

SYMPOSIUM W

Morphological and Compositional Evolution of Thin Films

December 2 – 5, 2002

Chairs

Michael J. Aziz Harvard Univ
Norman C. Bartelt Sandia Natl Laboratories
Isabelle Berbezier CNRS
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* Invited paper

SESSION W1: ATOMISTIC STRUCTURE AND
DYNAMICS OF STEPS AND ISLANDS AND THEIR
INFLUENCE ON LARGE-SCALE ASPECTS OF
FILM EVOLUTION

Chairs: Joanna Mirecki Millunchick and
Alberto Pimpinelli

Monday Morning, December 2, 2002
Constitution A (Sheraton)

8:30 AM *W1.1

NANOPATTERNING OF CRYSTALLINE SURFACES: FROM
MACROSCOPIC MORPHOLOGIES TO MICROSCOPIC
MECHANISMS. Alberto Pimpinelli, Florin Nita, Arnaud Videcoq,
LASMEA, CNRS-Univ. Clermont 2, Aubiere, FRANCE; Masha
Vladimirova, CNRS-Univ. Montpellier, FRANCE.

9:00 AM W1.2

NOVEL MECHANISMS ON THE GROWTH MORPHOLOGY OF
FILMS. T.-M. Lu, Y.-P. Zhao, J.T. Drotar, T. Karabacak, and G.-C.
Wang, Department of Physics, Applied Physics, and Astronomy,
Rensselaer Polytechnic Institute, Troy, NY.

9:15 AM W1.3

SELF ASSEMBLY OF STEPS ON VICINAL Si(113) SURFACES:
AN ATOMISTIC PERSPECTIVE. Cristian V. Ciobanu, Vivek. B.
Shenoy, Brown University, Division of Engineering, Providence, RI;
Cai-Zhuang Wang and Kai-Ming Ho, Ames Laboratory and Iowa
State University Department of Physics, Ames, IA.

9:30 AM W1.4

DYNAMICS OF NANOSCALE SELF-ORGANIZATION:
REAL-TIME SIMULATIONS VS. EXPERIMENT. Pita Atala,
IGIDEA, College Park, MD.

9:45 AM BREAK

10:15 AM *W1.5

SURFACE RECONSTRUCTION, STEP STRUCTURE, AND
ISLAND FORMATION IN InGaAs ALLOY LAYERS.
J. Mirecki Millunchick, A. Riposan, G.M.K. Martin, Department of
Materials Science and Engineering, University of Michigan, Ann
Arbor, MI; C.A. Pearson, Department of Physics, University of
Michigan, Flint, MI; B.G. Orr, Applied Physics Program, University
of Michigan, Ann Arbor, MI.

10:45 AM W1.6

GROWTH AND SURFACE DYNAMICS ON InAs(110). C. Ratsch,
F. Grosse, UCLA; W. Barvosa-Carter, R.S. Ross, S. Keith, and J.J.

Zinck, HRL Laboratories.

11:00 AM W1.7

FIRST-PRINCIPLES CALCULATIONS OF STEERING EFFECTS
IN EPITAXIAL GROWTH. Jacques G. Amar, Jianguo Yu, Dept. of
Physics & Astronomy, University of Toledo, Toledo, OH; A. Bogicevic,
Ford Research Laboratory, Dearborn, MI.

11:15 AM W1.8

STEP BUNCHING DURING Si(001)HOMOEPITAXY CAUSED BY
THE SURFACE DIFFUSION ANISOTROPY. J. Mysliveček, C.
Schelling, F. Schäffler, University Linz, AUSTRIA; B. Voigtländer,
Forschungszentrum Jülich, GERMANY; J. Krug, University Essen,
GERMANY; P. Šmilauer, Czech Academy Science, Prague, CZECH
REPUBLIC.

11:30 AM W1.9

STRAIN EFFECTS IN HETEROEPITAXIAL GROWTH.
Russel Cafilisch, Erding Luo, UCLA, Math Dept, Los Angeles, CA;
Cameron Connell, UCLA, Math Dept and NJIT, Math Dept, Newark,
NJ; Mark Gyure, HRL Labs, Malibu, CA; Geoff Simms, HRL Labs
and UCLA, Math Dept.

SESSION W2: ISLAND NUCLEATION, GROWTH,
COALESCENCE AND COARSENING

Chairs: John A. Venables and Christian Ratsch
Monday Afternoon, December 2, 2002
Constitution A (Sheraton)

1:30 PM W2.1

TIME-DEPENDENT CAPTURE NUMBERS WITH REPULSIVE
PAIR INTERACTIONS: Cu/Cu(111) & Ge/Si(001). J.A. Venables[†],
H. Brune^a, and J. Drucker, Arizona State University, Dept of Physics
& Astronomy, Tempe, AZ; ^aInstitut de Physique des Nanostructures,
EPFL, Lausanne, SWITZERLAND; [†]also at CPES, University of
Sussex, Brighton, UNITED KINGDOM.

1:45 PM W2.2

ISLAND SIZES AND CAPTURE ZONE AREAS IN
SUBMONOLAYER DEPOSITION: REALISTIC THEORETICAL
TREATMENT OF SPATIAL ASPECTS OF NUCLEATION.
J.W. Evans, Iowa State Univ, Ames, IA; M.C. Bartelt, Lawrence
Livermore National Laboratory, Livermore, CA.

2:00 PM W2.3

TOWARD QUANTIFICATION OF GaN FILM EVOLUTION ON
SAPPHIRE. D.D. Koleske, M.E. Coltrin, S.R. Lee, K.C. Cross, C.C.
Mitchell, A.A. Allerman, and J.J. Figiel, Sandia National
Laboratories, Albuquerque, NM.

2:15 PM W2.4

NUMERICAL SIMULATION FOR THE ISLAND FORMATION
PROCESS OF THE STRANSKI-KRASTANOW SYSTEMS.
Cheng-hsin Chiu, National University of Singapore, Dept of Materials
Science, SINGAPORE.

2:30 PM W2.5

REAL-TIME STUDY OF THE ROLE OF INTERLAYER
TRANSPORT IN SrTiO₃ PULSED LASER DEPOSITION
EMPLOYING SURFACE X-RAY DIFFRACTION. Gyula Eres, J.Z.
Tischler, B.C. Larson, C.M. Rouleau, D.H. Lowndes, Solid State
Division, Oak Ridge National Laboratory, Oak Ridge, TN; P. Zschack,
University of Illinois, Urbana, IL.

2:45 PM W2.6

SURFACTANT EFFECTS ON THE NUCLEATION OF InAsSb
SEMICONDUCTOR NANOSTRUCTURES GROWN BY
METAL-ORGANIC CHEMICAL VAPOR DEPOSITION.
J.G. Cederberg, S.R. Kurtz, and R.M. Biefeld, Sandia National
Laboratories, Albuquerque, NM.

3:00 PM BREAK

3:30 PM W2.7

USE OF IN-SITU FOCUSED ION BEAM SURFACE
MODIFICATION TO CONTROL GE ISLAND FORMATION AND
STRUCTURE. M. Kammler, University of Virginia, Department of
MS&E, Charlottesville, VA; F.M. Ross, IBM T.J. Watson Research
Center, Yorktown Heights, NY; R. Hull, University of Virginia,
Department of MS&E, Charlottesville, VA.132175

3:45 PM W2.8

ATOMISTIC AND CONTINUUM MODELING OF SINTERING OF
METAL(100) HOMOEPITAXIAL ISLANDS. Da-Jiang Liu, J.W.
Evans, Iowa State University, Ames, IA.

4:00 PM W2.9

INVESTIGATION OF THE EVOLUTION OF NANOSTRUCTURES FOR Er ON Si(001). Lena Fitting, M.C. Zeman, Woochul Yang, R.J. Nemanich, North Carolina State Univ., Dept of Physics, Raleigh, NC.

4:15 PM W2.10

THE DEVELOPMENT OF NANO-CLUSTER EPITAXY: Ag ON Si(111). B.Q. Li, J.M. Zuo, Univ. of Illinois at Urbana-Champaign, Dept. of Materials Science and Engineering and Materials Research Laboratory, Urbana, IL.

4:30 PM W2.11

EFFICIENT GEOMETRY-BASED MODELING OF SUBMONOLAYER FILM GROWTH. Maozhi Li, Institute of Physical Research and Technology, Ames Laboratory, Iowa State University, Ames, IA; M.C. Bartelt, Sandia National Laboratories, Livermore, CA; J.W. Evans, Department of Mathematics and Ames Laboratory, Iowa State University, Ames, IA.

4:45 PM W2.12

LEVEL-SET SIMULATION OF SUBMONOLAYER GROWTH WITH POINT DEFECTS. Raffaele Vardavas, Christian Ratsch, Russel E. Caflisch, Mathematics Department, University of California at Los Angeles, Los Angeles, CA.

SESSION W3: POSTER SESSION
ISLAND NUCLEATION, GROWTH, COALESCENCE
AND COARSENING

Chairs: Norman C. Bartelt and James B. Hannon
Monday Evening, December 2, 2002
8:00 PM
Exhibition Hall D (Hynes)

W3.1

MORPHOLOGICAL EVOLUTION OF Ag/MICA FILMS GROWN BY PULSED LASER DEPOSITION. Jeffrey M. Warrender, Michael J. Aziz, Harvard University, Division of Engineering and Applied Sciences, Cambridge, MA.

