



15th – 19th September

E·MRS FALL MEETING

Warsaw University of Technology, Poland



Symposium J

Room 306

Main Building

(Poster Session: Faculty of Physics, Ground Floor)

Alternative semiconductor integration in Si microelectronics

Symposium Organizers:

- Roger LOO, IMEC, Belgium
- Giovanni CAPELLINI, Dept. of Sciences, Università Roma Tre, Italy
- Thomas SCHROEDER, Leibniz Institute for innovative microelectronics (IHP), Germany
- Jean FOMPEYRINE, IBM Research GmbH, Switzerland

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| | Sunday Sept. 14 th | Monday Sept. 15 th | Tuesday Sept. 16 th | Wednesday Sept. 17 th | Thursday Sept. 14 th |
|---------------|----------------------------------|---|--|--|---|
| 9:00 – 10:30 | | Materials Science – Group IV Chair: J. Fompeyrine | Integration techniques – Advanced heteropitaxy Chair: G. Capellini, | | Application – Communication & Sensing Chair: P. S. Davids |
| 10:30 – 11:00 | | Coffee break | | Plenary Session | Coffee break |
| 11:00 – 12:30 | | Materials Science – III/IV Chair: L. Miglio | Advanced techniques – Layer transfer Chair: D. Landru | | Application – Communication & Sensing Chair: Ya-Hong Xie |
| 12:30 – 14:00 | | | Lunch break | | |
| 14:00 – 15:30 | 12:00 – 18:00 Registration | Materials Science – Oxides & Nitrides Chair: S. Takagi | Application – Data Computing & Storage Chair: T. Schroeder | Materials Science - Advanced characterization Joined with Symposia H and N | Materials Science - Advanced characterization Chair: P. Storck |
| 15:30 – 16:00 | | | Coffee break | | |
| 16:00 – 17:30 | | Materials Science – Oxides & Nitrides Chair: S. Spiga | Application – Data Computing & Storage Chair: J. Fischer | Materials Science - Advanced characterization Joined with Symposia H and N | Materials Science – Group IV R. Loo |
| 17:30 – 19:00 | | Poster Session, Chair: R. Loo, G. Capellini, T. Schroeder, J. Fompeyrine | - | 18:00 - -Best Poster Awards Ceremony and Reception | - |

Monday, September 15th, 2014

8:45 **Symposium J Opening**

Roger Loo (1), Giovanni Capellini (2), Thomas Schroeder (3), Jean Fompeyrine (4).

(1) Imec, Kapeldreef 75, B-3001 Leuven, Belgium; (2) Dept. of Sciences, Universita Roma Tre, Viale G. Marconi 446, 00146 Roma, Italy; (3) Leibniz Institute for innovative microelectronics (IHP), Im Technologiepark 25 15236 Frankfurt (Oder), Germany; (4) IBM Research GmbH, Zurich Research Laboratory Säeumerstrasse 4, CH-8803 Rueschlikon, Switzerland.

Session I: Materials Science - Group IV

Session Chair: Jean Fompeyrine

9:00 **Strain Engineering for Direct Bandgap (Si)GeSn Alloys**

1-1

S.Wirths (1), D. Stange (1), N.v.d. Driesch (1), T. Stoica (1), D. Gruetzmacher (1), S. Mantl (1), D. Buca (1), Richard Geiger (2), Hans Sigg (2), Zoran Ikonc (3), J.M. Hartmann (4).

(1) Peter Grünberg Institute (PGI 9) and JARA-FIT, Forschungszentrum Juelich, 52425, Germany; (2) Laboratory for Micro- and Nanotechnology (LMN), Paul Scherrer Institut, CH-5232 Villigen, Switzerland; (3) Institute of Microwaves and Photonics, School of Electronic and Electrical Engineering, University of Leeds, Leeds LS2 9JT, United Kingdom; (4) CEA, LETI, Minatoc Campus, 17 rue des Martyrs, 38054 Grenoble, France.

9:30 **GeSn Strain Relaxation Studies in view of SRB Application**

1-2

Wei Wang (1, 2), Yosuke Shimura (1, 2, 3), Wilfried Vandervorst (1, 2), Roger Loo (1).

(1) IMEC, Kapeldreef 75, Leuven, 3001, Belgium; (2) Instituut voor Kern- en Stralingsfysica, KU Leuven, 3001 Leuven, Belgium; (3) FWO Pegasus Marie Curie Fellow.

9:45 **Potential and Limitations of Phosphorus Delta-Doping of Germanium-based Materials in Ultra High Vacuum**

1-3

W. M. Klesse (1), G. Capellini (2,3), M. Y. Simmons (1,4), G. Scappucci (1).

(1) School of Physics, University of New South Wales, Sydney, NSW 2052, Australia; (2) IHP, 15236 Frankfurt (Oder), Germany; (3) Scienze, Università Roma Tre, 00146 Roma, Italy; (4) ARC-CQC2T, University of New South Wales, Sydney, NSW 2052, Australia.

- 10:00 **Growth and overgrowth of few monolayers of Sn on Ge with molecular beam epitaxy** 1-4
 F. Oliveira (1), I. A. Fischer (1) , S. Stefanov (2), S. Chiussi (2) , M. Cerqueira (3), M. Vasilevskiy (3), J. Schulze (1).
 (1) Institut für Halbleitertechnik, Universität Stuttgart, 70569 Stuttgart, Germany; (2) Dpto. Física Aplicada, Univ. de Vigo, Campus Universitario Lagoas Marcosende, Vigo, Spain; (3) Centre of Physics University of Minho, University of Minho, Campus de Gualtar, and International Iberian Nanotechnology Laboratory, Braga, Portugal.
- 10:15 **Structure and composition of Germanium-Lead Alloys Obtained by Pulsed Laser Induced Epitaxy** 1-5
 Stefan Stefanov (1), Carmen Serra (2), Alessandro Benedetti (2), Peter Zaumseil (3), Dan Buca (4), Stefano Chiussi (1).
 (1) Dpto. Física Aplicada, Universidade de Vigo, Campus Universitario, 36310 Vigo, Spain; (2) CACTI, Universidade de Vigo, Campus Universitario, 36310 Vigo, Spain; (3) IHP, Im Technologiepark 25 15236 Frankfurt (Oder), Germany; (4) Peter Gruenberg Institute (PGI 9) and JARA-FIT, Forschungszentrum Juelich, 52425, Germany.
- 10:30 Coffee break
- Session II: Materials Science - III/V
 Session Chair: Leo Miglio
- 11:00 **MOCVD of III-V compounds on silicon substrate-status and challenges** 2-1
 M.Heuken.
 AIXTRON SE Kaiserstrasse 98, 52134 Herzogenrath Germany.
- 11:30 **Germanium growth on mesoporous silicon buffer for III/V integration on silicon** 2-2
 Gabriele Calabrese, Robert Harper, Stefano Baricordi, Paolo Bernardoni, Vincenzo Guidi, Andrew Johnson, Aled Morgan, Stuart Thomas, Donato Vincenzi.
 University of Ferrara, Department of Physics and Earth Sciences, IQE Silicon Compounds Ltd.

