



Day 1 – Tuesday 21st May 2024

| Time | Location: Aerial Centre, UTS |
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| 8:30 | Registration and welcome coffee |
| 9:00 | BNW2024 Opening remarks – Igor Aharonovich |
| Boron Nitride Devices (Session Chair – Guillaume Cassabois) | |
| 9:20 | <i>Invited Speaker</i> – Siyuan Dai “Engineering phonon polaritons in hBN van der Waals structures” |
| 9:50 | <i>Contributed talk</i> – Joshua Caldwell “Ultrafast Thermal Dissipation via Surface Phonon Polaritons” |
| 10:10 | <i>Contributed talk</i> - Myungsoo Kim “BN for memory, computing and radiofrequency switches” |
| 10:30 | COFFEE BREAK |
| Growth and Color Centres 1 (Session Chair – Young Duck Kim) | |
| 11:10 | <i>Invited Speaker</i> – Wen Hao Chang “CVD-grown hBN for 2D transistors and quantum emitters” |
| 11:40 | <i>Invited Speaker</i> – Jieun Lee “Electrical control of light emission from h-BN single photon sources” |
| 12:10 | <i>Contributed talk</i> – Gyuna Park “Room temperature EL from isolated colour centres in van der Waals semiconductors” |
| 12:30 | LUNCH |
| Computational Modelling (Session Chair – Francisco Javier Muñoz Sáez) | |
| 14:00 | <i>Invited Speaker</i> – Viktor Ivady “Computational exploration of hBN defects: insights into topological defects, spins, and emitters” |
| 14:30 | <i>Invited Speaker</i> – Ludger Wirtz “Exciton-phonon coupling in boron nitride” |
| 15:00 | <i>Contributed talk</i> – Sheng-Shong Wong “The electronic band structure of mono-, bi-, and trilayer h-BN” |
| 15:20 | <i>Contributed talk</i> – Seokho Moon “Wafer-Scale AA-Stacked Hexagonal Boron Nitride Grown on GaN Substrate” |
| 15:40 | Round table with Q&A, facilitated by the chairs of the session |
| 16:30 | Welcome Reception, Aerial Centre, UTS |

Day 2 – Wednesday 22nd May 2024

| Time | Location: Aerial Centre, UTS |
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| Growth and Color Centres 2 (Session Chair – Andrzej Wysmolek) | |
| 9:00 | Invited Speaker – Young Duck Kim <i>"Manipulation of carbon color centers in hexagonal boron nitride"</i> |
| 9:30 | Invited Speaker – Francisco Javier Muñoz Sáez <i>"Carbon-based single photon emitters in hBN and van der Waals heterostructures"</i> |
| 10:00 | Contributed talk – Jonathan Bradford <i>"MBE of carbon-doped hBN on HOPG: Insights into the atomic structure of SPEs"</i> |
| 10:20 | Contributed talk – Camile Maestre <i>"Searching for diffuse defects in millimetre-sized h-BN crystals"</i> |
| 10:40 | COFFEE BREAK |
| Cubic Boron Nitride (Session Chair – Ying (Ian) Chen) | |
| 11:10 | Invited Speaker – Kazuyuki Hirama <i>"c-BN epitaxial growth mechanism in ion-beam-assisted MBE"</i> |
| 11:40 | Invited Speaker – Siddha Pimpukar <i>"Growth of Bulk Boron Nitride"</i> |
| 12:10 | Invited Speaker – Kaihui Liu <i>"Optical Crystals of Two-dimensional Rhombohedral Boron Nitride"</i> |
| 12:40 | LUNCH |
| Spin defects in hBN (Session Chair – Jieun Lee) | |
| 14:00 | Contributed talk – Tongcang Li <i>"Quantum sensing with single spin defects in boron nitride nanotubes"</i> |
| 14:20 | Contributed talk – Ruotian Gong <i>"Enhancing Coherence Properties of Spin Defects in hBN"</i> |
| 14:40 | Contributed talk – Kento Sasaki <i>"Nitrogen isotopes effects on hBN quantum sensor"</i> |
| 15:00 | Contributed talk – Guillaume Cassabois <i>"Optical and spin properties of boron-vacancy centers in few-layer thick hBN"</i> |
| 15:20 | Contributed talk – Islay Robertson <i>"Spin Properties of visible emitters in hBN"</i> |
| 15:40 | Round table with Q&A, facilitated by the chair of the session + summary of the day |
| 16:30 | Poster session + Wine/Canapes, Aerial Centre, UTS |

