bone Microstructure Remodeling Simulation* **Marcin Wierszycki**, Krzysztof Szajek, Tomasz Łodygowski, Michał Nowak
11:15	*A Second Gradient Model Accounting for the Effect of Micro-Structure on Bone Remodeling* Daniel George, Tomasz Lekszycki, **Angela Madeo**, Yves Rémond
11:35	*On the Numerical Solution of a Bioregulatory Model for Bone Fracture Healing* **Alexander Sapotnick**, Udo Nackenhorst
11:55	*Mechanical Testing and Constitutive Modelling of the Multi-Axial Yield Behaviour of Trabecular Bone* **N. Kelly**, D. Nolan, Patrick McGarry

Minisymposium MS-29

Multiscale Modelling of Polycrystalline Plasticity

Session	Day	Time	Room
MS-29.1	Thursday	10:15 - 12:15	K6
MS-29.2	Thursday	14:15 - 15:45	K6

MS-29.1 Multiscale Modelling of Polycrystalline Plasticity K6	Thursday, 10:15 - 12:15 Chair: A. Butz, J. Segurado
10:15	*Towards an Effective Material Model for Elastoplastic Polycrystalline Materials through Homogenisation* **Eva Lehmann**, Stefan Loehnert, Peter Wriggers
10:35	*Multiscale Simulations of Multiphase Steels* **Sergio Turteltaub**, Sourena Yadegari, Akke Suiker
10:55	*Microstructural Analysis and Process Chain Simulation of Copper-Ribbons for Solar Cell Interconnections* **Alexander Butz**, Dirk Helm, Rico Meier
11:15	*Multiscale Modeling of Acumulative Roll Bonding (ARB) Process* **Javier Segurado**, Alvaro Ridruejo, Javier LLorca
11:35	*Multiscale Representation of the Microstructure Evolution and the Mechanical Properties of Steel Grade DC04 during the Production Process* (Keynote) **Dirk Helm**, Maria Baiker, Pierre Bienger

MS-29.2 Multiscale Modelling of Polycrystalline Plasticity K6	Thursday, 14:15 - 15:45 Chair: A. Butz, J. Segurado
14:15	*Microstructural Influence on the Strain Hardening Response of Two-Phase (alpha2 gamma) TiAl Polycrystal Investigated Using Crystal Plasticity and FE2 Multi-Level Modeling Approach* **Mohammad Rizviul Kabir**, Liudmila Chernova, Marion Bartsch, Janine Schneider
14:35	*Numerical Multiscale Simulations of the Mechanical Behavior of Beta-Metastable Titanium Alloys Ti5553 and Ti17* **Guillaume Martin**, L. Nazé, Georges Cailletaud
14:55	*Plastic Strain Gradient Induced Internal Stress and Geometrically Necessary Dislocation Density in Grain Boundary Regions* **Anxin Ma**, Alexander Hartmaier

15:15 *Continuum Modeling of Dislocation Starvation and Subsequent Nucleation in Nano-Pillar Compressions*

Antoine Jerusalem, Ana Fernandez, Allison Kunz, Julia R. Greer

Minisymposium MS-30

Multiscale Muscle Mechanics: Theory and Experiment

Session	Day	Time	Room
MS-30.1	Monday	16:00 - 18:00	K4
MS-30.2	Tuesday	10:15 - 12:15	K4

MS-30.1 Multiscale Muscle Mechanics: Theory and Experiment	Monday, 16:00 - 18:00
K4	Chair: T. Leonard, W. Herzog
16:00	*Three-Dimensional Skeletal Muscle Modelling – Experiment and Simulation* **Markus Böl**, Maike Sturmat, Christine Weichert, Tobias Siebert
16:20	*Myosin-Myosin Interactions Cause Differences Between Ensemble and Single Molecule Actomyosin Interactions* **Sam Walcott**, Edward P. Debold
16:40	*Skeletal Muscle Myofibril Force Production During Lengthening* **Tim Leonard**, Walter Herzog
17:00	*The Tilting Lever Arm Model of the Working Stroke of Muscle Myosin II Verified in Situ* **Massimo Reconditi**, Elisabetta Brunello, Marco Linari, Gabriella Piazzesi, Malcolm Irving, Vincenzo Lombardi
17:20	*Force Enhancement in Skeletal Muscles: A Role for Titin?* **Walter Herzog**, Tim Leonard, Michael DuVall, Jens Herzog

MS-30.2 Multiscale Muscle Mechanics: Theory and Experiment	Tuesday, 10:15 - 12:15
K4	Chair: A. DiCarlo, G. Schappacher-Tilp
10:15	*Sarcomere Modeling and Sarcomere Dynamics: a Short Review* Jachen Denoth, **Fabian Dettwiler**, Irina Agarkova
10:35	*A Structural Model of Force Generation in Single Myofibrils Aimed at Explaining Force Regulation in the Absence of Cross-Bridge Interaction* **Gudrun Schappacher-Tilp**, Tim T. Leonard, Gertrud Desch, Walter Herzog
10:55	*Chemomechanical Coupling in Sarcomere Dynamics* **Lena Rebecca Zastrow**, Antonio DiCarlo
11:15	*Towards Multi-Scale Modeling of Muscle Fibers with Sarcomere Non-Uniformities* **Sefi (Josef) Givli**, Gregory Domeshek
11:35	*A Constitutive Model for Skeletal Muscle Contraction* **Babak Sharifimajd**, Jonas Stålhand

11:55 *Electromechanical Coupling in Cardiac Dynamics: Constitutive Issues and Numerical Experiments*

Simone Pezzuto, Davide Ambrosi

Minisymposium MS-31

Nonlinear Elasticity

Session	Day	Time	Room
MS-31.1	Monday	10:15 - 12:15	K3
MS-31.2	Monday	16:00 - 18:00	K3
MS-31.3	Tuesday	10:15 - 12:15	K3
MS-31.4	Tuesday	16:00 - 18:00	K3
MS-31.5	Wednesday	10:15 - 12:15	K3
MS-31.6	Thursday	10:15 - 12:15	K3

MS-31.1 Nonlinear Elasticity — Monday, 10:15 - 12:15
K3 — Chair: G. deBotton, Y. Fu

10:15 *On Axisymmetric Motions of a Finitely Deformed Magnetoelastic Thick-Walled Circular Cylindrical Tube*
Prashant Saxena, Raymond W. Ogden

10:35 *Long Wave Models for an Incompressible, Pre-Stressed Elastic Layer with Elastically Restrained Boundaries*
Graham Anthony Rogerson, Rinat Mukhomodyarov

10:55 *The Elastic and the Corresponding Dislocated Material: Definition, Strong Ellipticity, Solvability*
Dimitris Sfyris

11:15 *On Weakly Non-Linear Elastic Plane Waves in Anisotropic Materials*
Wlodzimierz Domanski

11:35 *Acoustic Radiation Force in Tissue-Like Solids Due to Modulated Sound Field*
Bojan B. Guzina, Egor V. Dontsov

MS-31.2 Nonlinear Elasticity — Monday, 16:00 - 18:00
K3 — Chair: G. Rogerson, M.H.B.M. Shariff

16:00 *On Loss of Ellipticity in Second-Gradient Hyper-Elasticity of Fibre-Reinforced Materials*
Kostas P. Soldatos

16:20 *Buckling of a Supported Annular Plate with a Non-Euclidean Metric*
Michael Schwarzbart, Alois Steindl

16:40 *Imperfection Sensitivity of Elastic Localizations*
Yibin Fu

17:00 *Annular Shear Driven Periodic Bifurcation Patterns for a Compressible Elastic Tube*
Roger Fosdick, P. Foti, **Aguinaldo Fraddosio**, S. Marzano, M.D. Piccioni

17:20 *New Lower Bound Estimates of Critical Loads for Incompressible Elastic Solids*
Roger Fosdick, **Pilade Foti**, Aguinaldo Fraddosio, Salvatore Marzano, Mario Daniele Piccioni

17:40 *Electrostrictive Effects on the Stability of Dielectric Elastomer Actuators*
Massimiliano Gei, **Roberta Springhetti**, Stefania Colonnelli

MS-31.3 Nonlinear Elasticity — Tuesday, 10:15 - 12:15
K3 — Chair: S. Federico, G. Schubert

10:15 *On Constructing Analytical Solutions for Large Localized States in a Blatz-Ko Cylinder*
Hui-Hui Dai, Xiaochun Peng

10:35 *Damage and Shape Transitions in Spherical Membranes*
Domenico De Tommasi, Salvatore Marzano, Giuseppe Puglisi, **Giuseppe Zurlo**

10:55 *Nonlinear Fracture Theory for Propellant Materials*
Panayiotis Kakavas, N.K. Anifantis

11:15 *The Mullins Effect and Transverse Isotropy*
Luis Dorfmann, Francesco Pancheri

11:35 *Constitutive Modeling of a Cast-Calendar SEBS: Large Strain, Compressibility and Anisotropic Damage Induced by the Process*
Anne-Sophie Caro-Bretelle, Patrick Ienny, Romain Leger, Jose-Marie Lopez-Cuesta

11:55 *Modelling of the Induced Anisotropy by Mullins Effect*
Guilherme Machado, Marie Rebouah, **Grégory Chagnon**, Denis Favier

MS-31.4 Nonlinear Elasticity — Tuesday, 16:00 - 18:00
K3 — Chair: R. Bustamante, K.P. Soldatos

16:00 *On the Formulation of the Spatial and Material Motion Problem in Nonlinear Electro-Elastostatics*
Duc Khoi Vu, Paul Steinmann

16:20 *Notes on Metric Independent Aspects of Electromagnetism*
Reuven Segev, Lior Falach

16:40 *Characterisation of the Magneto-Rheological Effect of Silicone Rubber – Iron Particle Composites Under Large Strains*
Gerlind Schubert, Philip Harrison, Zaoyang Guo

17:00 *Ogden-Type Energies for Nematic Elastomers*
Virginia Agostiniani, Antonio DeSimone

17:20 *Non-Linear Modeling of Magneto-Sensitive Elastomers within a Mixed-Finite-Element Framework*
Franziska Anna Vogel, Paul Steinmann

17:40 *Inverse Form Finding for Incompressible Electroelasticity*
Anna Ask, Ralf Denzer, Andreas Menzel, Matti Ristinmaa

MS-31.5 Nonlinear Elasticity K3	Wednesday, 10:15 - 12:15 Chair: L. Dorfmann, D. Sfyris
10:15	*Nonlinear Elasticity of Single Clusters in Colloidal Systems* **Khiêm Ngoc Vu**, Roozbeh Dargazany, Mikhail Itskov
10:35	*Covariant Tensor Algebra in Non-Linear Elasticity* **Salvatore Federico**
10:55	*On a New Class of Elastic Bodies: Some Theoretical Issues and Applications* **Roger Bustamante**, Kumbakonam Rajagopal
11:15	*Notes on the Mechanics of Irregular Bodies* **Lior Falach**, Reuven Segev
11:35	*Hyperelasticity Based upon Anisotropic Strain Measures* **Paweł Dłużewski**
11:55	*Finite Deformation of Elastic Solids Reinforced with Fibers Resistant to Extension, Flexure and Twist* **David J. Steigmann**

MS-31.6 Nonlinear Elasticity K3	Thursday, 10:15 - 12:15 Chair: H.-H. Dai, D.K. Vu
10:15	*Principal Axis Formulations for Anisotropic Soft Tissue Materials* **M.H.B.M. Shariff**
10:35	*Nonlinear Elasticity in the Interaction of Living Cells with their Mechanical Environment* **Yair Shokef**, Samuel A. Safran
10:55	*Finite Element Implementation of a 3D Fung-Type Model* **Tuan Minh Duong**, Huynh Nhu Nguyen, Manfred Staat
11:15	*A Micromechanics Approach for Estimating the Behavior of Soft Collagenous Tissues* **Gal H. deBotton**, Gal Shmuel, Tal Oren
11:35	*The Mechanics of Indentation and Penetration of a Flat Membrane* **Djenane C. Pamplona**, Guilherme R. Sampaio, Hans I. Weber
11:55	*Characterizing the Material Properties of Intestinal Tissues* T.N. Tran, V. Novacek, F. Turquier, U. Klinge, R. Tolba, D. Bronson, A. Miesse, J. Whiffen, **Manfred Staat**

Minisymposium MS-32

Nonlinear Guided Waves in Solids: Theory and Experiments

Session	Day	Time	Room
MS-32.1	Thursday	10:15 - 12:15	AU3
MS-32.2	Thursday	16:00 - 18:00	AU3

MS-32.1 Nonlinear Guided Waves in Solids AU3	Thursday, 10:15 - 12:15 Chair: K. Khusnutdinova, A. Samsonov
10:15	*Laser-Based Nonlinear Guided Acoustic Waves Propagating at Surfaces (2D) and Edges (1D)* (Keynote) Alexey M. Lomonosov, Andreas P. Mayer, **Peter Hess**
10:55	*Nonlinear Modulation of Extensional Waves in an Elastic Layer* **Mevlut Teymur**, Ali Demirci
11:15	*Torsional Wave Propagation in a Pre-Stressed Incompressible Mooney-Rivlin Annular Cylinder* Tom Shearer, William James Parnell, **Ian David Abrahams**
11:35	*Cauchy Problem for Nonlinear Waves in Layered Waveguides: Extension of d'Alembert's Formula* **Karima Khusnutdinova**, Kieron Moore

MS-32.2 Nonlinear Guided Waves in Solids AU3	Thursday, 16:00 - 18:00 Chair: K. Khusnutdinova, A. Samsonov
16:00	*Bulk Strain Solitons as the Delamination Detection Instrument* (Keynote) **Alexander M. Samsonov**, G.V. Dreiden, K.R. Khusnutdinova, I.V. Semenova
16:40	*Observations of Intrinsic Localized Modes and Dynamical 'Superlattices' in the High-Temperature Lattice Vibrations of Materials* **Michael E. Manley**
17:00	*Shock Wave Propagation in Random Media* **David I. Ketcheson**
17:20	*The Role of Nonlinearity and Dispersion on Wave Motion in Microstructured Solids* **Kert Tamm**, Tanel Peets

Minisymposium MS-33

Nonlinear Waves in Modern Materials and Acoustodiagostics

Session	Day	Time	Room
MS-33.1	Thursday	10:15 - 12:15	S1
MS-33.2	Thursday	14:15 - 15:45	S1
MS-33.3	Friday	10:15 - 12:15	S1

