GADEST 2019

Gettering and Defect Engineering in Semiconductor Technology 2019

September 22 to 27, 2019, Zeuthen, Germany

Program

Sunday September 22

9:30-10:00 *Coffee break*

Session: Opening

Chairperson: G. Kissinger

10:00-10:15 Conference opening
G. Kissinger

10:15-11:00 Keynote: Youths are the key to the transformation for a better world tomorrow
L. Altimime

SEMI Europe, Helmholtzstrasse 2, 10857, Berlin, Germany

11:00-11:45 Keynote: Fabrication of Medium Power IGBTs Using 300 mm MCz Silicon Wafers
H.-J. Schulze, H. Öfner, F.-J. Niedernostheide, F. Lükermann, A. Schulz

Infineon Technologies AG, Am Campeon 1-15, 85579 Neubiberg, Germany
Infineon Technologies, Max-Planck-Str. 5, 59581 Warstein, Germany

11:45-14:00 *Lunch*

Session: Photovoltaic silicon I

Chairpersons: H. G. Grimmeiss and P. Wilshaw

14:00-14:40 Invited: Defect engineering in silicon photovoltaics from a Chinese industry perspective
P.P. Altermatt, X. Zhang, Y. Yang, D. Chen, Y. Chen, Z. Zheng, D. Tweddle, R. Zhou, P. Hamer, R.S. Bonilla, P. Wilshaw, N.E. Grant, J.D. Murphy, K. Sporleder, M. Turek, J. Bauer, V. Naumann, C. Hagendorf

Trina Solar, SKL, No 2 Trina Road, Xinbei District, Changzhou, Jiangsu Province, China 213031
Department of Materials, University of Oxford, 16 Parks Road, Oxford OX1 3PH, UK, United Kingdom
School of Engineering, University of Warwick, Coventry, CV4 7AL, United Kingdom
Fraunhofer Institute for Microstructure of Materials and Systems IMWS, 06120 Halle (Saale), Germany

14:40-15:00 Contributed: Ionic surface passivation for ultra-long bulk carrier lifetime measurements in silicon
Nicholas E. Grant, Alex I. Pointon, John D. Murphy

School of Engineering, University of Warwick, Coventry, CV4 7AL, United Kingdom

15:00-15:20 Contributed: Investigation of artificial CSL grain boundaries and dislocations during directional solidification of silicon
B. Ryningen, M. Tsoutsouva, N. Mangelinck-Noel, G. Regula, G. Reinhart, E. Grove Dyrvik, M. Di Sabatino and G. Stokkan

SINTEF Industry, Trondheim, Norway
Dept. of Physics, Norwegian University Science and Technology, 7491 Trondheim, Norway
Aix Marseille Univ, Université de Toulon, CNRS, IM2NP, 13397 Marseille, France
Dept. of Materials Science and Engineering, Norwegian University Science and Technology, 7491 Trondheim, Norway

15:20-15:40 Contributed: Impurity Gettering by Boron and Phosphorus doped Poly-Silicon for High-Performance Multi-Crystalline-Si Passivated Contacts Solar Cells
M. Hayes, B. Martel, G. Wahyu Alam, H. Lignier, S. Dubois, E. Pihan, O. Palais

Uni. Grenoble Alpes, INES, F-73375 Le Bourget du Lac, France ; CEA, LITEN, Département des Technologies Solaires, F-73375 Le Bourget du Lac, France
Aix Marseille Université, IM2NP UMR CNRS 7334, Campus Saint-Jérôme, Case 142, 13397 Marseille Cedex 20, France
Centre of Technology for Materials, Agency for the Assessment and Application of Technology, Bldg. 224 PUSPIPTEK, South Tangerang 15314, Indonesia

15:40-16:10 *Coffee break*

Session: Photovoltaic silicon II

Chairpersons: J. Murphy and A. Liu

16:10-16:50 Invited: Limiting defects in n-type multicrystalline silicon solar cells

M. C. Schubert, F. Schindler, J. Schön, W. Kwapil, F. Heinz, A. Fell, S. Riepe, J. Benick, A. Morishige

Fraunhofer Institute of Solar Energy Systems, ISE, Heidenhofstr. 2, 79110 Freiburg, Germany
University Freiburg, Laboratory for Photovoltaic Energy Conversion, Freiburg, Germany
Massachusetts Institute of Technology, Cambridge, MA 02139, USA

16:50-17:30 Invited: Hydrogen charge states and recombination activity in photovoltaic silicon

A. Ciesla, R. Chen, P. Hamer, F. Rougieux, B. Hallam, C. Chan, D. Chen, C. M. Chong, M. Abbott, S. Wenham

UNSW Sydney, Kensington, NSW 2052 Australia

17:30-17:50 Contributet: Hydrogenation in multicrystalline silicon: the dependence of dielectric films and the impact of firing conditions

H. C. Sio, S. P. Phang, H. T. Nguyen, D. Macdonald

Research School of Electrical, Energy and Materials Engineering, The Australian National University, 2601, Canberra, Australia

17:50-18:10 Contributed: Etch Pit Density reduction in POCl3 and APCVD gettered mc-Si

M. Fleck, A. Zuschlag, G. Hahn

University of Konstanz, Department of Physics, Universitätsstraße 10, 78464 Konstanz, Germany

18:30-20:30 *Get together*

Monday September 23

Session: Group IV elements

Chairpersons: B. C. Johnson and C. Kaneta

9:00-9:40 Invited: All-group-IV GeSn-based mid-infrared lasers

A. Chelnokov, J. Chretien, M. Bertrand, L. Casiez, Q.-M. Thai, J. Widiez, F. A. Pilon, H. Sigg, J.-M. Hartmann, N. Pauc, V. Calvo, V. Reboud

