WCMNM 2022 PROGRAM

Sept 19	18:30	**Registration**			*Town Hall / Grote Markt*
	19:00-20:00	**Welcome Drink**			
Sept 20	08:00-09:00	**Registration with Coffee**			*Onderwijs en Navorsing (O&N)*
	09:00-09:30	**Opening and Welcome Speeches**			
	09:30-10:30	**Keynote Speech (I)** "Don't forget reliability during MEMS development" Prof Ingrid De Wolf, Imec and Dept. Materials Engineering, KU Leuven, Leuven, Belgium			
	10:30-10:50	*Coffee Break*			
	10:50-12:30	Mechanical Micromachining I	Laser Processing	Injection Moulding	
	12:30-13:30	*Lunch*			
	13:30-14:50	Mechanical Micromachining II	Electrical Discharge Machining I		
	14:50-15:10	*Coffee Break*			
	15:10-16:30	Additive Manufacturing	Electrical Discharge Machining II		
	16:30-17:30	4M committee meeting	I2M2 committee meeting	IFMM committee meeting	
	17:30-18:30	4M, I2M2 and IFMM joint committee meeting			
Sept 21	08:30-09:00	**Registration with Coffee**			*Onderwijs en Navorsing (O&N)*
	09:00-10:00	**Keynote Speech (II)** „Micro Machining of Brittle Materials" Prof Takashi Matsumura, Tokyo Denki University			*Onderwijs en Navorsing (O&N)*
	10:00-10:20	*Coffee Break*			
	10:20-12:00	Surface Engineering I	Process Control and Inspection Systems	Applications of Micro Fabrication Processes	
	12:00-13:00	*Lunch*			
	13:00-14:20	Surface Engineering II	Biomanufacturing and biomedical devices	Process Modelling and Simulation I	
	14:20-15:10	**Industry Talks**			
	15:10-15:30	*Coffee Break*			
	15:30-16:50	**Pannel Discussion**			
	16:50-17:30	**Travel by public transport to City Center (Oude Markt)**			
	17:30-19:00	**Social event: City Walk**			*Start Oude Markt*
	19:00-22:00	**Congress dinner**			*Faculty Club*
Sept 22	08:30-09:00	**Registration**			
	09:00-10:00	**Keynote Talk (III)** "Surface Engineering for Functionality- From Micro to Macro" Prof Jian Cao, Northwestern University USA			
	10:00-10:20	*Break*			
	10:20-11:40	Novel Product Designs	Emerging Micromanufacturing Methods and Smart Materials	Process Modelling and Simulation II	
	11:40-12:30	*Lunch*			
	12:30-13:50	Round table followed by awards ceremony			
		Travel by public transport to M-Museum or Stella Artois Brewery			
End of conference					

Day1

Monday, 19 Sept

18:30 - 20:00 **Registration (Town Hall)**

19:00 - 20:00 **Welcome Drink (Town Hall)**

Day2

Tuesday, 20 Sept

08:00 – 09:00 **Registration (*Onderwijs en Navorsing (O&N)*)**

09:00 - 09:30 **Opening and welcome speeches**

09:30 - 10:30 **Keynote Speech (I)**

Don't forget reliability during MEMS development
Prof Ingrid De Wolf

10:30 - 10:50 **Break**

10:50 - 12:30 **Session 1a: Mechanical Micromachining I:**

57. **Micromilling H13 Tool Steel and Tool Life Criteria for Coated Microtools**
Russell A., Suri S.B., Ribeiro K.S.B., Coelho R.T., De Freitas S.A., Gomes M.C., Da Silva M.B., De Oliveira D. and Hung N.P.W.