MS-33.1 Nonlinear Waves in Modern Mater. and Acoustodiagn. S1	Thursday, 10:15 - 12:15 Chair: V.I. Erofeyev, A. Porubov
10:15	*Strong Energy Exchanges and Nonlinear Breathers in Weakly Coupled Granular Chains* Yuli Starosvetsky, Md Arif Hasan, **Alexander Vakakis**, Leonid I. Manevitch
10:35	*Linear and Nonlinear Waves in Discrete Structures: Continualization and Discrete Effects* **Igor Vasilievich Andrianov**, Vladislav V. Danishevs'kyy, Dieter Weichert
10:55	*Searching for Local Contact Constraints in the Finite Element Analysis of Contact-Impact Problems* **Jiri Plesek**, Jan Kopacka, Dusan Gabriel
11:15	*Interaction of Bursts for Acoustodiagnostics of Functionally Graded Materials* **Arvi Ravasoo**
11:35	*Explicit Example of Non-Unique Extensional Edge Waves in Pre-Stressed Incompressible Plates* **Aleksey V. Pichugin**, Graham A. Rogerson
11:55	*Shear Viscosity from Angular Momentum Relaxation at Hydrodynamical Description* **German Maximov**, Vladimir Larichev

MS-33.2 Nonlinear Waves in Modern Mater. and Acoustodiagn. S1	Thursday, 14:15 - 15:45 Chair: I.V. Andriano
14:15	*Localization of Nonlinear Strain Waves in Composites* **Alexey Porubov**, Igor Andrianov, Dieter Weichert
14:35	*Elastic Waves in a Structurally-Nonlinear Fibrous Composite Material. 2D Anti-Plane Shear Problem* Igor V. Andrianov, **Vladyslav V. Danishevskyy**, Oleksandr I. Ryzhkov, Dieter Weichert

14:55	*The Formation of Localized Magnetoelastic Waves under the Influence of the Magnetic Field* **Vladimir Ivanovich Erofeyev**, Alexey Olegovich Malkhanov
15:15	*The Riemann Magnetoelastic Wave in a Rod* **Alexey Olegovich Malkhanov**, Vladimir Ivanovich Erofeyev

MS-33.3 Nonlinear Waves in Modern Mater. and Acoustodiagn.	Friday, 10:15 - 12:15
S1	Chair: C. Boutin, V.V. Danishevskyy

10:15	*Harmonic Bursts of Ultrasonic Frequency in Exponentially Graded Materials* **Andres Braunbrück**
10:35	*On Elastic Composite with Non-Local Space and Time Effects at the Leading Order* **Claude Boutin**, Stephane Hans, Celine Chesnais, Jean Soubestre
10:55	*Dynamics of Phase Transition in Solids* **Dmitry Sergeevich Vavilov**
11:15	*High Frequencies Modes of Large Correlation Length in Reticulated Media* **Antoine Rallu**, Stéphane Hans, Claude Boutin
11:35	*Wave Propagation Control via Internal-Degree-of-Freedom Engineering* **Alessandro Spadoni**

Minisymposium MS-34

Optimization in Nonlinear Solid Mechanics

Session	Day	Time	Room
MS-34.1	Tuesday	16:00 - 18:00	K6
MS-34.2	Wednesday	10:15 - 12:15	K6

MS-34.1 Optimization in Nonlinear Solid Mechanics K6	Tuesday, 16:00 - 18:00 Chair: H.C. Rodrigues, J. Stålhand
16:00	*Geometric Constraints in Structural Optimization via a Level-Set Method* Gregoire Allaire, Francois Jouve, **Georgios Michailidis**
16:20	*A Modified Extended Finite Element Approach – Structural and Sensitivity Analysis* **Daniel Materna**, Franz-Joseph Barthold
16:40	*Shape Optimization of Interfaces of Layered Structures* **Masatoshi Shimoda**
17:00	*Enhancing the Damping Properties of Viscoelastic Composites by Topology Optimization* **Casper Schousboe Andreasen**, Erik Andreassen, Ole Sigmund, Jakob Søndergaard Jensen
17:20	*Simultaneous Optimization of Orientation and Constituent Volume of Piezoelectric Composite Laminates* **K.P. Jayachandran**, J.M. Guedes, H.C. Rodrigues

MS-34.2 Optimization in Nonlinear Solid Mechanics K6	Wednesday, 10:15 - 12:15 Chair: H.C. Rodrigues, J. Stålhand
10:15	*Topology Optimization of Elastic Multibody Systems Using the Floating Frame of Reference Formulation* **Alexander Held**, Robert Seifried
10:32	*Parameter Free Shape Optimization Including Nonlinear Kinematics* **Helmut Masching**, Michael Fischer, Matthias Firl, Kai-Uwe Bletzinger
10:49	*Topology Optimization of Flexible Components in Multibody Systems: Application to the Housing of an Automotive Differential* **Emmanuel Tromme**, Olivier Brüls, Geoffrey Virlez, Pierre Duysinx
11:06	*Shape Optimization of a Balloon Expandable Coronary Stent* **Nelson Ribeiro**, João Folgado, Helder Rodrigues
11:23	*On In Vivo Parameter Identification in Soft Tissue* **Jonas Stålhand**

11:40	*Coupling Partially Converged Computations and Multiparametric Strategy for Structural Optimization of Assemblies* **Bruno Soulier**, P.A. Boucard
11:57	*Optimal Control of Quasistatic Evolution – Elastoviscoplastic Contact Problems* **Gonzalo Alduncin**

Minisymposium MS-35

Phase Transformations

Session	Day	Time	Room
MS-35.1	Monday	10:15 - 12:15	K5
MS-35.2	Tuesday	10:15 - 12:15	Saal Steiermark
MS-35.3	Tuesday	16:00 - 18:00	K5

MS-35.1 Phase Transformations K5	Monday, 10:15 - 12:15 Chair: A. Menzel, M. Peigney
10:15	*A Microelastic-Plastic Phase-Field Model for Phase Transformations* (Keynote) **Heike Emmerich**
10:55	*Inertia Dominated Criticality in Martensites* **Alphonse Finel**, Oguz Umut Salman, Lev Truskinovsky
11:15	*On the Structure of Impact Induced Interphase Layers – A Heat Conducting Maxwellian Rate-Type Approach to Solid-Solid Phase Transitions* **Cristian Faciu**, Alain Molinari
11:35	*On Kinetics of Interphase Boundaries and Chemical Reactions Fronts in Elastic Solids* **Alexander B. Freidin**, Elena N. Vilchevskaya, Igor K. Korolev, Daria O. Volkova

MS-35.2 Phase Transformations Saal Steiermark	Tuesday, 10:15 - 12:15 Chair: Th. Bartel, T. Ben Zineb
10:15	*The Role of the Microstructure on the Kinetics of Phase Transformations in Cu-Sn Reaction Couple* **Franz Dieter Fischer**, J. Svoboda
10:35	*Energy-Minimizing Strains in Martensitic Microstructures* **Michael Peigney**
10:55	*Modelling of Incompatible Martensitic Microstructures* **Stanislaw Stupkiewicz**, Anna Górzynska-Lengiewicz
11:15	*A Thermomechanical Mesoscopic Model for Shape-Memory Alloys* **Barbora Benešová**
11:35	*Phase Transformations Limiting Surfaces and Exact Energy Lower Bounds Construction for Elastic Solids* **Mikhail A. Antimonov**, Andrey V. Cherkaev, Alexander B. Freidin

11:55 *Phase Transitions of a SMA Wire: Analytical Formulas and the Determination of Material Constants*
Zilong Song, Hui-Hui Dai

MS-35.3 Phase Transformations	Tuesday, 16:00 – 18:00
K5	Chair: F.D. Fischer, St. Stupkiewicz

16:00 *Effect of Plastic Strain Induced Phase Transformation on Adaptation to Cyclic Loads at Cryogenic Temperatures* (Keynote)
Błażej Tomasz Skoczeń

16:40 *Experimental Analysis of FE-Based Shape Memory Alloy Behavior under Thermo-Mechanical Loading*
Walid Khalil, Luc Saint-Sulpice, Shabnam Arbab Chirani, Céline Bouby, Alain Mikolajczak, **Tarak Ben Zineb**

17:00 *A Large-Strain Model for Phase-Transformation-Plasticity-Interactions in Steels*
Thorsten Bartel, Andreas Menzel

17:20 *Elasto-Visco-Plasticity Involved During Diffusive Phase Transformation of Polycrystals. Focus on Viscosity in Steels*
Fabrice Barbe, Romain Quey, Lakhdar Taleb

17:40 *Phase Field Simulation as Part of Multiscale Modeling for PZT Ferroelectrics: Identification of the Free Energy and Domain Effective Small and Large Signal Properties*
Benjamin Völker, **Marc Kamlah**

Minisymposium MS-36

Refined Theories of Plates and Shells

Session	Day	Time	Room
MS-36.1	Wednesday	10:15 - 12:15	Casineum
MS-36.2	Thursday	10:15 - 12:15	Casineum
MS-36.3	Thursday	14:15 - 15:45	Casineum
MS-36.4	Thursday	16:00 - 18:00	Casineum
MS-36.5	Friday	10:15 - 12:15	Casineum

MS-36.1 Refined Theories of Plates and Shells Casineum	Wednesday, 10:15 - 12:15 Chair: D.H. Hodges, L. Noels
10:15	*A Definition of Polyconvex Stored Energy Functions for Nonlinearly Elastic Shells* (Keynote) **Philippe G. Ciarlet**
10:50	*One-Dimensional Model for the Combined Bending, Stretching, Shearing and Torsion of Laminated Rods Derived from Three-Dimensional Elasticity* **Erick Pruchnicki**
11:07	*Basic Modelling for Large Deformation on Plates* **Jens Rückert**, Arnd Meyer
11:24	*2D Models of Plates and Shells Made of an Anisotropic Material* **Petr Evgen'evich Tovstik**, Tatiana Petrovna Tovstik
11:41	*Analysis of 2-Dimensional Non-Homogeneous Residual Stress State in Plates* **Rostislav Dmitrievich Nedin**, Alexander Ovanesovich Vatulyan
11:58	*Some Considerations on the Plastic Buckling of Cylindrical Shells* **Federico Guarracino**

MS-36.2 Refined Theories of Plates and Shells Casineum	Thursday, 10:15 - 12:15 Chair: V.A. Eremeyev, W. Pietraszkiewicz
10:15	*Comparison of Different Shell Theories for Nonlinear Vibrations of Laminated Circular Cylindrical Shells* **Marco Amabili**

10:35 *Extension of Koiter's Linear Shell Theory to Materials Exhibiting Arbitrary Symmetry*
David J. Steigmann

10:55 *A One-Field Formulation of Elasto-Plastic Shells with Fracture Applications*
Gauthier Becker, **Ludovic Noels**

11:15 *Deformations of Transversely Accreted Plates*
Sergey Alexandrovich Lychev

11:35 *A Vekua-Type Thick Shells' Theory*
Sergey Igorevich Zhavoronok

11:55 *C1 Continuous Finite Element Approximation for Modeling Finite Deformations of Kirchhoff-Love Shells as Material*
Yury M. Vetyukov

MS-36.3 Refined Theories of Plates and Shells — Thursday, 14:15 - 15:45
Casineum — Chair: H. Altenbach, E. Ivanova

14:15 *A Modified Energy Method for the Buckling of Thin Plates in Tension*
Xiang Liu, **Ciprian Coman**

14:33 *Effect of 'Static Resonance' in Cylindrical Shells with Periodical Geometrical Imperfections*
Maksym Kolesnikov, Vasily L. Krasovsky, Ruediger Schmidt

14:51 *On the Unsymmetrical Wrinkling of Heterogeneous Circular and Annular Plates*
Eva Voronkova, Svetlana Bauer, Anders Eriksson

15:09 *On the Stability of the Cylindrical Shell under the Axial Compression with Use of Non-Classical Theories of Shells*
Andrei Ermakov

15:27 *Theory of Micropolar Orthotropic Elastic Thin Shells*
A.J. Farmanyan, **Samvel Hovhannes Sargsyan**

MS-36.4 Refined Theories of Plates and Shells — Thursday, 16:00 - 18:00
Casineum — Chair: G. Dhondt, E. Pruchnicki

16:00 *Efficient High-Fidelity Multiphysics Modeling of Composite Plates Using the Variational Asymptotic Method* (Keynote)
Wenbin Yu, Chang-Yong Lee, Dewey H. Hodges

16:35 *Automatic Expansion of Shell Elements into 3D by Use of Expandable Rigid Bodies*
Guido Dominique Dhondt

16:52 *Nonlinear Stability Analysis of Functionally Graded Shells Using the Invariant-Based Triangular Finite Element*
Stanislav Levyakov, V.V. Kuznetsov

17:09 *Enhanced FGM Shell Finite Elements*
Stephan Kugler, Peter Fotiu, Justin Murin

17:26 *Elastoplastic Thin Plate Finite Elements in Absolute Nodal Coordinate Formulation*
Peter Gruber, Yury Vetyukov, Johannes Gerstmayr

17:43 *Derivation of Thermoelastic Shell Theory by Means of Continuum with Internal Degrees of Freedom*
Elena Ivanova

MS-36.5 Refined Theories of Plates and Shells — Friday, 10:15 - 12:15
Casineum — Chair: F. Guarracino, D. Steigmann

10:15 *On Refined Constitutive Equations of the Resultant Non-Linear Thermomechanics of Shells*
Wojciech Pietraszkiewicz

10:35 *Asymmetric Thermo-Elastic Analysis of a Long Functionally Graded Piezoelectric Cylindrical Shell by DQM*
Reza Akbari Alashti, Mohammad Khorsand

10:55 *On the Theories of Shells with Surface Stresses*
Victor A. Eremeyev, Holm Altenbach

11:15 *A Shell Theory for Chiral Carbon Nanotubes*
Antonino Favata, Paolo Podio–Guidugli

11:35 *Governing Equations for Multi-Walled Carbon Nanotubes Derived from Theories of Orthotropic Cylindrical Shells and Nonlocal Elasticity*
Gennadi Mikhasev

11:55 *On the Bending of Plates in the Electromagnetic Theory of Microstretch Elasticity*
Catalin Bogdan Gales

Minisymposium MS-37

Shape Memory Alloys and Functional Materials

Session	Day	Time	Room
MS-37.1	Monday	16:00 - 18:00	K5
MS-37.2	Tuesday	10:15 - 12:15	K5

MS-37.1 Shape Memory Alloys and Functional Materials K5	Monday, 16:00 - 18:00 Chair: Th. Antretter, P. Šittner
16:00	*Phase Field Theory and Simulations for Stress-Induced Phase Transformations* (Keynote) **Valery I. Levitas**
16:40	*Finite Element Analysis of a Fishplate in Fe-Based Shape Memory Alloy* **Alain Mikolajczak**, Walid Khalil, Céline Bouby, Tarak Ben Zineb
17:00	*A Microstructural Model of the Reversible and Irreversible Deformation of Shape Memory Alloy with Deformation Defects* Margarita E. Evard, **Aleksandr E. Volkov**, Natalia A. Volkova
17:20	*Three Dimensional Thermomechanical Model for Shape Memory Alloys Exhibiting R-Phase Transformation and Material Anisotropy* Petr Sedlák, **Miroslav Frost**, Barbora Benešová, Tarak Ben Zineb, Petr Šittner
17:40	*Mechanical Vibrations of Shape Memory Alloy Wires and Rods: Mathematical and Constitutive Modelling* **Mario Leindl**, Eduard Roman Oberaigner

