



SYMPOSIUM F

Epitaxial Nanometer Structures

May 30 – June 2, 2000

Symposium Organizers:

E. Kasper, University of Stuttgart, Germany

H. Hasegawa, Hokkaido University, Sapporo, Japan

K.L. Wang, University of California, Los Angeles, USA

Papers will be published in Thin Solid Films

E-MRS 2000 SPRING MEETING

Symposium F

Tuesday May 30, 2000

Mardi 30 mai 2000

Morning

Matin

Session I - Surfaces and Initial Growth

Chairpersons : E. Kasper and Ph. E. Thomson

- F-I.1** 9:00 **Invited** NUCLEATION AND GROWTH OF SELF-ASSEMBLED Ge/Si(001) QUANTUM DOTS IN SINGLE AND STACKED LAYERS, **Vinh Le Thanh**, V. Yam, P. Boucaud, Y. Zheng, D. Débarre, D. Bouchier and J.-M. Lourtioz, Institut d'Électronique Fondamentale, UMR-CNRS 8622, Bât. 220, Université Paris-Sud, 91405 Orsay Cedex, France
- F-I.2** 9:40 NANOMETRIC PATTERNING WITH ULTRA-THIN TWIST BONDED SILICON WAFERS, **F. Fournel**^(1,2), H. Moriceau⁽¹⁾, N. Magnea⁽²⁾, J. Eymery⁽²⁾, A. Barski⁽²⁾, J.L. Rouvière⁽²⁾, K. Rousseau⁽²⁾, B. Aspar⁽¹⁾, CEA Grenoble, ⁽¹⁾LETI/Département de Microtechnologies, ⁽²⁾Département de Recherche Fondamentale sur la Matière Condensée, 17 rue des Martyrs, 38054 Grenoble Cedex 9, France
- F-I.3** 10:00 GROWTH INDUCED ATOMIC STEP ORDERING ON VICINAL SURFACES OF PATTERNED AND NON-PATTERNED Si(111), **Hiroo Omi** and Toshio Ogino, NTT Basic Research Laboratories, Atsugi, Kanagawa, Japan
- 10:20 **BREAK**
- F-I.4** 10:50 KINETIC VERSUS STRAIN-INDUCED GROWTH INSTABILITIES ON VICINAL Si(001), **C. Schelling**, G. Springholz, F. Schaeffler, Institut fuer Halbleiterphysik, Universitaet Linz, 4040 Linz, Austria; M. Sulzberger, B. Voigtlaender, Institut fuer Grenzflaechenforschung, Forschungszentrum Juelich, 52425 Juelich, Germany
- F-I.5** 11:10 DENSE ARRAY OF {105} FACETED SiGe ISLANDS INDUCED BY A CROSS-HATCH PATTERN, **C. Teichert**, C. Hofer, Department of Physics, Montanuniversitaet Leoben, Franz Josef Str. 18, 8700 Leoben, Austria, K. Lyutovich, M. Bauer, E. Kasper, Institut für Halbleitertechnik, Universitaet Stuttgart, Pfaffenwaldring 47, 70569 Stuttgart, Germany
- F-I.6** 11:30 BORON SURFACE PHASE ON SI(111): ATOMIC STRUCTURE AND SI OVERGROWTH STUDIED BY SCANNING TUNNELING MICROSCOPY AND WORK FUNCTION MEASUREMENT, **T. Stimpel**, H.E. Hoster, J.Schulze, I. Eisele, H. Baumgärtner, Institut für Physik, Universität der Bundeswehr München, Werner-Heisenberg-Weg 39, 85577 Neubiberg, Germany
- F-I.7** 11:50 Ge GROWTH MODE MODIFICATION ON CARBON-INDUCED Si(001)-c(4x4) SURFACES, **M. Stoffel**, L. Simon, J.L. Bischoff, D. Aubel, L. Kubler, LPSE, CNRS 7014, Faculté des Sciences, 68093 Mulhouse Cedex, France and G.Castelein, ICSI, CNRS 9069, BP 2288, 68057 Mulhouse Cedex, France
- 12:10 **LUNCH**

Tuesday May 30, 2000

Mardi 30 mai 2000

Afternoon

Après-midi

Session II - Strained Layer Structures

Chairpersons : K.L. Wang and A.I. Nikiforov

- F-II.1** 14:10 **Invited** SiGe BASED FETs: BUFFER ISSUES AND DEVICE RESULTS, **H.-J. Herzog**, T. Hackbarth, G. Höck, M. Zeuner and D. Behammer, Daimler Chrysler AG, Research Center Ulm, P.O. Box 2360, 89013 Ulm, Germany
- F-II.2** 14:50 STRANSKI-KRASTANOV GROWTH OF Si ON SiC(0001), A. Fisse⁽¹⁾, U. Kaiser⁽¹⁾, R. Akhtariev⁽¹⁾, J. Kräußlich⁽²⁾ and W. Richter⁽¹⁾, ⁽¹⁾Friedrich-Schiller-Universität Jena, Institut für Festkörperphysik, ⁽²⁾Institut für Optik und Quantenelektronik, Max-Wien-Platz 1, 07743 Jena, Germany
- F-II.3** 15:10 MORPHOLOGY CONTROL OF SIGE LAYERS ON Si: INFLUENCE OF STRAIN, A. Ronda, A. Portavoce, M. Abdallah, J.M. Gay and I. Berbezier, CRMC2-CNRS, Campus de Luminy, case 913, 13288 Marseille, France
- 15:30 **BREAK**
- F-II.4** 16:00 CHARACTERIZATION OF STRUCTURAL AND OPTICAL PROPERTIES OF Si/SiGe WIRES GROWN ON PATTERNED Si SUBSTRATES, Y. Zhuang, C. Schelling, A. Daniel, F. Schäffler, G. Bauer, Institut für Halbleiterphysik, Universität Linz, 4040 Linz, Austria, J. Grenzer Universität Potsdam, 14115 Potsdam, Germany, S. Senz, Max Planck Institut für Mikrostrukturphysik, 06120 Halle, Germany
- F-II.5** 16:20 GROWTH STUDY OF SURFACTANT-MEDIATED RELAXED SiGe GRADED LAYERS FOR GE PHOTODETECTOR APPLICATIONS, J.L. Liu, Y.S. Tang, D. Teng, G. Jin, Y.H. Luo and K.L. Wang, Device Research Laboratory, Department of Electrical Engineering, University of California at Los Angeles, Los Angeles CA 90095-1594, USA
- F-II.6** 16:40 DOPING AND ELECTRICAL CHARACTERISTICS OF IN SITU HEAVILY B-DOPED Si_{1-x-y}Ge_xC_y FILMS EPITAXIALLY GROWN USING ULTRACLEAN LPCVD, Takaaki Noda, Doohwan Lee, Hyunyoung Shim, Masao Sakuraba, Takashi Matsuura and Junichi Murota, Laboratory for Electronic Intelligent Systems, Research Institute of Electrical Communication, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai 980-8577, Japan

