SYMPOSIUM Y

Surface Engineering 2002—Synthesis, Characterization, and Applications

December 2 – 5, 2002

Chair: Ashok Kumar

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*Invited paper

SESSION Y1: NANO. AND MICRO-METER SCALE CHARACTERIZATION AND PROPERTIES

Chairs: Ashok Kumar and Wen J. Meng

Monday Morning, December 2, 2002

Constitution B (Sheraton)

8:30 AM *Y1.1

A NEW APPROACH TO MEASURING THE ELASTIC MODULUS OF THIN FILMS AND SURFACE LAYERS BY NANOINDENTATION. George M. Plumer, Andrei Rar, The University of Tennessee, Dept. of Materials Science & Eng., Knoxville, TN, and Oak Ridge National Laboratory, Metals and Ceramics Division, Oak Ridge, TN; Hauke Song, Rice University, Dept. of Materials Science and Engineering, Houston, TX.

9:00 AM Y1.2


9:15 AM Y1.3

POSSIBLE ARTIFACTS IN HARDNESS MEASUREMENTS ON SUPERHARD COATINGS AND THE VERIFICATION OF THE CORRECTNESS OF THE DATA. S. Vepejek, S. Mukherjee, P. Kurvankova, H. D. Maehn, J. L. He, Institute for Chemistry of Inorganic Materials, Technical University Munich, Germany; A. S. Argon, Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA.

9:30 AM Y1.4

CHARACTERIZATION OF THE SHAPE MEMORY AND SUPERELASTIC EFFECTS BY INSTRUMENTED INDENTATION EXPERIMENTS. Wangying Ni, Yang-Tze Cheng, Materials and Processes Laboratory, General Motors Research and Development Center, Warren, MI; David S. Grummon, Department of Chemical Engineering and Materials Science, Michigan State University, East Lansing, MI.

9:45 AM Y1.5

NANOINDENTATION AND DEFORMATION OF NIOBIUM PENTOXIDE FILMS ON NIOBIUM SINGLE CRYSTALS. C. Callanan, R. Ghosh, University of Michigan, Ann Arbor, MI; V. K. Sehi, Western Research Institute, Laramie, WY.

10:00 AM BREAK

10:30 AM Y1.6

CHARACTERIZATION AND ANALYSIS OF MICROSCALE STRAIN DISTRIBUTIONS OF INDENTED POLYCRYSTALLINE SURFACES. Changjin Xie, Hong Tao, and Wei Tong, Department of Mechanical Engineering, Yale University, New Haven, CT.

10:45 AM Y1.7

BILINEAR BEHAVIOR IN THE INDENTATION SIZE EFFECT: CONSEQUENCES IN STRAIN GRADIENT PLASTICITY. A. A. Elmastshian, NASA Langley Research Center-CentSIS, Hampton, VA; J. Lou, W. O. Schjegge, Department of Mechanical and Aerospace Engineering and Princeton Material Institute, Princeton, NJ; D. S. Stone, Department of Materials Science & Engineering, University of Wisconsin-Madison, Madison, WI.

11:00 AM Y1.8

ADHESION OF THIN DUCTILE FILMS USING STRESSED OVERLAYERS AND NANOINDENTATION. M. J. Caddell, Washington State University, Pullman, WA; N. R. Moody, Sandia National Laboratories, Livermore, CA; D. F. Bahr, Washington State University, Pullman, WA.

11:15 AM Y1.9

NEAR FRICTIONLESS CARBON (NFC) FILMS FOR TRIBOLOGICAL APPLICATIONS — A NEUTRON REFLECTIVITY AND UV RAMAN STUDY. Jacqueline Johnson, John Woodford, Ali Erdemir, Energy Technology Division, Argonne National Laboratory, Argonne, IL.

11:30 AM Y1.10

CHARACTERIZATION AND TRIBOLOGICAL TESTING OF CARBIDE-DERIVED CARBON FILMS ON SILICON CARBIDE SUBSTRATES. Beth Carroll, Yuriy Gogotsi, Drexel University, Dept of Materials Engineering, Philadelphia, PA; Michael McNallan, University of Illinois at Chicago, Dept of Civil and Materials Engineering, Chicago, IL; Ali Erdemir, Andry Kovshchenko, Argonne National Laboratory, Energy Technology Division, Argonne, IL.

11:45 AM Y1.11

MICROSTRUCTURE AND TRIBOLOGICAL BEHAVIOR OF SURFACE ALLOYED BIMETALLIC LAYERS PRODUCED BY PULSED ION BEAMS. T. J. Benk, P. P. Provencio, S. V. Prasad, Sandia National Laboratories, Albuquerque, NM; M. O. Thompson, Cornell University, Ithaca, NY.

