

Interfacing Low and High-Energy Physics with Topological Matter

797. WE-Heraeus-Seminar

15 Oct - 18 Oct 2023

at the Physikzentrum Bad Honnef, Germany

The WE-Heraeus Foundation supports research and education in science, especially in physics.
The Foundation is Germany's most important private institution funding physics.

**WILHELM UND ELSE
HERAEUS-STIFTUNG**



Program

Sunday, 15 October 2023

16:00 – 20:00 **Registration**

From 17:30 *BUFFET SUPPER*

18:45 – 19:00 Scientific organizers **Opening and Welcome**

Session: Topological phenomena I

19:00 – 19:45 Ivo Souza **Multipole theory of optical spatial dispersion in crystals**

19:45 – 20:30 Yang Qun **Monopole-like orbital-momentum locking and the induced orbital transport in topological chiral semimetals**

20:30 **Informal get together**

Monday, 16 October 2023

08:00 *BREAKFAST*

Session: Topological (meta) materials I

09:00 – 09:45 Andrew Boothroyd **Topological electronic states induced by helimagnetic order**

09:45 – 10:30 Chiara Devescovi **Axion topology in photonic crystal domain walls**

10:30 – 11:00 *COFFEE BREAK*

Session: Topological Transport I

11:00 – 11:45 Claudia Felser **Chirality and Topology**

Program

Monday, 16 October 2023

11:45 – 12:30	David Carpentier	From black hole's atmosphere to thermal quenches: probing the gravitational anomaly in quantum materials
12:30	<i>LUNCH</i>	
14:00 – 14:45	Bernd Gotsmann	Transport in the topological semimetal CoSi: From chiral transport to technological applications
14:45 – 15:30	Zengwei Zhu	Anomalous transverse thermal and thermoelectric response in topological magnets
15:30 – 16:00	<i>COFFEE BREAK</i>	
Session: Topological Transport II		
16:00 – 16:45	Philip Moll	Correlated order at the tipping point in the kagome metal CsV₃Sb₅
16:45 – 17:30	Stanislaw Galeski	Electrons, phonons and quantum anomalies: thermal transport and sound propagation in relativistic semimetals
17:30 – 17:45	Corentin Morice	Gravitational horizons in quantum matter
17:45 – 18:00	David Rodríguez	Couette and Poiseuille hydrodynamic fluid flows through a stable and causal hydrodynamic formulation
18:00 – 18:15	Daniel Varjas	Weyl node merging in symmetric crystals
18:15 – 18:30	Enriquo Rico	Two-way communication between high-energy physics and (topological) quantum matter
18:30 – 18:45	Stefan Jorda	About the Wilhelm and Else Heraeus Foundation
19:00	<i>DINNER</i>	

Program

Tuesday, 17 October 2023

08:00 *BREAKFAST*

Session: QFT I

09:00 – 09:45 Roni Ilan **Anomalous wave-packet dynamics in non-Hermitian systems**

09:45 – 10:30 Alexander Altland **Fragility of spectral flow in topological insulators**

10:30 – 11:00 *COFFEE BREAK*

Session: QFT II

11:00 – 11:45 Johanna Erdmenger **Hydrodynamics in strongly correlated kagomé metals**

11:45 – 12:30 Karl Landsteiner **Black Hole Quantum Matter**

12:30 *LUNCH*

Session: Topology and correlations

14:00 – 14:45 Ana Akrap **Physics in high magnetic fields: Landau level spectroscopy of topological semimetals**

14:45 – 15:30 Silke Buehler-Paschen **Strongly correlated topological semimetals**

15:30 – 16:00 *COFFEE BREAK*

16:00 – 17:30 **Poster session**

17:30 – 18:15 Joel Moore **Connecting ground states with intermediate-frequency behavior in topological materials**

18:15 – 18:30 Mikel Iraola Iñurrieta **Cummulative topology for heavy fermion insulators by means of topological quantum chemistry**

18:30 – 18:45 Gunnar Felix Lange **Projected spin textures as a bulk signature of fragile topology**

19:00 **HERAEUS DINNER**
(social event with cold & warm buffet with complimentary drinks)

Program

Wednesday, 18 October 2023

08:00 *BREAKFAST*

Session: Topology phenomena II

09:00 – 09:45 Inti
 Sodemann Villadiego

The Floquet Fermi Liquid

09:45 – 10:30 Duncan Haldane

Geometry of the Quantum Hall Effect

10:30 – 11:00 *COFFEE BREAK*

11:00 – 11:15 Federico Balduini

**Probing the Fermi surface of Weyl
semimetals using Transverse Electron
Focusing**

11:15 – 11:30 Julia Hannukainen

**Electric manipulation of domain walls in
magnetic Weyl semimetals via the axial
anomaly**

11:30 – 12:00 **Discussions**

12:00 – 12:15 Scientific organizers

Poster Prize Awards & Closing Remarks

12:15 – 14:00 *LUNCH*

End of the seminar and departure