

# YOUNG RESEARCH LEADERS GROUP WORKSHOP

## PROGRAM

SP/CE



### INVITED SPEAKERS:

Dmitry Abanin (Perimeter)  
Anton Akhmerov (Deift)  
Ophir Auslaender (Technion)  
Dmitry Bagrets (Cologne)  
Erez Berg (Weizmann)  
Eldad Bettelheim (Hebrew)

Cory Dean (Columbia)  
Maxim Dzero (Kent)  
Aaron Finck (UIUC)  
Matt Foster (Rice)  
Ion Garate (Sherbrooke)  
Shahal Ilani (Weizmann)  
Maxim Khodas (Hebrew)

Markus Koenig (Dresden)  
Vlad Manucharyan (Maryland)  
Karen Michaeli (Weizmann)  
Tobias Micklitz (Rio)  
Stevan Nadj-Perge (Princeton)  
Dima Pesin (Utah)  
Johannes Pollanen (Caltech)

Vlad Priblag (U Minnesota)  
Mark Rudner (Copenhagen)  
Thomas Schmidt (Luxemburg)  
Eran Sela (Tel Aviv)

The Sp/CE Phenomena Interdisciplinary Center aims to bring together scientists from diverse disciplines and of varying seniority in the broad area of spin-related research. Its goal is to break down scientific barriers and foster emergent areas of research that combine the strengths of different fields.

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## Junior Research Leaders Workshop 03-14 August 2015



**Location:** Kloster Johannisberg,  
Badpfad 1, 65366 Geisenheim-Johannisberg, Germany  
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# Program

(tutorial-talk= 65 minutes+10 minute questions; talk=35 minutes+5 minute questions)

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## Monday 3 August

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### Majorana Fermions and Topological Insulators

08:30-08:45 *Registration*

08:45-09:00 *Welcome and opening comments*

09:00-10:15 **Anton Akhmerov (tutorial-talk)**, Delft University - *Majoranas and their use for quantum computation*

10:15-10:55 **Stevan Nadj-Perge (talk)**, Princeton - *Majorana bound states in ferromagnetic atomic chains on a superconductor*

10:55-11:30 *Discussion and Coffee Break*

11:30-12:10 **Markus Koenig (talk)**, Dresden - *Local probing of the Quantum Spin Hall state*

12:10-14:00 *Lunch Break*

14:30-15:10 **Vlad Pribiag (talk)**, University of Minnesota- *2D topological insulators-hybrid superconducting devices*

15:10-15:50 **Ion Garate (talk)**, Sherbrooke - *Interplay between electronic band topology and phonons in Dirac materials*

18:00-21:00 *Dinner at Kloster Johannisberg*

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## Tuesday 4 August

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### Nanowires, Edge States and 2D Systems

09:00-10:15 **Eran Sela (tutorial-talk)**, Tel Aviv - *New perspectives from coupled wire construction: fractional topological insulators and quantum spin liquids*

10:15-10:55 **Andrea Young (talk)**, UCSB - *Topological edge states in graphene heterostructures*

10:55-11:30 *Discussion and Coffee Break*

**11:30-12:10** *Cory Dean (talk), Columbia University - Hofstadter's butterfly in the strongly interacting regime*

**12:10-14:00** *Lunch Break*

**14:30-15:10** *Thomas Schmidt (talk), University of Luxembourg - Spin-charge coupling in correlated one-dimensional quantum systems*

**15:10-15:50** *Johannes Pollanen (talk) Caltech – Engineering Quantum Matter: from superfluids to low-dimensional electrons*

**18:00-21:00** *Dinner at Kloster Johannisberg*

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## Wednesday 5 August

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### Unconventional Superconductivity

**09:00-10:15** *Maxim Khodas (tutorial-talk), Hebrew University of Jerusalem - Raman spectroscopy as a probe of electron correlations*

**10:15-10:55** *Ophir Auslaender (talk), Technion, Israel Institute of Technology - Local characterization of superconductivity in iron-pnictides*

**10:55-11:30** *Discussion and Coffee Break*

**11:30-12:10** *Shahal Ilani (talk), Weizmann - Attraction by repulsion: pairing electrons using electrons*

**12:10-14:00** *Lunch Break*

**14:30-15:10** *Karen Michaeli (talk), Weizmann- Superconductivity with spin-orbit interaction*

**15:10-15:50** *Katja Nowack (talk), Cornell - Magnetic imaging of quantum materials*

**15:50-16:30** *Coffee Break*

**16:30-18:00** *Sami Mitra (colloquium), Physical Review Letters - Colloquium: PRL Today*

**18:00-21:00** *Dinner at Kloster Johannisberg*

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## Thursday 6 August

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### Dirac Materials and Weyl Semimetals

- 09:00-10:15** *Matt Foster (tutorial-talk), Rice – A 3D version of the IQHE: universal spin and heat transport at the surface of a topological superconductor*
- 10:15-10:55** *Dima Pesin (talk), Utah – Physics of Weyl Semimetals*
- 10:55-11:30** *Discussion and Coffee Break*
- 11:30-12:10** *Maxim Dzero (talk), Kent State University - Topological Insulators driven by an electron spin*
- 12:10-14:00** *Lunch Break*
- 14:30-15:10** *Aaron Finck (talk), UIUC - Phase coherent transport in hybrid superconductor-topological insulator devices*
- 15:10-15:50** *Mark Rudner (talk), Copenhagen - Topology in periodically driven systems*
- 18:00-21:00** *Dinner at Schloß Vollrads (conference dinner)*

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## Friday 6 August

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### Disordered, Nonequilibrium Systems and Quantum Circuits

- 09:00-10:15** *Tobias Micklitz (tutorial-talk), Rio - Anderson localization with cold atoms*
- 10:15-10:55** *Dima Abanin (talk), Perimeter Institute for Theoretical Physics - Many Body Localization and periodically driven systems*
- 10:55-11:30** *Discussion and Coffee Break*
- 11:30-12:10** *Eldad Bettelheim (talk), Racah Institute of Physics, Hebrew University of Jerusalem - Bethe Ansatz - developments and applications*
- 12:10-14:00** *Lunch Break*
- 14:30-15:10** *Vlad Manucharyan (talk), Maryland - Towards ultrastrong light-matter interaction in Josephson circuits*

**15:10-15:50 Erez Berg (talk), Weizmann Institute of Science – Anyonic defects:  
a new paradigm for non-Abelian statistics**

**18:00-21:00 Dinner in Mainz**