11:45 **The atomic structure of GaP/Si(100) heterointerfaces studied with ab initio DFT and in situ RAS** 2-3

O. Supplie (1, 2), S. Brückner (1, 2), P. Kleinschmidt (1, 2), O. Romanyuk (3), H. Döscher (1), MM. May (2), C. Höhn (2), F. Große (4), T. Hannappel (1, 2).

(1) TU Ilmenau, Institut für Physik, FG Photovoltaik, Ilmenau, Germany; (2) Helmholtz-Zentrum Berlin, Institute for Solar Fuels, Berlin, Germany; (3) Academy of Sciences of the Czech Republic, Institute of Physics, Prague, Czech Republic; (4) Paul Drude Institut für Festkörperelektronik, Berlin, Germany.

12:00 **The exchanging mechanisms in anion sublattice during formation of InAs/GaSb heterointerfaces by MBE** 2-4

Vasev A.V., Emelyanov E.A., Feklin D.F., Putyato M.A., Semyagin B.R., Preobrazhenskii V.V.

Rzhanov Institute of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences.

12:15 **Low defect InGaAs quantum well selectively grown by mocvd on Si(100) 300 mm wafers** 2-5

T. Baron (1), R. Cipro (1), M. Martin (1), F. Bassani (1), S. Arnaud (1), S. David (1), V. Gorbenko (1, 2), JP. Barnes (2), Y. Bogumilovicz (2), P. Gergaud (2), N. Rochas (2), V. Loup (2), C. Vizios (2), K. Yckache (2), N. Chauvin (3), X.Y. Bao (4), Z .Ye (4), D. Carlson (4), JB Pin (4), E. Sanchez (4).

(1) Univ. Grenoble Alpes, LTM, F-38000Grenoble, France CNRS, LTM, F-38000Grenoble, France; (2) Univ. Grenoble Alpes, F-38000 Grenoble, France, CEA-LETI, MINATEC Campus, F-38054 Grenoble, France; (3) Institut des Nanotechnologies de Lyon (INL)-UMR5270-CNRS, INSA-Lyon, Université de Lyon, 7 Avenue Jean Capelle, 69621 Villeurbanne, France; (4) Applied Materials, 3050 Bowers Avenue, Santa Clara, CA 95054, USA.

12:30 Lunch break

Session III: Materials Science - Oxides & Nitrides

Session Chair: Shinichi Takagi

14:00 **Current status of highly efficient InGaN MQW LEDs grown on 8-inch Si substrates** 3-1

Masaaki Onomura.

Toshiba America Electronic Components, Inc., Toshiba Corporation.

- 14:30 **Monolithic integration of GaN-HEMTs with CMOS** 3-2
 Rémi Comyn, Yvon Cordier, Vincent Aimez, Hassan Maher.
 Laboratoire Nanotechnologies Nanosystèmes (LN2)- CNRS UMI-3463, Université de Sherbrooke, 3000 Boulevard Université, Sherbrooke, J1K OA5, Québec, Canada, CRHEA-CNRS, Rue Bernard Gregory, Valbonne, 06560, France.
- 14:45 **GaN ultraviolet detector on Si(111) via engineered oxide buffers with embedded Y2O3/Si distributed Bragg reflectors** 3-3
 A. Szyszka (1, 2), L. Lupina (1), G. Lupina (1), M. A. Schubert (1), P. Storck (3), S. B. Thapa (2), T. Schroeder (1,4).
 (1) IHP, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany; (2) Faculty of Microsystem Electronics and Photonics, Wrocław University of Technology, Janiszewskiego 11/17, 50-372 Wrocław, Poland; (3) Siltronic, Hanns-Seidel-Platz 4, 81737 München, Germany; (4) BTU Cottbus-Senftenberg, Konrad-Zuse-Strasse 1, 03046 Cottbus, Germany.
- 15:00 **Giant positive junction magnetoresistance at low temperatures in Fe3O4/MgO/n-Si magnetic diode like heterostructure** 3-4
 J. Panda, T. K. Nath.
 Department of Physics, Indian Institute of Technology Kharagpur, West Bengal 721302, India.
- 15:15 **Multiferroic CoFe2O4-BaTiO3 Epitaxial Heterostructures on Si(001)** 3-5
 M. Scigaj (1, 2), N. Dix (1), I. Fina (1), R. Bachelet (1), V. Skumryev (2), G. Herranz (1), J. Fontcuberta (1), F. Sánchez (1).
 (1) Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus de la UAB, Bellaterra 08193, Spain; (2) Dep. de Física, Universitat Autònoma de Barcelona, Campus de la UAB, Bellaterra 08193, Spain.

15:30 Coffee break

Session IV: Materials Science - Oxides & Nitrides

Session Chair: Sabine Spiga

- 16:00 **Monolithic integration of complex oxides with semiconductors** 4-1
 Charles H. Ahn.
 Department of Applied Physics, Yale University, USA.

- 16:30 **Structural dependence of electro-optical effect in barium titanate thin films grown on silicon** 4-2
 Y Popoff, S Abel, E Uccelli, M Sousa, H Siegwart, D Caimi, J Fompeyrine, C Marchiori.
 IBM Research GmbH, Zurich Laboratory, Saeumerstrasse 4, CH-8803 Rueschlikon.
- 16:45 **Epitaxial growth of BaTiO₃ on semiconductor substrates by molecular beam epitaxy for ferroelectric devices** 4-3
 L. Mazet (1), R. Bachelet (1), L. Louahadj (1), C. Botella (1), M.M. Frank (2), J. Jordan-Sweet (2), I. Lauer (2), V. Narayanan (2), D. Albertini (1), B. Gautier (1), G. Saint-Girons (1), M. H'tch (3), S. Schamm-Chardon (3), C. Dubourdieu (1).
 (1) Institut des Nanotechnologies de Lyon, CNRS, Ecole Centrale de Lyon, INSA de Lyon, Ecully and Villeurbanne, France , (2) IBM T.J. Watson Research Center, Yorktown Heights, NY, USA , (3) CEMES, CNRS, Université de Toulouse, Toulouse, France.
- 17:00 Coffee break
- 17:30 **Symposium J Poster Session (Faculty of Physcis, Ground Floor)**
 Session Chair: Roger Loo, Giovanni Capellini, Thomas Schroeder, Jean Fompeyrine.
- Unique mass transfer induced the formation of multilayered** J-1
 Xiaofan Jiang, Zhongyuan Ma, Sheng Ren, Huafeng Yang, Wei Li, Jun Xu, Ling Xu, Kunji Chen, Xinfan Huang, Duan Feng.
 National Laboratory of Solid State Microstructures Jiangsu Provincial Key Laboratory of Photonic Electronic Materials Sciences and Technology School of Electronic Science and Engineering Nanjing University, Nanjing 210093, People's Republic of China
- Morphology and composition of Au and Au(Mn) catalysts on Ge(111)** J-2
 H. Zitouni (1, 4), L. Vincent (2), A. Mehdaoui (1), C. Renard (2), G. Patriarche (3), K. D. Khodja (4), N. Hakiki (4), L. Josien (1), E. Denys (1), D. Bouchier (2), C. Pirri (1).
 (1) IS2M, Université de Haute Alsace, CNRS-UMR7361, 68057 Mulhouse, France; (2) IEF, Université Paris-Sud, UMR 8622, Orsay, F-91405 and CNRS, Orsay, F-91405; (3) Laboratoire de Photonique et Nanostructure UPR 20 Marcoussis, France; (4) Laboratoire de Physique des Couches Minces et des Matériaux pour l'Electronique (LPCM2E) Université d'Oran, BP 1524 El'Mnaouer Oran 31100, Algérie.