Session III - Simulation and Observation of Growth Phenomena

17:00-18:30 **Poster Session I**

- F-III/P1** INFLUENCE OF SCHWOEBEL BARRIERS AND SURFACE DIFFUSION ANISOTROPY ON SURFACE RELIEF EVOLUTION DURING EPITAXIAL GROWTH (SIMULATION), D.V. Brunev, I.G. Neizvestny, N.L. Shwartz, Z.Sh. Yanovitskaja, A.V. Zverev, Institute of Semiconductor Physics RAS SB, Lavrenteva 13, Novosibirsk 630090, Russia
- F-III/P2** MONTE CARLO SIMULATION OF STEPS BEHAVIOUR ON Si(111) SURFACE DURING SUBLIMATION, G. Neizvestny, N.L. Shwartz, Z.Sh. Yanovitskaja, A.V. Zverev, Institute of Semiconductor Physics RAS SB, Lavrenteva 13, Novosibirsk 630090, Russia
- F-III/P3** COMPUTER SIMULATIONS OF SELF-ORGANIZED FORMATION OF EPITAXIALLY STRAINED ISLANDS IN QUANTUM DOT SUPERLATTICES, Yong-Wei Zhang, Institute of Materials Research and Engineering, 3 Research Link, Singapore 117602
- F-III/P4** EXCLUSION ZONE MODEL OF ISLANDS SPATIAL DISTRIBUTION IN MOLECULAR-BEAM EPITAXY, V. I. Trofimov, Institute of Radioengineering & Electronics of RAS, Dept. of nanoelectronics, Mokhovaya Street, 103907 Moscow, Russia

- F-III/P5** GROWTH MODE TRANSITIONS AND SCALING BEHAVIOUR AT SUCCESSIVE STAGES OF MOLECULAR-BEAM EPITAXY, V. I. Trofimov, V. G. Mokerov, Institute of Radioengineering & Electronics of RAS, 11 Mokhovaya Street, 103907 Moscow, Russia
- F-III/P6** EPITAXIAL CRYSTAL GROWTH OF COPPER SURFACES, M. Doyama, T. Ohmae and Y. Kogure, Teikyo University of Science & Technology, Uenohara, Yamanashi 409-0193, Japan
- F-III/P7** ATOMISTIC SIMULATIONS OF BORON IN $\sqrt{3}\langle 111 \rangle$ GRAIN BOUNDARY IN TUNGSTEN, D. Fuks and K. Mundim, Institute of Physics, Federal University of Bahia, Salvador, Brasil, S. Dorfman, Faculty of Physics, Israel Institute of Technology - Technion, 32000 Haifa, Israel, V. Liubich, Department of Materials Engineering, Ben-Gurion University of the Negev, POB 653, Beer-Sheva, Israel
- F-III/P8** KINETICS OF INDIUM SEGREGATION IN InGaAs TERNARY COMPOUNDS, S. Karpov, V. Mymrin, Soft-Impact Ltd., St.Petersburg, Russia; Yu. Makarov, Univ Erlangen-Nurnberg, Fluid Mechanics Dept, Erlangen, Germany
- F-III/P9** CARBON SEGREGATION IN SILICON, M. Oehme, M. Bauer, C. Parry, G. Eifler and E. Kasper, Institut f. Halbleitertechnik, University of Stuttgart, Pfaffenwaldring 47, 70569 Stuttgart, Germany
- F-III/P10** STRUCTURAL AND OPTICAL PROPERTIES OF Ge ISLANDS GROWN IN AN INDUSTRIAL CVD REACTOR, R. Loo⁽¹⁾, M. Goryll⁽²⁾, D. Dentel⁽²⁾, K. Grimm⁽²⁾, L. Vescan⁽²⁾, P. Meunier-Beillard⁽¹⁾, D. Vanhaeren⁽¹⁾, P. Roussel⁽¹⁾, H. Bender⁽¹⁾ and M. Caymax⁽¹⁾, ⁽¹⁾IMEC, Kapeldreef 75, 3001 Leuven, Belgium, ⁽²⁾Institute of Thin Films and Ion Technology, Research Centre Jülich, 52425 Jülich, Germany
- F-III/P11** EFFECT OF Si DIFFUSION ON GROWTH OF GeSi SELF-ASSEMBLED ISLANDS, N.V. Vostokov, Yu.N. Drozdov, Z.F. Krasil'nik, D.N. Lobanov, L.D. Moldavskaya, A.V. Novikov, V.V. Postnikov, M.V. Stepikhova, Institute for Physics of Microstructures RAS, GSP-105, 603600 Nizhny Novgorod, Russia
- F-III/P12** KINETICS OF THE STRANSKI-KRASTANOW GROWTH MODE TRANSITION IN THE Ge/Si (001) SYSTEM, V. Yam, V. Le Thanh, Y. Zheng, P. Boucaud, D. Débarreand D. Bouchier, Institut d'Électronique Fondamentale, UMR-CNRS 8622, Bât. 220, Université Paris-Sud, 91405 Orsay Cedex, France
- F-III/P13** INTERLEVEL OPTICAL TRANSITIONS AND MANY-BODY EFFECTS IN ARRAYS OF Ge/Si SELF-ASSEMBLED QUANTUM DOTS, A.I. Yakimov, A.V. Dvurechenskii, A.I. Nikiforov, Institute of Semiconductor, Physics, 630090 Novosibirsk, Russia
- F-III/P14** Si/Ge-NANOCRYSTALS ON SILICON CARBIDE, G. Heß, A. Bauer, J. Kraußlich, A. Fissel, B. Schroeter, R. Sauerbrey, K. Goetz, Friedrich-Schiller-Universität Jena, Department of Physics, Max-Wien-Platz 1, 07743 Jena, Germany
- F-III/P15** MBE-GROWTH OF HETEROPOLYTYPIC LOW-DIENSIONAL STRUCTURES OF SiC, A. Fissel⁽¹⁾, U. Kaiser⁽¹⁾, B. Schröter⁽¹⁾, J. Kräußlich⁽²⁾ and W. Richter⁽¹⁾, ⁽¹⁾Friedrich-Schiller-Universität Jena, Institut für Festkörperphysik, ⁽²⁾Institut für Optik und Quantenelektronik, Max-Wien-Platz 1, 07743 Jena, Germany
- F-III/P16** INVESTIGATION OF THE NUCLEATION AND GROWTH OF SiC NANOSTRUCTURES ON Si, F. Scharmann, T. Stauden, Technical University Ilmenau, Institute of Solid State Electronics, 98684 Ilmenau, Germany, W. Attenberger, J.K.N. Lindner, B. Stritzker, University of Augsburg, Institute of Physics, 86135 Augsburg, Germany, J. Pezoldt, Technical University Ilmenau, Institute of Solid State Electronics, 98684 Ilmenau, Germany
- F-III/P17** OPTICAL PROPERTIES OF SELF-ASSEMBLED InAs QUANTUM DOTS GROWN ON GaAs(211)A SUBSTRATES, Akira Sugimura, Kazuhiro Ohnishi, Ikuro Umezu, Department of Applied Physics, Konan University, Kobe 658-8501, Japan and Pablo O. Vaccaro, ATR Adaptive Communications Research Laboratories, Kyoto 619-02, Japan
- F-III/P18** InAs/GaAs MULTIPLE QUANTUM DOT STRUCTURES GROWN BY LP-MOVPE, J. Pangrac, J. Oswald, E. Hulicius, V. Vorlicek, K. Melichar and T. Aimecek, Institute of Physics, Academy of Sciences, Cukrovarnicka 10, 162 53 Prague, Czech Republic

