Programme **http://www.uhasselt.be/sbdd**

Hasselt Diamond Workshop 2024

SBDD XXVIII

February 28 – March 1, 2024
cultuurcentrum Hasselt (Cultural Centre), Hasselt, Belgium

During three full days, SBDD XXVIII will address recent progress in a variety of topics ranging from fundamental material science to applications, focusing on CVD diamond.

Tuesday, February 27, 2024

18:00 – 19:00 **Registration at the *Express by Holiday Inn*.**

Wednesday, February 28, 2024

08:20 – 08:50 **Registration at the *cultuurcentrum Hasselt*.**

08:50 – 09:00 **Opening "Hasselt Diamond Workshop 2024 – SBDD XXVIII".**

Session 1
Diamond Device Technology
Chair: Ken Haenen, Hasselt University & IMEC vzw, Belgium

09:00
1.1 (Invited)
Diamond thermal impact on the technology development beyond Moore's law
M. Malakoutian
Electrical Engineering Department, Stanford University, 420 Via Palou Mall, Stanford, CA, USA

9:30
1.2
Heteroepitaxial Diamond for Integration with GaN-Devices
V. Lebedev[1], J. Weippert[1], T. Fehrenbach[2], S. Leone[1], J. Kustermann[1], J. Engels[1], L. Kirste[1], M. Ohnemus[2], C. Wild[2], and P. Knittel[1]
[1]Fraunhofer IAF, Fraunhofer Institute for Applied Solid State Physics, 79108 Freiburg, Germany. [2]Diamond Materials GmbH, 79108 Freiburg, Germany.

9:50
1.3
Diamond etching mechanism using an electron beam
D.D.Tran[1,2,3], F.Donatini[1], C.Mannequin[3,4], M.Regnier[1,2,3], E.Gheeraert[1,2,3]
[1]Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Neel, 38000 Grenoble, France. [2]Institute of Applied Physics, Faculty of Pure and Applied Sciences, University of Tsukuba, Tsukuba 305-8573, Japan. [3]Japanese-French lAboratory for Semiconductor physics and Technology J-FAST, CNRS, Universite Grenoble Alpes, Grenoble INP, University of Tsukuba, Japan. [4]CNRS-Nantes Universite-Institut des Materiaux de Nantes Jean Rouxel.

10:10 **Coffee Break (Grand Banquet Hall)**

Session 2
Diamond Quantum Technology
Chair: Christoph Becher, Universität des Saarlandes, Germany

10:50
2.1 (Invited)
Creating controlled NV systems in (001) and (111) diamond for quantum technologies
Lillian B. Hughes[1], Simon A. Meynell[2], Weijie Wu[3], Shreyas Parthasarathy[2], Emily J. Davis[3], Zilin Wang[3], Eveline Postelnicu[4], Kunal Mukherjee[4], Norman Y. Yao[3], Ania C. B. Jayich[2]
[1]Materials Department, University of California, Santa Barbara, CA 93106, USA. [2]Department of Physics, University of California, Santa Barbara, CA 93106, USA. [3]Department of Physics, Harvard University, Cambridge, MA 02138, USA. [3]Department of Materials Science and Engineering, Stanford University, Palo Alto, CA 94305, USA.

11:20
2.2
Investigating Spin Impurities in Diamond for Enhanced Quantum Sensors
Olga R. Rubinas[1,2,3], Vladimir V. Soshenko[1], Stepan V. Bolshedvorskii[1], Ivan S. Cojocaru[1], Victor G. Vins[4], Andrey N. Smolyaninov[1], Vadim N. Sorokin[1], Alexey V. Akimov[1]
[1]P.N. Lebedev Physical Institute of the RAS, Moscow, Russia, [2]IMOMEC, imec, Kapeldreef 75, Heverlee, B-3001 Belgium. [3]Institute for Materials Research (IMO), Hasselt University, Wetenschapspark 1, Diepenbeek, B-3590 Belgium, 4LLC Velman, Novosibirsk, Russia.

11:40
2.3
CW laser activation of color centers in diamond
E. Nieto Hernández[1,2], V. Pugliese[1,2], E. Corte[1,2], S. Ditalia Tchernij[1,2], P. Olivero[1,2], J. Forneris[1,2]
[1]Department of Physics, University of Torino,Italy. [2]Istituto Nazionale di Fisica Nucleare (INFN), sezione di Torino,Torino, Italy.

12:00
2.4
Silicon vacancy centres in diamond nanostructures for quantum sensing
M. Li[1], J.A. Zuber[1,2], Z.H. Zhang[3], M. Grimau[1], J. Happacher[1], P. Reiser[1], B. Shields[1], M. Batzer[1], N.P. de Leon[3], P. Maletinsky[1,2]
[1]Department of Physics, University of Basel, CH-4056 Basel, Switzerland. [2]Swiss Nanoscience Institute, University of Basel, CH-4056 Basel, Switzerland. [3]Department of Electrical and Computer Engineering, Princeton University, Princeton, New Jersey 08544, USA.

12:30 SBDD XXVIII group photo (Lecture Hall)

12:40 Lunch (Grand Banquet Hall)

Session 3
Quantum Sensing I
Chair: Quan Li, The Chinese University of Hong Kong, Hong Kong

14:20
3.1 (Invited)
Nanoscale magnetic resonance with an optimal sensitivity spin sensor in diamond
Fazhan Shi
CAS Key Laboratory of Microscale Magnetic Resonance and Department of Modern Physics, University of Science and Technology of China, Hefei 230026, China.

14:50
3.2
The role of electrolytes in the relaxation of near-surface spin defects in diamond
Fabian A. Freire-Moschovitis[1], Roberto Rizzato[1], Anton Pershin[2], Moritz R. Schepp[1], Robin D. Allert[1], Lina M. Todenhagen[1], Martin S. Brandt[1], Ádám Gali[2], and Dominik B. Bucher[1]
[1]TUM School of Natural Sciences, Technical University of Munich, 85748 Garching, Germany. [2]Institute for Solid State Physics and Optics, Wigner Research Centre for Physics, Budapest H-1525, Hungary.

15:10
3.3
Photovoltage imaging and magnetic resonance detection of single nitrogen- vacancy centers in diamond
Sergei Trofimov[1], Klaus Lips[1] and Boris Naydenov[1]
[1]Berlin Joint EPR Laboratory and Department Spins in Energy Conversion and Quantum Information Science (ASPIN), Hahn-Meitner-Platz 1, Berlin, Germany.

15:30
3.4
Heteroepitaxial CVD diamond quantum sensors for electric vehicle battery current monitor
Yuji Hatano[1], Kenichi Kajiyama[1], Moriyoshi Haruyama[2], Yuta Kainuma[1], Hiromitsu Kato[2], Masahiko Ogura[2], Toshiharu Makino[2], Hitoshi Noguchi[3], Hiroshi Abe[4], Shinobu Onoda[4], Takeshi Ohshima[4], Takayuki Iwasaki[1], Mutsuko Hatano[1,4] *[1]Tokyo Institute of Technology, Meguro-ku, Tokyo 152-8552, Japan. [2]National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki 305–8568, Japan. [3]Shin-Etsu Chemical Co., Ltd., Gunma 379-0224, Japan. [4]National Institutes for Quantum Science and Technology (QST), Takasaki, Gunma 370-1292, Japan.*

15:50 Coffee Break (Grand Banquet Hall)

Session 4
Diamond Devices I
Chair: Jan Isberg, Uppsala University, Sweden

16:30
4.1 (Invited)
n-Channel diamond MOSFET formation and related CVD technologies
Satoshi Koizumi
National Institute for Materials Science, 1-1 Namiki, Tsukuba 305-0044, Japan

17:00
4.2
First interdigitated diamond FET toward industrial power electronic
Damien Michez[1,2], Juliette Letellier[1], Marine COURET[2], Julien Pernot[3] and Nicolas Rouger[2]
[1]DIAMFAB, 25 avenue des Martyrs, 38042 Grenoble, France. [2]LAPLACE, Univ. Toulouse III Paul Sabatier, 2 rue Charles Camichel, 31071 Toulouse, France. [3]Institut Néel, Univ. Grenoble Alpes, CNRS, Grenoble INP, 38000 Grenoble, France.

17:20
4.3
Accumulation Channel H-diamond FETs with extreme Enhancement-Mode operation (< -6V Vgs) and high on-state current
Chunlin Qu[1], Isha Maini[1], Qing Guo[1], Alastair Stacey[2], David A. J. Moran[1]
[1]James Watt School of Engineering, University of Glasgow, Glasgow, UK. [2]Princeton Plasma Physics Laboratory, Princeton University, Princeton, NJ, USA.

