Programme

39th International MATADOR Conference on Advanced Manufacturing

5-7 July 2017

Humanities Bridgeford Street Building, The University of Manchester, Oxford Road, Manchester, M15 6FH, UK

MANCHESTER 1824
The University of Manchester

39th MATADOR Conference

5-7 July 2017, Humanities Bridgeford Street Building, Oxford Road, The University of Manchester, Manchester, M15 6FH,UK

Conference Programme Schedule (Final)

Day 1 (Wednesday, 5 July 2017, Humanities Bridgeford Street Building)

8:30-9:00	Registration			
9:00-9:20	Welcome and Opening: room Cordingley			
9:20 – 10:40	**PK-1:** room Cordingley			
10:40-11:00	Coffee/tea break: Foyer			
11:00-13:00	**PK-3:** room Cordingley			
13:00-14:00	**Lunch** and poster			
14:00-15:15	**LMN** (Cordingley)	**AM-1** (room G32)	**C** (room G33)	**SF-1** (room G6)
15:15 – 15:30	Tea/coffee break			
15:30-17:15	**LMN-2** (Cordingley)	**AM-2** (room G32	**MT** (room G33)	**SF-2** (room G6)

Day 2 (Thursday, 6 July 2017, Humanities Bridgeford Street Building)

9:00 – 11:00	**PK-3** (room Cordingly)			
11:00-11:15	Coffee/tea break			
11:15-12:35	**PK-4** (room Cordingley)			
12:35-13:30	**Lunch** and poster			
13:30-15:00	**LMN-3** (Cordingley)	**AM-3** (room G32)	**W-1** (room G33)	**MNF** (room G6)
15:00 – 15:15	Tea/Coffee break			
15:15-17:15	**LMN-4** (Cordingley)	**AM-4** (room G32)	**W-2** (room G33)	**LSP** (room G6)
18:30- 21:00	**Conference dinner: Christie's Bristro – Withworth Hall, Oxford Road, M13 9PL, Manchester**			

Day 3 (Friday, 7 July 2017, Humanities Bridgeford Street Building)

9:00 – 11:00	**PK-5** (Cordingley)			
11:00-11:15	Coffee/Tea break			
11:15-12:30	**LH-1** (Cordingley)	**SE -1** (room G32)	**W-3** (room G33)	**MM-1** (room G6)
12:30-13:30	**Lunch** and poster			
13:30-15:00	**LH-2** (Cordingley)	**SE-2** (room G32)	**LCM** (room G33)	**MM-2** (room G6)
15:00 – 15:15	Tea/Coffee break			
15:15-15:55	**PK-6** (Cordingley)			
15:55- 16:30	**Closing speech and prizes** (room Cordingley)			

PK: Plenary Keynotes	**LMN**: Laser Micro/Nano Fabrication
AM: Additive Manufacturing	**LH**: Laser Hybrid Manufacturing
C: Cutting (mechanical)	**LCM**: Laser Cladding and Melting
LSP: Laser Shock Peening	**MM**: Metrology and Measurement
SE: Systems Engineering	**MNF:** Micro/Nano Fabrication (non-laser)
SF: Surface Finishing	**MT**: Machine Tool and Manufacturing Processes
W: Welding	

39th MATADOR Conference Proramme
5-7 July 2017, Manchester

Day 1 (Wednesday, 5 July 2017) - Humanities Bridgeford Street Building

8:30-9:00	**Registration**
9:00-9:20	**Welcome and Opening -** Cordingley room **Professor Martin Schröder, Vice President, The University of Manchester** **Professor Paolo Bartolo, Chairman of 39th MATADOR Conference**
9:20-10:40	**Plenary Keynote Session 1** (Cordingley room) **Chair: Professor Lin Li,** FREng
9:20 – 10:00	**Keynote 1 (153)**: **Regius Professor Philip Withers**, FRS, FREng, The University of Manchester: ***The Henry Royce Institute – A Powerhouse for Advanced Manufacturing***
10:00-10:40	**Keynote 2 (165)**: **Regius Professor Joe McGeough**, FRSE, FREng, University of Edinburgh: ***How DTN Williamson, FRS, Changed the Face of Manufacturing***
10:40-11:00	**Coffee/tea break**
11:00-13;00	**Plenary Keynote Session 2** (Cordingley room) **Chair: Professor Paolo Bartolo**
11:00-11:40	**Keynote 3 (125)**: **Professor Dame Jane Jiang**, FREng, Director of the EPSRC Future Metrology Hub, University of Huddersfield, UK: ***Manufacturing Infratechnology.***
11:40 – 12:20	**Keynote 4 (111)**: **Dr. Andrew Soutar**, Director of Research Liaison, ARTC, Singapore: ***Using the PPP Model to Promote Advanced Manufacturing in Singapore***
12:20-13:00	**Keynote 5 (155): Professor Paul Maropoulos**, Pro-Vice-Chancellor for Research and Knowledge Exchange, at Aston University, Ashton University, Editor-in-Chief of IMechE B: Journal of Engineering Manufacture: ***Digitisation and Manufacturing – Global Perspective and Technology Development Options***

13:00 – 14:00 **Lunch**

14:00-15:15	5 July 2017. Parallel Session **LMN-1**, **Laser Micro/Nano Fabrication 1** room Cordingley Session chair: **Dr. Walter Perrie**, University of Liverpool, UK
14:00-14:30	**Invited (145)**: **Professor Geoff Dearden**, University of Liverpool, UK: *Security marking of high value components using advanced laser patterning*
14:30-14:45	**079** - **Mingyong Cai** et al, Tsinghua University, China: Large-Scale Hierarchical Oxide Nanostructures for High-Performance Electrocatalytic Water Splitting
14:45-15:00	**091** – **Qianliang Li** et al, University of Liverpool, UK: Investigation of PEEK ablation with femtosecond laser pulses
15:00-15:15	**081** – **Jiangyou Long** et al, Tsinghua University, China: *Metallic superhydrophobic surfaces fabricated by femtosecond laser ablation*

14:00-15:00	5 July 2017. Parallel Session **AM-1**, **Additive Manufacturing 1** room G32 Session chair: **Professor Paul Maropoulos**, Pro-Vice-Chancellor for Research and Knowledge Exchange, at Aston University, UK
14:00-14:15	**014** **Dr. Uwe Klaeger,** Fraunhofer Institute for Factory Operation and Automation, Germany: *Hybrid Robot Concept for Additive Manufacturing of Large Geometrically Complex Parts*
14:15-14:30	**023** **Saurav Goel**, Cranfield University, UK: *Structural and mechanical aspects of imperfections in 3D printing -validation of computer simulation model*
14:30-14:45	**043** **Omer Vikinski** and **Anath Fischer** et al, Technion, Haifa, Israel: *Design for Metal Additive Manufacturing of a Bicycle Truss*
14:45-15:00	**044** **Sagar Sarkar** et al, Indian Institute of Technology, Kharagpur, Indian: *Effect of variable amplitude loadings on fatigue life of direct metal laser sintered parts*