Univ. Grenoble Alpes, CEA, LETI, 38054 Grenoble, France
Univ. Grenoble Alpes, CEA, INAC, 38054 Grenoble, France
Laboratory for Micro- and Nanotechnology, Paul Scherrer Institut, 5232 Villigen, Switzerland

9:40-10:00 Contributed: Donor activity of Sn clusters in Silicon

L. Scheffler, S. Roesgaard, B. Julsgaard

Department of Physics and Astronomy, Aarhus University, Ny Munkegade 120, DK-8000 Aarhus C, Denmark

10:00-10:20 Contributed: Stability and evolution of extended defects in 3C-SiC phase by molecular dynamics simulations

A. Sarikov, A. Marzegalli, L. Barbisan, L. Miglio

Dipartimento di Scienza dei Materiali, Università degli Studi di Milano-Bicocca, via R. Cozzy 55, 20125 Milano, Italy
V. Lashkarev Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, 45 Nauki avenue, 03028 Kiev, Ukraine
L-NESS and Dipartimento di Scienza dei Materiali, Università degli Studi di Milano-Bicocca, via R. Cozzy 55, 20125 Milano, Italy

10:20-10:40 Contributed: Annealing and LEEBI effects on the stacking fault expansion and shrinking in 4H-SiC

E.E. Yakimov, E.B. Yakimov

Institute of Microelectronics Technology RAS, Acad. Ossipyan str., 6, Chernogolovka, 142432 Russia
National University of Science and Technology MISiS, Leninsky prosp., 4, Moscow, Russia

10:40-11:10 *Coffee break*

Session: Gettering and defect engineering in microelectronics I

Chairpersons: A. Claverie and H. Richter

11:10-11:50 Invited: Reaction kinetic analysis of hydrogen diffusion behaviour in hydrocarbon molecule ion implanted silicon wafers for advanced CMOS image sensors

R. Okuyama, A. Onaka-Masada, A. Suzuki, K. Kobayashi, S. Shigematsu, R. Hirose, T. Kadono, Y. Koga, K. Kurita

SUMCO Corporation, 1-52 Kubara, Yamashiro-cho, Imari-shi, Saga 849-4256 Japan

11:50-12:10 Contributed: Passivation of detector-grade Fz-Si with ALD-grown aluminium oxide

T. P. Pasanen, J. Ott, P. Repo, H. Seppänen, V. Vähänissi, H. Savin

Aalto University, Department of Electronics and Nanoengineering, Tietotie 3, FI-02150 Espoo, Finland
Helsinki Institute of Physics, Gustaf Hällströmin katu 2, FI-00014 University of Helsinki, Finland

12:10-12:30 Contributed: Observation of stacking faults in In.53Ga.47As by electron channeling contrast imaging

P.-C. (Brent) Hsu, H. Han, E. Simoen, C. Merckling, G. Eneman, Y. Mols, R. Langer, N. Collaert and M. Heyns

IMEC, Kapeldreef 75, 3001 Leuven, Belgium
Department of Materials Engineering, KU Leuven, 3001 Leuven, Belgium
Department of Solid State Sciences, Ghent University, 9000 Gent, Belgium

12:30-14:00 *Lunch*

Session: Mobility, transport, and defect engineering

Chairpersons: M. L. Polignano and E. Simoen

14:00-14:40 Invited: Appearance of high mobility 2D holes in strained epitaxial Germanium

M. Myronov

Department of Physics, The University of Warwick, Coventry CV4 7AL, UK

14:40-15:00 Contributed: Diffusion and reaction kinetics governing surface blistering in RF sputtered hydrogenated a-SixGe1-x (0≤ x ≤1) thin films

M. Serényi, A. Csík, B. Kalas, C. Frigeri

Institute of Technical Physics and Materials Science, Research Centre for Natural Sciences, Hungarian Academy of Sciences, P.O. Box 49, H-1525 Budapest, Hungary
Institute for Nuclear Research, Hungarian Academy of Sciences, P.O. Box 51, H-4001 Debrecen, Hungary
CNR-IMEM Institute, Parco Area delle Scienze 37/A, 43124 Parma, Italy

15:00-15:20 Contributed: A Comparative Study on Transport in conventional MOSFETs and SOI transistors with a short channel

U.Wulf, K. Czajkowski, H. Richter, J. Kucera, J. Höntschel, M.Wiatr, M. Horstmann

Brandenburgische Technische Universität Cottbus/Senftenberg, Fakultät 1, Postfach 101344, 03013 Cottbus, Germany
GFWW, Im Technologiepark 1, 15236 Frankfurt (Oder), Germany
Institute of Physics, Academy of Sciences of the Czech Republic, Cukrovanicka 10, 162 53, Praha 6, Czech Republic
Globalfoundries Dresden, Wilschdorfer Landstraße 101, 01109 Dresden, Germany

15:20-15:40 Contributed: Ab initio to TCAD workflow for accurate modelling of defects in semiconductor devices

I. Martin-Bragado, L. Agapito, Y.-S. Oh, Y. Park, C. Zechner, F. Corsetti, P. Vancraeyveld, G. Penazzi, M. Andersen and K. Stokbro

Synopsys, Inc., 690 E. Middlefield Road, Mountain View, CA 94043, USA
Synopsys Denmark ApS, Fruebjergvej 3, 2100 Copenhagen, Denmark
Synopsys GmbH, Karl-Hammerschmidt-Str. 34-40 85609 Aschheim, Germany

15:40-16:10 *Coffee break*

Session: Quantum dots and nano structures

Chairpersons: M. Myronov and A. Shengelaya

16:10-16:50 Invited: High-performance III-V lasers monolithically grown on Si substrates

