Condensed Matter and Quantum Materials 2024 (CMQM 2024)

2–5 July 2024
University of St Andrews, Scotland, UK

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	Rubidium	Strontium	Barium	Ytterbium
Trapping	810-840 nm	813 nm	553 nm	532 nm
Cooling	780 nm	461, 689 nm	493, 650 nm	399, 556 nm
Rydberg excitation	420-480 nm	317 nm	-	369, 308 nm
Clock transition	778 nm	698 nm	1762 nm	-

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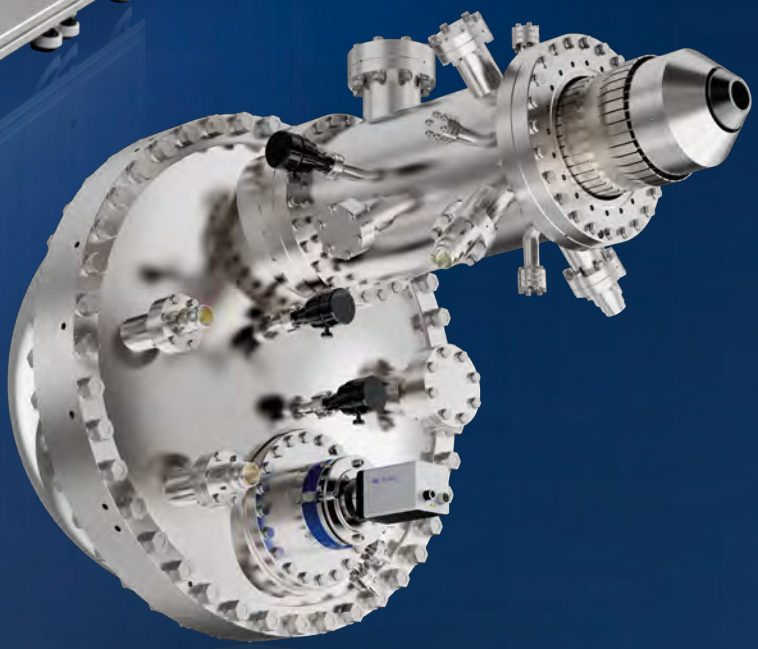

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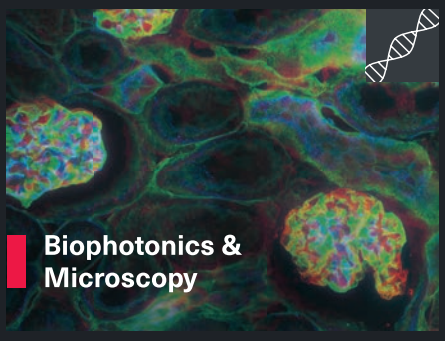

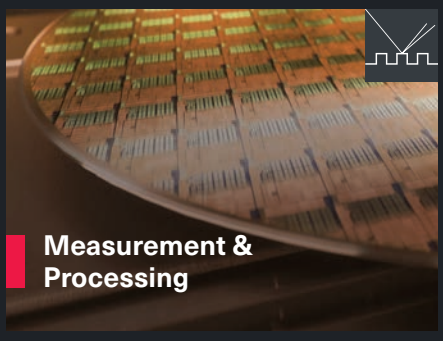

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Programme

Monday 1 July 2024

Time	Room	Programme
4:00 pm - 5:30 pm	Physics and Astronomy Building Foyer	**Registration and Drinks Reception**