30. **Experimental Investigation of Different Tool Geometries when Micromilling H13 Tool Steel**
Lucas Barbosa Queiroz, Samuel Alvesde Freitas, Tamires Isabela Mesquita Botelho, Arthur Vieira de Souza, Marcio Bacci da Silva and Wayne Nguyen P Hung

55. **A Study of Bulk Metallic Glass Drilling Process Near Plowing-dominated Region**
Nattasit Dancholvichit, Chi-Ting Lee and Shiv Kapoor

36. **Influence of Hydrogen-Free DLC Coated Micro Ball Endmills on Machining Response and Tool Wear in High-Speed Micromilling of Ti6Al4V**
Priyabrata Sahoo, Suraj Kumar, Rinku K. Mittal, Ramesh K. Singh and H. C. Barshilia

37. **Tribological Performance Analysis of Textured Cutting Insert Created Via High Speed Micromilling Process**
Akash Chadaram, Gururaja S, Rinku Mittal and Kundan K. Singh

10:50 - 12:30 Session 1b: Laser Processing

6. Method for Assessing the Performance of Multi-Axis Laser Processing Strategies
Themistoklis Karkantonis, Pavel Penchev, Tian Long See and Stefan Dimov

15. Removal Rates ScalabilitywithMHz BurstMode Ultrashort Laser Processing
Hoang Le, Themistoklis Karkantonis, Vahid Nasrollahi, Pavel Penchev and Stefan Dimov

28. Effect of Femtosecond Laser Textured Coppe r Surfaces on Wettability and Boiling Heat Transfer Enhancement
Balasubramanian Nagarajan, Larina Majidova,LouisJamaer, Maria Rosaria Vetrano and Sylvie Castagne

32. Investigation of Oxide Layer Removal of Low Carbon Steel using Nanosecond Pulsed Laser via Response Surface Methodology
Almigdad W. G. Ali, Vishnu Narayanan, Ramesh Singh and Deepak Marla

51. A Study on Laser Melting of EBM Ti6Al4V Surfaces in Different Environments
Rohit Gupta, Rajat Mishra, Subhrajit Chand and Madhu Vadali

10:50 - 12:30 Session 1c: Injection Moulding:

27. Effects of Surface Roughness on the Properties of Glass Fibre Filled Micro Injection Moulded Plastic Parts
Erindi N., Vella P. and Rochman A.

61. Replication Study of Molded Micro-Textured Samples Made of Ultra-High Molecular Weight Polyethylene for Medical Application
Francesco Modica, Vito Basile, Rossella Surace and Irene Fassi

67. Injection Compression Molding of Nanostructures from Direct Structured PVD Hard Coatings
H. Ruehl, T. Guenther and A. Zimmermann

72 Investigating the Deviations between Micro-Injection Molding Experiments and Simulations of Micro-Structured Micro-Optical Components
Komeil Saeedabadi, Alberto Santi, Matteo Calaon, Marcos Sampaio and Guido Tosello

49 Study on the Influence of Ventilation Position and Cutting Conditions on Breathable Molds
Kazuyoshi Oota, Kyohei Nakamura, Koharu Horikawa and Wataru Natsu

12:30 - 13:30 Lunch

13:30 - 14:50 Session 2a: Mechanical Micromachining II:

45. An Experimental Investigation of Deep-Hole Micro-Drilling of Pure Mg for Biomedical Applications
Margherita Pizzi, Francesco De Gaetano, Marco Ferroni, Federica Boschetti, Massimiliano Annoni

43. Assessment of Drilling Performance with Micro/Nanobubble-mixed Cutting Fluid Delivery
Prabhat Ranjan and Soham Mujumdar

18. Feasibility of Orthogonal Micro Turning Incorporating High Speed Machining Using Minimum Quantity Lubrication
Arnab Das and Vivek Bajpai

22. The Automatic Tool Wear Monitoring System for Micro-Milling Application with Image-Based Wear Detection
Muhammad Naufal Pratama, Christiand, Gandjar Kiswanto and Adinda Rahmah Shalihah

13:30 - 14:50 **Session 2b: Electrical Discharge Machining I:**

44. **Micro-EDM Milling of Free Form Surfaces Exploiting a 2 DOF High-Precision Rotary Table: Preliminary Tests**
Francesco Modica, Vito Basile and Irene Fassi

71. **Micro-Electrical Discharge Machining—EDM Effect of the Electrical Parameters on the Geometrical Performance of the Machining**
Asmae Tafraouti, Pascal Kleimann and Yasmina Layouni

