

NOTE: ALL TIMES ARE AS PER INDIAN STANDARD TIME (IST = GMT + 5:30)

WCMNM 2021 DAY 0: September 20, 2021

Monday, Sep 20, 6:00
PM - 6:20 PM

Welcome Address by Director, IIT Bombay

Monday, Sep 20, 6:20
PM - 6:35 PM

Prof. Joshi's Speech

Monday, Sep 20, 6:45
PM - 8:30 PM

Virtual Meet and Greet

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WCMNM 2021 DAY 1: September 21, 2021

Tuesday, Sep 21,
8:00 AM - 9:20 AM

Micro/Nano Fabrication Processes and Technologies (1)

Session Chair: Lawrence Kulinsky, Session Co-chair: J. Ramkumar

WCMNM Paper 91	Effects of Surface Texturing on Cutting Tool Performance	Nikam, Manoj; Tribeni Roy; Sachin Mastud;
WCMNM Paper 34	Influence of deficient cutting oil supply on machining performance during minimum quantity lubrication (MQL) assisted micro-milling	Saha, Suman; Deb, Sankha; Bandyopadhyay, Partha Pratim ;
WCMNM Paper 39	Fabrication of micro-hole using Maglev EDM	Sahoo, Rajesh; Kumar, Deepak; Singh, Nirmal Kumar; Bajpai, Vivek;
WCMNM Paper 46	Effect of Martensitic Transformation and Grain Misorientation on Surface Roughening Behavior in Thin Stainless Steel Foils During Tensile Test	Abdul, Aziz;

Tuesday, Sep 21,
8:00 AM - 9:20 AM

Additive and Hybrid Manufacturing (1)

Session Chair: Amber Shrivastava, Session Co-chair: Tatsuya Funazuka

WCMNM Paper 10	Effect of shell thickness on the deformation mode of TPMS lattices in quasi-static compression	Fu, Jin; Zhang, Lei; Song, Xu; Fu, Mingwang;
WCMNM Paper 37	A Thermal Model of Drilling a Titanium Alloy (Ti-6Al-4V) Under Different Cooling Techniques	Kumar, Ankit; Bhardwaj, Rajneesh; Joshi, S. S;
WCMNM Paper 41	Effect of punch surface grooves on micro-extrudability of micro backward extrusion of AA6063	Funazuka, Tatsuya; Dohda, Kuniaki; Shiratori, Tomomi; Hiramiya, Ryo; Watanabe, Ikumu;
WCMNM Paper 55	Effect of Rotational Speed on Axial Force and Spindle Torque during FSSW of AA6063/HE9 and CRCA/IS-513 steel with a Consumable Sheet	DAS, SUKANTA; Narayanan, R.Ganesh;

Tuesday, Sep 21,
8:00 AM - 9:20 AM

Process Modeling and Simulations (1)

Session Chair: Rakesh Mote, Session Co-chair: Priyabrata Sahoo

WCMNM Paper 4	Numerical simulation of multiple particle impact process during cold spray of the Ti-6Al-4V powder onto the Ti-6Al-4V substrate	Song, Xu; Sun, wen ; Tan, Wei-Yee Adrian; Marinescu, Julian; Liu, Erjia;
WCMNM Paper 50	A peridynamics simulation on the orthogonal glass cutting	Ono, Takenori;
WCMNM Paper 70	Cutting Velocity and Chip Load Dependent Force Prediction in High Speed Micromilling of Ti6Al4V Using Deep Learning Method	S, Gururaja; Singh, Kundan K;
WCMNM Paper 82	Compensation for Merchant's Circle Diagram to predict cutting force in orthogonal micro turning	Das, Arnab; Agnihotri, Shri Narayan; Bajpai, Vivek;

Tuesday, Sep 21,
1:00 PM - 2:20 PM

Invited Talk: (1) V. K. Jain (Formerly IIT Kanpur) (2) Mayank Shrivastava (IISC),