H. Deng, M. Liao, S. Pan, M. Tang, S. Chen, and H. Liu

Department of Electronic and Electrical Engineering, University College London, Torrington Place, London, WC1E 7JE, United Kingdom

16:50-17:30 Invited: Merging defect- and quantum dot-formation in group-IV nanomaterials for optoelectronic applications

L. Spindlberger, J. Aberl, P. Rauter, T. Fromherz, F. Schäffler, M. Grydlik, and M. Brehm

Institute of Semiconductor and Solid State Physics, Johannes Kepler University Linz, Altenberger Strasse 69, 4040 Linz, Austria

17:30-17:50 Contributed: Nanoscopic phase separation in laser annealed silicon-rich silicon oxide studied by transmission electron microscopy and optical spectroscopy

N. Wang, C. Gobert, P. Peretzki, T. Fricke-Begemann, J. Ihlemann, M.Seibt

University of Goettingen, 4. Physical Institute – Solids and Nanostrcutrures, Friedrich-Hund-Platz 1, 37077 Göttingen, Germany
Laser-Laboratorium Göttingen, Hans-Adolf-Krebs-Weg 1, D-37077 Göttingen, Germany
Silicon Epitaxy Department, China Electronics Technology Group Corporation No. 46 Institute 300220， No.26, Dongtinglu, Hexi Distr., Tianjin, China

17:50-18:10 Contributed: Enhancing the pumping-efficiency of defect-enhanced Ge quantum dots

L. Spindlberger, J. Aberl, A. Polimeni, M. Lusk, M. Kim, B. Hallam, S. Prucnal, T. Fromherz, F. Schäffler, M. Grydlik, M. Brehm

Institute of Semiconductor and Solid State Physics, Johannes Kepler University Linz, Altenbergerstr.69, A-4040 Linz, Austria
CNISM and Department of Physics, Sapienza Università di Roma, Piazzale A. Moro 2, 00185 Roma, Italy
Department of Physics, Colorado School of Mines, Golden, Colorado 80401, United States
School of Photovoltaic and Renewable Energy Engineering, The University of New South Wales, Kensington, NSW 2052, Australia
Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf Bautzner Landstr. 400, 01328, Dresden, Germany

18:10-20:00 *Dinner*

Session: After dinner keynote

Chairperson: *B. Hallam*

20:00-20:45 Keynote: Trends in c-Si PV - review of ITRPV 10th edition findings and manufacturing challenges for the PV powered future

M. Fischer and J. Trube

Hanwha Q Cells GmbH, Sonnenallee 17-21, D-06766, Bitterfeld-Wolfen, OT Thalheim, Germany
VDMA Electronics, Micro and Nano Technologies, Lyoner Str. 18, D-60528 Frankfurt am Main, Germany

Tuesday September 24

Session: Czochralski silicon crystal growth

Chairpersons: *K. Kakimoto and D. Yang*

09:00-09:40 Invited: Computer Simulation of Intrinsic Point Defect Distribution Valid for All Pulling Conditions in Large-diameter Czochralski Si Crystal Growth

K. Sueoka, Y. Mukaiyama, S. Maeda, M. Iizuka, V. M. Mamedov

Okayama Prefectural University, 111 Kuboki, Soja, Okayama 719-1197, Japan
STR Japan K.K., Yokohama Business Park, Hodogaya-ku, Yokohama, Kanagawa 240-0005, Japan
Technology, GlobalWafers Japan Co., Ltd., 6-861-5 Higashiko, Seiro, Niigata 957-0197, Japan
STR Group, Inc. - Soft Impact, Ltd., St. Petersburg, Russia

09:40-10:00 Contributed: Novel Way to Assess the Validity of CzochralskiI Growth Simulations

J. Veirman, E.Letty, W. Favre, M. Albaric, M. Lemiti

CEA, LITEN, INES, Le Bourget-du-Lac, France
Université de Lyon, INL, CNRS, France

10:00-10:20 Contributed: Numerical modeling of effect of thermal stress and heavy doping for behavior of intrinsic point defects in large-diameter Si crystal growing by Czochralski method

Y Mukaiyama, M. Iizuka, V. Mamedov, V. Kalaev, A. Smirnov, S. Maeda, K. Sueoka

STR Japan K.K., Yokohama Business Park, Hodogaya-ku, Yokohama, Kanagawa 240-0005, Japan
STR Group, Inc. – Soft-Impact, Ltd., 64 Bolshoi Sampsonievskii pr., Build. "E", Office 605, St. Petersburg, 194044, Russia
GlobalWafers Japan Co., Ltd., 6-861-5 Higashiko, Seiro, Niigata 957-0197, Japan
Okayama Prefectural University, 111 Kuboki, Soja, Okayama 719-1197, Japan

10:20-10:40 Contributed: Experimental and theoretical analysis of the growth ridge geometry of Czochralski-grown silicon crystals

L. Stockmeier, C. Kranert, P. Fischer, B. Epelbaum, C. Reimann, G. Raming, A. Miller

Fraunhofer IISB, Schottkystraße 10, 91058 Erlangen, Germany
Fraunhofer THM, Am St.-Niclas-Schacht 13, 09599 Freiberg, Germany
Siltronic AG, Johannes-Hess-Straße 24, 84489 Burghausen, Germany

10:40-11:10 *Coffee break*

Session: Oxygen precipitation and gettering

Chairpersons: K. Sueoka and Y. Yakimov

11:10-11:50 Invited: Gettering and diffusion of impurities in heavily boron-doped silicon wafer

K. Torigoe, T. Ono

Technology Division, Advanced Evaluation and Technology Development Department, SUMCO Corporation,1-52 Kubara, Yamashiro-cho, Imari, Saga 849-4256, Japan

11:50-12:10 Contributed: Effects of tin-doping on oxygen precipitation in Czochralski silicon with prior rapid thermal processing

