

# Cool Electrons in Flatlands

An international workshop: Catania (Italy), June 15-19 & June 22-24, 2020

## MONDAY 15 JUNE 2020 (times are CEST = UTC+2)

Pasadena (-9), New York (-6), Sao Paulo (-5), Rehovot (+1), Yekaterinburg (+3), Novosibirsk (+5), Beijing (+6), Tokyo (+7)

14:30 *Connecting to "Teams" and getting ready*

14:45 *Welcome and opening remarks*

**Session 15.A. Chair: Aron Pinczuk (Columbia University, New York, US)**

**Co-chair: Sergei Studenikin (NRC of Canada, Ottawa, CA)**

**15:00 Klaus von Klitzing (Max-Planck-Institut für Festkörperforschung, Stuttgart, DE)**

*40 years of Quantum Hall effect*

**15:30 Ilaria Zardo (Universität Basel, Basel, CH)**

*Thermal transport at the nanoscale*

**16:00 Liliana Arrachea (International Center for Advanced Studies, Buenos Aires, AR)**

*Phononless high-performance thermoelectricity in quantum-Hall Corbino structures*

16:30 *break and discussions*

**Session 15.B. Chair: Amir Yacoby (Harvard University, Cambridge, US)**

**Co-chair: Sergei Studenikin (NRC of Canada, Ottawa, CA)**

**16:45 Jim Eisenstein (California Institute of Technology, Pasadena, US)**

*Precursors to exciton condensation in quantum Hall bilayers*

**17:15 Philip Kim (Harvard University, Cambridge, US)**

*Interlayer excitons in Van der Waals heterostructures*

**17:45 Bert Halperin (Harvard University, Cambridge, US)**

*Fractional quantized Hall effects in Coulomb-coupled graphene layers*

18:15 *discussions*

18:30 *workshop ends for today*

Chairmen: G. G. N. Angilella (DFA.UniCT, Catania, IT), S.Studenikin (NRC-CNRC, Ottawa, CA), M. Zudov (U. of Minnesota, Minneapolis, US)  
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## TUESDAY 16 JUNE 2020 (times are CEST = UTC+2)

Pasadena (-9), New York (-6), Sao Paulo (-5), Rehovot (+1), Yekaterinburg (+3), Novosibirsk (+5), Beijing (+6), Tokyo (+7)

**Session 16.A. Chair: Elisabetta Paladino (Università degli Studi di Catania, Catania, IT)**

**Co-chair: Joe Falson (California Institute of Technology, Pasadena, US)**

**15:00 Akira Fujiwara (Nippon Telegraph and Telephone Basic Research Labs, Atsugi, JP)**

*Fast electron dynamics in a silicon dynamic quantum dot*

**15:30 Francesco Pellegrino (Università degli Studi di Catania, Catania, IT)**

*1/f critical current noise in short ballistic graphene Josephson junctions*

**16:00 Gaetano Calogero (Università di Pisa, Pisa, IT)**

*Electron transport in nano-porous flatland: a multi-scale simulation study*

**16:30 *break and discussions***

**Session 16.B. Chair: Ray Ashoori (MIT, Cambridge, US)**

**Co-chair: Joe Falson (California Institute of Technology, Pasadena, US)**

**16:45 Alexei Chepelianskii (Laboratoire de Physique des Solides, Université Paris-Saclay, Orsay, FR)**

*Coupled pair of one and two dimensional magneto-plasmons on electrons on helium*

**17:15 Erik Henriksen (Washington University in Saint Louis, Saint Louis, US)**

*Cyclotron resonance spectroscopy of broken symmetry states in monolayer graphene*

**17:45 Sergey Ganichev (Universität Regensburg, Regensburg, DE)**

*Edge photocurrents driven by THz electric field in graphene*

**18:15 *discussions***

**18:30 *workshop ends for today***

Chairmen: G. G. N. Angilella (DFA.UniCT, Catania, IT), S. Studenikin (NRC-CNRC, Ottawa, CA), M. Zudov (U. of Minnesota, Minneapolis, US)  
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## WEDNESDAY 17 JUNE 2020 (times are CEST = UTC+2)

