

**NB.** Sessions in the left column are in room M1 on the 1<sup>st</sup> floor.  
Sessions in the right column are in room S09 on the ground floor.

**Tuesday 13<sup>th</sup> September 2016**

<b>Time 8:00-9:00 • Room M1</b>	
<b>Registration</b> , Technical University of Denmark, Kongens Lyngby	
<b>Time 9:00-9:30 • Room M1</b>	
<b>Opening &amp; Welcome Speeches</b> <ul style="list-style-type: none"> <li>• 4M/IWMF2016 Chair, Dr. Guido Tosello, Technical University of Denmark, Denmark</li> <li>• DTU Mechanical Engineering, Prof. Hans Hansen, Technical University of Denmark, Denmark</li> <li>• DTU Executive Vice President and Provost, Prof. Henrik Wegener, Demark</li> <li>• 4M/IWMF2016 Co-Chair, Prof. Stefan Dimov, University of Birmingham, UK</li> </ul>	
<b>Time 9:30-10:15 • Room M1</b>	
<b>Plenary Session I</b> <b>Chair: Guido Tosello</b> Invited Talk: "Topology optimization for micro- and nano-systems design", Prof. Ole Sigmund, Technical University of Denmark, Denmark	
<b>Time 10:30-11:30</b>	
<b>Session 1: HINMICO</b> <b>Chair: Sabino Azcarate</b>  <b>688. Injection moulding and selective metallisation technologies for polymer Microsystems</b> S. Dessors, L. Tenchine, S. Gout, IPC S. Azcarate, Tekniker G. Tosello, M. Calaon, Technical University of Denmark N. Miller, B. Brown, Flann Microwave Ltd C. Edouard, Flowdit T. Müller, KIT W. Wittner, Ernst Wittner GmbH M. Prantl, Alicona Imaging GmbH X. Shang, A. Batal, University of Birmingham  <b>730. High accuracy and precision micro injection moulding of thermoplastic elastomers micro ring production</b> M. Calaon, G. Tosello, H.N. Hansen, Technical University of Denmark R. Elsborg, Ortofon  <b>742. Combining Metal Injection Moulding and Polymer Over Moulding for the Production of Orthopaedic Implants</b> T. Müller, L.S. Machado, S. Scholz, KIT M. Philipp-Pichler, RHP Technology GmbH T. Wilfinger, Wittmann Battenfeld GmbH W. Wittner, Ernst Wittner GmbH M. Prantl, Alicona Imaging GmbH	<b>Session 2: Micro Manufacturing I</b> <b>Chair: Morten Hannibal Madsen</b>  <b>676. High-resolution gravure printing of graphene biosensors</b> T. Knoll, A. Brenner, E. Gorjup, A.Schultz, T. Velten, Fraunhofer-Institut für Biomedizinische Technik R. Warmers, G. Jenke, Saueressig GmbH C. Spacie, Haydale Ltd  <b>679. Fabrication of functional plastic parts using nanostructured stainless steel mould inserts</b> N. Blondiaux, R. Pugin, G. Andreatta, CSEM L. Tenchine, S. Dessors, IPC P.F. Chauvy, M. Diserens, Micropat SA P. Vuillermoz, Vuillermoz SAS  <b>694. Ejection force analysis of sintered aluminium micro gears using a shrink-fit die principle</b> E. Cannella, University of Padova E.K. Nielsen, M. Arentoft, IPU
<b>Time 11:30-12:00 • M1 Foyer</b>	
<b>Coffee Break</b>	
<b>Time 12:00-13:00</b>	
<b>Session 3: Micro Injection Moulding I</b> <b>Chair: Per Magnus Kristiansen</b>	<b>Session 4: Manufacture of Microwave Devices</b> <b>Chair: Juan José Vegas Olmos</b>