- Origin of Fermi-level pinning at GaAs surfaces and interfaces** J-3
 Davide Colleoni, Giacomo Miceli, Alfredo Pasquarello.
 EPFL, Switzerland.
- Use of X-ray techniques in the development of Ge MOSFET devices** J-4
 Jianwu Sun, Andriy Hikavyy, Yosuke Shimura, Liesbeth Witters, Hilde Tielens, Paul Ryan* and Roger Loo.
 imec, Kapeldreef 75, B-3001 Leuven, * Jordan Valley Semiconductors UK LTD, Belmont Business Park, Belmont Durham, DH1 1TW, United Kingdom.
- Hydrogen gas sensors based on silicon carbide (SiC) MOS capacitor structure** J-5
 Razvan Pascu (1), Jenica Neamtu (2), Florea Craciunoiu (1), Gheorghe Brezeanu (3), Dragos Ovezza (2).
 (1) National Institute for Research&Development in Electrical Engineering, Bucharest Romania; (2) National Institute for Research&Development in Microtechnology Bucharest Romania; (3) Politechnica University Bucharest Romania.
- Thick semipolar GaN on planar (001)Si: HVPE growth and properties.** J-6
 V. N. Bessolov (1), E. V. Konenkova (1), S. A. Kukushkin (2), A. V. Myasoedov (1), S. N. Rodin (1), A. V. Osipov (2).
 (1) A.F.Ioffe Physical-Technical Institute, 194021, Saint-Petersburg, Russia; (2) Institute of Problems of Mechanical Engineering Science, 199178, Saint-Petersburg, Russia.
- Highly Efficient Control of SiO₂ Etch and Uniformity by Controlling Pulsed RF Capacitively Coupled Plasma** J-7
 In J. Kim, Soon C. Cho, Soo J. Lee, Hyun J. Kim, Hyung J. Woo
 SEMES, 77, 4 San Dan 5 Gil, Jic-San Eup, Seo-Buk Gu, Cheon-An Si, Korea.
- Processes Depending on Plasma Generation using a Control of the Harmonics Generation in a Capacitively Coupled Plasma** J-8
 In J. Kim, Soon C. Cho, Soo J. Lee, Hyun J. Kim, Hyung J. Woo
 SEMES, 77, 4 San Dan 5 Gil, Jic-San Eup, Seo-Buk Gu, Cheon-An Si, Korea.

Electrical resistance measurements on individual carbon nanotubes by a high-resolution-SEM-based nano-probing system for future VLSI interconnects

J-9

Mariko Suzuki, Masayuki Katagiri, Yuichi Yamazaki, Hisao Miyazaki, Daisuke Nishide, Takashi Matsumoto, Naoshi Sakuma, Akihiro Kajita, Tadashi Sakai.

Low-power Electronics Association & Project (LEAP).

Band alignment and electrical properties of Gd and Si co-doped HfO₂ gate dielectrics grown by atomic layer deposition

J-10

Xiao-Jie Liu, Xue-Fei Li, Yan-Qiang Cao, Lin Zhu, Ai-Dong Li, Di Wu.

Department of Materials Science and Engineering, College of Engineering and Applied Sciences, National Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, People's Republic of China.

A Long Term Stable Zinc Oxide TCO for Silicon Nanocrystal Based LEDs

J-11

J. Laube, S. Gutsch, D. Hiller, M. Zacharias.

Laboratory for Nanotechnology, Department of Microsystems Engineering - IMTEK, University of Freiburg, Georges-Koehler-Allee 103, 79110 Freiburg im Breisgau, Germany.

Electroluminescence from silicon nitride/silicon superlattice structures

J-12

Tomas Grigaitis, Arnas Naujokaitis, Giedrius Juška, Kęstutis Arlauskas.

Department of Solid State Electronics, Vilnius University.

Ion beam synthesis of InAs, InGaAs and GaAs nanocrystals in silicon

J-13

L. Rebohle, R. Wutzler, S. Prucnal, M. Helm, W. Skorupa.

Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden - Rossendorf, Bautzner Landstraße 400, 01328 Dresden, Germany.

Suppression of Sn agglomerations on GeSn surface

J-14

Yosuke Shimura (1, 2, 3), Wei Wang (1, 2), Wilfried Vandervorst (1, 2), Matty Caymax (1), Roger Loo (1).

(1) imec; (2) Department of Physics KU Leuven; (3) FWO Pegasus Marie Curie Fellow.

Improvement of Device Performance of Ge Gate-All-Around Tunneling Transistors by Means of GeSn J-15

E. Rolseth, A. Blech, I. A. Fischer, Y. Hashad, R. K?rner, V. S. Senthil Srinivasan, J. Schulze.

Institut für Halbleitertechnik, Universität Stuttgart, D-70569 Stuttgart, Germany.

MBE GaAs microcrystals on patterned Si : a defect study J-16

C. Frigeri (1), S. Bietti (2), A. Scaccabarozzi (2), M. Bollani (3), E. Bonera (2), C. V. Falub (4), H. von Känel (4), V. Grillo (1), L. Miglio (2), S. Sanguinetti (2).

(1) CNR-IMEM Institute, Parco Area delle Scienze 37/A, I-43100 Parma (Italy); (2) L-Ness and Dipartimento di Scienza dei Materiali, Via Cozzi 53, I-20125, Milano (Italy); (3) CNR-IFN, L-NESS, via Anzani 42, I-22100, Como (Italy); (4) Laboratory for Solid State Physics, ETH Zürich, Schafmattstrasse 16, CH-8093 Zürich, (Switzerland).

Effect of Ni-based substrates and Cu-based substrates on grain structure of beta-tin in Pb-free solder joints J-17

Tzu-Ting Chou, Wei Yu Chen, Cheng-Ying Ho, Hsiu-Min Lin, Jenq-Gong Duh.

No. 101, Kuang-Fu Road, Sec. 2, Hsinchu, TAIWAN.

High-k thin films/Ge gate stacks with sub-nanometer capacitance equivalent thickness and low interface state density J-18

Ai-Dong Li, Yan-Qiang Cao, Xue-Fei Li, Xiao-Jie Liu, Zheng-Yi Cao, Di Wu.