Tuesday 2 July 2024

Time	Room	Programme
8:00 am - 9:00 am	School of Physics and Astronomy Building Foyer	**Registration and Arrival Refreshments**
9:00 am to 10:00 am	Booth Lecture Theatre, Medical Sciences Building	**Plenary Speaker: Silvia Picozzi** Multiferroicity and magnetoelectricity in the flatland
10.00 am to 10:30 am	Physics and Astronomy Building and Medical Sciences Building	**Morning Break**
10:30 am to 12:30 pm	Theatre A, School of Physics and Astronomy Building	**Topology** **10:30 am - 10:50 am Joe Winter:** Topological Textures in Momentum Space and Their Entanglement Properties **10:50 am - 11:10 am Frank Kruger:** Nature of Topological Phase Transition of Kitaev Quantum Spin Liquids **11:10 am - 11:30 am Kadin Thompson:** Odd-frequency superfluidity from a particle-number-conserving perspective **11:30 am - 11:50 am Petri Heikkinen:** QUEST-DMC: Modelling early-Universe phase transitions in superfluid helium-3 under nanofluidic confinement
	Theatre B, School of Physics and Astronomy Building	**New Materials 1** **10:30 am - 11:05 am Finlay Morrison:** Antiferroelectric-like behaviour in tetragonal tungsten bronzes **11:05 am - 11:25 am Yin Chen:** Material with Random Layer Lattice - A State between the Crystalline and Amorphous States **11:25 am - 11:45 am DYaze Wu:** Sliding induced multiple polarization states in two-dimensional ferroelectrics **11:45 am - 12:05 pm Nilanthy Balakrishnan:** Synthesize of Iron selenide layers via salt-assisted chemical vapor deposition **12:05pm – 12:40pm Sang-Wook Cheong**: to be confirmed
	Theatre C, School of Physics and Astronomy Building	**Polaritons** **10:30 am - 11:05 am Francesca Maria Marchetti:** Charge-Imbalanced Polaritons **11:05 am - 11:25 am Arturo Camacho Guardian:** Intercavity polariton slows down dynamics in strongly coupled cavities **11:25 am - 11:45 am Rakesh Arul:** Bridging the visible and mid-IR with exciton plasmon-polaritons for mid-IR detection **11:45 am - 12:05 pm Gunda Kipp:** Cavity electrodynamics of van der Waals heterostructures **12:05 pm - 12:40 pm Daniele Sanvitto:** Exploring new superfluid phenomena in polariton condensates
	Booth Lecture Theatre, Medical Sciences Building	**Magnetism 1** **10:30 am - 11:05 am Julie Staunton:** Computational materials modelling of rare earth - transition metal magnets **11:05 am - 11:25 am Chris Stock:** jeff=1 magnetism and spin-orbit excitations in FeGa2S4 **11:25 am - 11:45 am Harry Lane:** Kernel Polynomial Method for Linear Spin Wave Theory **11:45 am - 12:05 pm Joe Crossley**: What is the origin of the specific heat capacity of the spin-liquid candidate Ca_{10} Cr_{7} O_{28}? **12:05 pm - 12:40 pm Tetsuo Hanaguri**: Spectroscopic-imaging scanning tunneling microscopy on quantum liquid crystals

12:30 pm to 2:00 pm	Physics and Astronomy Building and Medical Sciences Building	Lunch (Allergen Menu Served In MSB)
2:00 pm - 4:00 pm	Theatre A	Superconductivity 1 2:00 pm - 2:35 pm Antony Carrington: Charge Order in Cuprate Superconductors 2:35 pm - 2:55 pm Rebecca Nicholls: Low-temperature in-plane anisotropy of the electrical resistivity in YBa2Cu3O7-δ 2:55 pm - 3:15 pm Stephen Hayden: Low-energy spin fluctuations in the strange metal state of an overdoped cuprate superconductor 3:15 pm - 3:50 pm Peter Hirschfeld: H Ultranodal state in multiband spin-1/2 superconductors
	Theatre B	New Materials 2 2:00 pm - 2:35 pm Sian Dutton: Jahn-Teller Distortions in NaNiO2 2:35 pm - 2:55 pm Magdalena Sobota: Investigation of anti-corrosion properties of iron alloys by XPS and Mössbauer Spectroscopy 2:55 pm - 3:15 pm Rodrigo Soto Garido: Fragile dislocation modes 3:15 pm - 3:35 pm Piotr Sobota: New family of Ti-rich HEA superconductors with high upper critical field
	Theatre C	Polaritons 2 and cavity QED 2:00 pm - 2:35 pm Jeremy Baumberg: Extreme light-matter coupling: What happens when light is confined to the atom scale? 2:35 pm - 2:55 pm Roman Potjan: Tunable superconductivity in 300 mm CMOS-compatible ZrN nanoconstrictions 2:55 pm - 3:15 pm Shima Poorgholam Khanjari: The development of high-Q tantalum superconducting microwave coplanar waveguide resonator arrays 3:15 pm - 3:35 pm Andreas Mischok: Breaking the angular dispersion limit in thin film optoelectronics by ultra-strong light-matter coupling 3:35 pm - 4:10pm Dmitry. N. Krizhanovskii: Towards single polariton optical nonlinearity in semiconductor microcavities
	Booth Lecture Theatre	Magnetism 2 2:00 pm - 2:35 pm Chiara Ciccarelli: Extracting spin from an antiferromagnet at picosecond timescales 2:35 pm - 2:55 pm Manuel Fernández López: Bad Weyl semimetals and spinon Fermi arcs in a model for pyrochlore iridates 2:55 pm - 3:15 pm Clifford Hicks: Topological Hall Effect in Mn3Pt and Mn3Sn 3:15 pm - 3:35 pm Bhaskaran Muralidharan: Quantum transport theory for 2D-topological electronics: translating quantum matter into emerging device paradigms 3:35 pm - 3:55 pm Nabil Menai: Large Spin Hall Angle in Mn-based Antiferromagnetic Alloys
4:00 pm - 4:30 pm	Physics and Astronomy Building and Medical Sciences Building	Afternoon Break - Physics and Astronomy Building and Medical Sciences Building
4:30 pm - 5:30 pm	Booth Lecture Theatre	Plenary Speaker: Sir Richard Friend Coulomb interactions in organic semiconductors
5:30 pm - 8:30 pm	Physics and Astronomy Building and Medical Sciences Building	Poster Session, Whisky Tasting, Buffet and Drinks Reception 5:40pm: Whisky lecture in Booth Lecture Theatre, Medical Sciences Building 6pm –7pm: Whisky tasting, drinks reception and poster session in Medical Sciences Building (Posters in Seminar Room 1) 7pm – 8:30pm: Drinks reception, buffet and poster session in Physics and Astronomy Building (Posters outside Theatres A and C)