- F-III/P19** CRYSTALLOGRAPHIC DEPENDENCE OF OMVPE InGaAs/InP LATERAL GROWTH ON PATTERNED (100) InP SUBSTRATES PREPARED BY WET ETCHING, P. Elias, S. Hasenoehrl, V. Cambel and J. Novak, Institute of Electrical Engineering, Slovak Academy of Sciences, Dubravská cesta 9, 84239 Bratislava, Slovak Republic and P. Hudek and I. Kostì, Institute of Informatics, 84237 Bratislava, Slovak Republic
- F-III/P20** OBTAINING OF LOW-DIMENSIONAL STRUCTURES ON THE BASIS OF A³BE⁵ COMPOUNDS BY THE METHOD OF PULSE COOLING OF SATURATED SOLUTION-MELT, Ye. Golitsin, A. Kalashnikov, T. Kulutkina, I. Maronchuk, Department of Physical Electronics, Kherson State Technical University, 73008 Berislavskoye Shosse 24, Kherson, Ukraine
- F-III/P21** INTERFACE STRUCTURE IN THE GROWTH OF SEMI-CONDUCTOR CRYSTALS USING BRIDGMAN-STOCKBAR-GER METHOD, A.M. Balint, M. Mihailovici, D.G. Baltean, St. Balint, University of the West Timisoara, Blv. Parvan no.4, 1900 Timisoara, Romania
- F-III/P22** QUASI-NANOMETER STRUCTURES BASED ON EPITAXIAL CdTe THIN FILMS, G. Khlyap, State Pedagogical University, 24 Franko str., Drogobych, Ukraine and V. Belosertseva, State Politechnical University, 21 Frunze str., Kharkov 61002, Ukraine
- F-III/P23** STEP DECORATION RELATED TO ENHANCED DIFFUSION OF Co ON Ag(100), B. Degroote, H. Pattyn, S. Degroote, A. Vantomme, G. Langouche, K.U. Leuven, Instituut voor Kern- en Stralingsfysica, Celestijnenlaan 200 D, 3001 Leuven, Belgium
- F-III/P24** EFFECT OF THE CO-DEPOSITION OF Sb AND Si ON SURFACE MORPHOLOGY, G.G. Jernigan and Ph. E. Thompson, Naval Research Laboratory, Washington, USA
- F-III/P25** QUANTUM SIZE EFFECTS IN THE LOW-TEMPERATURE GROWTH OF Pb ISLANDS ON Si(111)7x7 SURFACES, S.H. Chang, W.B. Su, C.S. Chang, C.M. Wei, L.J. Chen and T.T. Tsong, National Tsing Hua University, Hsinchu, Republic of China
- F-III/P26** DEPENDENCE OF THE FREE SURFACE DEFORMATION OF AN EPITAXIAL LAYER ON THE DISSOCIATION OF SUBSURFACE MISFIT DISLOCATIONS, S. Ben Youssef⁽¹⁾, M. Fnaiech⁽¹⁾ and R. Bonnet⁽²⁾, ⁽¹⁾Laboratoire d'Analyse Structurale des Matériaux, Faculté des Sciences de Monastir, 5000 Monastir, Tunisie; ⁽²⁾INPG/UJF, Laboratoire de Thermodynamique et Physico-Chimie Métallurgiques (UMR 5614)/ENSEEG, Domaine Universitaire, BP 75, 38402 Saint Martin-d'Hères, France
- F-III/P27** INFLUENCE OF STRAIN ON THE SURFACE MORPHOLOGY AND DEFECT CONCENTRATION IN 2-DIMENSIONAL GaAs/InGaAs/GaAs STRUCTURE, A.I. Klimovskaya, E.G. Gule, Ju.A. Driga, V.G. Litovchenko, Kyiv, Ukraine
- F-III/P28** EFFECT OF STRESS ON INTERFACE TRANSFORMATION IN THIN EPITAXIAL SEMICONDUCTING LAYERS, J. Bak-Misiuk, J. Domagala, J. Sadowski, Institute of Physics PAS, lotnikow 46, 02-668 Warsaw, Poland, A. Misiuk, H.B. Surma, IET, 02-668 Warsaw, Poland, I.V. Antonova, ISP RAS, 630090 Novosibirsk, Russia
- F-III/P29** TAILORING THE LATTICE CONSTANT OF SILICON BY CARBON INCORPORATION, P. Laveant, P. Werner, G. Gerth, S. Senz, A. Ploessl, U. Goesele, MPI of Microstructure Physics, Weinberg 2, 06120 Halle/Saale, Germany
- F-III/P30** THE THERMO-IMPLANTATION AS A DISLOCATION FREE WAY OF A STRAIN FALL IN EPITAXIAL Ge_{0.2}Si_{0.8}/Si STRUCTURE, V.K. Egorov, A.F. Vyatkin, IPMT RAS, Chernogolovka, Moscow Dist. 142432, Russia, E.V. Egorov, Metal Phys. Dep., Moscow Engineering Phy. Inst., Moscow 115409, Russia
- F-III/P31** SELECTIVE AND NON-SELECTIVE GROWTH BY GSMBE/ULPCVD FOR HETEROJUNCTION TRANSISTOR BIPOLAR, G. Breton⁽¹⁾, N. Woods⁽¹⁾, J.J. Harris⁽²⁾, H. Graoui⁽³⁾ and J. Zhang⁽¹⁾, ⁽¹⁾Dept. of Physics, Centre for Electronics Materials and Devices, The Blackett Laboratory, Imperial College of Science Technology and Medicine, Prince Consort Road, London SW7 2BW, UK, ⁽²⁾Dept. of Electronic and Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, ⁽³⁾University of Surrey, School of Electronic Engineering Information Technology and Mathematics, Guildford, Surrey GU2 5XH, UK