Department of Materials Science and Engineering, College of Engineering and Applied Sciences, National Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, People's Republic of China.

Robust Femto-Farad Capacitance Extraction Method for High-k MIM Capacitor with Complex Dielectric Materials in DRAM J-19

Incheol Nam (1, 2), Daewon Kim (1, 3), Chan-Wook Baik (4), Sung Woo Hwang (3, 4), Sangsig Kim (1).

(1) Department of Electrical Engineering, Korea University, Seoul 136-713, Korea; (2) Memory Division, Samsung Electronics Co., Hwaseong 445-330, Korea; (3) Research Center for Time-domain Nano-functional Devices, Samsung Advanced Institute of Technology, Suwon 443-803, Korea; (4) Nano Electronics Laboratory, Samsung Advanced Institute of Technology, Suwon 443-803, Korea.

- An extraction of Metal/Ge_{1-x}Sn_x contact resistivity and Schottky barrier height** J-20
V. S. Senthil Srinivasan, I. A. Fischer, A. Hornung, J. Schulze.
Institute for Semiconductor Engineering, University of Stuttgart, Pfaffenwaldring 47, 70569 Stuttgart, Germany.
- Numerical Investigation of nanoscale SiGe DG MOSFET with graded doping channel for improving reliability behavior** J-21
T. Bentrucia (1), F. Djeffal (2), Z. Dibi (2), D. Arar (2).
(1) Physics Department, University of Batna, Batna 05000, Algeria Email: toufikmit@yahoo.com; (2) Electronics Department, University of Batna, Batna 05000, Algeria. Email: faycal.djeffal@univ-batna.dz, faycaldzdz@hotmail.com.
- Retarding the Cu-Sn and Ag-Sn Intermetallic Compounds in the Cu/Sn/Cu-15Zn Microbump in 3D-IC Technology** J-23
Wei-Yu Chen, Wei-Tu, Hsiang-Ching Chang, Jenq-Gong Duh.
Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.
- Comparative study of Er-silicide formation on Si and Si_{1-x}Gex substrates** J-24
S.-H. Choi (1), J. Choi (1), Y. Kim (2), H. Kim (1).
(1) School of Advanced Materials Science and Engineering, Sungkyunkwan University, Suwon 440-746, Korea; (2) Applied Materials, 974 E. Arques Ave., Sunnyvale, CA 94085, USA.
- Structural and Electrical Characteristics of Zinc Tin Oxide Thin Films Deposited by Atomic Layer Deposition Method** J-25
Seung-Youl Kang, Seung Eon Moon, Seong-Deok Ahn.
Electronics and Telecommunications Research Institute.

Fabrication and Characterization of Epitaxial Si-O Superlattices J-26

Suseendran Jayachandran (1, 2), Annelies Delabie (1, 3), Dennis Lin (1), Bastien Douhard (1), Olivier Richard (1), Johan Meersschaut (1), Alain Moussa (1), Hugo Bender (1), Matty Caymax (1), Wilfried Vandervorst (1, 4), Marc Heyns (1, 2).

(1) Imec, Kapeldreef 75, 3001 Leuven, Belgium; (2) KU Leuven, Department of Metallurgy and Materials, Castle Arenberg 44, B-3001 Leuven, Belgium; (3) KU Leuven Department of Chemistry, Celestijnenlaan 200F, B-3001 Leuven, Belgium; (4) KU Leuven, Department of Physics and Astronomy, Celestijnenlaan 200D, B-3001 Leuven, Belgium.

Electrical properties of ALD-TiO₂-capped HfO₂ film on n-type InP with TaN and TiN electrodes J-27

Sungho Choi, Youngseo An, Changmin Lee, Hyongsun Kim.

School of Advanced Materials Science & Engineering, Sungkyunkwan University.

Investigation of the hydrogen effect on the interface and bulk layer for Al/NiO_x/Si structured resistive random access memory J-28

Doo Hyun Yoon, Young Jun Tak, Sung Pyo Park, Joohye Jung, Heesoo Lee, and Hyun Jae Kim.

School of Electrical and Electronic Engineering, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul 120-749, Republic of Korea.

Copper/porous silicon nanocomposite as a sacrificial material for Layer Transfer J-29

A. Dolgyi (1), E. Chubenko (1), H. Bandarenka (1), A. Klyshko (1), M. Balucani (2), V. Bondarenko (1).

(1) Belarusian State University of Informatics and Radioelectronics; (2) University of Rome "Sapienza".

Ultra-shallow junctions formed by nitrogen doping via self-assembled monolayers J-30

Bin Guan (1), Hamid Siampour (1), Zhao Fan (1), Jian Zhang (2), Yaping Dan (1).

(1) University of Michigan - Shanghai Jiao Tong University Joint Institute; (2) Faculty of Medicine, Shanghai Jiao Tong University, Shanghai, 200040, China.

- Interdiffusion in nanocrystalline Ag-Ti-Si thin film system** J-31
 A. Tynkova, S. Sidorenko, S. Voloshko.
 National Technical University of Ukraine 'Kyiv Polytechnic Institute' Peremogy av. 37, Kyiv, 03056, Ukraine.
- LPCVD growth and characterization of thin poly-Ge/SiGe alloy layers for NIR photodetection** J-32
 A. Novikau, O. Nalivajko*, S. Prakopyeu, A. Chizh, P. Gaiduk
 Belarusian State University, 4 Nezavisimosti av., Minsk, Belarus, *JSC "INTEGRAL", Kazintsa sq.1, Minsk, Belarus.
- Metal Film Assisted Sub 10 nm Patterning of Graphene Nanoribbon Array with Focused Ion Beam** J-33
 Jaehyun Han, Jong-Souk Yeo.
 School of Integrated Technology, College of Engineering, Yonsei University, Incheon, Korea, Republic of. Yonsei Institute of Convergence Technology, Incheon, Korea, Republic of.
- Bilayer structure of solution processed GaZnOx resistive random access memory for highly reliable switching characteristics** J-34
 Sung Pyo Park, Doo Hyun Yoon, Young Jun Tak, Heesoo Lee, Hyun Jae Kim.
 School of Electrical and Electronic Engineering, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul 120-749, Republic of Korea.
- Impact of traps on the electrical characteristics of GeSn/Ge diodes** J-35
 B. Baert, S. Gupta, F. Gencarelli, R. Loo, E. Simoen, N.D. Nguyen.
 Department of Physics, Solid State Physics - Interfaces and Nanostructures, University of Liege, 4000 Liege, Belgium. IMEC, Kapeldreef 75, 3001 Leuven, Belgium MTM department, KU Leuven, Kasteelpark Arenberg 10, 3001 Leuven, Belgium.
- Investigation of antimonide-based materials grown on exactly oriented (001) silicon substrate by MOVPE** J-36
 Andrea Ott (1), Andreas Beyer (1), Antje Ruiz Perez (2), Bernadette Kunert (1), Wolfgang Stolz (1), Kerstin Volz (1).
 (1) Philipps-Universitaet Marburg, Faculty of Physics and Materials Science Center, Marburg, Germany; (2) NAsP III/V GmbH, Marburg, Germany, NAsP III/V GmbH, Marburg, Germany.