<p><b>680. Injection moulding of microstructured 3D plastic parts using standard stainless steel inserts</b> L. Tenchine, S. Dessors, IPC N. Blondiaux, R. Pugin, G. Andreatta, CSEM P.F. Chauvy, M. Diserens, Micropat SA P. Vuillermoz, Vuillermoz SAS</p> <p><b>715. Influence of Process Temperatures on Blister Creation in Micro Film Insert Moulding of a Dual Layer Membrane</b> T. Wöhner, G. Tosello, H.N. Hansen, A. Islam, Technical University of Denmark B.R. Whiteside, University of Bradford</p> <p><b>728. Effects of Different Mould Coatings on Polymer Filling Flow in Thin-Wall Injection Moulding</b> M. Sorgato, D. Masato, G. Lucchetta, University of Padova</p>	<p><b>701. Additive manufacturing of Ka-band antennas for wireless communications</b> U. Armendariz, S. Rommel, S. Rodriguez, I.T. Monroy, J.J Vegas Olmos, C.B. Olsen, Technical University of Denmark</p> <p><b>735. Rapid Prototyping by 3D Printing for Advanced Radio Communications at 80GHz and Above</b> A. Salazar, S. Rommel, E. Anufriyev, I.T. Monroy, J.J Vegas Olmos, Technical University of Denmark</p> <p><b>743. Process Optimization for Injection Moulding of Passive Microwave Components</b> S. Scholz, T. Müller, L.S. Machado, KIT M. Calaon, G. Tosello, Technical University of Denmark S. Dessors, IPC M. Prantl, Alicona Imaging GmbH N. Miller, Flann Microwave Ltd</p>
<b>Time 13:00-14:00 • Glass Salen ground floor</b>	
<b>Lunch</b>	
<b>Time 14:00-15:00</b>	
<p><b>Session 5: Hearing Aid</b> <b>Chair: Aminul Islam</b></p> <p><b>672. A conceptual framework for designing micro electrical connectors for hearing aid instruments</b> S. Doagou-Rad, A. Islam, Technical University of Denmark M. Fuglsang-Philip, Oticon</p> <p><b>677. Feasibility study of injection mouldable conductive plastic for the hearing aid applications</b> T.D. Merca, A. Islam, Technical University of Denmark T. Lindberg, GN Store Nord Lautrupbjerg 7</p> <p><b>732. Investigation of Bandgap Microstructure for Miniaturized Acoustic-Mechanical Devices: Application to BTE Hearing Aid Design</b> J. Kook, J.S. Jensen, Technical University of Denmark</p>	<p><b>Session 6: Machining I</b> <b>Chair: Jun Qian</b></p> <p><b>693. Efficiency and quality of cutting polymer materials with cooled water jet</b> M. Jerman, A. Lebar, P. Drešar, I. Sabotin, J. Valentinčič, University of Ljubljana</p> <p><b>712. Analysis of the reproducibility of Jet-ECM point removals on defined shape deviations</b> A. Martin, H. Zeidler, M. Hackert-Oschätzchen, A. Schubert, Technische Universität Chemnitz</p> <p><b>725. Advantages of using a non-rigid cutting mechanism for the machining of glass</b> G. Herrera-Granados, N. Morita, H. Hidai, S. Matsusaka, A. Chiba, Chiba University K. Ashida, I. Ogura, AIST</p>
<b>Time 15:00-15:30 • M1 Foyer</b>	
<b>Coffee Break</b>	
<b>Time 15:30-17:00</b>	
<p><b>Session 7: Laser Processing I</b> <b>Chair: José Luis Ocaña</b></p> <p><b>668. Micro-Dimple Texturing for Semi-Dry Stamping Dies</b> T. Aizawa, Shibaura Institute of Technology</p>	<p><b>Session 8: Simulation/Modelling</b> <b>Chair: Samuel Bigot</b></p> <p><b>685. Experimental verification of drop impact test and analysis for mobile electronics</b> B. Choi, H. Yeom, Y. Jeon, M.G. Lee, Ajou</p>