Y. Sun, W. Lan, J. Zhao, T. Zhao, J. Zhao, X. Ma, D. Yang

State Key Laboratory of Silicon Materials and School of Materials Science and Engineering, Zhejiang University, Hangzhou 310027, People's Republic of China

12:10-12:30 Contributed: Oxygen Precipitation in Nitrogen-Doped Czochralski Silicon Single Crystals with Low Oxygen Concentration

K. Kajiwara, K. Harada, K. Torigoe, M. Hourai

SUMCO Corporation, 2201 Oaza-Kamioda, Kouhoku-cho, Kishima-gun, Saga 849-0597, Japan
SUMCO Corporation 1-51, Kubara, Yamashiro-cho, Imari-shi, Saga 849-4256, Japan

12:30-14:00 *Lunch*

Session: Quantum effects and applications

Chairpersons: M. Brehm and H. Liu

14:00-14:40 Invited: Investigation of the SiC/SiO2 interface using quantum emitters

B. C. Johnson, J. Woerle, R. A. Parker, C. T. K. Lew, D. Haasmann, S. Dimitrijev, M. Camarda, J. C. McCallum

ARC Centre for Quantum Computing and Communication Technology, School of Physics, University of Melbourne, Victoria 3010, Australia
Paul Scherrer Institut, 5232 Villigen, Switzerland
Advanced Power Semiconductor Laboratory, ETH Zurich, Physikstrasse 3, 8092 Zurich, Switzerland
Queensland Micro- and Nanotechnology Centre, Griffith University, Queensland, Australia
School of Physics, University of Melbourne, Victoria 3010, Australia

14:40-15:20 Invited: Electron spin resonance of dopants in 2D materials
A. Stesmans

Department of Physics and Astronomy, University of Leuven, Celestijnenlaan 200D, 3001 Leuven, Belgium

15:20-15:40 Contributed: Low-energy implantation of group-IV and group-III-V elements to enhance optical properties of (Si)Ge quantum dots
J. Aberl , L. Spindlberger, J. Freund, T. Fromherz, F. Schäffler, M. Grydlik, M. Brehm

Institute of Semiconductor and Solid State Physics, Johannes Kepler University, Altenberger Straße 69, A-4040 Linz, Austria

15:40-16:10 *Coffee break*

Session: Advanced diagnostics

Chairpersons: V. Kveder and M. Seibt

16:10-16:50 Invited: Self-Diffusion in Amorphous Semiconductors - Studies with Neutron Reflectometry
F. Strauß, H. Schmidt

Clausthal Centre for Material Technology, Agricolastraße 2, 38678 Clausthal-Zellerfeld, Germany
Institute for Metallurgy, TU Clausthal, Robert-Koch-Str. 42, 38678 Clausthal-Zellerfeld, Germany

16:50-17:10 Contributed: The photo-elastic constants of silicon reviewed in experiment and simulation
M. Herms, G. Irmer, G. Kupka, M. Wagner

PVA Metrology & Plasma Solutions GmbH., Am Nasstal 6/8, D-07751 Jena-Maua, Germany
2TU Bergakademie Freiberg, Institute of Theoretical Physics, D-09596 Freiberg

17:10-17:30 Contributed: Scanning spreading resistance microscopy and numerical simulations for the characterization of electrically active dopants in semiconductors
J. K Prüßing, T. Böckendorf, G. Hamdana, E. Peiner, H. Bracht

Institute of Materials Physics, University of Münster, Wilhelm-Klemm-Straße 10, D-48149 Münster, Germany
Institute of Semiconductor Technology (IHT) and Laboratory of Emerging Nanometrology (LENA), Technische Universität Braunschweig, Hans-Sommer-Straße 66, D-38106 Braunschweig, Germany

17:30-17:50 Contributed: High-resolution scanning transmission EBIC: advances and limits of spatial resolution
T.Meyer, P.Peretzki, M.Seibt

University of Goettingen, 4. Physical Institute – Solids and Nanostrcutrures and CRC 1073, Friedrich-Hund-Platz 1, 37077 Göttingen, Germany

17:50-18:10 Contributed: Evolution of the properties of helium nanobubbles in silicon during in situ annealing probed by spectrum imaging in the transmission electron microscope
M.-L. David, J. Dérès, K. Alix, C. Hébert, L. Pizzagalli

Institut Pprime, CNRS-Université de Poitiers, Bd M.&P. Curie, BP 30179, 86962 Futuroscope-Chasseneuil cedex
CIME, EPFL-SB-CIME-GE, CH-1015 Lausanne, Switzerland

18:10-19:30 *Dinner*

Tuesday September 24

Postersession I

19:30-21:30 Defect induced unusual magnetism in semiconducting molybdenum dichalcogenides
A. Shengelaya, Z. Guguchia, A. Kerelsky, D. Edelberg, S. Banerjee, F. von Rohr, D. Scullion, M. Augustin, M. Scully, D. A. Rhodes, Z. Shermadini, H. Luetkens, C. Baines, E. Morenzoni, A. Amato, J. C. Hone, R. Khasanov, S. J. L. Billinge, E. Santos, A. N. Pasupathy, Y. J. Uemura

19:30-21:30 Dramatic changes of spin-dependent probability of annihilation of electron-positron pairs in bismuth impurity centers of different symmetry in floating-zone n–type natural silicon
N. Arutyunov, M. Elsayed, R. Krause-Rehberg, V. Emtsev, N. Abrosimov, G. Oganesyan, V. Kozlovskii

19:30-21:30 Decomposition of the solid solution of interstitial magnesium in silicon
Yu.A. Astrov, V.B. Shuman, L.M. Portsel, A.N. Lodygin, S.G. Pavlov, N.V. Abrosimov, H.-W. Hübers

