



UNIVERSITY of LIMERICK

OLLSCOIL LUIMNIGH



## Frontiers in Materials Characterisation towards Industrial Translation (FRIMACHAT) 2017

11-13<sup>th</sup> July 2017

University of Limerick, Limerick, Ireland

### *INTERNATIONAL WORKSHOP ORGANISED BY*

Modelling Simulation And Innovative Characterisation (**MOSAIC**) Group, Bernal Institute, University of Limerick, Ireland and European materials Characterisation Council (**EMCC**)

**Chair:** Prof. Tewfik Soulimane, Bernal Institute, University of Limerick

**Co-Chairs:** Prof. Syed A. M. Tofail, Dr. Christophe Silien and Engr. John Mulcahy, Bernal Institute, University of Limerick, Ireland

**Workshop Coordinator:** Dr. Karrina McNamara, Bernal Institute, University of Limerick, Ireland

**Industry Liaison:** Dr. Ehtsham Ul Haq, Bernal Institute, University of Limerick and Analog Devices International, Limerick

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## PROGRAMME

Tuesday 11 <sup>th</sup> July 2017	
08:00-8:45	<b>Coffee/Registration</b>
08:45-09:00	Welcome by Professor Edmond Magner, Dean, S&E, UL and Prof. Tewfik Soulimane, Chair, FRIMACHAT
<b>Session I: Properties and Applications Chair: Dr. Damien Thompson, Bernal Institute, University of Limerick, Limerick, Ireland</b>	
09:00-09:30	<b>Prof. Eiichi Fukada</b> , <i>Kobayasi Institute of Physical Research, Tokyo, Japan</i> Polymer piezoelectricity: Bases and Applications
09:30-09:45	<b>Prof. Sidney Lang</b> , <i>Ben Gurion University of the Negev, Israel</i> Material characterization using the Laser Intensity Modulation Method (LIMM)
09:45-10:00	<b>Dr. Yasunobu Sawaji</b> , <i>Department of Orthopedic Surgery, Tokyo Medical University Japan</i> A possible cellular action of osteoblasts by pulsed electromagnetic field during bone fracture healing
10:00-10:15	<b>Prof. Toshiaki Dobashi</b> , <i>Division of Molecular Science, Gunma University, Kiryu, Japan</i> Anisotropic gelation induced by a contact of two phases
10:15-10:30	<b>Dr. Katarzyna Krukiewicz</b> , <i>National University of Ireland, Galway, Ireland</i> The Role of Electrically Active Polymers in Next Generation Electro-Modulation Strategies
10:30-10:45	<b>Prof. Constantinos Varotsis</b> , <i>Department of Environmental Science and Technology, Cyprus</i> Bacterial Interaction with Graphene/Graphite and Surfaces
10:45-11:15	<b>Tea/Coffee</b>
<b>Session II: Surface and Interface: A Chair: Dr. Ning Liu, Bernal Institute, University of Limerick, Limerick, Ireland</b>	
11:15-11:45	<b>Prof. Andrej Plecenik</b> , <i>Department of Experimental Physics, Comenius University in Bratislava, Slovakia</i> Surface properties of high-Tc and middle-Tc superconducting thin films
11:45-12:00	<b>Dr. Khalid Hossain</b> , <i>Program Manager, Amethyst Research Inc., 123 Case Circle, Ardmore, OK, USA</i> Defect Tagging and Near Surface Hydrogen Profiling by Ion Beam Analysis
12:00-12:15	<b>Dr. Ioannis A. Kartsonakis</b> , <i>National Technological University of Athens, Greece</i> Advancement in corrosion resistance characterisation of multifunctional materials and structures
12:15-12:30	<b>Prof. Gustav Plesch</b> , <i>Comenius University in Bratislava, Slovakia</i> Variously doped self-organized titania nanotube arrays and their photocatalytic applications
12:30-12:45	<b>Dr. Andy Stewart</b> , <i>Bernal Institute &amp; Department of Physics, School of Natural Sciences, University of Limerick, Ireland</i> What next for Transmission Electron Microscopy data formats, a unified strategy
12:45-13:00	<b>Prof. Thomas Plecenik</b> , <i>Department of Experimental Physics, Comenius University in Bratislava, Slovakia</i> Semiconductor metal oxides: the gas sensing playground
13:00-13:15	<b>Dr. Olena Madden</b> , <i>Limerick Institute of Technology, Ireland</i> Characterisation of plasmonic nanostructures for biotechnological applications
13:15-14:30	<b>Lunch</b>
<b>Session III: Surface and Interface: B Chair: Dr. Christophe Silien, Bernal Institute, University of Limerick, Limerick, Ireland</b>	
14:30-15:00	<b>Prof. Michael Bredol</b> , <i>Department of Chemical Engineering, FH Muenster University of Applied Sciences, Germany</i> Interface design of nanoparticles embedded in organic and inorganic matrices
15:00-15:15	<b>Dr. Anna Costa</b> , <i>ISTEC-CNR, Italy</i> The role of physicochemical characterisation for the justification of nanomaterial safe by design practices
15:15-15:30	<b>Dr. Ewa Dworniczek</b> , <i>Wroclaw Medical university, Poland</i> The effects of titania nanotube arrays on clinically relevant microorganisms
15:30-15:45	<b>Dr. Carlo Baldisseri</b> , <i>CNR-ISTEC, Italy</i> Electrochemical Characterization of Colloidal Suspensions
15:45-16:15	<b>Tea/Coffee</b>
<b>Session IV: Nano and Microscopy Chair: Prof. Tewfik Soulimane, Bernal Institute, University of Limerick, Limerick, Ireland</b>	
16:15-16:45	<b>Prof. Alberto Diaspro</b> , <i>Italian Institute of Technology, University of Genoa, Italy</i> Multiscale and multimodal optical microscopy
16:45-17:15	<b>Dr. Christophe Silien</b> , <i>Bernal Institute and Department of Physics, School of Natural Sciences, University of Limerick, Ireland</i> Nonlinear spectro-microscopy
17:15-17:30	<b>Dr. Paolo Bianchini</b> , <i>Italian Institute of Technology, University of Genoa, Italy</i> Super-resolution in NIR transient absorption microscopy exploiting saturation processes
17:30-17:45	<b>Dr. Toufik El-Arnaout</b> , <i>Dublin Institute of Technology, Dublin, Ireland</i> Process analytical technology (PAT) and quality by design (QbD) for API and protein crystallization
19:30-23:30	<b>Social Event and Medieval Banquet at Bunratty Castle</b>