Wednesday 3 July 2024

Time	Room	Programme
9:00 am to 10:00 am	Booth Lecture Theatre, Medical Sciences Building	**Plenary Speaker: Ulrike Diebold** Surface Science of Functional Oxides
10.00 am to 10:30 am	Physics and Astronomy Building and Medical Sciences Building	**Morning Break**
10:30 am to 12:40 pm	Theatre A, Physics and Astronomy Building	**Electronic Structure 1** **10:30 am - 11:05 am Chris Pickard:** A computational hunt for conventional high temperature superconductivity **11:05 am - 11:25 am Luke Soneji:** Electronic Behaviour at Commensurate Interfaces between Semi-Infinite Graphite Crystals **11:25 am - 11:45 am Alok Shukla:** Theory of Electronic Structure and Optical Properties of Graphene Quantum Dots **11:45 am - 12:05 pm Llorenç Serra:** Conductance asymmetry and current distributions in proximitized magnetic topological insulator junctions with Majorana modes **12:05 pm - 12:40 pm Timur Kim:** Holstein polarons, Rashba-like spin splitting and Ising superconductivity in electron-doped MoSe2
	Theatre B, Physics and Astronomy Building	**Materials for Quantum Technologies - Materials Horizon Scanning** **10:30 am - 11:05 am Alice Bowen:** Electron Paramagnetic Resonance as a tool for characterising molecular qubit systems and implementing quantum gates **11:05 am - 11:25 am Sai Kiran Rajendran:** Towards Rydberg mediated quantum applications in cuprous oxide **11:25 am - 11:45 am Soham Pal:** Nitrogen Vacancy Centres, a Versatile Testbed for Quantum Sensing and Simulations **11:45 am – 12:20 pm Ivan Vera Marun:** Quantized transport in one-dimensional nanowire-graphene spin injectors
	Theatre C, Physics and Astronomy Building	**Hybrid Organic/Inorganic** **10:30 am - 11:05 am Akshay Rao:** Probing Quantum Processes in Condensed Matter with Extreme Spatiotemporal Precision **11:05 am - 11:25 am Fangxin Zou:** Stretch-Induced Tunability of Electrical Transport in 3D Graphene Foam **11:25 am - 11:45 pm Mairi McCauley:** Modification of surface phenomena at hybrid Bi2Se3/organic interfaces **11:45 am - 12:05pm Muhammad Zia:** Charge Transport in Molecular Junctions **12:05 pm - 12:40 pm Sam Stranks**: Charge Carrier Recombination and Transport in Halide Perovskite Semiconductors
	Booth Lecture Theatre, Medical Sciences Building	**2D Materials 1** **10:30 am - 11:05 am Johannes Lischner:** Electrons, excitons and phonons in moiré materials **11:05 am - 11:25 am Anirudh Chandrasekaran:** Interplay of flat bands and higher order Van Hove singularities in Kagome metals **11:25 am - 11:45 pm Olivia Armitage:** Probing the magnetism of CrTe2 using quasiparticle interference **11:45 am - 12:05 pm Matthew Watson**: Evidence of folded pseudochiral Fermi surface in the layered charge density wave of 4Hb-TaSe2 **12:05 pm - 12:40 pm Carolina de Almeida Marques**: Dispersion of flat-bands at the 1T-termination of 4Hb-TaS2 probed by quasiparticle interference