SESSION Y2: NANOSTRUCTURED MATERIALS

Chairs: Jeffrey S. Zabinski and Steve J. Bull

Monday Afternoon, December 2, 2002

Constitution B (Sheraton)

1:30 PM Y2.1

NANOMANUFACTURING INFRASTRUCTURE: CHALLENGES AND OPPORTUNITIES. Hani Dossoumou, National Science Foundation, DMI Nanomanufacturing, Arlington, VA.

2:00 PM Y2.2

TOUGHENING MECHANISMS IN NANOSTRUCTURED HARD THIN FILMS BY NANOINDENTATION. A. Kurimi, A. E. Santos, Faculty of Basic Science, Swiss Federal Institute of Technology (EPFL), T. Gess, M. Monstein, Phat A. Grenchen, Switzerland.

2:15 PM Y2.3


2:30 PM Y2.4

CHARACTERIZATION AND TRIBOLOGICAL PROPERTIES OF NANOSTRUCTURED COPPER/CARBON COMPOSITE FILMS PREPARED BY MICROWAVE PLASMA-ASSISTED DUAL DEPOSITION PROCESSES. F. Thiery, Y. Paulou, J. Pelletier, CNRS-LMDC, Grenoble, France; J. Treix, CNRS-PHASE, Strasbourg, France; M. Belin, J. Fontaine, CNRS-LIDS, Ecole Centrale de Lyon, France.

2:45 PM Y2.5


3:00 PM BREAK
3:30 P.M. **Y3.6**
NOVEL NANOSTRUCTURED METAL AND CERAMIC COMPOSITES. Jagdish Narayan, North Carolina State Univ, Dept of Materials Science and Engineering, Raleigh, NC.

4:00 P.M. **Y3.7**
SYNTHESIS OF SEQUENTIAL NANOSTRIPES BY CONTROLLED ELECTROCHEMICAL DEPOSITION. M. Mikhailov, M. Toprek, D.K. Kim, and M. Muhammed, Dept. of Material Science and Engineering, Royal Institute of Technology, SWEDEN.

4:15 P.M. **Y3.8**
TEM CHARACTERIZATION OF TaIN/Ni AND CrN/Ni/TaN NANO-SCALE MULTILAYERS. Q. Luo, Sheffield Hallam University. Materials Research Institute, Sheffield, UNITED KINGDOM. Z. Zhou, W.M. Rainforth, University of Sheffield, Department of Engineering Materials, Sheffield, UNITED KINGDOM. P.H. Horrobin, D.B. Lewis, W-D. Münz, Sheffield Hallam University. Materials Research Institute, Sheffield, UNITED KINGDOM.

4:30 P.M. **Y3.9**
THERMAL STABILITY OF NANOCRYSTALLINE DIAMOND FILMS GROWN BY MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION. Mevlüt Balu, Shane A. Carledge, Yogesh K. Vohra, Renato P. Camia, University of Alabama at Birmingham, Department of Physics, Birmingham, AL.

4:45 P.M. **Y3.10**
PROCESSING AND CHARACTERIZATION OF CVD c-BN FILMS AND c-BN/HQD AMONOLAMINATES. Tien-Syh Yang, Jong-Bin Cheng, Ming-Show Wong, Department of Materials Science and Engineering, National Dong Hwa University, Taiwan, ROC.

SESSION Y3: DEPOSITION, CHARACTERIZATION, AND PROPERTIES OF FILMS AND COATINGS

- Chairs: Gary L. Doll and Elizabeth P. Cooke
- Tuesday Morning, December 3, 2002
- Constitution B (Sheraton)

NOTE EARLY START

8:15 A.M. **Y3.1**
STRESS AND NANOPATTERN FORMATION IN THIN FILMS. H.M. Clemen, W.D. Nix, K.J. Cho, R.F. Subbaram, M.J. Lasseter, V. Ramaswamy, G. Hassen, Y-W. Lee, and A. Chandra, Department of Materials Science and Engineering, Stanford University, Stanford, CA; D. Chrzan and P.A. Greaney, Department of Materials Science and Engineering, University of California-Berkeley, Berkeley, CA.

8:45 A.M. **Y3.2**
IN SITU MONITORING OF STRESSES IN Ti:CH CERAMIC NANO COMPOSITE COATINGS. B. Shi, W.J. Meng, Mechanical Engineering Department, Louisiana State University, Baton Rouge, LA; L.E. Rehn, P.M. Bald, Materials Science Division, Argonne National Laboratory, Argonne, IL.

9:00 A.M. **Y3.3**
IN SITU FRACTURE AND ADHESION FAILURE OF Al-Co-Fe QUASICRYSTALLINE FILMS. Matthew Daniels, Benjamin French, John C. Bickel, Center for Nanoscale Materials Science, University of Michigan, Ann Arbor, MI; David King, Technology Assessment and Transfer, Annapolis, MD.