Session Chair: Soham Mujumdar

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Tuesday, Sep 21, 3:00 PM - 4:20 PM		Micro/Nano Fabrication Processes and Technologies (2) Session Chair: Rinku Mittal, Session Co-chair: Sachin Mastud		Parallel Tracks
WCMNM Paper 48	Analysis and prediction of surface roughness on lead free brass in high speed micro turning	Das, Arnab; Bajpai, Vivek;		
WCMNM Paper 51	Effect of micro roughness on Wettability and Anti-corrosion properties	Chauhan, Poonam;		
WCMNM Paper 52	Nanofinishing of tiny gear using magnetorheological abrasive flow finishing process	Kumar, Manjesh; Kumar, Abhinav; Das, Manas;		
WCMNM Paper 79	An Experimental Study on Laser Ablation of Ultra-thin SiNx Layer of PERC Solar Cell	Rana, Pinal; Khatri, Durga Prasad; Kottantharayil, Anil; Marla, Deepak;		
Tuesday, Sep 21, 3:00 PM - 4:20 PM		Process Modeling and Simulations (2) Session Chair: Massimiliano Annoni, Session Co-chair: Kundan K. Singh		Parallel Tracks
WCMNM Paper 95	Modelling and numerical study of the effect of temperature rise in laser-induced darkening of mild steel	S, Vishnu Narayanan; Ghormode, Kshitij ; Singh, Ramesh K; Marla, Deepak;		
WCMNM Paper 90	Micromilling force prediction through Digital Twins	Barna, Francesco; Parenti, Paolo; Annoni, Massimiliano;		
Tuesday, Sep 21, 3:00 PM - 4:20 PM		Biomanufacturing and Devices (1) Session Chair: Joško Valentinčič, Session Co-chair: Tohru Sasaki		
WCMNM Paper 27	Metal Bellows Structure for Micro Device Sensing	Mir, Bilal Ahmed; Sasaki, Tohru; Murakami, Atsushi; Muranaka, Akane; Sugawara, Shinichiro; Terabayashi, Kenji; Dohda, Kuniaki;		
WCMNM Paper 98	Hybrid machining of P20 die steel masters for the development of polymer-based microfluidic devices	Pavan Pandit; Samuel, G.I.;		Parallel Tracks
Tuesday, Sep 21, 4:40 PM - 5:40 PM		Micro/Nano Fabrication Processes and Technologies (3) Session Chair: Albert Weng-Jeng Hsue, Session Co-chair: Gracious Ngaile		
WCMNM Paper 43	Precision electroforming of variable aspect ratio micro structures: simulation and validation	Zhang, Honggang; Zhang, Nan ; Fang, Fengzhou ;		
WCMNM Paper 53	Surface functionalization with nanostructure patterning by a green nanosecond pulsed laser	Karkantonis, Themistoklis; Gaddam, Anvesh; See, Tian Long; Dimov, Stefan;		
WCMNM Paper 54	Ultrashort laser micro-machining of thick terahertz mesh filters	Le, Hoang; Pradhani, Chandrasekhar; Penchev, Pavel; Wang, Yi; Dimov, Stefan; Lancaster, Michael ;		
Tuesday, Sep 21, 4:40 PM - 5:40 PM		Additive and Hybrid Manufacturing (2) Session Chair: Irene Fassi, Session Co-chair: Ahmed Elkaseer		Parallel Tracks
WCMNM Paper 56	Intense Pulsed Light Healing of Copper Nanoparticles Based Flexible Circuits	Jeong, Robin; Horton, Tyler; Park, Simon ;		
WCMNM Paper 45	Femtosecond laser processing of maraging steel fabricated by laser powder bed fusion	Nagarajan, Balasubramanian; Metelkova, Jitka; Han, Jide; Van Hooreweder, Brecht; Castagne, Sylvie;		
WCMNM Paper 64	Effect of build platform location and part orientation on dimensional accuracy of down-facing surfaces in LPBF	Charles, Amal; Elkaseer, Ahmed; Thijs, Lore; Scholz, Steffen;		
Tuesday, Sep 21, 4:40 PM - 5:40 PM		Smart Materials and Smart Manufacturing (1) Session Chair: Kamlesh Joshi, Session Co-chair: Jithin S.		
WCMNM Paper 18	Analytical Study for the selection of mask size and shape for the machining of circular features	Singh, Gaganpreet; Sharman, Bhawandeep; Ramkumar, J.,; Ramakrishna., S.A.;		
WCMNM Paper 30	Monitoring of Uncut Fiber in Carbon Fiber-Reinforced Polymer (CFRP) in Drilling	Jaiswal, Anand Prakash; Lee, Hae Gu ; Park, Hyung Wook ;		Parallel Tracks
Tuesday, Sep 21, 6:00 PM - 7:20 PM		KEYNOTE 1: Prof. Tatsuhiko Aizawa Chair: Sathyan Subbiah		
Tuesday, Sep 21, 7:20 PM - 9:00 PM		Round Table 1: Emerging and Future Micromanufacturing Technologies Prof. Stefan Dimov, Prof. Albert Shih, Prof. Hitomi Yamaguchi Greenslet, Prof. Marc J Madou (Moderator: Irene Fassi)		

