

QMS2025 – Symposium on Quantum Materials Synthesis

Porto, October 21-24, 2025

QMS2025 – Program

October 21, Tuesday – Pestana Douro hotel

Arrival

- 18:30** **Welcome drink (terrace in front of the Douro V room – Pestana Douro)**
- 20:00** **Dinner (Douro V room)**

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PAUL SCHERRER INSTITUT



**UNIVERSITÉ
DE GENÈVE**

QMS2025 – Program

October 22, Wednesday – conference room Douro III - Pestana Douro

Session 1 – Membranes and flexible oxides

9:00 Invited Talk – Chang-Beom Eom (University of Wisconsin Madison)

Twisted oxide membrane interface by local atomic registry design

9:30 Invited Talk – Jacobo Santamaria (Universidad Complutense, Madrid)

Moiré polar topologies and interlayer interactions in twisted oxide membranes

10:00 Invited Talk – Varun Harbola (MPI Stuttgart)

New horizons for interfaces by oxide membranes

10:30 Coffee break

Session 2 – Complex magnetism I

11:00 Invited Talk – Ian Fisher (Stanford University)

Multipolar order: materials and applications

11:30 Invited Talk – Bharat Jalan (University of Minneapolis)

Tricks of strain and treats of emergent phases: unraveling altermagnetism and polar metallic states in epitaxial RuO₂ Films

12:00 Contributed Talk – Maya Ramesh (Cornell University)

Designer enhanced magnon transport in epitaxial, multiferroic heterostructures grown by molecular-beam epitaxy

12:15 Contributed Talk – Yoony Baek (Harvard University)

Interplay of frustration and f-d exchange in a pyrochlore ferromagnet

12:45 Lunch break

Session 3 – Superconductivity in nickelates I

14:30 Invited Talk – Harold Hwang (Stanford University)

Correlated phases in nickelates

15:00 Invited Talk – Charles Ahn (Yale University)

Superconducting $\text{Nd}_{1-x}\text{Eu}_x\text{NiO}_2$ thin films using in-situ MBE synthesis

15:30 Invited Talk – Karsten Held (Tu Wien)

Theory of infinite-layer nickelate superconductors

16:00 Contributed Talk – Sangjae Lee (Yale University)

Doping-dependent electronic structure of $\text{Nd}_{1-x}\text{Eu}_x\text{NiO}_2$

16:15 Coffee break

Session 4 – Growth control of electronic properties

16:45 Invited Talk – Darrell Schlom (Cornell University)

Hot quantum materials—turning up the heat to achieve adsorption-controlled synthesis and improved perfection

17:15 Invited Talk – Eva Benckiser (MPI Stuttgart)

Directional imprinting of structural distortions drives spin-orbital order in a vanadate

17:45 Invited Talk – Duncan Alexander (EPFL)

Engineering symmetry breaking interfaces in orthorhombic perovskite thin films via structural-energetics

18:15 Contributed Talk – Arun Kumar Jaiswal (University of Geneva)

Epitaxial control of octahedral rotations in antiferromagnetic DyFeO_3

Dinner – not organized

October 23, Thursday – conference room Douro III - Pestana Douro

Session 5 – Topology and chirality

9:00 Invited Talk – Sang-Wook Cheong (Rutgers)

Chirality, false chirality and time chirality

9:30 Invited Talk – Andrea Caviglia (University of Geneva)

The quantum metric of electrons with spin-momentum locking

10:00 Invited Talk – Seongshik (Sean) Oh (Rutgers)

Interface-engineered topological quantum matter

10:30 Coffee break

Session 6 – Complex ferroelectric domain patterns in oxide structures

11:00 Invited Talk – Philippe Ghosez (University of Liege)

Manipulation of inhomogeneous polar textures in ferroelectric perovskites and related nanostructures

11:30 Contributed Talk – Ludovica Tovaglieri (University of Geneva)

Domain and superdomain structures in ferroelectric PbTiO_3 based heterostructures

11:45 Contributed Talk – Fernando Gómez-Ortiz (University of Liege)

Dynamics of complex polar textures in ferroelectric nanostructures

12:00 Contributed Talk – Isabel Tenreiro (Complutense University of Madrid)

Flexoelectrically induced polar vortices in twisted SrTiO_3 bilayers

12:15 Contributed Talk – Greta Segantini (University of Geneva)

Electron-beam writing of atomic-scale reconstructions at oxide interfaces

12:45 Lunch break

Session 7 – Topological magnets

14:30 Invited Talk – Yuri Suzuki (Stanford University)

Spin and topological phenomena in low loss ferromagnetic insulator thin films

15:00 Invited Talk – Je-Geun Park (Seoul National University)

Triangular van der Waals topological magnet $\text{Co}_{1/3}\text{-TaS}_2$

15:30 Invited Talk – Jennifer Fowlie (Northwestern University)

Soft chemical dimensionality evolutions in complex oxides

16:00 Contributed Talk – Carlos A.F. Vaz (PSI)

Controlling the antiferromagnetic domain state of ultrathin $\text{La}_{0.45}\text{Sr}_{0.55}\text{MnO}_3$ films through oxygen vacancies

16:15 Coffee break

Session 8 – Superconductivity in nickelates II

16:45 Invited Talk - Julia Mundy (Harvard) – to be confirmed

Title to be announced

17:15 Contributed Talk – Lucia Varbaro (University of Geneva)

Infinite layer nickelates solid solutions: unusual magnetic field driven re-entrant superconductivity

17:30 Contributed Talk – Leonard Verhoff (TU Wien)

Surface effects in infinite-layer nickelate films

Session 9 – Food for thoughts

17:45 Invited Talk – Jochen Mannhart (MPI-Stuttgart)

Exploring the quantum–classical interface for revolutionary quantum materials and technologies

18:45 Bus transfer to the Graham's caves / Wine tasting and dinner

October 24, Friday – conference room Douro III - Pestana Douro

Session 10 – Transport properties of d^1 systems

9:00 Invited Talk – Masashi Kawasaki (RIKEN and University of Tokyo)

Metal-insulator transitions in double quantum wells of SrVO_3

9:30 Invited Talk – Marin Alexe (University of Warwick)

Negative differential photoconductivity and Gunn-like oscillations in SrTiO_3 single crystals

10:00 Contributed Talk – Evgenios Stylianidis (TU Wien)

Electrical properties of epitaxial capacitors based on compressively strained SrTiO_3

10:15 Contributed Talk – Takahiro Fujita (RIKEN)

Proximity effect of emergent magnetic field

10:30 Coffee break

Session 10 – Complex magnetism II

11:00 Invited Talk – Ramamoorthy Ramesh (UC Berkeley)

Magnon confinement in oxide heterostructures

11:30 Invited Talk – Marta Gibert (Tu Wien)

Engineering the magnetic phase diagram and unequal antipolar displacement in double-perovskite oxide heterostructures

12:45 Lunch

End of the workshop