17:40
4.4
Improvement of device variation in inversion channel diamond MOSFETs by buried p+-layer for source and drain
Kai Sato[1], Tsubasa Yoshimoto[1], Hiromitsu Kato[3], Toshiharu Makino[3], Masahiko Ogura[3], Daisuke Takeuchi[3], Kimiyoshi Ichikawa[1], Kan Hayashi[1,2], Takao Inokuma[1], Satoshi Yamasaki[1], Norio Tokuda[1,2], Tsubasa Matsumoto[1,2]
[1]Nanomaterials Research Institute, Kanazawa University, Kakuma-machi, Kanazawa, Japan. [2]Graduate School of Natural Science and Technology, Kanazawa University, Kakuma-machi, Kanazawa, Japan. [3]Advanced Power Electronics Research Center, AIST, 1-1-1 Umezono, Tsukuba, Japan.

Session 5
Posters I & Reception sponsored by: SEKI DIAMOND SYSTEMS
Chairs: Jocelyn Achard, Université Sorbonne Paris Nord, France; Shery L.Y. Chang, University of New South Wales, Australia; Anke Krueger, Universität Stuttgart, Germany; Boris Naydenov, Helmholtz-Zentrum Berlin (HZB), Germany

18:00 – 20:00 (Grand & Small Banquet Hall)

5.1
Quantum defect fabrication in diamond utilizing a 515 nm femtosecond laser
João P. Silva[1,2,3] , João M. Maia[2,3], Filipe Camarneiro[1], Paulo V.S. Marques[2,3], Jana B. Nieder[1]
[1]INL - International Iberian Nanotechnology Laboratory, Ultrafast Bio- and Nanophotonics group, Av. Mestre José Veiga s/n, Braga, Portugal. [2]INESC TEC, CAP – Centre for Applied Photonics, Rua do Campo Alegre 687, Porto, Portugal. [3]Department of Physics and Astronomy, Faculty of Sciences, University of Porto, Rua Campo Alegre 687, Porto, Portugal.

5.2
NIR defects in electronic grade CVD diamond from photocurrent spectroscopy
Remy Vandebosch[1,3], Zdenek Remes[2], Emilie Bourgeois[1,3], Jaroslav Hruby[1,3], Boo Carmans[1], Milos Nesladek[1,3]
[1]Institute for Materials research (IMO), Hasselt University, Wetenschapspark 1, Diepenbeek, Belgium. [2]Institute of Physics of the Czech Academy of Sciences, Na Slovance 2, Prague, Czechia. [3]Imomec division IMEC, Wetenschapspark 1, Diepenbeek, Belgium.

5.3
Transient Absorption Spectroscopy of Carbon Vacancies in Diamond: Electronic Structure and Dynamics
Minh-Tuan Luu[1], Ali Tayefeh Younesi[1], Ronald Ulbricht[1]
[1]Max-Planck-Institut für Polymerforschung, Ackermannweg 10, 55128 Mainz

5.4
Investigation of oxygen-vacancy complexes in diamond by means of ab initio calculations
Nima Ghafari Cherati[1,2], Gergő Thiering[1], Adam Gali[1,2]
[1]Wigner Research Centre for Physics, PO Box 49, H-1525 Budapest, Hungary 2Department of Atomic Physics, Budapest University of Technology and Economics, Budapest, Hungary

5.5
The impact of strain on GeV color centers in diamond.
Thijs van Wijk[1,2], E. Aylin Melan[1,2], Emerick Y. Guillaume[1,2], Danny E. P. Vanpoucke[1,2]
[1]QuATOMs, Hasselt University, Agoralaan Gebouw D, 3590 Diepenbeek, Belgium. [2]Institute for Materials Research (IMO), IMOMEC, IMEC vzw, Diepenbeek, Belgium.

5.6
Impact of annealing conditions on optical properties of GeV centers produced via ion implantation
Lev Kazak[1], Francesco Maruca[1,2], Katharina Senkalla[1], Stefan Dietel[1], Varvara Foteinou[3], Jens Fuhrmann[1], Petr Siyushev[1,4], Roberto Osellame[2,5], Fedor Jelezko[1]
[1]Institute for Quantum Optics, Ulm University, Albert-Einstein-Allee 11, 89081 Ulm, Germany. [2]Dipartimento di Fisica, Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133 Milano, Italy. [3]RUBION, Ruhr-Universität Bochum, Universitätstrasse 150, 44780 Bochum, Germany. [4]Institute for Material Research (IMO), Hasselt University, Wetenschapspark 1, B-3590 Diepenbeek, Belgium. [5]Instituto di Fotonica e Nanotechnologie, CNR, Piazza Leonardo da Vinci 32, 20133 Milano, Italy.

5.7
MeV carbon implantation in N-rich single crystal CVD diamond
Matija Matijević[1,2], Zdravko Siketić[1], Jacopo Forneris[2], *Elena Nieto Hernandez*[2], Emilio Corte[2]
[1]Ruđer Bošković Institute, Bijenička cesta 54, 10000 Zagreb, Croatia. [2]Department of Physics, University of Turin, Via Pietro Giuria 1, 10125 Turin, Italy.

5.8
Development of focused MeV ion beam implantation system for fabrication of colour centres in diamond with single ion detection capability
Andreo Crnjac[1], Arnold Müller[1], Christof Vockenhuber[1], Enrico Sangregorio[2], Massimo Camarda[3]
[1]Laboratory of Ion Beam Physics, ETH Zurich, Zurich, Switzerland. [2]Department of Physic and Astronomy, University of Catania, Catania, Italy. [3]SenSiC GmbH,, Villigen, Switzerland

5.9

Hot ion implantation for creating dense NV ensemble near the diamond surface

Midrel Wilfried Ngandeu Ngambou[1], Pauline Perrin[2], Alexandre Tallaire[1, 2], Ovidiu Brinza[1], Vianney Mille[1], Audrey Valentin[1], Fabien Bénédic[1], Philippe Goldner[2], Jocelyn Achard[1]

[1]LSPM, CNRS, Université Sorbonne Paris Nord, 99 Avenue JB clément 93430, Villetaneuse, France. [2]IRCP, Chimie ParisTech, CNRS, PSL Research University, 11 rue Pierre et Marie Curie, 75005 Paris, France.

5.10

Formation mechanism of PbV centers from implanted Pb in diamond

Ulrich Wahl[1], João G. Correia[1], Ângelo Costa[1], Brecht Biesmans[2], Kirill Danilov[2], S. Malven Tunhuma[2], Afonso Lamelas[3], Vítor Amaral[3], Karl Johnston[4], André Vantomme[2], Lino Pereira[2]

[1]Centro de Ciências e Tecnologias Nucleares (C2TN), Departamento de Engenharia e Ciências Nucleares (DECN), Instituto Superior Técnico, Universidade de Lisboa, 2695-066 Bobadela LRS, Portugal. [2]KU Leuven, Quantum Solid-State Physics, 3001 Leuven, Belgium. [3]CICECO- Instituto de Materiais de Aveiro, Universidade de Aveiro, 3810-193 Aveiro, Portugal. [4]CERN-EP, 1211 Geneva 23, Switzerland.

5.11

Influence of Surface Termination on Near-surface NV-doped Diamond Thin Films

Rebekka Eberle, Philip Schätzle, Riccardo Bellese, Patrik Straňák, Peter Knittel

Fraunhofer Institute for Applied Solid State Physics, Tullastraße 72, Freiburg, Germany.

5.12

Influence of diamond oxygen termination on shallow NV centers

Jens Fuhrmann[1], Johannes Lang[1,2], Jochen Scharpf[3], Thomas Unden[3], Joachim Bansmann[4], Thorsten Bernhardt[4], Philipp Neumann[3] and Fedor Jelezko[1,5]

[1]Institute for Quantum Optics, Ulm University, Albert -Einstein-Allee 11, Ulm 89081, Germany. [2]Diatope GmbH, Buchenweg 23, Ummendorf 88444, Germany. [3]NVision Imaging Technologies GmbH, Albert -Einstein-Allee 11, Ulm 89081, Germany. [4]Institute for Surface Chemistry and Catalysis, Ulm University, Albert -Einstein-Allee 11, Ulm 89081, Germany. [5]Integrated Quantum Science and Technology (IQST), Ulm University, Albert -Einstein-Allee 11, Ulm 89081,
Germany.

5.13

Shallow NV- colour centres in diamond

Elena Missale[1], Rossana Dell'Anna[1], Damiano Giubertoni[1], Antonino Picciotto[1,2], Alina Samusenko[1], Danny Zanardo[1], Giorgio Speranza[1,2,3]

[1]Fondazione Bruno Kessler, v. Sommarive 18, 38123 Trento, Italy. [2]Department of Industrial Engineering, University of Trento, v. Sommarive 9, 38123 Trento, Italy. [3]IFN - CNR, CSMFO Lab., via alla Cascata 56/C, 38123 Trento, Italy.

5.14

Optimizing nitrogen-vacancy center formation during CVD diamond growth

Karolina Schüle[1], Allegra De Gleria Clark[1,2], Christoph Findler[1,3], Oliver Schmid[1], Fedor Jelezko[1,4]

[1]Institute for Quantum Optics, Ulm University, Albert-Einstein-Allee 11, D-89081 Ulm, Germany. [2]Department of Materials Science and Engineering, Monash University, 14 Alliance Lane, Clayton, Victoria 3800, Australia. [3]Diatope GmbH, Buchenweg 23, D-88444 Ummendorf, Germany. [4]Center for Integrated Quantum Science and Technology (IQST), Albert-Einstein-Allee 11, D-89081 Ulm, Germany.