9:15 A.M. **Y3.4**
FILM STRESS CHARACTERIZATION USING SUBSTRATE SHAPE DATA AND NUMERICAL TECHNIQUES. Zhichun Feng, Edward G. Lovell, Roxann L. Engelstad, Andrew R. Mikloshen, Phillip L. Res, and Jeewong Shin, Computational Mechanics Center, University of Wisconsin, Madison, WI.

9:30 A.M. **Y3.5**
MIXED-MODE THIN FILM ADHESION MESSUREMENT BY LASER GENERATED STRESS WAVES. Junhua Wang, Nancy R. Sotos, Richard L. Werner, University of Illinois at Urbana-Champaign, Dept of Theoretical and Applied Mechanics, Urbana, IL.

9:45 A.M. **Y3.6**
ION ENERGY/MOMENTUM EFFECTS DURING ION ASSISTED GROWTH OF NbN FILMS. Melissa Klages, Concurrent Technologies Corp, Johnstown, PA; Russell Mennig, Pennsylvania State University, Dept of Engineering Science and Mechanics, University Park, PA.

10:00 A.M. **Y3.7**
HARDNESS AND WEAR OF PVD HARD COATINGS: A COMPARISON. W-D. Münz, Materials Research Institute, Sheffield Hallam University, Sheffield, UNITED KINGDOM.

10:15 A.M. **Y3.8**

11:00 A.M. **Y3.9**
NOVEL COMPOSITE COATINGS WITH 3D COATING ARCHITECTURES FOR TRIBOLOGICAL APPLICATIONS FABRICATED USING SEMICONDUCTOR PATTERNING PROCESSES. James E. Krznaric, Jose L. Endrino, Mechanical Engineering Department, University of New Hampshire, Durham, NH; Keri Hirschman, Semiconductor and Microsystems Fabrication Laboratory, Rochester Institute of Technology, Rochester, NY.

11:15 A.M. **Y3.10**
STRUCTURAL INVESTIGATION OF ALUMINA THIN FILMS DEPOSITED BY CHEMICAL VAPOR DEPOSITION. P. Bekaszynska, S. Blittersdorf, B. Arolaks, K. Kohne-Heinrich, J. Müller, Physical Chemistry I, Bielefeld University, Bielefeld, GERMANY; "Institute of Combustion and Gidynamics, Gerhard-Mercator-University Duisburg, Duisburg, GERMANY; "Institute for Theoretical Metallurgy, RWTH Aachen, GERMANY.

11:30 A.M. **Y3.11**
THIN FILM GROWTH BY PVD IN THE PRESENCE OF RESIDUAL GAS. Jochen M. Schneider, Materials Chemistry, RWTH Aachen, Aachen, GERMANY.

SESSION Y4: INDUSTRIAL APPLICATIONS OF SURFACE ENGINEERING

- Chairs: Dieter Munz and James E. Krznaric
- Tuesday Afternoon, December 3, 2002
- Constitution B (Sheraton)

1:30 P.M. **Y4.1**
NANOCOMPOSITE AND NANORAGRENIENT COATINGS FOR CUTTING TOOLS. Marcus Moselein, T. Cielie, PhD AG, Grenchen, SWITZERLAND; P. Holub, M. Jilek, SHM Ltd, Novy Malin, CZECH REPUBLIC; A. Kirimi, EPF Lausanne, SWITZERLAND.

TOWARDS INDUSTRIALIZATION OF SUPERHARD NANOCRYSTALLINE COMPOSITES FOR HIGH SPEED AND DRY MACHINING. Majmir Jalil, Pavel Holub, SHM, Novy Malin, CZECH REPUBLIC; Stan Vajsek, Technical University Munich, Institute for Chemistry of Inorganic Materials, Munich, GERMANY.

INVESTIGATIONS OF MULTIFUNCTIONAL ZIRCON CARBIDE GRADIENT PVD COATINGS FOR THE APPLICATION ON MACHINE PARTS. E. Luippenscheider, O. Krusek, K. Boxsz, M. Muen, A. Juelich, RWTH Aachen, Material Science Institute, Aachen, GERMANY.

2:30 P.M. **Y4.4**
NANOCOMPOSITE TRIBOLOGICAL COATINGS WITH "CHAMELEON" SURFACE ADAPTATION. A.A. Vorotnikov, Air Force Research Laboratory, Materials and Manufacturing Directorate, Wright Patterson Air Force Base, OH.

3:00 P.M. BREAK

3:30 P.M. **Y4.5**
MACRO AND MICRO PERSPECTIVE FOR HIGH SPEED MACHINING. Amitabh Vyas, The Boeing Company, Boeing Commercial airplane Group, Manufacturing Research & Development, Wichita, KS.