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WCMNM 2021 DAY 2: September 22, 2021

Wednesday, Sep 22, 8:00 AM - 9:20 AM		Micro/Nano Fabrication Processes and Technologies (4)		Parallel Tracks
Session Chair: J. Ramkumar , Session Co-chair: Lawrence Kulinsky				
WCMNM Paper 58	Nano-Texturing onto Tool-Surface by the Femtosecond Laser Processing	Aizawa, Tatsuhiko; Inohara, Tadahiko; Wasa, Kenji;		
WCMNM Paper 59	Material Characterization on the Affected Zones by Fine Piercing into Single Crystal Fe-6Si Steel Sheet	Aizawa, Tatsuhiko; Shiratori, Tomomi; Yoshino, Tomoaki; Dohda, Kuniaki;		
WCMNM Paper 67	Experimental Research of Adaptability of Palladium Coated Copper Material as an Alternate for Bare Copper or Gold Material in Conventional Wire Bonding	S, Harsha;		
Wednesday, Sep 22, 8:00 AM - 9:20 AM		Additive and Hybrid Manufacturing (3)		
Session Chair: Rakesh Mote, Session Co-chair: Tatsuya Funazuka				
WCMNM Paper 71	Surface micro-layer modification of selectively laser melted TiAl alloy using wire electrical discharge polishing	Boban, Jibin; Ahmed, Afzaal;		
WCMNM Paper 77	An Integrated Image Processing Approach for Micro-Defect Detection	Birla, Sandesh; Alya, Sachin; Singh, Ramesh;		
WCMNM Paper 96	3D Finite Element Modeling of Micro Rolling assisted Direct Laser Deposition	Raj, Ravi; Marla, Deepak ; N. S. CHIU, Louis ; Huang, Aijun ;		
Wednesday, Sep 22, 8:00 AM - 9:20 AM		Process Modeling and Simulations (3)		
Session Chair: Simon Park, Session Co-chair: Jithin S.				
WCMNM Paper 83	Numerical modeling to predict threshold fluence for material ejection in laser induced transfer of metals	Bhartiya, Divyanshu; M, Aanjinappa; Marla, Deepak;		
WCMNM Paper 84	A 3D FEM-based model of laser heating for selection of process parameters in laser-assisted machining of Ti6Al4V	Divse, Vishwas; Dubey, Amit ; Marla, Deepak;		
WCMNM Paper 92	Design for easy surface machined and highly absorbing metamaterials for Infrared frequencies	Yadav, Jyoti; J Ramkumar; K V Srivastava;		
Wednesday, Sep 22, 1:00 PM - 2:20 PM		Invited Talk: Jon Spangenberg (DTU)		Parallel Tracks
Chair: Deepak Marla				
Wednesday, Sep 22, 3:00 PM - 4:20 PM		Micro/Nano Fabrication Processes and Technologies (5)		
Session Chair: Priyabrata Sahoo, Session Co-chair: Albert Wen-Jeng Hsue				
WCMNM Paper 68	Characterization of shear transformation zone volume during Orthogonal micro turning of Zr-based Bulk metallic glass	Dhale, karuna; Banerjee, Nilanjan; Singh, Ramesh;		
WCMNM Paper 74	Fabrication of microcylinder using a tubular electrode in magnetic levitation based μ -EDM	Kumar, Deepak; nirmal kumar singh; Vivek Bajpai;		
WCMNM Paper 78	Microwave assisted wet chemical synthesis and characterizations of ZnO nanoflowers for optoelectronic applications	Rai, Ravi; Bajpai, Vivek;		
Wednesday, Sep 22, 3:00 PM - 4:20 PM		Surface Engineering (1)		
Session Chair: Rinku Mittal. , Session Co-chair: Pradeep Dixit				
WCMNM Paper 88	A study on oxide formation during nanosecond laser color marking of stainless steel	Awasthi, Ankit; Kumar, Deepoo; Marla, Deepak;		
WCMNM Paper 65	Surface Periodicity Index (S_PI): A Measure of Periodicity of Surface Topography	Gupta, Rohit;Vadali, Madhu;		
WCMNM Paper 97	Modeling and validation of Surface Roughness in Micro Turned Nickel based alloys (Nimonic 90)	Vineet Kumar; Samuel, G.I.;		
Wednesday, Sep 22, 3:00 PM - 4:20 PM		Additive and Hybrid Manufacturing (4)		Parallel Tracks
Session Chair: Sylvie Castagne, Session Co-chair: Amber Shrivastava				
WCMNM Paper 66	Geometrical-based Simulation of Drop-on-Demand 3D Inkjet Printing	Elkaseer, Ahmed; Schneider, Stella ; Scholz, Steffen;		
WCMNM Paper 69	Assessing the relationships between interdigital geometry quality and inkjet printing parameters	Bertolucci, Federico; Berdozzi, Nicolò; Rebaioli, Lara; Patil, Trunal; Vertechy, Rocco; Fassi, Irene;		
WCMNM Paper 85	Preliminary Investigation on Plasma Electrolytic Polishing of Microfluidic Platform Produced by Selective Laser Melting	Sabotin, Izidor; Jerman, Marko; Lebar, Andrej; Valentinčič, Joško; Böttger, Toni; Kühnel, Lisa; Zeidler, Henning;		