5.15

Fabrication of tin vacancies in CVD diamond

Rani Mary Joy[1,2], Paulius Pobedinskas[1,2], Rozita Rouzbahani[1,2], Giridharan Krishnamurthy[1,2], Miloš Nesládek[1,2], Ken Haenen[1,2]

[1]Institute for Materials Research (IMO), Hasselt University, 3590 Diepenbeek, Belgium. [2]IMOMEC, IMEC vzw, 3590 Diepenbeek, Belgium.

5.16

Incorporation of nitrogen into nanocrystalline diamond films studied by multi-wavelength Raman spectroscopy

Miklós Veres[1], Tamás Váczi[1], Roman Holomb[1], Victor Ralchenko[2], Cyril Popov[3], László Himics[1]

[1]HUN-REN Wigner Research Centre for Physics, Konkoly-Thege M. str. 29-33, 1121Budapest, Hungary . [2]Prokhorov General Physics Institute, Russian Academy of Sciences, Vavilova st. 38, 119991 Moscow, Russia . [3]University of Kassel, Heinrich-Plett-Str. 40, 34132 Kassel, Germany.

5.17

Incorporation of nitrogen during CVD measured through quantum sensing

Jeroen Prooth[1,2], Olga Rubinas[1,2], Michael Petrov[2], Milos Nesladek[1,2]

[1]IMOMEC, imec, Kapeldreef 75, Heverlee, B-3001 Belgium. [2]Institute for Materials Research (IMO), Hasselt University, Wetenschapspark 1, Diepenbeek, B-3590 Belgium.

5.18

Machine Learning Assisted Growth of Nitrogen Vacancy Diamonds

Collin N. Muniz[1],Dane W. deQuilettes[1,2] Eden Price[1], Linh Pham[1,2], Arthur Kurlej[1], Swaroop Vattam[3], Justin Mallek[1], Alexander Melville[1], Tom Osadchy[1], Boning Li[4], Guoqing Wang[4], Jennifer Schloss[1], Paola Cappellaro[3,4,5], Danielle Braje[1,2]

[1]Division of Quantum Information and Integrated Nanosystems, Massachusetts Institute of Technology, Lincoln Laboratory, Lexington, MA, 02421, USA. [2]Center for Quantum Engineering, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA. [3]Division of Artificial Intelligence and Systems, Massachusetts Institute of Technology, Lincoln Laboratory, Lexington, MA, 02421, USA. [4]Department of Nuclear Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA. [5]Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA.

5.19

Controlled positioning of NV centres in optical resonators by N-doped CVD growth

Nicola Lang, Christian Giese, Patricia Quellmalz, Isabel Wiegand, Rebekka Eberle, Daniel Hähnel, Peter Knittel

Fraunhofer Institute for Applied Solid State Physics, Tullastraße 72, Freiburg, Germany

5.20

Enhancing Quantum Sensing through Preferentially-Aligned Nitrogen Vacancy Centers on (111) and (110) Diamond

Marina Davydova, Rebekka Eberle, Patrik Stranak, Patricia Quellmalz, Peter Knittel

Fraunhofer Institute for Applied Solid State Physics, Tullastraße 72, 79108 Freiburg, Germany

5.21

Optimization of the Atmospheric Annealing Processes for Creation of Group IV-V Centers in Diamond

Tomoya Baba[1,2], Masatomi Iizawa[2], Kosuke Kimura[1,2], Airi Kawasaki[1], Takashi Taniguchi[3], Masashi Miyakawa[3], Osamu Hanaizumi[1], Shinobu Onoda[2,4]

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5.22

Ambiguous Resonances in Multipulse Quantum Sensing

Lucas B. E. Tsunaki[1], Kseniia Volkova[1], Anmol Singh[1], Sergei Trofimov[1], Tommaso Pregnolato[2], Tim Schröder[2], Boris Naydenov[1,3]

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5.23

Hyperpolarized NMR spectroscopy enhanced by nuclear spin refocusing

Tobias Spohn[1], Nicolas Staudenmaier[1], Gerhard Wolff[1], Genko Genov[1], Philipp Vetter[1], Raúl Gonzalez[1], Jens Fuhrmann[1], Jochen Scharpf[2], Thomas Unden[2], Philipp Neumann[2], Fedor Jelezko[1]

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5.24

Confocal microscopy in a controlled atmosphere for nano-scale nuclear magnetic resonance spectroscopy

Kseniia Volkova[1], Abhijeet Kumar[2], Karolina Schüle[3], Jens Fuhrmann[3], Fedor Jelezko[3], Kirill Bolotin[2], Boris Naydenov[1]

[1]Department Spins in Energy Conversion and Quantum Information Science (ASPIN), Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Kekuléstraße, Berlin, Germany. [2]Department of Physics, Freie Universität Berlin, Arnimallee, Berlin, Germany. [3]Institut für Quantenoptik, Freie Universität Ulm, Albert-Einstein-Allee, Ulm, Germany.

5.25

Low-field magnetic sensing with nitrogen-vacancy centers in nanodiamondfor chemical reaction monitoring

María Camposano[1,2], Omkar Dhungel[1,2], Mariusz Mrózek[3], Arne Wickenbrock[1,2], Anna Ermakova , Dmitry Budker[1,2,5], Wojciech Gawlik[3], Adam M. Wojciechowski[3]

[1]Helmholtz-Institut Mainz, GSI Helmholtzzentrum für Schwerionenforschung GmbH, 55128 Mainz, Germany. [2]Johannes Gutenberg-Universität Mainz, 55128 Mainz, Germany. [3]Jagiellonian University, Faculty of Physics, Astronomy and Applied Computer Science, Lojasiewicza St. 11, 30-348 Krakow, Poland. [4]Hasselt University, Diepenbeek, Belgium. [5]Department of Physics, University of California, Berkeley, California 94720-300, USA.

5.26

Abnormal charge state switching of single NV centers via voltage control

Darya Meniailava[1], Michael Petrov[1], Milos Nesladek[1]

[1]IMO-IMOMEC, Hasselt University, Wetenschapspark 1, Diepenbeek, Belgium.

5.27

Photoelectrical readout of single shallowly implanted NV centres in diamond

Ilia Chuprina[1], Christoph Findler[1,2], Johannes Lang[2], Petr Siyushev[3], Fedor Jelezko[1]

[1]Institute for Quantum Optics, Ulm University, D-89081 Germany. [2]Diatope GmbH, Buchenweg 23, D-88444 Ummendorf, Germany. [3]Institute for Materials Research, Hasselt University, Wetenschapspark 1, 3590 Diepenbeek, Belgium.

5.28

Temperature dependence of charge conversion during NV-center relaxometry

Isabel Cardoso Barbosa[1], Jonas Gutsche[1], Stefan Dix[1], Dennis Lönard[1], and Artur Widera[1]

[1]Department of Physics and State Research Center OPTIMAS, University of Kaiserslautern-Landau, Erwin-Schroedinger-Str. 46, 67663 Kaiserslautern, Germany

5.29

Assembly of industry-ready HPHT-diamond diaphragms containing NV-centres into pressure sensor devices

Mario Bähr[1], Raphael Kuhnen[2], Christoph Wild[3], Wolfgang Knolle[4], Andre Grün[1], Thomas Frank[1], Thomas Ortlepp[1]

[1]CiS Forschungsinstitut für Mikrosensorik GmbH, Konrad-Zuse-Str. 14, 99099 Erfurt, Germany . [2]Endress+Hauser SE+Co. KG, Hauptstraße 1, 79689 Maulburg, Germany. [3]Diamond Materials GmbH & Co. KG, Hans-Bunte-Straße 19, 79108 Freiburg, Germany. [4]Leibniz-Institut für Oberflächenmodifizierung e.V., Permoserstraße 15, 04318 Leipzig.

5.30

Diamond surface preparation for optically coherent NV centers in nanostructures

Kilian Unterguggenberger[1], Marco E. Stucki[1,2], Tommaso Pregnolato[1,2], Tim Schröder[1,2]

[1]Department of Physics, Humboldt-Universität zu Berlin, Newtonstr. 15, 12489 Berlin, Germany. [2]Ferdinand-Braun-Institut gGmbH, Leibniz-Institut für Höchstfrequenztechnik, Gustav-Kirchhoff-Str. 4, 12489 Berlin, Germany.

5.31

Surface morphology dependent emission properties of colour centre containing CVD nanodiamond films

László Himics[1], Dávid Gál[1], Péter Csíkvári[2], Roman Holomb[1], Tamás Váczi[1], Margit Koós[1], Miklós Veres[1]

[1]HUN-REN Wigner Research Centre for Physics, Konkoly-Thege Miklós str. 29-33, Budapest, 1121, Hungary. [2]Budapest University of Technology and Economics, Budafoki str. 8, Budapest, 1111, Hungary.

