

Sunday 11th August 2019

	Classrom H 2.40	
	Tutorials	
14:00 - 15:00	Pavlo Zubko	The State of Play in Negative Capacitance
15:00 - 16:00	Hermann Kohlstedt	Current and Future Devices for Neuromorphic Computing
16:00 - 16:30	Tea & Coffee Break	
16:30 - 18:00	Stephen Jesse & Amit Kumar	Advanced Methods in Scanning Probe Microscopy
18:00 - 19:30	Welcome Reception	

Monday 12th August 2019

	George Moore			Intel			Icon		
08:45 - 10:00	Plenary 1								
	Susanne Stemmer	Tuning the Superconducting States of SrTiO3	101						
10:00 - 10:30	Coffee Break & Posters								
10:30-12:45	Advanced and Novel Characterisation (1)			Superlattices and Thin Films (1)			Sensors and Transducers (1)		
	Chair: Alexei Gruverman			Chair: Pavel Zubko			Chair: Nian Sun		
10:30 - 11:00	Finlay Morrison	Relaxor behaviour, local structure and disorder in ferroelectric tetragonal tungsten bronzes	164	Anand Bhattacharya	Meeting a strange metal in thin films and heterostructures of LaNiO3	73	Julian Walker	Piezoelectric MEMS with Integrated electronics	47
11:00 - 11:15	Richard Beanland	Refinement of crystal parameters in functional oxides using digital electron diffraction	114	Woo Seok Choi	Magnetically Coupled Metal-Insulator Transition in Low Dimensional Synthetic Oxide Crystal	68	Henning Winterfeld	Piezoelectric field-effect transistor for force and tactile sensor applications	53
11:15 - 11:30	Yinlian Zhu	Atomic Mappings of Giant Polarizations in Ultrathin Ferroelectric Films	76				Hartmut W. Gundel	Ferroelectric thin film based smart temperature sensors	107
11:30 - 11:45	Yukio Sato	Structural investigation of dielectrics under an electric field by atomic-scale in-situ electron microscopy	70	Charles Paillard	Strain engineering of electro-optic constants in ferroelectric materials	102	Ebraheem Azhar	Internet of Things (IoT)-Enabled Hybrid Photovoltaics-Electrochromic Devices for Smart Windows	69
11:45 - 12:00	Andrei Zenkevich	Gauging an electric potential distribution across nanoscale ferroelectric capacitors	37	Brian Foley	Phonon scattering mechanisms dictating the thermal conductivity of PZT films across the compositional phase diagram	132	Susan Trolier-McKinstry	Electrical-Thermal-Mechanical Reliability of Piezoelectric Thin Films	25

12:00 - 12:15				Matthew Dawber	Unlocking the secrets of growth and switching in ferroelectric multilayers using synchrotron x-ray diffraction	119			
12:15 - 12:30	Jiri Hlinka	Polarized Raman microscopy	126						
12:30 - 12:45									
12:45 - 14:00	<b>Lunch Break</b>								
14:00-15:30	<b>Advanced and Novel Characterisation (2)</b>			<b>Superlattices and Thin Films (2)</b>			<b>Sensors and Tranducers (2)</b>		
	<b>Chair: Finlay Morrison</b>			<b>Chair: Ho Nyung Lee</b>			<b>Chair: Susan Trolier-McKinstry</b>		
14:00 - 14:30	Bryan Huey	3-D Resolved Ferroelectric Domains via Tomographic AFM	23	Pavlo Zubko	Domain formation in lead-titanate heterostructures under tensile strain	120	Levent Degertekin	Integrated Microsystems for Catheter Based Ultrasound Imaging	127
14:30 - 14:45	Alexei Gruverman	Domain Switching Behavior in Ferroelectric HfO2 Capacitors	22	Marios Hadjimichael	Domain Structures and Dielectric Properties of Ultrathin PbTiO3 Layers in Metal-Ferroelectric Superlattices	33	Seung Tae Choi	Audio-Tactile Skinny Buttons by Using Fretting Vibration Phenomenon for Flexible User Interfaces	60
14:45 - 15:00				Céline Lichtensteiger	Tuning of the depolarization field, built-in voltage and nanodomain structure in ferroelectric thin films	81	Nian Sun	Intergrated Ferroics for Sensing Electronics	35
15:00 - 15:15	Fengyuan Zhang	Identifying the Physical Origins of Nanoscale Variations in Switching Behaviour across Pb(Zr0.53,Ti0.47)O3 Thin Films	45	Christian Weymann	Controlling defect distribution and intrinsic domain structure in ultrathin ferroelectric films	64			
15:15 - 15:30	Kumara Cordero Edwards	Ferroelectric fracture ratchet effect caused by flexoelectricity	95	Xiaoyan Lu	Collective Ferroelastic Switching and Non-Local Mechanical Response in Epitaxial PbTiO3 Thin Films	72			
15:30 - 16:00	<b>Coffee Break &amp; Posters</b>								
16:00 - 18:30	<b>Advanced and Novel Characterisation (3)</b>			<b>Superlattices and Thin Films (3)</b>			<b>Materials Theory</b>		
	<b>Chair: Brian Huey</b>			<b>Chair: Matt Dawber</b>			<b>Chairs: Nicole Benedek &amp; Nick Bristowe</b>		
16:00 - 16:30	Hugh Simons	Real-time nondestructive mapping of defects and their dynamics	116	Ho Nyung Lee	Emergent phenomena in 3d-5d oxide quantum heterostructures	51	Nicole Benedek	Turn Up the Volume: Understanding Negative Thermal Expansion in Ferroelectric Perovskites	48
16:30 - 16:45	Martin Schmidbauer	Ferroelectric Phase Transitions in K0.9Na0.1NbO3/(110)NdScO3 Strained Epitaxial Layers Probed by In-Situ Grazing-Incidence X-Ray Diffraction	99	Edoardo Zatterin	Local structure and switching of ferroelectric/ferroelastic nanodomains probed by X-ray nanodiffraction	74	Alexander Edström	Prediction of enormous magnetoelectric coupling and cross-caloric effect around a tetracritical point in multiferroic SrMnO3	52
16:45 - 17:00	Alexander Sigov	Analysis of the metal-ferroelectric interface in PZT films	128	Joseph Guy	The role of strain gradients in enhanced conductivity at phase boundaries in mixed-phase BiFeO3	110			

