pcs Center for Theoretical Physics of Complex Systems

ibs Institute for Basic Science

International Workshop

Quantum Information and Correlation in Quantum Dots

August 13 — 17, 2018

Program

Monday, August 13

09:50 – 10:30 Registration & Poster session preparation

10:30 – 10:40 Sergej Flach, PCS IBS
Opening address

10:40 – 11:20 Yuval Oreg, Weizmann Institute of Science, Israel
Spin liquids from Majorana zero modes in a network of Cooper boxes

11:20 – 12:00 Heung-Sun Sim, KAIST, Korea
Kondo effects in a quantum dot: Kondo cloud and entanglement

12:00 – 13:00 Lunch

13:00 – 13:30 Discussions

13:30 – 14:10 Satoru Miyamoto, Keio University, Japan
Silicon isotope engineering for quantum information processing

14:10 – 14:50 Nodar Samkharadze, Delft Univ. of Technology, Netherlands
Strong spin-photon coupling in silicon

14:50 – 16:40 Coffee break & Discussions

16:40 – 17:20 Guo-Ping Guo, Univ. of Science and Tech. of China, China
Fast quantum control in gate-defined semiconductor quantum dots

17:20 – 18:00 Dohun Kim, Seoul National University, Korea
Quantum manipulation of individual spins in artificial and natural quantum dots

18:00 – 20:00 Welcome reception

Tuesday, August 14

09:30 – 10:10 Klaus Ensslin, ETH Zurich, Switzerland
Strong coupling of a microwave photon to spin and charge qubits in GaAs quantum dots

10:10 – 10:30 Workshop picture

10:30 – 11:00 Coffee break

11:00 – 11:20 Ivan Borzenets, City University of Hong Kong, China
Direct measurement on the Kondo cloud length in a quantum dot coupled to a 1D Fabry-Perot interferometer

11:20 – 12:00 Leonid Rokhinson, Purdue University, USA
Development of quantum Hall - based platforms to realize high order non-Abelian excitations

12:00 – 13:00 Lunch

13:00 – 13:30 Discussions

13:30 – 14:10 David Goldhaber-Gordon, Stanford University, USA
Emergent symmetries and quantum phase transitions in quantum impurities built from quantum dots

14:10 – 14:50 Gleb Finkelstein, Duke University, USA
Quantum critical behavior and Majorana fermions in a resonant level coupled to a dissipative environment

14:50 – 15:40 Coffee break & Discussions

15:40 – 16:20 Frédéric Pierre, CNRS C2N, France
Tunable quantum criticality and super-ballistic transport in a 'charge' Kondo circuit

16:20 – 17:00 Eran Sela, Tel Aviv University, Israel
Charge fractionalization in the two-channel Kondo model

17:00 – 18:00 Poster session

18:00 – 20:00 Poster session dinner

Wednesday, August 15

09:30 – 10:10 Seigo Tarucha, University of Tokyo, Japan
QND spin readout and cohorent entanglement transfer with a triple quantum dot

10:10 – 10:40 Coffee break

10:40 – 11:20 Yunchul Chung, Pusan National University, Korea
Electron interactions in triple quantum dots

11:20 – 12:00 Sven Rogge, University of New South Wales, Australia
Engineered Hamiltonians for strongly correlated fermions

12:00 – 19:00 Excursion

lunch
Magoksa (마곡사) temple area
Gongsanseong (공산성) fortress area
Gongju (공주) museum
Gongju (공주) traditional hanok village
optionally: fan crafting experience

19:00 – 21:00 Workshop banquet

Thursday, August 16

09:50 – 10:30 Felix von Oppen, Freie Universität Berlin, Germany
Quantum computation with Majorana fermion codes

10:30 – 11:00 Coffee break

11:00 – 11:20 Jukka Vaeyrynen, Microsoft Station Q, Santa Barbara, USA
Microscopic model of Coulomb blockaded multi-Majorana island

11:20 – 12:00 Mahn-Soo Choi, Korea University, Korea
Topological classification of quantum states of bosons

12:00 – 13:00 Lunch

13:00 – 13:30 Discussions

13:30 – 14:10 Björn Trauzettel, University of Würzburg, Germany
Fractional excitations at the helical edge

14:10 – 14:50 Matthieu Delbecq, Pierre and Marie Curie University, France
Synthetic spin orbit interaction for Majorana devices

14:50 – 16:30 Coffee break & Discussions

16:30 – 17:10 Jens Bardarson, KTH Royal Institute of Technology, Sweden
Probing Majorana zero modes in topological insulator nanowires

17:10 – 17:50 Yong-Joo Doh, GIST, Korea
Quantum electronic transport in topological insulator nanoribbons

17:50 – 18:50 Dinner

Friday, August 17

09:50 – 10:30 David Franke, Delft University of Technology, Netherlands
Gate-controlled quantum dots and superconductivity in planar germanium

10:30 – 11:00 Coffee break

11:00 – 11:20 Minkyung Jung, DGIST, Korea
Quantum dots formed in three-dimensional Dirac semimetal Cd3As2 nanowires

11:20 – 12:00 Gil-Ho Lee, POSTECH, Korea
Correlated Andreev pairs under magnetic field in graphene

12:00 – 13:00 Lunch

13:00 – 13:30 Discussions

13:30 – 14:10 Hee Chul Park, PCS IBS
Quantum transport of Dirac particle through graphene quantum dot based on quantum Hall effect

14:10 – 14:50 Robert Shekhter, University of Gothenburg, Sweden
Spin-active mesoscopic weak links

14:50 – 15:10 Closing remarks

15:10 – 15:40 Coffee break & Poster removal