5.32

Comprehensive Characterization of Nitrogen-Vacancy (NV) Center Ensembles in Diamond for Quantum Sensing Applications

Jixing Zhang[1], Mingxin Li[2], Andrej Denisenko[1], Joerg Wrachtrup[1]

[1]3rd Institute of Physics, University of Stuttgart, Allmandring 13, Stuttgart, Germany. *[2]School of Instrumentation and Optoelectronic Engineering, Beihang University, Xueyuan Road 37, Beijing, China.*

5.33

NV Centers in diamond as a CL temperature probe

Pablo Sáenz de Santa María Modroño[1], Gwenolé Jacopin[1]

[1]Institut Néel CNRS/UGA, 25 rue des Martyrs 38042 Grenoble cedex 9, France.

5.34

Probing heat transport in diamond cantilevers with NV centers as quantum thermometers

Valentin Goblot[1,2], Kexin Wu[1,3], Enrico Di Lucente[4], Elena Losero[1], Hossein Babashah[1], Nicola Marzari[4], Michele Simoncelli[5], Christophe Galland[1, 2]

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5.35

Nanoscale temperature sensor for biological applications

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5.36

Technological steps for realization of diamond-based quantum tokens

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5.37

Real-world NV-center vector magnetometry of a 3D coil system

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5.38

Fabrication and optimization of Solid Immersion Lenses in diamond for sensing and cryogenic applications

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5.39

A compact radiofrequency spectrum analyser based on nitrogen-vacancy centers in diamond

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5.40

High-dynamic-range high-sensitivity NV-based Vector Magnetometry

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5.41

Free induction decay measurements of a Nitrogen-Vacancy centres ensemble in a weak transverse magnetic field

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5.42

Near zero-field magnetic imaging of a cross-structure with nitrogen vacancy centers in diamond

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5.43

Enhancing photon collection from single shallow nitrogen-vacancy centres in diamond nanopillars for quantum heterodyne measurements

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5.44

Sensitivity enhancement of a diamond quantum sensor with continuously excited Ramsey protocol

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5.45

Fiber-Coupled Absorption-based Quantum Nanoprobes with NV Ensembles in a Suspended Diamond Photonic Cavity

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5.46

A miniaturized and integrated fiber-based magnetic field sensor

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5.47

Fabrication and Assembly of Fiber-coupled Diamond Nanobeam Scanning Probes for 2D Nanoscale Magnetic Imaging

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5.48

Quantum Sensing and Imaging of van der Waals Ferromagnet using Nitrogen-Vacancy Centers

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5.49

Towards Fast and Sensitive Characterization of Diamond Films and Surfaces through Wide-Field Imaging

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5.50

Fast optoelectronic charge state conversion of silicon vacancies in diamond

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5.51

Towards Microwave Control of Silicon Vacancies in Diamond

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5.52

Enhanced emission of SnV centers in diamond nano-pillars

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5.53

Broadband and Efficient Microwave Antenna using Standing Wave for Diamond Sensing Application

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5.54

Radial transfer matrix model for free-space emission optimization

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5.55

Nanofabrication methods for suspended "Sawfish" cavities in diamond

Tommaso Pregnolato[1,2], Marco E. Stucki[1,2], Julian M. Bopp[1,2], Maarten H. van der Hoeven[2], Alok Gokhale[2], Olaf Krüger[1], and Tim Schröder[1,2]
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5.56

Trapping of Nanodiamonds using Optical Tweezers

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5.57

Fabrication of thin and highly smooth single crystal diamond platelets for quantum applications

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5.58

Processing diamond materials for improved performance in quantum sensing and power electronics

Adam J. Biacchi[1], J. Trey Diulus[1], Michele Kelley[1], Sean M. Blakley[2], Robert D. McMichael[1], Andrei Kolmakov[1]

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5.59

Fractal apertures in metamaterial-based waveguides for surface wave plasma CVD

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5.60

Reduction of strain distribution in CVD diamond lattice by using substrate with large misorientation angle

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5.61

Microwave plasma modelling for heterogeneous diamond growth on III-nitrides

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5.62

Model of Large Area Diamond Growth by MPCVD at 915 MHz

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5.63

Multi-Scale simulation of CVD diamond growth: from the experimental conditions to the crystal morphology

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5.64

Modeling asymmetric diamond crystal shapes during temperature gradient HPHT growth

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5.65

Enhancing nanodiamond seeding through spray coating and inkjet printing: unravelling the impact of O2, CF4 plasma, and UV-Ozone modification

Pieter Verding[1,2], Rani Mary Joy[1,2], Dieter Reenaers[1,2], Rachith Shanivarasanthe Nithyananda Kumar[1,2], Rozita Rouzbahani[1,2], Ewoud Jeunen[1], Seppe Thomas[1], Derese Desta[1,2], Hans-Gerd Boyen[1,2], Paulius Pobedinskas[1,2], Ken Haenen[1,2], Wim Deferme[1,2]

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5.66

Selective growth of diamond on laser-treated seed layers

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5.67

Effect of seed density on the deposition of polycrystalline diamond films by plasma-enhanced chemical vapor deposition

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5.68

Optimized CVD growth conditions of (100)-oriented P-doped diamond films for p+/p-/n Schottky diodes

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5.69

Optimizing growth of phosphorus-doped diamond via dynamic gas flow

Kil-Dong Sung[1], Stefan Andrei Irimiciuc[1], Šárka Havlová[1], Michal Novotný[1], Zdeněk Weiss[1], Jaromír Kopeček[1], Andrew Taylor[1], Vincent Mortet[1]

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5.70

Controlled positioning of NV centres in optical resonators by N-doped CVD growth

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5.71

Diamond Encapsulated Plasmonic Nanostructures for SERS

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5.72

Comparative study of AlN deposition on Si(1 1 1) and polycrystalline diamond by TEM

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5.73

Coating of self-sensing AFM cantilevers with boron-doped nanocrystalline diamond films at low temperatures

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5.74

Engineered Diamond Coatings Topographies for Osseointegration

Marit Hougen[1], Ivan R. Mondragon[2], Mihaela Roxana Cimpan[2], Paul Johan Høl[3], Justas Zalieckas[1]

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5.75

Simple Setup for Thermal and Plasma-Assisted Hydrogenation of Diamond

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5.76

Simulated hydrogen diffusion in diamond grain boundaries

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5.77

Optimizations of Single-Crystal Diamond Surfaces for Implantation, Membranes and Nanophotonic Structures

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5.78

Planar 2-inch diamond wafers as a basis for functional microstructures and quantum optical applications

Jan Engels, Jürgen Weippert, Tingpeng Luo, Lukas Lindner, Jan Kustermann, Patricia Quellmalz, Christian Giese, Jan Jeske, Peter Knittel, Lutz Kirste, Vadim Lebedev

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5.79

Experimental Evidence for Large Negative Electron Affinity from Scandium-Terminated Diamond

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5.80

Recent development in DFT+VTST investigations of (100)–(2×1):H diamond surfaces by means of first-principle calculations

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5.81

Processing diamond materials for improved performance in quantum sensing and power electronics

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5.82

Enhanced Cyclic Stability in Diamond Supercapacitors via Mn-Ion Implantation-Induced Dual-Phase MnO2-Graphitic Transformation

Sujit Deshmukh[1], Srinivasu Kunuku[1], Pawel Jakobczyk[1], Adrian Olejnik[1], Chien-Hsu Chen[2], Huan Niu[2], Bing Yang[3], Nianjun Yang[4] and Robert Bogdanowicz[1]

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5.83

Application of diamond derived carbon in a sulphur doped high performance anode for sodium ion batteries

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5.84

Boron-doped carbon nanowall and boron-doped diamond electrodes for electrochemical detection of paraquat and glyphosate herbicides

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5.85

Fabrication at the speed of light: towards analyte-specific sensors made of diamond using UV laser as energy source

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5.86

Electrochemistry Using Nanostructured Diamond Electrodes

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5.87

Periodically patterned boron-doped diamond electrodes for electrochemical applications

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5.88

Diamond-on-polyimide flexible implant for cortical recordings

Clément Hébert[1], Gaëlle Lissorgue[2], Blaise Yvert[1], Lionel Rousseau[2]

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5.89

B,N-codoped carbon nanowalls for non-faradaic electrochemical impedimetric detection of E.coli

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5.90

Design and Applications of Diamond Composites

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5.91

Fabrication and Applications of Diamond/graphite Nano-composite Film

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5.92

Functionalisation of detonation nanodiamond with small zwitterionic peptides to control interactions and improve biocompatibility in biological environments

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5.93

Characterizing Infrared Effects on Nanodiamond Fluorescence for Intracellular Temperature Measurement by using ODMR

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5.94

Towards the next level of in vitro free radical quantum sensing: biocompatibility and biodistribution of NV--FNDs in precision-cut tissue slices from mouse organs

Alina Sigaeva[1,2], Arturo Elías Llumbet[2], Britt Coenen[2], Claudia Reyes San Martin[2], Elkin Escobar[2], Willem Woudstra[2], Siyu Fan[2], Aldona Mzyk[3], Yue Zhang[2], Rokshana Sharmin[2], Dorenda Oosterhuis[2], Alan R. Gorter[2], Peter Olinga[2], Romana Schirhagl[2]

[1]SciLifeLab, Tomtebodavägen 23, 171 65 Solna, Sweden. [2]Department of Biomaterials & Biomedical Technology, University Medical Center Groningen, University of Groningen, Hanzeplein 1, Groningen, The Netherlands . [3]DTU Health Tech, Ørsteds Plads Bldg 345C, 2800 Kongens Lyngby, Denmark.