4:00 P.M. **Y4.6**
STRUCTURE AND FORMATION OF WHITE LAYERS IN STEELS BY MACHINING. Shawn P. Mogul, Stevivan Swaminathan and Stevivan Chandrasekar, Center for Materials Processing and Tribology, School of Industrial Engineering, Purdue University, West Lafayette, IN.

4:15 P.M. **Y4.7**
ELEMENTAL DISTRIBUTIONS IN Ta/Ni/YN MULTILAYER
HARD COATINGS USING FIELD EMISSION GUN ANALYTICAL TRANSMISSION ELECTRON MICROSCOPY. Zuzana Zhou, W. Mark Rainforth, Peples Eh, Honsegin *+, and W. Deter Mize*, Department of Engineering Materials, The University of Sheffield, Sheffield, UNITED KINGDOM, *Materials Research Institute, Sheffield Hallam University, Sheffield, UNITED KINGDOM.

4:30 PM #6.8
NANOCOMPOSITE TRIBOLOGICAL COATINGS FOR ROLLING ELEMENT BEARINGS. Elizabeth P. Cooke, Gary I. Doll, Carl R. Ribnido, Ryan D. Evans, The Timken Company, Canton, OH.

SESSION V5 POSTER SESSION
SYNTHESIS AND CHARACTERIZATION
Chair: Ashok Kumar, Wen J. Meng, Yang Tse Cheng, Jeffrey S. Zubiak, Gary I. Doll and Stan Veggek Tuesday Evening, December 3, 2002
8:00 PM
Exhibition Hall D (Hynes)

V5.1
STRUCTURE AND ELECTRICAL PROPERTIES OF PULSED LASER DEPOSITED AMORPHOUS CARBON NITRIDE THIN FILMS. Yoshifumi Aoi, Kojiro Oto, Kunio Sukada, Eiji Kamiyo, Ryoiku Univ, Dept of Materials Chemistry, Shiga, JAPAN.

V5.2
STRUCTURAL, MECHANICAL AND TRIBOLOGICAL PROPERTIES OF MOLYBDENUM DISULFIDE AND METAL (Cr, Ti, Ni, Co, Al) MULTILAYERED FILMS DEPOSITED BY PULSED LASER DEPOSITION TECHNIQUE. A.R. Phani, J.E. Kranzowski, Dept of Mechanical Engineering, University of New Hampshire, Durham, NH.

V5.3
SYNTHESIS AND CHARACTERIZATION OF TRANSITION METAL-CONTAINING CARBON FILMS BY LASER ABLATION OF CARBONACEOUS TARGETS CONTAINING TRANSITION METAL IN OXYGEN ATMOSPHERE. T. Yamamoto, S. Saida, S. Akiba, M. Yoshimoto, Tokyo Inst. of Tech., Yokohama, JAPAN; M. Tahayoku, NIMS, Tsukuba, JAPAN; Y. Takagi, Teikyo Univ. of Sci. & Tech., Yokohama, JAPAN.

V5.4
GROWTH OF FUN/AIN SUPERLATTICE BY PULSED LASER DEPOSITION. H. Wang, Ashokshi Tiwari, A. Gupta, X. Zhang, and J. Narram, North Carolina State University, Raleigh, NC.

V5.5
PHOTOCHEMICAL LAMINATION OF LOW REFRACTIVE INDEX TRANSPARENT SiO2 FILM AT ROOM TEMPERATURE FOR ANTIREFLECTION COATING. Yoshiro Ogawa, Manato Murahara, Tokai Univ, Department of Electrical Engineering, Kanagawa, JAPAN.

V5.6
LOW TEMPERATURE DEPOSITION OF ULTRANANO-CRYSTALLINE DIAMOND BY MPCVD. X. Xiao, O. Anciello, J. Barrass, J.E. Gerbi and J.A. Carlisle, Argonne National Laboratory, Argonne, IL.

V5.7
HARDENING MECHANISMS OF AMORPHOUS / POLYCRYSTALLINE NANOSTRUCTURED MULTILAYER FILMS. Junhua Xu, Luhua Yu, Yasashi Azuma, Koichi Hatter, Isao Kojima, Materials Characterization Division, National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology, AIST, Tsukuba, JAPAN.

V5.8
THE NUCLEATION AND GROWTH OF NANO-STRUCTURED DIAMOND ON PHOSPHOR AND BORON ION IMPLANTED Si SUBSTRATES. C.Z. Gu*, Y. Sun†, J.K. Jin† and Z.J. Jin†, *State Key Laboratory of Surface Physics, Institute of Physics, Chinese Academy Science, Beijing, CHINA; †State Key Laboratory of Superhard Materials, Jilin University Changchun, CHINA.

V5.9
NANOSTRUCTURED DLC:Au COMPOSITES FOR BIOMEDICAL APPLICATIONS. B.J. Narram, H. Wang, A. Tiwari, North Carolina State Univ, Raleigh, NC.