Pasadena (-9), New York (-6), Sao Paulo (-5), Rehovot (+1), Yekaterinburg (+3), Novosibirsk (+5), Beijing (+6), Tokyo (+7)

### Session 17.A. Chair: Mitali Banerjee (EPFL, Lausanne, CH)

Co-chair: Chi Zhang (SKLSM, Institute of Semiconductors, CAS, Beijing, CN)

**15:00 Denis Maryenko (RIKEN Center for Emergent Matter Science, Wako, JP)**

*Spin-orbit coupling effect in high mobility ZnO structures*

**15:30 Evgeny Sherman (University of the Basque Country, Bilbao, ES)**

*Spin and charge dynamics in 2D electron systems with random spin-orbit coupling*

**16:00 Mike Manfra (Purdue University, West Lafayette, US)**

*Aharonov-Bohm interference of fractional quantum Hall edge modes*

**16:30 *break and discussions***

### Session 17.B. Chair: Francesco Pellegrino (Università degli Studi di Catania, Catania, IT)

Co-chair: Chi Zhang (SKLSM, Institute of Semiconductors, CAS, Beijing, CN)

**16:45 Bob Willett (Nokia Bell Labs, Murray Hill, US)**

*Interference measurements of fermionic parity at  $5/2$  and  $7/2$  filling factors*

**17:15 Mansour Shayegan (Princeton University, Princeton, US)**

*Bloch ferromagnetism of composite fermions*

**17:45 Rui-Rui Du (International Center for Quantum Materials, Peking University, Beijing, CN)**

*Anomalous conductance oscillations in a quantum spin Hall insulator*

**18:15 Amir Yacoby (Harvard University, Cambridge, US)**

*Magnons in quantum Hall ferromagnets*

**18:45 *discussions***

**19:00 *workshop ends for today***

Chairmen: G. G. N. Angilella (DFA.UniCT, Catania, IT), S. Studenikin (NRC-CNRC, Ottawa, CA), M. Zudov (U. of Minnesota, Minneapolis, US)  
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## THURSDAY 18 JUNE 2020 (times are CEST = UTC+2)

Pasadena (-9), New York (-6), Sao Paulo (-5), Rehovot (+1), Yekaterinburg (+3), Novosibirsk (+5), Beijing (+6), Tokyo (+7)

**Session 18.A. Chair: Oleg Raichev (ISP, NASU, Kyiv, UA)**

**Co-chair: Mads Brandbyge (Technical University of Denmark, Lyngby, DK)**

**15:00 Chi Zhang (SKLSM, Institute of Semiconductors, CAS, Beijing, CN)**

*Quantum capacitance anomalies of 2D non-equilibrium states*

**15:30 Grisha Minkov (Ural Federal University, Ekaterinburg, RU)**

*Magneto-intersubband oscillations in 2D systems with strong spin-orbit splitting*

**16:00 Sergey Vitkalov (City University of New York, New York, US)**

*Anomalous decay of quantum resistance oscillations of 2D helical electrons in magnetic field*

**16:30 break and discussions**

**Session 18.B. Chair: Rui-Rui Du (ICQM, Peking University, Beijing, CN)**

**Co-chair: Mads Brandbyge (Technical University of Denmark, Lyngby, DK)**

**16:45 Michel Dyakonov (Université de Montpellier, Montpellier, FR)**

*Gated two-dimensional electron gas in magnetic field: nonlinear versus linear regimes*

**17:15 Mark Greenaway (Loughborough University, Loughborough, UK)**

*Magnetophonon resonance oscillations in graphene: a spectroscopic probe of Dirac fermion-phonon interactions*

**17:45 Oleg Raichev (Institute of Semiconductor Physics, NASU, Kyiv, UA)**

*Effect of Berry phase on nonlinear response of 2D fermions in magnetic field*

**18:15 Ivan Dmitriev (Universität Regensburg, Regensburg, DE)**

*MIR0 in graphene*

**18:45 discussions**

**19:00 workshop ends for today**

Chairmen: G. G. N. Angilella (DFA.UniCT, Catania, IT), S. Studenikin (NRC-CNRC, Ottawa, CA), M. Zudov (U. of Minnesota, Minneapolis, US)  
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## FRIDAY 19 JUNE 2020 (times are CEST = UTC+2)