5.95

Diamond-based platforms for biochemical measurements of time-resolved clock cell signaling

Rezvaneh Ghasemitabesh[1], Daniel Merker[1], Daniela Bertinetti[2], Friedrich W. Herberg[2], Cyril Popov[1]

[1]Institute of Nanostructure Technologies and Analytics (INA), Center for Interdisciplinary Nanostructure Science and Technology (CINSaT), University of Kassel, Germany. [2]Department of Biochemistry, Center for Interdisciplinary Nanostructure Science and Technology (CINSaT), University of Kassel, Germany.

5.96

Manipulating and Detecting Subcellular Temperatures through Organelle-Targeted Photothermal Nanodiamond Complexes

Kaiqi Wu, Qi Lu, Yingke Wu, and Tanja Weil

Max Planck Institute for Polymer Research, Ackermannweg 10, 55128 Mainz, Germany

5.97

Photonic Quantum Nanosensors for Subcellular Neuronal Signaling

Beatriz N. L. Costa[1], Filipe Camarneiro[1], Ana Marote[2], Catarina Barbosa[2], António Salgado[2], Jana B. Nieder[1]

[1]INL - International Iberian Nanotechnology Laboratory, Ultrafast Bio- and Nanophotonics group, Av. Mestre José Veiga s/n, Braga, Portugal. [2]ICVS - Life and Health Sciences Research Institute (ICVS), School of Medicine, University of Minho, Campus de Gualtar, Braga, Portugal.

5.98

Unraveling Eumelanin Radical Formation by Nanodiamond Optical Relaxometry in a Living Cell

Qi Lu[1], Berlind[1], Zhenyu[2,3,4], Priyadharshini[5], Maabur[5], Carla[1], Raul[5], Ingo[1], Robert[1], Fedor[5], Martin[2], Yingke[1], Tanja Weil[1]

[1]Max Planck Institute for Polymer Research, Ackermannweg 10, Mainz, Germany. [2]Institute of Theoretical Physics and Center for Integrated Quantum Science and Technology (IQST), Ulm University, Albert-Einstein-Allee 11, Ulm, Germany. [3]Key Laboratory of Atomic and Subatomic Structure and Quantum Control (Ministry of Education), and School of Physics, South China Normal University, Guangzhou, China. [4]Guangdong Provincial Key Laboratory of Quantum Engineering and Quantum Materials, and Guangdong-Hong Kong Joint Laboratory of Quantum Matter, South China Normal University, Guangzhou, China. [5]Institute for Quantum Optics and Center for Integrated Quantum Science and Technology (IQST), Ulm University, Albert-Einstein-Allee 11, Ulm, Germany.

5.99

Radiation tolerance of diamond detector with 68 MeV protons: flux and fluence studies

R. Molle[1], M-L. Gallin-Martel[1], C. Koumeir[3], D. Dauvergne[1], P. Everaere[1,4], L. Gallin-Martel[1], A. Guertin[2], F. Haddad[3], C. Hoarau[1], F. Lafont[4], J. Livingstone[1], V. Metivier[2], J-F Muraz[1], F. Poirier[3], F. Rarbi[1], N. Servagent[2]

[1]Univ. Grenoble Alpes, CNRS/IN2P3 Laboratoire de Physique Subatomique et Cosmologie (LPSC), 53 Av. des Martyrs, 38000 Grenoble, France. [2]Univ. Nantes, SUBATECH, 4 rue Alfred Kastler, 44 307 Nantes Cedex 3, France. [3]ARRONAX, 1 rue Aronnax, 44800 Saint Herblain, France. [4]European Synchrotron Radiation Facility, 71 avenue des Martyrs, 38000 Grenoble, France.

5.100

Modelling a Diamond-Based Radiation Detector for Beta Particles from Tritium

Sophie E Osbourne

School of Physics, University of Bristol, HH Wills Physics Laboratory, Tyndall Avenue, Bristol UK, BS8 1TL.

5.101

Performance of a scCVD particle detector operated at cryogenic temperatures in radiation harsh environments

Karla Ivanković Nizić[1], Georgios Provatas[1], Donny Cosic[1], Milko Jakšić[1], Milan Vićentijević[1], Michal Pomorski[2]

[1]Ruder Boskovic Institute, Bijenička cesta 54, Zagreb, Croatia. [2]Universite Paris-Saclay, CEA, List, Palaiseau, F-91120, France.

5.102

Diamond Sensors for Pulse-Resolved Measurements of High Energy X-rays at European XFEL

Tuba Çonka Yıldız[1], Wolfgang Freund[1], Jia Liu[1], Matthias Schreck[2], Dmitry Khakhulin[3], Hazem Yousef[3], Peter Zalden[3], Christopher Milne[3] and Jan Grünert[1]

[1]XPD, European XFEL, Holzkoppel 4, 22869, Schenefeld, Germany. [2]Department of Physics, University of Augsburg, Universitätsstr. 1, 86159, Augsburg, Germany. [3]FXE, European XFEL, Holzkoppel 4, 22869, Schenefeld, Germany.

5.103

Patterning and Structuring of CVD Diamond by Catalytic Etching Using Nickel

Anjana Wijesekara[1], Saffron Tyler[1], Daniel Field[2], Ben L. Green[1], Mark E. Newton[1]

[1]Department of Physics, University of Warwick, Coventry, CV4 7AL, United Kingdom. [2]Element Six (UK) Ltd., Global Innovation Centre, Didcot, OX11 0QR, United Kingdom.

5.104

Electron Beam-Induced Etching of Single Crystal Diamond: effect of atmosphere

M. Régnier[1,2], D.D. Tran[1,2], F. Donatini[1], E. Gheeraert[1,2]

[1]Institut Neel, CNRS, Grenoble INP, Univ. Grenoble Alpes, 38000 Grenoble, France. [2]Institute of Applied Physics, Faculty of Pure and Applied Sciences, University of Tsukuba, Tsukuba 305-8573, Japan.

5.105

Vertical 1kV deep depletion diamond MOSFET: optimization and compact model

Nicolas Rouger[1], Marine Couret[1], Ralph Makhoul[1], Juliette Letellier[2], Julien Pernot[3]

[1]Université de Toulouse, LAPLACE, CNRS, UPS, INPT, F-31071 Toulouse, France. [2]DIAMFAB, 38000, Grenoble, France. [3]Université Grenoble Alpes, Grenoble INP, Institut Néel, 38000, Grenoble, France.

5.106

New optical gate configuration for FET device

J.L. Cruces[1], F. Lloret[2], G. Alba[1], R. Alcantara[3], J. Navas[3], D. Eon[4], R. Rouzbahani[5], K. Haenen[5], D.Araujo[1]

[1]Departament of Materials Science and Metallurgical Engineering and Inorganic Chemistry. University of Cádiz, 11510, Puerto real, Spain. [2]Departament of Applied of Physics. University of Cádiz, 11510, Puerto real, Spain. [3]Departament of Physical Chemistry. University of Cádiz, 11510, Puerto real, Spain. [4]Institut Néel, CNRS, Grenoble INP. University of Grenoble Alpes, 38000, Grenoble, France. [5]Institute for Materials Research (IMO), Hasselt University, & IMOMEC, IMEC vzw, 3590 Diepenbeek,Belgium.

5.107

Proposal of inversion channel diamond MOSFET with drift layer-free for low-loss and high-voltage

Tsubasa Matsumoto[1,2], Kai Sato[2], Yuto Nakamura[2], Toshiharu Makino[3], Hiromitsu Kato[3], Masahiko Ogura[3], Traore Aboulayé[4], Kimiyoshi Ichikawa[1], Kan Hayashi[1,2], Takako Inokuma[2],Satoshi Yamasaki[1], Norio Tokuda[1,2]

[1]Nanomaterials Research Institute, Kanazawa University, Kakuma-machi, Kanazawa, Japan. [2]Graduate School of Natural Science and Technology, Kanazawa University, Kakuma-machi, Kanazawa, Japan. [3]Advanced Power Electronics Research Center, AIST, 1-1-1 Umezono, Tsukuba, Japan. [4]Graduate School of Pure and Applied Sciences, University of Tsukuba, 1-1-1 Tennodai, Tsukuba, Japan.