V5.10
PLASMA-ENHANCED CHEMICAL VAPOR DEPOSITION OF HIGH QUALITY CUBIC BN FILMS WITH AN INTERMEDIATE LAYER OF TURBOSTRUCTURE BN THINNER THAN 3 NM.

Y5.23 TANTALUM NITRIDE SEED LAYERS FOR BCC TANTALUM COATINGS DEPOSITED ON STEEL BY MAGNETRON SPATTERING. Amrita Patel, Leszek Gladzuk, Charanjit Singh Puar, Chirag Joshi, Marek Sosnowski, Dept. of Electrical Engineering, New Jersey Institute of Technology, Newark, NJ; Daniel R. Morse, Tarleton State University, Stephenville, TX.

Y5.24 FABRICATION OF THERMAL BARRIER COATINGS USING ELECTROPHORETIC DEPOSITION AND LOW TEMPERATURE SINTERING. Ying Yuan, Nadine Cornet, Ping Xiao, University of Manchester, Manchester Materials Science Centre, UNITED KINGDOM.

Y5.25 USING OF SIL TECHNOLOGY FOR SURFACE MODIFICATION OF SiO2 FILMS FOR GAS SENSOR APPLICATIONS. Ghasem Korotevich, Vladimir Mostovoy, Vladimir Bruzar, Yulia Beis, Lab. of Microelectronics, Technical University of Moldova, Chisinau, MOLDOVA; Valery Tolstoy, Dept. of Chemistry, St. Petersburg State University, St. Petersburg, RUSSIA; Johannes Schwank, Dept. of Chemical Engineering, University of Michigan, Ann Arbor, MI.

Y5.26 ON THE GROWTH OF FULLERENELIKE CARBON NITRIDE THIN FILMS BY LOW-ENERGY (<100 eV) ION BEAM ASSISTED DEPOSITION. Paul Gray, Andrew Kolitsch, Wolfram Moeller, Inst of Ion Beam Physics and Materials Research, Research Center Rosendorf, Dresden, GERMANY.

Y5.27 THERMAL AND MASS BALANCE IN REACTIVE THERMAL DEPOSITION OF NICKEL ALUMINIDE COATINGS ON STEEL SUBSTRATES. Rajesh Rangarajan, Northeastern University, Boston, MA; Anastassia Paskaleva, Tufts University, Medford, MA; Charalabos C. Doumanidis, Tufts University, Medford, MA; Teijichi Araki, Northeastern University, Boston, MA.

Y5.28 MICROSTRUCTURE AND STRESS ANALYSES OF COPPER FILMS DEPOSITED ON BIASED SUBSTRATES BY MICROWAVE PLASMA-ASSISTED SPATTERING. F. Thery, Y. Paulsen, Y. Armain, S. Bechu, and J. Pelletier, CNRS-LED, Grenoble, FRANCE; L. Ortega, CNRS-Cristallographie, Grenoble, FRANCE.

Y5.29 ALUMINUM OXIDE COATINGS ON NICKEL SUBSTRATE BY METAL ORGANIC CHEMICAL VAPOR DEPOSITION. Jun Nable, Malgorzata Ganczarska, Steven L. Sui, Francis Galasso, University of Connecticut, Department of Chemistry, Storrs, CT.

Y5.30 SURFACE MODIFICATION OF SPATTERED SILICON DIOXIDE THIN FILMS BY METAL DOPING. Satoshi Takeda, Makoto Fukumaa, Aihui Glass Co., Ltd., Research Center, Yokohama, JAPAN.

Y5.31 SURFACE MODIFICATION OF ALUMINUM-6061 BY PLASMA IMMERSION ION implantation - ION BEAM ENHANCED DEPOSITION (PIEBD). P. Peng, X.B. Tian, P.K. Chu, Dept. of Physics and Materials Science, City University of Hong Kong, Kowloon, HONG KONG; B.Y. Tang, G.W. Zhang, National Key Lab on Modern Welding Production Technology, Harbin Institute of Technology, Harbin, CHINA; S.P. Wang, Dept. of Electronic Engineering, Chinese University of Hong Kong, Shatin, HONG KONG.

Y5.32 Transferred to Y8.46

Y5.33 EFFECTS OF IRRADIATION TIME BY LOW ENERGY NITROGEN IONS ON CARBON NITRIDE THIN FILMS. Yuko Naga, Masami Aono, Shinichiro Aizawa, Nobuki Kitamura, and Yoshitaka Watanabe, Department of Materials Science and Engineering, National Defense Academy, Kanagawa, JAPAN.

