Program of the International CECAM-Workshop
Crystal defects for qubits, single photon emitters and nanosensors
Bremen Center for Computational Materials Science – BCCMS
University of Bremen, July 9th - 13th 2018
Conference site: House of Science, Downtown

Monday, July 9th 2018 (Radisson Blu Hotel)
18:00 – 21:00 Registration

Tuesday, July 10th 2018 (House of Science Bremen, Downtown)
08:00 – 08:50 Registration
08:50 – 09:00 Opening and welcome, Thomas Frauenheim
Session: Quantum defects for qubits
Chair: Thomas Frauenheim
09:00 – 09:40 Joerg Wrachtrup, University of Stuttgart, Germany
Applying single solid state quantum defects
09:40 – 10:20 David D. Awschalom, The University of Chicago, Illinois, USA
Controlling defect spin states with photons, magnons, and phonons
10:20 – 10:45 Coffee Break
10:45 – 11:25 Ádám Gali, Wigner Research Centre for Physics, Hungarian Academy of Sciences, Budapest, Hungary
Toward full ab initio description of qubits in solids
Session: Spin states
Chair: Peter Deák
11:25 – 12:05 Fedor Jelezko, Ulm University, Germany
Photoelectrical readout of single spins in diamond
12:05 Group photo
12:15 – 13:35 Lunch Break (Restaurant Q1) and Coffee
13:35 – 14:15 Ronald Hanson, Delft University of Technology, The Netherlands
The dawn of quantum networks
14:15 – 14:55 Martin B. Plenio, Ulm University, Germany
Controlling nuclear spin registers by NV centers
Session: Quantum spintronics
Chair: Michael Lorke
14:55 – 15:35 Mike J. Ford, University of Technology Sydney, New South Wales, Australia
Evaluating electronic structure calculations of single photon emitting defects in hBN
15:35 – 16:00 Coffee Break
16:00 – 16:40 Marcus W. Doherty, Australian National University, Canberra, Australia
Quantum spintronic properties of diamond nanowires
16:40 – 17:20 Jeronimo R. Maze, Pontifical Catholic University of Chile, Santiago
Effect of phonons on individual electronic spin relaxation and electron spin resonance
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18:00 – 20:30 Welcome Reception (Bremen Town Hall)

Wednesday, July 11th 2018 (House of Science Bremen, Downtown)

Session: Quantum probes and quantum control

Chair: Joerg Wrachtrup

09:00 – 09:40 Gavin W. Morley, University of Warwick, Coventry, UK
Levitating nanodiamonds containing NV centers

09:40 – 10:20 John J. L. Morton, University College London, UK
Strain effects on donor spins in silicon

10:20 – 10:50 Coffee Break

10:50 – 11:30 Alex Retzker, The Hebrew University of Jerusalem, Israel
Limits on spectral resolution measurements by quantum probes for nano NMR

11:30 – 12:10 Vladimir Dyakonov, University of Würzburg, Germany
Engineering of highly coherent vacancy spins in SiC

12:10 – 13:50 Lunch Break (Restaurant Q1) and Coffee

13:50 – 14:30 Viktor Ivády, Wigner Research Centre for Physics, Hungarian Academy of Sciences, Budapest, Hungary
Novel ab initio and model spin Hamiltonian methods for spin dynamic simulations of point defect quantum bits

Session: Interactions with photons

Chair: Ádám Gali

14:30 – 15:10 Sophia Economou, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA
Spin-photon interfaces for graph generation based on defects in diamond and SiC

15:10 – 15:50 Michel Bockstedte, University of Salzburg, Austria
Spin and photo physics of prototypical defect centers in diamond and SiC

15:50 – 16:20 Coffee Break

16:20 – 17:00 Brett C. Johnson, The University of Melbourne, Victoria, Australia
Silicon carbide single photon source devices

17:00 – 17:40 Christoph Becher, Saarland University, Saarbrücken, Germany
Spin properties and quantum control of Si vacancy centers in diamond

18:40 Bus Pickup to Conference Dinner
(Venue: Radisson Blu Hotel, Wachtstraße)

19:00 – 22:30 Conference Dinner (Restaurant Juergenshof)
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Thursday, July 12th 2018 (House of Science Bremen, Downtown)

Session: Defect control and qubits
Chair: Tim Wehling

09:00 – 09:40 Nguyen Tien Son, Linköping University, Sweden
Electron paramagnetic resonance studies of silicon vacancy in isotopically purified SiC

09:40 – 10:20 Lee C. Bassett, University of Pennsylvania, Philadelphia, USA
Optically addressable spin defects in hexagonal boron nitride

10:20 – 10:50 Coffee Break
Chair: Andreia Luisa da Rosa

10:50 – 11:30 Uwe Gerstmann, Paderborn University, Germany
Magneto-optical properties of NV centers in SiC: how relativistic effects trigger spin-based qubits

11:30 – 12:10 Kai-Mei C. Fu, University of Washington, Seattle, USA
Shallow impurities in ZnO for quantum information applications

12:10 – 13:50 Lunch Break (Restaurant Q1) and Coffee

13:50 – 14:30 Hosung Seo, Ajou University, Suwon, South Korea
Computational design of new point defects in semiconductors for qubit applications

Session: Experimental characterization of interfaces
Chair: Jean-Marie Bluet

14:30 – 15:10 Shengbai Zhang, Rensselaer Polytechnic Institute, Troy, New York, USA
Dynamic Jahn-Teller effect of the NV center in diamond and beyond

15:10 – 15:50 Arne Lauch, University of New South Wales, Sydney, Australia
Donor spin qubits in Si: from single-shot readout to advanced control methods

17:20 Poster Mounting

17:30 – 20:30 Poster Session, Catering Buffet (House of Science)
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Friday, July 13th 2018 (House of Science Bremen, Downtown)

Session: Quantum emitters

Chair: Edwin Barnes

09:00 – 09:40 Igor Aharonovich, University of Technology Sydney, New South Wales, Australia
Spectroscopy of single defects in hexagonal boron nitride

09:40 – 10:20 Martin S. Brandt, Technical University of Munich, Garching, Germany
Electrical readout of the spin state of NV in diamond

10:20 – 10:50 Coffee Break

10:50 – 11:30 Maciej Koperski, University of Manchester, UK
Single photon emitters in various forms of boron nitride

11:30 – 12:10 Audrius Alkauskas, Center for Physical Sciences and Technology, Vilnius, Lithuania
Vibrational properties of isolated colour centres in diamond

12:10 – 12:20 Closing words: Thomas Frauenheim

12:20 Departure