W3.2

Transferred to W2.11

W3.3

EPITAXIAL CRYSTAL GROWTH OF LONG-RANGED REPULSIVE COLLOIDS. Jacob P. Hoogenboom^{a,b}, Anand

Yethiraj^{a,b}, Anja K. van Langen-Suurling^c, Hans Romijn^c, and Alfons van Blaaderen^{a,b}, ^aFOM-Institute for Atomic and Molecular Physics, Amsterdam, THE NETHERLANDS; ^bSoft Condensed Matter, Debye Institute, Utrecht Univ, THE NETHERLANDS; ^cDelft Institute of Microelectronics and Submicron Technology, Technical Univ of Delft, THE NETHERLANDS.

W3.4

THE FORMATION OF NANO-CLUSTER ALLOY: Ag/Cu on Si (111)-H. H. Chen, B.Q. Li, J.M. Zuo, Univ. of Illinois at Urbana-Champaign, Dept. of Materials Science and Engineering and Materials Research Laboratory, Urbana, IL.

W3.5

MORPHOLOGY AND CRYSTALLINE STRUCTURE CONTROL OF Cu NANOISLANDS ON SiO₂ WITH METAL UNDERLAYERS. Minghui Hu, Suguru Noda, Hiroshi Komiyama, Univ of Tokyo, Dept of Chemical System Engineering, Tokyo, JAPAN.

W3.6

MORPHOLOGY CONTROL OF PULSED-LASER DEPOSITED Ag QUANTUM DOTS. Kinuyo Machi, Kenji Hamada, Nara Machinery Co., Ltd. Ootaku, Tokyo, JAPAN; Mamoru Senna, Faculty of Science and Technology, Keio University, Yokohama, JAPAN.

W3.7

FINITE SIZE EFFECTS ON INTERFACE ENERGY. J.K. Bording, S. Yunfeng, B.Q. Li and J.M. Zuo, Dept of Materials Science and Engineering and Materials Research Laboratory, University of Illinois at Urbana and Champaign, Urbana, IL.

W3.8

INFLUENCE OF SUBSTRATE SURFACE CHEMISTRY ON THE ATOMIC LAYER DEPOSITION OF TITANIA. G. Triani, P.J. Evans, D.R. Mitchell, K.S. Finnie, J.R. Bartlett, C.J. Barbe, Australian Nuclear Science and Technology Organisation, Menai, AUSTRALIA.

W3.9

NANOISLAND NUCLEATION UNDER CONTINUOUS DEPOSITION OF MONOMERS. Alexander E. Volkov and Michael

V. Sorokin, Institute of General and Nuclear Physics, Russian Research Centre Kurchatov Institute, Moscow, RUSSIA.

W3.10

LATTICE EFFECT ON NANOCLUSTER ORIENTATION AND EPITAXY: Ag ON H-TERMINATED Si(111) AND Si(100) SURFACES. B.Q. Li, J.M. Zuo, Univ of Illinois at Urbana-Champaign, Dept of Materials Science and Engineering and Materials Research Laboratory, Urbana, IL.

W3.11

MOLECULAR DYNAMICS STUDY OF THE GROWTH OF SILVER CLUSTERS ON H-Si(111) SURFACES. Yunfeng Shi, Jan Kare Bording, Boquan Li, Jian-Min Zuo, Dept of Materials Science and Engineering, Materials Research Lab Univ. of Illinois, Urbana, IL.

SESSION W4: POSTER SESSION
ATOMISTIC STRUCTURE OF ADATOMS, STEPS,
ISLANDS, MONOLAYERS, AND INFLUENCE ON
LARGE-SCALE ASPECTS

Chairs: Norman C. Bartelt and James B. Hannon
Monday Evening, December 2, 2002
8:00 PM
Exhibition Hall D (Hynes)

W4.1

FIRST-PRINCIPLES CALCULATIONS OF INTRINSIC SURFACE STRESS FOR Ge(100). M. Beck, A. van de Walle and M. Asta, Northwestern University, Dept. of Materials Science and Engineering, Northwestern University, Evanston, IL.

W4.2

STABILITY OF PSEUDOMORPHIC InGaAs LAYERS. A. Riposan, G.K.M. Martin, Dept. of Materials Science and Engineering, University of Michigan-Ann Arbor, Ann Arbor, MI; C.A. Pearson, Dept. of Physics, University of Michigan-Flint, Flint, MI; B.G. Orr, Applied Physics Program, University of Michigan-Ann Arbor, Ann Arbor, MI; J. Mirecki Millunchick, Dept. of Materials Science and Engineering, University of Michigan-Ann Arbor, Ann Arbor, MI.

W4.3

EFFECTS OF STEERING IN METAL EPITAXIAL GROWTH. Jianguo Yu, Jacques G. Amar, University of Toledo, Dept. of Physics & Astronomy, Toledo, OH.

W4.4

COMPARISON OF EPITAXIAL CuInSe₂ ON GaAs GROWN WITH THERMAL AND PLASMA SELENIUM CRACKING SOURCES. B.J. Stanbery, HelioVolt Corporation, Austin, TX; S. Kincal, S. Kim, T.J. Anderson, O.D. Crisalle, Univ of Florida, Dept of Chemical Engineering, Gainesville, FL; C.H. Huang, S. Li, Univ of Florida, Dept of Electrical and Computer Engineering, Gainesville, FL.

W4.5

BISMUTH-INDUCED LAYER-BY-LAYER GROWTH IN THE HOMOEPITAXIAL GROWTH OF Fe(100). M. Kamiko, H. Chihaya, H. Mizuno, R. Yamamoto, Inst. of Industrial Sci., Univ. of Tokyo, Tokyo, JAPAN; J.-H. Xu, I. Kojima, Materials Characterization Div., National Metrology Inst. of Jpn., National Inst. of Advanced Industrial Sci. and Tech. (AIST), Ibaraki, JAPAN.

W4.6

PRE-ROUGHENING DYNAMICS ON Si(100) STEPPED SURFACES: A STUDY BASED ON MOLECULAR DYNAMICS WITH CLASSICAL FORCES. A.M. Mazzone, C.N.R. Istituto IMM, Sezione di Bologna, Bologna, ITALY.

W4.7

CHLORINE-INDUCED MORPHOLOGICAL CHANGES OF THE Cu/Si(111) "5 × 5" SURFACE. D.V. Potapenko, S.E. Sysoev, L.V. Goncharova, A.V. Ermakov and B.J. Hinch, Rutgers Univ, Dept of Chemistry, Piscataway, NJ; D.R. Strongin, Temple Univ, Dept of Chemistry, Philadelphia, PA; L. Wood, Dow Corning Corp, Carrollton, KY.

SESSION W5: POSTER SESSION
PHENOMENOLOGICAL DESCRIPTION OF
STRUCTURE AND MORPHOLOGY

Chairs: Norman C. Bartelt and James B. Hannon
Monday Evening, December 2, 2002
8:00 PM
Exhibition Hall D (Hynes)

W5.1

THE EVOLUTIONS OF SURFACE STRUCTURES AND THE EFFECT OF FINITE CONCENTRATIONS OF Si IN THE SUBMONOLAYER Sn GROWTH ON Cu(001).

Lyudmila V. Goncharova, Denis V. Potapenko, Alexei V. Ermakov, Jane Hinch, Rutgers University, Department of Chemistry and Laboratory of Surface Modification, Piscataway, NJ; Xiang Zhang, Daniel R. Strongin, Temple University, Department of Chemistry, Philadelphia, PA; L. Wood, Dow Corning Corporation, Carrolton, KY.

W5.2

INITIAL GROWTH OF TiN: TRANSITION FROM AMORPHOUS INITIAL LAYER INTO CRYSTALLINE FILM. T.Q. Li, S. Noda, H. Komiyama, Univ of Tokyo, Dept of Chemical System Engineering; T. Yamamoto, Univ of Tokyo, Dept of Advanced Materials Science; Y. Ikuhara, Univ of Tokyo, Dept of Materials Science, Tokyo, JAPAN.

W5.3

ATOMIC STRUCTURE OF ULTRATHIN IRON SILICIDE FILMS ON Si(111): METASTABLE PHASES AND A NEW TEMPLATE STRUCTURE. U. Starke, Max-Planck-Institut für Festkörperforschung, Stuttgart, GERMANY; S. Walter, M. Krause, F. Blobner, R. Bandorf, W. Weiss, S. Müller and K. Heinz, Universität Erlangen-Nürnberg, Erlangen, GERMANY.

W5.4

MICROSTRUCTURAL CHARACTERIZATION OF POROUS THIN FILMS. B. Djurfors, D.G. Ivey, University of Alberta, Dept of Chemical and Materials Engineering, Edmonton, Alberta, CANADA; M.J. Brett, University of Alberta, Dept of Electrical and Computer Engineering, Edmonton, Alberta, CANADA.

W5.5

KINETIC FACETING OF MULTIPLY TWINNED DIAMOND CRYSTALS DURING VAPOR PHASE SYNTHESIS. R.C. Mani, M.K. Sunkara, University of Louisville, Louisville, KY.