- F-III/P32** SELF-ASSEMBLED GROWTH AND MAGNETOTRANSPORT PROPERTIES OF LATERALLY MODULATED Si/SiGe/Si MULTILAYERS ON VICINAL Si(113) SUBSTRATES, R. Neumann, Jianhong Zhu, K. Brunner and G. Abstreiter, Walter Schottky Institut, Am Coulombwall, 85748 Garching, Germany
- F-III/P33** Ge/Si HETERO-NANOCRYSTALS ON SiO₂, J. Wu, Y. Shi, S.L. Gu, W. Bu, H.M. Bu, X.L. Yuan, L.Q. Hu, M. Wang, N.B. Ming and Y.D. Zheng, Department of Physics & National Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, P.R.China
- F-III/P34** COMPARISON OF EPITAXIAL GROWTH OF CoSi₂ AMONG Co/Ti, Co/Hf and Co/Nb BILAYERS ON (100)Si, Youngjae Kwon, Chongmu Lee, Department of Metallurgical Engineering, Inha University, 253 Younghyeon dong Nam-ku, Incheon 402-751, South Korea
- F-III/P35** ELECTRODEPOSITED Co/Ru MULTILAYERS, A. Cziraki, Dept. of Solid State Phys., Eötvös University, P.O.B. 32, 1518 Budapest, Hungary, I. Bakonyi and E. Tóth Kádár, Res. Inst. Sol. State Phys. & Opt., HAS, P.O.B. 49, 1525 Budapest, Hungary, B. Arnold and K. Wetzig, IFW-Dresden, Helmholtzstrasse 20, 1069 Dresden, Germany, C. Ulhaq-Bouillet, V. Pierron-Bohnes and A. Dinia, IPCMS, 23 rue du Loess, 67037 Strasbourg, France, P. Santiago and M.-J. Yacamán, ININ, 52045 Salazar, Mexico

Wednesday May 31, 2000
Mercredi 31 mai 2000

Afternoon
Après-Midi

Session IV - Multilayers and Superlattices
Chairpersons : I. Berbezier and K.-P. Lieb

- F-IV.1** 14:10 withdraw
- F-IV.2** 14:50 TEMPERATURE AND EXCITATION POWER DEPENDENCE OF THE PHOTOLUMINESCENCE OF PLANAR AND VERTICALLY SELF-ORGANIZED Si_{0.71}Ge_{0.29}/SI STRAINED SUPERLATTICES, S. Bozzo⁽¹⁾, J.-L. Lazzari⁽¹⁾, B. Hollaender⁽²⁾, S. Mantl⁽²⁾, G. Bremond⁽³⁾, F.A. d'Avitaya⁽¹⁾ and J. Derrien⁽¹⁾; ⁽¹⁾Centre de Recherche sur les Mécanismes de la Croissance Cristalline, CRMC2-CNRS, Campus de Luminy, case 913, 13288 Marseille cedex 9, France; ⁽²⁾Forschungszentrum Juelich GmbH, Institut fuer Schicht und Ionentechnik, ISI-2, 52425 Juelich, Germany; ⁽³⁾Laboratoire de Physique de la Matière, INSA de Lyon, Bât 502, UMR CNRS 5511, 20 Avenue Albert Einstein, 69621 Villeurbanne Cedex, France
- F-IV.3** 15:10 ATOMIC-LAYER DOPING IN Si BY ALTERNATELY SUPPLIED PH₃ AND SiH₄, Yosuke Shimamune, Masao Sakuraba, Takashi Matsuura and Junichi Murota, Laboratory for Electronic Intelligent Systems, Research Institute of Electrical Communication, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai 980-8577, Japan
- 15:30 **BREAK**
- F-IV.4** 16:00 CORRELATION BETWEEN MAGNETIC AND TRANSPORT PROPERTIES OF Co/Ir/Co SANDWICHES AND SURFACE ROUGHNESS, S. Colis, G. Schmerber and A. Dinia, IPCMS-GEMME (UMR 7504 du CNRS), 23 rue du Loess, 67037 Strasbourg, France
- F-IV.5** 16:20 EXCITED STATES OF TWO DIMENSIONAL HOLE GAS AT AlGaAs/GaAs INTERFACE, L. Bryja, M. Ciorga, M. Kubisa, K. Ryczko, J. Misiewicz, Institute of Physics Wroclaw University of Technology, Wyb. Wyspianskiego 27, 50-370 Wroclaw, Poland, O. Stern, M. Bayer, A. Forchel, Technische Physik, Universität Würzburg, Am Humbland, 97974 Würzburg, Germany and O. P. Hansen, Niels Bohr Institute, University of Copenhagen, Universitetsparken 5, 2100 Copenhagen, Denmark