MS-37.2 Shape Memory Alloys and Functional Materials K5	Tuesday, 10:15 - 12:15 Chair: Th. Antretter, P. Šittner
10:15	*On the Young's Modulus of Austenite and Stress Induced Martensite in Superelastic NiTi Wires* **Petr Šittner**, Caroline Curfs, Thiery Alonso, Jan Pilch, Ludek Heller
10:35	*Effect of High Strain Rate on TiNi Shape Memory Alloys* A. Galieva, V. Grigorieva, A. Gruzdkov, S. Krivosheev, E. Ostropiko, A. Motorin, **Alexander Igorevich Razov**
10:55	*Measurement by DMA in Tension of Elastic Moduli and Transformation Behaviour of Fine Nitinol Medical Wires as Function of Stress and Temperature* Thierry Alonso, **Denis M. Favier**, Gregory Chagnon, Petr Šittner
11:15	*Micromorphology and Mobility of Macro-Twin Boundaries in Ni-Mn-Ga 10M Martensite* **Hanus Seiner**, Ladislav Straka, Oleg Heczko

11:35 *Experiments and Modeling of Smart Silicone Elastomer Membranes Reinforced with Shaped NiTi Textiles*

François Tissot, Thierry Rey, Ludek Heller, Nathanael Connesson, Gregory Chagnon, Yohan Payan, Denis M. Favier, Petr Šittner

11:55 *Functional Plain Weft Knitted NiTi Textiles and Elastomeric Composites*

Ludek Heller, **Bohdana Marvalova**, Jarmil Vlach, Katerina Janouchova, David Vokoun

Minisymposium MS-38

Stability and Nonlinear Behavior of Steel Structures

Session	Day	Time	Room
MS-38.1	Wednesday	10:15 - 12:15	K7
MS-38.2	Thursday	10:15 - 12:15	K7
MS-38.3	Thursday	14:15 - 15:45	K7
MS-38.4	Thursday	16:00 - 18:00	K7

MS-38.1 Stability and Nonlinear Behavior of Steel Structures K7	Wednesday, 10:15 - 12:15 Chair: L. Gardner, A. Taras
10:15	*Interactive Buckling in Structural Components: Analytical Modelling* **Mohammad Ahmer Wadee**
10:35	*The Application of Plastic Flow Theory to Bifurcation Problems* **Jurgen Becque**
11:55	*Non-Linear Elastic Response of Shallow Fixed-Pinned Arches* Yong-Lin Pi, **Mark A. Bradford**
11:15	*A Semi-Analytical Model for the Post-Buckling Analysis and Ultimate Strength Prediction of Stiffened Plates Used in Steel Bridges* **Pedro Salvado Ferreira**, Francisco Virtuoso
11:35	*Consistent Stiffness Matrices for the Semi-Analytical Finite Strip Method* **Dávid Visy**, Sándor Ádány

MS-38.2 Stability and Nonlinear Behavior of Steel Structures K7	Thursday, 10:15 - 12:15 Chair: D. Camotim, M. Knobloch
10:15	*Influence of Strain Hardening on the Behaviour and Design of Steel and Steel-Concrete Composite Structures* **Leroy Gardner**, Lorenzo Macorini, Merih Kucukler
10:35	*Towards a Uniform Stability Design Procedure for Steel Beam-Columns with Compact, Semi-Compact and Slender Cross-Sections* **Andreas Taras**
10:55	*Experimental and Numerical Investigations towards Lateral Torsional Buckling of Cellular Steel Beams* Moussa Lo, Joanna Nseir, Hugues Somja, **Nicolas Boissonnade**

11:15	*Yield Slenderness Limits for Cold-formed High Strength Carbon and Stainless Steel Tubes* **Tak Ming Chan**, Xiao-Ling Zhao, Ben Young
11:35	*Structural Stability of Steel Members in Fire* **Markus Knobloch**

MS-38.3 Stability and Nonlinear Behavior of Steel Structures	Thursday, 14:15 - 15:45
K7	Chair: M.A. Bradford, M.A. Wadee

14:15	*Finite Element Analysis of Columns with Semi-Elliptical Hollow Section* **Nuno Silvestre**, Tiago Pires
14:35	*Prediction of the Collapse Mode of Axially Crushed Steel Profiles* **Bernhard Müller**, Martin Schagerl, Kai-Uwe Schröder
14:55	*Strength of Hollow Tubular Flange Plate Girders with Slender Webs Containing Square Openings* **Mostafa Fahmi Hassanein**
15:15	*Buckling Collapse of Tank Wagon in Consequence of Pressure Difference* **Dmitry Nesterenko**, Dmitry Nesterenko

MS-38.4 Stability and Nonlinear Behavior of Steel Structures	Thursday, 16:00 - 18:00
K7	Chair: G. Ranzi, N. Silvestre

16:00	*Shell-Model-Based Analytical Solutions for Column Buckling with Considering Shear Deformations* **Sándor Ádány**
16:20	*A Semi-Discretization Approach to Generalized Beam Theory and Analytical Solutions of the Generalized Column Equations* **Jeppe Jönsson**, Michael Joachim Andreassen
16:40	*A New Approach for the GBT Analysis of Thin-Walled Members* Gerard Taig, **Gianluca Ranzi**, Angelo Luongo
17:00	*Design of Steel Storage Rack Columns against Distortional Buckling: Investigating Possible Improvements to the EN15512* **Miquel Casafont**, Maria Magdalena Pastor, Francesc Roure, Jordi Bonada
17:20	*Numerical Investigation on the Distortional-Global Interaction in Fixed-Ended and Pin-Ended Thin-Walled Lipped Channel Columns* **Dinar Camotim**, Pedro B. Dinis

Minisymposium MS-39

Surface and Interface Acoustic Waves in Solids

Session	Day	Time	Room
MS-39.1	Monday	10:15 - 12:15	S2
MS-39.2	Monday	16:00 - 18:00	S2

MS-39.1 Surface and Interface Acoustic Waves in Solids — Monday, 10:15 - 12:15
S2 — Chair: S. Nair, D. Sotiropoulos

10:15 *Health Monitoring of Composite Structures Using Ultrasonic Waves*
Ajit K. Mal, Fabrizio Ricci, Harsh K. Baid

10:35 *Joint Analysis of Surface Waves*
Giancarlo Dal Moro

10:55 *Propagation, Transmission and Reflection of Acoustic Waves in Second Gradient 3D Continua*
Francesco dell'Isola, Angela Madeo, **Luca Placidi**

11:15 *The Areolar Strain Approach for Elastic Waves*
Ihor Kotchergenko

11:35 *Rayleigh Wave Scattering from a Sinusoidal Perturbation of a Flat Surface in an Incompressible Monoclinic Medium*
Sudhakar Nair, Dimitrios A. Sotiropoulos

MS-39.2 Surface and Interface Acoustic Waves in Solids — Monday, 16:00 - 18:00
S2 — Chair: S. Nair, D. Sotiropoulos

16:00 *On Propagation of Singular Surfaces in Thermo-Piezoelectricity*
Adriano Montanaro

16:20 *Acoustic Propagation along a Fluid-Solid Interface*
Piotr Borejko

16:40 *Damage Detection in Plate-Like Structures Using a Beam-Forming Technique*
Fabrizio Ricci, Ernesto Monaco, Simone Tancredi, Domenico Caporrino, Ajit K. Mal

17:00 *Using Embedded PZT Transducers to Determine the Elastic Constants of Concrete Structures*
Costas Providakis, Vagelis Liarakos, Stelios Providakis

17:20 *Interaction of Elastic Waves with a Disbond in a Honeycomb Composite*
Harsh K. Baid, Fabrizio Ricci, **Ajit K. Mal**

17:40 *Characterizing Anisotropic Solids from a Linearized Surface Acoustic Wave Equation*
Dimitrios A. Sotiropoulos, Sudhakar Nair

Minisymposium MS-40

Surface Effects in Nano-Mechanics

Session	Day	Time	Room
MS-40.1	Thursday	10:15 - 12:15	K2
MS-40.2	Thursday	16:00 - 18:00	K2
MS-40.3	Friday	10:15 - 12:15	K2

MS-40.1 Surface Effects in Nano-Mechanics K2	Thursday, 10:15 - 12:15 Chair: H. Altenbach, J. Povstenko
10:15	*Mathematical Modeling of Phenomena Caused by Non-Uniform Surface Tension in Solids* (Keynote) **Yuriy Povstenko**
10:50	*On Modeling of Surface and Interface Elastic Effects in Case of Eigenstrains* **Konstantin B. Ustinov**, Robert V. Goldstein, Valentin A. Gorodtov
11:07	*On Mechanical Properties of Materials Considering Surface Effects* **Holm Altenbach**, Victor A. Eremeyev, Nikita F. Morozov
11:24	*Influence of Surface Stress on Stability of Nanoscale Plate with a Circular Hole* Nikita F. Morozov, **Stanislava V. Kashtanova**
11:41	*Surface Stress in an Elastic Plane with a Near-Circular Hole* **Mikhail Grekov**, Anna Yazovskaya
11:58	*Mathematical Models of Continuous Growth* **Alexander V. Manzhirov**

MS-40.2 Surface Effects in Nano-Mechanics K2	Thursday, 16:00 - 18:00 Chair: S.A. Lurie, Z.-P. Huang
16:00	*Interface Energy Theory and its Application for Thermo-Elastic Nanocomposites* **Zhu-Ping Huang**, Yongqiang Chen, Lizhi Sun
16:17	*Glass Spheres – Functionalization and Surface Modification* **Zinaida Ivanova Kutelova**, H. Mainka, K. Mader, W. Hintz, J. Tomas
16:34	*Surface Mechanics and Full-Field Measurements: Investigation of the Electro-Elastic Coupling* **Fabien Amiot**, Cécile Flammier, Frédéric Kanoufi, Sorin Munteanu, Jean Paul Roger, Gilles Tessier
16:51	*Surface Chemical Reactions Kinetics in Elastic Solids* **Elena Vilchevskaya**, Alexander Freidin, Igor Korolev

17:08 *Elastic Properties of Ideal Crystals: From Macro to Micro*
Anton Krivtsov, Olga Loboda, Ekaterina Podolskaya

17:25 *Reassessing the Bending Stiffness of Graphene and the Applicability of Continuum Mechanics*
Fengpeng Zhao, Yongkuan Shen, Hengan Wu

17:42 *Bounding Wall Structure Effect on Buckling of a Carbon Nanotube and on a Fluid Flow*
Andrei Karenovitch Abramian, L.V. Mirantsev

MS-40.3 Surface Effects in Nano-Mechanics — Friday, 10:15 - 12:15
K2 — Chair: I. Berinskii, P. Steinmann

10:15 *The Admissibility of Negative Material Parameters for Surface Elasticity Theory*
Ali Javili, Andrew McBride, **Paul Steinmann**, B. Daya Reddy

10:35 *Tunable Bending Stiffness, Natural Frequency and Buckling Force of Nanowires and Nanoplates*
Hanxing Zhu

10:55 *Generalized Continuum Model of Adhesion: Adhesion Phenomena for Solids, and Micro/Nanostructures*
Sergey Albertovich Lurie, Natalia P. Tuchkova, Jury O. Soliaev

11:15 *Models of Graphene Crystal Lattice Based on Discrete and Continuous Approaches*
Igor Berinskii, Anton Krivtsov

11:35 *Stability and Structural Transitions in Crystal Lattices*
Ekaterina Podolskaya, Anton Krivtsov, Artem Panchenko

11:55 *Effect of a Type of Loading on Stresses at a Planar Boundary of a Nanomaterial*
Mikhail Grekov, **Yulia Vikulina**

Minisymposium MS-41

Theoretical and Numerical Modelling of the Function of the Eye

Session	Day	Time	Room
MS-41.1	Tuesday	10:15 - 12:15	K6
MS-41.2	Tuesday	14:45 - 15:45	K6

MS-41.1 Theor. and Numerical Modelling of the Function of the Eye Tuesday, 10:15 - 12:15
K6 Chair: H.J. Burd, A. Pandolfi

10:15 *Assessment of the Ocular Response Analyzer as a Tool for Measuring Intraocular Pressure and Corneal Biomechanical Properties*
Ahmed Elsheikh, David F. Garway-Heath

10:35 *A Molecular-Level Model of Collagen-Proteoglycan Structural Interactions in the Cornea Stroma: A New Theory for Swelling Pressure*
Xi Cheng, **Peter M. Pinsky**

10:55 *Testing and Modeling the Behavior of Porcine Cornea*
Federica Boschetti, **Anna Pandolfi**

11:15 *The Complex Biomechanical Analysis of the Human Eye*
Zoltán Bocskai, Imre Bojtár

11:35 *A Multi-Scale Model for the Mechanics of the Human Lens Capsule*
Harvey John Burd

MS-41.2 Theor. and Numerical Modelling of the Function of the Eye Tuesday, 14:45 - 15:45
K6 Chair: A. Elsheikh, P.M. Pinsky

14:45 *A Model of Posterior Vitreous Detachment and Generation of Tractions on the Retina*
Amabile Tatone, Rodolfo Repetto

15:05 *Effect of the Scleral Collagen Structure on the Biomechanical Response of the Optic Nerve Head*
Baptiste Coudrillier, Thao D. Nguyen

15:25 *Fiber Distributed Hyperelastic Modeling of Biological Tissues*
Marcello Vasta, Anna Pandolfi

Minisymposium MS-42

Trends in Phase-Field Modelling

Session	Day	Time	Room
MS-42.1	Thursday	16:00 - 18:00	S2
MS-42.2	Friday	10:15 - 12:15	S2

MS-42.1 Trends in Phase-Field Modelling S2	Thursday, 16:00 - 18:00 Chair: S. Forest, B. Markert
16:00	*Study of Three Dimensional Crack Instabilities Using a Phase Field Model* **Hervé Henry**
16:20	*Diffusive Porous Media Fracture* **Bernd Markert**
16:40	*Configurational Forces in the Context of a Phase Field Fracture Model* **Charlotte Kuhn**, R. Müller
17:00	*Relaxed Phase Field Modeling for Compressible Media* **Christian Rohde**
17:20	*Continuous Modeling of Microstructure Evolution Coupled with Plastic Activity* **Maeva Cottura**, Yann Le Bouar, Alphonse Finel, Benoît Appolaire, Samuel Forest
17:40	*A Phase Field Approach to Reactive Systems* **Kerstin Weinberg**, Denis Anders