19:30-21:30 Deep levels due to nickel reactions with vacancy-type defects in silicon
N. Yarykin, S. Lastovskii, J. Weber

19:30-21:30 Peculiarity of electric properties of oxygen implanted silicon at early precipitation stages
D.V. Danilov , O.F. Vyvenko and N.A. Sobolev

19:30-21:30 Room-temperature Ni interaction with deformation-induced defects in Si: A DLTS study
O.A. Soltanovich, N.A. Yarykin and E.B. Yakimov

19:30-21:30 Annealing behaviour of oxygen-related centres in oxygen-lean silicon
A. A. Grigorev, H. M. Ayedh, A. Galeckas, E. V. Monakhov

19:30-21:30 Rapid thermal processing based internal gettering for Czochralski silicon wafers: Effect of high temperature pre-anneal
J. Wang , L. Jiang, W. Lan, X. Sun, T. Zhao, D. Yang , X. Ma

19:30-21:30 In situ synchrotron X-ray imaging of silicon crystal growth – Correlation with electrical properties
H. Ouaddah, I. Périchaud, O. Palais, M. Di Sabatino, G. Reinhart, G. Regula, N. Mangelinck-Noël

19:30-21:30 Photoluminescence and phase transition of fullerene films on porous silicon
N. Mamedov, T. Dzhafarov, A. Bayramov, S. Asadullayeva, E. Alizade, M. Sadigov, S. Ragimov

19:30-21:30 Diffusion characteristics of the oxygen dimer and VO_2 defect in silicon
L. I. Murin, E. A. Tolkacheva, V. P. Markevich, and A. R. Peaker

19:30-21:30 Gettering mechanism of copper in n-type silicon wafers
R. Ozaki, K. Torigoe, T. Mizuno, K. Yamamoto

19:30-21:30 Formation and diffusion of intrinsic point defects in bulk and monolayer MoS2: first principles study
V. Gusakov, J. Gusakova, B. K. Tay

19:30-21:30 Effect of aluminum gettering and thermal treatments on light-emitting properties of dislocation structures in self-implanted silicon subjected to boron ion doping
A. Tereshchenko, D. Korolev, M. Khorosheva, A. Mikhaylov, A. Belov, A. Nikolskaya, D. Tetelbaum

19:30-21:30 Iodine-ethanol surface passivation for measurements of millisecond carrier lifetimes in silicon
M. Al-Amin, N. E. Grant, J. D. Murphy

19:30-21:30 Deep levels in sulfur hyperdoped silicon probed by Deep Level Transient Spectroscopy
A. Ahrens, B. Jürgens, A. L. Baumann, S. Kontermann, W.Schade, M.Seibt

19:30-21:30 Silicon-Aluminum alloying at grain boundaries in multicrystalline silicon studied by ex-situ and in-situ electron microscopy techniques
C. Flathmann, H.Spende, T. Meyer, P.Peretzki, M.Seibt

19:30-21:30 Electrically detected magnetic resonance study of intrinsic defects in SiC pn junction devices
C. T.-K. Lew, R. A. Parker, D. L. Creedon, J. C. McCallum, and B. C. Johnson

19:30-21:30 High efficiency silicon based photomodulators for mm and THz wave radiation
N. Grant, I. Hooper, L. Barr, S. Hornett, and J. Murphy

19:30-21:30 A Laplace DLTS study of thermal donors in silicon
K. Gwozdz, V. Kolkovsky, J. Weber

19:30-21:30 Diffusion of phosphorus and boron from ALD oxides into silicon
S. Beljakowa, P. Pichler, B. Kalkofen, R. Hübner

19:30-21:30 Radiation defects created in n-type 4H-SiC by electron irradiation in the energy range of 1 to 10 MeV
P. Hazdra, J. Vobecký

19:30-21:30 Lifetime control in irradiated and annealed Cz n-Si: role of divacancy-oxygen defects
M. Kras'ko, A. Kolosiuk, V. Voitovych, V. Povarchuk

Wednesday September 25

Session: Degradation effects in solar silicon

Chairpersons: *H. Bracht and A. R. Peaker*

9:00-9:40 Invited: Boron-Oxygen Complex Responsible for Light Induced Degradation in Silicon Photovoltaic Cells: a New Insight into the Problem
V. P. Markevich, M. Vaqueiro-Contreras, J. Coutinho, P Santos, I. Crowe, M. P. Halsall, I. Hawkins, S. B. Lastovskii, L. I. Murin, and A. R. Peaker

Photon Science Institute and School of Electrical and Electronic Engineering, the University of Manchester, Manchester M13 9PL, United Kingdom
Department of Physics and I3N, University of Aveiro, Campus Santiago, 3810-193 Aveiro, Portugal
Department of Physics and I3N, University of Aveiro, Campus Santiago, 3810-193 Aveiro, Portugal
Scientific-Practical Materials Research Center of the National Academy of Sciences of Belarus, Minsk 220072, Belarus

9:40-10:00 Contributed: Direct detection of carrier traps in mc-Si solar cells after degradation at elevated temperatures

T. Mchedlidze, J. Weber

Technische Universität Dresden, Haeckelstr. 3, 01062 Dresden, Germany

10:00-10:20 Contributed: Light-induced degradation in annealed and electron irradiated silicon

K. Lauer, T. Klein, A. Lawerenz, R. Röder, T. Ortlepp, U. Gohs

CiS Forschungsinstitut für Mikrosensorik GmbH, Konrad-Zuse-Str. 14, 99099 Erfurt, Germany
Leibniz-Institut für Polymerforschung Dresden e. V., Hohe Straße 6, 01069 Dresden, Germany

