

Superconducting Quantum Circuits Meet Quantum Materials

834. WE-Heraeus-Seminar

18 May - 22 May 2025

at the Physikzentrum Bad Honnef, Germany

**WILHELM UND ELSE
HERAEUS-STIFTUNG**



Program

Sunday, 18 May 2025

17:00 – 21:00 Registration

18:30 *BUFFET SUPPER and informal get-together*

Monday, 19 May 2025

08:00 *BREAKFAST*

09:00 – 09:10	Elke Scheer Christoph Strunk Wolfgang Belzig	Opening & Welcome words
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09:10 – 09:50	Jeong Min Park	Simultaneous transport and spectroscopy of moiré graphene
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09:50 – 10:30	Deividas Sabonis	Continuous monitoring of parity-flips in a planar superconducting island
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10:30 – 11:00 *COFFEE BREAK*

11:00 – 11:40	Benjamin Sacepe	Superfluid density near the superconductor-insulator transition
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11:40 – 12:20	Beena Kalisky	Imaging Quantum Materials
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12:20 – 12:25 ***Conference Photo***

12:25 – 14:30 *LUNCH*

Program

Monday, 19 May 2025

14:30 – 15:10	Leonid Glazman	Microwave Spectroscopy of Schmid Transition and Theory of Quantum-Limited Dual Shapiro Steps
15:10 – 15:35	Philippe Joyez	Why the Schmid transition does not exist
15:35 – 16:00	<i>COFFEE BREAK</i>	
16:00 – 16:40	Sebastián Díaz	Engineering the topological landscape in magnet- superconductor heterostructures
16:40 – 18:30	<i>Poster Session I</i>	
18:30 – 20:00	<i>DINNER</i>	
20:00	Claudia Felser	Superconductivity, flatbands, topology, and beyond

Program

Tuesday, 20 May 2025

08:00	<i>BREAKFAST</i>	
09:00 – 09:40	Landry Bretheau	Superconducting Quantum Devices with Ultraclean Carbon Nanotubes
09:40 – 10:05	Maciej Zgirski	A single superconducting vortex on a leash
10:05 – 10:30	Lucia Vigliotti	Nonequilibrium plasmon fluid in a Josephson junction chain
10:30 – 10:45	Scientific Organizers	Video “About the Wilhelm and Else Heraeus Foundation”
10:45 – 11:10	<i>COFFEE BREAK</i>	
11:10 – 11:50	Ambroise Peugeot	Two-tone Josephson Spectroscopy
11:50 – 12:30	Uri Vool	Hybrid circuits with van-der-Waals cuprate superconductors
12:30 – 14:30	<i>LUNCH</i>	
14:30 – 15:10	Milena Grifoni	Friedel oscillations and chiral superconductivity in monolayer NbSe₂
15:10 – 15:35	Hadar Steinberg	Thickness effects in superconducting TMDs
15:35 – 16:00	<i>COFFEE BREAK</i>	
16:00 – 16:40	Audrey Cottet	A hybrid cavity-magnon-quantum circuit platform for axion dark matter detection
16:40 – 17:05	Julien Basset	Photoelectric detection of single microwave photons in a granular aluminum high-impedance quantum circuit
17:05 – 17:30	Aleksandr Svetogorov	Theory of three-terminal Andreev spin qubits
18:30	<i>HERAEUS DINNER (social event with cold & warm buffet with complimentary drinks)</i>	

Program

Wednesday, 21 May 2025

08:00	<i>BREAKFAST</i>	
09:00 – 09:40	Dmitri Efetov	Strongly correlated topological flat bands in the novel class of moiré materials
09:40 – 10:20	Tristan Cren	Misfit compounds as a platform for engineering doping, charge density waves and Ising superconductivity
10:20 – 10:45	Samy Annabi	Non-local Josephson effect in ultraclean carbon nanotube-based junctions
10:45 – 11:10	<i>COFFEE BREAK</i>	
11:10 – 11:50	Nicolas Roch	Josephson meta-materials: a new platform for quantum optics
11:50 – 12:30	Floriana Lombardi	Nanostructured substrate control of Quantum Phases in Ultrathin YBCO films: Enhanced Superconductivity and novel Emergent Orders
12:30 – 14:30	<i>LUNCH</i>	
14:30 – 15:10	Chuan Li	Revealing Higher-order topological states in $\text{Bi}_{1-x}\text{Sb}_x$ ($x=3\%$) revealed by Josephson current
15:10 – 15:35	Ruben Seoane Souto	Majorana states in quantum dot systems
15:35 – 16:00	<i>COFFEE BREAK</i>	
16:00 – 16:25	Alexandre Buzdin	Magnetoelectric and photogalvanic effects in the helical state of a superconductor/ferromagnet bilayer
16:25 – 16:50	Lea Pfaffinger	Finite-size effects in the vicinity of the BKT transition
16:50 – 18:30	<i>Poster Session II</i>	
18:30	<i>DINNER AND GET-TOGETHER</i>	

Program

Thursday, 22 May 2025

08:00	<i>BREAKFAST</i>	
09:00 – 09:40	Rais Shaikhaidarov	Current quantization in small Josephson junctions due to synchronization of Bloch oscillations with microwave
09:40 – 10:20	Dhavala Suri	Interface Driven Superconducting Diode Effect in Proximity Coupled All Metallic Planar Josephson Junctions
10:20 – 10:45	Danilo Nikolic	Spin-resolved Josephson diode effect in strongly spin-polarized magnetic materials
10:45 – 11:10	<i>COFFEE BREAK</i>	
11:10 – 11:35	Denis Kochan	Magnetoelectric phenomena of non-centrosymmetric superconductors – supercurrent diode effect and anisotropic vortex squeezing
11:35 – 12:00	Szabolcs Csonka	Realization of basic types of Andreev-molecules
12:00 – 12:30	<i>Poster Award</i>	
12:30 – 13:30	<i>LUNCH</i>	

End of the seminar and departure

NO DINNER for participants leaving on Friday however, a self-service breakfast will be provided on Friday morning