14:00-15:15	5 July 2017. Parallel Session C, **Cutting (mechanical)** room G33 Session chair: **Professor Sri Hinduja**, FREng, The University of Manchester, UK
14:00-14:15	134 **Zainal Zailani** et al, The University of Manchester, UK: Effects of chilled air on machinability of NiTi shape memory alloy
14:15-14:30	033 **Dr. Daniel Bachrathy** et al., Budapest University of Technology and Economics, Hungary: *Cutting Force Measurements in High Speed Milling - Extension of the Frequency Range of Kistler Dynamometer*
14:30-14:45	**008 Chetan Harry** et al., IIT DELHI, India: *Machining of Nickel based Nimonic 90 aerospace grade alloy with carbide inserts using sustainable techniques*
14:45-15:00	034, **Zoltan Dombovari** et al. Budapest University of Technology and Economics, Hungary: *Study of the Tuning of Variable Pitch Milling Cutters*
15:00 – 15:15	036 **Dr. Handriko Handriko** et al, Politeknik Caltex Riau, Indonesia: *Analytical method to calculate scallop height in multi axis milling using toroidal cutter with helical angle.*

14:00-15:15	5 July 2017. Parallel Session SF-1, **Surface Finishing 1** room G6 Session chair: **Professor Dame Jane Jiang**, FREng, Director of the EPSRC Future Metrology Hub, University of Huddersfield, UK
14:00-14:15	018 **Zafar Alam** et al, Indian Institute of Technology Delhi, India: *Analysis of forces in ball end magnetorheological finishing process*
14:15-14:30	019 **Faiz Iqbal** et al., Indian Institute of Technology Delhi, India: *Localized finishing by ball end magnetorheological finishing process using integrated confocal sensor for in-situ surface roughness measurement*
14:30-14:45	020, **Dilshad Khan** et al. Indian Institute of Technology Delhi, India: *A study on the effect of polishing fluid composition in ball end magnetorheological finishing of aluminum*
14:45-15:00	021 **Dr. Salwinder Bedi** et al, Thapar University, India: *Magnetorheological finishing on inhection barriel type surfade of moulding machine.*
15:00 – 15:15	022 **Vishwas Grover** et al, Thapar University, India: Development of New *Magnetorheological Nano-finishing Tool Using Permanent Magnets for Flat Surfaces*

15:30-17:15	5 July 2017. Parallel Session **LMN-2**, **Laser Micro/Nano Fabrication 2** room Cordingley. Session chair: **Dr. Ting Huang,** Beijing University of Technology, China
15:30-15:45	**106** - **Dr. Olivier Allegre**, The University of Manchester, UK, *Improvement of process control in laser surface texturing for industrial applications*
15:45-16:00	**090** - **Guangyu Zhu** et al. University of Liverpool, UK: *Femtosecond laser inscription inside Poly-Methyl Pentene with polarised helical beams carrying orbital and spin angular momentum*
16:00-16:15	**105** - **Fatema Rajab** et al, The University of Manchester, UK: *Picosecond laser surface texturing of Ti-6Al-4V as a method to reduce bacteria fouling*
16:15-16:30	**092** – **Yue Tang** et al., University of Liverpool, UK: *FE Modelling of Laser Sintering of Copper nano-particulate paste using a laser line source*
16:30-16:45	**103** – **Tahseen Jwad** et al, University of Birmingham, UK: *Employing Laser induced oxidation to Fabricate Fresnel Zone Plates using Nanosecond Laser Direct Writing*
16:45 – 17:00	**029** – **Saurav Goel**, Cranfield University, UK: *Finite element modelling and simulation of spherical tip nano-indentation of nanocrystalline silicon carbide*
17:00 – 17:15	**083 - Mian Wang** et al, Jiangsu University, China: *Morphology-selective preparation of single-wall carbon nanohorn aggregates by laser ablation of graphite*

15:30-17:15	5 July 2017. Parallel Session **AM-2**, **Additive Manufacturing 2** room G32 Session chair: **Professor Gideon Levy**, IRPD, Switzerland
15:30-15:45	**162** – **Jorge Lopes**, (Presented by **Professor Paolo Bartolo**) Portugal, *Porcelain and ceramic 3D printing applied in experimental design projects*
15:45-16:00	**056** – **Maurizio Motta** et al, Politecnico di Milano, Italy: *Coaxial Laser Metal Wire Deposition of Stainless Steel: Process Characterization and Benchmarking*
16:00-16:15	**061** – **Shahar Halevy** et al, Technion, Israel: *Modeling and Mechanical Analysis of Biodegradable Bone Scaffolds*
16:15-16:30	**059** – **Leonardo Caprio** et al, Politecnico di Milano, Italy: *Effect of pulsed and continuous wave emission on the densification behaviour in Selective Laser Melting*
16:30 – 16:45	**069** – **Dr. Kursad Sezer**, Gazi University, Turkey: *Enhanced Mechanical and Electrical Properties of 3D Printed MWCNT Reinforced ABS Nano-Composite Parts*
16:45-17:00	**070** - **Neri Volpato** et al., Federal University of Technology, Brazil: *A review of zigzag toolpath generation methods for additive manufacturing*

15:30-17:00	5 July 2017. Parallel Session **MT**: **Machine Tools and Manufacturing Processes.** Room G33 Session chair: **Professor Joe McGeough**, FREng, University of Edinburgh, UK.
15:30-15:45	**028** – **Matthias Ophey** et al., RWTH Aachen University, Germany: *Virtual gear production - Current opportunities and future potentials*
15:45-16:00	**016** – **Pawan Sharma** et al., Indian Institute of Technology Delhi, India: *On the in-vitro degradation behaviors of Mg, Zn and Fe specimens fabricated by microwave sintering*
16:00-16:15	**041** – **Dr. Rahul Mulik** et al., Indian Institute of Technology Roorkee, India: *Parametric study into magnetic field assisted travelling wire electrochemical spark machining (TW-ECSM) process*
16:15-16:30	**130** – **Ali Elghawail** et al., University of Birmingham, UK: *Effect of overhang between die and blank holder on thickness distribution in multi-point forming*
16:30 – 16:45	**136** – **Bor-Jen Lin** et al., National Formosa University, Taiwan: *A structure geometric dynamic rigidity modal analysis of machine tools*
16:45-17:00	**013** - **Dr. Joy Misra** et al., National Institute of Technology Kurukshetra, India: *Manufacturing of miniature gear for AA6082 by WEDM process.*
17:00 – 17:15	**011** - **Hardik Beravala** et al., IIT. Delhi, India: *Effect of magnetic field on the performance of air assisted EDM*