- Low-frequency noise characterization of epitaxial GaP/Si heterostructure** J-37
 Emad H. Hussein (1, 2), Fariba Hatami (1), W.T. Masselink (1).
 (1) Institut für Physik, Humboldt Universität zu Berlin, Newtonstrasse D-15, 12489 Berlin, Germany; (2) On leave from department of Physics, college of Science, Al-Mustansiriyah University, Baghdad, Iraq
- Defects reduction and characterization of epitaxial Si:C/Si:C:P layers grown using cyclic deposition and etching technique** J-38
 Sathish kumar Dhayalan (1, 2), Roger loo (1), Erik Rosseel (1), Andriy Hikavyy (1), Yosuke Shimura (1, 2, 3), Thomas Nuytten (1), Bastien Douhard (1), Wilfried Vandervorst (1, 2).
 (1) Imec, Kapeldreef 75, Leuven, B – 3001; (2) Instituut voor Kern- en Stralingsfysica, Celestijnenlaan 200d, Heverlee, B – 3001; (3) FWO Pegasus Marie Curie fellow.
- On the crystallographic and electronic structure of Ce_{1-x}Pr_xO_{2-δ} (x = 0-1) thin films on Si(111)** J-39
 M. H. Zoellner (1), G. Niu (1), P. Zaumseil (1), J.-H- Jhang (2), A. Schaefer (2), M. Bäumer (2), H. Wilkens (3), J. Wollschläger (3), F. Boscherini (4), F. dAcapito (5), T. Schroeder (1, 6).
 (1) IHP, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany; (2) Universität Bremen, Institut für angewandte und physikalische Chemie, Leobener Str. 2, 28357, Germany; (3) Universität Osnabrück, Fachbereich Physik, Barbarastr. 7, 49076 Osnabrück, Germany; (4) University of Bologna, Department of Physics and Astronomy, viale C. Bertipichat 6/2, 40127 Bologna, Italy; (5) Consiglio Nazionale delle Ricerche, Istituto Officina dei Materiali, Operative Group in Grenoble, c/o European Synchrotron Radiation Facility, BP 220, 38043 Grenoble Cedex, France; (6) Brandenburgisch Technische Universität, Institute of Physics, Germany, 03046 Cottbus.
- Optical gain calculation in strained GeSn alloy system** J-40
 Z. Ikonic, D. Buca, S. Wirths.
 Institute of Microwaves and Photonics, School of Electronic and Electrical Engineering, University of Leeds, Leeds, LS2 9JT, United Kingdom, Peter Grunberg Institute (PGI 9) and JARA-FIT, Forschungszentrum Juelich, 52425, Germany.

Above room temperature ferromagnetism in Mn doped Si ultrathin films J-41

Chuan gui Wu (1, 2), Wen xu. Zhang (1), Ye Yuan (2), Fang Liu (2), Yao Shuai (1), Wen bo Luo (1), Wan li Zhang (1), Sheng qiang Zhou (2)

(1) State Key Lab of Electronic Thin films and integrated devices, University of Electronic Science and Technology of China, Chengdu 610054, China; (2) Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden Rossendorf, Bautzner Landstrasse 400, D-01328 Dresden, Germany.

3D Control of Through Silicon Via (TSV) Etching J-42

O. Fursenko (1), J. Bauer (2), S. Marschmeyer (1).

(1) IHP, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany; (2) Technical University of Applied Sciences, Bahnhofstraße 1, 15745 Wildau, Germany.

Hyperdoping Si with chalcogen: solid vs. liquid phase epitaxy J-43

Fang Liu, Shengqiang Zhou, S. Prucnal, Kun Gao, M. Khalid, W. Skorupa, M. Helm.

Helmholtz-Zentrum Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research, P.O. Box 510119, 01314 Dresden, Germany.

Fabrication of hexagonally arranged Si nanopore arrays by poly(ethylene oxide)-b-polystyrene templated 'insitu' hard mask approach J-44

Tandra Ghoshal, Matthew T. Shaw, Justin D. Holmes, Michael A. Morris.

Materials research group, Department of Chemistry and Tyndall National Institute, University College Cork, Cork, Ireland, Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN/AMBER), Trinity College Dublin, Dublin, Ireland, Intel Ireland Ltd., Collinstown Industrial Estate, Co. Kildare, Ireland.

Epitaxial growth and characterization of 3D GaN micro-crystals on (001) patterned Si substrate by plasma-assisted MBE

F. Isa (1, 2), C. Chčze (3), M. Siekacz (4), C. Hauswald (3), J. Lähnemann (3), S. Fernández-Garrido (3), M. Ramsteiner (3), T. Kreiliger (1), O. Brandt (3), G. Isella (2), R. Calarco (3), H. Riechert (3), L. Miglio (6).

(1) Laboratory for Solid State Physics, ETH Zurich, Otto-Stern-Weg 1, CH-8093, Zurich, Switzerland; (2) L-NESS and Department of Physics, Politecnico di Milano, Via Anzani 42, I-22100 Como, Italy; (3) Paul-Drude-Institut für Festkörperelektronik, Hausvogteiplatz 5-7, 10117 Berlin, Germany; (4) Institute of High Pressure Physics, Polish Academy of Sciences, ul. Sokolowska 29/37, 01-142 Warszawa, Poland; (5) TopGaN sp. z.o.o., al. Prymasa Tysią,clecia 98, 01-424 Warszawa, Poland; (6) L-NESS, Department of Materials Science, Università di Milano-Bicocca, via Cozzi 55, I-20126 Milano, Italy.