Wednesday 12 <sup>th</sup> July 2017	
08:30-09:00	Tea/Coffee
<b>Session V: Processing and Manufacturing Chair: Prof. Noel O'Dowd, Chair, Mechanical Engineering, School of Engineering and Bernal Institute, University of Limerick, Limerick, Ireland</b>	
09:00-09:30	<b>Prof. Susmita Bose</b> , School of Mechanical and Materials Engineering, Washington State University, Pullman, Washington, USA 3D Printed Ceramics for bone tissue engineering and drug delivery
09:30-09:45	<b>Dr. Patrick Cronin</b> , Powder Manufacturing Technology Centre, Bernal Institute, University of Limerick, Ireland Off-line and In-line Process Analytical Equipment for Characterisation of Powders in the Pharmaceutical and Bioprocessing Industry
09:45-10:00	<b>Katherine O'Sullivan</b> , Borgwarner Beru Systems, Kerry, Ireland Materials Characterisation during product development in the automotive sector
10:00-10:15	<b>Dr. Elias Koumoulos</b> , National Technological University of Athens, Greece Carbon based composite structures and advanced tools for mechanical behaviour assessment
10:15-10:45	<b>Prof. Christoph Eberl</b> , Department for Materials and Micromechanics, Freiburg University and Deputy Director, Fraunhofer Institute for Mechanics of Materials, Germany Digitising materials for Industry 4.0
10:45-11:15	Tea/Coffee
<b>Session VI: Emerging Materials, Devices, and Characterisation Challenges: A Chair: Dr. Rabah Mouras, Bernal Institute, University of Limerick, Limerick, Ireland</b>	
11:15-11:45	<b>Prof. Andrei Kholkin</b> , Director, Multifunctional Ferroic Ceramics and Nanostructures, Aveiro Institute of Materials (CICECO), University of Aveiro, Portugal Energy harvesting materials and characterisation
11:45-12:00	<b>Dr. Ehtsham ul Haq</b> , Analog Devices International and Bernal Institute and Department of Physics, University of Limerick, Ireland Surface and interface characterization of thermoelectric films
12:00-12:15	<b>Dr. Abbasi Gandhi</b> , ghd (Jemella LTD), Cambridge, UK Heat to Human Hair: Damage Detection
12:15-12:30	<b>Dr. Katarzyna Kowal and Dr. Matthew Tipper</b> , Nonwoven Innovation and Research Institute Ltd (NIRI), Leeds, UK Opportunities and Challenges in Nonwovens Research
12:30-12:45	<b>Dr. Ann O'Connell</b> , Advanced Materials Ireland, Tyndall National Institute Cork, Ireland The importance of supply-chain partnerships in Irish Materials research
12:45-13:00	<b>Dr. Ning Liu</b> , Bernal Institute and Department of Physics, School of Natural Sciences, University of Limerick, Ireland Low loss nano-cavities near metal
13:00-13:15	<b>Dr. Sumsun Naher</b> , London City University, UK Modelling and simulation in developing advanced manufacturing techniques: semi-solid, laser processing and peening
13:15-14:30	Lunch
<b>Session VII: Emerging Materials, Devices, and Characterisation Challenges: B Chair: Dr. Ehtsham UI Haq, Bernal Institute, University of Limerick, Limerick, Ireland</b>	
14:30-15:00	<b>Prof. Amit Bandopadhyay</b> , School of Mechanical and Materials Engineering, Washington State University, Pullman, Washington, USA Additive manufacturing of multimaterials structures
15:00-15:15	<b>Dr. Sergei V. Kalinin</b> , Director, Institute for Functional Imaging of Materials, Oak Ridge National Laboratory, Tennessee, USA Big, deep, and smart data in physical imaging: from materials genome to atom by atom manufacturing
15:15-15:30	<b>Aidan Goggin</b> , Seagate Technology Inc., Northern Ireland, UK Data Storage Technology and Nanophotonics
15:30-16:00	Tea/Coffee
<b>Session VIII: Industrial Translation: A Chair: Mr. John Mulcahy, Bernal Institute, University of Limerick, Limerick, Ireland</b>	
16:00-16:30	<b>Dmitry Kazantsev</b> , NT-MDT Spectrum Instruments, Zelenograd, Russia and Institute for Theoretical and Experimental Physics, Moscow, Russia Nanometer Resolution Material Recognition By Apertureless Near-Field Scanning Microscopy
16:30-16:45	<b>Antonio Nigro</b> , CEO, GNR, Milan, Italy Residual stress evaluation and different field of application
16:45-17:00	<b>Jean-Bernard Lecourt</b> , MultiTel, Mon, Belgium Multiphoton microscopy with femtosecond fiber lasers
17:00-17:15	<b>Dr. Nagavalli Kiran</b> , Tescan, Brno, Czech Republic Instrumentation for investigating the nano-world: Multimodal Systems for Imaging & Analysis
19:00-21:00	Dinner at Kilmurry Lodge Hotel