Session V – Tunneling
Chairpersons : C. Teichert and F. Schäffler

- F-V.1** 16:40 **Invited** EPITAXIAL SI-BASED TUNNEL DIODES, **Ph.E. Thompson**, Naval Research Laboratory, K.D. Hobart, Naval Research Laboratory, S. L. Rommel, University of Delaware, P.R. Berger, University of Delaware, R. Lake, Raytheon Systems, A. Seabaugh, University of Notre Dame, P.H. Chi, National Institute of Standards and Technology and D. S. Simons, National Institute of Standards and Technology, USA
- F-V.2** 17:20 PHYSICS AND APPLICATIONS OF Si/SiGe/Si RESONANT INTERBAND TUNNELING DIODES, R. Duschl and K. Eberl, Max-Planck-Institut für Festkörperforschung, Heisenbergstr. 1, 70569 Stuttgart, Germany
- F-V.3** 17:40 VERTICAL MOS-GATED PIN-DIODES IN SILICON (100) AND (111), J. Schulze, C. Fink, I. Eisele, Universität der Bundeswehr München, Institut für Physik, 85577 Neubiberg and W. Hansch, Technische Universität München, Lehrstuhl Technische Elektronik, 80290 München, Germany

Thursday June 1, 2000

Jeudi 1^{er} juin 2000

Morning

Matin

Session VI - Selfassembling and Quantum Dots

Chairpersons : H.-J. Herzog and J. Yu

- F-VI.1** 9:00 Invited IN SITU RHEED CONTROL OF SELF-ORGANIZED Ge QUANTUM DOTS, **A.I. Nikiforov**, V.A. Cherepanov, O.P. Pchelyakov, A.V. Dvurechenskii and A.I. Yakimov, Institute of Semiconductor Physics, Russian Academy of Sciences, Siberian Branch, Lavrentjeva 13, 630090 Novosibirsk, Russia
- F-VI.2** 9:40 SHADOW-MASKS FOR LOCAL NANO-EPITAXY, **C. Schelling**, H. Seyringer, G. Lengauer, Y. Zhuang, G. Bauer, F. Schaeffler, Institut fuer Halbleiterphysik, Universitaet Linz, 4040 Linz, Austria, S. Senz, Max-Planck-Institut fuer Mikrostrukturphysik, 06120 Halle, Germany
- F-VI.3** 10:00 SB SEGREGATION AND SURFACTANT BEHAVIOUR IN THE GROWTH OF SELF-ORGANISED Ge DOTS, **A. Portavoce**^(1,2), A. Ronda⁽¹⁾, I. Berbezier⁽¹⁾; ⁽¹⁾CRMC2-CNRS case 913 Campus Luminy 13288 Marseille, France; ⁽²⁾L2MP-CNRS Faculté des Sciences de St Jérôme, case 511 13397 Marseille, France
- 10:20 **BREAK**
- F-VI.4** 10:50 COOPERATIVE ARRANGEMENT OF SELF-ASSEMBLED Ge DOTS ON PRE-GROWN Si MESAS, **G. Jin**, J.L. Liu, Y.H. Luo and K.L. Wang, Device Research Laboratory, Electrical Engineering Department, University of California at Los Angeles, Los Angeles CA 90095-1594, USA
- F-VI.5** 11:10 Ge-Si INTERMIXING IN Ge QUANTUM DOTS ON Si, **F. Boscherini**⁽¹⁾, G. Capellini⁽²⁾, L. Di Gaspare⁽²⁾, F. Rosei⁽³⁾, N. Motta⁽³⁾ and S. Mobilio⁽⁴⁾, ⁽¹⁾ INFM and Dipartimento di Fisica, Università di Bologna, Italy; ⁽²⁾INFM and Dipartimento di Fisica, Università di Roma Tre, Italy; ⁽³⁾INFM and Dipartimento di Fisica, Università di Roma Tor Vergata, Italy; ⁽⁴⁾Dipartimento di Fisica, Università di Roma Tre and INFN, Frascati, Roma, Italy
- F-VI.6** 11:30 NUCLEATION OF Ge DOTS ON THE C-ALLOYED Si(001) SURFACE, **O. Leifeld**, A. Beyer, D. Grützmacher, Laboratory for Micro- and Nanotechnology, Paul Scherrer Institute, 5232 Villigen-PSI, Switzerland and K. Kern, Institut de Physique Expérimentale, EPFL, 1015 Lausanne, Switzerland
- F-VI.7** 11:50 INTRA-VALENCE BAND PHOTOCURRENT MEASUREMENTS ON Ge QUANTUM DOTS IN Si, **C. Miesner**, O. Roethig, K. Brunner and G. Abstreiter, Walter Schottky Institut, Technische Universitaet Muenchen, Am Coulombwall, 85748 Garching, Germany
- 12:10 **LUNCH**