Pasadena (-9), New York (-6), Sao Paulo (-5), Rehovot (+1), Yekaterinburg (+3), Novosibirsk (+5), Beijing (+6), Tokyo (+7)

**Session 19.A. Chair: Gaetano Calogero (Università di Pisa, Pisa, IT)**

**Co-chair: Erik Henriksen (Washington University in Saint Louis, Saint Louis, US)**

**15:00 Mads Brandbyge (Technical University of Denmark, Lyngby, DK)**

*Towards covalent carbon circuitry: Lessons from multi-scale first principles simulations*

**15:30 Klaus Ensslin (Eidgenössische Technische Hochschule Zürich, Zürich, CH)**

*Mind the gap: bilayer graphene*

**16:00 Leonid Rokhinson (Purdue University, West Lafayette, US)**

*Helical channels in the fractional quantum Hall regime*

**16:30 *break and discussions***

**Session 19.B. Chair: Philip Kim (Harvard University, Cambridge, US)**

**Co-chair: Erik Henriksen (Washington University in Saint Louis, Saint Louis, US)**

**16:45 Boris Shklovskii (University of Minnesota, Minneapolis, US)**

*QHE Stripes at 25: Hunt for hidden stripes*

**17:15 Benedikt Friess (Max-Planck-Institut für Festkörperforschung, Stuttgart, DE)**

*Inhomogeneous phases in the quantum Hall regime probed by surface acoustic waves*

**17:45 Michael Zudov (University of Minnesota, Minneapolis, US)**

*Anomalous nematic states in half-filled Landau levels*

**18:15 Loren Pfeiffer (Princeton University, Princeton, US)**

*Achievement of a new higher electron mobility plateau for GaAs quantum wells*

**18:45 *discussions***

**19:00 *workshop ends for today, see you next week***

Chairmen: G. G. N. Angilella (DFA.UniCT, Catania, IT), S. Studenikin (NRC-CNRC, Ottawa, CA), M. Zudov (U. of Minnesota, Minneapolis, US)  
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# Cool Electrons in Flatlands

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## MONDAY 22 JUNE 2020 (times are CEST = UTC+2)

Pasadena (-9), New York (-6), Sao Paulo (-5), Rehovot (+1), Yekaterinburg (+3), Novosibirsk (+5), Beijing (+6), Tokyo (+7)

**Session 22.A. Chair: Jan Kycia (University of Waterloo, Waterloo, CA)**

**Co-chair: Evgeny Sherman (University of the Basque Country, Bilbao, ES)**

**15:00 Shiro Saito (Nippon Telegraph and Telephone Basic Research Labs, Atsugi, JP)**

*Electron spin resonances detected by superconducting circuits*

**15:30 Grazia Salerno (Université Libre de Bruxelles, Brussels, BE)**

*Quantized Hall conductance of a single atomic wire: a proposal based on synthetic dimensions*

**16:00 Sergei Studenikin (National Research Council of Canada, Ottawa, CA)**

*Hyperfine effects in hole GaAs/AlGaAs structures probed by EDSR measurements in a double quantum dot device*

**16:30 *break and discussions***

**Session 22.B. Chair: Dieter Weiss (Universität Regensburg, Regensburg, DE)**

**Co-chair: Evgeny Sherman (University of the Basque Country, Bilbao, ES)**

**16:45 Eli Zeldov (Weizmann Institute of Science, Rehovot, IL)**

*Mapping the twist-angle disorder and unconventional Landau levels in magic angle graphene*

**17:15 Joe Falson (California Institute of Technology, Pasadena, US)**

*Low density, high mobility oxide heterostructures*

**17:45 Qianhui Shi (Columbia University, New York, US)**

*Quantum Hall physics in 2D WSe<sub>2</sub>*

**18:15 Peide Ye (Purdue University, West Lafayette, US)**

*Quantum Hall effect of Weyl fermions in n-type semiconducting tellurene*

**18:45 *discussions***

**19:00 *workshop ends for today***

Chairmen: G. G. N. Angilella (DFA.UniCT, Catania, IT), S.Studenikin (NRC-CNRC, Ottawa, CA), M. Zudov (U. of Minnesota, Minneapolis, US)  
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## TUESDAY 23 JUNE 2020 (times are CEST = UTC+2)