MS-42.2 Trends in Phase-Field Modelling S2	Friday, 10:15 - 12:15 Chair: S. Forest, B. Markert
10:15	*Phase-Field Modelling Coupled with Micro-Elasticity Applied to Ageing in Sn-Cu/Cu and Sn-Ag-Cu/Cu Lead-Free Solder Joints* **Durga Ananthanarayanan**, Patrick Wollants, Nele Moelans
10:35	*Interface Stress in Phase Field Models with Elasticity* **Benoit Appolaire**, Yann Le Bouar, Alphonse Finel, Elisabeth Aeby-Gautier
10:55	*Coupling Diffusion and Mechanics within a Multiscale Material Modelling Framework* **Aurelien Villani**, E.P. Busso, S. Forest, B. Appolaire
11:15	*Modeling of Dislocations at an Atomic Scale within a Continuum Framework and Coupling with a Phase Field Model* **Pierre-Antoine Geslin**, Benoît Appolaire, Alphonse Finel

11:35	*Antiphase Boundaries in Rafted Structures: Experimental Investigation and Phase Field Modeling* Adèle Lyprendi, **Yann Le Bouar**, Alphonse Finel, Jean-Sébastien Mérot, Loïc Patout, Francois Brisset
11:55	*Phase-Field Formulation for Heterogeneous Systems and its Implementation into the OpenPhase Library* **Ingo Steinbach**, Oleg Shchyglo

Minisymposium MS-43

Virtual Testing of Composites

Session	Day	Time	Room
MS-43.1	Monday	10:15 - 12:15	K6
MS-43.2	Monday	14:45 - 15:45	K6
MS-43.3	Monday	16:00 - 18:00	K6

MS-43.1 Virtual Testing of Composites K6	Monday, 10:15 - 12:15 Chair: C. González, St. Hallett
10:15	*Virtual Tests for High-Temperature Ceramic Composites* (Keynote) **Brian Cox**, Hrishikesh Bale, Renaud Rinaldi, Matthew Blacklock, Rob Ritchie, Matthew Begley, Frank Zok, Dave Marshall, Qingda Yang
10:50	*Micromechanical Study of the Failure of Fiber-Reinforced Polymers* **Luis Pablo Canal**, Carlos González, Javier Segurado, Javier LLorca
11:07	*Micro-Level Simulation of Fracture in Laminated Composite Materials* David Mollenhauer, Tim Breitzman, **Endel Iarve**, Kevin Hoos, Michael Swindeman, Eric Zhou
11:24	*The Effect of Micro-Scale Matrix Nonlinearity on Composite Strength under Combined Transverse and Shear Loads* **Martin Hirsekorn**, Gaël Grail
11:41	*Mode I Single Z-Pin Pull-Out from a Cured Unidirectional Laminate* Fabrice Hélénon, James K. Lander, Giuliano Allegri, **Stephen R. Hallett**, Michael R. Wisnom
11:58	*A Generalized Finite Element Method for Fiber Composites* **Adriaan Sillem**, A. Simone, L.J. Sluys

MS-43.2 Virtual Testing of Composites K6	Monday, 14:45 - 15:45 Chair: C. González, St. Hallett
14:45	*Isogeometric Analysis of Thin–Walled Composite Structures* **Saman Hosseini**, Clemens V. Verhoosel, Joris J.C. Remmers, René de Borst
15:05	*A Level Set Model for Delamination in Shells* **Frans van der Meer**, Bert Sluys
15:25	*A-FEM Based Multiscale Models with Discrete Microscopic Damage Evolution for Virtual Testing of Composites* **Qingda Yang**, Brian Cox, Mark Spearing

MS-43.3 Virtual Testing of Composites K6	Monday, 16:00 - 18:00 Chair: C. González, St. Hallett
16:00	*Discrete Damage Modeling Methods for Laminated Composite Strength Prediction* **Endel Iarve**, Michael Swindeman, Kevin Hoos, David Mollenhauer, Stephen Hallett
16:20	*A Study on Matrix Crack Induced Delamination in Laminated Composites* **Lierni Zubillaga**, Albert Turon , Josep Costa, Stephane Mahdi, Peter Linde
16:40	*Scaled Tests as Validation Tools: the Case of Low Velocity Impact Applied to a Mesomodel for Laminates* **Emmanuelle Abisset**, Federica Daghia, Pierre Ladevèze, Michael R. Wisnom, Stephen R. Hallett
17:00	*Modelling of the Low-Velocity Impact Behaviour of 3D Orthogonal Hybrid Woven Composites* **Raúl Muñoz**, Rocío Seltzer, Francisca Martínez, Carlos González, Javier LLorca

Minisymposium MS-44

Viscoelastic Behavior of Soft Tissues and Polymers

Session	Day	Time	Room
MS-44.1	Thursday	16:00 - 18:00	Blauer Salon
MS-44.2	Friday	10:15 - 12:15	Blauer Salon

MS-44.1 Viscoelastic Behavior of Soft Tissues and Polymers — Thursday, 16:00 - 18:00
Blauer Salon — Chair: S. Govindjee, V. Nguyen

16:00 *A Coupled Theory for Thermally Responsive Polymeric Gels*
Shawn A. Chester, Lallit Anand

16:20 *Mechanics of a Segmented Random Polyurea Copolymer*
Hansohl Cho, Renaud G. Rinaldi, Mary C. Boyce

16:40 *Application of Statistical Mechanics in Thermo-Mechanics and its Effects on Free-Energy Structure*
Sanjay Govindjee, Sunny Mistry, Aurelie Azoug

17:00 *The Role of Evolving Anisotropy and Physical Aging in Deformation and Fracture of Glassy Polycarbonate*
Mehrdad Negahban, Shawn Meagher, Laurent Delbreilh, Jean-Marc Saiter, Derek Peterson, Zheng Li

17:20 *Nonlinear Viscoelastic Contribution to the Tensile Cyclic Behavior of High Density Polyethylene: Experiments and Modeling*
Song Thanh Thao Nguyen, Sylvie Castagnet, Jean-Claude Grandidier

MS-44.2 Viscoelastic Behavior of Soft Tissues and Polymers — Friday, 10:15 - 12:15
Blauer Salon — Chair: S. Govindjee, V. Nguyen

10:15 *Heating and Stretching of Magneto-Sensitive and Mechanically Active Polymer Composites*
M. Heuchel, Muhammad Yasar Razzaq, Marc Behl, **Karl Kratz**, Andreas Lendlein

10:35 *Modeling the Shape Memory Behavior of Amorphous Polymers*
Thao Nguyen

10:55 *Multi-Scale Modeling of the Viscoelastic Behavior of Cross-Linked F-Actin Networks*
Michael J. Unterberger, Gerhard A. Holzapfel

11:15 *Influence of Cryopreservation on the History Dependent Mechanical Response of Tissue Engineered Vascular Grafts*
Arabella Mauri, Steffen M. Zeisberger, Simon P. Hoerstrup, Edoardo Mazza

11:35 *Finite Element Model for the Frequency Response of Poroelastic Tissues under Dynamic Spherical Indentation Tests*

Matteo Taffetani, Emanuele Bertarelli, Riccardo Gottardi, Roberto Raiteri, Pasquale Vena

Minisymposium MS-45

Wave Propagation in Saturated and Partially Saturated Porous Media

Session	Day	Time	Room
MS-45.1	Thursday	10:15 - 12:15	Maybach
MS-45.2	Thursday	14:15 - 15:45	Maybach

MS-45.1 Wave Propagation in Saturated Porous Media Maybach	Thursday, 10:15 - 12:15 Chair: B. Albers, K. Wilmanski
10:15	*Acoustics of Partially Saturated Rocks: Experiment, Theory and Simulation* **Tobias M. Mueller**, Sofia Correia Lopes, German Rubino, Eva Caspari, Maxim Lebedev, Boris Gurevich
10:35	*Wave Propagation in Residual-Saturated Porous Media with Trapped Fluids* **Patrick S. Kurzeja**, Holger Steeb
10:55	*The Effect of Fluid Streams in Porous Media on Acoustic Compression Wave Propagation, Transmission and Reflection* **Angela Madeo**, Irini Djeran-Maigre, Giuseppe Rosi, Claire Silvani
11:15	*Two-Phase Finite Element Investigation of Vibrations due to Bankside Shipping Traffic* **Bettina Albers**, Stavros A. Savidis

MS-45.2 Wave Propagation in Saturated Porous Media Maybach	Thursday, 14:15 - 15:45 Chair: B. Albers, K. Wilmanski
14:15	*A General Two-Phase Debris Flow Model: Benchmark Simulations for Subaerial and Submarine Flows, Complex Wave Generation and Interactions* **Shiva P. Pudasaini**
14:35	*Monitoring of Fabric Change in Multi-Phase Granular Material by Use of Coda-Wave Interferometry* **Frank Wuttke**, Tom Schanz
14:55	*Sound Propagation in Particulate Systems with Disorder and Friction* **Lisa de Mol**, Brian P. Lawney, Vanessa Magnanimo, Stefan Luding
15:15	*Acoustics and Anisotropic Diffusion in Poroelastic Media* Bettina Albers, **Krzysztof Wilmanski**

General Session GS-CM

Continuum Mechanics

Session	Day	Time	Room
GS-CM.1	Monday	10:15 - 12:15	K4
GS-CM.2	Monday	14:15 - 15:45	K4
GS-CM.3	Monday	14:15 - 15:45	AU1
GS-CM.4	Tuesday	16:00 - 18:00	K4
GS-CM.5	Wednesday	10:15 - 12:15	K4
GS-CM.6	Wednesday	10:15 - 12:15	S3
GS-CM.7	Thursday	14:15 - 15:45	K2
GS-CM.8	Thursday	16:00 - 18:00	Maybach
GS-CM.9	Friday	10:15 - 12:15	K1

GS-CM.1 Continuum Mechanics K4	Monday, 10:15 - 12:15 Chair: M. Amabili, K.A. Elsibai
10:15	*Slip Dynamics at Frictional Interfaces: Influence of Viscoelasticity and Energetic Analysis* **David S. Kammer**, Vladislav A. Yastrebov, Jean-François Molinari
10:35	*Scattering of Compressional Waves from a Spherical Void in a Pre-Stressed Non-Linear Elastic Host Medium* **Tom Shearer**, William James Parnell, Ian David Abrahams
10:55	*Shear Wave Propagation in an Elastic Layer Containing Void Pores* **Prakash Chandra Pal**, Banti Sen, Lalan Kumar
11:15	*Reflected Waves from a Solid Half Space in the Context of the Two-Temperature Theory* **Khaled A. Elsibai**
11:35	*Physically and Geometrically Nonlinear Vibrations of Thin Rectangular Plates* **Ivan Breslavskyi**, Marco Amabili, Mathias Legrand

GS-CM.2 Continuum Mechanics K4	Monday, 14:45 - 15:45 Chair: H. Welemane
14:45	*Three-Parameter Damage Model for Quasi-Brittle Solids* **Ji Zhang**, Jie Li
15:05	*Micromechanical Modeling of Brittle Damage in Composite Materials: Primary Anisotropy, Induced Anisotropy and Opening-Closure Effects* **Hélène Welemane**, Cristina Goidescu, Olivier Pantalé, Floran Barelli, Olivier Dalverny
15:25	*A Stochastic Continuum Damage Mechanics Based Methodology for Residual Life Assessment against Creep Damage* Y. Appalanaidu, Yash Vyas, **Sayan Gupta**

GS-CM.3 Continuum Mechanics AU1	Monday, 14:45 - 15:45 Chair: I. Guz
14:45	*Buckling of an Elastic Hemispherial Shell with an Obstacle* **Alberto Maria Bersani**, Ivan Giorgio, Giovanna Tomassetti
15:05	*Thermal Fatigue Life Prediction for a Sandwich Beam Containing Piezoactive Layers* **Igor Guz**, Yaroslav Zhuk, Maria Kashtalyan
15:25	*Prediction of the Nonlinear Load and Unload Pressure-Volume Curves of a Complex Microsphere Composite including Buckling Effects* I.D. Abrahams, **Riccardo De Pascalis**, W.J. Parnell

GS-CM.4 Continuum Mechanics K4	Tuesday, 16:00 - 18:00 Chair: G. Parry, H. Petryk
16:00	*Continuous and Discrete Symmetries for Defective Crystals Related to a Class of Nilpotent Groups* **Gareth Parry**, Rachel Nicks
16:20	*Symmetries of Crystals with Defects Related to Classes of Solvable Lie Groups* **Rachel Nicks**, Gareth Parry
16:40	*Crystal Plasticity Using the Principle of Maximum Dissipation* **Markus Orthaber**, Thomas Antretter, Werner Ecker
17:00	*Modelling of Deformation Banding by Incremental Energy Minimization in Crystal Plasticity* **Henryk Petryk**, Michal Kursa
17:20	*A Strain Gradient Plasticity Model for the Finite Element Simulation of Lüders Band Propagation* **Matthieu Maziere**, Anthony Marais, Samuel Forest
17:40	*On the Atomistic Definition of Local Stress in Continuum Mechanics* **Manfred H. Ulz**, Kranthi K. Mandadapu, Panayiotis Papadopoulos

GS-CM.5 Continuum Mechanics K4	Wednesday, 10:15 - 12:15 Chair: V. Monchiet, E. Starostin

10:15 *Representations of Fourth-Order Cartesian Tensors of Solid Mechanics*
András Lengyel, Tibor Tarnai

10:35 *Thermodynamic Approach to Generalized Mechanics*
Peter Ván, Christina Papenfuss

10:55 *Rheology, Plasticity, and Thermal Expansion in a Nonequilibrium Thermodynamical Framework*
Attila Csatár, **Tamás Fülöp**, Péter Ván

11:15 *Solution of Coupled Thermomechanical Problems Using p-FEM*
Balázs Pere

11:35 *Algebra, Irreducible Bases and Compact Representations for Higher-Order Tensors*
Vincent Monchiet, Guy Bonnet

11:55 *Ghost Forces in Non-Local-to-Local Continua Coupling by the Morphing Method*
Yan Azdoud, Gilles H. Lubineau, Fei Han, Abe Askari

GS-CM.6 Continuum Mechanics S3	Wednesday, 10:15 - 12:15 Chair: J. Sanahuja, P. Harrison

10:15 *Two Dimensional Deterministic Model of a Thin Body with Micro High Stiffness Fibers Randomly Distributed*
Azdine Nait-Ali, Gérard Michaille, Stéphane Pagano

10:35 *Homogenization of Ageing Linear Viscoelastic Random Composite Materials: an Efficient Approach*
Julien Sanahuja

10:55 *Homogenization for Modal Purposes*
Daniel Christopher Kreuter, M. Beitelschmidt