W5.6

SURFACTANT MEDIATED EPITAXIAL GROWTH OF Co ON Au(111) SURFACE. M. Kamiko, Sangmum Oh, H. Chihaya, H. Mizuno, R. Yamamoto, Inst. of Industrial Sci., Univ. of Tokyo, Tokyo, JAPAN; J.-H. Xu, I. Kojima, Materials Characterization Div., National Metrology Inst. of Japan; National Inst. of Advanced Industrial Sci. and Tech. (AIST), Ibaraki, JAPAN.

W5.7

FIRST-LAYER MORPHOLOGY OF PENTACENE FILMS ON HYDROPHILIC AND HYDROPHOBIC SUBSTRATES. Ricardo Ruiz, Richard F. Haglund Jr., Leonard C. Feldman, Vanderbilt Univ., Dept. of Physics and Astronomy, Nashville, TN; Bert A. Nickel, N. Koch, G. Scoles, Princeton Univ., Princeton Materials Institute and Dept. of Chemistry, Princeton, NJ; A. Kahn, Princeton Univ., Princeton Materials Institute and Dept. of Electrical Engineering, Princeton, NJ.

W5.8

PREPARATION AND CHARACTERIZATION OF Eu- AND Y-POLYTANTALATE THIN FILMS DEPOSITED BY RF DIODE SPUTTERING. Vladimir Vasilyev, Alvin Drehman, Lionel Bouthilllette, Air Force Research Laboratory, Hanscom AFB, MA.

W5.9

ARE HIDDEN CONSERVATION LAWS IN SURFACE GROWTH A MYTH OR REALITY? Somnath Pal, SciMax Research, Mountain View, CA.

W5.10

PROPERTIES OF TITANIUM OXIDE THIN FILM PREPARED WITH E-BEAM EVAPORATION. Ping Hou, Nortel Networks, Wilmington, MA; Lianchao (Richard) Sun, SOPRA Inc, Acton, MA.

W5.11

SURFACE ROUGHNESS EVOLUTION IN AMORPHOUS TANTALUM OXIDE FILMS DEPOSITED BY PULSED REACTIVE SPUTTERING. Pushkar Jain, Jasbir S. Juneja, Tansel Karabacak, Eugene J. Rymaszewski and Toh-Ming Lu, Center of Integrated Electronics and Electronics Manufacturing, Rensselaer Polytechnic Institute, Troy, NY.

W5.12

Abstract Withdrawn

W5.13

ONE DIMENSIONAL NANO STRUCTURE OBSERVED IN COPPER/COPPER OXIDE MOCVD WITH HIGH

SUPERSATURATION RATIO. Yuneng Chang, Chunhung Sung, Mengtao Hsieh, Chunjung Hsiao, Lunghwa University of Science and Technology, Dept. of Chemical Engineering, Gueishan, TAIWAN, R.O.C.

W5.14

TIME EVOLUTION OF THE MICROSTRUCTURE OF VO₂(B) FILMS DEPOSITED ON GLASS BY MOCVD. M.B. Sahana and S.A. Shivashankar, Materials Research Center, Indian Institute of Science, Bangalore, INDIA.

W5.15

CONTINUUM MODEL OF COLUMNAR GROWTH INCLUDING ATOMIC LENGTH SCALES. Peter L. O'Sullivan, New York, NY; George H. Gilmer, LLNL, Livermore, CA; Jacques Dalla Torre, CEA, Paris, FRANCE.

W5.16

MEASUREMENT OF THE NANOSCALE ROUGHNESS OF ADVANCED MOSFET LAYER STRUCTURES. D.J. Norris, A.G. Cullis, S.H. Olsen[†] and A.G. O'Neill[†], Department of Electronic and Electrical Engineering, Sheffield, UNITED KINGDOM; [†]Department of Electronic and Electrical Engineering, University of Newcastle upon Tyne, Newcastle, UNITED KINGDOM.

SESSION W6: MORPHOLOGICAL RELAXATION
TOWARDS EQUILIBRIUM

Chairs: L. B. Freund and Frans Spaepen
Tuesday Morning, December 3, 2002
Constitution A (Sheraton)

8:30 AM W6.1

EVOLUTION OF SURFACE MORPHOLOGY AND STRESS RELAXATION IN In_{0.2}Ga_{0.8}As/GaAs. Benny Perez-Rodriguez, G.K.M. Martin, J. Mirecki Millunchick, University of Michigan, Department of Materials Science and Engineering, Ann Arbor, MI.

8:45 AM W6.2

RELAXATION OF EPITAXIAL STRESS DUE TO FORMATION OF MODULATED STRUCTURES. Alexander L. Roytburd, Department of Materials and Nuclear Engineering, University of Maryland; Julia Slutsker, Materials Science and Engineering Laboratory, National Institute of Standards and Technology.

9:00 AM W6.3

SPINODAL DECOMPOSITION OF A FILM ON A STRAIN PATTERNED SUBSTRATE. P. Alex Greaney, Department of Materials Science and Engineering, U.C. Berkeley, CA; B.M. Clemens, W.D. Nix, Department of Materials Science and Engineering, Stanford University, CA; D.C. Chrzan, Department of Materials Science and Engineering, U.C. Berkeley, CA.

9:15 AM W6.4

THE EFFECT OF PLASTIC STRAIN ON GRAIN GROWTH IN Al FILMS. C.A. Volkert, Max Planck Institute for Metals Research, Stuttgart, GERMANY.

9:30 AM W6.5

EVOLUTION OF MORPHOLOGY AND STRESSES IN IRRADIATED NANOSTRUCTURES. S.G. Mayr and R.S. Averback, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL.

9:45 AM BREAK

SESSION W7: STRESS RELAXATION
Chairs: L. B. Freund and Frans Spaepen
Tuesday Morning, December 3, 2002
Constitution A (Sheraton)

10:15 AM W7.1

COMPETING CLASSICAL AND QUANTUM EFFECTS IN SHAPE RELAXATION OF A METALLIC NANOSTRUCTURE. Dongmin Chen, Hiroshi Okamoto, Rowland Institute, Harvard University, Cambridge, MA; T. Yamada, NASA Ames Research Center, Moffett Field, CA.

10:30 AM W7.2

KINETIC MONTE CARLO STUDY OF ISLAND FLUCTUATION ON Pb(111) DURING DECAY TOWARD EQUILIBRIUM. Ferenc Szalma^{a,b}, T.L. Einstein^a; ^aDept. of Physics, Univ. of Maryland, College Park, MD; ^bInstitute for Theoretical Physics, Univ.

of Szeged, HUNGARY; Michael I. Haftel, Naval Research Lab, Washington, DC.

10:45 AM W7.3

DECAY OF PATTERNED STRUCTURES DURING MBE GROWTH OF GaAs AND AlAs/GaAs MULTILAYERS. R.J. Phaneuf, M. Tucker, S. Shah, T.J. Garrett, K. Limpaphayom, and H-C. Kan, Department of Materials Science and Engineering, Department of Physics and Laboratory for Physical Sciences, University of Maryland, College Park, MD.

11:00 AM W7.4

ON THE SHAPE AND DEPTH OF THERMAL GRAIN BOUNDARY GROOVES. Joachim H. Schneibel, Oak Ridge National Laboratory, Metals and Ceramics Division, Oak Ridge, TN; Wen Zhang, Oakland Univ, Dept of Mathematics and Statistics, Rochester, MI; Pavlo P. Sachenko, Oak Ridge National Laboratory, Life Sciences Division, Oak Ridge, TN.

11:15 AM W7.5

TRANSIENT-ENHANCED SURFACE DIFFUSION ON NATURAL-OXIDE-COVERED Si(001) TEMPLATES DURING VACUUM ANNEALING. H. Lichtenberger, M. Mühlberger, C. Schelling, F. Schäffler, Univ. Linz, Linz, AUSTRIA; S. Senz, MPI Halle, GERMANY.

11:30 AM W7.6

MORPHOLOGICAL INSTABILITY OF SOLID-ON-LIQUID THIN FILM STRUCTURES. Rui Huang, Z. Suo, Princeton Univ, Dept of Mechanical and Aerospace Engineering and Princeton Materials Institute, Princeton, NJ.

11:45 AM W7.7

DELAMINATION OF THIN FILMS ON SUBSTRATES: FROM STRAIGHT-SIDED WRINKLES TO BOTH WORM-LIKE AND VARICOSE STRUCTURES. Matthieu George, Franck Cleymand, Christophe Coupeau, Jerome Colin, Jean W. Grilhe, Poitiers Univ, Dept of Materials Science, Poitiers, FRANCE.

SESSION W8: EFFECTS OF STRESS

Chairs: Jerrold A. Floro and Bruce M. Clemens
Tuesday Afternoon, December 3, 2002
Constitution A (Sheraton)

1:30 PM W8.1

EVIDENCE OF VACANCY FORMATION DURING LOW-T Cu(001) HOMOEPITAXY – AN X-RAY SCATTERING STUDY. Cristian E. Botez, Paul F. Miceli, University of Missouri-Columbia, Dept of Physics and Astronomy, Columbia, MO; Peter W. Stephens, SUNY at Stony Brook, Dept of Physics and Astronomy, Stony Brook, NY.