12:30 pm to 2:00 pm	Physics and Astronomy Building and Medical Sciences Building	Lunch (Allergen Menu Served In MSB)
2:00 pm - 4:00 pm	Theatre A	Superconductivity 2 2:00 pm - 2:35 pm Pascal Puphal: Synthesis and crystal growth in extreme conditions: Around perovskite and Ruddlesden-Popper Nickelates 2:35 pm - 2:55 pm Maximilian Tobermory Pelly: Nanocalorimetry of CeRh2As2 2:55 pm - 3:15 pm Joseph Alec Wilcox: Unique interplay between magnetic irreversibility and vortex behaviour in the ferromagnetic Fe-based superconductor EuFe2(As1-xPx)2 3:15 pm - 3:35 pm Morgan Grant: Fully-gapped superconductivity in quasi-1D spin-triplet candidate Li0.9Mo6O17 3:35 pm - 4:10pm Mark Golden: Momentum dependent scaling exponents of cuprate strange-metal self energies: ARPES meets semi-holography
	Theatre B	Non-equlibrium and Quantum Thermodynamics 2:00 pm - 2:35 pm Peter Littlewood: Non-reciprocal phase transitions 2:35 pm - 2:55 pm Christian Spanslatt: Charge and heat current fluctuations of quantum Hall edge channels in the heat Coulomb blockade regime 2:55 pm - 3:15 pm Jan Knapp: Non-ergodicity of nuclear spins in a dilute system of two dimensional 3He impuritons 3:15 pm - 3:50pm Juliette Monsel: Energy transport and refrigeration with driven quantum dots
	Theatre C	Surface Physics/2D Materials 2:00 pm - 2:35 pm Reinhard Maurer: Controlling charge transfer in metastable nanostructures and topological 2D materials 2:35 pm - 2:55 pm James Broadhurst: Evaluation of the exchange properties of transition metal phthalocyanines using broken symmetry density functional theory 2:55 pm - 3:15 pm Aaron Coe: Unraveling the influence of polarized terminations on the surface states of YbB6 using STM 3:15 pm - 3:35 pm Daniel Halliday: Surface structure of the strontium ruthenates 3:35 pm - 3:55pm Muntaser Naamneh: Low dimensional electronic state at the surface of a transparent conductive oxide
	Booth Lecture Theatre	Strongly Correlated 2:00 pm - 2:35 pm Alix McCollam: Ferromagnetic quantum criticality in Fe(Ga1-xGex)3 2:35 pm - 2:55 pm Harshit Agarwal: Incommensurately modulated charge density wave structure of BaAl4 type compounds 2:55 pm - 3:15 pm Jahnatta Dasini: Discovery of Dynamical Heterogeneity in a Magnetic Monopole Fluid 3:15 pm - 3:35 pm Chris Hooley: Non-Fermi Liquids Arising from Magnetic Field Interactions: A Functional Renormalisation Group Analysis 3:35 pm - 4:10pm Priyanka Yogi: The pressure-induced CDW transition in CeTe3 probed by time-resolved spectroscopy
4:00 pm - 4:30 pm	Physics and Astronomy Building and Medical Sciences Building	Afternoon Break - Physics and Astronomy Building and Medical Sciences Building
4:30 pm - 5:30 pm	Booth Lecture Theatre	Plenary Speaker: Andrew Goodwin Correlated Disorder in Functional Materials