11:15 *A Hyperelastic Model for Incompressible Particle-Reinforced Neo-Hookean Composite*
Zaoyang Guo, Xiaohao Shi, Xiongqi Peng, Philip Harrison

11:35 *Application of a Multi-Scale Homogenization Technique to Nonlinear Composites*
Andreas Brandmair, Wolfgang H. Müller

11:55 *Two-Scale Simulation of Piezoelectric Materials Using Configurational Force Theory*
Md Khalaquzzaman, Ralf Müller, Baixiang Xu

GS-CM.7 Continuum Mechanics K2	Thursday, 14:15 - 15:45 Chair: M.N. da Silva

14:15 *Analytical Solution of an Inverse Elastostatic Problem for Ellipsoidal Defect in Anisotropic Elastic Solid*
Efim Il'ich Shifrin, P.S. Shushpannikov

14:35 *Influence of Coating on Stress Intensity Factor at the Tip of Transverse Crack*
Boris Sobol, Alexander Krasnoschekov

14:55	*Cyclic Loading of a Cracked Sheet: Approaches and Results* **Larisa Valentinovna Stepanova**, Pavel S. Roslyakov
15:15	*A Phase-Field Based Theory as a Regularization of a Sharp Theory for Crack Propagation* **Milton Nogueira da Silva**, Fernando P. Duda, Eliot Fried

GS-CM.8 Continuum Mechanics	Thursday, 16:00 - 18:00
Maybach	Chair: A. Bertram, J.-B.M. Leblond
16:00	*On the Introduction of Thermoplasticity* **Albrecht Bertram**, Arnold Krawietz
16:20	*Multiaxial Constitutive Model of Discontinuous Plastic Flow at Cryogenic Temperatures* **Jan Bielski**, Błażej Tomasz Skoczeń
16:40	*Plastic Flow at a Crack Tip. Energy Fracture Criterion and its Relation to the J-Integral* Alexander I. Khromov, **Anastasia A. Bukhanko**
17:00	*The Strain Rate Intensity Factor in Plasticity* **Sergei Alexandrov**
17:20	*Three-Dimensional Continuum Dislocation Microplasticity FE-Simulation* **Stephan Wulfinghoff**, Thomas Böhlke
17:40	*A Gurson-Type Model for Porous Ductile Materials Containing Arbitrary Ellipsoidal Voids* **Jean-Baptiste M. Leblond**, Komlanvi Madou

GS-CM.9 Continuum Mechanics	Friday, 10:15 - 12:15
K1	Chair: R. Huang, G. Marini
10:15	*Coupling of Mechanical and Physical-Chemical Models to Predict the Lifetime of Self-Healing Ceramic Matrix Composite Structure* **Elen Hemon**, M. Kaminski, F. Laurin, J.-F. Maire, F. Bouillon
10:35	*On the Finite Strain Constitutive Modelling of Plant Cell Wall Growth* **Ruoyu Huang**, A.A. Becker, I.A. Jones
10:55	*The Interaction of Mechanics and Solvent Uptake: Theory and Applications* **Fernando Pereira Duda**, Angela Cristina Cardoso de Souza, Eliot Fried
11:15	*Determination of Material Constants of Hyperelastic Fung-Type Model from Molecular Calculations* Marcin Gajewski, **Marcin Maździarz**
11:35	*Influence of the Swelling Pressure in a Bottom-Up Description of the Intervertebral Disc* **Giacomo Marini**, Harald Studer, Stephen J. Ferguson

General Session GS-CoM

Computational Mechanics

Session	Day	Time	Room
GS-CoM.1	Monday	10:15 - 12:15	Saal Steiermark
GS-CoM.2	Monday	14:45 - 15:45	S3
GS-CoM.3	Monday	14:45 - 15:45	AU3
GS-CoM.4	Monday	14:45 - 15:45	Saal Steiermark
GS-CoM.5	Tuesday	14:45 - 15:45	K3
GS-CoM.6	Tuesday	14:45 - 15:45	Saal Steiermark
GS-CoM.7	Tuesday	14:45 - 15:45	S3
GS-CoM.8	Tuesday	16:00 - 18:00	Saal Steiermark
GS-CoM.9	Wednesday	10:15 - 12:15	K5
GS-CoM.10	Wednesday	10:15 - 12:15	Maybach
GS-CoM.11	Thursday	14:15 - 15:45	Blauer Salon
GS-CoM.12	Thursday	16:00 - 18:00	S1

GS-CoM.1 Computational Mechanics Saal Steiermark	Monday, 10:15 - 12:15 Chair: W. Fenz, D.M. Pierce
10:15	*An Efficient Finite Element Model for Hip Joint Contact* **Kristin Fietz**, Udo Nackenhorst
10:35	*Model Reduction for Nonlinear Biomechanics Based on the Proper Orthogonal Decomposition Method* **Annika Radermacher**, Stefanie Reese
10:55	*Finite Element Simulation of Blood Flow through Intracranial Aneurysms including Fluid-Structure Interaction* **Wolfgang Fenz**, Johannes Dirnberger
11:15	*Effectiveness of the Edge-Based Smoothed Finite Element Method Applied to Soft Biological Tissues* **Ralf Frotscher**, Manfred Staat, Hans-Jürgen Raatschen

11:35	*Mathematical Modelling and Numerical Methods of the Feedbacks between Tree Growth and Biomechanics* **Thomas Guillon**, Yves Dumont, Thierry Fourcaud
11:55	*A Method for Incorporating Residual Stresses into Finite Element Simulations with an Application to Abdominal Aortic Aneurysms* **Thomas E. Fastl**, David M. Pierce, Hannah Weisbecker, Gerhard A. Holzapfel

GS-CoM.2 Computational Mechanics S3	Monday, 14:45 - 15:45 Chair: T.L. Nguyen
14:45	*Integrated Implementation of an Extended Kalman Filter within Finite Element Analysis for Material Pamaremeter Identification* **Thanh Luan Nguyen**, Tamara Nestorovic
15:05	*On the Prediction of Anisotropy Evolution in Polycrystalline Multiphase Materials* **Erik Lindfeldt**, Magnus Ekh
15:25	*Prediction of Fractures by Gravimetric Interference Method* **Matheus Alves Laranjeira Neri**, Lurimar Smera Batista

GS-CoM.3 Computational Mechanics AU3	Monday, 14:45 - 15:45 Chair: R. Patho
14:45	*Approximation of Anisotropic Trajectories of Elasticity of Human Bone from a 3D-Profile Based on Volumetric Visualization of CT Images* **Cornelia Kober**, Christoph Mueller, Philippe Young, Andreas Fritsch, Christian Hellmich
15:05	*Shape Optimization for Ergonomy and Comfort Based on Minimum Contact Stress Variance* **Damir Vučina**, Igor Pehnec, Marko Banić
15:25	*Shape Optimization in Discretized Contact Problems with Friction and a Solution-Dependent Coefficient of Friction* **Robert Patho**, Jaroslav Haslinger, Jiri V. Outrata

GS-CoM.4 Computational Mechanics Saal Steiermark	Monday, 14:45 - 15:45 Chair: S. Datoussaid
14:45	*On the Design of Compliant Thermal Mechanisms Using Evolutionary Topology Optimization* Ruben Ansola, **Estrella Veguería**, Javier Canales, José Antonio Tárrago
15:05	*Optimization of Composite Structures – A Comparison of Two Approaches* **Dženan Hozić**, Anders Klarbring, Bo Torstenfelt
15:25	*Stress and Fatigue Constrained Topology Optimization* **Erik Holmberg**, Bo Torstenfelt, Anders Klarbring

GS-CoM.5 Computational Mechanics K3	Tuesday, 14:45 - 15:45 Chair: F. Dirksen
14:45	*The Relationship between Optimal Periodic Structures and Optimal Material Microstructures* **Yi Min Xie**, Zhi Hao Zuo, Xiao Ying Yang, Xiaodong Huang, Jian Hua Rong
15:05	*Structural Optimization of Large-Displacement, Path-Following Compliant Mechanisms with Optimally Designed Flexure Hinges* **Frank Dirksen**, Rolf Lammering, Tarek I. Zohdi
15:25	*Multicriteria Optimal Design of Multibody Systems by Using Evolutionary Strategies* **Selim Datoussaid**, Jérôme Noël, Thierry Descamps

GS-CoM.6 Computational Mechanics Saal Steiermark	Tuesday, 14:45 - 15:45 Chair: H. Wu
14:45	*Molecular Configuration and Flow of Water in Graphene Nanochannels* **Hengan Wu**
15:05	*Segregation in Horizontally Vibrated Granular Mixture* **Ashish Bhateja**, Ishan Sharma, Jayant K. Singh
15:25	*Numerical Modeling of the Boundary Value Problems Using the R-Function Method and Atomic Basis Functions* **Nives Brajčić** , Blaž Gotovac, Vedrana Kozulić

GS-CoM.7 Computational Mechanics S3	Tuesday, 14:45 - 15:45 Chair: K. Bagi
14:45	*Computational Comparison of the Mechanical Behavior of Two Stent-Grafts within a Tortuous Abdominal Aortic Aneurysm* Nicolas Demanget, **Pierre Badel**, Stéphane Avril, Laurent Orgéas, Christian Geindreau, Jean-Noel Albertini, Jean-Pierre Favre
15:05	*Heat Generation and Residual Stresses Analysis in External Cylindrical Grinding Process* **Haifa Sallem**, Hédi Hamdi
15:25	*DEM Analysis of Masonry Domes with Oval Plan* József Simon, **Katalin Bagi**

GS-CoM.8 Computational Mechanics Saal Steiermark	Tuesday, 16:00 - 18:00 Chair: J. Eberhardsteiner, G. Meschke
16:00	*Influence of Different Knot Groups on Effective Mechanical Properties of Solid-Wood Based Products Determined by Means of 3D Finite-Element Simulations* Markus Lukacevic, Karin de Borst, Josef Füssl, **Josef Eberhardsteiner**
16:20	*Jump Conditions at Discontinuities in Solids: Numerical Implementation* **Arkadi Berezovski**

16:40 *Residual Stress Analysis of an Oil Distillation Tower's Lining with Sysweld*
Davi Mário Cunha de Souza, Diego Jullian de Morais Lopes, Danielle Mariano Espíndola da Silva, **Francisco Ilo Bezerra Cardoso**

17:00 *An Edge-Based Imbricate Finite Element Method*
Fabien Cazes, Günther Meschke

17:20 *Cohesive Zone Modelling of Spot Weld Fracture for Crash Simulation*
Thomas Carlberger, Jonas Jonsson Holm, Ulf Stigh

17:40 *Flexibility Based Beam Element Based on Large Increment Method*
Ali Biglari, Philip Harrison, Zaoyang Guo

GS-CoM.9 Computational Mechanics — Wednesday, 10:15 - 12:15
K5 — Chair: K.G.F. Janssens, H. Schmidt

10:15 *Extended Finite Element Model Prediction of Cyclic Thermal Shock Induced Crack Initiation and Short Crack Propagation Using a Cyclic Damage Model*
Koenraad G.F. Janssens, Giacomo Facheris

10:35 *Large Scale, Massively Parallel Implementation of eXtended Finite Element Method (XFEM) for Fracture Simulations*
Denny Dharmawan Tjahjanto, G. Houzeaux, M. Vázquez, Antoine Jerusalem

10:55 *A New Intrinsic Enrichment in Meshless Methods for Arbitrary and Non-Planar Multiple Cracks in Linear Elasticity*
Ettore Barbieri, Nik Petrinic

11:15 *An Adaptive Mixed Finite Element Method for Nonlinear Elastic Incompressibility with Large Deformations*
Martina Balg, Arnd Meyer

11:35 *Evaluation of Different Level Set Update Schemes for 3D X-FEM Mixed Mode Crack Propagation*
Daniele Colombo, **Patrick A. Massin**

11:55 *On Adaptive FEM for Viscoelasticity at Large Strain Deformations*
Hansjörg Schmidt, Arnd Meyer

GS-CoM.10 Computational Mechanics — Wednesday, 10:15 - 12:15
Maybach — Chair: M. Hammer, E. Mazza

10:15 *An Internal Parameter Dependent Cyclic Plastic Material Description for Finite Element Modeling of Ratcheting in Low Cycle Fatigue*
Giacomo Facheris, Koenraad Janssens, Edoardo Mazza

10:35 *Warm-Start Strategy in Implicit Reformulation Method for Frictionless Contact Problems*
Yoshihiro Kanno, Makoto Ohsaki

10:55 *Bonding and Debonding of Wavy Adhesive Elastic Thin Film*
Ravi Dalmeya, Ishan Sharma, Chandrashekhar Upadhyay

11:15	*Damage Detection Through Wavelet Transform and Inverse Analysis* **Anna Knitter-Piatkowska**, Tomasz Garbowski, Andrzej Garstecki
11:35	*Bursting of a Circular Plate Subjected to Blast Loads Field Test – Computational Modelling* **Herbert Linsbauer**
11:55	*Non-Regularized Frictional Mortar Contact for Finite Deformation Problems – Synthetic Contact Kinematics* **Michael Hammer**

GS-CoM.11 Computational Mechanics	Thursday, 14:15 - 15:45
Blauer Salon	Chair: M. Weise

14:15	*Boundary Element Analysis of Unsymmetric Laminated Plates* **Chyanbin Hwu**, Hanwen Chang
14:33	*On Alternative Numerical Frameworks for a New Conservation Law Formulation in Structural Dynamics* D. Mukherjee, **Hean Chun Lee**, Antonio Javier Gil, Javier Bonet, M. Aguirre
14:51	*Analysis of Bar Structures by the Use of Stochastic Work Hardening and/or Softening Constitutive Models* Sandor Kaliszky, Janos Logo, **Daniel B. Merczel**
15:09	*Multi-Field Subregion BEM for Analysis of Effective Properties of Composites* **Grzegorz Dziatkiewicz**, Piotr Fedeliński
15:27	*Adaptive FEM for Layered Anisotropic Plates* Arnd Meyer, **Michael Weise**

GS-CoM.12 Computational Mechanics	Thursday, 16:00 - 18:00
S1	Chair: M.J. Mikl, V. Vavourakis

16:00	*Evaluation of the CNT and CNT Network Morphological Parameters' Impact on the Mechanical Properties of CNT-Reinforced Composites* **Willy Leclerc**, Philippe Karamian, Alexandre Vivet, Alain Campbell
16:20	*A Coupled Fluid/Solid Approach for Numerical Simulation of Welding* **Hussein Amin el Sayed**, Thomas Heuze, Eric Feulvarch, J.B. Leblond, J.M. Bergheau
16:40	*Development of Techniques for Rock Cutting Applications* **Markus Johannes Mikl**, Thomas Antretter, Gerhard Pittino
17:00	*Borderless Numerical Scheme between Incompressibility/Compressibility in Solid and Fluid Analyses Based on Helmholtz-Decomposition* **Junya Imamura**, Takahiko Tanahashi
17:20	*Large Deformation Analysis of Geotechnical Problems Through a Non-Linear Finite Element Approach* **Vasileios Vavourakis**, D. Loukidis, D. Charmpis, P. Papanastasiou
17:40	*A Runge-Kutta-Chebyshev-Projection Immersed Structural Potential Method for Fluid Structure Interaction* A. Arranz Carreno, **Antonio Javier Gil**, Javier Bonet, O. Hassan