<p>H. Morita, Nano Film and Coat Laboratory LLC T. Inohara, LIPS-Works Co. Ltd</p> <p><b>740. Laser Polishing of 3D Printed Miniaturised Titanium Parts</b> D. Bhaduri, P. Penchev, S.S. Dimov, University of Birmingham U. Harrysson, Digital Metal</p> <p><b>741. A new laser drilling method for producing high aspect ratio micro holes</b> V. Nasrollahi, P. Penchev, S.S. Dimov, University of Birmingham</p> <p><b>744. On the development of a chip breaker in metal-matrix PCD insert</b> A. Elkaseer, J. Lambarri, J.A. Sarasua, Tekniker</p>	<p>University</p> <p><b>698. Analytical Study on New Type of Porous Aerostatic Bearing</b> K. Huang, H. Li, Y. Chen, K. Chien, MIRDC C. Liu, C. Yang, K. Huang, M. Chen, National Changhua University of Education</p> <p><b>709. Product cost modelling for micro-EDM drilling</b> G. D'Urso, G. Maccarini, M. Quarto, C. Ravasio, Università degli Studi di Bergamo</p> <p><b>736. Friction and Elasto-plastic Property Modelling for Finite Element Analysis of Micro Extrusion Process</b> H. Kitano, National Institute for Materials Science K. Dohda, J. Cao, Northwestern University</p>
<b>Time 17:15</b>	
<b>Bus to Copenhagen</b>	
<b>Time 18:00</b>	
<b>Boat Tour</b>	
<b>Time 19:00</b>	
<b>Gala Dinner</b>	

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<b>Time 9:00-9:45 • Room M1</b>	
<b>Plenary Session II</b> <b>Chair: Kornel Ehmann</b> Invited Talk: "Solid-state electrochemical nanopatterning of silver and copper", Prof. Placid Ferreira, University of Illinois, USA	
<b>Time 10:00-11:00</b>	
<b>Session 9: Advanced Materials and Processes I</b> <b>Chair: Joško Valentinčič</b>  <b>669. Plasma Nitriding of Inner Surfaces in the Mini- and Micro-Nozzles for Joining</b> T. Aizawa, Shibaura Institute of Technology K. Wasa, TEC-DIA Co. Ltd  <b>695. Estimate of power spectral density of discharge pulses in micro-EDM milling</b> V. Marrocco, F. Modica, G. Guadagno, I. Fassi, ITIA CNR  <b>706. Development of highly efficient combined polishing method for single-crystal silicon carbide</b> T. Kurita, K. Miyake, K. Kawata, K. Ashida, T. Kato, AIST	<b>Session 10: Injection Moulding II</b> <b>Chair: Steffen Scholz</b>  <b>689. Accurate validation of micro injection moulding process for manufacturing of a thin-wall micro part</b> Q. Su, N. Zhang, M.D. Gilchrist, University College Dublin N. Symms, S4innovation Limited-Reseller for CoreTech System Co. Ltd  <b>733. Design and fabrication of a mould with multiple inserts for a polymeric microfluidic device</b> G.Trotta, F.Modica, I. Fassi, ITIA CNR A.Volpe, R.Martinez, A. Ancona, R.Osellame, IFN CNR  <b>734. Impact of micro milling strategy on the demoulding forces in micro injection moulding</b> D. Masato, M. Sorgato, G. Lucchetta, University of Padova P. Parenti, M. Annoni, Politecnico di Milano
<b>Time 11:00-11:30 • M1 Foyer</b>	
<b>Coffee Break</b>	
<b>Time 11:30-13:00</b>	
<b>Session 11: Micro Parts' Assembly and Manipulation</b> <b>Chair: Irene Fassi</b>  <b>675. Towards Remote Telecontrol of a Desktop Microfactory via Internet Protocol with Virtual Reality</b> T. Tiemerding, OFFIS M. Mikczinski, MiCROW GmbH S. Fatikow, University of Oldenburg  <b>707. Diameter adaptive guides for wire based linked micro parts</b> P. Wilhelmi, C. Schenck, B. Kuhfuss, University of Bremen  <b>713. Programmable platform design and its electrodes activation algorithm for microparts motion</b> G. Kritikou, N. Aspragathos, University of Patras	<b>Session 12: Laser Processing II</b> <b>Chair: Iban Quintana</b>  <b>667. Influence of the Pulse Repetition Rate on the Hierarchical Features of Micro-Channels Fabricated by ns Lasers in Different Materials</b> R. Jagdheesh, A. Tur, J.L. Ocaña, UPM  <b>690. A thinner technology from thick to thin films microprocessing of microelectronics hybrids circuitry by laser precision trimming</b> D. Ulieru, O.M. Ulieru, A.Topor, X. Vila, SITEX 45 SRL  <b>699. Nanosecond Laser Milling of the Amorphous Alloy Zr41.2Ti13.8Cu12.5Ni10Be22.5</b> E.R. Williams, E.B. Brousseau, V.L. Keast, C.E. Hughes, K.D.M. Harris, Cardiff University