10:20-10:40 Contributed: Light and elevated temperature induced degradation in n-type mono-like silicon: Influence of phosphorus and boron diffusion

D. Kang, H. C. Sio, X. Zhang, T. Zhang, H. Jin, D. Macdonald

Research School of Engineering, The Australian National University (ANU), Canberra ACT, 0200, Australia
Jinko Solar Co., Ltd., China

10:40-11:10 *Coffee break*

Session: Extended defects

Chairperson: M. Zöllner

11:10-11:30 Contributed: More Insights in Semiconductor Material Quality with Advanced X-ray Topography Imaging

R. Weingärtner, C. Reimann, E. Meissner, P. Berwian, J. Friedrich, J. Grässlin, U. Preckwinkel

Fraunhofer Institute for Integrated Systems and Device Technology IISB, Schottkystr. 10, 91058 Erlangen, Germany
Rigaku Europe SE, Hugenottenallee 167, 63263 Neu-Isenburg, Germany

11:30-11:50 Contributed: Unusual polarization dependence of dislocation related luminescence in n GaN

O. Medvedev, M. Albrecht, O. Vyvenko

Faculty of Physics, St. Petersburg State University, Ulyanovskaya 1, 198504, St. Petersburg, Russia
IRC Nanotechnology, Research Park, St. Petersburg State University, Ulyanovskaya 1, 198504, St. Petersburg, Russia
Leibniz-Institut für Kristallzüchtung, Max-Born-Straße 2, 12489 Berlin, Germany

11:50-13:30 *Lunch*

Social Event

13:30-19:00 Excursion to Potsdam

19:30-22:00 Conference Dinner

Thursday September 26

Session: Si, SiGe and Ge on insulator

Chairpersons: O. Kononchuk and H. Sudo

9:00-9:40 Invited: Defect evolution in the SmartCut™ process: from implantation to fracture
F. Rieutord, S. Tardif, F. Mazen, D. Landru, O. Kononchuk

Univ. Grenoble Alpes, CEA, INAC-MEM, 38000 Grenoble, FRANCE
Univ. Grenoble Alpes, CEA, LETI, 38000 Grenoble, FRANCE
SOITEC, Parc Technologique des Fontaines, 38600 Bernin, FRANCE

9:40-10:00 Contributed: Crystallization of thin Si and Ge films on SiO2 by flash lamp annealing
L. Rebohle, V. Begeza, T. Ravsher, M. Neubert, Y. Xie, J. Grenzer, S. Zhou, W. Skorupa

Helmholtz-Zentrum Dresden - Rossendorf, Institute of Ion Beam Physics and Materials Research, Bautzner Landstraße 400, 01328 Dresden, Germany
Rovak GmbH, Zum Teich 4, 01723 Grumbach, Germany

10:00-10:20 Contributed: Strain characteristics of SiGe-On-Insulator obtained by the Ge-condensation technique
A. Claverie, V. Boureau, S. Reboh, D. Benoit

CEMES-CNRS, 29 rue Jeanne Marvig, 31055 Toulouse, France
STMicroelectronics, 850 rue Jean Monnet, 38926 Crolles Cedex, France
Univ. Grenoble Alpes, CEA, LETI, 38000 Grenoble, France

10:20-10:50 *Coffee break*

Session: Gettering and defectengineering in microelectronics II

Chairpersons: R. Falster and N. Sobolev

10:50-11:30 Invited: Stories of metallic contamination in integrated circuit fabrication
I. Mica, M. L. Polignano, D. Codegoni, A. Galbiati, D. Magni, S. Grasso, J. Frascaroli

STMicroelectronics, via Camillo Olivetti,2 Agrate Brianza MB, Italy

11:30-11:50 Contributed: Impact of in-situ annealing on the deep levels in Ni-Au/AlN/Si MIS Capacitors

C. Wang, M. Zhao, W. Li, E. Simoen
Depart. of Solid State Sciences, Ghent University, Krijgslaan 281 S1, 9000 Gent, Belgium
Imec, Kapeldreef 75, B-3001 Leuven, Belgium
School of Optoelectronic Information, University of Electronic Science and Technology of China, Chengdu 610054, China

11:50-12:10 Contributed: On a novel source technology for deep aluminium diffusion for silicon power electronics
G. Rattmann, P. Pichler, T. Erlbacher

Fraunhofer Institute for Integrated Systems and Device Technology IISB, Schottkystrasse 10, 91058 Erlangen, Germany
Chair of Electron Devices, University of Erlangen-Nuremberg, Cauerstrasse 6, 91058 Erlangen, Germany

12:10-12:30 Contributed: Doping in silicon affects the blistering of ALD-grown aluminium oxide
J. Ott, M. Garín, K. Rosta, T. P. Pasanen, V. Vähänissi, H. Savin

Aalto University, Department of Electronics and Nanoengineering, Tietotie 3, FI-02150 Espoo, Finland
Helsinki Institute of Physics, Gustaf Hällströmin katu 2, FI-00014 University of Helsinki, Finland
Universitat Politècnica de Catalunya, Department of Electronic Engineering, c/ Jordi Girona 1-3, ES-08034 Barcelona, Spain

12:30-14:00 *Lunch*

Session: Photovoltaic silicon III

Chairpersons: P. Altermatt and T. Mchedlidze

14:00-14:40 Invited: Impurity gettering to dielectric thin films in silicon photovoltaic materials

A. Liu, D. Macdonald

Research School of Engineering, College of Engineering and Computer Science, Australian National University, 2601, Canberra, Australia

14:40-15:20 Invited: Recent Development of Silicon Crystals for Solar Cells in Japan

K. Kakimoto

Research Institute for Applied Mechanics Kyushu University, Japan

15:20-15:40 Contributed: Injection enhanced formation of a bistable interstitial complex in p-type silicon