General Session GS-DY

Dynamics

Session	Day	Time	Room
GS-DY.1	Tuesday	16:00 - 18:00	Maybach
GS-DY.2	Wednesday	10:15 - 12:15	AU3
GS-DY.3	Friday	10:15 - 12:15	Maybach

GS-DY.1 Dynamics Maybach	Tuesday, 16:00 - 18:00 Chair: E. Hacker, K. Yunt
16:00	*The Impulsive Action Integral* **Kerim Yunt**
16:20	*Vibrational Stabilization of Statically Unstable Multi-Degrees-of-Freedom Systems* **Inga M. Arkhipova**, Angelo Luongo, Alexander P. Seyranian
16:40	*Three-Dimensional Modeling and Dynamic Analysis of High-Speed Train Composed of Multiple Vehicles Coupled with Ballast Track* **Liang Ling**, Xinbiao Xiao, Xuesong Jin, Lei Wu, Shouqiao Zhong
17:00	*Nonlinear Dynamics of Hybrid Cantilevers for Scanning Probe Microscopy* **Evyatar Hacker**, John Saffury, Oded Gottlieb
17:20	*Exploring Global Stability in a Nonsmooth Dynamical Model of Hydraulic Cylinders* **Bálint Magyar**, Gábor Stépán

GS-DY.2 Dynamics AU3	Wednesday, 10:15 - 12:15 Chair: I. Tanabe
10:15	*Digital Evaluation of Control Factors with Complex Noise Factors Using Inverse Analysis of Taguchi Methods* **Ikuo Tanabe**
10:35	*Numerical Methods for Analysis of Integrability of Dynamical Systems* **Vladimir Salnikov**
10:55	*Three-Dimensional Numerical Analysis on Wheel/Rail Adhesion under Contamination of Oil with Surface Roughness* **Bing Wu**, Zefeng Wen, Hengyu Wang, Xuesong Jin
11:15	*Modelling and Simulation of Brake System Based on Matlab/SimMechanics* **Ehsan Zamani Shandiz**, Daniel Wallner

11:35	Transverse Vibrations of Nonhomogeneous Rectangular Plates on Winkler Foundation Using DQM **Roshan Lal**, Yajuvindra Kumar

GS-DY.3 Dynamics	Friday, 10:15 - 12:15
Maybach	Chair: E. Manoach, M.V. Shamolin

10:15	*Variety of the Cases of Integrability in Dynamics of a 2D-, and 3D-Rigid Body Interacting with a Resisting Medium* **Maxim V. Shamolin**
10:35	*The Paradox of Nicolai and Related Effects* **Alexander P. Seyranian**, Alexei A. Mailybaev
10:55	*Shock Compression of Monocrystalline Copper: the Effects of Vacancy Defects and Crystal Orientations* **Enqiang Lin**, Lisha Niu, Huiji Shi
11:15	*A Short Note on the Dynamical Behaviour of Composite Materials under Special Consideration of Interphase Thicknesses* **Wolfgang Weber**, Bernd W. Zastrau
11:35	*Dynamics and Fault Localization of Composite Beams with Delamination* **Emil Manoach**, Sylwester Samborski, Andrzej Mitura, Jerzy Warminski

General Session GS-EM

Experimental Mechanics

Session	Day	Time	Room
GS-EM.1	Monday	10:15 - 12:15	AU1
GS-EM.2	Thursday	10:15 - 12:15	K1
GS-EM.3	Friday	10:15 - 12:15	AU1

GS-EM.1 Experimental Mechanics AU1	Monday, 10:15 - 12:15 Chair: E. Charkaluk, K. Uenishi
10:15	*Experimental Study on Fatigue Damage Evolution and its Effect on Structural Response* **Ding Ding He**, Zhao Xia Li
10:32	*Structural Degradation and Variation of Mechanical Properties Determined by Means of Magnetic Non-Destructive Techniques* **Katarzyna Makowska**, Z.L. Kowalewski
10:49	*On Some Crack Dynamics in Inhomogeneous Solid Materials* **Koji Uenishi**
11:06	*Damage Detection in Thin-Walled Tubes by Circumferential Waves* **Zheng Li**, Yu Liu
11:23	*A New Method for Determination of Normal-Shear Bonding Strength Envelope of Bi-Material Interface* **Zihui Xia**, M. A. K. Chowdhuri
11:40	*Thermomechanical Determination of the Granular Yield Stress in a Polycrystal* Rian Seghir, **Eric Charkaluk**, Jean-Francois Witz, Philippe Dufrenoy
11:57	*Fatigue Cracks in Natural Rubber: In-Situ Synchrotron WAXD Experiments* **Pierre Rublon**, Bertrand Huneau, Erwan Verron, Stephanie Beurrot, Adrien Leygue, Nicolas Saintier, Daniel Berghezan, Dominique Thiaudière, Cristian Mocuta

GS-EM.2 Experimental Mechanics K1	Thursday, 10:15 - 12:15 Chair: E. Peronnet, A.J. Schriefl
10:15	*Characterization of Tissue Deformation and Wrinkles in the Forehead* **Johannes Weickenmeier**, Michael Wyss, Edoardo Mazza
10:32	*Identification of Orthotropic Material Properties Using Displacement Field Measurements* **Elodie Peronnet**, O. Dalverny, H. Welemane, S. Mistou

10:49	*Tensile Stress Variation Due to Stepwise Increase of Cyclic Torsion Amplitude* **Tadeusz Szymczak**, Zbigniew L. Kowalewski
11:06	*Damping Properties of Random Fibre Networks Used as Sandwich Core Material* **Elsa Piollet**, Guilhem Michon, Dominique Poquillon
11:23	*Exploring the Formation of Different Lamination Configurations within the Orientation Space* **Anahita Khorashadizadeh**, Dierk Raabe
11:40	*Roles of Thrombus and Collagen Remodeling in Intramural Dissecting Aortic Aneurysms* **Andreas J. Schriefl**, Gerhard A. Holzapfel, Jay D. Humphrey
11:57	*Aspects of Cyclic Loading on Intervertebral Discs* **Aurica Truta**, Aurora Felicia Pop, Mariana Arghir, Gerhard A. Holzapfel

GS-EM.3 Experimental Mechanics	Friday, 10:15 - 12:15
AU1	Chair: A. Yuda, Y. Demmouche
10:15	*Study on the Bulge Test applied to Sandwich Plates with Metal Foam Core* **Helder Mata**, Renato Natal Jorge, A.D. Santos, R.A.F. Valente, M.P.L. Parente, A.A. Fernandes
10:32	*Global and Local Mechanical Behavior of Similar 2050-T851, 7449-T79 and Dissimilar 7449-T79/ 2050-T851 Friction Stir Welded Aluminum Alloys Joints* **Younes Demmouche**, Nicolas Saintier, Thierry Palin-Luc
10:49	*Investigation of Engine Casing Containment Using of Blade Releasing Method* **Alexandr Roaldovich Lepeshkin**
11:06	*Entrained Air Voids Characterization of Hardened Cement Paste Using Ultrasonic Wave Attenuation* **Hong Jae Yim**, Hyo-Gyoung Kwak, Jae Hong Kim
11:23	*A Study of the Effect of Linear and Rotational Speed of Tool on Tensile Strength of Polypropylene in FSW Process* Behrooz Asadi Boroujeni, **Hadi Homaei**, A.M. Rezavand
11:40	*Variability of Wetting Behaviour with Change in Time of 316L Stainless Steel Laser Irradiation* **Ayaka Yuda**, Ryo Honda, Masayoshi Mizutani, Jun Komotori, Masaki Matsumoto, Ichiro Katsuyama
11:57	*DIC as an Evaluation Tool for In-Vitro Coronary Stent Implantation* Lukáš Horný, **Jan Veselý**, Hynek Chlup, Rudolf Žitný

General Session GS-MM

Material Mechanics

Session	Day	Time	Room
GS-MM.1	Monday	10:15 - 12:15	S3
GS-MM.2	Monday	14:45 - 15:45	K3
GS-MM.3	Monday	14:45 - 15:45	K8
GS-MM.4	Monday	16:00 - 18:00	Saal Steiermark
GS-MM.5	Monday	16:00 - 18:00	S3
GS-MM.6	Tuesday	10:15 - 12:15	S7
GS-MM.7	Tuesday	14:45 - 15:45	K7
GS-MM.8	Tuesday	14:45 - 15:45	K4
GS-MM.9	Tuesday	16:00 - 18:00	S3
GS-MM.10	Wednesday	10:15 - 12:15	K8
GS-MM.11	Wednesday	10:15 - 12:15	Saal Steiermark
GS-MM.12	Thursday	10:15 - 12:15	Saal Steiermark
GS-MM.13	Thursday	14:15 - 15:45	AU2
GS-MM.14	Thursday	16:00 - 18:00	K6
GS-MM.15	Thursday	16:00 - 18:00	Saal Steiermark
GS-MM.16	Friday	10:15 - 12:15	AU2
GS-MM.17	Friday	10:15 - 12:15	K3

GS-MM.1 Material Mechanics — Monday, 10:15 - 12:15
S3 — Chair: A. Lemaître, M. Muhibullah

10:15 *Mechanical Behavior of Ductile Materials Based on an Elasto-plastic Model Dependent on the Second and Third Invariants*
João V. Sahadi, Lucival Malcher

10:35 *Elementary Mechanisms of Plastic Deformation in Amorphous Materials*
Anaël Lemaître

10:55	*Robust Identification of Elasto-Plastic Constitutive Law Parameters from Digital Images Using 3D Kinematics* **Muhibullah Muhibullah**, Julien Réthore, Thomas Elguedj, Michel Coret, Philippe Chaudet, Alain Combescure
11:15	*Processing and Properties of Three-Layer Al-Si/Al-Mn/Al-Si Clad Sheets by Using Various Cold Rolling Conditions* Yu-Sung Koo, **Mok-Soon Kim**
11:35	*Frequency Impacts on Mechanisms of Microplasticity under Fatigue Loading – Case of Polycrystalline Pure Copper* **Nicolas Marti**, Nicolas Saintier, Véronique Favier, Fabienne Grégori, Nicolas Ranc
11:55	*Temporal Scaling in the Mechanoluminescence of Shocked Quarz Rods* **Sergey Uvarov**, Marina Davydova

GS-MM.2 Material Mechanics	Monday, 14:45 - 15:45
K3	Chair: I. Schmidt
14:45	*Numerical Homogenisation of the Yield-behaviour of Metal Powders* **Ingo Schmidt**, Andreas Trondl
15:05	*Mechanisms of Plastic Deformation of Synthetic Salt Polycrystals: Experimental Observations and Finite Element Modeling* **Jean Raphanel**, Mathieu Bourcier, Alexandre Dimanov, Michel Bornert
15:25	*Poroelastic Behavior of Saturated Unidirectional Fibrous Reinforcements during Consolidation of Composite Parts: Identification of the Biot Coefficients* **Christophe Binetruy**, Sébastien Comas-Cardona

GS-MM.3 Material Mechanics	Monday, 14:45 - 15:45
K8	Chair: G. Sommer
14:45	*Coatings Durability of the Femoral Heads* **Liliana-Laura Badita**, Lucian Capitanu, Virgil Florescu
15:05	*Passive Mechanical Response and Residual Deformations of Ovine Esophagus: Impact on Esophagus Tissue Engineering* **Gerhard Sommer**, Georg Zeindlinger, Andreas Katzensteiner, Andreas J. Schriefl, Herwig Ainödhofer, Amulya Saxena, Gerhard A. Holzapfel
15:25	*An Energetic Model for the Unfolding of Titin Macromolecules* Domenico De Tommasi, Nicola Millardi, **Giuseppe Puglisi**, Giuseppe Saccomandi

GS-MM.4 Material Mechanics	Monday, 16:00 - 18:00
Saal Steiermark	Chair: N. Billon, H.L. Schreyer
16:00	*New Constitutive Modelling for Visco Hyper Elastic Polymers* **Noëlle Billon**, Jérome BIKARD
16:20	*Indentation of Pre-Stressed Rubber-Like Incompressible Materials* **Antonios E. Giannakopoulos**, Vassiliki Zaphiropoulou

16:40	*Closed-Form Formulas of Effective Stiffness and Engineering Constants of Laminate Composites with Auxetic Constituents* **Mirella Ramírez**, Gerardo G. Nava-Gómez, Federico J. Sabina, Héctor Camacho-Montes, Raúl Guinovart-Díaz, Reinaldo Rodríguez-Ramos, Julian Bravo-Castillero
17:00	*Effect of Swelling on Large Strain Properties of Gels: a General Framework* **Violette Brulliard**, Erwan Verron, Steven Le Corre
17:20	*Constitutive Models for Joints and Wave Propagation through Rock with Joints* **Howard Linn Schreyer**, Tyler Baker, Deborah Sulsky

GS-MM.5 Material Mechanics	Monday, 16:00 - 18:00
S3	Chair: J. Bonet, J.-Q. Tarn
16:00	*Some Unsolved Problems of Anisotropic Elasticity and Piezoelasticity are Solvable by the Hamiltonian State Space Approach* **Jiann-Quo Tarn**
16:20	*Fracture in Ferroelectric Ceramics and Single Crystals under Electromechanical Loading* **Daining Fang**, Bin Liu
16:40	*Experimental Study of Martensite Reorientation in Ni-Mn-Ga Ferromagnetic Shape Memory Alloys under Biaxial Compression* **Xue Chen**, Yongjun He, Ziad Moumni
17:00	*Finite Element Calculation of the Effective Properties for Porous Piezoceramics Considering the Non-Homogeneous Polarization and Cluster Models* A.V Nasedkin, V.V Remizov, **Maria Sergeevna Shevtsova**
17:20	*Nonlinear Dynamic Stability of Laminated Plates with Piezoelectric Actuators Subjected to Thermo-Electro-Mechanical Loadings* **Pradyumna Sathyasimha**, Abhishek Gupta
17:40	*On the Development of Constitutive Laws for Large Strain Hyperelastic Piezoelectric Materials* R. Ortigosa, Antonio Javier Gil, **Javier Bonet**