Thursday 13 <sup>th</sup> July 2017	
08:30-09:00	Tea/Coffee
<b>Session IX: Industrial Translation: B Chair: Dr. Liam Brown, Vice President Research, Limerick Institute of Technology, Limerick</b>	
09:00-09:30	<b>Prof. Vladimir Shur</b> , Director, Ural Center of Shared Use "Modern Nanotechnology", Ural Federal University, Russia Ural Center for Shared Use "Modern Nanotechnology" UrFU: experience of advanced characterization for industry
09:30-10:00	<b>Dr. Panagiotis Kavouras</b> , School of Chemical Engineering, National Technical University of Athens, Greece Industrial translation of research passes through the gate of research integrity in characterization methods
10:00-10:30	<b>Prof. Marco Sebastiani</b> , Materials Science at the University of "Roma TRE" Novel characterization techniques for micro-scale fracture toughness analysis in coatings
10:30-10:45	Tea/Coffee
<b>Session X: European Materials Characterisation Council: Stakeholders Consultation</b>	
10:45-12:00	EMCC Road Map/ Round table Discussion
<b>Session XI: Industrial Translation: C</b>	
12:00-14:00	Lunch/Poster Session
14:00-17:00	Industrial Visit for EMCC OMB
14:00-17:00	Tour of Bernal Institute (Please confirm at the registration desk)