15:30-16:30	5 July 2017. Parallel Session **SF-2**: **Surface Finishing 2.** Room G6 Session chair: **Dr. Andrew Soutar**, Director, ARTC, Singapore
15:30-15:45	**045** – **Mario Pohl** et al., University of Aalen, Germany: *Algorithm for polishing shape correction of freeform surfaces*
15:45-16:00	**122** - **Yuxiang Liu** et al., The University of Manchester, UK: *Corrosion Behaviour of Excimer Laser Surface Melted Mg-1Ca Alloy in Simulated Body Fluid*
16:00-16:15	**120** - **Dr. Hong Liu et al.,** The University of Manchester, UK: *Corrosion behaviour of Laser-cleaned AA7075 aluminium alloy*
16:15-16:30	**024** - **Aviral Misra** et al, Indian Institute of Technology Delhi, India: *Simulation of magnetic field in ultrasonic assisted magnetic abrasive finishing process*

Day 2 (Thursday, 6 July 2017) - Humanities Bridgeford Street Building

9:00-11:00	6 July 2017. **Plenary Keynote Session 3.** Room Cordingley **Chair: Professor Sri Hinduja,** FREng, The University of Manchester, UK
9:00–9:40	**Keynote 6 (127)**: **Professor Duc Pham**, OBE, FREng, University of Birmingham, UK: ***How can robots help manufacturing industry use natural resources more efficiently and be kinder to the environment***
9:40-10:20	**Keynote 7 (98)**: **Professor Wei Gao**, Director of Research Center for Precision Nanosystems, Tohoku University, Japan: ***In situ, in-line, on-machine and in-process surface metrology of precision parts***
10:20-11:00	**Keynote 8 (100)**: **Professor Fengzhou Fang**, University College Dublin, Ireland. and Tianjin University, China, Editor-in-Chief, Nanomanufacturing and Nanometrology: ***Nanomanufacturing – perspective and applications***
11:00-11:15	**Coffee/tea break**
11:15-12:35	6 July 2017. **Plenary Keynote Session 4.** Room Cordingley **Chair: Professor Duc Pham,** OBE, FREng, University of Birmingham, UK
11:15-11:55	**Keynote 9**: **Professor Anath Fischer**, Israel Institute of Technology, Israel: *Fast geometrical modelling from scanned data based on machine learning*
11:55 – 12:35	**Keynote 10 (108)**: **Dr. Jonathan Blackburn**, TWI, UK: ***New laser joining technologies for the transport industry***

12:35 – 13:30 Lunch

13:30-15:00	6 July 2017. Parallel Session **LMN-3**, **Laser Micro/Nano Fabrication 3** room Cordingley, Session chair: **Professor Geoff Dearden,** University of Liverpool, UK
13:30-14:00	**Invited**: (**123**) **Dr. Zhu Liu**, The University of Manchester, UK: Laser sintering for dye sensitized solar cells.
14:00-14:15	**107** – **Dr. Olivier Allegre**, The University of Manchester, UK: *New techniques for laser vector field control of femtosecond pulses and their applications in nano-precision materials modification*
14:15-14:30	**113** – **Yuan-hui Chueh**, The University of Manchester, UK: *Picosecond laser micro-machining of tubular materials for potential coronary stent manufacture.*
14:30-14:45	**121** – **Raid Baiee**, The University of Manchester, UK: *Production of ultrafine Ag nanoparticles by laser ablation in liquid and their antibacterial properties*
14:45-15:00	**131** – **Antonio Garcia-Giron**, University of Birmingham, UK: *Manufacture of Super-Hydrophobic Metallic Surfaces by Combining Surface Engineering and Direct Laser Patterning*

13:30-14:45	6 July 2017. Parallel Session **AM-3**, **Additive Manufacturing 3** room G32 Session chair: **Professor Duc Pham**, OBE, FREng, University of Birmingham, UK
13:30-13:45	**138** - **Hussein Mishbak**, The University of Manchester, UK: *3D interpenetrating polymer network hydrogels for cartilage applications*
13:45-14:00	**102** - **Jian-Yuan Lee** et al, Nanyang Technological University, Singapore *Fundamentals and Applications of 3D Printing for Novel Materials*
14:00-14:15	**109** - **Sankaranarayanan Seetharaman**, ARTC, Singapore: *Additive manufacturing of nickel and titanium alloys*
14:15-14:30	**148** - **Philipp Sembdner**, Dresden University of Technology, Germany: *Analysis and evaluation of simulation tools for additive manufactured parts*
14:30-14:45	**166** - **Weiguang Wang** et al. **The University of Manchester, UK:** *Fabrication and assessment of composite scaffold for bone regeneration*

13:30-15:00	6 July 2017. Parallel Session **W-1**, **Welding 1** room G33 Session chair: **Dr. Jonathan Blackburn**, TWI, UK.
13:30-14:00	**Invited (142)**: **Professor Rongshi Xiao**, Beijing University of Technology, China: *Laser beam welding of aluminum alloys with current assistance*
14:00-14:15	**015** – **Dr. Giuseppe D'Angelo**, Centro Ricerche FIAT, Italy: *Teager-Kaiser energy operator (TKEO) in combination with the Orthogonal Empirical Mode Decomposition (OEMD) method for improving the analysis of laser welding*
14:15-14:30	**104** – **Tapio Vaisto**, The University of Manchester, UK: *Dissimilar Metal Narrow Gap Laser Welding of Thick Section Steels 316L and S275*
14:30-14:45	**025** – **Maxime Bolut**, Brunel University, UK: *Laser beam welding of duplex stainless steel with a diffractive optical element to locally reduce high ferrite content*
14:45-15:00	**112** – **Zhe Sun**, The University of Manchester, UK: *Laser 2G Welding of Thick Section P91 Steel Plates*