GS-MM.6 Material Mechanics	Tuesday, 10:15 - 12:15
S7	Chair: A. Krasnikovs, M. Pawlikowski
10:15	*Rheological Constitutive Modeling of Polyurethane Nanocomposite* **Marek Pawlikowski**
10:35	*Multiscale Modeling of Mechanoresponsive Polymers* **Meredith N. Silberstein**, Cassandra M. Kingsbury, Kyoungmin Min, Lee D. Cremar, Todd J. Martinez, Narayan R. Aluru, Scott R. White, Nancy R. Sottos
10:55	*Numerical Simulation and Experimental Validation of Polymer Foams Subjected to Low-Speed Impact Loading* **Martin Herrenbrück**, Marcus Maier, Roland Wüchner, Wenjia Wang, Fabian Duddeck, Kai-Uwe Bletzinger, Roman Lackner

11:15	*Mechanical Properties of Structural Element with Non-Homogeneous Fibers Distribution in Concrete* **Andrej Krasnikovs**, Olga Kononova, Edgar Machanovsky, Videvuds-Arijs Lapsa, Vitaly Lusis
11:35	*Sound Energy Harvesting Using Macro Fiber Composites* **Ananya Renuka Balakrishna**, Dineshkumar Harursampath
11:55	*Mechanical Behaviour of VHB 4910 Polymer: Experiments, Modelling and Validation* **Mokarram Hossain**, Duc Khoi Vu, Paul Steinmann

GS-MM.7 Material Mechanics K7	Tuesday, 14:45 - 15:45 Chair: Th. Linse
14:45	*Evaluation of General Elasticity of Textured and Microstructured Materials* **Michal Landa**, Hanus Seiner, Petr Sedlák, Lucie Bodnarova, Jan Zidek
15:05	*Modelling the Mechanical Behavior of Adaptive Textile-Reinforced Composites* **Thomas Linse**, Volker Ulbricht
15:25	*PGD based Model Reduction for Simulating Shell Geometries using a Space Variable Separation Approach* B. Bognet, Adrien Leygue, F. Chinesta, **Arnaud Poitou**

GS-MM.8 Material Mechanics K4	Tuesday, 14:45 - 15:45 Chair: J. Sweeney
14:45	*The Flow Rule for Polymers at Large Deformations* **John Sweeney**, C.P.J. O'Connor, P.E. Spencer, H. Pua, P. Caton-Rose, P.J. Martin
15:05	*Void Growth in a Mineral-Filled PVC – Experimental and Numerical Study* Anne Serine Ognedal, Thomas Seelig, Odd Sture Hopperstad, **Arild H. Clausen**
15:25	*Determination of the Mechanical Properties of Amorphous Materials through Instrumented Indentation* **Marcos Rodríguez**, Jon M. Molina-Aldareguía, Carlos D. González, Javier Llorca

GS-MM.9 Material Mechanics S3	Tuesday, 16:00 - 18:00 Chair: G.A. Volkov, M. Zaccariotto
16:00	*Micromechanical Modeling of Ductile Fracture in Nodular Cast Iron* **Lutz Zybell**, Geralf Hütter, Thomas Linse, Uwe Mühlich, Meinhard Kuna
16:20	*Energy Aspects of Vibration Fracture of Rocks* **Grigory A. Volkov**, Yuri V. Petrov, Evgeniy N. Dolmatov
16:40	*Prediction of the Fatigue Life in the Friction Stir Welds with Welding Flaws Based on Nondestructive Testing* **Toshifumi Kakiuchi**, Yoshihiko Uematsu, Eisuke Kondoh, Ichinori Shigematsu, Takahiko Nomura, Yuichiro Yamamoto, Naoki Imai, Toshihiko Fukuda
17:00	*Free Vibration of Functionally Graded Materials with Crack by a BEM* **Yang Yang**, Kun Pang Kou, Chi Chiu Lam, Vai Pan Iu

17:20 *Modeling of Fatigue Crack Propagation with a Peridynamics Approach*
Mirco Zaccariotto, Ugo Galvanetto

GS-MM.10 Material Mechanics	Wednesday, 10:15 - 12:15
K8	Chair: M. Davydova, R. Kouhia

10:15 *Spatial and Temporal Scaling of Brittle Fragmentation*
Marina Davydova, Sergey Uvarov

10:35 *Thermal-Structural Finite Element Analysis of a Ductile Material at High Strain Rates Using an Improved Material Model for Ductile-to-Brittle Failure Mode Transition*
Ladislav Ecsi, Pavel Élesztős

10:55 *Influence of Static Strain Ageing on the Ductile to Brittle Transition in a C-Mn Steel*
Anthony Marais, M. Mazière, S. Forest, A. Parrot, P. Le Delliou

11:15 *Ultra-High Strain Rate Deformation of Nano-Structured FCC and BCC Metals*
Dariush Seif, Giacomo Po, Ryan Crum, Suneel Kodambaka, Vijay Gupta, Nasr Ghoniem

11:35 *Modelling Strain-Rate Dependent Ductile-to-Brittle Transition*
Juha Hartikainen, Kari Kolari, **Reijo Kouhia**

11:55 *Multiscale Approach for Modelling the Thermomechanical Behaviour of Functionally Graded Materials*
Ralf Müller, **Natalia Konchakova**, Oliver Goy

GS-MM.11 Material Mechanics	Wednesday, 10:15 - 12:15
Saal Steiermark	Chair: A. Dyskin, R. Martinez

10:15 *Mechanical Behavior of Graphene-Epoxy Nanocomposites*
Catalin Picu, Ardavan Zandiatashbr, **Dan Constantinescu**

10:35 *Effect of Mesoscale Defects on the Strength Properties of Structural Glass*
Gergely Molnár, Imre Bojtár

10:55 *Relation of Microstructural Condition to the Evolution of Internal Stresses during Cyclic Loading of AISI 316L*
Minh-Son Pham, Stuart R. Holdsworth

11:15 *A Microstructure-Informed Model Describing Aging in 319 Aluminium Alloy and the Associated Residual Stress Evolution*
R. Martinez, I. Guillot, Georges Cailletaud

11:35 *Micromechanics of Ferromagnetic Solids with Weak Magnetocrystalline Anisotropy: A Case Study of Ni-Mn-Ga FSMA Austenite*
Hanus Seiner, **Petr Sedlák**, Michal Landa, Oleg Heczko

11:55 *Hybrid Materials with Internal Architecture*
Yuri Estrin, Elena Pasternak, Arcady Dyskin

GS-MM.12 Material Mechanics Saal Steiermark	Thursday, 10:15 - 12:15 Chair: M. Fourmeau, D.A. Nguyen

10:15	*Experimental Characterization and Cohesive Zone Modeling of Rate-Dependent Interfacial Fracture in Lead-Free Solder Joints* **Milad Maleki**, Joel Cugnoni, John Botsis
10:35	*Characteristics of Single Damage Variable Models for Fatigue* **Elisha Rejovitzky**, Eli Altus
10:55	*Cumulative Damage Reconstruction in Composites – Different Perspectives Based on the Inverse Problem* **Manuel Chiachio**, Juan Chiachio, Guillermo Rus
11:15	*Effects of Temperature and Frequency on Fatigue Behavior of Metastable Type 304 Stainless Steel* **Yuki Nakamura**, Masaki Nakajima, Kenta Isono, Toshihiro Shimizu, Yoshihiko Uematsu
11:35	*Anisotropic Failure of Aluminium Alloy AA7075-T651* **Marion Fourmeau**, T. Børvik, A. Benallal, O.S. Hopperstad
11:55	*Anisotropic Gradient-Damage Model for Viscoplastic Thin-Shell Structures* **Danh An Nguyen**, Marcus Stoffel, Dieter Weichert

GS-MM.13 Material Mechanics AU2	Thursday, 14:15 - 15:45 Chair: C.L. Martin

14:15	*On the Toughness of Highly Porous Ceramics: Added Value of Discrete Element Simulations* **David Jauffres**, Denis Roussel, Christophe L. Martin, Aaron Lichtner, Rajendra K. Bordia
14:33	*New Phase Domains Growth around Inclusions in Materials Undergoing Stress-Induced Phase Transformations* **Roman Filippov**, Alexander B. Freidin, E.N. Vilchevskaya
14:51	*Cohesive Parameter Determination: Experiments and Simulations* **Faizan Md. Rashid**, Anuradha Banerjee
15:09	*Modeling of Large Radius Curvature Ring Rolling Process by an Analytical Method* G.L. Petrosyan, A.G. Petrosyan, **Seyed Reza Motallebi**
15:27	*A Saddle-Node Ghost Arising in High Cycle Fatigue Life-Predictions* **Stefano Bosia**, Andrei Constantinescu, Maurizio Grasselli

GS-MM.14 Material Mechanics K6	Thursday, 16:00 - 18:00 Chair: K. Agbessi, D.A. Vajari

16:00	*Effects of Uneven Interfacial Strength on Damage Evolution in Composites* **Danial Ashouri Vajari**, Brian Nyvang Legarth, Christian Frithiof Niordson

16:20 *Plastic Deformation and Fatigue Damage Mechanisms in Copper Polycrystal under Multiaxial Fatigue Loadings*
Komlan Agbessi, Nicolas Saintier, Thierry Palin-Luc

16:40 *A Global Constitutive Model of Reinforced Concrete Plates coupling Damage and Plasticity for Structures Subjected to Cyclic Solicitations*
Christelle Combescure, François Voldoire, Hélène Dumontet

17:00 *Modelling of Coupling between Damage and Phase Transformation in Two-Phase Metallic Materials at Cryogenic Temperatures*
Halina Egner, Błażej Tomasz Skoczeń, Maciej Ryś

17:20 *Experimental and Numerical Investigations of the Damage and Ductile Fracture Mechanisms in TRIP Steel Sheets*
Matthieu Dunand, Dirk Mohr

17:40 *Elastic Analysis of a Sandwich Composite with a Functionally Graded Core*
Roberta Sburlati

GS-MM.15 Material Mechanics — Thursday, 16:00 - 18:00
Saal Steiermark — Chair: G. Mejak, W. Ochsenberger

16:00 *Fatigue Strength Evaluation of Spot Welded Joints under Different Loading Modes*
Kodai Hayashida, Ryota Tanegashima, Hiroyuki Akebono, Masahiko Kato, Atsushi Sugeta

16:20 *Study of Solid Strengthening of Nickel by Transition Metal Solutes Using Diffusion Couples and Nanoindentation*
Hamad ur Rehman, Mathias Göken, Karsten Durst

16:40 *An Application of the Equivalent Eigenstrain Method to a Problem with a Nonconstant Eigenstrain*
George Mejak

17:00 *Mesoscopic Surface Roughening in Polycrystalline Steel under Uniaxial Tension*
Olga Zinovieva, Varvara Romanova

17:20 *Phase Field Simulation of Static Recrystallization for Deformed Mg Alloy*
Gao Yingjun

17:40 *The Configurational Forces Concept in Elastic-Plastic Fracture Mechanics: An Investigation to Cyclic Loading*
Walter Ochensberger, Otmar Kolednik

GS-MM.16 Material Mechanics — Friday, 10:15 - 12:15
AU2 — Chair: M. Ryvkin, B. El Zoghbi

10:15 *Nucleation of Brittle Cracks in Open-Cell Kelvin Foam*
Michael Ryvkin, Leonid Kucherov

10:35 *Separation of the Effects of the Lode Angle and Stress Triaxiality on Ductile Fracture: Experiments and Modeling*
Jessica Papasidero, Véronique Doquet, Dirk Mohr

10:55 *Quantitative Analysis of Fracture Surface Induced by Plug Formation in Metallic Samples*
Elena Lyapunova, A.N. Petrova, I.G. Brodova, V.V. Chudinov, M.A. Sokovikov, S.V. Uvarov, O.B. Naimark

11:15 *Effects of Constitutive Model and Fracture Criteria on Ductile Crack Propagation in Dual-Phase Steel*
Gaute Gruben, Odd Sture Hopperstad, Tore Børvik

11:35 *Cohesive Zone Model for Intergranular Slow Crack Growth in Zirconia and Ceramic: Influence of the Moisture, Temperature and Microstructure*
Bassem El Zoghbi, Rafael Estevez, Christian Olagnon

GS-MM.17 Material Mechanics — Friday, 10:15 - 12:15
K3 — Chair: N.-C. Fahlbusch, M. Sistaninia

10:15 *Analysis of the Strength of Bonded Joints in Composite Structures*
Azalia Moradi, Nicolas Carrere, Cédric Huchette, Dominique Leguillon

10:35 *Postbuckling Analysis of Closed-Cell Foams with an FE-Model Based on Image Processing*
Nina-Carolin Fahlbusch, Wilfried Becker

10:55 *On the Sensitivity of Creasing Force to Parameters in Constitutive Models of Paperboard*
Aleksander Marek, Tomasz Garbowski

11:15 *Analysis of Load-Deflection Characteristics of Composite Belleville Springs*
Watcharapong Patangtalo, Sontipee Aimmanee, Surachate Chutima

11:35 *A Numerical Study on the Fracture Resistance of Multi-Layered Composites*
Masoud Sistaninia, Otmar Kolednik

11:55 *On One Approach in Plasticity*
Rustam Abirov

General Session GS-MP

Multifield Problems

Session	Day	Time	Room
GS-MP.1	Wednesday	10:15 - 12:15	S2
GS-MP.2	Friday	10:15 - 12:15	Saal Steiermark

GS-MP.1 Multifield Problems S2	Wednesday, 10:15 - 12:15 Chair: M. Klassen, H.M. Youssef
10:15	*Fractional Order Generalized Thermoelasticity of Piezoelectric Materials* **Hamdy Mahmoud Youssef**
10:35	*Phase Diagram of Martensite Reorientation in Magnetic Shape Memory Alloys under Three-Dimensional Magnetomechanical Loadings* **Yongjun He**, Xue Chen Chen, Ziad Moumni
10:55	*Continuum Modeling of Plastic Deformation Coupled to Diffusion in Silicon Electrodes During Lithiation-Delithiation Cycles* **Laurence Brassart**, Kejie Zhao , Matt Pharr, Zhigang Suo
11:15	*Coupling Between Mass Density and Director Arrangement in Nematic Liquid Crystals* **Giuseppe Rosi**, Luciano Teresi, Francesco dell Isola, Antonio DiCarlo
11:35	*Curved Timoshenko-Euler-Bernoulli Beam Coupled to its Analog Electromagnetic Waveguide via Piezoelectric Transducers* Roberto Paccapeli, **Giuseppe Rosi**, Ugo Andreaus
11:55	*3D Optimization of Dielectric Elastomer Actuators with Inhomogeneities* **Markus Klassen**, Baixiang Xu, Ralf Müller