5.108

Study of GaN-HEMTs with a diamond for high power applications

Mourad Kaddeche[1], Zine Eddine KADDECHE[2]

[1]Department of Technology, Faculty of Science and Technology, Djilali Bounaama University of Khemis Miliana, Route theniet elhad, 44225 Ain Defla, Algeria. [2]Faculty of E.A.S, Bilecik Şeyh Edebali University, 11230 Bilecik Merkez, Bilecik, Türkiye.

5.109

Deep level transient spectroscopy and hole injection used to investigate deep traps in lightly doped diamond layer

Philippe Ferrandis[1], Jesus Canas Fernandez[1], Julien Bassaler[1], Martin Kah[1], Julien Pernot[1], David Eon[1]

[1]Université Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, 38000 Grenoble, France.

5.110

Defects studies on Schottky barrier diode by Electron Beam Induced Current for beta-voltaic applications

H. Ribeiro[1,2], M. Jacquemin[1], G. Jacopin[2]

[1]DIAMFAB, 25 avenue des martyrs, 38042 Grenoble, France. [2]Institut Néel CNRS, Univ. Grenoble Alpes, 38042, Grenoble, France.

5.111

Numerical simulations on thermally stimulated current (TSC) measurements

Maximilian Bosak, Theodor Peter, Theodor Grünwald, Matthias Schreck

University of Augsburg, Institute of Physics, D-86135 Augsburg (Germany)

5.112

Charge carrier transport in graphene/diamond hybrids

S. Majdi[1], R. Yamazaki[1], A. Aitkulova[1], N. Suntornwipat[1], J. Isberg[1]

[1]Division of Electricity, Department of Electrical Engineering, Uppsala University, Box 65, 751 03, Uppsala, Sweden.

5.113

Increased Hall mobility in graphene-on-diamond

Aisuluu Aitkulova[1], Nattakarn Suntornwipat[1], Saman Majdi[1], Jan Isberg[1]

[1]Division of Electricity, Department of Electrical Engineering, Uppsala University, Box 65, 751 03, Uppsala, Sweden.

5.114

Photon-induced conductivity enhancement in N- P- co-doped polycrystalline diamond layers

A. Freire de Rivas[1], F. Lloret[2], M. Domínguez[3], K.J. Sankaran[4], K. Haenen[5,6], Daniel Araujo[1]

[1]Department of Materials Sciences, University of Cadiz, 11510, Puerto Real, Spain. [2]Department of Applied Physics, University of Cadiz, 11510, Puerto Real, Spain. [3]Department of Condensed Matter Physics, University of Cadiz, 11510, Puerto Real, Spain. [4]CSIR-Institute of Minerals and Materials Technology, BBSR, 751013, Odisha, India. [5]Institute for Materials Research (IMO), Hasselt University, 3590 Diepenbeek, Belgium. [6]IMOMEC, IMEC vzw, 3590 Diepenbeek, Belgium.

5.115

Cryogenic EBID for the fabrication of diamond-metal contacts

J. Valendolf[1], J.C. Piñero[2], G. Alba[1], F. Lloret[3], D. Araujo[1]

[1]Department of Materials Science and Metallurgical Engineering and Inorganic Chemistry. University of Cadiz, 11510, Puerto Real, Spain. [2]Department of Didactics, section of Mathematics. University of Cadiz, 11510, Puerto Real, Spain. [3]Department of Applied Physics. University of Cadiz, 11510, Puerto Real, Spain.

5.116

Influence of the interfacial carbide formation for ohmic behaviour unveiled on semiconducting diamond

J. Valendolf[1], JC. Piñero[2], G. Alba[1], F. Lloret[3], D. Araujo[1]

[1]Department of Materials Science and Metallurgical Engineering and Inorganic Chemistry. University of Cádiz, 11510, Puerto Real, Spain. [2]Department of Didactics, section of Mathematics. University of Cádiz, 11510, Puerto Real, Spain. [3]Department of Applied Physics. University of Cádiz, 11510, Puerto Real, Spain.

5.117

Investigating the Effect of Nitrogen on the Structural and Electrical Properties of Phosphorus and Nitrogen Co-doped Nanocrystalline Diamond

Essraa Ahmed[1,2], Rozita Rouzbahani[1,2], Paulius Pobedinskas[1,2], Nianjun Yang[1,2], Ken Haenen[1,2]

[1]Institute for Materials Research (IMO), Hasselt University, 3590 Diepenbeek, Belgium. [2]IMOMEC, IMEC vzw, 3590 Diepenbeek, Belgium.

5.117

Towards High-Resolution Magnetic Resonance Imaging Combined Scanning Probe Technique and NV centers in Diamond

Raúl González Brouwer[1], Berndt Koslowski[1], Fedor Jelezko[1]

[1]Institute for Quantum Optics, Ulm University, Albert-Einstein-Allee 11, 89081 Ulm, Germany.

20:00 Closing Day 1 "Hasselt Diamond Workshop 2024 – SBDD XXVIII".

Thursday, February 29, 2024

Session 6
Nanodiamond and Surfaces
Chair: Oliver A. Williams, Cardiff University, U.K.

09:00
6.1 (Invited)
Transmission electron microscopy and spectroscopy for high spatial resolution color center detection and correlation
Shery L. Y. Chang[1,2], Haotian Wen[2], Christian Dwyer[3]
[1]Electron Microscope Unit, Mark Wainwright Analytical Center, University of New South Wales, Sydney, Australia. [2]School of Materials Science and Engineering, University of New South Wales, Sydney, Australia. [3]Electron Imaging and Spectroscopy Tools, Sans Souci, Australia.

09:30
6.2
Fluorescence Lifetime of Nanodiamonds for Intracellular Thermometry
Filipe Camarneiro[1], Beatriz Costa[1], Miguel Ferreira-Cao[1], Jana B. Nieder[1]
[1]INL – International Iberian Nanotechnology Laboratory, Ultrafast Bio- and Nanophotonics group, Av. Mestre José Veiga s/n, Braga, Portugal.

09:50
6.3
A multifunctional cascade nanoreactor based on Fe decorated nanodiamond for enhancing chemodynamic/starvation Therapy for tumor hypoxia
Rajakar Selvam[1], Elena Prevedentseva[1,2], Artashes Karmenyan[1], Chia-Liang Cheng[1]
[1]Department of Physics, National Dong Hwa University, Hualien, Taiwan. [2]P.N. Lebedev Physics Institute of Russian Academy of Science, Moscow, 119991, Russia.

10:10
6.4
Utilizing electrons from diamond surfaces: Photocatalytic dehalogenation of aromatic compounds using nanodiamond
Tobias Karl[1], Johannes Ackermann[2], Rocio B. Rodriguez[2], Burkhard König[1], Anke Krueger[2]
[1]Institute of Organic Chemistry, University of Regensburg, Universitätsstraße 31, Regensburg, Germany. [2]Institute of Organic Chemistry, University of Stuttgart, Pfaffenwaldring 55, Stuttgart, Germany.

10:30 Coffee Break (Grand Banquet Hall)

Session 7
Diamond Growth
Chair: Paul W. May, University of Bristol, U.K.

11:10
7.1
Hydrogen incorporation in nitrogen-doped CVD diamond
Tokuyuki Teraji[1], Chikara Shinei[1], Yuta Masuyama[2]
[1]National Institute for Materials Science, 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan. [2]National Institutes for Quantum Science and Technology, Takasaki, Gunma 370-1292, Japan.

11:30
7.2
Investigation on the mechanisms at the origin of reduction of the emerging dislocation density in W-doped diamond layer
Dov Zvi Nusimovici[1,2], Thu-Nhi Tran Caliste[3], José Baruchel[3], David Eon[4], Jessica Bousquet[1], Didier Chaussende[2]
[1]DIAMFAB, 25 avenue des Martyrs, 38042 Grenoble, France. [2]Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMaP, 38000 Grenoble, France. [3]ESRF, 71 avenue des Martyrs, 38043 Grenoble, France. [4]Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, 38000 Grenoble, France.

11:50
7.3
Synthesis of single crystal diamond films using a distributed antenna array microwave system
Chaimaa Mahi[1], Alexandra Oliveira[1], Ovidiu Brinza[2], Riadh Issaoui[1], Alexandre Tallaire[2,3], Jocelyn Achard[1], Fabien Bénédic[1]
[1]Université Sorbonne Paris Nord, LSPM, CNRS, UPR 3407, Villetaneuse, France. [2]LSPM, CNRS, UPR 3407, Université Sorbonne Paris Nord, Villetaneuse, France. [3]Institut de Recherche de Chimie Paris, Chimie ParisTech, CNRS, PSL Research University, Paris, France.

12:10
7.4
Synthesis of P-doped diamond using tert-butyl phosphine toward the high sensitivity quantum sensor of the NV center
Riku Kawase[1], Hiroyuki Kawashima[1], Hiromitsu Kato[2], Norio Tokuda[3], Satoshi Yamasaki[3], Masahiko Ogura[2], Toshiharu Makino[2], Norikazu Mizuochi[1, 4]
[1]Institute for Chemical Research, Kyoto University, Gokasho, Uji, Kyoto 611-0011, Japan. [2]National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki 305-8568, Japan. [3]Graduate School of Natural Science and Technology, Kanazawa University, Kanazawa, Ishikawa 920-1192, Japan.