13:30-14:30	6 July 2017. Parallel Session **MNF**, **Micro/Nano Fabrication** room G6 Session chair: **Professor Fengzhou Fang,** Tianjin University, China.
13:30-13:45	**080** – **Mingyong Cai** et al, Tsinghua University, China: *Large-Scale Tunable 3D Self-Supporting WO_3 Micro-Nano Architectures as Direct Photoanodes for Efficient Photoelectrochemical Water Splitting*
13:45-14:00	**071** - **G.P. Yan** et al. Tianjin University, China: Manufacturing of aspheric microlens array mold insert with virtual spindle kinematics grinding
14:00-14:15	**073** – **Jinshi Wang** et al., Tianjin University, China: *Molecular dynamics study on the nanocutting of amorphous silicon*
14:15-14:30	**054** - **Rui-Jun Li** et al., Hefei University of Technology, China: *A high-precision manufacturing method for structured leaf springs of micro/nano probe*

15:15-17:00	6 July 2017. Parallel Session **LMN-4**, **Laser Micro/Nano Fabrication 4** room Cordingley. Session chair: **Dr. Zhu Liu,** The University of Manchester, UK
15:15-15:45	**Invited(093)** - **Dr. Walter Perrie**, University of Liverpool, UK: *Investigation of the thermal and optical performance of a spatial light modulator with 220 W of picosecond laser exposure for materials processing applications*
15:45-16:15	**Invited (143)** - **Dr. Ting Huang**, Beijing University of Technology, China: *Femtosecond laser fabrication of 3D TiO_2 with chemical treatment.*
16:15-16:30	**132** – **Jean-Michel Romano** et al., University of Birmingham, UK: *Large-area symmetry and homogeneity of laser-induced submicron texturing on steel*
16:30-16:45	**163** – **Dr. Joerg Schille** et al., Laserinstitut Hochschule Mittweida, Germany: *Study on high-average power ultrashort pulse laser processing of AISI 304 stainless steel*
16:45 – 17:00	**133** – **D.Bhaduri**, et al. University of Birmingham, UK: *Pulsed Laser Polishing of 3D Printed Mesoscale Parts*
17:00-17:15	**135** – **Vahid Nasrollahi**, University of Birmingham, UK: *Two-side Laser Processing Method for Producing High-Aspect Ratio Micro Holes*

15:15-16:45	6 July 2017. Parallel Session **AM-4**, **Additive Manufacturing 4,** room G32 Session chair: **Professor Anath Fischer**, Israel Institute of Technology, Israel
15:15-15:30	**151** - **Udi Woy** et al., NAMRC, Sheffield, UK: *AM at Scale: The Requirements, Drivers and Enablers.*
15:30-15:45	**152 - Baoyang Huang** et al., The University of Manchester, UK: *Organic-Inorganic Based Composite Scaffolds for Bone Applications*
15:45-16:00	**154** - **Sasan Dadbakhsh** et al., KU Leuven, Leuven, Belgium: *Selective laser melting of nickel-titanium alloys towards biomedical applications: a review*
16:00-16:15	**159** - **Thomas Kendall** et al., The University of Manchester, UK, *Investigation into post-processing Laser Metal Deposition parts using Jet Electrochemical Machining*
16:15-16:30	**161** – **Yilei Zhang** et al., Nanyang Technological University, Singapore: *Electrospun fibers for 3D cell cultures under external stimulations*
16:30-16:45	**164** – **Ninian Sing Kok Ho** et al., Nanyang Technological University, and Singapore Institute of Manufacturing Technology, Singapore: *The effect of slurry composition on the microstructure and mechanical properties of open-cell Inconel foams manufactured by the slurry coating technique.*

15:15-17:00	5 July 2017. Parallel Session **W-2**, **Welding-2,** room G33, Session chair: **Professor Rongshi Xiao**, Beijing University of Technology, China
15:15-15:30	**119** - **Chutimon Suebka** et al., The University of Manchester, UK: *Reduction of Porosity in Laser Welding of Aluminium Alloy 2024-T3 by Laser Cleaning*
15:30-15:45	**140** - **Dr. Yongle Sun** et al., The University of Manchester, UK: Thermal-metallurgical modelling of narrow-gap multi-pass laser welding in thick-section low alloy steel plates
15:45-16:00	**30** - **Dr. Sukhomay Pal,** IIT Guwahati, India: *Enhancement of weld qualities in Mg alloy joints using alloying element*
16:00-16:15	**37** - **Dr. Wanghui Xu** et al., Guangdong Welding Institute（China-Ukraine E.O. Paton Institute of welding）, China: *Microstructure and mechanical properties of Q690 steel joints with TANDEM twin-wire narrow gap GMA welding*
16:15-16:30	**141** - **Dr. Yashar Javadi** and Professor Mike Smith et al., The University of Manchester, UK: *Comparison between electron probe micro-analysis (EPMA) measurements and FlintHEStateFoam solver in an electron beam welded joint*
16:30-16:45	**39** – **Dr. Yupeng Zhang** et al., Guangdong Welding Institute, China: *High cycle fatigue property of thick parts Ti-6Al-4V joint by the electron beam method*
16:45 – 17:00	**97** – **Bin Wang** et al., Shanghai Rui Rong Laser Technology Co., Ltd., China: *Numerical Simulation of Linear Friction welding of Ti-6Al-4V*

15:15-16:30	6 July 2017. Parallel Session **LSP**, **Laser Shock Peening,** room G6 Session chair: **Dr. Olivier Allegre,** The University of Manchester, UK
15:15-15:45	**Invited(085)** – **Professor Xudong Ren** et al., Jiangsu University, China, *Thermostability of surface nano-crystallization layer in AZ91D magnesium alloy induced by laser shock peening*
15:45-16:00	**082** - Professor Yunxia Ye et al., Jiangsu University, China: *Research on laser peen forming of 2024 aluminum alloy through experiment and simulation*
16:00-16:15	**084** – Hongfeng Zhang et al., Jiangsu University, China: Strengthening mechanism and anti-cavitation erosion effects of 2A70 alloy induced by laser-induced cavitation bubbles
16:15 – 16:30	**089** – Dr. Yanqun Tong et al, Jiangsu University, China: *Characteristics of cavitation bubbles induced by nanosecond pulsed laser and influence on the residual stresses of 2A02 Aluminum Alloys in water*

Day 3 (Friday, 7 July 2017) - Humanities Bridgeford Street Building

9:00-11:00	7 July 2017. **Plenary Keynote Session 5.** Room Cordingley **Chair: Professor Paulo Bartolo,** The University of Manchester, UK
9:00–9:40	Keynote 11: **Professor Gideon Levy**, IRPD, Switzerland: ***Additive Manufacturing - The Enabling Space for Future Innovation with Game Changing Recent Emphases***
9:40-10:20	Keynote 12: **Professor K.P. Rajurkar**, University of Nebraska-Lincoln, USA: ***Review of EDM and USM of Hard Materials,***
10:20-11:00	Keynote 13 (139): **Dr. Michael Ward**, CTO of AFRC, Strathclyde, UK: ***Rapid validation and certification – the overarching opportunity and threat to digitally assisted manufacturing technology insertion.***
11:00-11:15	**Coffee/tea break**