9. **Influence of Different Electrode Materials During Micro Hole Fabrication in Titanium Grade 5**
K P Maity and H. Mishra

17. **Feasibility Assessment of Novel Maglev Dry-EDM by Machining Aerospace Al-6062 Alloy**
Rajesh Sahoo, Nirmal Kumar Singh and Vivek Bajpai

14:50 - 15:10 **Break**

15:10 - 16:30 **Session 3a: Additive Manufacturing:**

29. **Design of a Low Cost Micro-Electrochemical Additive Manufacturing Setup**
Muhammad Hazak Arshad, Krishna Kumar Saxena, Rex Smith, Jun Qian and Dominiek Reynaerts

65. **Microscale 3D Printing of Water Ice (3D-ICE)**
Akash Garg, Philip R. Le Duc and O. Burak Ozdoganlar

69. **On the Assessment of the Effect of Multiple Process Parameters on the Precision of 3D Inkjet Printing**
Ahmed Elkaseer, Matthias Kuchta and Steffen Scholz

33. **The Effects of Multiple Scans on Heat Penetration and Surface Roughness During Laser Surface Melting**
Justin Hijam, Sunilkumar Turpati and Madhu Vadali

15:10-16:30 **Session 3b: Electrical Discharge Machining II:**

12. **Preliminary Study for Surface Quality Implementation of SLM Samples via Micro-EDM**
Mariangela Quarto, Paola Serena Ginestra and Andrea Abeni

21. **Comparison of EDM Trimming with Ultrasonic Assisted Milling (UAM)for the Permeability Mold Steel Fabricated by SLM-AM Technology**
Albert Wen-Jeng Hsue, Li-Wei Lu and Chien-Lun Li

34. **Automatic Recognition of Machinable Regions for Micro-EDM**
Jun-Wei Lu, Yao-Yang Tsai and Shih-Ming Wang

20. **Experimental Analysis of Powder Mixed EDM of Hastelloy C-276**
Apurva Kulkarni, Ganesh Dongre and Ravi Raut

16:30 - 17:30

4m Association committee meeting

I2M2 committee meeting

IFMM committee meeting

17:30 - 18:30 **4M, I2M2 and IFMM joint committee meeting**

Day 3

Wednesday, 21 Sept

08:30 – 09:00 **Registration with coffee (*Onderwijs en Navorsing (O&N)*)**

09:00 - 10:00 **Keynote Speech (II)**

"Micro Machining of Brittle Materials"
Prof Takashi Matsumura, Tokyo Denki University (Japan)

10:00 – 10:20 **Break**

10:20 - 12:00 **Session 4a: Surface Engineering I:**

59 **Laser Removal of SiN x Nanofilm on Si Substrate via Film Breakage Due to Thermal Expansion**
Pinal Rana, Anil Kottantharayil and Deepak Marla

48. **The Effect of Substrate Temperature on Autonomously Generating Micro-Textured Surfaces with Regular Alignment Shapes by Applying Molecular Beam Epitaxy with Helicon Sputtering Molecular Beam Source for Nanoimprint Die**
Akira Kakuta and Yasuyuki Shigeta

35. **Strengthening of Tungsten Carbide Ceramicsby Ultrashort Pulse Laser Shock Peening**
Arun Prasanth Nagalingam, ArunIngersol,Nithin Kumar Gupta Dachepally and Swee Hock Yeo

26. **Influence of Initial Roughness on Laser Ablation of AA7075 Alloy and its Wettability Transition**
Nishkarsh Srivastava, Biki Kumar Sah Kalwar and Madhu Vadali

10:20 - 12:00 **Session 4b: Process Control and Inspection Systems:**

25. **Optical Dimensional Metrology for Quality Inspection of the Functional Surface of Punching Tools**
Kerstin Zangl, Reinhard Danzl, Urban Muraus and Franz Hemli

46. **Control of the Plasma-Workpiece Distance Using a Convolution Neural Network in Laser-Induced Plasma Micromachining**
Suman Bhandari, Dominik Kozjek, Jian Cao and Kornel Ehmann