1:45 PM W8.2

DISLOCATION MEDIATED LAYER-BY-LAYER GROWTH OF STRAINED Ag AND Au FILMS ON Ru(0001). W.L. Ling, J.C. Hamilton, G.E. Thayer, J. de la Figuera, R.Q. Hwang, Sandia National Laboratories, Livermore, CA; A.K. Schmid, Lawrence Berkeley National Laboratory, Berkeley, CA.

2:00 PM W8.3

EVOLUTION OF Ge/Si(001) SURFACE MORPHOLOGY DURING EXPOSURE TO A Si FLUX. G. Albin, P. Raiteri, D. Migas, INFN and Dipartimento di Scienza dei Materiali, Università degli Studi di Milano-Bicocca, Milano, ITALY; A Rastelli, INFN and Dipartimento di Fisica "A. Volta" della, Università degli Studi di Pavia, Pavia, ITALY; H. von Kaenel, ETH Zürich, Laboratorium für Festkörperphysik, Zürich, SWITZERLAND; and Leo Miglio, INFN and Dipartimento di Scienza dei Materiali, Università degli Studi di Milano-Bicocca, Milano, ITALY.

2:15 PM W8.4

MEASUREMENT OF STRESS EVOLUTION IN BIMETALLIC Cu-Sn THIN FILMS. Lucine Kabakian, Sharvan Kumar, Eric Chason, Brown University, Division of Engineering, Providence, RI.

2:30 PM BREAK

SESSION W9: STRESS EVOLUTION DURING FILM DEPOSITION

Chairs: Jerrold A. Floro and Bruce M. Clemens
Tuesday Afternoon, December 3, 2002
Constitution A (Sheraton)

3:00 PM *W9.1

INFLUENCE OF NON-EQUILIBRIUM SURFACE CONDITIONS ON STRESS EVOLUTION IN THIN FILMS. E. Chason, B. Sheldon, L.B. Freund, C. Lynch, M. Sofos, Brown University, Division of Engineering, Providence, RI; J.A. Floro, S.J. Hearne, Sandia National Laboratories, Albuquerque, NM.

3:30 PM W9.2

THE EFFECT OF DEPOSITION RATE ON THE INTRINSIC STRESS AND MICROSTRUCTURE OF POLYCRYSTALLINE Cu THIN FILMS. A.L. Del Vecchio, F. Spaepen, Harvard Univ., Div. of Engineering and Applied Sciences, Cambridge, MA.

3:45 PM W9.3

REVERSIBLE STRESS RELAXATION DURING PRE-COALESCENCE INTERRUPTIONS OF VOLMER-WEBER THIN FILM GROWTH. Cody Friesen, Carl V. Thompson, Massachusetts Institute of Technology, Cambridge, MA.

4:00 PM W9.4

TENSILE STRESS GENERATION DURING ISLAND COALESCENCE FOR VARIABLE ISLAND-SUBSTRATE CONTACT ANGLE. Steven C. Seel^a and Carl V. Thompson, Dept of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA; ^aCurrently at Sandia National Laboratories, Surface and Interface Sciences Dept, Albuquerque, NM.

4:15 PM W9.5

UNDERSTANDING TENSILE STRESS EVOLUTION IN DIAMOND THIN FILMS. A. Rajamani, K.H.A. Lau, A.F. Bower, B.W. Sheldon, Brown University, Division of Engineering, Providence, RI.

4:30 PM W9.6

STRESS GENERATION IN AMORPHOUS SEMICONDUCTOR THIN FILMS. J.A. Floro and P. Kotula, Sandia National Laboratories, Albuquerque, NM; D.J. Srolovitz, Princeton University, Princeton Materials Institute, Dept of Mechanical and Aerospace Engineering, Princeton, NJ.

4:45 PM W9.7

STRESSES AND STRESS GRADIENTS IN GROWING OXIDE FILMS. Ramanathan Krishnamurthy and David J. Srolovitz, Princeton Materials Institute and Dept. of Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ.

SESSION W10: POSTER SESSION
STRESS CREATION AND RELAXATION AND
MORPHOLOGY RELAXATION

Chairs: Sean J. Hearne and Isabelle Berbezier
Tuesday Evening, December 3, 2002
8:00 PM

Exhibition Hall D (Hynes)

W10.1

A MODEL OF MIGRATING GRAIN-BOUNDARY GROOVES WITH APPLICATION TO TWO METHODS FOR MEASURING MOBILITY. Donghong Min, Harris Wong, Louisiana State Univ, Mechanical Engineering Dept, Baton Rouge, LA.

W10.2

EFFECT OF SURFACE ENERGY ANISOTROPY ON SURFACE DIFFUSIVITY MEASUREMENTS. Tinghui Xin, Harris Wong, Louisiana State Univ, Mechanical Engineering Dept, Baton Rouge, LA.

W10.3

INFLUENCE OF GROWTH FLUX ON THE STRAIN RELAXATION RATE OF InGaAs/GaAs. C. Lynch, E. Chason, R. Beresford, S.K. Hong, Brown University, Division of Engineering, Providence, RI.

W10.4

ANISOTROPY AND TIME-DEPENDENCE OF THE STRESS IN SPIN-COATED FILMS OF PMMA. Anita Bowles, Frans Spaepen, Harvard Univ, Division of Engineering and Applied Sciences, Cambridge, MA.

W10.5

THE NANOSTRUCTURE EVOLUTION DURING AND AFTER MAGNETRON DEPOSITION OF GOLD FILMS. N. Schell, Institute of Ion Beam Physics and Materials Research, Forschungszentrum Rossendorf, Dresden, GERMANY; T. Jensen, J.H. Petersen, K.P. Andreasen, J. Bottiger, J. Chevallier, Institute of Physics and Astronomy, University of Aarhus, Aarhus, DENMARK.

W10.6

GROWTH STRESS OF HOMOEPITAXIAL YTRIA-STABILIZED ZIRCONIA (YSZ) THIN FILMS. Jason Draut, Frans Spaepen, Harvard Univ, Division of Engineering and Applied Sciences, Cambridge, MA; Jian-Sheng Wang, American Superconductor, Westborough, MA.

W10.7

EXPERIMENTS WITH IN-SITU THIN FILM PHONE CORD DELAMINATION PROPAGATION. Alex A. Volinsky, Motorola, Mesa, AZ.

W10.8

IN-SITU THIN FILM STRESS MEASUREMENTS – A PATH TO UNDERSTANDING THE STRUCTURE AND MORPHOLOGY OF ELECTRON BEAM EVAPORATED ZnS. Vincent Barrioz, Stuart James Curzon Irvine, Univ of Wales, Opto-electronic Materials Chemistry, Bangor, UNITED KINGDOM; David Paul Jones, Thales Optics Ltd, Optical Coating Dept, St. Asaph, UNITED KINGDOM.

W10.9

IN SITU INVESTIGATION OF THE STRESS EVOLUTION DURING DEPOSITION OF Ti/Al-MULTILAYER FILMS AS A FUNCTION OF LAYER THICKNESS AND SUBSTRATE TEMPERATURE. Stefan Lackner and Reinhard Abermann, Institute of Physical Chemistry, University of Innsbruck, AUSTRIA.

W10.10

Abstract Withdrawn

W10.11

DEFECTS IN THIN COPPER FILMS GROWN ON MOLYBDENUM. Vinay Venugopal, Léon Seijbel, Barend Thijse, Delft University of Technology, Laboratory of Materials Science, Delft, THE NETHERLANDS.

W10.12

ATOMISTIC SIMULATION STUDY OF STRAIN RELAXATION AND ISLAND NUCLEATION IN EPITAXIAL GROWTH. Avinash M. Dongare, Leonid V. Zhigilei, Department of Materials Science and Engineering, University of Virginia, Charlottesville, VA.

SESSION W11: POSTER SESSION
FILM STRUCTURE AND PROPERTIES

Chairs: Sean J. Hearne and Isabelle Berbezier
Tuesday Evening, December 3, 2002
8:00 PM

Exhibition Hall D (Hynes)

W11.1

PREPARATION OF PLATE-LIKE BULK BETA IRON DISILICIDE CRYSTALS USING METAL TO SEMICONDUCTOR PHASE TRANSITION BY HEAT TREATMENT. Masato Osamura, System Engineering Corporation, Kanagawa, JAPAN; Hidetaka Ishihara, Yasushi Hoshino, Nippon Institute of Technology, Saitama, JAPAN; Hisao Tanoue, Yunosuke Makita, National Institute of Advanced Industrial Science and Technology, Ibaraki, JAPAN; Shirou Sakuragi, Union Material Co. Ltd., Ibaraki, JAPAN; Yasuhiko Yakayama, Japan Science and Technology Corporation Ibaraki, JAPAN.

W11.2

GROWTH STUDIES OF THIN PTCDA FILMS ON H PASSIVATED Si(001). J.B. Gustafsson, L.S.O Johansson, E. Moons, S.M. Widstrand, M. Gurnett, Dept of Physics, Karlstad, SWEDEN; M. Tengelin-Nilsson, L. Iver, J. Kanski, Dept of Experimental Physics, Gothenburg, SWEDEN.

