

Workshop on
“Spin-Orbit Entangled Quantum Magnetism”

September 23 - 27, 2024

organized by

Cesare Franchini (U of Vienna), Vesna Mitrovic (Brown U, Providence),
Leonid Pourovskii (École Polytechnique, Palaiseau)

• **Monday, September 23rd, 2024**

09:00 – 09:20 **Registration**

09:20 – 09:40 **Opening**

09:40 – 10:40 **Giniyat Khaliullin (MPI Stuttgart)**

Lattice effects in spin-orbit Mott insulators

10:40 – 11:20 **Liviu Chibotaru (KU Leuven)**

Vibronic vs. orbital order in magnetic insulators

11:20 – 11:50 **Coffee Break**

11:50 – 12:30 **Arun Paramakanti (U Toronto)**

Probing and controlling multipolar orders via strain and phonons

12:30 – 14:00 **Lunch Break**

14:00 – 14:40 **Mikhail Katsnelson (Radboud U)**

Selected problems of two-dimensional magnetism

14:40 – 15:00 **Johanna Paulina Carbone (TU Vienna)**

Magnetocrystalline anisotropy of heavy rare-earth atoms on graphene: From DFT to crystal field theory

15:00 – 15:30 **Coffee Break**

15:30 – 16:10 **Alberto Morpurgo (UNIGE, Geneva)**

Probing 2D magnetic materials with magnetotransport

16:10 – 16:30 **Branislav Nikolic (U Delaware)**

What can spintronics do for quantum magnetism and vice versa?

• **Tuesday, September 24th, 2024**

09:00 – 09:40 **Nandini Trivedi (Ohio State U, Columbus)**

Signatures of fractionalization in quantum spin liquids and predictions for experiments

09:40 – 10:00 **Yong Baek Kim (U Toronto)**

Dynamical signatures of fractionalization in dipolar-octupolar quantum spin ice

10:00 – 10:20 **Sergey Streltsov**

Possible spin-liquid and cluster Mott states on a breathing Kagome lattice

10:20 – 11:00 **Coffee Break**

11:00 – 11:40 **Hae-Young Kee (U Toronto)**

Transforming from Kitaev to Disguised Ising Chain

11:40 – 12:00 **Jungho Kim (Argonne National Laboratory)**

RIXS Study of Excitations in Kitaev Honeycomb Iridates

12:00 – 13:40 **Lunch Break**

13:40 – 14:20 **Jeffrey Quilliam (U of Sherbrooke)**

Non-trivial spin dynamics in quantum spin liquid candidates with and without applied pressure

14:20 – 15:00 **Olle Eriksson (Uppsala U)**

Relativistic effects for exchange interactions and spin-dynamics simulation

15:00 – 15:40 **Marco Gibertini (U Modena)**

Expanding the portfolio of two-dimensional magnetic materials and their applications from first principles

15:40 – 16:20 **Coffee Break**

16:20 – 17:00 **Ellen Fogh (EPFL, Lausanne)**

Tuning magnetoelectricity in a mixed-anisotropy antiferromagnet

17:00 – 19:00 **Poster Session with Welcome Buffet**

• **Wednesday, September 25th, 2024**

09:00 – 09:40 **Nicola Spaldin (ETH Zurich)**

Hidden magnetic order with and without spin-orbit coupling

09:40 – 10:00 **Thomas Olsen (Technical U Denmark, Kongens Lyngby)**

Type II multiferroic order in 2D materials from first principles calculations

10:00 – 10:40 **Silvia Picozzi (CNR-SPIN, Chieti)**

Multiferroicity and magnetoelectricity in the flatland

10:40 – 11:10 **Coffee Break**

11:10 – 11:50 **Maria Daghofer (U Stuttgart)**

Light-induced couplings and spin-orbit coupling

11:50 – 12:30 **Xinwei Li (NUS, Singapore)**

Light induced metastable spin-orbital order in Ca_2RuO_4

12:30 – 14:00 **Lunch Break**

14:00 – 15:00 **Stefan Blügel (FZ Jülich)**

Spin-orbit related phenomena in magnets from density functional theory

15:00 – 15:20 **Stefano Pittalis (CNRNANO, Modena)**

Density functionals for spin-orbit entangled systems: from theory to practice

15:20 – 15:40 **Coffee Break**

15:40 – 16:20 **Marie Therese Huebsch (VASP, Vienna)**

Predicting the magnetic ground state with VASP, Vienna

16:20 – 16:40 **Diana Csontosova (Masaryk U, Brno)**

Hidden covalent insulator and spin excitations in SrRu_2O_6

19:00 – 22:00 **Social Dinner**

• **Thursday, September 26th, 2024**

09:00 – 09:40 **Bruce Gaulin (McMaster U, Hamilton)**

Multipolar Order and Fluctuations in 5d Double Perovskites

09:40 – 10:20 **Daigorou Hirai (Nagoya U)**

Multipole orders in 5d transition metal double perovskites and pyrochlores

10:20 – 11:00 **Coffee Break**

11:00 – 11:20 **Claude Ederer (ETH Zurich)**

Multipolar order in the 5d double perovskite Ba_2MgReO_6 from DFT+DMFT

11:20 – 11:40 **Dario Fiore Mosca (École Polytechnique, Palaiseau, U of Vienna)**

Interplay of superexchange and vibronic effects in the hidden order of Ba_2MgReO_6 unravelled from first principles

11:40 – 12:20 **Marco Moretti (Politecnico Milano)**

The origin of magnetism in a supposedly nonmagnetic osmium oxide

12:20 – 14:00 **Lunch Break**

14:00 – 14:40 **Samuele Sanna (U Bologna)**

Effect of electron-doping in $Ba_2Na_{1-x}Ca_xOsO_6$ Mott insulator with strong spin orbit coupling

14:40 – 15:00 **Lorenzo Celiberti (U of Vienna)**

Jahn-Teller spin-orbital bipolarons in doped magnetic oxides

15:00 – 15:20 **Naoya Iwahara (U Chiba)**

Ordering of spin-orbit-lattice entangled states in 5d1 double perovskites

15:20 – 15:40 **Coffee Break**

15:40 – 16:20 **Eva Pavarini (FZ Jülich)**

Finding true Kugel-Khomskii materials

16:20 – 16:40 **Marjana Lezaic (FZ Jülich)**

$CaIrO_3$: a nonmagnetic semimetal, a magnetic insulator, or something in-between?

• **Friday, September 27th, 2024**

09:00 – 09:40 **Silke Biermann (École Polytechnique, Palaiseau)**

Hund's exchange in electrochemistry: Electronic properties of cathode materials for battery applications

09:40 – 10:20 **Sergey Artyukhin (IIT, Genova)**

Towards the modelling of VBS states in $IrTe_2$

10:20 – 11:00 **Sergii Khmelevskiy (TU Vienna)**

Exotic Phenomena Due to Multipolar Superexchange Interactions in f-Electron Systems

11:00 – 11:30 **Coffee Break**

11:30 – 12:10 **Kemp Plumb (Brown U, Providence)**

Pulling order from the brink of disorder: Observation of a nodal line spin liquid and fluctuation stabilized order in the FCC lattice K_2IrCl_6

12:10 – 12:50 **Bongjae Kim (KNU, Daegu)**

Competing magnetisms and onset of the static magnetic order in Sr_2RuO_4

All talks take place at ESI Boltzmann Lecture Hall!