International Workshop of the CRC1277:

Emergent Relativistic Effects in Condensed Matter

Vielberth-building, H24, University of Regensburg

April 10-12, 2024

– Scientific Program –

Wednesday, April 10

08:45 – 09:30	Registration
09:25 – 09:30	Opening remarks
Moiré	Chair: Jaroslav Fabian & Ferdinand Evers
09:30 – 10:00	**Helene Bouchiat** (LPS Paris-Saclay) *Singular orbital magnetism in graphene with a moiré potential*
10:00 – 10:30	**Eva Andrei** (Rutgers) *Moiré x Moiré: self-alignment, topology and quasi-crystals*
10:30 – 11:00	*Coffee break*
11:00 – 11:30	**Efthimios Kaxiras** (Harvard) *Twisted multilayer graphene revisited: where is the "magic"?*
11:30 – 11:45	Paulo Faria Junior (Regensburg) *Emergent spin and orbital physics in van der Waals heterostructures via proximity and twisting*
11:45 – 12:00	Jan Wilhelm (Regensburg) *Towards nanoscale electron dynamics simulations from low-scaling GW and Bethe-Salpeter*
12:00 – 14:00	*Lunch break*
14:00 – 16:00	**Poster session**, discussion with coffee
Nanostructures	Chair: Christoph Strunk
16:00 – 16:30	**Georgios Katsaros** (IST Austria) *cQED experiments in planar Ge*
16:30 – 17:00	**Christoph Stampfer** (RWTH Aachen) *Symmetry protected spin-valley blockade in graphene quantum dots*
17:00 – 17:30	**Peter Makk** (Budapest) *Coupling of Andreev bound states in InAs quantum dots*
17:30 – 17:45	Simon Reinhardt (Regensburg) *Magnetochiral vortex ratchet effect in two-dimensional Josephson junction arrays*
19:00	Stadtmaus guided city tour from hotel Goliath

Thursday, April 11

Scanning probes	Chair: Jascha Repp
09:00 – 09:30	**Ali Yazdani** (Princeton) *Visualizing correlated quantum phases of matter in flat bands*
09:30 – 10:00	**Katharina Franke** (FU Berlin) *Diode effect in Josephson junctions with a single magnetic atom*
10:00 – 10:30	**Beena Kalisky** (Bar-Ilan University Ramat-Gan) *Imaging quantum materials with scanning SQUID microscopy*
10:30 – 11:00	*Coffee break*

Spintronics	Chair: Jörg Wunderlich
11:00 – 11:30	**Michel Viret** (CEA Saclay) *Observation of the Orbital Inverse Rashba-Edelstein effect*
11:30 – 12:00	**Cheng Song** (Tsinghua University) *Electrical 180° switching of Néel vector in altermagnets*
12:00 – 12:15	Dmitri Kozlov (Regensburg) *Anomalous conductance steps in 3D Tl HgTe-based quantum point contacts*
12:15 – 14:00	*Lunch break*

Light-matter	Chair: Christian Schüller & Sebastian Bange
14:00 – 14:30	**Vinod Menon** (CCNY) *Strong light-matter interaction in van der Waals material*
14:30 – 15:00	**Stefan Mathias** (Göttingen) *Excitonics at the Space-Time Limit*
15:00 – 15:30	**Mackillo Kira** (U Michigan) *Lightwave electronics in quantum materials*
15:30 – 16:00	**Hope Bretscher** (MPI Hamburg) *Cavity electrodynamics of vdW heterostructures*
16:00 – 16:15	Eva Schmid (Regensburg) *Single-molecule readout of spin quantum beats in charge-separated pair states*

17:30	Stadtmaus guided city tour from hotel Goliath, ending in Leerer Beutel
18:30	Conference dinner, Restaurant Leerer Beutel, Bertoldstraße 9, Regensburg

Friday, April 12

Chiral matter Chair: Isabella Gierz

09:00 – 09:30 **Niels Schröter** (MPI Halle)
New fermions with radial spin- and orbital-momentum locking in chiral crystals

09:30 – 10:00 **Piet Brouwer** (FU Berlin)
Fermi-arc metals

10:00 – 10:30 **Peide Ye** (Purdue University)
The resurrection of tellurium as an elemental two-dimensional semiconductor

10:30 – 11:00 *Coffee break*

Correlations Chair: Milena Grifoni

11:00 – 11:30 **Dmitri Efetov** (LMU Munich)
Novel thermodynamic probes of the many-body ground states in magic angle twisted bilayer graphene

11:30 – 12:00 **Andrei Bernevig** (Princeton)
Heavy fermion mapping of the twisted Bilayer graphene and other flat band models: a wholistic explanation of a series of experiments.

12:00 – 12:15 Julian Siegl (Regensburg)
Kohn-Luttinger like Ising superconductivity in monolayer $NbSe_2$

12:15 Concluding remarks

12:30 – 14:00 *Lunch*