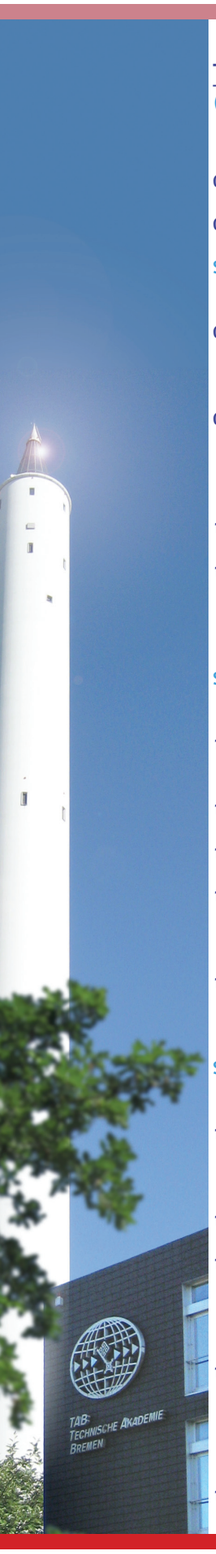
Crystal defects for qubits, single photon emitters and nanosensors

cecam Centre Européen de Calcul Atomique et Moléculaire 2018

Bremen Center for BCCMS Computational Materials Science



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 Science, 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 ofTechnology 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, Australien National University, Canberra (Australia)	*Quantum spintronic properties of diamond nanowires*
16:40 - 17:20	Jeronimo R. Maze, Pontifical Catholic University of Chile, Santiago de Chile (Chile)	*Effect of phonons on individual electronic spin relaxation and electron spin resonance*
18:00 - 20:30	**Welcome Reception (Bremen Town Hall)**	

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

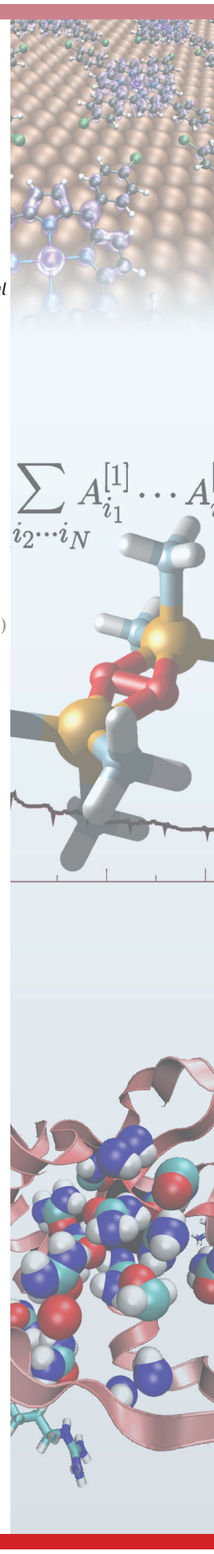
Session:	**Quantum probes and quantum control** *Chair: Joerg Wrachtrup*	
09:00 - 09:40	Gavin W. Morley, University of Warwick, Coventry (UK)	*Levitating nanodiamonds containing NV centers*
09:40 - 10:20	John J. L. Morton, University College London (UK)	*Strain effects on donor spins in silicon*
10:20 - 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	Victor 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*
Sesson:	**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 defencts 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** (Pickup Venue: Radisson Blu Hotel, Wachtstraße)	
19:00 - 22:30	**Conference Dinner (Juergenshof)**	

Thursday, July 12th 2018
(House of Science Bremen/Downtown)

Session:	**Defect control and qubits** *Chair: Tim Wehling*	
09:00 - 09:40	Ngyen 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**	
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 Laucht, 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 and Catering Buffet**	

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 centers in diamond*
12:10 - 12:20	**Closing words: Thomas Frauenheim**	
12:20	**Departure**	



Conference Organisers

Thomas Frauenheim — University of Bremen, Department of Physics, BCCMS, www.bccms.uni-bremen.de

Ádám Gali — Wigner Research Centre for Physics & Hungarian Academy of Science, www.fat.bme.hu/kulonc/galia/index.en.phtml

Joerg Wrachtrup — University of Stuttgart, 3rd Institute of Physics, www.pi3.uni-stuttgart.de

www.bccms.uni-bremen.de/veranstaltungen/2018/cecam-qubit/

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