12:30 Lunch (Grand Banquet Hall) + Joint Committees Meeting (Fluistertuin)

Session 8
Quantum Sensing II
Chair: Miloš Nesládek, Hasselt University & IMEC vzw, Belgium

14:00
8.1 (Invited)
Diamond sensing of magnetic transitions and fluctuations of nanoparticles
Ren-Bao Liu
Department of Physics, Centre for Quantum Coherence, The Hong Kong Institute of Quantum Information Science and Technology, and New Cornerstone Science Laboratory, The Chinese University of Hong Kong.

14:30
8.2
Towards low-noise magnetic sensing with tin-vacancy centers in diamond
Gesa Welker[1], Yufan Li[1], Richard Norte[1,2] and Toeno van der Sar[1]
[1]Department of Quantum Nanoscience, Kavli Institute of Nanoscience, Delft University of Technology, Delft, The Netherlands. [2]Department of Precision and Microsystems Engineering, Faculty of Mechanical, Maritime and Materials Engineering, Delft University of Technology, Delft, The Netherlands.

14:50
8.3
Cavity-free room temperature magnetometry using singlet absorption of NV centers in diamond
Ali Tayefeh Younesi[1], Muhib Omar[2, 3], Arne Wickenbrock[2,3], Dmitry Budker[2,3,4], Ronald Ulbricht[1]
[1]Max Planck Institute for Polymer Research, Ackermannweg 10, 55128 Mainz, Germany. [2]Helmholtz-Institut Mainz, GSI Helmholtzzentrum für Schwerionenforschung GmbH, 55128 Mainz, Germany. [3]Johannes Gutenberg-Universität Mainz, 55128 Mainz, Germany. [4]Department of Physics, University of California, Berkeley, California 94720-300, USA.

15:10
8.4
In-plane strain distribution in HPHT diamond detected by ODMR of NV- centers
Chikara Shinei[1], Yuta Masuyama[2], Hiroshi Abe[2], Masashi Miyakawa[1], Takashi Taniguchi[1], Takeshi Ohshima[2], Tokuyuki Teraji[1]
[1]National Institute for Materials Science, 1-1 Namiki, Tsukuba, Ibaraki, 305-0044, Japan. [2]National Institutes for Quantum Science and Technology, Takasaki, Gunma 370-1292, Japan.

Session 9
Posters II & Coffee Break
Chairs: Jocelyn Achard; Shery L.Y. Chang; Anke Krueger; Boris Naydenov

15:30 – 17:00 (Grand & Small Banquet Hall)

For a detailed list of posters, see Session 5.

Session 10
Nuclear Spin Memories
Chair: Fazhan Shi, University of Science and Technology of China, China

17:00
10.1 (Invited)
Germanium-Vacancy in diamond as quantum memory exceeding 20ms
Katharina Senkalla[1], Genko Genov[1], Mathias H. Metsch[1], Petr Siyushev[1,2,3], Fedor Jelezko[1]
[1]Institute for Quantum Optics, Ulm University, Albert-Einstein-Allee 11, 89081 Ulm, Germany
[2]3rd Institute of Physics, Center for Applied Quantum Technologies University of Stuttgart, Stuttgart, Germany
[3]Institute for Materials Research (IMO), Hasselt University, Wetenschapspark 1, B-3590 Diepenbeek, Belgium

17:30
10.2
Novel methodology for Quantum State Tomography, accessing 0.9995 fidelity two qubit electron-nuclear spin gates
Abhishek Shukla[1], Boo Carmans[1], Michael Petrov[1] , Daan Vrancken[1], Milos Nesladek[1]
[1]Quantum Science and Technology, IMO-IMOMEC, Wetenschapspark 1, Diepenbeek, België

17:50
10.3
Ab-initio theory of nuclear spin flip processes within NV center of diamond via orbital degrees of freedom
Gergő Thiering[1], Richard Monge[3,4], Tom Delord[3], Carlos A. Meriles[3,4], Adam Gali[1,2]
[1]HUN-REN Wigner Research Centre for Physics, Budapest, Hungary. [2]Department of Atomic Physics, Budapest University of Technology and Economics, Budapest, Hungary [3]Department of Physics, CUNY-City College of New York, New York, New York 10031, USA 4CUNY-Graduate Center, New York, New York 10016, USA.

18:10 Closing Day 2 "Hasselt Diamond Workshop 2024 – SBDD XXVIII".

20:00 Conference Dinner at the *Ravel* & *De Boulevard* of the *Holiday Inn*.

Friday, March 1, 2024

Session 11
Diamond Device Technology II
Chair: M. Pilar Villar, Universidad de Cádiz, Spain

09:30
11.1 (Invited)
Polycrystalline Diamond Micro-Hotplates
Evan L. H. Thomas[1], Jaspa Stritt[1], Soumen Mandal[1], Matthias Imboden[2], Oliver A. Williams[1]
[1]School of Physics and Astronomy, Cardiff University, Queen's Buildings, The Parade, Cardiff, UK. [2]4K-MEMS SA, St Blaise, Switzerland.

10:00
11.2
Sawfish photonic crystal cavities with Q-factors of several thousand
Marco E. Stucki[1,2], Tommaso Pregnolato[1,2], Julian M. Bopp[1,2], Maarten H. v. d. Hoeven[2], Alok Gokhale[2], Olaf Krüger[1], Tim Schröder[1,2]
[1]Ferdinand-Braun-Institut gGmbH, Leibniz-Institut für Höchstfrequenztechnik, Gustav-Kirchhoff-Str. 4, 12489 Berlin, Germany. [2]Department of Physics, Humboldt-Universität zu Berlin, Newtonstr. 15, 12489 Berlin, Germany.

10:20
11.3
Microwave dielectric resonator for the quality control of freestanding diamond plates
Jerome A. Cuenca[1], Soumen Mandal[1], Jaspa Stritt[1], Xiang Zheng[2], James Pomeroy[2], Martin Kuball[2], Adrian Porch[3], Oliver A. Williams[1]
[1]School of Physics and Astronomy, Cardiff University, Cardiff, CF24 3AA, United Kingdom. [2]University of Bristol, Bristol, BS8 1TL, United Kingdom. [3]School of Engineering, Cardiff University, Cardiff, CF24 3AA, United Kingdom.

10:40
11.4
Inkjet printing-manufactured boron-doped diamond chip electrodes for electrochemical sensing purposes
Zhichao Liu[1], Simona Baluchová[1], Bob Brocken[1], Essraa Ahmed[2,3], Paulius Pobedinskas[2,3], Ken Haenen[2,3], Josephus G. Buijnsters[1]
[1]Precision and Microsystems Engineering, Delft University of Technology, 2628 CD Delft, the Netherlands. [2]Institute for Materials Research (IMO), Hasselt University, 3590 Diepenbeek, Belgium. [3]IMOMEC, IMEC vzw, 3590 Diepenbeek, Belgium.

11:00 Coffee Break (Grand Banquet Hall)

Session 12
Diamond Devices II
Chair: David A.J. Moran, University of Glasgow, U.K.

11:30
12.1
High quality Al2O3/(111) (OH)-terminated diamond interface for MOSFETs fabrication
Pietro Argenton[1], Martin Kah[1], Marine Couret[2], Nicolas Rouger[2], David Eon[1], Julien Pernot[1]
[1]Univ. Grenoble Alpes, CNRS, Grenoble INP, Institut Néel, 38000 Grenoble, France. [2]Université de Toulouse, LAPLACE, CNRS, INPT, UPS, F-31071 Toulouse, France.

11:50
12.2
Development of monolithic diamond capacitors for high voltage applications
Michal Pomorski[1], Larry Buffle[2], Cyrille Laviron[3], Baptiste Truffet[1], Frederic Voiron[2]
[1]Université Paris-Saclay, CEA, LIST, F-9112, Palaiseau, France. *[2]Murata Integrated Passive Solutions, 14000, Caen, France. [3]CEA-LETI, Grenoble, France.*

12:10
12.3
Laser-written All-carbon Transistors in Diamond
Calum Henderson[1], Marta Krueger[2], Emil Jonasson[3], Patrick Salter[2], Richard B. Jackman[1]
[1]London Centre for Nanotechnology and the Department of Electronic and Electrical Engineering, UCL (University College London), 17-19 Gordon Street, London, WC1H 0AH, UK. [2]Department of Engineering Science, University of Oxford, Parks Road, Oxford OX1 3PJ, UK. [3]Remote Applications in Challenging Environments (RACE), UK Atomic Energy Authority, Culham Campus, Abingdon, UK.

12:30
12.4
Experimental Evidence for Large Negative Electron Affinity from Scandium-Terminated Diamond
Ramiz Zulkharnay, Paul W. May
School of Chemistry, University of Bristol, Bristol BS8 1TS, United Kingdom.