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Wednesday, Sep 22, 4:40 PM - 5:40 PM		Micro/Nano Fabrication Processes and Technologies (6) Session Chair: Samuel G. L., Session Co-chair: Chandrakant Nirala	
WCMNM Paper 76	Study of the influence of cutting edge radius on micro-cutting of hardened steel using FE and SPH modeling	Chaabani, Lobna;	
WCMNM Paper 40	Novel process chain for the integration of printed electronics with microinjection molded plastic parts.	Krantz, Joshua;	
WCMNM Paper 49	Drawing Velocity Regulation for Thermoplastic Micro-forming of Bulk Metallic Glass Drawing Process	Dancholvichit, Nattasit; Kapoor, Shiv; Salapaka, Srinivasa;	
Wednesday, Sep 22, 4:40 PM - 5:40 PM		Emerging Micromanufacturing Methods, Machines and Equipment (1) Session Chair: Joško Valentinčič, Session Co-chair: Anvesh Gaddam	
WCMNM Paper 20	Characterization of Hole Morphology in Deep Hole Micro Drilling Using QCW Laser	Ankamreddy, Bhargavi; Alya, Sachin; Singh, Ramesh;	
WCMNM Paper 21	Fabrication and verification of a small machined Granier sensor using precision processing technology	Kameda, Wataru; Ino, Fumiya; Terao, Kyohei; Takao, Hidekuni; Shiratori, Tomomi; Shimokawa, Fusao;	
WCMNM Paper 12	Fundamental investigations of size effects in multi-stage cold forming of metallic micro parts from sheet metal	Kraus, Martin; Merklein, Marion;	
Wednesday, Sep 22, 4:40 PM - 5:40 PM		Smart Materials and Smart Manufacturing (2) Session Chair: Ming-chyuan Lu, Session Co-chair: Sajan Kapil	
WCMNM Paper 32	Complementary approaches for enhancing polystyrene hydrophobicity: additives development and replication of micro/nanotextures	Le Brouster, Rachel; Giboz, Julien; Nourdine, Ali; Tenchine, Lionel; Dubelley, Florence; Mele, Patrice;	
WCMNM Paper 87	Applying Microphone Array to the Quality Monitoring System in Laser Micro Lap Welding	Chen, Ming-Zong; Lu, Ming-chyuan;	
Wednesday, Sep 22, 6:00 PM - 7:20 PM		KEYNOTE 2: Prof. Jinglin Fu Chair: Lawrence Kulinsky	
Wednesday, Sep 22, 7:20 PM - 9:00 PM		Industry Talks: 7:20 to 7.50 pm (Harrish Bajaj, Mitutoyo); 8 to 8.30 pm (Michael Kreil, Bruker Alicona); 8.40 to 9 PM (Light Conversion) (Chair: Ramesh Singh) 4M Meeting (7:20 - 8:20 PM IST) followed by I2M2 Meeting (8:30 - 9:30 PM IST)	

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WCMNM 2021 DAY 3: September 23, 2021