Y5.34 SURFACE MODIFICATION USING IRON ALUMINIDE-BASED COMPOSITE COATINGS. G. Marukihiron, P.G. Engleman, C.A. Blue, V.K. Sklin, Metals and Ceramics Division, Oak Ridge National Laboratory, Oak Ridge, TN; N.B. Dukore, Department of Materials Science and Engineering, University of Tennessee, Knoxville, TN.

Y5.35 CORROSION PROTECTION OF DEPLETED URANIUM VIA PLASMA SOURCE ION IMPLANTATION AND ION BEAM ASSISTED DEPOSITION. J. Derek Demaree, Army Research Laboratory, Aberdeen Proving Ground, MD.

Y5.36 ION BEAM ETCHING OF CVD DIAMOND ENHANCED BY PRIOR Au AND O IMPLANTATION. Patrick W. Leech, CSIRO, Division of Manufacturing Science and Technology, Melbourne, AUSTRALIA; Geoffrey K. Reeves and Anthony Holland, RMIT University, School of Computer Systems and Electrical Eng., Melbourne, AUSTRALIA; Mark C. Ridgway, Dept. of Electronic Materials Engineering, Australian National University, Canberra, AUSTRALIA.

Y5.37 TAILORED SURFACE FUNCTIONALITIES BY MICROSTRUCTURING. H. Hacke, Y. Gerbag, L. Ahmed, CSEM Swiss Center for Electronics and Microtechnology Inc, Neuchatel, SWITZERLAND; G. Dumitru, V. Romano, Univ Berne, Inst Appl Phys, SWITZERLAND.


Y5.39 SURFACE HARDENING EFFICIENCY OF MEDIUM-ENERGY LIGHT IONS ON POLYCARBONATE. David B. Poley, Oak Ridge National Laboratory, Oak Ridge, TN.

Y5.40 ION-BEAM MODIFICATION OF METAL-POLYMER COATINGS. T.D. Badgley, A.I. Kamarov, A.V. Shchurov, SIA "Academperobor," Tashkent, UZBEKISTAN.

Y5.41 ELECTRONIC DOPING OF C60 SURFACE LAYERS: EVALUATING THE FEASIBILITY OF IRON INCORPORATION IN C60 WITH LOW ENERGY IONS. P. Reineke, P. Reineke, S. Eyhsen, 2. Physikalisches Institut, Universität Göttingen, Göttingen, GERMANY.

Y5.42 ELECTRICAL RESISTIVITY OF SHOCK WAVE INDUCED POLYMORPHIC SILICON BY HIGH-TEMPERATURE THERMAL SPALLING. S.Y. Tan, R.J. Gambino, R. Giovannini, S. Sampath, H. Herman, SUNY at Stony Brook, Dept of Materials Science and Engineering, Stony Brook, NY.

Y5.43 BRIGHT NITRIDING OF FERRITIC STEEL UNDER PVD CONDITIONS. J.D. Kemmer, a Netherlands Institute for Metals Research, Delft, NETHERLANDS; G.C.A.M. Janssen, Delft University of Technology, Materials Science Dept, Delft, NETHERLANDS.

Y5.44 NOVEL METHOD FOR FABRICATING CERAMIC SURFACES COMPRISED OF ORIENTED NONFIBERS. Sho-Suen Yoo, Sheikh A. Akbar, Ken H. Sandhage, Dept of Materials Science and Engineering, The Ohio State Univ, Columbus, OH.

Y5.45 Abstract Withdrawn

Y5.46 ATTENUATION OF SURFACE ACoustic WAVES BY CARBON NANOtUBES. Dariusz Cyplik, Renesas Polytechnic Inst, Dept of Electrical, Computer, and Systems Engineering, Troy, NY; and Vilnius University, Dept of Radiophysics Vilnius, LITHUANIA; Sergey Rumyantsev, Michael Shur, Renesas Polytechnic Inst, Dept of Electrical, Computer, and Systems Engineering, Troy, NY; Robert Vajtai, Bingbing Wei, Pulikkel Ajayam, Renesas Polytechnic Inst, Dept of Materials Science and Engineering, Troy, NY; Remis Gaid, Sensor Electronic Technology Inc., Latham, NY; Roman Wadzek, Rimeik, a
SESSION Y6: ATOMIC AND CONTINUUM MODELING OF MATERIALS PROPERTIES
Chongsan Y. Choi, Yee Sang Lee, University of Illinois, Urbana-Champaign, USA
Wednesday, December 6, 2002

8:30 AM **Y6.1**
MODELLING THE MECHANICAL AND TRIBOLOGICAL PROPERTIES OF MULTILAYER COATINGS. J.A. de la Fuente, University of Bristol, UK

9:00 AM **Y6.2**
EFFECTS OF INCLUSIONS AND POROSITY ON THE INDENTATION RESPONSE. G.C. Sobjor, Technical University of Denmark, Denmark