11:15-12:30	7 July 2017. Parallel Session **LH-1**, **Laser Hybrid Manufacturing -1,** room Cordingley, Session chair: **Professor Rongshi Xiao**, Beijing University of Technology, China
11:15-11:45	Invited(074) – **Professor Jianhua Yao**, Director, Institute of Laser Advanced Manufacturing, Zhejiang University of Technology, China: *Current status and future prospects of laser hybrid manufacturing*
11:45-12:00	086 – **Dezhi Xu** et al., Southwest Jiaotong University, Chengdu, China: *Mechanical property investigation of laser-MAG hybrid and narrow gap laser welded SUS301L stainless steel*
12:00-12:15	076 – **Dr. Qunli Zhang**, et al., Zhejiang University of Technology, China: *Microstructure and Mechanism Investigation of High Performance Superhard Particle Reinforced Metal Composite Coatings Produced by Supersonic Laser Deposition*
12:15 – 12:30	075 - **Dr. Guolong Wu** et al., Zhejiang University of Technology, China: *Microstructure and tribological performance of laser surface melting/ micro-arc oxidation duplex-treated Ti6Al4V alloyg*

11:15-12:15	7 July 2017. Parallel Session SE-1, **Systems Engineering - 1,** room G32, Session chair: **Professor Wenyuh Jywe**, President of National Formosa University, Taiwan
11:15-11:30	**124** - **Al Amin Sultan** et al., The University of Manchester, UK: *What should be recycled: an integrated model for product recycling desirability*
11:30-11:45	**129** – **Muhamad Bahari** et al., University of Birmingham, UK: *The Bees Algorithm with Hooke and Jeeves Method for Continuous Global Optimisation Problems*
11:45-12:00	**035** – **Dr. Azfar Khalid**, et al., Capital University of Science & Technology, Pakistan: *Implementing safety and security concepts for human-robot collaboration in the context of industry 4.0*
12:00-12:15	**167** - **Dr Glen Cooper**, The University of Manchester, UK, *Teaching Biomanufacturing to Large Student Groups*

11:15-11:45	7 July 2017. Parallel Session W-3, **Welding-3,** room G33, Session chair: **Professor Rongshi Xiao,** Beijing University of Technology, China.
11:15-11:30	**146** – **Hamed Yazdani-Nezhad** et al., Cranfield University, UK: *Performance of aerospace composite bonded joints in the presence of process-induced defects*
11:30-11:45	**160** - **Dr. Dinesh Rathod** et al., The University of Manchester, UK: *Transverse Shrinkage and Angular Distortion in Thick-Section Narrow-Gap Submerged-Arc and Gas-Tungsten-Arc Welds*

11:15-12:30	6 July 2017. Parallel Session **MM-1**, **Metrology and Measurements – 1,** room G6, Session chair: **Professor Wei Gao, Tohoku University, Japan**
11:15-11:30	**137** - **Jing-Chung Shen** et al., National Formosa University, Taiwan: *Development of a Dual-Axis Measurement System for Vertical Straightness and Flatness Compensation for Machine Tools*
11:30-11:45	**115** - **Cao-Sang Tran** et al., National Formosa University, Taiwan: *The Mobile Application Design with Wireless Data Acquisition and Transmission System Design in the Precise Machine Tools Measurement*
11:45-12:00	**062** – **Dr. Xian Wang** et al., Hunan University of Science and Technology, China: *Robust image processing algorithm of Laser spot center location in Complex industrial environment*
12:00-12:15	**047** - **Dr. Wenwen Liu** et al., Hefei University of Technology, China: *Four-probe Error Separation Method for On-line Measuring Cylindricity*
12:15 – 12:30	**050** - **Professor Yonghong Wang** et al., Hefei University of Technology, China: *3D Shape Reconstruction Method Based on Digital Image Correlation*

13:30-14:15	7 July 2017. Parallel Session **LH-2**, **Laser Hybrid Manufacturing-2** room Cordingley, Session chair: **Professor Jianhua Yao**, Director, Institute of Laser Advanced Manufacturing, Zhejiang University of Technology, China.
13:30-13:45	**087** – **W.L. Chen** et al., Southwest Jiaotong University, China: *Research on Filler Melting Performances, Microstructural Characteristics and Mechanical Properties of Narrow-Gap Laser and Laser-Arc Hybrid Welded 301L Stainless Steel*
13:45-14:00	**088** - **Z.H.Fu** et al. Southwest Jiaotong University, China: *Iinvestigation of the microstructure and mechanical properties of SUS301L stainless steel by MIG, laser and laser-MIG hybrid welding*
14:00-14:15	**118** - **Dr. Zheng Kuang** et al., Advanced Laser Technology Ltd. UK: *High efficient nanosecond fibre laser paint stripping with suppression of flames and sparks during the processing*

13:30-14:45	7 July 2017. Parallel Session **SE-2**, **Systems Engineering -2** room G32 Session chair: **Dr. Michael Ward**, CTO of AFRC, Strathclyde, UK
13:30-13:45	**126** - **Simon Fletcher** and **Dr. Andrew Longstaff**, University of Huddersfield, UK: *The role of machine and process simulation for improving product accuracy*
13:45-14:00	**150** - **John Erkoyuncu**, Cranfield University, UK: *Use of augmented reality in human and robot collaboration*
14:00-14:15	**149** - **John Ahmet Erkoyuncu** et al., Cranfield University, UK: *Servitization of machine tools sector*
14:15 – 14:30	**156** - **Flávio Craveiro** et al., University of Lisbon, Lisbon, Portugal and Polytechnic Institute of Leiria, Portugal: *Fabricating construction elements with varying material composition: a case study*
14:30-14:45	**157** - **Duangthida Hussadintorn** et al., Asian Institute of Technology, Pathumthani, Thailand: *Improving Research Experience with 'LOVE'*
14:45-15:00	**158** - **Pisut Koomsap** et al., Asian Institute of Technology, Path, Thailand: *Use of Customer-Oriented FMEA in Service*