Thursday, Sep 23, 8:00 AM - 9:20 AM		Micro/Nano Fabrication Processes and Technologies (7) Session Chair: Tohru Sasaki, Session Co-chair: Kundan K. Singh		Parallel Tracks
WCMNM Paper 80	Formation of laser-induced periodic surface structures on reaction-bonded silicon carbide by femtosecond pulsed laser irradiation	Meshram, Tushar; Yan, Jiwang;		
WCMNM Paper 81	Effect of polishing time on the surface property of Maraging Steel on Electropolishing	Kumar, Abhinav;		
WCMNM Paper 86	Modeling of Hot Embossing Process for the Fabrication of Microlens Array	Kanishk, Kanishk; Soham Mujumdar; Parag Tandaiya;		
Thursday, Sep 23, 8:00 AM - 9:20 AM		Emerging Micromanufacturing Methods, Machines and Equipment (2) Session Chair: Vivek Bajpai, Session Co-chair: Sachin Mastud		
WCMNM Paper 31	Establishing Digital Recognition and Identification of Microscopic Objects for Implementation of Artificial Intelligence (AI) Guided Microassembly	Zhou, Tuo; Yu, Shih-Yuan ; Michaels, Matthew ; Du, Fangzhou ; Kulinsky, Lawrence; Al Faruque, Mohammad Abdullah ;		
WCMNM Paper 33	3D optical inspection of cutting tool geometry	Kreil, Michael; Zangl, Kerstin; Danzl, Reinhard; Helml, Franz;		Parallel Tracks
WCMNM Paper 36	Machining Removal Rate and Worn-Out for the Mesoscale Mold of Tungsten Carbide through Rotary Ultrasonic-Assisted EDM Milling	Hsue, Albert;		
WCMNM Paper 35	Introduction of a New Suction based Dielectric Flushing in Reverse-μEDM	Hreetabh Kishore; Vikrant Sharma; Jay Airao; Nirala, Chandrakant; Anupam Agrawal;		
Thursday, Sep 23, 1:00 PM - 2:20 PM		Invited Talks: Nagahanumiah (CMTI) Chair: Suhas Joshi		
Thursday, Sep 23, 3:00 PM - 4:20 PM		Micro/Nano Fabrication Processes and Technologies (8) Session Chair: Paolo Parenti, Session Co-chair: Kundan K. Singh		
WCMNM Paper 94	The effect of reciprocating motion of drum collector on electrospun PVDF nanofiber for energy harvesting application	Kumar, Mukesh; Poonam Kumari;		
WCMNM Paper 99	Ultrashort pulse laser machining and characterization of micro holes in silicon	Shalini Singh; Samuel, G.I.;		Parallel Tracks
WCMNM Paper 22	μEDM machining of ZrB2-based ceramics reinforced with SiC fibres or whiskers	Quarto, Mariangela; Bissacco, Giuliano; D'Urso, Gianluca;		
WCMNM Paper 28	Forming of components with microgearings from coil material - Numerical modeling of the process chain and experimental validation	Rohrmoser, Andreas; Kraus, Martin; Merklein, Marion;		
Thursday, Sep 23, 4:40 PM - 5:20 PM		Micro/Nano Fabrication Processes and Technologies (9) Session Chair: Chandrakant Nirala., Session Co-chair: Samuel G. L.		
WCMNM Paper 93	An Integrated Method for Selective Metallization on Glass Surface: Laser Direct Writing Coupled with Supersonic Spray Coating	Jo, Seunghwan; Akin, Semih; Park, Min soo; Jun, Martin;		
WCMNM Paper 61	Drag reduction properties of femtosecond laser-induced superhydrophobic dual-scale topographies	Gaddam, Anvesh; Sharma, Himani; Ahuja, Ratan; Dimov, Stefan; Joshi, Suhas; Agrawal, Amit;		
Thursday, Sep 23, 4:40 PM - 5:20 PM		Surface Engineering (2) Session Chair: Pradeep Dixit , Session Co-chair: Rinku Mittal		Parallel Tracks
WCMNM Paper 11	Micro-EDM milling as a potential technique for fabrication of artificial defects on bearing raceways for accelerated testing	Ye, Long; Krishna Kumar Saxena ; Jun Qian; Dominiek Reynaerts;		
WCMNM Paper 63	Utilization of Secondary Jet in Cavitation Peening and Cavitation Abrasive Jet Polishing	Pang, Hao ; Ngaile, Gracious;		
Thursday, Sep 23, 5:30 PM - 5:55 PM		Award Ceremony (Scientific Committee)		Parallel Tracks
Thursday, Sep 23, 6:00 PM - 7:20 PM		KEYNOTE 3: Prof. Lihui Wang Chair: Sylvie Castagne		
Thursday, Sep 23, 7:20 PM - 9:00 PM		Round Table 2: Evolving Directions of Micro- and Nano-manufacturing Research Dr. Samuel Bigot, Prof. Burak Ozdoganlar, Prof. Jinglin Fu, Prof. Mayank Shrivastava (Moderator: Lawrence Kulinsky)		