9:30 AM **Y6.3**
MOLECULAR DYNAMICS SIMULATION OF WEAR PROCESSES. H. Poon, North Carolina State University, USA

9:45 AM **Y6.4**
ADHESION AND INTERFACE AND INTERFACE STRENGTH OF THE ALTi(DIAMOND)(111) INTERFACE: A FIRST PRINCIPLES SIMULATION. Yue Qi, University of Notre Dame, USA

10:00 AM **Y6.5**
FIRST-PRINCIPLES INVESTIGATIONS OF THE FORMATION AND STABILITY OF EARLY TRANSITION-META NITRIDE SURFACES, INTERFACES, AND NANO-LAYERED STRUCTURES: AlN/VOO/VO, AlN/VO/VO, and AlN/VO/VO. T. K. Chen, Brown University, USA

10:30 AM **Y6.6**
HIGH-ENERGY DIAMOND-NANOSTRUCTURED GOLD: A MOLECULAR DYNAMICS SIMULATION. Q. Chen, University of California, USA

11:00 AM **Y6.7**
A TRANSPORT-DAGGER APPROACH TO THE ROUTE OF RESISTANCE. D. Feinberg, R. M. Farrow, R. T. K. Chang, A. Y. C. Kung, University of California, USA

11:30 AM **Y6.8**
DETERMINING STAIN DEFEATING CONSTITUTIVE MODELS FROM CONICAL INDENTATION: A SENSITIVITY ANALYSIS. J. W. C. Peng, T. W. C. Tsang, University of California, USA

11:45 AM **Y6.9**
Elastic Recovery and Reloading of HARDNESS.

SESSION Y7: SURFACE ENGINEERING ISSUES IN MEMS STRUCTURES AND DEVICES
Chairs: Thomas E. Buchheit and Orlando Auricchio
Wednesday, December 6, 2002

1:00 PM **Y7.1**
ULTRANANOCRYSTALLINE DIAMOND FOR TRIBOMECHANICAL SYSTEMS. M. C. Mosconi, A. Spaggiari, University of Padua, Italy

2:00 PM **Y7.2**
ENVIRONMENT-INDUCED EFFECTS ON DIAMOND FRICTION AND WEAR. D. Auffinger, J. M. Monroe, University of California, USA

3:00 PM **Y7.3**
DETERMINING THE EFFECTS OF DIAMOND FRICTION AND WEAR. H. B. Frenkel, B. M. Deloef, University of California, USA

4:00 PM **Y7.4**
INTERPLAY BETWEEN THE LITHOGRAPHIC AND FIBER LITHOGRAPHIC SYSTEMS. G. B. Frenkel, B. M. Deloef, University of California, USA

5:00 PM **Y7.5**
DIAGNOSING THE EFFECTS OF DIAMOND FRICTION AND WEAR. H. B. Frenkel, B. M. Deloef, University of California, USA

6:00 PM **Y7.6**
DETERMINING THE EFFECTS OF DIAMOND FRICTION AND WEAR. H. B. Frenkel, B. M. Deloef, University of California, USA

7:00 PM **Y7.7**
INTERPLAY BETWEEN THE LITHOGRAPHIC AND FIBER LITHOGRAPHIC SYSTEMS. G. B. Frenkel, B. M. Deloef, University of California, USA

8:00 PM **Y7.8**
DIAGNOSING THE EFFECTS OF DIAMOND FRICTION AND WEAR. H. B. Frenkel, B. M. Deloef, University of California, USA

9:00 PM **Y7.9**
DETERMINING THE EFFECTS OF DIAMOND FRICTION AND WEAR. H. B. Frenkel, B. M. Deloef, University of California, USA
SESSION V8: POSTER SESSION
MECHANICAL, TRIBOLOGICAL, AND OTHER PROPERTIES

Chair: Ashok Kumar, Wen J. Meng, Yang Tse Cheng, Jeffrey S. Zukuni, Gary L. Doll and Stan Vogrek
Wednesday Evening, December 4, 2002
8:00 PM
Exhibition Hall D (Hynes)

Y8.1 STRUCTURE AND MECHANICAL PROPERTIES OF Ts-SiN NANOCOMPOSITE COATINGS. X.D. Zhang, W.J. Meng, Mechanical Engineering Department, Louisiana State University, Baton Rouge, LA, I.E. Rehn, P.M. Budko, Materials Science Division, Argonne National Laboratory, Argonne, IL.

Y8.2 MECHANISMS OF LUBRICATION AND WEAR IN NANOCOMPOSITE HfC-Ag AND SiC-Ag THIN FILMS. Jose L. Endrino, and James E. Kranowski, Mechanical Engineering Department, University of New Hampshire, Durham, NH, Jose J. Ninaprapamul, Air Force Wright Laboratory, Materials Directorate, Wright Patterson AFB, OH.