17:00 - 17:15				Jamal Belhadi	Switchable photovoltaic effect in ITO/BiFeO3/SrRuO3/SrTiO3 (111) heterostructure	90	Elif Ertekin	Predicting Ionic Diffusivity and Electronic Carrier Concentrations in Disordered Mixed Conducting Perovskites	140
17:15 - 17:30	Sam Seddon	Magnetic Domains and Dynamics in SrRuO3, as studied by Magnetic Force Microscopy	152	Orlando Auciello	Science/Technology of Interface-Engineered High-K Dielectric Nanolaminate-Oxides / Diamond Films for New Generation High Power Electronics	80	Nicholas Bristowe	A symmetry roadmap to new perovskite multiferroics	159
17:30 - 17:45	Xiaoqing Pan	Anisotropic Polarization-Induced Conductivity at Ferroelectric Domain Walls and Heterointerfaces	141						
17:45 - 18:00				Krzysztof Pomorski	Programmable quantum matter in CMOS electronics	176			
18:00 - 18:15							Shuai Dong	Theoretical Design of Two-Dimensional Magnetoelectric Materials	8
18:15 - 18:30									

## Tuesday 13th August

	George Moore			Intel			Icon		
09:00 - 10:00	Plenary 2								
	Russell Cowburn	Magnetism for Biomedical Applications – Beyond Superparamagnetic Iron Oxide Nanoparticles	111						
10:00-10:30	Coffee Break and Posters								
10:30-12:30	Novel Topologies and Domain Walls (1)			Multiferroics (1)			Memory and Data Storage (1)		
	Chair: Jorge Iniguez			Chair: Si-Young Choi			Chair: Sayani Majumder		
10:30 - 11:00	Gavin Burnell	All Electrical Nucleation, Motion and Detection of Room Temperature Magnetic Skyrmions	77	Annette Bussmann-holder	Bending/flexing induced conversion from ferroelectric to antiferromagnetic order in a single component bulk material	9	Martin Ziegler	Memristive stochastic learning for neuromorphic computing	21
11:00 - 11:30	Jiri Hlinka	Towards ferroelectric skyrmion phases	125	Bohdan Kundys	The elastic way to multifunctionality between spins, photons and electric charges	62	Hermann Kohlstedt	Impedance spectroscopy on plasma engineered double-barrier memristive devices	106
11:30 - 11:45	Kane Esien	Novel Magnetoresistance Measurements of Artificial Spin Ice Structures	129	Stephane Fusil	A journey into the coupled ferroelectric order and antiferromagnetic spin textures of BiFeO3	92	Maximilian Lederer	Influences on the nonlinearity of HFO2 based ferroelectric synapses (FeFETs) for neuromorphic computing	39
11:45 - 12:00	Dennis Meier	Topological domain walls in chiral magnets	11	Je-geun Park	Magnetic Van der Waals materials: new platform for 2D physics	14	Natalia Andreeva	The concept of multilevel resistive switching in heterogeneous oxide systems	34
12:00 - 12:15							Qiangfei Xia	Memristor Crossbar Arrays for Analog Computing and Machine Learning	133
12:15 - 12:30									
12:30 - 14:00	Lunch Break								