<b>731. Strategies for micro-handling of solder balls for the automated reballing of BGA packages</b> G. Fontana, S. Ruggeri, I. Fassi, ITIA CNR G. Legnani, University of Brescia	N.P. Lavery, S. Mehraban, Swansea University  <b>716. Laser-induced oxidation of titanium</b> T. A. Jwad, S. Deng, H. Butt, S. Dimov, University of Birmingham
<b>Time 13:00-14:00 • Glass Salen ground floor</b>	
<b>Lunch</b>	
<b>Time 14:00-15:00</b>	
<b>Session 13: Process Chains</b> <b>Chair: Giovanni Lucchetta</b>  <b>682. Development of metal MEMS manufacturing technologies using pierced metal foil and diffusion bonding process at low temperature</b> T. Shiratori, Y. Suzuki, T. Aihara, Komatsuseiki Kosakusho Co. Ltd S. Nakano, M. Katoh, National Institute of Advanced Industrial Science and Technology M. Yang, Tokyo Metropolitan University  <b>691. Effect of Residual Stress on the Distortion of Microembossed Metal Inserts for Assembly Injection Moulding</b> P. Frey, C. Höhler, M. Merklein, FAU  <b>711. The post treatment process of additive manufacturing for intramedullary nail by ultrasonic vibration machining, abrasive flow machining, and electropolishing technology</b> F. Hsu, T. Hung, Y. Lu, MIRDC Y. Liao, National Taiwan University S. Wang, Chung Yuan Christian University M. Lu, National Chung Hsing University H. Fu, National Kaohsiung University of Applied Sciences	<b>Session 14: Micro Manufacturing II</b> <b>Chair: Emmanuel Brousseau</b>  <b>697. Ultrasonic-Assisted Incremental Microforming of Thin Shell Pyramids of Aluminum Foil</b> T. Obikawa, M. Hayashi, University of Tokyo  <b>722. Xurography and lamination for manufacturing Point-of-Care (POC) micromixers</b> J.I. Martínez-López, M. Mojica, H.A. Betancourt, C.A. Rodríguez, H.R. Siller, Tecnológico de Monterrey  <b>723. Corner Deposition On Near-Field Electrospinning For Pin-To-Pin And Pin-To-Plate Electrode Configurations</b> N. Martinez-Prieto, J. Cao, K. Ehmann, Northwestern University
<b>Time 15:00-15:30 • M1 Foyer</b>	
<b>Coffee Break</b>	
<b>Time 15:30-16:30</b>	
<b>Session 15: Machining II</b> <b>Chair: Massimiliano Annoni</b>  <b>700. Study on the fabrication of hierarchical structure using a micro pyramidal tip with revolving trajectory</b> B. Xue, Y. Yan, X. Zhao, Harbin Institute of Technology  <b>719. Single point diamond turning of injection moulding aluminium inserts for intraocular lens production</b> X. Bazan, G. Cortazar, X. Mendibil, I. Quintana, Tekniker	<b>Session 16: Advanced Materials and Processes II</b> <b>Chair: André Zimmermann</b>  <b>708. A study of fluid flow characteristics using micro structured surfaces produced by WEDM</b> M. Al-Fahham, S. Bigot, A.V. Medina, Cardiff University  <b>710. Development and characterization of functional polymer-ceramic composite structures using fused deposition modelling</b> B. Khatrim K. Lappe, M. Habedank, C. Megnin, T. Hanemann, University of Freiburg T. Müller, KIT