Tuesday, September 16th, 2014

Session VI: Integration techniques - Advanced heteroepitaxy

Session Chair: Giovanni Capellini

- 9:00 **Understanding complex dislocation behavior and reactions in advanced GeSi epitaxy** 6-1
 Anna Marzegalli.
 L-NESS and Dipartimento di Scienza dei Materiali, Università degli Studi di Milano Bicocca, via Cozzi 55, 20126, Milano, Italy.
- 9:30 **SiGe channel formation for 3D vertical channel transistor applications** 6-2
 E. Capogreco (1,2), J. G. Lisoni (1), A. Hikavyy (1), A. Arreghini (1), E. Vecchio (1), T. Numata (3), C.-L. Tan (1), K. De Meyer (1,2), G. Van den bosch (1), J. Van Houdt (1).
 (1) imec, Belgium; (2) Katholieke Universiteit Leuven, Belgium; (3) Assignee at imec from Toshiba Corporation.
- 9:45 **Epitaxial growth and structural characterization of 3D Ge quantum well crystals on patterned Si substrates** 6-3
 F. Isa (1,2), M. Meduňa (3,4), C. V. Falub (1), E. Müller (5), D. Chrastina (2), G. Isella (2), P. Niedermann (6), H. von Känel (1).
 (1) Laboratory for Solid State Physics, ETH Zurich, Otto-Stern-Weg 1, CH-8093, Zurich, Switzerland; (2) L-NESS and Department of Physics, Politecnico di Milano, Via Anzani 42, I-22100 Como, Italy; (3) Department of Condensed Matter Physics, Masaryk University, Kotlářská 2, CZ-1137 Brno, Czech Republic; (4) CEITEC, Masaryk University, Kamenice 5, CZ-60177 Brno, Czech Republic; (5) Electron Microscopy ETH Zurich, Auguste-Piccard-Hof 1, CH-8093 Zürich, Switzerland; (6) CSEM, Jaquet-Droz 1, CH-2002 Neuchatel, Switzerland.
- 10:00 **InGaAs quantum well emission from epitaxial crystals on patterned Si substrates** 6-4
 A. Jung, A.G. Taboada, W. Stumpf, T. Kreiliger, F. Isa, G. Isella (2), H. von Känel
 Laboratory for Solid State Physics, ETH Zurich, Otto-Stern-Weg 1, 8093, Zurich, Switzerland; (2) L-NESS, Dept of Physics, Politecnico di Milano, via Anzani 42, 22100 Como, Italy.

- 10:15 **Selective growth of strained Ge on relaxed SiGe in shallow trench isolation for p-MOS FINFET** 6-5
 Jianwu Sun (1), Roger Loo (1), Liesbeth Witters (1), A. Hikavy (1), Y. Shimura (1, 2, 3), P. Favia (1), O. Richard (1), H. Bender (1), W. Vandervorst (1, 2), N. Collaert (1), A. Thean (1).
 (1) Imec, Kapeldreef 75, B- 3001 Leuven, Belgium; (2) KU Leuven, Department of Physics and Astronomy, Nuclear and Radiation Physics Section, Celestijnenlaan 200D, B - 3001, Belgium; (3) FWO Pegasus Marie Curie Fellow.
- 10:30 Coffee break
- Session VII: Advanced techniques - Layer transfer
 Session Chair: Didier Landru
- 11:00 **III-V CMOS device technologies on Si platform** 7-1
 Shinichi Takagi and Mitsuru Takenaka.
 The University of Tokyo and JST-CREST.
- 11:30 **Batch-Processable Fabrication of Wafer-scale Graphene Device Onto Large-Area Substrates** 7-2
 JooHo Lee, ChangSeung Lee, Sunghee Lee, Chang-Yul Moon, Seong Chan Jun.
 Samsung Advanced Institute of Technology, Yongin 446-577, South Korea, School of Mechanical Engineering, Yonsei University, Seoul 120-749, South Korea.
- 11:45 **Millisecond range heteroepitaxy for hybrid nanoelectronics – beyond silicon limits** 7-3
 S. Prucnal (1), M. Glaser (2), A. Lugstein (2), M. Helm (1), S. Zhou (1) W. Skorupa
 (1) Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, P.O. Box 510119, 01314 Dresden, Germany; (2) Institute of Solid State Electronics, Vienna University of Technology, Floragasse 7, 1040 Vienna, Austria.
- 12:00 **Top-down fabrication and definition of side-contacts on SOI and InAs nanowires** 7-4
 A. Verma, N. Thiyagarajah, S. Connaughton, E. Holmes, A. Bell, V. Krstic, P. Stamenov
 School of Physics, AMBER and CRANN, Trinity College, Dublin 2, Ireland, Friedrich-Alexander Universitaet, Erlangen-Nuernberg, D-91058 Erlangen, Germany.

- 12:15 **Large Size III-V on Insulator substrates made by Direct Wafer Bonding** 7-5
 N. Daix, E. Uccelli, L. Czornomaz, D. Caimi, C. Rossel, M. Sousa, H. Siegwart, C. Marchiori, J. Fompeyrine
 IBM Research - Zürich, Säumerstrasse 4, CH-8803 Rüschlikon, Switzerland.
- 12:30 Lunch break
- Session VIII: Application - Data Computing & Storage
 Session Chair: Thomas Schroeder
- 14:00 **Spin behaviour in strained silicon films** 8-1
 Viktor Sverdlov, Dmitri Osintsev, Siegfried Selberherr.
 Institute for Microelectronics, TU Wien.
- 14:30 **Parallel-Antiparallel Spin Orientation Control In The Conduction Band Valleys Of Ge** 8-2
 S. Hayashi(1), T. Tayagaki(2), Y. Okawa(1), Y. Yasutake(1,3), H. Yaguchi(4), Y. Kanemitsu(2), S. Fukatsu(1)*
 (1) Graduate School of Arts and Sciences, University of Tokyo, Komaba, Meguro, Tokyo 153-8902, Japan; (2) Institute for Chemical Research, Kyoto University, Uji, Kyoto 611-0011, Japan; (3) JST, Kawaguchi, Saitama 332-0012, Japan; (4) Graduate School of Science and Engineering, Saitama University, Shimo-Okubo 255, Sakura, Saitama 338-8570, Japan. *Phone: +81-3-5454-6754 Fax: +81-3-5454-6998 E-mail: cfkatz@mail.ecc.u-tokyo.ac.jp
- 14:45 **Addressing spin-optoelectronic properties of Ge by polarization and time-resolved PL investigations** 8-3
 Anna Giorgioni, Elisa Vitiello, Emanuele Grilli, Emiliano Bonera, Mario Guzzi, Fabio Pezzoli.
 LNESS and Dipartimento di Scienza dei Materiali, Università degli Studi di Milano Bicocca, via Cozzi 55, I-20125 Milano, Italy.
- 15:00 **Delta doped Ge and GeSn channel Transistor** 8-4
 V. S. Senthil Srinivasan, I.A. Fischer, R. Koerner, E. Rolseth, J. Schulze.
 Institute for Semiconductor Engineering, University of Stuttgart, Pfaffenwaldring 47, 70569 Stuttgart, Germany.

15:15 **Schottky electroluminescent diodes with n-doped germanium** 8-5

M. Prost (1, 2) M. El Kurdi (1), A. Ghrib (1), X. Checoury (1), N. Zerounian (1), F. Aniel (1), G. Beaudoin (3), I. Sagnes (3), C. Baudot (2), F. Boeuf (2), P. Boucaud (1).

(1) Institut d'Electronique Fondamentale, CNRS-Univ. Paris Sud 11, Batiment 220, F-91405 Orsay, France; (2) STMicroelectronics, 850 Rue Jean Monnet, F-38920 Crolles, France; (3) Laboratoire de Photonique et de Nanostructures, CNRS - UPR 20, Route de Nozay, F-91460 Marcoussis, France.

15:30 Coffee break

Session IX: Application - Data Computing & Storage

Session Chair: Inga Fischer

16:00 **Oxides for memristive devices: from resistive switching memories to neuromorphic computing** 9-1

S. Spiga (1)*, S. Brivio (1), G. Tallarida (1), E. Cianci (1), E. Covi (1), C. Wiemer (1), A. Lamperti (1), M. Fanciulli (1, 2).

