NB. Sessions in the left column are in room M1 on the 1st floor.
Sessions in the right column are in room S09 on the ground floor.

Tuesday 13th September 2016

Time 8:00-9:00 ● Room M1

Registration, Technical University of Denmark, Kongens Lyngby

Time 9:00-9:30 ● Room M1

Opening & Welcome Speeches

- 4M/IWMF2016 Chair, Dr. Guido Tosello, Technical University of Denmark, Denmark
- DTU Mechanical Engineering, Prof. Hans Hansen, Technical University of Denmark, Denmark
- DTU Executive Vice President and Provost, Prof. Henrik Wegener, Demark
- 4M/IWMF2016 Co-Chair, Prof. Stefan Dimov, University of Birmingham, UK

Time 9:30-10:15 ● Room M1

Invited Speaker
Chair: Guido Tosello

"Topology optimization for micro- and nano-systems design", Prof. Ole Sigmund, Technical University of Denmark, Denmark

Time 10:30-11:30

Session 1: HINMICO
Chair: Sabino Azcarate

688. Injection moulding and selective metallisation technologies for polymer Microsystems
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

730. High accuracy and precision micro injection moulding of thermoplastic elastomers micro ring production
M. Calaon, G. Tosello, H.N. Hansen, Technical University of Denmark
R. Elsborg, Ortofon

742. Combining Metal Injection Moulding and Polymer Over Moulding for the Production of Orthopaedic Implants
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

Session 2: Micro Manufacturing I
Chair: Morten Hannibal Madsen

676. High-resolution gravure printing of graphene biosensors
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

679. Fabrication of functional plastic parts using nanostructured stainless steel mould inserts
N. Blondiaux, R. Pugin, G. Andreatta, CSEM
L. Tenchine, S. Dessors, IPC
P.F. Chauvy, M. Diserens, Micropat SA
P. Vuillermoz, Vuillermoz SAS

694. Ejection force analysis of sintered aluminium micro gears using a shrink-fit die principle
E. Cannella, University of Padova
E.K. Nielsen, M. Arentoft, IPU

Time 11:30-12:00 ● M1 Foyer

Coffee Break

Time 12:00-13:00

Session 3: Micro Injection Moulding I	**Session 4: Manufacture of Microwave Devices**

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

668. Micro-Dimple Texturing for Semi-Dry Stamping Dies T. Aizawa, Shibaura Institute of Technology H. Morita, Nano Film and Coat Laboratory LLC T. Inohara, LIPS-Works Co. Ltd **740. Laser Polishing of 3D Printed Miniaturised Titanium Parts** D. Bhaduri, P. Penchev, S.S. Dimov, University of Birmingham U. Harrysson, Digital Metal **741. A new laser drilling method for producing high aspect ratio micro holes** V. Nasrollahi, P. Penchev, S.S. Dimov, University of Birmingham **744. On the development of a chip breaker in metal-matrix PCD insert** A. Elkaseer, J. Lambarri, J.A. Sarasua, Tekniker	**685. Experimental verification of drop impact test and analysis for mobile electronics** B. Choi, H. Yeom, Y. Jeon, M.G. Lee, Ajou University **698. Analytical Study on New Type of Porous Aerostatic Bearing** K. Huang, H. Li, Y. Chen, K. Chien, MIRDC C. Liu, C. Yang, K. Huang, M. Chen, National Changhua University of Education **709. Product cost modelling for micro-EDM drilling** G. D'Urso, G. Maccarini, M. Quarto, C. Ravasio, Università degli Studi di Bergamo **736. Friction and Elasto-plastic Property Modelling for Finite Element Analysis of Micro Extrusion Process** H. Kitano, National Institute for Materials Science K. Dohda, J. Cao, Northwestern University
Time 17:15	
Bus to Copenhagen	
Time 18:00	
Boat Tour	
Time 19:00	
Gala Dinner	

Wednesday 14th September 2016

Time 9:00-9:45 ● Room M1

Invited Speaker
Chair: Kornel Ehmann

"Solid-state electrochemical nanopatterning of silver and copper", Prof. Placid Ferreira, University of Illinois, USA

Time 10:00-11:00

Session 9: Advanced Materials and Processes I
Chair: Joško Valentinčič

669. Plasma Nitriding of Inner Surfaces in the Mini- and Micro-Nozzles for Joining
T. Aizawa, Shibaura Institute of Technology
K. Wasa, TEC-DIA Co. Ltd

695. Estimate of power spectral density of discharge pulses in micro-EDM milling
V. Marrocco, F. Modica, G. Guadagno, I. Fassi, ITIA CNR

706. Development of highly efficient combined polishing method for single-crystal silicon carbide
T. Kurita, K. Miyake, K. Kawata, K. Ashida, T. Kato, AIST