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**Session 23.A. Chair: Denis Maryenko (RIKEN, Wako, JP)**

**Co-chair: Qianhui Shi (Columbia University, New York, US)**

**15:00 Jian Wang (International Center for Quantum Materials, Peking University, Beijing, CN)**  
*High-Chern-number and high-temperature quantum Hall effect without Landau levels*

**15:30 Maksym Myronov (University of Warwick, Warwick, UK)**  
*Emergence of 2D hole gas in novel strained Ge/Sn epilayers*

**16:00 Michael Hilke (McGill University, Montreal, CA)**  
*New excitations probed by non-linear transport in narrow quantum Hall bars*

**16:30 *break and discussions***

**Session 23.B. Chair: Peide Ye (Purdue University, West Lafayette, US)**

**Co-chair: Qianhui Shi (Columbia University, New York, US)**

**16:45 Inti Sodemann (Max-Planck-Institut für Physik komplexer Systeme, Dresden, DE)**  
*The quantum sounds of electrons and the quantum noise of spinons*

**17:15 Gwendal Fève (Laboratoire de Physique de l'École Normale Supérieure, ENS, Université PSL, CNRS, Sorbonne Université, Université de Paris, Paris, FR)**  
*Fractional statistics in anyon collisions*

**17:45 Aron Pinczuk (Columbia University, New York, US)**  
*Experimental study of interplays between nematic and topological orders in fractional quantum Hall effects*

**18:15 Jainendra Jain (Pennsylvania State University, State College, US)**  
*New developments in FQHE theory*

**18:45 *discussions***

**19:00 *workshop ends for today***

Chairmen: G. G. N. Angilella (DFA.UniCT, Catania, IT), S. Studenikin (NRC-CNRC, Ottawa, CA), M. Zudov (U. of Minnesota, Minneapolis, US)  
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An international workshop: Catania (Italy), June 15-19 & June 22-24, 2020

## WEDNESDAY 24 JUNE 2020 (times are CEST = UTC+2)

Pasadena (-9), New York (-6), Sao Paulo (-5), Rehovot (+1), Yekaterinburg (+3), Novosibirsk (+5), Beijing (+6), Tokyo (+7)

**Session 24.A. Chair: Michael Hilke (McGill University, Montreal, CA)**

**Co-chair: Michael Zudov (University of Minnesota, Minneapolis, US)**

**15:00 Dima Kvon (Rzhanov Institute of Semiconductor Physics, Novosibirsk, RU)**

*HgTe-based topological insulators*

**15:30 Gena Gusev (Universidade de São Paulo, São Paulo, BR)**

*Weak antilocalization in HgTe double well with massive Dirac fermions*

**16:00 Dieter Weiss (Universität Regensburg, Regensburg, DE)**

*2D-Dirac surface states and bulk Coulomb gap probed via quantum capacitance in a 3D topological insulator*

**16:30 *break and discussions***

**Session 24.B. Chair: Leonid Rokhinson (Purdue University, West Lafayette, US)**

**Co-chair: Michael Zudov (University of Minnesota, Minneapolis, US)**

**16:45 Mitali Banerjee (École Polytechnique Fédérale de Lausanne, Lausanne, CH)**

*Quantized heat flow through quantum Hall edge states*

**17:15 Steve Simon (University of Oxford, Oxford, UK)**

*Thermal conductance of the  $\nu = 5/2$  fractional quantum Hall state*

**17:45 Gabor Csathy (Purdue University, West Lafayette, US)**

*Competition of pairing and nematic orders at half-filling*

**18:15 Ray Ashoori (Massachusetts Institute of Technology, Cambridge, US)**

*Pump-probe tunneling spectroscopy of the quantum Hall liquid*

**18:45 *discussions***

**19:00 *closing remarks, workshop ends***

Chairmen: G. G. N. Angilella (DFA.UniCT, Catania, IT), S. Studenikin (NRC-CNRC, Ottawa, CA), M. Zudov (U. of Minnesota, Minneapolis, US)  
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