W11.3

VAPOR DEPOSITION OF ALUMINUM SINGLE CRYSTALS. Alan Jankowski, Jeff Hayes, Livermore CA.

W11.4

DEHYDROGENATION AND POLYMERIZATION OF TiO_xH_y FILMS IN OBTAINING ANATASE COATING AT LOW TEMPERATURE. Kouichi Takayama, Shigeo Ohshio and Hidetoshi Saitoh, Nagaoka Univ Tech, Dept of Chemistry, Nagaoka, Niigata, JAPAN.

W11.5

CONTROLLING THE AGGREGATE MORPHOLOGIES OF PRIMARILY HYDROPHOBIC POLY(STYRENE)-POLY(ETHYLENE OXIDE). Caitlin Devereaux, Shenda Baker, Harvey Mudd College, Dept of Chemistry, Claremont, CA.

SESSION W12: POSTER SESSION
GRAIN AND MICROSTRUCTURE EVOLUTION

Chairs: Sean J. Hearne and Isabelle Berbezier
Tuesday Evening, December 3, 2002
8:00 PM

Exhibition Hall D (Hynes)

W12.1

QUANTITATIVE CHARACTERIZATION OF MORPHOLOGICAL EVOLUTION IN $Q = 2$ POTTS MODEL ALUMINUM THIN FILMS. D.H. Alsem^{a,b}, E.A. Stach^b and J.Th.M. de Hosson^a; ^aUniversity of Groningen, Dept. Applied Physics/Materials Science, Groningen, THE NETHERLANDS; ^bLawrence Berkeley National Laboratory, National Center for Electron Microscopy, Berkeley, CA.

W12.2

TEXTURE EVOLUTION DURING CRYSTALLIZATION OF THIN AMORPHOUS FILMS. W. Chen, Institut für Physik, Humboldt Universität, Berlin, GERMANY; Q.K.K. Liu, Theoretical Physics Division, Hahn-Meitner-Institut, Berlin, GERMANY; G. Schumacher, SF4, Hahn-Meitner-Institut, Berlin, GERMANY.

W12.3

MICROSTRUCTURAL STUDY OF FINE-GRAIN METALLIC THIN-FILMS CREATED BY PULSED ION BEAM ABLATION. T.J. Renk, P.P. Provencio, Sandia National Laboratories, Albuquerque, NM; M. Kawamura, Kitami Institute of Technology, Dept. of Materials Science, Kitami, JAPAN.

W12.4

CRACKS FORMATION DUE TO ANNEALING OF Al_2O_3 FILMS GROWN ON Si(100) BY MOCVD. M.P. Singh and S.A. Shivashankar, Materials Research Center, Indian Institute of Science, Bangalore, INDIA.

W12.5

QUANTITATIVE REAL TIME CORRELATION BETWEEN GRAIN GROWTH AND TEXTURE EVOLUTION IN Ag THIN FILMS. K. Hukari, AFG Development Corporation, Petaluma, CA; E.A. Stach and D.K. Owen, National Center for Electron Microscopy, Lawrence Berkeley National Laboratory, Berkeley, CA; R. Dannenberg, Chahaya Optronics, Fremont, CA.

W12.6

ROOM TEMPERATURE GRAIN GROWTH IN SPUTTERED COPPER FILMS. D. Deduytsche, C. Detavernier, J. Debaerdemaeker, R.L. Van Meirhaeghe, C. Dauwe, Universiteit Gent, Gent, BELGIUM.

W12.7

INTERMEDIATE ANNEALING BEHAVIOR AND GRAIN GROWTH OF Al-Cu-Fe QUASICRYSTALLINE COATINGS. Matthew Daniels, John C. Bilello, Center for Nanomaterials Science, University of Michigan, Ann Arbor, MI; David King, Technology Assessment and Transfer, Annapolis, MD; Jeff Zabinski, Air Force Research Laboratory, WPAFB, OH.

SESSION W13: POSTER SESSION
COMPOSITIONAL AND STRUCTURAL
MODULATIONS AND QUANTUM DOTS

Chairs: Sean J. Hearne and Isabelle Berbezier
Tuesday Evening, December 3, 2002
8:00 PM

Exhibition Hall D (Hynes)

W13.1

ADATOM DIFFUSION ON STRAINED Si(001)-(2x1) SURFACE. Antti Kuronen, Krister Henriksson, Helsinki University of Technology, Laboratory of Computational Engineering, Espoo, FINLAND.

W13.2

SPATIAL ORDERING IN InP/InGaP NANOSTRUCTURES. J.R.R. Bortoleto, H.R. Gutiérrez, M.A. Cotta and M.M.G. de Carvalho, IFGW-DFA/LPD, UNICAMP, Campinas-SP, BRAZIL.

W13.3

HUT CLUSTER FORMATION DURING Si HOMOEPITAXIAL GROWTH ON CARBON-CONTAINING Si(001) SURFACES. Jian-hong Zhu, Scott K. Stanley, and John G. Ekerdt, Department of Chemical Engineering, University of Texas at Austin, Austin, TX.

W13.4

STRUCTURE OF $(GaAs)_1/(AlAs)_1$ ULTRA-SHORT-PERIOD SUPERLATTICES ANALYZED BY X-RAY DIFFRACTION. Jianhua Li, Simon C. Moss, Univ of Houston, Dept of Physics, Houston, TX; Yong Zhang, Angelo Mascarenhas, NREL, Golden, CO; Jianming Bai, ORNL, Oak Ridge, TN.

W13.5

STRUCTURAL AND MORPHOLOGICAL TRANSFORMATIONS IN SELF-ASSEMBLED SEMICONDUCTOR QUANTUM DOTS. Peter Moeck, Armando Acha, Dept of Physics, Portland State University, Portland, OR; Teya Topuria, Yuanyuan Lei, Nigel D. Browning, Dept of Physics, University of Illinois at Chicago, Chicago, IL; Klaus Pierz, Physikalisch-Technische Bundesanstalt, Braunschweig, GERMANY; Patrick J. McCann, Huizhen Wu, School of Electr. and Computer Engin., University of Oklahoma, Norman, OK.

W13.6

Ge/Si(100) ISLAND AND WETTING LAYER COMPOSITION. Yangting Zhang and Jeff Drucker, Arizona State University, Dept of Physics and Astronomy, Tempe, AZ.

W13.7

STRAIN ENERGY IN Ge ISLAND ON Si(001) VS. SIZE AND MORPHOLOGY: A SPECTRAL AND SITE-RESOLVED ANALYSIS. Paolo Raiteri and Leo Miglio, INFN and Dip. di Scienza dei Materiali, Università degli Studi di Milano-Bicocca, ITALY.

W13.8

InAs INTERMIXING WITH SUBSTRATE LAYERS DURING FORMATION OF QUANTUM DOTS. Michael Yakimov, R. Moore, V. Tokranov, and S. Oktyabrsky, School of NanoSciences and NanoEngineering, University at Albany-SUNY, Albany, NY.

W13.9

THREE-DIMENSIONAL SIMULATIONS OF SELF-ASSEMBLY OF QUANTUM DOTS. A. Ramasubramaniam, V.B. Shenoy, Division of Engineering, Brown University, Providence, RI.

SESSION W14: SEGREGATION, SURFACE ALLOYING, COMPOSITION EVOLUTION
Chairs: David J. Srolovitz and Karl Sieradzki
Wednesday Morning, December 4, 2002
Constitution A (Sheraton)

8:30 AM W14.1

DETERMINATION OF LOCAL ATOMIC ARRANGEMENTS IN A BULK-IMMISCIBLE ULTRATHIN FILM SURFACE ALLOY. Kristine (Kupiecki) Witkowski, Denis Keane, John Quintana, John Okasinski, Mark Asta, Northwestern University, Department of Materials Science and Engineering, Evanston, IL; Don Walko, Advanced Photon Source, Argonne National Laboratory, Argonne, IL.

8:45 AM W14.2

DELTA DOPING OF SiGe NANOSTRUCTURES. I. Berbezier, A. Portavoce, A. Ronda, P. Gas^a, CRMC2-CNRS, Marseille, FRANCE; ^aL2MP-CNRS, Marseille, FRANCE.

9:00 AM W14.3

KINETIC MODELING OF DOPANT AND IMPURITY SURFACE SEGREGATION DURING VAPOR PHASE GROWTH OF SEMICONDUCTOR THIN FILMS: MULTIPLE MECHANISM APPROACH. Craig B. Arnold, Materials Sciences and Technology Division, Naval Research Laboratory, Washington, DC; Michael J. Aziz, Division of Engineering and Applied Sciences, Harvard University, Cambridge, MA.

9:15 AM W14.4

Si_{1-y}C_y/Si(001) GAS-SOURCE MOLECULAR BEAM EPITAXY FROM Si₂H₆ AND CH₃SiH₃: SURFACE REACTION PATHS AND GROWTH KINETICS. Y.L. Foo, K.A. Bratland, B. Cho, P. Desjardins, and J.E. Greene, Frederick Seitz Materials Research Laboratory and the Materials Science Department, University of Illinois, Urbana, IL.

9:30 AM W14.5

A MULTISCALE APPROACH TO THE STUDY OF EPITAXIAL FILM EVOLUTION DURING CVD. Carlo Cavallotti, Maurizio Masi, Sergio Carra, Dept Chimica, Materiali e Ingegneria Chimica, Politecnico di Milano, Milano, ITALY.