Thursday June 1, 2000

Jeudi 1^{er} juin 2000

Afternoon

Après-midi

Session VII - Selfassembling and Quantum Dots

Chairpersons :K. Brunner and W. Jaegermann

- F-VII.1** 14:10 **Invited** SELF-ASSEMBLING InAs AND InP QUANTUM DOTS FOR OPTOELECTRONIC DEVICES, **K. Eberl**, M. Lipinski, Y. Manz and O.G. Schmidt, Max-Planck-Institut für Festkörperforschung, Heisenbergstr. 1, 70569 Stuttgart, Germany
- F-VII.2** 14:50 ORIGIN OF NONUNIFORMITY IN MBE GROWN NANOMETER-SIZED InGaAs RIDGE QUANTUM WIRES AND ITS REMOVAL BY ATOMIC HYDROGEN-ASSISTED CLEANING, **T. Muranaka**, C. Jiang, A. Ito, H. Fujikura and H. Hasegawa, Research Center for Interface Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University, Japan
- F-VII.3** 15:10 OPTICALLY INDUCED CHARGE STORAGE IN SELF ASSEMBLED InAs QUANTUM DOTS, **D. Heinrich**, J. Hoffmann, J. J. Finley, A. Zrenner, G. Boehm and G. Abstreiter, Walter Schottky Institut, Technical University Munich, Am Coulombwall, 85748 Garching, Germany
- 15:30 **BREAK**
- F-VII.4** 16:00 MBE GROWN InGaN QUANTUM DOTS : LED RESULTS AND GAIN MEASUREMENTS, **S. Dalmasso**⁽¹⁾, B. Damilano⁽¹⁾, N. Grandjean⁽¹⁾, J. Massies⁽¹⁾, M. Leroux⁽¹⁾, J-L Reverchon⁽²⁾ and J-Y Duboz⁽²⁾, ⁽¹⁾Centre de Recherche sur l'Hétéro-Epitaxie et ses Applications, Centre National de la Recherche Scientifique, Rue Bernard Grégory, Sophia Antipolis, 06560 Valbonne, France; ⁽²⁾LCR Thomson, Domaine de Corbeville, 91404 Orsay Cedex, France
- F-VII.5** 16:20 PIEZOELECTRIC EFFECTS IN InAs/GaAs(N11) SELF-ASSEMBLED QUANTUM DOTS, **S. Sanguinetti**, M. Gurioli, E. Grilli and M. Guzzi INFN and Dipartimento di Scienza dei Materiali, Università di Milano Bicocca, M. Henini, School of Physics and Astronomy, University of Nottingham, UK
- F-VII.6** 16:40 SELF-ASSEMBLY NANOMETER PATTERNING OF ULTRA-THIN EPITAXIAL COBALT DISILICIDE LAYERS BY LOCAL APPLICATION OF STRESS, **P. Kluth**, Q.-T. Zhao, J. Xu, L. Kappius, St. Lenk, S. Mantl, Institut für Schicht- und Ionentechnik, Forschungszentrum Jülich, 52425 Jülich, Germany, C. Detavernier, Vakgroep Vaste Stof Wetenschappen, Laboratorium voor Kristallografie en Studie van de Vaste Stof, Universiteit Gent, Krijgslaan 281/S1, 9000 Gent, Belgium

SESSION VIII – Electrical, Optical and Structural Properties

17:00-18:30 **Poster Session II**

- F-VIII/P1** SiGe/Si HETERO-FIELD-EFFECT-TRANSISTORS WITH PN-JUNCTION GATE, U. Seiler, T. Hackbarth, DaimlerChrysler AG, Wilhelm-Runge-Str.11, 89081 Ulm, Germany
- F-VIII/P2** VERTICAL DEVICES WITH SUB 100nm CHANNEL LENGTH WITH LOCAL CHANNEL DOPING FOR POWERMOS APPLICATION, C. Fink, K.G. Anil, J. Schulze, I. Eisele, Institute of Physics, Universitaet der Bundeswehr Muenchen, 85577 Neubiberg, Germany, W. Hansch, Semiconductor Manufacturing Technology, TU Muenchen, 80290 Muenchen Germany
- F-VIII/P3** GIANT MAGNETORESISTANCE IN ARTIFICIAL ANTIFERROMAGNETIC Co/Ru/Co/ZnSe (or ZnS) /Co/Fe THIN FILMS, M. Guth, G. Schmerber and A. Dinia, IPCMS-GEMME (UMR 7504 du CNRS), 23 rue du Loess, 67037 Strasbourg, France
- F-VIII/P4** MICROWAVE COLOSSAL MAGNETO-RESISTANCE OF La-Ca-MnO FILMS, Alka V. Kuanr⁽¹⁾ and Bijoy K. Kuanr⁽²⁾, ⁽¹⁾College of Applied Science, Jhilmil Colony, (University of Delhi), Delhi-110 095, India; ⁽²⁾Institut Elektronische Eigenschaften im IFF, Forschungszentrum Juelich GmbH, 52425 Juelich, Germany
- F-VIII/P5** MICROWAVE GIANT-MAGNETO-RESISTANCE AND INTER-LAYER EXCHANGE COUPLING IN Ni/Cu MULTILAYER SAMPLES ON Si(111), Alka V. Kuanr⁽¹⁾ and Bijoy K. Kuanr⁽²⁾, ⁽¹⁾College of Applied Science, Jhilmil Colony, (University of Delhi), Delhi-110 095, India, ⁽²⁾Institut Elektronische Eigenschaften im IFF, Forschungszentrum Juelich GmbH, Juelich 52425, Germany
- F-VIII/P6** MAGNETIC-FIELD TUNING OF THE ALLOY-INDUCED DISORDER IN QUATERNARY SEMIMAGNETIC (Zn,Cd,Mn)Se QUANTUM WELLS AND QUANTUM DISC STRUCTURES, H. Falk, P.J. Klar and W. Heimbrodt, Department of Physics and Materials Science Centre, Philipps University, 35032 Marburg, Germany, Torsten Henning, Swedish Nanometer Laboratory, S-41296 Goeteborg, Sweden
- F-VIII/P7** OBSERVATION OF CURRENT-VOLTAGE CHARACTERISTICS IN Si_{1-x}Ge_x/Si RESONANT TUNNELING STRUCTURES WITH MULTIPLE BARRIER, P. Han⁽²⁾, M. Sakuraba⁽¹⁾, Y.C. Jeong⁽¹⁾, T. Matsuura⁽¹⁾, J. Murota⁽¹⁾ and Y.D. Zheng⁽²⁾, ⁽¹⁾Research Institute of Electrical Communication, Tohoku University, Sendai 980-8577, Japan; ⁽²⁾Department of Physics, Nanjing University, Nanjing 210093, P.R.China
- F-VIII/P8** HOLE TRANSPORT DUE TO SHALLOW ACCEPTORS ALONG BORON DOPED SiGe QUANTUM WELLS, I.V. Altukhov, M.S. Kagan, V.P. Sinis, Institute of Radioengineering and Electronics of RAS, 11, Mokhovaya, 103907 Moscow, Russia, S.G. Thomas, K.L. Wang, University of California, 66-147KK Engineering IV, Los Angeles CA 90095, USA and A. Blom, M.O. Odnoblyudov, Dept. Theoretical Physics, Lund University, Helgonavagen 5, 22362 Lund, Sweden
- F-VIII/P9** ELECTRONIC PROPERTIES OF VAN DER WAALS-EPITAXY QUANTUM FILMS, A. Klein, W. Jaegermann, Darmstadt University of Technology, Dept. of Materials Science, 64287 Darmstadt, Germany, S. Tiefenbacher, O. Lang, E. Schaar-Gabriel, V. Eyert, C. Pettenkofer, Hahn-Meitner-Institut, Dept. of Physical Chemistry, 14109 Berlin, Germany
- F-VIII/P10** CARRIER CAPTURE AND QUENCHING IN VERTICALLY ALIGNED QUANTUM DOTS, M. Padovani, S. Sanguinetti, M. Gurioli, E. Grilli and M. Guzzi, INFN and Dipartimento di Scienza dei Materiali, Università di Milano Bicocca, Italy, A. Vinattieri and M. Colocci, INFN and LENS, Università di Firenze, Italy, P. Frigeri, S. Franchi, L. Lazzarini and G. Salviati, CNR-MASPEC, Parma, Italy
- F-VIII/P11** ADMITTANCE AND CAPACITANCE-VOLTAGE SPECTROSCOPY OF Ge DOTS IN Si, C. Miesner, T. Asperger, K. Brunner and G. Abstreiter, Walter Schottky Institut, Technische Universitaet Muenchen, Am Coulombwall, 85748 Garching, Germany
- F-VIII/P12** CAPACITANCE-CONDUCTANCE INVESTIGATION ON THE PHASE TRANSITIONS IN Ga NANOPARTICLES, P. Tognini, G.B. Parravicini, L. Fornari, A. Stella, Università di Pavia, Italy; R. Kofman, P. Cheyssac, Université de Nice-Sophia Antipolis, France