I. Martinez de la Pera, Aurrenak S. Coop

**724. Profile Evaluation of Radial Fresnel Lenses directly machined on Roller Moulds by Rotating-tool Diamond Turning**

R. Huang, X. Zhang, K. Liu, Singapore Institute of Manufacturing Technology

S. Kumar, M. Rahman, National University of Singapore

**714. Fabrication of Micro DLC-Nozzles by Plasma Oxidation Printing**

T. Aizawa, Shibaura Institute of Technology

K. Wasa, TEC-DIA Co. Ltd

H. Tamagaki, KOBELCO Co. Ltd



<b>Time 9:00-10:15 • Room M1</b>	
<b>Plenary Session III</b> <b>Chair: Stefan Dimov</b> Invited Talk: "Nanoimprint lithography: the (planar) world is not enough", Dr. Helmut Schiff, Paul Scherrer Institute, Switzerland  "World Congress on Micro and Nano Manufacturing 2017", Ming-Chyuan Lu, National Chung Hsing University, Taiwan  "World Congress on Micro and Nano Manufacturing 2018", Joško Valentinčič, UoL, Slovenia	
<b>Time 10:15-10:45 • M1 Foyer</b>	
<b>Coffee Break</b>	
<b>Time 10:45-12:30</b>	
<b>Session 17: Characterisation/Metrology</b> <b>Chair: Tatsuhiko Aizawa</b>  <b>681. Tolerance Verification of an Industrial Assembly using Computed Tomography</b> A. Stolfi, L. De Chiffre, F. Regi, Technical University of Denmark  <b>684. Comparison of scatterometry, imaging scatterometry, AFM and confocal microscopy</b> M. H. Madsen, J. S. Madsen, P. E. Hansen, Danish Fundamental Metrology A/S P. Boher, Universitetsparken 5 J. Nygård, Center for Quantum Devices & Nano-Science Center D. Dwarakanath, J. F. Jørgensen, Image Metrology A/S  <b>686. Real time effective dimensional verification of high throughput Nano-Embossing manufacturing</b> M. Calaon, G. Tosello, H.N. Hansen, Technical University of Denmark P. Chamberlain, D. Hardt, MIT M.H. Madsen, Danish Fundamental Metrology A/S  <b>726. Investigation on the micromilled surface characterization through replica technology</b> F. Baruffi, P. Parenti, F. Cacciato, M. Annoni, Politecnico di Milano G. Tosello, Technical University of Denmark <b>738. Correction of systematic behaviour in topographical surface analysis</b> D. Qualiotti, F. Baruffi, G. Tosello, R. Sobiecki, H.N. Hansen, Technical University of Denmark S. Gasparin, LEGO M. Annoni, P. Parenti, Politecnico di Milano	<b>Session 18: Systems</b> <b>Chair: Ming-Chyuan Lu</b>  <b>678. Investigations on Flexural Fatigue Strength of Conductor Paths Fabricated by LPKF-LDS® Technology</b> H. Mueller, T. Groezinger, S. Weser, W. Eberhardt, A. Zimmermann, Hahn-Schikard M. Ketata, University of Stuttgart  <b>720. Design and manufacture of a flexure-based XYZ-force sensor</b> J. Correa, N. Kapur, S. Kapoor, P.M. Ferreira, University of Illinois  <b>727. Development of a micro pump actuated by oxidative expansion of Fe powder</b> H. Kan, T. Shimizu, M. Yang, Tokyo Metropolitan University  <b>729. Micro-Scale Tensile Fatigue Test System using a Micro-Manipulator with Scanning Electron Microscope</b> K. Tsuchiya, N. Hayakawa, K. Fujimura, University of Tokyo T. Kakiuchi, Y. Uematsu, Gifu University  <b>737. Application of MEMS Microphone Array for Tool Wear Monitoring in Turning</b> P. Wang, M. Lu, National Chung Hsing University S. Wang, Chung Yuan Christian University Y. Liao, Y. Tsai, National Taiwan University
<b>Time 12:30-14:00 • Glass Salen ground floor</b>	
<b>Lunch</b>	
<b>Time 14:00 - End of the 4M/IWMF2016 Conference</b>	



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