L. F. Makarenko, S. B. Lastovskii, H. S. Yakushevich,E. Gaubas, J. Pavlov, M. Moll, I. Pintilie

Belarusian State University, Independence Ave. 4, 220030 Minsk, Belarus
2Scientific-Practical Materials Research Centre of NAS of Belarus,P. Browka str. 17, Minsk, Belarus
Institute of Applied Research, 10 Sauletekio, 10223, Vilnius, Lithuania
CERN, CH-1211 Geneva 23 Switzerland
National Institute of Materials Physics, Atomistilor str. 405A, Bucharest-Magurele, Romania

15:40-16:10 *Coffee break*

Session: Intrinsic point defects and complexes with H in silicon

Chairpersons: P. Pichler and J. Weber

16:10-16:50 Invited: Point defect reaction in silicon wafers by rapid thermal processing at more than 1300°C using an oxidation ambient

H. Sudo, K. Nakamura, S. Maeda, H. Okamura, K. Sueoka

Graduate School of Computer Science and Systems Engineering, Okayama Prefectural University, 111 Kuboki, Soja, Okayama 719-1197, Japan
Base Technology Group, Technology Department, GlobalWafers Japan Co., Ltd., 6-861-5 Seiro-machi Higashiko, Kitakanbara-gun, Niigata 957-0197, Japan
Regional Cooperative Research Organization, Okayama Prefectural University, 111 Kuboki, Soja, Okayama 719-1197, Japan
Faculty of Computer Science and Systems Engineering, Okayama Prefectural University, 111 Kuboki, Soja, Okayama 719-1197, Japan

16:50-17:10 Contributed: Near Surface Defect Control by Vacancy Injecting / Out-diffusing RTA Processes

T. Müller, M. Gehmlich, A. Sattler, E. Daub, A. Miller, D. Kot, G. Kissinger

Siltronic AG, Johannes Hess Straße 24, 84489 Burghausen, Germany
IHP – Leibniz-Institut für innovative Mikroelektronik, Im Technologiepark 25, 15236 Frankfurt/Oder, Germany

17:10-17:30 Contributed: Dissolution of donor-vacancy clusters in heavily doped n-type germanium via millisecond annealing

S. Prucnal, M.O. Liedke, M. Butterling, M. Posselt, X. Wang, J. Knoch, H. Windgassen, E. Hirschmann, Y. Berencén, E. Napolitani, J. Frigerio, A. Ballabio, G. Isella, R. Hübner, A. Wagner, M. Helm, S. Zhou

Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research, Bautzner Landstraße 400, D-01328 Dresden, Germany
Helmholtz-Zentrum Dresden-Rossendorf, Institute of Radiation Physics, Bautzner Landstraße 400, D-01328 Dresden, Germany
Institut für Halbleitertechnik, RWTH Aachen, Germany
Dipartimento di Fisica e Astronomia, Università di Padova and CNR-IMM MATIS, Via Marzolo 8, I-35131 Padova, Italy
L-NESS, Dipartimento di Fisica, Politecnico di Milano, Polo di Como, Via Anzani 42, I-22100 Como, Italy

17:30-17:50 Contributed: Hydrogen atoms and complexes resulting from high dose H+ ions implantation in Si at room temperature

N. Cherkashin, A. Louiset, P. Pochet, A. Claverie

CEMES-CNRS and Université de Toulouse, 29 rue J. Marvig, 31055 Toulouse, France
Corporate R&D, SOITEC, Parc Technologique des Fontaines, Chemin des Franques, 38190 Bernin, France
CEA, INAC-SP2M, Atomistic Simulation Lab. (L_Sim), F-38000 Grenoble, France

17:50-18:10 Contributed: Trap-limited vacancy diffusion in silicon at high temperatures

V. V. Voronkov

Global Wafers, via Nazionale 59, 39012 Merano, Italy

18:10-19:30 *Dinner*

Thursday September 26

Postersession II

19:30-21:30 Transport of charge carriers along dislocations in Si and Ge

M. Kittler, M. Reiche, B. Schwartz, H. Uebensee, H. Kosina, Z. Stanojevic, O. Baumgartner, and T. Ortlepp

19:30-21:30 Platinum-copper defects in silicon

V. Kolkovsky, J. Weber

19:30-21:30 Density functional theory study on stability and diffusion barrier of metal atoms near the Si (001) surface

N. Nonoda, K. Sueoka

19:30-21:30 In-situ observation of the degradation in multi-crystalline Si solar cells by electroluminescence

T. Mchedlidze, M.A. Md, A. Herguth, J. Weber

19:30-21:30 Effect of electron irradiation on repetition rate of picosecond-range silicon avalanche sharpener

I.A. Smirnova, M.S. Ivanov, V.I. Brylevskiy, A.A. Gutkin, P.N. Brunkov, P.B. Rodin, I.V. Grekhov

19:30-21:30 Influence of Carbon and Oxygen Impurities on Bulk Lifetime-Control Defects in Silicon Crystals for Power Device Application

D. Tsuchiya, K. Sueoka, H. Yamamoto

19:30-21:30 A DLTS study of sulfur-related defects in n- and p-type Si
K. Gwozdz, V. Kolkovsky, J. Weber, A.A. Yakovleva, Yu. A. Astrov

19:30-21:30 Effect of iron atoms on the electronic properties of silicon in a presence of dislocations, “trail”-defects and crystal growth vacancy complexes
M. Khorosheva, V. Kveder, A. Tereshchenko

19:30-21:30 First principles study of the stability and diffusion mechanism of a carbon vacancy in the vicinity of a SiO2/4H-SiC interface
H. Alsnani, J. P. Goss, S. H. Olsen, P. R. Briddon, M. J. Rayson, A. B. Horsfall