73. **Edge Radius Impact on The Tool Geometry Estimation Process: Application in Tool Pre-Setting Systems**
Amrozia Shaheen, Klaus Liltorp, Nicolaj Elias Nielsen, Christian Wissing Kruse and Giuliano Bissacco

41. **Study of AE and Sound Signals in Micro Laser Welding**
Nai-Chia Chi and Ming-Chyuan Lu

10:20 - 12:00 **Session 4c: Applications of Micro Fabrication Processes**

47. **Punch-Edge Sharpening Effect on Process Affected Zone and Punch Wear in Punching Non-Oriented Electrical Steel Sheets**
Tomomi Shiratori, Youhei Suzuki and Tatsuhiko Aizawa

60. **Two Step Process Chain for Micromixer Tool Insert Production**
Izidor Sabotin and Joško Valentinčič

64. **Freeze Casting of Silica with Controllable Microporosity**
Mert Arslanoglu, O. Burak Ozdoganlar and Rahul Panat

5. **Influences of Fit Clearance on Extrusion Force of Titanium Alloy Micro-Gears**
Xiangzhong Yan, Yi Yang, Kunlan Huang and Mingxia Wu

40. **Adhesion Improvement of the Electroless Film Deposited on Glass by the Ultrasonic Micromachining Process**
Harsh Pandey, Karan Pawar and Pradeep Dixit

12:00 - 13:00 Lunch

13:00 - 14:20 Session 5a: Surface Engineering II

52. **The Process Parametersof Micro ParticleBombarding(MPB) for Surface Integrity Enhancement of Cermet Material**
Fu-Chuan Hsu, Li-Jie Chen, Zong-Rong Liu, Hsiu-AnTsai, Chin-Hao Lin, Chia-Hung Huang, Tsung-Jen Cheng, Hwa-TengLee and Chiu-FengLin

2. **Effect of PunchSurfaceTexture on Micro-Extrudabilityof AA6063 Micro Backward Extrusion**
T. Funazuka, K. Dohda, T.Shiratori, S. Horiuchi and I. Watanabe

58. **Laser Color Marking of Stainless Steel: An Experimental Study on the Effect of Process Parameters**
Ankit Awasthi, Makarand S Kulkarni and Deepak Marla

54. **Effects of Laser Polishing on Corrosion Resistance of Additive Manufactured Inconel 718 Alloy**
Rama Balhara, Kshitija Anam and Madhu Vadali

13:00 - 14:20 Session 5b: Biomanufacturing and biomedical devices

7. **Development of Micro Device Sensing for Surgical Robot – Investigationof Atherosclerosis Models**
Akane Muranaka, Atsushi Murakami, Tohru Sasaki, Shinichiro Sugawara, Keigo Sakakibara, Atsushi Shibata, Kenji Terabayashi, Akihiro Kiri and Kuniaki Dohda

50. **Immersed Microfluidic Spinning of Calcium Alginate Microfibers Towards Tissue Engineering Applications**
Tuo Zhou, Sahar Najafikhoshnoo, Rahim Esfandyarpour and Lawrence Kulinsky

63. **Fabrication of Titanium Microneedle Probes using Micromachining**
Toygun Cetinkaya, Burak Ozsoy, Yusuf Ozgur Cakmak and O. Burak Ozdoganlar

23. **Mechanism of Bacterial Interaction on Nanopillars using Finite Element Simulation**
Reshma Y. Siddiquie, Amit. Agrawal and Suhas S. Joshi

13:00 - 14:20 Session 5c: Process Modelling and Simulation I:

56. **Simulation of Crater Formation During the Micro EDM Process Using the ALE Method**
Sohaib Raza, Sujit Kadam, Hreetabh Kishore, Chandrakant Kumar Nirala

53. **Prediction of Milling—EDM Tool Wear: The Benefit of Process Monitoring and Machine Learning Model**
Long Ye, Ming Wu, Krishna Kumar Saxena, Jun Qian and Dominiek Reynaerts

38. **1D Model of Dry Electrical Discharge Machining (EDM) Plasma**
Shayan Bayki, Soham Mujumdar and Asif Tanveer