12:50 Lunch (Grand Banquet Hall)

Session 13
Physics of Colour Centres
Chair: Tokuyuki Teraji, National Institute for Materials Science (NIMS), Japan

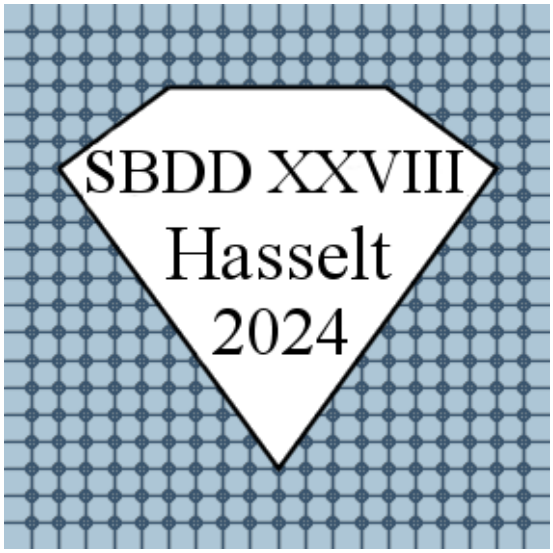
14:10
13.1
Drift force around dislocations affecting the luminescence quantum efficiency of excitons in CVD diamond
Daiki Totsuka[1], Kazuki Konishi[1], Rintaro Toda[1], Jan Isberg[2], Nobuko Naka[1]
[1]Department of Physics, Kyoto University, Kyoto 606-8502, Japan. [2]Department of Electrical Engineering, Uppsala University, Box 65, S-751 03, Uppsala, Sweden.

14:30
13.2
Ultrafast optoelectronic charge state switching of silicon vacancies in diamond
Manuel Rieger[1], Viviana Villafañe[1,2], Lina M. Todenhagen[1], Stephan Matthies[2], Stefan Appel[2], Martin S. Brandt[1], Kai Müller[2], Jonathan J. Finley[1]
[1]Walter Schottky Institute, School of Natural Sciences and MCQST, Technical University of Munich, 85748 Garching, Germany. [2]Walter Schottky Institute, School of Computation, Information and Technology and MCQST, Technical University of Munich, 85748 Garching, Germany.

14:50
13.3
Electrical excitation of color centers in phosphorus-doped diamond
Florian Sledz[1], Igor A. Khramtsov[2], Assegid M. Flatae[1], Stefano Lagomarsino[3], Shannon S. Nicley[4,5], Rozita Rouzbahani[4], Paulius Pobedinskas[4], Ken Haenen[4], Tianxiao Guo[6], Xin Jiang[6], Paul Kienitz[7], Peter Haring Bolivar[7], Dmitry Yu. Fedyanin[1,2], Mario Agio[1,8]
[1]Laboratory of Nano-Optics, University of Siegen, Germany. [2]Laboratory of Nanooptics and Plasmonics, Moscow Institute of Physics and Technology, Russian Federation. [3]Istituto Nazionale di Fisica Nucleare, Sezione di Firenze, Italy. [4]Institure for Material Research (IMO) & IMOMEC, Hasselt University & IMEC vzw, Belgium. [5]Department of Electrical and Computer Engineering, Michigan State University, USA. [6]Lehrstuhl für Oberflächen- und Werkstofftechnologien, University of Siegen, Germany. [7]Group of Graphene-based Nanotechnology, University of Siegen, Germany. [8]National Institute of Optics (INO), National Research Council (CNR), Italy.

15:10
13.4
Low Earth Orbit Mission Results of the OSCAR-QUBE Integrated Diamond-based Quantum Sensor
Yarne Beerden[1], Siemen Achten[1], Musa Aydogan[1], Sam Bammens[1], Sofie Bammens[1], Daphne Box[1], Boo Carmans[1], Jeffrey Gorissen[1], Teoman Köseoglu[1], Dries Hendrikx[1], Jens Mannaerts[1], Remy Vandebosch[1], Siemen Vandervoort[1], Sebastiaan Vanspauwen[1], Anna Ermakova[1,2], Milos Nesladek[1,3], Jaroslav Hruby[1,3]
[1]Institute for Materials Research (IMO), Hasselt University, Wetenschapspark 1, B-3590 Diepenbeek, Belgium [2]Belgian Institute for Space Aeronomy (BIRA-IASB), Ringlaan 3, B-1180 Brussels, Belgium. [3]IMOMEC Division, IMEC, Wetenschapspark 1, B-3590 Diepenbeek, Belgium.

15:30 Closing "Hasselt Diamond Workshop 2024 – SBDD XXVIII".



Workshop sponsored by Seki Diamond Systems, Diatope, MUEGGE, Qnami, HiQuTe Diamond, Mintres, Orbray, Diamfab, Konfidi, and Hasselt University via the Institute for Materials Research (IMO-IMOMEC).

HASSELT DIAMOND WORKSHOP 2024 – SBDD XXVIII

Tuesday, February 27, 2024

18:00 – 19:00	**Registration at the *Express by Holiday Inn* & Reception**

Wednesday, February 28, 2024

08:20 – 08:50	**Registration at the *cultuurcentrum Hasselt*.**
08:50 – 09:00	**Opening "Hasselt Diamond Workshop 2024 – SBDD XXVIII".**
09:00 – 10:10	**Session 1** **Diamond Device Technology** **Chair: Ken Haenen, Hasselt University & IMEC vzw, Belgium**
10:10 – 10:50	**Coffee Break (Grand Banquet Hall)**
10:50 – 12:20	**Session 2** **Diamond Quantum Technology** **Chair: Christoph Becher, Universität des Saarlandes, Germany**
12:30	**SBDD XXVIII group photo (Lecture Hall)**
12:40 – 14:20	**Lunch (Grand Banquet Hall)**
14:20 – 15:50	**Session 3** **Quantum Sensing I** **Chair: Quan Li, The Chinese University of Hong Kong, Hong Kong**
15:50 – 16:30	**Coffee Break (Grand Banquet Hall)**
16:30 – 18:00	**Session 4** **Diamond Devices I** **Chair: Jan Isberg, Uppsala University, Sweden**
18:00 – 20:00	**Session 5** **Posters I & Reception sponsored by:** SEKI DIAMOND SYSTEMS **Chairs: Jocelyn Achard, Université Sorbonne Paris Nord, France; Shery L.Y. Chang, University of New South Wales, Australia; Anke Krueger, Universität Stuttgart, Germany; Boris Naydenov, Helmholtz-Zentrum Berlin (HZB), Germany**
20:00	**Closing Day 1 "Hasselt Diamond Workshop 2024 – SBDD XXVIII".**

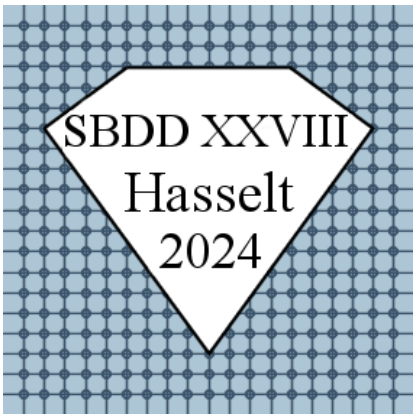
Thursday, February 29, 2024

09:00 – 10:30	**Session 6** **Nanodiamond & Surfaces** **Chair: Oliver A. Williams, Cardiff University, U.K.**
10:30 – 11:10	**Coffee Break (Grand Banquet Hall)**
11:10 – 12:30	**Session 7** **Diamond Growth** **Chair: Paul W. May, University of Bristol, U.K.**

12:30 – 14:00	**Lunch (Grand Banquet Hall)**
14:00 – 15:30	**Session 8** **Quantum Sensing II** **Chair: Miloš Nesládek, Hasselt University & IMEC vzw, Belgium**
15:30 – 17:00	**Session 9** **Posters II** **Chairs: Jocelyn Achard; Shery L.Y. Chang; Anke Krueger; Boris Naydenov**
17:00– 18:10	**Session 10** **Nuclear Spin Memories** **Chair: Fazhan Shi, University of Science and Technology of China, China**
18:10	**Closing Day 2 "Hasselt Diamond Workshop 2024 – SBDD XXVIII".**
20:00	**Conference dinner at the *Ravel* & *De Boulevard* of the *Holiday Inn.***

Friday, March 1, 2024

09:30 – 11:00	**Session 11** **Diamond Device Technology II** **Chair: M. Pilar Villar, Universidad de Cádiz, Spain**
11:00 – 11:30	**Coffee Break (Grand Banquet Hall)**
11:30 – 12:50	**Session 12** **Diamond Devices II** **Chair: David A.J. Moran, University of Glasgow, U.K.**
12:50 – 14:10	**Lunch (Grand Banquet Hall)**
14:10 – 15:30	**Session 13** **Physics of Colour Centres** **Chair: Tokuyuki Teraji, National Institute for Materials Science (NIMS), Japan**
15:30	**Closing "Hasselt Diamond Workshop 2024 – SBDD XXVIII".**



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