Day 3 – Thursday 23rd May 2024

| Time | Location: Aerial Centre, UTS |
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| Growth (Session Chair – Wen Hao Chang) | |
| 9:00 | Invited Speaker – Andrzej Wysmolek "MOVPE growth and applications of layered boron nitride" |
| 9:30 | Invited Speaker – Pengfei Yang "Controllable growth of uniform multilayer hexagonal boron nitride on metals and insulators" |
| 10:00 | Contributed talk – Simonas Krotkus "Interfacial engineering for wafer scale synthesis of multilayer sp ² -BN films" |
| 10:20 | Contributed talk – George Bepete "Chemical intercalation, exfoliation, and functionalization of hBN materials" |
| 10:40 | COFFEE BREAK |
| hBN Nanophotonics (Session Chair – Joshua Caldwell) | |
| 11:20 | Invited Speaker – Valentyn Volkov "hBN Nanophotonics: UV Transparency, High Refractive Index and Optical Anisotropy" |
| 11:50 | Invited Speaker – Stefan Maier "Tunability and applications of hBN metasurfaces" |
| 12:20 | Contributed talk – Lesley Spencer "Monolithic Integration of Single Quantum Emitters in hBN Bullseye Cavities" |
| 12:40 | LUNCH |
| Future Applications of Boron Nitride (Session Chair – Stefan Maier) | |
| 14:00 | Invited Speaker – Ying (Ian) Chen "Boron nitride nanomaterials for energy applications" |
| 14:30 | Invited Speaker – Tomoki Machida "hBN in van der Waals Heterostructures" |
| 15:00 | Contributed talk – Eveline Mayner "Optical Readout of Redox Reaction via hBN Surface Emitters" |
| 15:20 | Contributed talk – Kristina Malinowski "Photon statistics analysis of h-BN emitters with pulsed and cw excitation through Mandel Q" |
| 15:40 | Round table with Q&A, facilitated by the chair of the session + summary of the day |
| 16:30 | Concluding remarks and plans for Future hBN meetings |
| 17:30 - 19:30 BBQ Dinner, Universal Cafeteria (building 6) | |

The Boron Nitride Workshop is proudly supported by:



Poster Presentations

| N° | Presenter name | Title |
|----|-----------------------|---|
| 1 | Sergei Nedic | <i>Electron Beam Restructuring of Quantum Emitters in Hexagonal Boron Nitride</i> |
| 2 | Guillaume Cassabois | <i>Spatially-resolved UV-C emission in epitaxial monolayer boron nitride</i> |
| 3 | Qiran Cai | <i>Thermal property and applications of boron nitride nanosheets</i> |
| 4 | Roy Styles | <i>The effect of electric fields on visible spin defects in hBN</i> |
| 5 | Guillaume Cassabois | <i>What is the nature of the UV color center emitting at 300 nm in hexagonal boron nitride ?</i> |
| 6 | Christopher J. Mellor | <i>Single photon emitters created by intentional carbon doping of hBN grown on sapphire by high-T MBE</i> |
| 7 | Kabilan Sripathy | <i>QUICK3 – Towards satellite-based quantum communication, and fundamental physics tests in microgravity</i> |
| 8 | Rotem Malkinson | <i>Systematically creating boron vacancies in bulk exfoliated hBN flakes using focused ion beam</i> |
| 9 | Paul Konrad | <i>Quantum Sensors in hBN: Intersystem Crossing Relaxation of the Metastable State and Irradiation Protocol</i> |
| 10 | Jakub Rogoża | <i>Conductivity induced by post growth annealing of boron nitride grown by MOVPE</i> |
| 11 | Sonachand Adhikari | <i>hBN-Enabled Flexible GaN Photodetector</i> |
| 12 | Fei Kong | <i>Optimal sensitivity of a spin sensor with high fidelity quantum controls</i> |
| 13 | Jakub Iwański | <i>Polytype Identification in MOVPE Grown sp²-BN Using Ultraviolet Defect Photoluminescence</i> |
| 14 | Qiran Cai | <i>Boron nitride nanosheet aggregates for enhanced acoustic energy harvesting</i> |
| 15 | Hayoung Ko | <i>Growth of wafer-scale, high-quality, multilayer hBN on liquid Fe₂B for high-performance of 2D heterostructure</i> |
| 16 | Pragya Joshi | <i>Carbon Migration and Single Photon Emission in Electron Irradiated hBN flakes</i> |
| 17 | Jong Sung Moon | <i>Fiber-integrated quantum sensors using color centers with optimal cavity interface</i> |
| 18 | Bindu Bindu | <i>Quantum Sensing and Imaging of van der Waals Ferromagnet using Nitrogen-Vacancy Centers</i> |
| 19 | Galya Haim | <i>Exploring methods for creation of Boron-vacancies in hexagonal Boron Nitride exfoliated from bulk crystal</i> |