- F-VIII/P13** ENERGY STATES AND THE TYPE OF THE GaAs/AlAs SHORT-PERIOD SUPERLATTICES, M. Sznajder, Pedagogical University, Rejtana 16a, 35-310 Rzeszow, Poland and A.I. Bercha, P. Bogdan, K. Glukhov, Uzhgorod State University, Voloshina Str. 54, Ukraine
- F-VIII/P14** InAs/GaAs LASERS WITH VERY THIN ACTIVE LAYER, J. Oswald, E. Hulicius, J. Pangrac, K. Melichar, Taimecek, O. Petricek, M. Vancura and J. Hradil, Institute of Physics, Academy of Sciences, Cukrovarnicka 10, 162 53 Prague, Czech Republic
- F-VIII/P15** REGULATED AND ENTANGLED PHOTONS FROM SEMICONDUCTOR NANOSTRUTURES, O. Benson*, C. Santori, M. Peltonand, Yoshihisa Yamamoto, ICORP Quantum Entanglement Project, E. L. Ginzton Laboratory, Stanford University, Stanford, CA 94305; *presently Sektion Physik, University of Konstanz, 78457 Konstanz, Germany
- F-VIII/P16** TERAHERTZ EMISSION OF GeSi/Si QUANTUM WELLS, M.S. Kagan, I.V. Altukhov, V.P. Sinis, Institute of Radioengineering and Electronics of RAS, 11, Mokhovaya, 103907 Moscow, Russia, S.G. Thomas, K.L. Wang, University of California, 66-147KK Engineering IV, Los Angeles CA 90095, USA, K.-A. Chao, Department of Theoretical Physics, Lund University, 223 62 Lund, Sweden and I.N.Yassievich, A.F. Ioffe Physico-Technical Institute of RAS, 194021 St. Petersburg, Russia
- F-VIII/P17** PHOTOREFLECTANCE SPECTROSCOPY OF InGaAsN/GaAs QUANTUM WELLS GROWN BY MBE, G. Sek, J. Misiewicz, Institute of Physics, Wrocław University of Technology, Wybrzeze Wyspianskiego 27, 50-370 Wrocław, Poland, M. Fischer, A. Forchel, Institute of Physics, Würzburg University, Am Hubland, 97074 Würzburg, Germany
- F-VIII/P18** PHOTOREFLECTANCE STUDY OF DELTA-DOPED SEMICONDUCTOR LAYERS BY A FAST FOURIER TRANSFORMATION, M. Nowaczyk, G. Sek, J. Misiewicz, Institute of Physics, Wrocław University of Technology, Wybrzeze Wyspianskiego 27, 50-370 Wrocław, Poland, B. Sciana, D. Radziejwicz, M. Tlaczala, Institute of Microsystem Technology, Wrocław University of Technology, Janiszewskiego 11/17, 50-372 Wrocław, Poland
- F-VIII/P19** PHOTOLUMINESCENCE OF CARBON-INDUCED Ge ISLANDS IN SILICON, A. Beyer, O. Leifeld, E. Müller, S. Stutz, H. Sigg, D. Grützmacher, Laboratory for Micro- and Nanotechnology, Paul Scherrer Institute, 5232 Villigen-PSI, Switzerland
- F-VIII/P20** INTERFACE CONTROL OF InGaAs/AlAsSb HETEROSTRUCTURES, T. Mozume and N. Georgiev, Femtosecond Technology Research Association (FESTA), 5-5 Tokodai, Tsukuba 300-2635, Japan
- F-VIII/P21** RAMAN STUDY OF INTERFACE RECONSTRUCTION IN GaAs/AlAs HETEROSTRUCTURES, V.A. Volodin, M.D. Efremov, V.V. Preobrazhenskii, B.R. Semyagin, Institute of Semiconductor Physics SB RAS, pr.Lavrentjeva 13, Novosibirsk 630090, Russia, V.V. Bolotov, V.A. Sachkov, Institute of Sensor Microelectronics SB RAS, pr.Mira 55a, Omsk 644077, Russia, E.A. Galaktionov, Novosibirsk State University, Pirogova 2, 630090 Novosibirsk, Russia
- F-VIII/P22** RAMAN SPECTRA OF TiN/AlN SUPERLATTICES, M. Bernard, A. Deneuve, LEPES-CNRS, BP 166, 38042 Grenoble Cedex 9, France, O. Thomas, P. Gergaud, MATOP-CNRS, Faculté des Sciences et Techniques de St Jérôme, 13397 Marseille Cedex 20, France, P. Sandstrom, J. Birch, Dpt of Physics, Linköping University, 58183 Linköping, Sweden
- F-VIII/P23** X-RAY MICROANALYSIS INVESTIGATION AND ELECTROREFLECTANCE SPECTROSCOPY OF HgCdTe PLD FILMS ON SILICON PATTERNED SUBSTRATES, T. Ya. Gorbach, L. A. Matveeva, P. S. Smertenko, Institute of Semiconductors Physics NASU, prospekt Nauki 45, 252028 Kyiv, Ukraine, M. Kuzma, G. Wisz, Institute of Physics, Higher Pedagogical School, Rejtana 16a, 35-309 Rzeszow, Poland; R. Ciach, Institute of Metallurgy and Material Science, Polish Academy of Sciences, Reymonta 25, 30-059 Cracow, Poland
- F-VIII/P24** LOCAL STRUCTURE PARAMETERS OF ORDERED Ge NANOCLESTERS IN Si- MATRIX BY XAFS SPECTROSCOPY, S.B. Erenburg, N.V. Bausk, Institute of Inorganic Chemistry SB RAS, Novosibirsk, Russia and N.P. Stepina, A.I. Nikiforov, A.I. Yakimov, Institute of Semiconductors Physics SB RAS, Novosibirsk, Russia