GS-MP.2 Multifield Problems Saal Steiermark	Friday, 10:15 - 12:15 Chair: S. Castagnet, Y.G. Pronina
10:15	*Prediction of Failure for an Ideal Elastoplastic Tube Subjected to Uniform Mechanochemical Corrosion* **Yulia Grigorievna Pronina**
10:35	*Modelling of Elastic Properties of Sintered Porous Materials* **Anton Manoylov**, F.M. Borodich, H.P. Evans
10:55	*One-Dimensional Response of Submerged Plates to Underwater Blast* **Andreas Schiffer**, Vito L. Tagarielli
11:15	*Experimental Characterization and Numerical Simulation of Cavitation upon Fast Decompression in a Gas-Saturated Rubber* Julien Jaravel, **Sylvie Castagnet**, Jean-Claude Grandidier

11:35	*Fatigue Life Prediction of Thermally Stressed Copper Vias and Plated-Through Holes in Electronic Printed Circuit Boards (PCB)* **Abdellah Salahouelhadj**, Marion Martiny, Sebastien Mercier, Laurent Bodin, David Manteigas
11:55	*Thermodynamically Consistent Modeling of a Multifunctional Structure plus Battery System* H. Sreedhara, **Dineshkumar Harursampath**

General Session GS-SM

Structural Mechanics

Session	Day	Time	Room
GS-SM.1	Monday	10:15 - 12:15	Maybach
GS-SM.2	Monday	14:45 - 15:45	S2
GS-SM.3	Monday	14:45 - 15:45	K5
GS-SM.4	Tuesday	14:45 - 15:45	S2
GS-SM.5	Thursday	14:45 - 15:45	Saal Steiermark
GS-SM.6	Friday	10:15 - 12:15	AU3
GS-SM.7	Friday	10:15 - 12:15	S3

GS-SM.1 Structural Mechanics Maybach	Monday, 10:15 - 12:15 Chair: H. Herrmann, S. Neukirch
10:15	*Analytical Description of Fibre Orientation Distributions in Short Fibre Reinforced Materials Based on µCT Imaging* **Heiko Herrmann**, M. Eik
10:35	*Large Displacement Analysis of Flexibly Connected Framed Structures* **Goran Turkalj**, Edin Merdanović, Josip Brnić
10:55	*Vibrations of Post-Buckled Rods: the Singular Inextensible Limit* **Sebastien Neukirch**, Joel Frelat, Alain Goriely, Corrado Maurini
11:15	*Bio-Inspired Distributed Actuation of Rods* **Sébastien Turcaud**, John Dunlop, Peter Fratzl, Yves Brechet
11:35	*Evaluation of Progressive Collapse Resisting Capacity of the Transfer Girder System* **MinJung Kim**, SungSoo Park
11:55	*Equilibria of Elastic Knots* **Eugene Starostin**, Gert van der Heijden

GS-SM.2 Structural Mechanics S2	Monday, 14:45 - 15:45 Chair: D. Lanc
14:45	*Nonlinear Buckling Analysis of Thin-Walled Laminated Composite Beams* Igor Pesic, **Domagoj Lanc**, Goran Turkalj

15:05 *An Analytical Approach for Buckling Analysis of an Inflatable Beam Made of Orthotropic Technical Textiles*
Nguyen Thanh Truong, Sylvie Ronel, Michel Massenzio, Dinh-Huan Phan, K.L. Apedo, Eric Jacquelin

15:25 *Trivial Path after Bifurcation: from Unstable back to Stable Configuration*
Francesco Dal Corso, Davide Bigoni, Federico Bosi, Diego Misseroni

GS-SM.3 Structural Mechanics — Monday, 14:45 - 15:45
K5 — Chair: K. Tajs-Zielinska

14:45 *Robust Population-Based Heuristics in Structural Optimization: Dream or Reality*
Aniko Csebfalvi

15:05 *Optimum Reinforcement Design of Concrete Shell Elements by Means of a Genetic Algorithm*
Simona Mancini, Gabriele Bertagnoli, Luca Giordano

15:25 *On Equivalence of Stress and Compliance Based Topologies*
Bogdan Bochenek, **Katarzyna Tajs-Zielinska**

GS-SM.4 Structural Mechanics — Tuesday, 14:45 - 15:45
S2 — Chair: M.M. Attard

14:45 *Buckling of Funicular Arches*
Mario M. Attard, David Kellermann

15:05 *Finite Element Analysis of Buckling of Laminated Struts Based on a Variational Formulation*
Christina Völlmecke, Stylianos Yiatros, Wolfgang H. Müller

15:25 *Buckling of Laminated Plates Considering Pre-Buckled Stress State*
Alfia Bano, P.M. Mohite, Ashwini Kumar

GS-SM.5 Structural Mechanics — Thursday, 14:15 - 15:45
Saal Steiermark — Chair: A.I. Oleinikov

14:15 *Models of Anisotropic Heterogeneous Creep in Integrated Design of Wing Panel Manufacture Processes*
Alexander Ivanovich Oleinikov

14:35 *Numerical Analysis of a Composite Beam under Cyclic Loading Condition Considering the Bond-Slip Effect along Material Interface*
Jin-Wook Hwang, Hyo-Gyoung Kwak

14:55 *Orientational Averaging in Modeling the Elastic Properties of Highly Porous Plastic Foams*
Aivars Lagzdins, Alberts Zilaucs, **Ilze Beverte**, Janis Andersons

15:15 *Image-Based Damage Evaluation in Drilled Carbon/Epoxy Laminates*
Luís Miguel Durão, João Manuel R. S. Tavares, Victor Hugo C. de Albuquerque, Daniel J. S. Gonçalves

GS-SM.6 Structural Mechanics AU3	Friday, 10:15 - 12:15 Chair: L.A. Mihai, P. Le Grognec
10:15	*Limit Load Analysis of Elastic Multibody Structures with Friction* **L. Angela Mihai**
10:35	*Special Mathematical Model for Laminated Shells* **Denys Volchok** , Eduard Kvasha, Ruediger Schmidt
10:55	*Energy Transfer Analysis of an Elastically Connected Circular Double-Membrane Compound System* **Milan Slavoljub Cajić**, Danilo Karličić
11:15	*Buckling Analysis of Reinforced Sandwich Panels under Through-Thickness Compression* Cyril Laine, **Philippe Le Grognec**, Sébastien Comas Cardona, Christophe Binetruy
11:35	*Delamination Studies on Composite Laminates – An Asymptotic Approach* Gottimukkula Venkatesh, Sathiskumar Anusuya Ponnusami, **Dineshkumar Harursampath**

GS-SM.7 Structural Mechanics S3	Friday, 10:15 - 12:15 Chair: J. Kratochvil, J. Kreutz
10:15	*Augmented Beam Element Based on Unit Deflection Shapes of the Cross Section* **Johannes Kreutz**, Gerhard Müller
10:35	*Modal Analysis Applied to Transient Thermal Problems* **Evert Cente Hooijkamp**, F. van Keulen, J. van Eijk
10:55	*Asymptotic Analysis of Load Transfer by Bolted Double-Lap Joints of Isotropic Plates* **Jan Kratochvil**, Wilfried Becker
11:15	*Nonlinear Finite Element Analysis for Un-Bonded Tendon Behaviors in Containment Building* **Yang Soo Kwon**, Hyo-Gyoung Kwak
11:35	*Mindlin's Problem for a Surface Stiffened Transversely Isotropic Medium* Morteza Eskandari, **Hamed Naghib**

PS

Poster Session

PS Poster – Wednesday, 10:15 - 13:45	
10:15	*Time-Discrete Geometrical Integration of Finite Deformations* **Zdenek Fiala**
10:15	*Development of New Active Bioreactor to Biomechanical Characterization of Engineered Tissue Cartilage* **Antonio Godinho Completo**, Joana Pereira, Carlos Relvas, Antonio Ramos, Jose Simoes, Alexandrina Mendes
10:15	*Singularly Perturbed Problems in Mechanics (Theoretical and Applied Aspects)* **Lyudmila Kuzmina**
10:15	*Mathematical Model of Micropolar Orthotropic Elastic Thin Plates* Gayane Sokrat Hayrapetyan, **S.H. Sargsyan**
10:15	*Deformable Body Oscillations on Layer with Visco-Elastic and Inertia Properties* Katica (Stevanovic) Hedrih, **Marija (Branislav) Stamenković**
10:15	*Temperature-Dependent Materials in a Pad/Disc Brake System* Aleksander Yevtushenko, **Piotr Grzes**
10:15	*Optimal Design of Annular Disks with Respect to Mixed Creep Rupture Time* **Aneta Ustrzycka**, Krzysztof Szuwalski
10:15	*Barodesy – A Constitutive Model Based on Two Rules by Goldscheider* Dimitrios Kolymbas, **Gertraud Medicus**
10:15	*Three-Dimensional Finite Element Model of the Radiocarpal Joint: Load Transfer Analysis through the Normal Wrist* Susana Meireles, **Antonio Godinho Completo**, Jose Simoes, Carlos Relvas, Antonio Ramos
10:15	*The FE Simulation of Vibrations Attenuation via Mass Reconfiguration* **Walerian Szyszkowski**, Ehsan Sharbati
10:15	*Comparison of Optimum Topologies Obtained by Using Different Functions for Young's Modulus* **Ting-Yu Chen**, Yen-Jui Li
10:15	*Modeling and Simulation of Dynamic Debonding Propagation in Sandwich Plates* **Vyacheslav Nikolayevich Burlayenko**, Tomasz Sadowski
10:15	*Damping Effect in Dynamic Buckling of Thin-Walled Plate Structures* **Radoslaw Mania**, Zbigniew Kolakowski
10:15	*FE Analysis of the Elastomeric Artificial Disc in the Lumbar Spine* **Pawel Borkowski**, G. Krzesinski, P. Marek, B. Wasniewski, P. Wymyslowski, T. Zagrajek

10:15	*Nonlinear Interaction of Co-Directional SH Waves in a Plate* **Esra Akman**, Semra Ahmetolan
10:15	*Dynamic Buckling of Thin-Walled Beams Subjected to Bending* **Tomasz Kubiak**, Mariusz Urbaniak
10:15	*Adaptive Mesh Refinement for Geomaterials* **Claire E. Heaney**, Ronald B.J. Brinkgreve, Paul G. Bonnier, Michael A. Hicks
10:15	*Nonlinear Oscillations of a Membrane on the Elastic Foundation* **Nikola Nesic**
10:15	*Numerical Evaluation of Mechanical Parameters in Cerebral Aneurysm Formation at Bifurcations* **Robert Nagy**, Imre Bojtár
10:15	*Exact Geometry Based Quasi-Conforming Analysis* **Yang Xia**, Ping Hu
10:15	*Non-Stationary Frictional Heat Problem for Two Plane-Parallel Strips* Aleksander Yevtushenko, **Michal Kuciej**
10:15	*Modified Predictir-Corrector Method in Structural Dynamics* **Mladen Mestrovic**, Eva Ocvirk
10:15	*Infrared Image Analysis for Cancer Risk Diagnosis* **Evgeniya Gerasimova**, Yuriy Bayandin, Oleg Naimark, Genriatta Freynd
10:15	*Biomechanical Data Repository for Multiscale Modelling of Lower Limbs* **Massimiliano Baleani**, Luca Cristofolini, Enrico Schileo, Serge Van Sint Jan, Mateusz Juszczyk, Caroline Öhman, Iwona Zwierzak, Philippe Lefèvre, Jan Maria Juszczyk, Marco Viceconti
10:15	*Numerical Simulation Based on FEM/MESHLESS Coupling in Axisymmetric Elastoplasticity for 2D Solid Mechanics* **Yosr Ghozzi**, Carl Labergere, Pierre Villon
10:15	*Finite Element Modeling of the Humidity-Driven Wetting Mechanism of Wheat Awns* **Gerald A. Zickler**, John W.C. Dunlop, Davide Ruffoni, Rivka Elbaum, Richard Weinkamer, Peter Fratzl, Thomas Antretter
10:15	*Damage Accumulation in Metals under Hydrogen Embrittlement* **Vladimir Astafiev**
10:15	*Equilibrium of Thin-Walled Tube with Rigid Insert* **Alexei Mikhailovich Kolesnikov**
10:15	*Comparison of Analytical Approaches for the Infinite Plate on an Elastic Isotropic Halfspace* **Manuela Hackenberg**, Gerhard Müller, Roland Friedl
10:15	*Numerical Computation of the Thin-Walled Structure under the Influence of the Fluctuating Load, Considering the Secondary Plastic Deformation and Damages* **Abdusamat Abdusattarovich Abdusattarov**, Muhamadaziz Rasulmuhamedov, Anvar Inomovich Isomidinov

10:15 *Variational Approach to Ductile Fracture: A Simple Model with Damage and Plasticity*
Roberto Alessi, Jean Jacques Marigo, Stefano Vidoli

10:15 *Analysis of the Properties of Resins Used in the Processes – JS and SLA*
Jacek Bernaczek, Grzegorz Budzik

10:15 *Electrical Fail Safe Actuator Design of Shut Down Valves*
Sina Poorgol, **Hadi Homaei**

10:15 *Determination of Effective Elastic Properties of Nanofibrils and Nanofibers by the Method of Differential Replacement with Asymptotic Homogenization*
Edwin Yesid Gomez Pachon, F.J. Sabina, R. Vera-Graziano

10:15 *Incipient Failure Detection and Diagnostics of Self-Aligning Ball Bearing*
Sylvester Aondolumun Aye

10:15 *Analysis of Properties of Models Constructed from Ti6Al4V Alloy Powder*
Jacek Bernaczek, **Grzegorz Budzik**

10:15 *Finite Element Analysis of Shape Memory Polymer Seal Using a Thermomechanical Constitutive Model*
Sujithra Renganathan, Sivakumar Madras Srinivasan, Arockiarajan Arunachalam

10:15 *Optimisation of the Ultra-Supercritical Steam Turbine Rotor Shape and Start-Up Method*
Grzegorz Nowak, Andrzej Rusin

10:15 *Friction Torque Compensation in the Balanced Leg Orthosis for Robotic Rehabilitation*
Vigen Arakelian, **S. Sargsyan**, M. Harutyunyan

10:15 *Relation between Displacement Gradients*
Turat Duishenaliev, R.N. Askarbekov

10:15 *Numerical Simulation of Bulk Stress Effects in Partial Slip Contacts of Finite Width*
Y.S. Rammohan, **H. Murthy**

10:15 *Considerations on Skin Expansion over Adipose Tissue*
Djenane C. Pamplona, Hans Ingo Weber

10:15 *Evaluation of Glass Fiber/Epoxy Interfacial Failure Criterion by Using a Single Fiber Model Composite Specimen*
Shinji Ogihara, Hayato Nakatani, Jun Koyanagi, Satoshi Kobayashi

10:15 *Chaotic Vibrations of the Duffing System with Fractional Damping*
Grzegorz Litak, Arkadiusz Syta, Stefano Lenci, Michael Scheffler

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