Session 10: Injection Moulding II
Chair: Steffen Scholz

689. Accurate validation of micro injection moulding process for manufacturing of a thin-wall micro part
Q. Su, N. Zhang, M.D. Gilchrist, University College Dublin
N. Symms, S4innovation Limited-Reseller for CoreTech System Co. Ltd

733. Design and fabrication of a mould with multiple inserts for a polymeric microfluidic device
G.Trotta, F.Modica, I. Fassi, ITIA CNR
A.Volpe, R.Martinez, A. Ancona, R.Osellame, IFN CNR

734. Impact of micro milling strategy on the demoulding forces in micro injection moulding
D. Masato, M. Sorgato, G. Lucchetta, University of Padova
P. Parenti, M. Annoni, Politecnico di Milano

Time 11:00-11:30 ● M1 Foyer

Coffee Break

Time 11:30-13:00

Session 11: Micro Parts' Assembly and Manipulation
Chair: Irene Fassi

675. Towards Remote Telecontrol of a Desktop Microfactory via Internet Protocol with Virtual Reality
T. Tiemerding, OFFIS
M. Mikczinski, MiCROW GmbH
S. Fatikow, University of Oldenburg

707. Diameter adaptive guides for wire based linked micro parts
P. Wilhelmi, C. Schenck, B. Kuhfuss, University of Bremen

713. Programmable platform design and its electrodes activation algorithm for microparts motion

Session 12: Laser Processing II
Chair: Iban Quintana

667. Influence of the Pulse Repetition Rate on the Hierarchical Features of Micro-Channels Fabricated by ns Lasers in Different Materials
R. Jagdheesh, A. Tur, J.L. Ocaña, UPM

690. A thinner technology from thick to thin films microprocessing of microelectronics hybrids circuitry by laser precision trimming
D. Ulieru, O.M. Ulieru, A.Topor, X. Vila, SITEX 45 SRL

699. Nanosecond Laser Milling of the Amorphous Alloy Zr41.2Ti13.8Cu12.5Ni10Be22.5
E.R. Williams, E.B. Brousseau, V.L. Keast, C.E.

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

X. Bazan, G. Cortazar, X. Mendibil, I. Quintana, Tekniker 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	Hanemann, University of Freiburg T. Müller, KIT **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

Thursday 15th September 2016

Time 9:00-9:45 ● Room M1

Invited Speaker
Chair: Stefan Dimov

"Nanoimprint lithography: the (planar) world is not enough", Dr. Helmut Schift, Paul Scherrer Institute, Switzerland

Time 9:45-10:15 ● M1 Foyer

Coffee Break

Time 10:15-12:00

Session 17: Characterisation/Metrology
Chair: Tatsuhiko Aizawa

681. Tolerance Verification of an Industrial Assembly using Computed Tomography
A. Stolfi, L. De Chiffre, F. Regi, Technical University of Denmark

684. Comparison of scatterometry, imaging scatterometry, AFM and confocal microscopy
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

686. Real time effective dimensional verification of high throughput Nano-Embossing manufacturing
M. Calaon, G. Tosello, H.N. Hansen, Technical University of Denmark
P. Chamberlain, D. Hardt, MIT
M.H. Madsen, Danish Fundamental Metrology A/S

726. Investigation on the micromilled surface characterization through replica technology
F. Baruffi, P. Parenti, F. Cacciatore, M. Annoni, Politecnico di Milano
G. Tosello, Technical University of Denmark

738. Correction of systematic behaviour in topographical surface analysis
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

Session 18: Systems
Chair: Ming-Chyuan Lu

678. Investigations on Flexural Fatigue Strength of Conductor Paths Fabricated by LPKF-LDS® Technology
H. Mueller, T. Groezinger, S. Weser, W. Eberhardt, A. Zimmermann, Hahn-Schikard
M. Ketata, University of Stuttgart

720. Design and manufacture of a flexure-based XYZ-force sensor
J. Correa, N. Kapur, S. Kapoor, P.M. Ferreira, University of Illinois

727. Development of a micro pump actuated by oxidative expansion of Fe powder
H. Kan, T. Shimizu, M. Yang, Tokyo Metropolitan University

729. Micro-Scale Tensile Fatigue Test System using a Micro-Manipulator with Scanning Electron Microscope
K. Tsuchiya, N. Hayakawa, K. Fujimura, University of Tokyo
T. Kakiuchi, Y. Uematsu, Gifu University

737. Application of MEMS Microphone Array for Tool Wear Monitoring in Turning
P. Wang, M. Lu, National Chung Hsing University
S. Wang, Chung Yuan Christian University
Y. Liao, Y. Tsai, National Taiwan University

Time 12:00-14:00 ● Glass Salen ground floor

Lunch

Time 14:00 - End of the 4M/IWMF2016 Conference