70. **On the Performance Evaluation of Microtextured Surfacesusing Computational Fluid Dynamics: A Comparative Study**
Aland Yarden Escudero-Ornelas, Debajyoti Bhaduri, Haydee Martinez-Zavala ,Agustin Valera-Medina and Samuel Bigot

14:20 - 15:10	**Industry Talks**
15:10 - 15:30	**Coffee Break**
15:30 - 16:50	**Pannel Discussion**
16:50 - 17:30	**Travel by public transport to City Center (Oude Markt)**
17:30 - 19:00	**Social event: City Walk**
19:00 - 22:00	**Congress dinner (Faculty Club)**

Day 4

Thursday, 22 Sept

08:30 - 09:00	**Registration**
09:00 - 10:00	**Keynote Speech (III)** "Surface Engineering for Functionality- From Micro to Macro" Prof Jian Cao, Northwestern University (USA)
10:00 - 10:20	**Break**
10:20 - 11:40	**Session 6a: Novel Product Designs**

3. **Manufacturing and Characterization of Acicular Fe-Ni Micro-Textured Heat-Transferring Sheets**
Tatsuhiko Aizawa, Hiroki Nakata and Takeshi Nasu

16. **Punch-Edge SharpeningEffect on Work H ardeningand Iron Losses in Shearing Non-Oriented Electrical Steel Sheets**
Yu Okai, Youhei Suzuki, Tatsuhiko Aizawa, Masahito Katoh and Tomomi Shiratori

31. **The Design and Control Schemeof MiniatureSerpentine Robot for In-Body Visual Servo Applications**
Hao-Yan Wu, Shu Huang, Chien-Yu Wu, Cheng-Peng Kuan and An-Peng Wang

1. **Micro-Textured GraphiticSubstrate– Copper Packaging for Robustness**
Tatsuhiko Aizawa, Hiroshi Nakata, Takashi Nasu and Yoshiro Nogami

10:20 - 11:40	**Session 6b: Emerging Micromanufacturing Methods and Smart Materials**

62. **Vortex Fluid Flow for Generation of Hydrodynamic Cavitation Aimed at Enhancing Manufacturing Processes**
Hao Pang, Swadheen Thakar and Gracious Ngaile

13. **Enhancing Electrical Conductivity of Flexible PEDOT:PSS Film by Intense Pulsed Light Irradiation**
Sina Rezvani, Hongseok Jo and Simon S. Park

19. **Solvothermal Growth of ZnO Nanorods on Woven Carbon Fabric for Enhanced Impact Energy Absorption Capacity of Laminated Composite**
Ravi Shankar Rai and Vivek Bajpai

68. **Development of Dual Transverse Ultrasonic Vibration System for Micro-Forming Application**
Gandjar Kiswanto, Wildan Zulfa Abdurrohman, Siska Titik Dwiyati, Sugeng Supriadi, Hans Thiery Tjong, Edward Joshua Patrianus Mendrofa and Raditya Aryaputra Adityawarman

10:20 - 11:40 **Session 6c: Process Modelling and Simulation II**

39. **Ultrafast Laser Ablation of Grooves in Metals: Experimental Study and Comparison with Simulations**
Pol Vanwersch, Albert Van Bael and Sylvie Castagne

42. **Numerical Studyof Grain Size Affected Deformation Behavior in Two-Stage Micro Deep Drawing using CPFEM**
Xu Tong and M.W. Fu

24. **Effect of Textured Substrate on High-Speed Impact-InducedGraphene Exfoliation: A Molecular Dynamics Simulation Study**
Milukuri Srivashista, Wazeem Nishad and Sathyan Subbiah

74. **Finite Element Simulation of Micro-Drilling of A Ni-based Superalloy**
Sabana Azim, Soumya Gangopadhyay and Siba Sankar Mahapatra

11:40 - 12:30 **Lunch**
12:30 - 13:50 **Round table followed by awards ceremony (12:30 to 13:50)**

Travel by public transport to M-Museum or Stella Artois Brewery

14:30 – 16:00 **Guided Tour M-Museum**

or

15:00 – 17:00 **Guided Tour Stella Artois Brewery**

End of conference