19:30-21:30 Fast Non-destructive Recognition and Evaluation of Defects in Semiconductor Wafers by SIRD
M. Herms, G. Kupka, M. Wagner

19:30-21:30 Excess carrier recombination at screw dislocations in GaN studied by temperature-dependent EBIC
T. W. Westphal, O. S. Medvedev, O. F. Vyvenko, S.V. Shapenkov, M. Seibt

19:30-21:30 Annealing of Pt-H defects in high voltage Si p+/n-diodes
F. Rasinger, J. Prohinig, H. Schulze, H.-J. Schulze, G. Pobegen

19:30-21:30 Dissociation and formation kinetics of iron-boron pairs in silicon after phosphorus implantation gettering
N. Khelifati, H. S. Laine, V. Vähänissi, H. Savin, F. Z. Bouamama, D. Bouhafs

19:30-21:30 Peculiarities of the formation of BiBs defects in boron-doped silicon
L. I. Khirunenko, M.G. Sosnin, A.V. Duvanskii, N.V. Abrosimov, H. Riemann

19:30-21:30 Dose dependence of damage induced by N+-implantation in GaAs
N.A. Sobolev, V.I. Sakharov, I.T. Serenkov, K.V. Karabeshkin, A.E. Kalyadin, V.M. Mikoushkin, E.I. Shek, E.V. Sherstnev

19:30-21:30 Silicon nanowires and their characterization in the process of metal-assisted chemical etching of c-Si using spectroscopic ellipsometry
Y. Zharova, S. Pavlov, Y. Koshtyal, V. Tolmachev

19:30-21:30 Sonochemical modification of SiGe layers for photovoltaic applications
A. Nadtochiy, O. Korotchenkov, V. Schlosser

19:30-21:30 Nanoparticle Formation in Zn and O Hot Implanted Si
V. Privezentsev, V. Kulikauskas, O. Zilova, A. Burmistrov, D. Kiselev, A. Trifonov, A. Tereschenko

19:30-21:30 Defects in oxidized n- and p-type Si wafers observed by surface photovoltage spectroscopy
V. Kolkovsky

19:30-21:30 Erbium and defect luminescence in SiC nano-pillars
R. A. Parker, J. C. McCallum, and B. C. Johnson

19:30-21:30 GaN dislocation motion at low indentation temperatures.
P.S. Vergeles, E. B.Yakimov

19:30-21:30 Contributed: Annealing study of the dominant minority trap in p-type Si
H. M. Ayedh, A. A. Grigorev, A. Galeckas, E. Monakhov

19:30-21:30 Capacitance spectroscopy of magnesium-doped n-type silicon
N. Yarykin, V. B. Shuman, L. M. Portsel, A. N. Lodygin, Yu. A. Astrov, N. V. Abrosimov, J. Weber

Friday September 27

Session: Gettering and metallic impurities

Chairpersons: D. Kot and H. Savin

9:00-9:40 Invited: Device Performance as a Metrology Tool to Detect Metals in Silicon
C. Claeys, E. Simoen
EE Dept., KU Leuven, Kasteelpark Arenberg 10, 3001 Leuven, Belgium
imec, Kapeldreef 75, 3001 Leuven, Belgium

9:40-10:00 Contributed: Proximity Gettering Design of Si Wafers for Advanced CMOS Image Sensors using CH4N Multi-element Molecular Ion Implantation Technique
A. Suzuki, T. Kadono, R. Hirose, R. Okuyama, A. Masada, S. Shigematsu, K. Kobayashi, Y. Koga, K. Kurita
SUMCO CORPORATION, 1-52 Kubara, Yamashiro-cho, Imari-shi, Saga 849-4256, Japan

10:00-10:20 Contributed: Interaction of chromium atoms with dislocations and growth vacancy defects in n-FZ silicon
V. Kveder, M. Khorosheva
Institute of Solid State Physics, Russian Academy of Sciences, 142432 Chernogolovka, Russia

10:20-10:40 Contributed: Copper-nickel complexes in p-type silicon
N. Yarykin, J. Weber
Institute of Microelectronics Technology RAS, Chernogolovka, 142432 Russia
Technische Universität Dresden, 01062 Dresden, Germany

10:40-11:10 *Coffee break*

Session: Photovoltaic silicon IV

Chairpersons: B. Hallam and M. Schubert

11:10-11:30 Contributed: On the Application of the Concept of Lifetime Equivalent Defect Density in Defect Systems comprising a Multitude of Defect Species
A. Herguth
University of Konstanz, Department of Physics, 78457 Konstanz, Germany

11:30-11:50 Contributed: Root cause analysis of potential induced degradation at the rear side of mono silicon based bifacial solar cells
K. Sporleder, J. Bauer, M. Turek, C. Hagendorf, V. Naumann
HTWK, Leipzig University of Applied Sciences, Karl Liebknecht Straße 134, 04277 Leipzig, Germany
Fraunhofer Institute for Microstructure of Materials and Systems IMWS, Otto-Eißfeldt-Straße 12, 06120 Halle (Saale), Germany
Anhalt University of Applied Sciences, Bernburger Straße 55, 06366 Köthen, Germany

11:50-12:10 Contributed: P-type Upgraded Metallurgical Grade Multicrystalline Silicon Heterojunction Solar Cells with Voc exceeding 690 mV
B. V. Stefani, D. Chen, J. Shi, Z. (Jason) Yu, W. Weigand, M. Kim, M. Wright, S. Wenham, Z. Holman, B. Hallam
School of Photovoltaic and Renewable Energy Engineering, University of New South Wales, Kensington, NSW, 2052, Australia
School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, 85287, United States of America

12.10-12:20 Closing
G. Kissinger

12:20-13:30 *Lunch*