9:45 AM BREAK

SESSION W15: FUNDAMENTAL ASPECTS OF ELECTRODEPOSITION
Chairs: David J. Srolovitz and Karl Sieradzki
Wednesday Morning, December 4, 2002
Constitution A (Sheraton)

10:15 AM *W15.1

MORPHOLOGICAL STABILITY DURING ELECTRO-DEPOSITION. Mikko Haataja and David J. Srolovitz, Princeton Univ, Princeton, NJ.

10:45 AM W15.2

SUPERCONFORMAL FILM GROWTH. T.P. Moffat, D. Wheeler, B. Baker, D. Josell, NIST, Gaithersburg, MD.

11:00 AM *W15.3

EVOLUTION OF THE ELECTROCHEMICAL INTERFACE BY PHASE FIELD MODELING. J.E. Guyer, W.J. Boettinger, J.A. Warren, and G.B. McPadden, National Institute of Standards and Technology, Gaithersburg, MD.

11:30 AM W15.4

METAL-OXIDE INTERFACIAL EVOLUTION IN THERMALLY GROWN OXIDE FILMS. Donald E. Mencer, Department of Chemistry, Wilkes University, Wilkes-Barre, PA; Mohammad A. Hossain, Gill Chair Research Group, Lamar University, Beaumont, TX; Mehmet Kesmez, Gill Chair Research Group, Lamar University, Beaumont, TX; Donald G. Naugle, Department of Physics, Texas A&M University, College Station, TX; David L. Cocke, Gill Chair of Chemistry and Chemical Engineering, Lamar University, Beaumont, TX.

11:45 AM W15.5

SPONTANEOUS OSCILLATIONS DURING THE ELECTRO-DEPOSITION OF GOLD THIN FILMS. Serge Ravaine, Raphael Saliba, Christophe Mingotaud, Francoise Argoul, Centre de Recherche Paul Pascal, C.N.R.S., Pessac, FRANCE.

SESSION W16: NOVEL AND UNCONVENTIONAL SYNTHESIS METHODS

Chairs: Konrad Samwer and John P. Leonard
Wednesday Afternoon, December 4, 2002
Constitution A (Sheraton)

1:30 PM *W16.1

DIFFUSION, ANCHORING AND FORCED ASSEMBLY OF ORGANIC MOLECULES ON A METAL SURFACE. Federico Rosei[†], Y. Naitoh, M. Schunack, E. Lægsgaard, I. Stensgaard, and F. Besenbacher, Physics Department and I-NANO, University of Aarhus, DENMARK; P. Jiang, A. Gourdon, and C. Joachim, CEMES-CNRS, Toulouse, FRANCE. [†]Present address: INRS-EMT, Université du Québec, Varennes (QC), CANADA.

2:00 PM W16.2

3D REAL-SPACE ANALYSIS OF EPITAXIAL GROWTH OF A METASTABLE COLLOIDAL HCP CRYSTAL AND THE EFFECTS OF TEMPLATE-CRYSTAL MISMATCH. Jacob P. Hoogenboom^{a,b}, Anja K. van Langen-Suurling^c, Hans Romijn^c, and Alfons van Blaaderen^{a,b}, ^aFOM-Institute for Atomic and Molecular Physics, Amsterdam, THE NETHERLANDS; ^bSoft Condensed Matter, Debye Institute, Utrecht Univ, THE NETHERLANDS; ^cDelft Institute of Microelectronics and Submicron Technology, Technical Univ of Delft, THE NETHERLANDS.

2:15 PM W16.3

KINETIC ROUGHENING OF AMORPHOUS THIN FILMS DEPOSITED UNDER VARIABLE INCIDENT ANGLES: EXPERIMENT AND SIMULATIONS. S. Vauth, C. Streng, S. Mayr^a and K. Samwer, I. Physikalisches Institut, Universität Göttingen, Göttingen, GERMANY; ^aDepartment of Materials Sciences and Engineering, University of Illinois, Urbana, IL.

2:30 PM W16.4

OSCILLATORY DRIVING OF CRYSTAL SURFACES: POSSIBLE EXPERIMENTAL SCENARIOS. Michael I. Haftel, Chris Kendziora, Dong-Ho Wu, Naval Research Laboratory, Washington, DC; Olivier Pierre-Louis, UJF, Grenoble, FRANCE.

2:45 PM W16.5

A SIMPLE MODEL FOR THE FORMATION OF STEP-FREE SURFACES. Kee-Chul Chang, Jack M. Blakely, Cornell University, Dept. of Materials Science & Engineering, Ithaca, NY.

3:00 PM BREAK**3:30 PM W16.6**

STM STUDIES OF ISLAND NUCLEATION DURING HYPERTHERMAL ATOM DEPOSITION. J.M. Pomeroy and J.D. Brock, Cornell Center for Materials Research, Ithaca, NY.

3:45 PM W16.7

REAL-TIME OBSERVATION OF ION BEAM ERODED SILICON SURFACES: RIPPLE PROPAGATION AND COHERENCE IN SURFACE EROSION. Soenke Habenicht, Klaus-Peter Lieb, II. Physikalisches Institut und Sonderforschungsbereich 602, Georg-August-Universität Göttingen, GERMANY; Joerg Koch, Andreas Wieck, Angewandte Festkörperphysik, Ruhr-Universität Bochum, GERMANY.

4:00 PM W16.8

SURFACE PATTERN FORMATION ON FOCUSED ION BEAM BOMBARDED Ge(001). Wei Zhou, Alexandre Cuenat and Michael J. Aziz, Division of Engineering and Applied Sciences, Harvard University, Cambridge MA.

4:15 PM W16.9

ULTRAFAST LASER ENHANCED KINETICS DURING THIN FILM GROWTH. S.M. Yaliso, Y.N. Picard, and E.C.M. Carroll, University of Michigan, Dept. of Mat. Sci. & Eng., Ann Arbor, MI.

4:30 PM W16.10

MBE STUDIES OF PULSED GROWTH ON Ge(100). Martha A. Gallivan and Harry A. Atwater, California Institute of Technology, Division of Engineering and Applied Science, Pasadena, CA.

4:45 PM W16.11

COMPARISON OF GROWTH MORPHOLOGY IN Ge(001) HOMOEPITAXY USING PULSED LASER DEPOSITION AND MBE. John P. Leonard, Michael J. Aziz, Division of Engineering and Applied Sciences, Harvard University, Cambridge, MA.

SESSION W17: POSTER SESSION
ENERGETIC BEAMS

Chairs: Michael J. Aziz and Isabelle Berbezier
Wednesday Evening, December 4, 2002
8:00 PM
Exhibition Hall D (Hynes)

W17.1

ION ASSISTED CONTROL OF THE NUCLEATION OF GaN ON SAPPHIRE DURING MBE. B. Cui, I. Steinke, and P.I. Cohen, University of Minnesota, Dept of Electrical and Computer Engineering and Dept of Chemical Engineering and Materials Science, Minneapolis, MN.

W17.2

INTERFACE FORMATION AND SURFACE MORPHOLOGY OF GaAs SATURABLE ABSORBER LAYERS GROWN ON INSULATOR. S. Schön, T. Fritz, G. Wrigge, U. Keller, Swiss Federal Institute of Technology, Zurich, SWITZERLAND.

W17.3

THE ENHANCEMENT OF THE CHARACTERISTICS OF Cu FILMS AFTER THE MODIFICATION OF A MAGNETRON SPUTTER USING A CESIUM INJECTOR. Namwoong Paik, Daeil Kim, James Sohn, Steven Kim, Plasmion Corporation, Hoboken, NJ.

W17.4

KINETICS OF CHROMIUM AND NICKEL SILICIDE FORMATION ON SILICON BY RADIATION ENHANCED DIFFUSION. James D. Hoyland and John M. Shannon, University of Surrey, School of Electronics, Computing and Mathematics, Guildford, Surrey, UNITED KINGDOM.

W17.5

SELECTIVE EPITAXIAL GROWTH AND IN-PLANE PATTERNING OF OXIDE AND NITRIDE THIN FILMS VIA ELECTRON-BEAM IRRADIATION IN PLD PROCESS. H. Isa, J. Liu, A. Sasaki, and M. Yoshimoto, Tokyo Inst. of Tech., Yokohama, JAPAN; M. Takeguchi, NIMS, Tsukuba, JAPAN.

W17.6

MICROSTRUCTURAL AND COMPOSITIONAL EVOLUTION OF HIGH TEMPERATURE SUPERCONDUCTING FILMS. Jodi Reeves, Venkat Selvamanickam, IGC-SuperPower, Schenectady, NY; Michael Hatzistergos, Harry Efstathiadis, and Alain Kaloyeros, School of NanoSciences and NanoEngineering, The University at Albany-SUNY, Albany, NY; Lisa Allen, Rory MacCrimmon, Epion Corporation, Billerica, MA.

