

Program – Les Houches, 09-13 September 2024

	Sunday 08.09	Monday 09.09.	Tuesday 10.09.	Wednesday 11.09.	Thursday 12.09.	Friday 13.09.
09:00 – 10:30		<i>Session 1.1:</i> Gauzzi Caldeira	<i>Session 2.2:</i> Di Liberto Platero	<i>Session 3.2:</i> Bampoulis Vanmaekelberg Tsai	<i>Session 4.3:</i> Schoutens Goldman Schmelcher	<i>Session 6.1:</i> Doretto Palumbo
10h30 – 11:00		<i>Coffee break</i>	<i>Coffee break</i>	<i>Coffee break</i>	<i>Coffee break</i>	<i>Coffee break</i>
11:00 – 12:25		<i>Session 1.2:</i> Carlson Conte Canyellas Nunez	<i>Session 3.1:</i> Baym Nigggli	<i>Session 3.3:</i> Liu Xu	<i>Session 4.4</i> Peralta Jankowski van Wezel	Akbar Arouca <i>Closing remarks</i>
12:30 – 13:30		<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
14:00 – 16:00	Arrival	<i>Session 1.3:</i> Roy Marino Holmvall Rai	Free afternoon, hiking, discussions	<i>Session 4.1:</i> Gritsev Beugeling Hansson	<i>Session 5.1:</i> Bergholtz Bercioux Hemmerich	
16:00 – 16:30		<i>Coffee break</i>	<i>Coffee break</i>	<i>Coffee break</i>	<i>Coffee break</i>	
16:30 – 18:30	Registration and Welcome session	<i>Session 2.1:</i> Rasing Slot Goerbig		<i>Session 4.2:</i> Backlund Moustaj Poster session	<i>Session 5.2:</i> Creffield Roccati Martinez Strasser	
19:30 – 20:30	<i>Dinner</i>	<i>Dinner</i>	<i>Social Dinner</i>	<i>Dinner</i>	<i>Dinner</i>	

Monday 09/09

Session 1: Correlated states in condensed matter systems, fractals

09:00 A. Gauzzi, Tuning topological Dirac states using correlated d-electrons in the Ba(Co,Ni)S₂ system (Tutorial)

9:50 A. Caldeira, Effective momentum-momentum coupling in a correlated electronic system: the diamagnetism of benzene

- coffee (10:30 - 11:00) -

11:00 E. Carlson, Universal Features of Emergent Electronic Fractals in Quantum Materials

11:30 M. Conte (C), The Fractal-Lattice Hubbard Model

11:50 R. Canyellas Nunez (C), Topological edge and corner states in bismuth fractal nanostructures

- lunch -

14:00 B. Roy, Topological insulators on fractal lattices: A general principle of construction

14:30 E. Marino, A Successful Theory for High-T_c Superconductivity in Cuprates

15:00 P. Holmvald (C), Josephson effect in a Fibonacci quasicrystal

15:20 G. Rai (C), Dynamical correlations and order in twisted bilayer graphene

- coffee (15:45 - 16:30) -

Session 2: Manifestation of correlations and topology in mesoscopic transport and spectroscopy

16:30 T. Rasing, All Optical Control of Magnetism

17:00 M. R. Slot, A quantum ruler for orbital magnetism in moiré quantum matter

17:30 M. O. Goerbig (O), Magneto-spectroscopy of topological surface states

Tuesday 10/09

Session 3: Quantum simulators (theory and experiment)

09:00 M. Di Liberto, Quantum simulation: overview and perspectives (Tutorial)

09:50 G. Platero, Long range quantum transfer in one dimensional systems mediated by topological edge states

- coffee (10:30 - 11:00) -

11:00 G. Baym, Exploring high density nuclear matter with cold atoms

11:30 L. Niggli (C), A quantum simulator to study lower dimensional electronic structure using artificial atoms on the surface of a semiconductor

- lunch + free afternoon -

19:30 Social Dinner

Wednesday 11/09

09:00 P. Bampoulis, Topological Phase Transition in Germanene Nanoribbons: from 1D to 0D Topological States

09:30 D. Vanmaekelberg, Atom-by-atom made lattices as simulators for real materials

10:00 S.-W. Tsai, Quantum simulators for strongly correlated systems and lattice gauge theories

- coffee (10:30 - 11:00) -

11:00 V. Liu, Orbital symmetry, order and topology in synthetic quantum materials

11:30 X.-Y. Xu, Quantum simulation based on three-dimensional photonic chips

- lunch -

Session 4: Quantum geometry and topology, Quantum-field-theory approaches to topological and Dirac Matter

14:00 V. Gritsev, Geometry and topology of quantum states (Tutorial)

14:50 W. Beugeling, Finding signatures of the parity anomaly in a topological insulator: Theory, numerics, and experiment

15:20 H. Hansson, Classical mechanics of identical particles

- coffee (16:00 - 16:30) -

16:30 M. Backlund (C), Topological Doubling Theorems in Nodal Band Structures

16:50 A. Moustaj (C), Topological Phase of the interacting SSH model

17:15 Poster session

Thursday 12/09

Session 4: Quantum geometry and topology, Quantum-field-theory approaches to topological and Dirac Matter (continued)

9:00 K. Schoutens, Fermionic bricks in the wall

9:30 N. Goldman, On the edge of interacting topological matter

10:00 P. Schmelcher, Local and latent symmetries and their generalization to control localization

- coffee (10:30 - 11:00) -

11:00 Lucila Peralta (C), The Widom-Streda Formula and its Remarkable Consequences: From Strongly Correlated to Topological Floquet Systems

11:20 W. Jankowski (C), Quantised responses in multi-gap topological phases

11:40 J. van Wezel, Protected degeneracies and the concentric Wilson loop spectrum

- lunch -

Session 5: Topology in non-Hermitian and Floquet systems

14:00 E. Bergholtz, Beyond Quantum Connections (Tutorial)

14:50 D. Bercioux, Spectral Properties of Non-Hermitian Systems Featuring Impurities and Flat Bands

15:20 A. Hemmerich, Dissipative time crystals in an atom-cavity system

- coffee (16:00 - 16:30) -

16:30 C. Creffield, Floquet engineering without shaking

17:00 F. Roccati (C), Hermitian and non-Hermitian topology from photon-mediated interactions

17:20 C. Martinez Strasser (C), Topological Properties of a Non-Hermitian Quasi-1D Chain with a Flat Band

Friday 13/09

Session 6: Lower-dimensional systems and FQHE

9:00 R. Doretto, Flat-band ferromagnetism and spin waves in the Haldane-Hubbard model

09:30 G. Palumbo, Higher-Spin Modes in the Fractional Quantum Hall Effect

- coffee -

11:00 W. Akbar (C), Effect of intersite coulomb interaction on superconductivity in twisted transition metal dichalcogenide homobilayer and Heterobilayer

11:20 R. Arouca, A thermodynamic approach to topological phase transitions (O)

11:40 *Closing remarks*