(1) Laboratorio MDM, IMM-CNR, Via C. Olivetti 2, 20864 Agrate Brianza (Italy); (2) Dipartimento di Scienza dei Materiali, Università degli Studi di Milano Bicocca, Milano (Italy) *e-mail: sabina.spiga@mdm.imm.cnr.it

16:30 **SOI substrates thickness control for fully depleted digital applications** 9-2

Didier Landru, Oleg Kononchuk, Pablo Acosta, Nicolas Daval, Christophe Gourdel.

SOITEC, Parc technologique des Fontaines, F-38190 Bernin, France.

16:45 **Use of Si-O-Si based molecules for p-type microcrystalline silicon oxide layers** 9-3

Prabal Goyal, Vanina Lahootun, Alain Madec, Pere Roca i Cabarrocas, and Erik Johnson.

(1) Air Liquide Centre de Recherche Claude Delorme, Jouy en Josas, France; (2) LPICM, UMR 7647, CNRS, Palaiseau, France.

Wednesday, September 17th, 2014

9:00 **Plenary Session – Main Hall**

12:30 Lunch break

Session XI: Materials Science - Advanced characterization

Sesion Chair: W. Paszkowicz, Th. Glatzel, J. Fomeyrine

Joined with Symposia H and N

14:00 **Reciprocal space meets real space - employing nano-beams for scanning diffraction** HJN-1

T. Dane (1), E. Di Cola (1), L. Lardiere (1), C. Montero (2), C. Riekel (1), M. Sztucki (1), B. Weinhausen (1), M. Burghammer (1, 3).

(1) European Synchrotron Radiation Facility, Grenoble, France; (2) Université Montpellier 2, Laboratoire de Mécanique et Génie Civil, Montpellier, France; (3) Ghent University, Department of Analytical Chemistry, Ghent, Belgium.

14:30 **Combined refinement of GIXRF, XRR and XRD data in a global approach: analysis of textured In₂O₃/Ag/In₂O₃/Si architectures and III-V based heterostructures** HJN-2

Magali Morales (1), L. Lutterotti (2), Daniel Chateigner (2), Bérenger Caby (3), Emmanuel Nolot (3), Patrice Gergaud (3), Giancarlo Pepponi (4).

(1) CIMAP – ENSICAEN, 6 boulevard du Maréchal Juin, 14050 Caen Cedex 4; (2) CRISMAT – ENSICAEN, 6 boulevard du Maréchal Juin, 14050 Caen Cedex 4; (3) CEA Grenoble – Leti – Minatec Campus, 17 rue des Martyrs, 38054 Grenoble Cedex 9; (4) Fondazione Bruno Kessler – Via S.Croce 77, 38122 Trento, Italie.

15:00 **Aberration-corrected atomic-resolution electron microscopy for advanced materials characterization** HJN-3

Rolf Erni.

Electron Microscopy Center, Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland.

15:30 Coffee break

- 16:00 **Local probing and writing with helium ions** HJN-4
E. van Veldhoven (1), D. J. Maas (1), G. Nanda (2),
P.F.A. Alkemade (2).
(1) TNO, Nano-instrumentation, Delft, the Netherlands;
(2) Delft University of Technology, Kavli Institute of
Nanoscience, Delft, The Netherlands.
- 16:30 **Investigation of photovoltaic and photo-catalytic materials by surface photovoltage techniques** HJN-5
Thomas Dittrich.
Helmholtz Center Berlin for Materials and Energy, Hahn-
Meitner-Platz 1, 14109 Berlin, Germany.
- 17:00 **Hall effect metrology for ultra-thin semiconducting layers** HJN-6
Dirch H. Petersen, Henrik H. Henrichsen, Rong Lin, Peter F.
Nielsen, Ole Hansen.
Department of Micro- and Nanotechnology, Technical
University of Denmark, DTU Nanotech, Building 345E, DK-
2800 Kongens Lyngby, Denmark , CAPRES A/S, Scion-DTU,
Building 373, DK-2800 Kongens Lyngby, Denmark.
- 18:00 **Best Presentation Awards Ceremony and Reception (Main Hall)**

Thursday, September 18th, 2014

Session XII: Application - Communication & Sensing

Session Chair: Paul S. Davids

- 8:30 **The New Application Potential of Graphene in Bio-sensing** 12-1
 P. Wang, M. Xia, Z.B. Yan, W. Zhang, O. Liang, P. Zhang, P.Y. Ye, Y.H. Xie.
 Department of Materials Science & Engineering
 The University of California Los Angeles.
- 9:00 **Fabrication and characterization of GaP membrane on Si(111) and GaP(111) for photonic crystal cavities** 12-2
 Fariba Hatami, Kelley Rivoire, Jelena Vuckovic.
 Department of physics, Humboldt-Universität zu Berlin, Germany, E. L. Ginzton Laboratory, Stanford University, USA.
- 9:15 **Electro-optical characterization of SiGeSn multi-quantum-well diodes** 12-3
 Inga A. Fischer (1), Torsten Wendav (2), Lion Augel (1), Songchai Jitpakdeebodin (1), Filipe Oliveira (1), Kurt Busch (2), Jörg Schulze (1).
 (1) Institut für Halbleitertechnik (IHT), Universität Stuttgart, Pfaffenwaldring 47, Stuttgart, 70569, Germany; (2) Humboldt-Universität zu Berlin, Institut für Physik, AG Theoretische Optik & Photonik, 12489 Berlin, Germany.
- 9:30 **Strain and composition dependence of optical properties of Ge_{1-x}Sn_x epitaxial layers** 12-4
 T. Stoica (1), D. Stange (1), N. von den Driesch (1), S. Wirths (1), G. Mussler (1), M. Stoica (1, 2), M. Gartner (2), Z. Ikonic (3), J M. Hartmann (4), D. Grützmacher (1), S. Mantl (1) and D. Buca (1).
 (1) Peter Grünberg Institute (PGI 9) and JARA-Fundamentals of Future Information Technologies, Forschungszentrum Juelich, 52425, Germany; (2) Institute of Physical Chemistry "Ilie Murgulescu" of the Romanian Academy, Spl. Independentei 202, 060021 Bucharest, Romania; (3) Institute of Microwaves and Photonics, School of Electronic and Electrical Engineering, University of Leeds, Leeds LS2 9JT, United Kingdom; (4) CEA, LETI, MINATEC Campus, 17 rue des Martyrs, 38054 Grenoble, France.