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|----|----------------------|---|
| 20 | Momoko Onodera | <i>Evaluation of hexagonal boron nitride in van der Waals junctions of 2D materials</i> |
| 21 | Juliette Plo | <i>Nitrogen isotope effects on hexagonal boron nitride</i> |
| 22 | Min-Jae Maeng | <i>Transport band gap measurement of large-area hBN using direct and inverse photoemission spectroscopy</i> |
| 23 | Richard Escalante | <i>Sensitivity Optimization of Boron Vacancy Centers in Hexagonal Boron Nitride</i> |
| 24 | Andrew Beling | <i>Toward Nanoscale NMR Spectroscopy using the Boron Vacancy Quantum Defect in hBN</i> |
| 25 | Jake Horder | <i>Resonant Spectroscopy of B-Center Quantum Emitters in hBN</i> |
| 26 | Minhyun Cho | <i>Remote moire effect engineering using the twisted hBN</i> |
| 27 | YoungJae Kim | <i>High electric field vertical tunneling transports in hexagonal boron nitride</i> |
| 28 | Heeyeon Lee | <i>Hexagonal boron nitride surface engineering for remote modulation doping</i> |
| 29 | Shih-Chu Lin | <i>Defect engineering in CVD-Grown Hexagonal Boron Nitride for Quantum Photonic Applications</i> |
| 30 | Dominic Scognamiglio | <i>Controlling and stabilizing the Charge State of Spin Defects in hBN</i> |
| 31 | Seungmin Park | <i>High-efficiency deep ultraviolet emitting from hexagonal boron nitride heterostructure</i> |
| 32 | Nils Bernhardt | <i>UV defect emitters in thin hBN</i> |
| 33 | Helen Zeng | <i>Hexagonal Boron Nitride-Based Quantum Key Distribution with Room Temperature Single Photon Emission</i> |
| 34 | Benjamin Whitefield | <i>Magnetic Field Sensitivity Optimization of Negatively Charged Boron Vacancy Defects in hBN</i> |
| 35 | Karin Yamamura | <i>Plasmonic lattices-assisted emission enhancement and optimized creation of blue colour centre in hBN</i> |
| 36 | Anand Kumar | <i>Solid states quantum emitters in wide band gap materials for quantum technology applications</i> |
| 37 | Madeline Hennessey | <i>Towards Boron Nitride Nanotube Optical Emitters in Sensing Applications</i> |
| 38 | Wei Liu | <i>Coherent control of an ultrabright single spin in hexagonal boron nitride at room temperature</i> |
| 39 | Ryan Kowalski | <i>Correlating Defect Emission with Infrared Near-Field Imaging in Strained Hexagonal Boron Nitride</i> |
| 40 | Takashi Taniguchi | <i>TBD</i> |

The prize for the best poster presentation by a PhD student is supported by IOP MQT and 2D Materials journals.

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