13:30-14:45	7 July 2017. Parallel Session **MM-2**, **Metrology and Measurements-2,** room G6, Session chair: **Professor K.P. Rajurkar**, University of Nebraska-Lincoln, USA:
13:30-13:45	**099** – **Dr. Yuki Shimizu** et al. Tohoku University, Miyagi, Japan: *Quantitative evaluation of a cutting tool edge geometry by using a micro laser probe*
13:45-14:00	**114** - **Chun-Jen Chen** et al. National Formosa University, Taiwan: *To develop a alignment system for collet slit cutting machine*
14:00-14:15	**026** **Simon Rekers,** RWTH University, Aachen, Germany: *Correction of Systematic Errors in Cutting Force Measurements*
14:15 – 14:30	**116** - **Yung-Hoh Sheu** et al., National Formosa University, Taiwan: *The Embedded System Design with Wireless Data Capture and Straightness Measurements Applied in the Precise Machine Tools Measurement*
14:30-14:45	**063** – **Dr. Qihui Ling** et al., Hunan University of Science and Technology, China: *Work Rolls Vibration Characteristic under Multi-source Excitation in Hot Strip Tandem Mill*
14:45-15:00	**048** – **Dr. Penhao Hu** et al. Hefei University of Technology, China: *Embedded Hall Sensors for Two-Degree of Freedom Spherical Joint Angle Sensing*

13:30-14:15	7 July 2017. Parallel Session LCM, **Laser Cladding and Melting,** room G33, Session chair: **Dr. Olivier Allergre,** The University of Manchester, UK.
13:30-13:45	**046** – **Ms Jing Liu** et al., University of Liverpool, UK: *Low Power Blown Powder Laser Cladding for Uniform Equiaxed Micro-Structures*
13:45-14:00	**147** - **Dr. Zhenhuan Zhu** et al., Advanced Laser Technology Ltd, UK: *NDT-AI Technology for the Evaluation of Laser Welding/Cladding Quality*
14:00-14:15	**053** - **Christine Schattmann** et al., Bremer Institut für angewandte Strahltechnik GmbH, Germany: *Irregularities in thickness of preforms generated by laser blank rim melting*

15:15-15:55	7 July 2017. **Plenary Keynote Session 6.** Room Cordingley, **Chair: Professor Paul Mativenga**, The University of Manchester, UK
15:15–15:55	**Keynote 14 (117)**: **Professor Wenyuh Jywe**, President of National Formosa University, Taiwan: ***The calibration and compensation techniques for 5-axis CNC machine tools***

15:55-16:30	7 July 2017. **Closing Ceremony** Room Cordingley **Chair: Professor Paolo Bartolo**, The University of Manchester, UK
15:55–16:20	**Prizes: Professor Sri Hinduja,** FREng, The University of Manchester, UK
16:20-16:30	**Closing speech: Professor Paolo Bartolo**

Poster presentations

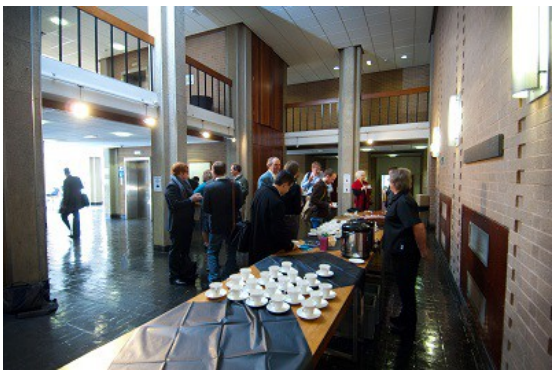
(077) Liang Wang et al, Zhejiang University of Technology, China: Numerical simulation of pores distribution in laser additive manufacturing with external electromagnetic field support

(078) Dr. Qunli Zhang et al., , Zhejiang University of Technology, China: Microstructure and Strengthening Mechanism of Hybrid Processing with Laser Solid Solution and Laser Alloying on 17-4PH Stainless Steel

(110) Dr. Shanshen Yang et al, ARTC, Singapore: Revolutionizing Technology Adoption for the Remanufacturing Industry

(072) – Min Lai et al., Tianjin University, China: Experimental study on the crystal orientation and rake angle effects in nanometric cutting of crystal germanium

Humanities Bridgeford Street Building, Manchester, M15 6FH



Plenary Keynote Speaker Biographies

Regius Professor Philip Withers, is an elected ***Fellow of Royal Society and Fellow of Royal Academy of Engineering***. He has made a seminal contribution to the fundamental understanding of the performance of materials through his pioneering use of neutron, synchrotron X-ray and laboratory X-ray beams to provide new insights on behavior of materials, often in-operando under demanding conditions. Withers was educated at the University of Cambridge where he was awarded an undergraduate degree in Natural Sciences (Physics) followed by a PhD in the metallurgy of Metal Matrix Composites (MMCs) in 1988. In 1989, he became a lecturer in Materials Science and Metallurgy at Cambridge, before being appointed to a Chair at The University of Manchester in 1998. In September 2012, Professor Withers became the founding Director of the £64 m BP International Centre for Advanced Materials (BP-ICAM); In 2017 he was appointed as the Chief Scientist of the £250 million Henry Royce Institute for Advanced Materials and the first Regius professor in material science in the UK. ***Note: Regius professor is a highly prestigious university professor with royal patronage (established in 1497). There have been a total of 82 regius professors in the UK over the past 520 years.***

Regius Professor Joe McGeough is an Honorary Professorial Fellow at the University of Edinburgh. He is a Fellow of International Academy for Production Engineering, Royal Society of Edinburgh, and Royal Academy of Engineering. He has served as Vice-President of the Institute of Mechanical engineers and chair of its International Strategy Board. He is a graduate of the Universities of Glasgow (B.Sc. and Ph.D.) and Aberdeen (D.Sc.). He was successively a Lecturer, Senior Lecturer and Reader in Engineering at Aberdeen University, and then moved to Edinburgh University to take up its Regius Chair of Engineering. His research work has dealt mainly with manufacturing processes for which has been awarded Institution of Mechanical Engineers and the Society for Underwater Technology prizes. He has been the recipient of a Royal Society/ SERC (Science and Engineering (now Engineering and Physical Sciences) research council) Industrial Fellowship in order to transfer the results of his research to industry. Publications by Joe McGeough include “Principles of Electrochemical

Machining" "Advanced Methods of Machining" and "Micromachining of Engineering Materials (editor). His latest book is "The Engineering of Human Joint Replacements (2013) which contains details of the materials, and manufacturing processes, used in this field.

