

Novel Quantum Phases in Superconducting Heterostructures

769. WE-Heraeus-Seminar

30 May - 02 Jun 2022

**Hybrid at the Physikzentrum Bad
Honolf/Germany**

**WILHELM UND ELSE
HERAEUS-STIFTUNG**



Program

Sunday, 29 May 2022

17:00 – 21:00 Registration

From 18:30 BUFFET SUPPER / Informal get together

Monday, 30 May 2022

08:00 BREAKFAST

08:50 – 09:00 Scientific Organizers Opening remarks

09:00 – 09:40 Katharina Franke Quantum spins and hybridization in artificially-constructed chains of magnetic adatoms on superconducting 2H-NbSe₂

09:40 – 10:20 Sebastian Bergeret Magnetoelectric effects and non-reciprocal transport in superconducting systems with spin-orbit coupling and spin-splitting fields

10:20 – 10:45 Saulius Vaitiekėnas Semi-super-ferro hybrids: A new platform for unconventional superconductivity

10:45 – 11:10 COFFEE BREAK

11:10 – 11:50 Ewelina Hankiewicz Thermal versus electric response of superconducting topological materials; are Majorana states more widespread than expected?

11:50 – 12:30 Alexandra Palacio Morales Misfit Layer Compounds: A Platform for Heavily Doped 2D Transition Metal Dichalcogenides

12:30 LUNCH

Program

Monday, 30 May 2022

14:30 – 15:10	Alexander Buzdin	Spontaneous currents and vortex generation at S/F interfaces
15:10 – 15:35	Denis Kochan	Anisotropic vortex squeezing in Rashba superconductors: a manifestation of Lifshitz invariants
15:35 – 16:00	<i>COFFEE BREAK</i>	
16:00 – 16:40	Dimitri Roditchev	Resonant transmission of Josephson current in Nb-Bi₂Te_{2.3}Se_{0.7}-Nb junctions via Andreev bound states
16:40 – 17:20	Beena Kalisky (online)	Hidden magnetism and spontaneous vortices in 4Hb-TaS₂
17:20 – 17:35	Stefan Jorda	About the Wilhelm and Else Heraeus Foundation
17:35 – 19:35	Poster Session I	
19:40	<i>HERAEUS DINNER at the Physikzentrum (cold & warm buffet, with complimentary drinks)</i>	

Program

Tuesday, 31 May 2022

08:00	<i>BREAKFAST</i>	
09:00 – 09:40	Julia Meyer	Diode effect in topological Josephson junctions
09:40 – 10:20	Landry Bretheau	Weyl Josephson Circuits
10:20 – 10:45	Julien Basset	Gate-assisted phase fluctuations in all-metallic Josephson junctions
10:45 – 11:10	<i>COFFEE BREAK</i>	
11:10 – 11:50	Sophie Gueron	Signatures of Higher Order Topology in Bismuth-based Josephson Junctions
11:50 – 12:30	Angelo Di Bernardo	Spectroscopic evidence for unconventional superconducting and magnetic states
12:30	<i>LUNCH</i>	
14:30 – 15:10	Charis Quay	Tunnelling spectroscopy of few-monolayer NbSe₂ in high magnetic field: Ising protection and triplet superconductivity
15:10 – 15:35	Yoichi Ando	Proximity-induced superconductivity in bulk-insulating topological insulators
15:35 – 16:00	<i>COFFEE BREAK</i>	

Program

Tuesday, 31 May 2022

16:00 – 16:40	Patrik Recher	Transport signatures of Majorana edge modes in two-dimensional topological insulator - chiral topological superconductor junctions
16:40 – 17:05	Magdalena Marganska	Two-gap Ising superconductivity from Coulomb interactions in monolayer NbSe₂
17:05 – 17:30	Hannes Weisbrich	Higher-dimensional topological states of matter in superconducting systems
18:00	<i>DINNER</i>	
20:00 – 20:50	Silke Bühler-Paschen	Strange metal behavior and unconventional superconductivity in heavy fermion compounds and beyond

Program

Wednesday, 1 June 2022

08:00	<i>BREAKFAST</i>	
09:00 – 09:40	Jacob Linder (online)	Breaking the Clogston-Chandrasekhar limit via flat bands and giant anisotropy in antiferromagnetic Josephson junctions
09:40 – 10:20	Hugues Pothier	Signatures of interactions in the Andreev spectrum of nanowire superconducting weak links
10:20 – 10:45	Igor Zutic	Enhanced Spin-Triplet Superconductivity: From Spintronics to Majorana States
10:45 – 11:10	<i>COFFEE BREAK</i>	
11:10 – 11:50	Chiara Ciccarelli	Spin transport in a conventional superconductor
11:50 – 12:30	Mario Cuoco	Electric field effects on superconductors: π-pairing, orbital vortex phases and novel phenomena
12:30	<i>LUNCH</i>	
14:30 – 15:10	Jaroslav Fabian	Spin physics in superconducting junctions
15:10 – 15:35	Simon Reinhardt	Supercurrent diode and magnetochiral effects in symmetric Josephson junctions
15:35 – 16:00	<i>COFFEE BREAK</i>	
16:00 – 16:40	Jagadeesh Moodera (online)	Superconductor Heterostructures Displaying Unusual Behavior
16:40 – 17:20	Peter Makk	Superconductivity in double nanowires: Cooper pair splitting and Andreev molecule
17:20 – 19:20	Poster Session II	
19:30	<i>DINNER</i>	

Program

Thursday, 2 June 2022

08:00	<i>BREAKFAST</i>	
09:00 – 09:40	Juan Carlos Cuevas	Recent developments in the understanding of Yu-Shiba-Rusinov bound states
09:40 – 10:20	Francesco Giazotto	The T-SQUIPT: Thermal Superconducting Quantum Interference Proximity Transistor
10:20 – 10:45	Léo Peyruchat	Topological phenomena in Josephson tunnel junction circuits
10:45 – 11:10	<i>COFFEE BREAK</i>	
11:10 – 11:50	Bayan Karimi	Ultrasensitive thermal detection by a proximitized nano-calorimeter in superconducting quantum circuits
11:50 – 12:30	Bertrand Reulet	Observation of microwave Higgs-Anderson modes in superconducting Titanium nanostructures
12:30 – 12:40	Scientific Organizers	Closing remarks and poster awards
12:40	<i>LUNCH</i>	

End of seminar and departure