W17.7

IMPROVEMENT OF SURFACE ROUGHNESS BY ULTRA-THIN FILM DEPOSITION WITH OXYGEN CLUSTER ION BEAM ASSIST DEPOSITION. Noriaki Toyoda, Yuji Fujiwara, Laboratory of

Advanced Science and Technology, Himeji Institute of Technology, Hyogo, JAPAN; Isao Yamada, Collaborative Research Center for Cluster Ion Beam Process Technology, Kyoto, JAPAN.

W17.8

DEPOSITION MECHANISM OF OXIDE THIN FILMS MANUFACTURED BY A FOCUSED ENERGETIC BEAM PROCESS. Heinz D. Wanzenboeck, Stefan Harasek, Helmut Langfischer, Wolfgang Brezna, Juergen Smoliner, Emmerich Bertagnolli, Vienna University of Technology, Institute for Solid State Electronics, Vienna, AUSTRIA.

W17.9

STUDY OF SURFACE MORPHOLOGICAL EVOLUTION BY CLUSTER ION IRRADIATION ON SOLID TARGET. Takaaki Aoki^{a,b}, Atsuko Nakai^a, Jiro Matsuo^a, Gikan Takaoka^a; ^aKyoto Univ., Ion Beam Engineering Experimental Lab., Kyoto JAPAN; ^bCollaborative Research Center for Cluster Ion Beam Process Technology.

W17.10

SURFACE DYNAMICS OF GaAs THIN FILM FORMATION BY PULSED LASER DEPOSITION INVESTIGATED USING RHEED. A. Pun^a, S.M. Durbin^b, J. Kennedy^c, A. Markwitz^c, R. Reeves^d and J.P. Zheng^a; ^aDepartment of Electrical and Computer Engineering, Florida A&M University and Florida State University, Tallahassee, FL; ^bDepartment of Electrical and Computer Engineering, University of Canterbury, Christchurch, NEW ZEALAND; ^cInstitute of Geological & Nuclear Sciences, Lower Hutt, NEW ZEALAND; ^dDepartment of Physics & Astronomy, University of Canterbury, NEW ZEALAND.

W17.11

TIME RESOLVED STUDIES OF FOCUSED ION BEAM INDUCED TUNGSTEN DEPOSITION. Helmut Langfischer, Stefan Harasek, Heinz D. Wanzenboeck, Bernhard Basnar, Emmerich Bertagnolli, Vienna University of Technology, Vienna, AUSTRIA.

W17.12

Mo-Si INTERFACE FORMATION BY ION BEAM DEPOSITION. Anke Köhler, J.W. Gerlach, G. Wagner, W. Frank, H. Neumann, T. Chasse, Institute for Surface Modification, Leipzig, GERMANY.

W17.13

THRESHOLD ENERGY FOR GENERATING DAMAGE WITH CLUSTER ION IRRADIATION. Toshio Seki^{a,b}, Takaaki Aoki^{a,b}, Atsuko Nakai^a, Jiro Matsuo^a, Gikan H. Takaoka^a; ^aIon Beam Engineering Experimental Laboratory, Kyoto University, Kyoto, JAPAN; ^bCollaborative Research Center for Cluster Ion Beam Process Technology.

W17.14

REAL-TIME X-RAY SCATTERING STUDY OF HOMOEPITAXIAL GROWTH OF SrTiO₃ DURING RF SPUTTERING. Hsin-Yi Lee, C.-H. Hsu, Yung-Wei Hsieh and K.S. Liang, Synchrotron Radiation Research Center, Hsinchu, TAIWAN.

W17.15

SURFACE MORPHOLOGY AND OPTO-ELECTRICAL PROPERTIES OF ITO FILMS PREPARED BY DC MAGNETRON SPUTTER TYPE NEGATIVE ION SOURCE AT LOW SUBSTRATE TEMPERATURE. Daeil Kim, Minho Sohn, Namwoong Paik, Steven Kim, PLASMION Corporation, Hoboken, NJ; Sungjin Kim, Sooho Park, Stevens Institute of Technology, Dept of Chemical, Biochemical and Materials Engineering, NJ.

SESSION W18: POSTER SESSION
NOVEL OR UNCONVENTIONAL SYNTHESIS
METHODS OR RESULTS

Chairs: Michael J. Aziz and Isabelle Berbezier
Wednesday Evening, December 4, 2002
8:00 PM
Exhibition Hall D (Hynes)

W18.1

LARGE-AREA FILM STRUCTURE CONSISTED BY AGGREGATION OF ZINC OXIDE MICRO-WHISKERS. Shuji Tokita, Tokita CVD Systems Ltd, Niigata, JAPAN; Shigeo Ohshio, Nagaoka Univ. Tech., Dept. of Chemistry, Niigata, JAPAN; Hidetoshi Saitoh, Nagaoka Univ. Tech., Dept. of Chemistry, Niigata, JAPAN.

W18.2

GROWTH STUDIES OF PERIODIC AND APERIODIC ARRAYS OF POSTS AND HELICES. Brian Dick, Michael J. Brett, University

of Alberta, Department of Electrical and Computer Engineering, Edmonton, CANADA; Tom Smy, Carleton University, Department of Electronics, Ottawa, CANADA.

W18.3

DIAMOND SYNTHESIS FROM ACETONE VAPOR AND IMPURITY CONTROL. Kaoru Gyoda, Yuki Tanaka, Yoshiki Takagi, Teikyo Univ. of Science & Technology, Yamanashi-pref., JAPAN.

W18.4

EVOLUTION OF THE GROWTH FRONT OF PERYLENE THIN FILMS ON GLASS AND Au SUBSTRATES. Serkan Zorba and Yongli Gao, Dept of Physics and Astronomy, Rochester, NY.

W18.5

GRAIN SIZE CONTROL VIA ADDITIVES IN ELECTRO-DEPOSITION. Mikko Haataja, Princeton University, Princeton, NJ; Corbett Battaile, Sandia National Laboratory, Albuquerque, NM; and David J. Srolovitz, Princeton University, Princeton, NJ.

W18.6

MOLECULAR-DYNAMICS SIMULATION OF INITIAL PERIODS OF CLUSTER DEPOSITION. K. Shintani, T. Nakajima, Univ of Electro-Comm, Dept of ME & Intelligent Sys, Tokyo, JAPAN.

W18.7

THREE-DIMENSIONAL EHRlich-SCHWOEBEL BARRIER – A NEW CONCEPT AND APPLICATIONS. Hanchen Huang, Department of Mechanical, Aerospace & Nuclear Engineering, Rensselaer Polytechnic Institute, Troy, NY; Shaojun Liu, Chung Ho Woo, and B. Sundaravel, Department of Mechanical Engineering, PolyU, HONG KONG.

SESSION W19: POSTER SESSION SEGREGATION, ADSORPTION, COMPOSITION EVOLUTION

Chairs: Michael J. Aziz and Isabelle Berbezier
Wednesday Evening, December 4, 2002
8:00 PM
Exhibition Hall D (Hynes)

W19.1

STRAIN, COMPOSITION AND MORPHOLOGICAL PROPERTIES OF LIGHT EMITTING $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ HETEROSTRUCTURES. S. Pereira, M.R. Correia, E. Pereira, Departamento de Fisica, Universidade de Aveiro, Aveiro, PORTUGAL; K.P. O'Donnell, Department of Physics, University of Strathclyde, Glasgow, UNITED KINGDOM; A.D. Sequeira, N. Franco, E. Alves, Departamento de Fisica do ITN, Sacavem, PORTUGAL; I.M. Watson, C.J. Deatcher, Institute of Photonics, University of Strathclyde, Glasgow, UNITED KINGDOM.

W19.2

STRESS EVOLUTION DURING DEPOSITION AND DURING ANNEALING OF Ti_xAl_y -ALLOY FILMS. Stefan Lackner and Reinhard Abermann, Institute of Physical Chemistry, University of Innsbruck, AUSTRIA.

W19.3

IN-SITU TEM STUDIES OF Ni-MEDIATED SILICON CRYSTALLISATION. Marcel A. Verheijen, Philips CFT, Eindhoven, THE NETHERLANDS; P.J. van der Zaag, S.-Y. Yoon and N.D. Young, Philips Research Redhill, Surrey, UNITED KINGDOM.

W19.4

INTERDIFFUSION AND INTERMEDIATE PHASE FORMATION IN Cu/Mg MULTILAYERS. M. Gonzalez-Silveira, J. Rodriguez-Viejo, M.T. Clavaguera-Mora, Universidad Autónoma de Barcelona, Physics Dep., Bellaterra, SPAIN.

W19.5

SELECTIVE EPITAXIAL GROWTH OF SiGeC USING A CHLORINATED CHEMISTRY. J.M. Hartmann, V. Loup, G. Rolland, D. Lafond, F. Laugier, P. Holliger and M.N. Semeria, CEA-DRT, LETI/DTS, CEA/GRE, Grenoble, FRANCE.

W19.6

MEASUREMENT OF PHOSPHORUS-COVERAGE ON GALLIUM PHOSPHIDE (001) SURFACES BY REFLECTANCE DIFFERENCE SPECTROSCOPY. D.C. Law, Y. Sun, and R.F. Hicks, Department of Chemical Engineering, University of California, Los Angeles, CA.

