

**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 9<sup>th</sup> - 13<sup>th</sup> 2018  
Conference site: House of Science, Downtown

Monday, July 9<sup>th</sup> 2018 **H+ Hotel Bremen** (formerly known as RAMADA)

**18:00 – 21:00 Registration**

Tuesday, July 10<sup>th</sup> 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:**

**09:00 – 09:40** Joerg Wrachtrup, University of Stuttgart, Germany  
*Applying single solid state quantum defects*

**09:40 – 10:20** David Awschalom, University of Chicago, USA  
*Quantum manipulation of single spin states in diamond and SiC*

**10:20 – 10:50 Coffee Break**

**Chair:**

**10:50 – 11:30** Adam Gali, Wigner Research Center of Physics, Budapest, Hungary  
*Toward full ab initio description of qubits in solids*

**Session: Spin states**

**11:30 – 12:10** Fedor Jeletzko, University of Ulm, Germany  
*Spin photon quantum interface based on single diamond defects*

**12:10 – 12:50** Ronald Hanson, Technical University Delft, The Netherlands  
*Building quantum networks with spins*

**12:45 – 14:30 Lunch Break (Restaurant Stadtwirt) and Coffee**

**14:30 – 15:10** Martin Plenio, University of Ulm, Germany  
*Hyperpolarization and signal processing for applications in MRI and nano NMR*

**Session: Quantum spintronics**

**Chair:**

**15:10 – 15:50** Martin Brandt, Technical University Munich, Germany  
*Electrical readout of NV-centers*

**15:50 – 16:20 Coffee Break**

**16:20 – 17:00** Marcus Doherty, Australian National University, Canberra  
*Quantum spintronic properties of diamond nanowires*

**17:00 – 17:40** Jero Maze, Pontificia Universidad Catolica Santiago, Chile  
*Effects of phonons on spins and optical dynamics of point defects in large gap materials*

**19:00 – 21:30 Welcome Reception (Bremen Town Hall)**

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

**Session: Quantum probes and quantum control**

**Chair:**

- 08:30 – 09:10** Gavin Morley, University of Warwick, UK  
*Levitating Nanodiamonds containing NV-centers*
- 09:10 – 09:50** Christoph Becher, University of Saarland, Germany  
*Spin properties and quantum control of Si vacancy centers in diamond*
- 09:50 – 10:20** **Coffee Break**
- 10:20 – 11:00** Alex Retzker, Hebrew University of Jerusalem, Israel  
*Limits of spectral resolution measurements by quantum probes*
- 11:00 – 11:40** Vladimir Dyakonov, University of Würzburg, Germany  
*Engineering of highly coherent vacancy spins in SiC*
- 11:40 – 12:20** Mingwen Zhao, Shandong University, China  
*Vacancy related defects in SiC for qubit applications: 1st principle study*
- 12:20 – 14:00** **Lunch Break (Restaurant Stadtwirt) and Coffee**

**Session: Interactions with photons**

**Chair:**

- 14:00 – 14:40** Sophia Economou, Virginia Tech, Blacksburg, USA  
*Spin-photon interfaces for graph generation based on defects in diamond and SiC*
- 14:40 – 15:20** Michael Bockstedte, University of Erlangen, Germany  
*Spin and photophysics of prototype defect centers in diamond and SiC*
- 15:20 – 15:50** **Coffee Break**
- 15:50 – 16:30** Brett Johnson, University of Melbourne, Australia  
*SiC single photon source devices*
- 16:30 – 17:10** Stefania Castelletto, RMIT University, Melbourne, Australia  
*Direct laser writing of colour centers in SiC*
- 18:40** **Bus Pickup to Conference Dinner**  
**(Venue: H+ Hotel Bremen (formerly known as RAMADA), Wachtstraße 27-29)**
- 19:00 – 22:30** **Conference Dinner (Restaurant Juergenshof)**

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

**Session: Defect control and qubits**

**Chair:**

- 08:30 – 09:10** Ngyen Tien Son, University of Linköping, Sweden  
*Realization and control of defects in SiC*
- 09:10 – 09:50** Giulia Galli, University of Chicago, USA  
*Toward full ab initio description of qubits in solids*
- 09:50 – 10:20** **Coffee Break**
- 10:20 – 11:00** Uwe Gerstmann, University of Paderborn, Germany  
*Magneto-optical properties of NV-centers in SiC: how relativistic effects trigger spin-based qubits*
- 11:00 – 11:40** Kai-Mei Fu, University, Bethlehem, Pennsylvania, USA  
*Shallow impurities in ZnO for quantum information applications*
- 11:40 – 12:20** Chris Van de Walle, University of California Santa Barbara, USA  
*Single photon emitters in nitrides*
- 12:20 – 14:00** **Lunch Break (Restaurant Stadtwirt) and Coffee**

**Session: Experimental characterization of interfaces**

**Chair:**

- 14:00 – 14:40** Shengbai Zhang, Rensselaer Polytechnical Institute Troy, New York  
*Colour centers in ionic analogue of diamond for qubits*
- 14:40 – 15:20** John Morton, University College London, UK  
*Electron and nuclear spin qubits based on donors in silicon*
- 15:20 – 16:00** 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, Catering Buffet (House of Science)**

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Friday, July 13<sup>th</sup> 2018 (House of Science Bremen, Downtown)

<b>Session:</b>	<b>Quantum emitters</b>
	<b><i>Chair: Dmitry Ryndyk</i></b>
<b>08:30 – 09:10</b>	Igor Aharonovich, University of Technology Sydney, Australia <i>Quantum emitters in atomically thin materials</i>
<b>09:10 – 09:50</b>	Atac Imamoglu, Swiss Institute of Technology, Zurich, Switzerland <i>Single photon emitters in atomically thin semiconductors</i>
<b>09:50 – 10:30</b>	Marijn van Huis, University of Utrecht, The Netherlands <i>Antisite defects in TMDs for spintronics</i>
<b>10:30 – 11:00</b>	<b>Coffee Break</b>
<b>11:00 – 11:40</b>	Marek Potemski, CNRS, Grenoble, France <i>Single photon emitters in TMDs and h-BN: a comparative study</i>
<b>11:40 – 12:20</b>	Audrius Alkauskas, Center for Physical Sciences and Technology Lithuania, Vilnius <i>Vibrational properties of isolated colour centers in diamond and SiC</i>
<b>12:20 - 13:00</b>	Hannu-Pekka Komsa, Aalto University Helsinki, Finland <i>Charged defects in 2D materials and the role of dielectric environment</i>
<b>13:00 – 13:10</b>	<b><i>Closing words: Thomas Frauenheim</i></b>
<b>13:30</b>	<b>Departure</b>