Thursday 4 July 2024

Time	Room	Programme
9:00 am to 10:00 am	Booth Lecture Theatre, Medical Sciences Building	**Plenary Speaker: Ataç İmamoğlu** Strongly correlated electrons in moire materials: an optical investigation
10.00 am to 10:30 am	Physics and Astronomy Building and Medical Sciences Building	**Morning Break**
10:30 am to 12:30 pm	Theatre A, Physics and Astronomy Building	**Superconductivity 3** **10:30 am - 11:05 am Amalia Coldea:** Quantum oscillations of superconducting iron-chalcogenides FeSe1-xSx **11:05 am - 11:25 am Freek Massee:** Majorana or not? A story of Fe(Se,Te) **11:25 am - 11:45 pm Rebecca Bisset:** Determination of the superconducting order parameter of Sr2RuO4 by use of phase-referenced Bogoliubov quasi-particle interference **11:45 am - 12:05 pm Matteo Dürrnagel:** Universality of intra-unit-cell Cooper-pair modulation **12:05 pm - 12:40 pm Shuqiu Wang:** Topological Surface State in a Spin-triplet Superconductor
	Theatre B, Physics and Astronomy Building	**Materials for Quantum Technologies 2** **10:30 am - 11:05 am Hannah Stern:** A new 2D platform for quantum technology: A quantum coherent spin in hexagonal boron nitride that operates at ambient conditions **11:05 am - 11:25 am Pablo Burset:** Electron quantum optics with superconducting devices **11:25 am - 11:45 pm Giorgos Georgiou:** Quantum nanoelectronics at ultrafast time scales **11:45 am - 12:05 pm Matthew Green:** Spin Coherence of the Clock Molecule 15N@C60
	Theatre C, Physics and Astronomy Building	**Electronic Structure 2** **10:30 am - 11:05 am Adrian Kantian:** Recent advances on quantitative theory for near-1D correlated systems in 2D and 3D **11:05 am - 11:25 am Harry Mullineauxsanders:** Topological Classification of Dimensionally Embedded Chains of Magnetic Impurities on Superconductors **11:25 am - 11:45 pm Edward McCann:** One-dimensional Z4 topological superconductor **11:45 pm - 12:20 pm Sophie Weber:** An alternative bulk-boundary correspondence: ferromagnetism at the surfaces of antiferromagnets
	Booth Lecture Theatre, Medical Sciences Building	**Spintronics** **10:30 am - 11:05 am Hidekazu Kurebayashi:** Spin dynamics of van der Waals magnets probed by superconducting resonators and electron doping in Cr2Ge2Te6 **11:05 am - 11:25 am Rostislav Mikhaylovskiy:** Terahertz coherent magnonics in canted antiferromagnets **11:25 am - 11:45 pm Yuri Pashkin:** Suppression of back-tunnelling events in hybrid single-electron turnstiles by using AC bias drive **11:45 am - 12:05 pm Habib Rostami**: Third-Order Thermoelectric and Spin Photocurrents in 2D Topological Electronic Systems **12:05 pm - 12:40 pm Anne Anthore**: Observation of a Kondo impurity state and universal screening using a charge pseudospin
12:30 pm to 2:00 pm	Physics and Astronomy Building and Medical Sciences Building	**Lunch (Allergen Menu Served In MSB)**