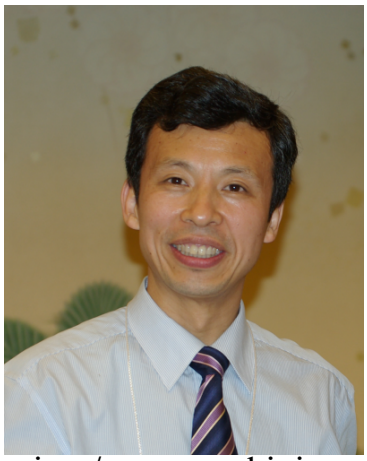
Professor Dame Jane Jiang, is an elected Fellow of Royal Academy of Engineering, Professor of Precision Metrology at the University of Huddersfield's Centre for Precision Technologies. She is the Director of the £30 million EPSRC Future Metrology Hub and is the Renishaw/Royal Academy of Engineering Chair in Precision Metrology. Jane's research involves two major aspects: mathematical models and algorithms for geometrical products specification and metrology. Jane has published over 330 papers, is the author/co-author of 8 books and has several patents in the field of measurement science/surface metrology. She held a prestigious European Research Council (ERC) Advanced Investigator Grant between 2009-2015 and is a principal member of ISO/TC 213 and BSI TW/4, as well as an Advisory Member for the UK National Measurement System. She was awarded the Sir Harold Hartley Medal in 2014 for her outstanding contribution to the technology of measurement and control. In 2017 she received the honour of Damehood from her majesty the Queen.

Dr. Andrew Soutar is currently the Director of Research Liaison in Advanced Remanufacturing Technology Centre (ARTC) in Singapore. Andrew graduated from the University of Exeter with a PhD in Chemistry in 1989. He then started his career with the Cookson Group in the UK, developing materials for manufacturing and assembly of printed circuit boards. He relocated to Singapore in 1996 to work for GINTIC (now the Singapore Institute of Manufacturing Technology), first of all in the area of Electronics Packaging and then in the Surface Technology Group, where he worked on developing functional coatings based on sol-gel chemistry.

Professor Paul Maropoulos, is Pro-Vice-Chancellor for Research and Knowledge Exchange, at Aston University, where he is also the Professor of Manufacturing Engineering. Professor Maropoulos completed his postgraduate studies at UMIST, Manchester and prior to joining Aston University has held Professorial appointments at Durham University and the University of Bath. He was a Fellow and Chairman of the Manufacturing Industries Division of the Institution of Mechanical Engineers. He maintains an international research presence as an elected Fellow of the International Academy of Production Engineering (CIRP) and Editor of the Journal of Engineering Manufacture, Part B of the Proceedings of the IMechE. Apart from research with blue chip companies.

Professor Duc Pham, OBE, is an elected Fellow of Royal Academy of Engineering. He holds the Chance Chair of Engineering at the University of Birmingham where he started his career as a lecturer in robotics and control engineering following undergraduate and postgraduate studies at the University of Canterbury in New Zealand. Prior to returning to Birmingham in 2011, he was Professor of Computer-Controlled Manufacture and Director of the Manufacturing Engineering Centre at Cardiff University. His research is in the areas of intelligent systems, robotics and autonomous systems and advanced manufacturing technology. He has published over 500 technical papers and books and has graduated more than 100 PhD students.

Professor Wei Gao, is the Director of Research Center for Precision Nanosystems of Tohoku University, Japan. He serves as the Chairman of The Scientific Technical Committee Precision Engineering and Metrology (STC-P) of CIRP and also served as a Vice President of Japan Society for Precision Engineering (JSPE) in 2015. He is the author of the book "Precision Nanometrology" (Springer). He received his Bachelor of Precision Instrumentation from Shanghai Jiao Tong University, China, and MSc and Ph.D degrees from Tohoku University, Japan. He is a fellow of the International Academy for Production Engineering (CIRP).



Professor Fengzhou Fang is a professor of nano manufacturing at University College Dublin, Ireland and Tianjin University, China. He is the founding President of the International Society for Nanomanufacturing (ISNM), the editor-in-chief of the International Journal of Nanomanufacturing (IJNM) and council member of the International Academy for Production Engineering (CIRP). He is also a CIRP fellow, ISNM Fellow and SME Fellow.
He has been working in the fields of ultra-precision machining, freeform machining, micro/nano machining and metrology since 1982. He holds more than 60 patents and delivered more than 90 keynote speeches and invited presentations in the international conferences, symposiums and seminars in the field of manufacturing. He initiated the series of international conferences on nanomanufacturing (NanoMan), which is one of the leading conferences in the field of manufacturing.

Professor Anath Fischer is a faculty member in the Department of Mechanical Engineering at Israel Institute of Technology. She is the head of Technion Product Lifecycle Management Competency Centre. Her research interests include feature based systems, reverse engineering and 3D printing, mechanical based geometrical models and lifecycle management. Anath graduated from Israel Institute of Technology with BSc, MSc and PhD degrees in computer science, technical science and mechanical engineering. Prof. Fischer has published over 145 papers in academic journals and at international conferences. She is on the editorial boards of ASME Trans. JCISE and Virtual and Physical Prototyping journals. She has been program chair, conference co-chair and IPC member in international including the several bi-international conferences. Prof. Fischer has received the Gutwirth and Taub awards for excellence in research.
Her work also received M. Landau Award and Alexander Goldberg Prize.

Dr. Jonathan Blackburn, is a Group Manager at TWI – The Welding Institute, where his responsibilities include managing TWI's laser welding activities. He joined TWI in 2006 as a Research Engineer, and since then has been working in the development and application of laser welding processes for TWI's Industrial Members in primarily the aerospace, automotive, defence and rail sectors. Within TWI's Joining Group he also has close interaction with TWI's other joining technologies, including electron beam, friction and arc-based welding activities.

Professor Gideon Levy studied at Technion Israel Institute of Technology Haifa for B.Sc. in Mechanical Engineering, M.Sc. in Control Engineering, and D.Sc. Manufacturing Technology. During1973-1989, he was Head of R&D department of AGIE for Industrial Electronic Switzerland, EDM (Electro Discharge Machining) Technologies, Product management. During 1989-1995 He was the Technical Vice President Soudronic AG, on welding technologies. Since 1997 he had been the Head of Department of Mechatronics and Head of the Centre for Reverse Engineering and Rapid Prototyping at the University of Applied Sciences (ISG) St. Gallen, Switzerland. Prof. Levy's career has been mainly in advanced R&D in Mechanical / Electronic world with leading Swiss machinery industries. Specialising in Manufacturing technologies, Technology management, Market - Product strategies. He is a fellow of International Academy of Production Engineering (CIRP).