- F-VIII/P25** IMAGE OF ISLANDS ON OBJECT SURFACE IN EMISSION ELECTRON MICROSCOPE, S.A. Nepijko, Institute of Physics, Ukrainian Academy of Sciences, pr.Nauki 46, 252022 Kiev, Ukraine, N.N. Sedov, The Moscow Higher Military Command School, Golovachev str., 109380 Moscow, Russia, G. Schönhense, Institute of Physics, University of Mainz, Staudingerwer 7, 55099 Mainz, Germany, M. Escher, Focus GmbH, Am Birkhecker Berg 20, 65510 Hünstetten, Germany, Xinhe Bao, Weixin Huang, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, 116023 Dalian, China
- F-VIII/P26** MBE Si REGROWTH ON CARBON-INDUCED Si(001)-c(4x4) RECONSTRUCTIONS STUDIED BY RHEED, M. Stoffel, L. Simon, J.L. Bischoff, D. Aubeland, L. Kubler, LPSE, CNRS 7014, Faculté des Sciences, 68093 Mulhouse Cedex, France
- F-VIII/P27** QUASI-VAN DE WAALS-EPITAXY OF II-VI COMPOUNDS ON LAYERED CHALCOGENIDE SUBSTRATES, E. Wisotzki, A. Klein, W. Jaegermann, University of Technology, Darmstadt, Germany
- F-VIII/P28** NANOSCALE THICKNESS FILMS OF Cr AND CrSi₂ ON Si(111), N. I. Plusnin and A. P. Milenin, Institute for Automation and Control Processes, FEB RAS, Radio 5, 690041 Vladivostok, Russia
- F-VIII/P29** EFFECT OF SUBSTRATE TEMPERATURE ON THE STRUCTURAL AND MAGNETIC PROPERTIES OF Fe/Ag SUPERLATTICES, F. Chemam, Institut des Sciences Exactes et Technologie, Centre universitaire de Tebessa, 12000 Tebessa, Algérie, A. Bouabellou and R. Halimi, Département et Unité de Recherche de Physique, Université Mentouri, 25000 Constantine, Algérie

Friday June 2, 2000
Vendredi 2 juin 2000

Morning
Matin

Session IX - Thin Film Characterization

Chairpersons : K. Eberl and V. Le Thanh

- F-IX.1** 9:00 **Invited** THIN FILM ANALYSIS VIA ACCELERATOR – BASED NUCLEAR METHODS, **K.-P. Lieb**, II. Physikalisches Institut and SFB 345, Universität Göttingen, Bunsenstr. 7-9, 37073 Göttingen, Germany
- F-IX.2** 9:40 X-RAY SCATTERING AND OPTICAL STUDY OF Si / SiGe SUPERLATTICES GROWN BY GAS SOURCE MOECULAR BEAM EPITAXY, **J.M. Hartmann**, Center for Electronic Materials and Devices, Imperial College of Science, Technology and Medicine, London SW7 2BZ, UK, J. Eymery and V. calvo, Département de Recherche Fondamentale sur la Matière Condensée, CEA-Grenoble, 17 Avenue des Martyrs, 38054 Grenoble Cedex 9, France
- F-IX.3** 10:00 METALLIC QUANTUM WELLS STUDIED BY SECOND-HARMONIC GENERATIONS SPECTROSCOPY, **T.B. Kristensen**, T.G. Pedersen and K. Pedersen, Institute of Physics, Aalborg University, Pontoppidanstraede 103, 9220 Aalborg Ost, Denmark
- 10:20 **BREAK**

Session X - Novel Growth Methods

Chairpersons : V. Le Thanh and K. Eberl

- F-X.1** 10:50 **Invited** PERSPECTIVES OF THE CONCEPT OF VAN DER WAALS EPITAXY: GROWTH OF LATTICE MISMATCHED GASE (0001) FILMS ON Si (111), Si (110) and Si (100), R. Rudolph⁽¹⁾, A. Klein⁽²⁾, C. Pettenkofer⁽¹⁾, **W. Jaegermann**⁽²⁾, ⁽¹⁾Hahn-Meitner-Institut, Interface Science Division, Glienicke Str. 100, 14109 Berlin, Germany, ⁽²⁾Darmstadt University of Technology, Materials Science Division, Petersenstr. 23, 64287 Darmstadt, Germany
- F-X.2** 11:30 A ROLE OF INTERFACE BONDING IN EXPLAINING THE LARGE MISFIT, STILL COMMON, EPITAXY BETA-FeSi₂(101) or (110) // Si(111), M. Gemelli, D. Migas and **L. Miglio**, Istituto Nazionale per la Fisica della Materia and, Dipartimento di Scienza dei Materiali, Università degli studi di Milano-Bicocca, Via Cozzi 53, 20125 Milano, Italy
- F-X.3** 11:50 EPITAXIAL MAGNETIC FE LAYERS GROWN ON SI(001) BY MEANS OF A TEMPLATE METHOD, **P. Bertoni**, D. Berling, P. Wetzel, A. Mehdaoui, B. Loegel, G. Gewinner, LPSE 4, rue des Frères Lumière, 68093 Mulhouse, France, C. Ulhaq-Bouillet, V. Pierron-Bohnes, IPCMS GEMM, 23 rue du Loess, 67037 Strasbourg, France
- 12:10 **LUNCH**

END OF SYMPOSIUM F