2:00 pm - 4:00 pm	Theatre A	**Tuning many-body interactions** **2:00 pm - 2:35 pm Julien Barrier:** Superconductivity in graphene bilayers - New directions from proximity effect to unconventional pairing **2:35 pm - 3:10 pm Luke Rhodes:** The magic angle of Sr2RuO4: Optimising correlation-driven superconductivity **3:10 pm - 3:30 pm John Saunders:** Evidence for odd-parity superconductivity in $YbRh_2Si_2$, and its enhancement by the onset of electro-nuclear antiferromagnetic **3:30 pm - 4:05 pm Felix Baumberger:** Interfacial electron-phonon coupling in 2D materials
	Theatre B	**Materials for Quantum Technologies 3** **2:00 pm - 2:35 pm Helena Knowles:** Spins in diamond for exploring quantum dynamics of interacting spin systems and for quantum sensing applied to life sciences **2:35 pm - 2:55 pm Viv Kendon:** Quantum walk algorithms for finding spin glass ground states **2:55 pm - 3:15 pm Aleksey Kozikov:** Deterministically induced single-photon light emitting diodes **3:15 pm - 3:50 pm Richard Warburton:** Adding spin control to a quantum dot-based single-photon source
	Booth Lecture Theatre	**2D materials 2** **2:00 pm - 2:35 pm Alexey Chernikov:** Manipulation and transport of excitons in monolayer semiconductors and 2D antiferromagnets **2:35 pm - 2:55 pm Jakub Schusser:** Assessing Nontrivial Topology in Weyl Semimetals by Dichroic Photoemission **2:55 pm - 3:15 pm Jack Engdahl:** Driving Viscous Hydrodynamics in Bulk Electron Flow in Graphene Using Micromagnets **3:15 pm - 3:35 pm Johannes Hofmann:** Hydrodynamics and long-lived modes in two-dimensional Fermi liquids **3:35 pm - 3:55 pm Alessandro Principi:** Non-conservation of the valley density and its implications for the observation of the valley Hall effect
4:00 pm - 4:30 pm	Physics and Astronomy Building and Medical Sciences Building	**Afternoon Break - Physics and Astronomy Building and Medical Sciences Building**
4:30 pm - 5:30 pm	Booth Lecture Theatre	**Plenary Speaker: Sarah Haigh** Exploring the Atomic Structure and Dynamics of 2D Heterostructures with Advanced Electron Microscopy
7:00 pm - 10:30 pm	Lower and Upper Hall	**Drinks Reception and Conference Dinner**

Friday 5 July 2024

Time	Room	Programme
9:00 am to 10:00 am	Theatre A	**Plenary Speaker: Andrew P Mackenzie** Using uniaxial pressure to both tune and probe quantum materials
10.00 am to 10:30 am	Physics and Astronomy Building and Medical Sciences Building	**Morning Break**
10:30 am to 12:30 pm	Theatre A	**Ultrafast/2D** **10:30 am - 11:05 am Charlotte Sanders:** Time-Resolved Photoelectron Diffraction: Mapping Atomic Motion in Phonon Oscillations **11:05 am - 11:25 am Roosmarijn de Wit:** Simulating 2D electronic spectroscopy with tensor networks **11:25 am - 11:45 pm Deepnarayan Biswas:** Soft X-ray k-resolved photoelectron spectroscopy with a momentum microscope at Diamond Light Source **11:45 am - 12:05 pm Sebastian Buchberger:** Investigating the influence of screening on the unconventional charge density wave in monolayer TiSe2 **12:05 pm - 12:40 pm Angela Wittmann:** Chiral-induced Unidirectional Spin-to-charge conversion
	Theatre B	**Thin Films** **10:30 am - 10:50 am Bruno Kenichi Saika:** Electronic structure of Cr-intercalated NbSe2 epitaxial thin films studied by angle-resolved photoemission spectroscopy **10:50 am - 11:10 am Akhil Rajan:** Epitaxial growth of large-area monolayers and van der Waals heterostructures of transition-metal chalcogenides **11:10 am - 11:30 pm Naina Kumari:** Synthesis, Electronic and Magnetic Investigation of Polymorphic 2D CrxTey Monolayers **11:30 am - 11:50 am Tugrul Ersoz:** Metal 3D Printing of Nb-47Ti Superconductor Components **11:50 am - 12:25 pm Christopher Bell:** Physics and Materials Science of Heavy Element Thin Films
	Theatre C	**Magnetism 3** **10:30 am -11:05 am Libor Smejkal:** Altermagnetism: from spintronics to unconventional magnetic phases **11:05 am - 11:25 am Malcolm Connolly:** Nanomagnet-induced Synthetic Spin-Orbit Coupling in a Superconductor-Semiconductor Nanowire **11:25 am - 11:45 pm Dirk Backes:** Magnon-Magnon Coupling in a Pinned Synthetic Antiferromagnet **11:45 am - 12:05 pm Adam McRoberts:** From matrix product states to field theory in the J1-J2 spin chain **12:05 pm - 12:25 pm Adil Gangat:** Numerical evidence for weak and "half-weak" first-order phase transitions in the frustrated classical J1-J2 square lattice Ising model
12:30 pm to 1:30 pm	Physics and Astronomy Building	**Lunch (grab and go)**