W19.7

MOLECULAR DYNAMICS SIMULATION OF TEMPERATURE EFFECT DURING PVD Cu FILM GROWTH ON β -Ta (002)

SURFACE. Youhong Li, James B. Adams, Arizona State Univ, Chemical and Materials Engineering Dept, Tempe, AZ.

SESSION W20: COMPOSITIONAL AND STRUCTURAL MODULATIONS

Chairs: Brian J. Spencer and Jerry Tersoff
Thursday Morning, December 5, 2002
Constitution A (Sheraton)

8:30 AM *W20.1

MECHANISMS OF ALLOY PHASE SEPARATION IN HETEROEPITAXIAL SEMICONDUCTOR FILMS. R.S. Goldman, B. Shin, W. Chen, A. Lin, K. Lappo, Department of MSE, University of Michigan, Ann Arbor, MI; M.C. Hanna, S. Francoeur, A.G. Norman, A. Mascarenhas, National Renewable Energy Laboratory, Golden, CO; J.D. Song, J.M. Kim, Y.T. Lee, Kwangju Institute of Science and Technology, Kwangju, KOREA.

9:00 AM W20.2

LATERAL COMPOSITION MODULATION IN $(\text{InAs})_n/(\text{AlAs})_m$ SHORT PERIOD SUPERLATTICES STUDIED BY X-RAY DIFFRACTION. Jianhua Li, Simon C. Moss, Univ of Houston, Physics Dept, Houston, TX; Vaclav Holy, Masaryk Univ, Dept of Solid State Physics, Brno, CZECH REPUBLIC; Andrew G. Norman, Angelo Mascarenhas, NREL, Golden, CO; John L. Reno, SNL, Albuquerque, NM.

9:15 AM W20.3

THE INFLUENCE OF COMPOSITIONAL STRESS ON SELF-DIFFUSION AND VOIDING IN CRYSTALLINE THIN FILMS: A THEORETICAL TREATMENT. Krishna Garikipati, Hashem Mourad, University of Michigan, Dept of Mechanical Engineering, Ann Arbor, MI.

9:30 AM W20.4

ON THE ROLE OF STRAINS, SURFACE RECONSTRUCTION AND MORPHOLOGY ON INTERFACE INTERMIXING DURING III-V HETEROSTRUCTURE GROWTH. Catherine Priester and Xavier Wallart, IEMN UMR CNRS 8520, Dept ISEN, Villeneuve d'Ascq, FRANCE.

9:45 AM BREAK

10:15 AM *W20.5

MIXING ENERGETICS OF BINARY-ALLOY FILMS COHERENT ON COMPOSITIONAL PERTURBATIONS. S.R. Lee and N.A. Modine, Sandia National Laboratories, Albuquerque, NM.

10:45 AM W20.6

THE EFFECT OF AS SPECIES ON LATERAL COMPOSITION MODULATION IN GaAs/GaSb MULTILAYERS. Catalina Dorin, Joanna Mirecki Millunchick, Chris J. Lane, Department of Materials Science and Engineering, University of Michigan, Ann Arbor, MI; Corinna Wauchope, Electron Microbeam Analysis Laboratory, University of Michigan, Ann Arbor, MI; Chris A. Pearson, Department of Computer Science, Engineering Science and Physics, University of Michigan-Flint, Flint, MI.

11:00 AM W20.7

FIRST-PRINCIPLES MODELING OF NANOMETER-SCALE COMPOSITIONALLY MODULATED STRUCTURES IN ULTRATHIN ALLOY FILMS OF BULK-IMMISCIBLE METALS. Bo Yang and M. Asta, Department of Materials Science and Engineering, Northwestern University, Evanston, IL; V. Ozolins, Sandia National Laboratories, Livermore, CA.

11:15 AM W20.8

THE ORIGINS OF LATERAL COMPOSITIONAL MODULATION: AN IN SITU SCANNING TUNNELING MICROSCOPY STUDY. Chris Pearson, Univ of Michigan-Flint, Dept of Computer Science, Engineering Science and Physics, Flint, MI; Chris Lane, Univ of Michigan, Dept of Materials Science and Engineering, Ann Arbor, MI; Yunqing Chen, Univ of Michigan, Dept of Physics, Ann Arbor, MI; Catalina Dorin, Joanna Mirecki Millunchick, Univ of Michigan, Dept of Materials Science and Engineering, Ann Arbor, MI; Brad Orr, Univ of Michigan, Dept of Physics, Ann Arbor, MI.

11:30 AM W20.9

THE DEPENDENCE OF STRAIN AND COMPOSITION ON COMPOSITIONAL INSTABILITIES ARISING DURING MBE GROWTH OF $\text{Sn}_x\text{Ge}_{1-x}/\text{Ge}(001)$ NANOWIRE ARRAYS. Regina Ragan and Harry A. Atwater, Thomas J. Watson Laboratory of Applied Physics, California Institute of Technology, Pasadena, CA; Jonathan E. Guyer, National Institute of Standards and Technology, Metallurgy Division, Gaithersburg, MD.

11:45 AM W20.10

FIRST-PRINCIPLES CALCULATION OF THE EFFECT OF STRAIN ON THE DIFFUSION OF Ge ADATOMS ON Si (001) AND Ge (001) SURFACES. Axel van de Walle, Mark Asta, Peter Voorhees, Northwestern University, Dept of Materials Science and Engineering, Evanston, IL.

SESSION W21: FORMATION AND STABILITY OF QUANTUM DOT STRUCTURES

Chairs: Martin Kammler and Frances M. Ross
Thursday Afternoon, December 5, 2002
Constitution A (Sheraton)

1:30 PM *W21.1

A CONTINUUM DESCRIPTION OF SELF-ASSEMBLY OF SiGe QUANTUM DOTS BASED ON THE PHYSICS OF SURFACE STEPS. Vivek Shenoy, Cristian Ciobanu, Ashwin Ramasubramanian and Ben Freund, Division of Engineering, Brown University, Providence RI.

2:00 PM W21.2

SELF-ORGANIZED Ge QUANTUM DOTS ON STEP-BUNCHED VS NANOSTRUCTURED Si SUBSTRATES. A. Sgarlata^a, P.D.

Szkutnik^a, S. Nufri^a, A. Balzarotti^a, F. Rosei^{a,c}, N. Motta^{a,b},
^aINFM Dipartimento di Fisica, Universita di Roma Tor Vergata, Roma, ITALY; ^bINFM Dipartimento di Fisica, Universita di RomaTre, Roma, ITALY; ^cINRS-EMT, Varennes (QC), CANADA.

2:15 PM *W21.3

STRUCTURAL PROPERTIES OF SiGe ISLANDS: EFFECT OF CAPPING. J. Stangl, A. Hesse, V. Holy, G. Bauer, Johannes Kepler Universität, Linz, AUSTRIA; U. Denker, O.G. Schmidt, Max-Planck Institut für Festkörperforschung, Stuttgart, GERMANY.

2:45 PM BREAK

3:15 PM *W21.4

KINETIC SURFACE SEGREGATION AND THE EVOLUTION OF NANOSTRUCTURES. Jerry Tersoff, IBM Watson Center, Yorktown Heights, NY.

3:45 PM W21.5

EQUILIBRIUM SHAPES OF QUANTUM DOTS, RINGS, AND MOLECULES IN STRAINED SOLID FILMS. Brian Spencer, Linda Shanahan, SUNY Buffalo, Dept of Mathematics, Buffalo, NY.

4:00 PM W21.6

KINETIC CONTROL OF DOME CLUSTER COMPOSITION BY VARYING Ge DEPOSITION RATE. E.P. McDaniel, Department of Physics and Astronomy, Arizona State University, Tempe, AZ; Jeff Drucker, Department of Physics and Astronomy and Center for Solid State Science, Arizona State University, Tempe, AZ; P.A. Crozier, Center for Solid State Science, Arizona State University, Tempe, AZ.

4:15 PM W21.7

FORMATION OF SELF-ASSEMBLED QUADRUPLET QUANTUM DOT ARRAYS DURING HETEROEPITAXIAL GROWTH IN THE GeSi/Si(100) SYSTEM. J.L. Gray, R. Hull, Department of Materials Science and Engineering, Charlottesville, VA; J.A. Floro, Sandia National Laboratories, Albuquerque, NM.

4:30 PM W21.8

DIRECT MEASUREMENT OF STRAIN DEPTH PROFILE CHANGE IN Ge NANOSTRUCTURES ON Si(001) WITH PYRAMID TO DOME SHAPE TRANSITION. D.W. Moon, H.I. Lee, Korea Research Institute of Standards and Science, NanoSurface Group, Daejeon, KOREA; B. Cho, C.P. Liu, M.A. Wall, and J.E. Greene, University of Illinois, Dept of Materials Science and the Frederick Seitz Materials Research Laboratory, Urbana, IL.

4:45 PM W21.9

ANOMALOUS X-RAY DIFFRACTION FROM IV-VI SEMICONDUCTOR MULTILAYERS AND QUANTUM DOTS. Tobias U. Schuelli, Michael Sztucki, Till H. Metzger, European Synchrotron Radiation Facility (ESRF), Grenoble, FRANCE; Rainer T. Lechner, Julian Stang, Gunther Springholz, Guenther Bauer, Institute for Semiconductor Physics, Johannes Kepler Universitaet Linz, Linz, AUSTRIA.