- 9:45 **Optical gain calculation in tensile-strained n-doped Ge** 12-5
 O. Aldaghri, Z. Ikonic, R. W. Kelsall.
 Institute of Microwaves and Photonics, School of Electronic and Electrical Engineering, University of Leeds, Leeds, LS2 9JT, United Kingdom.
- 10:00 **From optical to NEMS or sol gel sensing : New solutions to monitor air quality and health parameters?** 12-6
 Sergi Nicoletti.
 CEA-LETI, France.
- 10:30 Coffee break
- Session XIII: Application - Communication & Sensing
 Session Chair: Ya – Hong Xie
- 11:00 **CMOS Si photonics for exascale computing** 13-1
 Paul Davids, Chris DeRose, Jonathan Cox, Andrew Starbuck, Andrew Pomerene, Anthony Lentine.
 Applied Photonics and Microsystems Sandia National Laboratories.
- 11:30 **Ge on Si and SiGeOI for future photonic integrated systems** 13-2
 F. Y. Gardes, C. G. Littlejohns, T. Dominguez Bucio, J. Soler Penades, C. J. Mitchell, A. Z. Khokhar, G. T. Reed and G. Z. Mashanovich.
 University of Southampton.
- 11:45 **Optical properties of tensile strained heavily doped Germanium layers** 13-3
 M. Virgilio, C. L. Manganelli, G. Grosso, L. Zimmermann, B. Tillack, T. Schroeder, and G. Capellini.
 M. Virgilio, C. L. Manganelli, G. Grosso Dipartimento di Fisica 'E Fermi', Università di Pisa, Largo Pontecorvo 3, I56127 Pisa, Italy L. Zimmermann, B. Tillack, T. Schroeder, and G. Capellini IHP, Im Technologiepark 25, D-15236 Frankfurt (Oder), Germany.
- 12:00 **Applications of piezo- and ferroelectric thin films in RF and MEMS technologies** 13-4
 Tuomas Pensala.
 VTT Technical Research Centre of Finland.
- 12:30 Lunch break

Session XIV: Materials Science - Advanced Characterization

Session Chair: Peter Storck

- 14:00 **Advanced Material Characterization using X-ray Nano- and Micro Diffraction Techniques** 14-1
 G. Chahine (1), M.I. Richard (1, 2), T. Schroeder (3), G. Capellini (3), TN Tran Thi (1), T. U. Schüllli (1).
 (1) European Synchrotron Radiation Facility, BP 220, F-38043, cedex, Grenoble, France; (2) Aix-Marseille Université, CNRS, IM2NP UMR 7334, 13397 Marseille Cedex 20, France; (3) Innovations for High Performance Microelectronic, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany.
- 14:30 **Monitoring Defectivity in III-V/Si Heterostructures on Patterned Si Wafers using High Resolution X-ray Diffraction** 14-2
 P.Y. Hung, M.-H. Wong, Qiang Li, K.M. Lau, M. Wormington, P.A. Ryan, K. Dunne, R. J.W. Hilla.
 SEMATECH, 257 Fuller Road, Suite 2200, Albany, NY 12203, USA Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong Jordan Valley Semiconductors, 3913 Todd Lane, Suite 106, Austin, TX 78744, USA Jordan Valley Semiconductors UK Ltd, Belmont Business Park, Durham, UK, DH1 1TW CNSE, NanoFab 300 East, 257 Fuller Road, Albany, NY 12203.
- 14:45 **Advanced non-destructive X-ray Methods for Semiconductor Materials** 14-3
 Antonia Neels and Alex Dommann.
 Center for X-ray Analytics Empa - Swiss Federal Laboratories for Materials Science and Technology Überlandstrasse 129, 8600 Dübendorf, Switzerland.
- 15:00 **Functionalization of the Si and Ge surfaces for Hybrid Molecular Electronics** 14-4
 R. Czajka.
 Institute of Physics, Faculty of Technical Physics, Poznan University of Technology, Nieszawska 13 A, 60-965 Poznan, Poland.
- 15:30 Coffee break

- 16:00 **Strain relaxed SiGe buffer layers as virtual substrates for 7 nm CMOS technology** 15-1
Peter Storck.
Siltronic AG, Hans-Seidel-Platz 4, 81737 Munich, Germany.
- 16:30 **A novel X-ray micro-diffraction imaging technique for studying the structural homogeneity of 300 mm Si_{0.3}Ge_{0.7} buffers on Si(001) for CMOS applications** 15-2
M. H. Zoellner (1), G. Chahine (2), M.-I. Richard (2, 3), P. Zaumseil (1), G. Capellini (1), C. Reich (1), P. Storck (4), T. U. Schulli (2), T. Schroeder (1, 5).
(1) IHP, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany; (2) European Synchrotron Radiation Facility, BP 220, 38043 Grenoble Cedex, France; (3) Aix-Marseille Universita, CNRS, IM2NP UMR 7334, 13397 Marseille Cedex 20, France; (4) Siltronic AG, Hans-Seidel-Platz 4, 81737 M?nchen, Germany; (5) Brandenburgisch Technische Universitat, Institute of Physics , Germany, 03046 Cottbus.
- 16:45 **Growth studies of strain relaxed and high Sn content GeSn layers for optoelectronic applications** 15-3
N. von den Driesch (1), S. Wirths (1), D. Stange (1), A.T. Tiedemann (1), G. Mussler (1), T. Stoica (1), S. Lenk (1), U. Breuer (2), D. Gruetzmacher (1), S. Mantl (1), D. Buca (1).
(1) Peter Gruenberg Institute (PGI 9) and JARA-Fundamentals of Future Information Technologies, Forschungszentrum Juelich, 52425, Germany; (2) Central Division of Analytical Chemistry (ZCH), Forschungszentrum Juelich, 52425, Germany.
- 17:00 **Local uniaxial tensile deformation of germanium up to the 4% threshold by epitaxial nanostructures.** 15-4
L. Gagliano (1), L. Rossetto (1), D. Scopece (1), V. Mondiali (2), M. Lodari (2), A. Giorgioni (1), F. Pezzoli (1), M. Bollani (3), D. Chrastina (2), F. Montalenti (1), E. Bonera (1).
(1) Dipartimento di Scienza dei Materiali and L-NESS, Universit? di Milano-Bicocca, via Cozzi 53, I-20125 Milan, Italy; (2) L-NESS and Politecnico di Milano, Polo regionale di Como, via Anzani 42, I-22100 Como, Italy; (3) IFN-CNR, LNESS laboratory, via Anzani 42, I-22100 Como, Italy.

17:15 **Comparative STM, LEED, TEM-EDX and XPS study of Co and Ni germanide growth on Ge(001)**

15-5

T. Grzela (1), W. Koczorowski (2, 3), K. Seweryniak (3), G. Capellini (1, 4), R. Czajka (3), N. Curson (2), T. Schroeder (1, 5).

(1) IHP, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany; (2) London Centre for Nanotechnology, University College London, 17-19 Gordon Street, London, UK; (3) Institute of Physics, Poznan University of Technology, Nieszawska 13A, 60-965 Poznan, Poland; (4) Dipartimento di Scienze, Università degli Studi Roma Tre, Viale G. Marconi 446, 00146 Roma, Italy; (5) Brandenburgische Technische Universität, Konrad-Zuse Str. 1, 03046 Cottbus, Germany.