14:00-15:30	Novel Topologies and Domain Walls (2)			Materials for Energy (1)			Memory and Data Storage (2)		
	Chair: Dennis Meier			Chair: Brahim Dkhil			Chair: Hermann Kohlstedt		
14:00 - 14:30	Anquan Jiang	Wall current enhancement in ferroelectric domain wall memory	32	Jonathan Spanier	The bulk photovoltaic effect: features, mechanisms, materials and nanoscale considerations	134	Lin Chen	Flexible Electronic Devices for Neuromorphic Computing Applications	41
14:30 - 14:45	James McConville	Ferroelectric Domain Wall Memristor	79	Mingmin Yang	The Bulk Photovoltaic Effect in Non-centrosymmetric Materials	75	Sayani Majumdar	From synaptic to neuronal functionality in ferroelectric tunnel junctions	96
14:45 - 15:00	Ursel Bangert	Imaging and spectroscopy of conducting domain wall structure and dynamics at the atomic scale	67	Ilya Grinberg	Band Gap Engineering of Perovskites Oxide Ferroelectrics	163			
15:00 - 15:15	Jorge Iñiguez	Theoretical predictions of domain walls with tailored functional and topological properties	43				Doo Seok Jeong	Memory-centric neuromorphic processor design	26
15:15 - 15:30									

**Coffee Break and Posters**

16:00 - 17:30	Novel Topologies and Domain Walls (3)			Materials for Energy (2)			Spintronics (1)		
	Chair: Jirka Hlinka			Chair: Jon Spanier			Chair: Mark Blamire		
16:00 - 16:15	Kalani Moore	Novel charged domain wall configurations in lead titanate	61	Ying-Hao Chu	Development of Flexible Photoelectrochemical Photoelectrodes	137	Agnès Barthélémy	Potential of the LaAlO <sub>3</sub> /SrTiO <sub>3</sub> interface for spintronics	27
16:15 - 16:30	Patrick Turner	Electrical characterisation of one-dimensional p-n junctions in erbium manganite conducting domain walls	100						
16:30 - 16:45	Oliver Paull	Designer defect- and domain-engineering of BiFeO <sub>3</sub> thin films	169	Brahim Dkhil	Ferroelectrics for calorics	118	Evgeny Tsybal	Persistent spin texture in ferroelectric oxides	24
16:45 - 17:00	Jing Ma	The novel structure and properties in self-assembled, topologically confined BiFeO <sub>3</sub> nano-islands array	49						
17:00 - 17:15				Junling Wang	Unique properties of 2D ferroelectric CuInP <sub>2</sub> S <sub>6</sub>	17	Robert Hicken	Time resolved imaging of magnetization dynamics induced by spin-orbit torques	97
17:15 - 17:30	Ivana Savic	Large Seebeck coefficient of ferroelectric domain walls in GeTe	173						
17:30 - 18:30	Plenary 3								
	Jim Scott	50 Years of Ferroelectrics: A Personal View							

**Networking Dinner (Guinness Storehouse)**



**Wednesday 14th August**

	George Moore			Intel			Icon		
09:00 - 10:00	Plenary 4								
	Gustau Catalan	Flexoelectricity: one size fits all	30						



15:30 - 16:00	Coffee Break & Posters								
16:00 - 17:30	Spintronics (2)			Medical Applications (2)			Functional Ceramics (2)		
	Chair: Evgeny Tsybal			Chair: Sandy Cochran			Chair: Andy Bell		
16:00 - 16:30	Joao Godinho	Scanning magneto-thermoelectric imaging of spin-orbit torque switching in antiferromagnetic films	93	Mario Joaquin Saravia	Nanotechnology for Retinal Detachment	59	Ian Reaney	Cold Sintered Microwave Materials and Devices	20
16:30 - 16:45	Mark Blamire	Superconductor / Ferromagnet Films and Superconducting Spintronics	13	Orlando Auciello	Materials Science Before/After Implantation for Unique Biocompatible Ultrananocrystalline Diamond Coating for New Generation Dental Implants	83	Julian Dean	Finite element modelling of micro-structural features in dielectric materials	65
16:45 - 17:00							Jiyue Wu	Perovskite $Sr_x(Bi_{1-x}Na_{0.97-x}Li_{0.03})_{0.5}TiO_3$ ceramics including polar nano regions for high power energy storage	86
17:00 - 17:30	Weinan Lin	Spin-orbitronics in the ferromagnetic metal/ferroelectric interface	160						
17:30 - 17:45	Solveig Felton	Magnetisation studies of two field-induced Er(III) single molecule magnets	109						
17:30	Conference Ends								