Professor K.P. Rajurkar, Distinguished Professor of Engineering at the College of Engineering University of Nebraska-Lincoln, USA, received his M.S. and Ph.D. degrees from Michigan Technological University in 1978 and 1982, respectively. Dr. Rajurkar is the founder and Director of the Center for Nontraditional Manufacturing Research. Dr. Rajurkar is a Fellow of ASME, SME and International Academy for Production Engineering (CIRP). He was President of the North American Manufacturing Research Institute of SME in 1998-1999. He also served as the ASME Manufacturing Technical Group Leader (previously called Vice President-Manufacturing) for three years (2005-2008). Dr. Rajurkar has more than 135 refereed publications. His research in macro, micro and nano scale manufacturing has received the 2005 Charles F. Carter Jr. Advancing Manufacturing Award from the Association of Manufacturing Technology. He has received 2009 International Honor, Gold Medal from the Society of Manufacturing Engineers. He has received 2010 Distinguished Investigator in Flexible Automation Award (Japan). He has received 2011 Distinguished Service Award from the North American Research Institution of SME. He is a co-inventor of a U.S. patent on cryogenically cooled tool machining.

Dr. Michael Ward as CTO of the 140 people strong Advanced Forming Research Centre, UK, is the technical lead for the centre which is the focal point for high value manufacturing in Scotland and for forming and forging technologies across the UK. He has responsibilities for strategy, technical excellence and capability of the technical team. Michael previously worked in Rolls-Royce as corporate Chief of Capability Acquisition. He was responsible for the definition and leadership of Capability Acquisition across aerospace, marine, energy, and nuclear sectors. He has significant experience in manufacturing process modelling, having led the Rolls-Royce Process Modelling Group for five years.

Professor Wenyuh Jywe, is the President of National Formosa University (NFU), Taiwan. He is a specialist in optical precision measurement, machine tool calibration measurement, and precise positioning stage design. During his doctoral study in University of Manchester Institute of Science and Technology (UMIST), he developed a measurement system for CNC machine tools based on Ball-Bar technology, which has now marketed worldwide. In 2003, he established the Precision Machine Center of NFU and served as the director in the fields including design, manufacturing, control, solid mechanics, optics, electronics and etc. He is also the independent director of two foundations and is currently running an intelligent machine flagship-type plan.

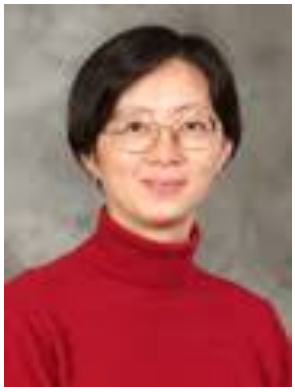
Biographies of Invited Speakers

Professor Geoff Dearden is a chair of Laser Engineering at the University of Liverpool, UK and has led the long-established research group there since 2012. He has more than 30 years' academic and industrial experience in laser engineering / photonics R&D, including previous employment with BAE Systems. His research interests include the experimental study of laser-material interactions and the application of laser techniques in manufacturing processes, ignition of car engines, sensing and optical manipulation. In addition to research and teaching, he has carried out knowledge exchange and training activity in laser technology since 1995, in support of SMEs in regional and European industry. He has over 180 scientific publications including 80+ journal papers and 4 patents awarded / published. He has supervised more than 35 PhD students and approaching 300 Masters' students. He has worked with well over 100 external collaborators and organisations worldwide including academic institutes, research organisations and industry partners large and small. He has served as Visiting Professor at 2 China institutes, as journal co-editor and as scientific advisor to conferences.

Professor Rongshi Xiao is currently a full professor in the Institute of Laser Engineering, Beijing University of Technology (BJUT). Prior to joining BJUT, he worked in Huazhong University of Science and Technology, where he also obtained both his Bachelor's and Master's degrees in the Department of Mechanical Engineering. He received a PhD degree in optics at BJUT in 1997. His research interests include laser welding, additive manufacturing and ultrafast laser manufacturing.

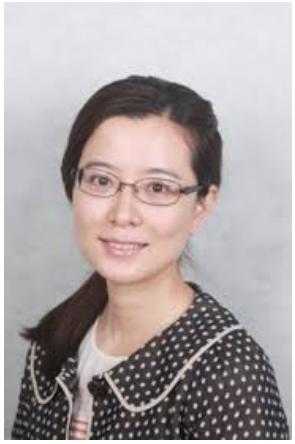
Professor Jianhua Yao, is the Dean of Institute of Laser Advanced Manufacturing, Dean of College of Mechanical Engineering, Zhejiang University of Technology, China. He has been engaging in the research of laser processing and manufacturing technology for more than 30 years, and has published more than 260 papers and presided more than 120 research projects. He holds the position of Member of Laser Institute of America, Presidium Member of Laser Processing Committee of Chinese Optical Society, Vice-chairman of high energy heat treatment Committee of Chinese Mechanical Engineering Society, Vice-Director of Engineering Research Center of Process Equipment and Remanufacturing, Ministry of Education. He has won the national technical innovation 2nd prize for his successful application of laser surface engineering into turbine blade manufacture industry.

Professor Xudong Reng, is the Dean of School of Mechanical Engineering, and Director of Advanced Manufacturing and Modern Equipment Technology Engineering Research Institute, Jiangsu University, China. His research interests include mechanical equipment manufacturing technologies, laser based manufacturing, shock peening, and laser manufacturing equipment automation. He is the author of the book "Laser Shock Peening". He received the national technical innovation 2nd prize, and national science and technology progress 2nd prize.



Dr. Zhu Liu holds the post of Reader in Laser Surface Engineering at The University of Manchester, School of Materials. Dr Liu has over 30 years' experience in high-power laser materials processing, particularly in laser surface modification. She currently runs the laser laboratory equipped with various high power laser facilities and the research group with a special focus on laser surface engineering. Research collaborations include Rolls-Royce, BAE Systems, BNFL, BP, The Welding Institute, Dyson Ltd. and various academic research groups. Dr Liu has published over 120 SCI journal papers, with an H-Index of 22 (Web of Science).

Dr. Walter Perrie, is one of the pioneers in femstosecond laser materials processing. He formally worked as a research scientist at British Nuclear Fuels plc and over the last 15 years has been the Research Fellow at Liverpool University leading research in ultrafast laser materials processing and knowledge transfer to industries. He is a Member of both the Institute of Physics and the European Physical Society.



Dr. Ting Huang, is currently an Associate Professor in the Institute of Laser Engineering, Beijing University of Technology. Prior to joining BJUT, Dr. Huang worked in Tsinghua University for two and half years as a postdoc, where she also obtained both her Bachelor's and Master's degrees in the Department of Mechanical Engineering. She received a PhD degree in materials processing at Tohoku University in Japan in 2009. Her primary research background has been in laser nano/micro fabrication, laser material processing and ultrafast laser manufacturing.