Y8.3 THE ADHESION BEHAVIOR OF ALUMINA-BASED CERAMIC COATINGS AND NANOARCHITECTURES. Maksim V. Kiretskev, L.V. Yernkhawa, Ian Nemerenko, Institute of Machine Reliability, National Academy of Sciences, Minsk, BELARUS.

Y8.4 SIMPLE METHODS FOR MEASURING TENSILE AND SHEAR BOND STRENGTH AND FOR DETERMINING ELASTIC MODULUS AND STRENGTH OF BRITTLE COATING. Yiwen Bao, Yunhuan Zhou, Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Science, Shenyang, CHINA.

Y8.5 DEVELOPMENT OF IN-SITU SURFACE OBSERVATION SYSTEM WITH AN ATOMIC RESOLUTION UNDER TENSILE STRESS BY ATOMIC FORCE MICROSCOPE. Akhino Masaaru, Kimaharu Kiyakawa, Yohes Fujimoto, Taeke Ando and Kamo Sato, Nagoya Univ, Dept of Micro System Engineering, Nagoya, JAPAN.

Y8.6 FAILURE MECHANISM RESEARCHES OF MATERIAL SURFACE AND INTERFACE IN MICRO-SCRATCH TEST. Yuegunan Wei, Manhong Zhao, Shao Tang, LNM, Institute of Mechanics, Chinese Academy of Sciences, Beijing, CHINA.

Y8.7 MAPPING OF SURFACE RESIDUAL STRESS FIELD BY LASER INTERFEROMETRY USING STRESS RELAXATION METHOD. Dongwon Kim, Dongil Kwon, Seoul National University, School of Material Science and Engineering, National Research Lab. for NanoAssessment & MicroReliability, Seoul, KOREA.

Y8.8 CORRELATION OF STRESS AND PHASE EVOLUTION OF THIN Ta FILMS ON Si (100) DURING THERMAL TESTING. B.L. Benn, M.J. Daniels, and J.C. Biddle, Center for Nanomaterials Science, Department of Materials Science and Engineering, University of Michigan, Ann Arbor, MI.


Y8.10 SUBMICRON RESOLUTION 3D X-RAY STRUCTURAL MICROSCOPY FOR INVESTIGATIONS OF DEFORMATION BELOW NANOINDENTS. B.C. Lawson, Wenge Yang, G.E. Ie, J.D. Budai, and J.Z. Tischler; Oak Ridge National Laboratory, Oak Ridge, TN.

Y8.11 MATERIAL MECHANICAL PROPERTIES INFLUENCE ON THE RATIO OF DRILLING THRUST TO HARDNESS. Glouad Mouvono, Oliver Butler, Rochel El Abd, Ali Nepadi, Rene 1 University, Lomar, Rennes, FRANCE.

Y8.12 NONINDENTATION-INDUCED DEFORMATION MECHANISMS OF CRYSTALLINE SEMICONDUCTOR MATERIALS. J.E. Brady, J.S. Williams, and J. Weng-Leung, The Australian National University, Department of Electronic Materials Engineering, Research School of Physical Sciences and Engineering, Canberra, AUSTRALIA; M.V. Swan The University of Sydney, Biomaterials Science Research Unit, Department of Mechanical and Mechatronic Engineering and Faculty of Dentistry, AUSTRALIA; P. Munroe University of New South Wales, Electron Microscope Unit, Sydney, AUSTRALIA.

Y8.13 MECHANICAL PROPERTIES OF PULSED LASER DEPOSITED HYDROXYAPATITE THIN FILMS FOR APPLICATIONS IN BIOMEDICAL IMPLANTS. Hyung Kim, Shane A. Carledge, Yogesh K. Vohra, Renato P. Carmin, University of Alabama at Birmingham, Dept of Physics, Birmingham, AL, William R. Lancefield, University of Alabama at Birmingham, Dept of Prosthodontics and Biomaterials, Birmingham, AL.

Y8.14 ACTIVATION VOLUME ANALYSIS FOR Cu/Ag NANOLAYER COMPOSITES AND BULK Cu-BrASS AND ALUMINUM FCC MATERIALS USING NANOINDENTATION. A.A. Elharrasi, NASA Langley Research Center, ContTS, Hampton, VA; P.M. Tambe, Intel Corporation, Portland, OR; D.S. Stone, Department of Materials Science & Engineering, University of Wisconsin-Madison, Madison, WI.

Y8.15 PATTERNED MICROSTRUCTURE OF TWO-DIMENSIONAL CRYSTALS OF POLYSTYRENE COLLOIDAL MICROSHERES FORMED BY MICROCONTACT PRINTING TECHNOLOGY AND SURFACE PROPERTIES. Shifeng Hao, Eric Geiss, Baoshong Yang, Harris Marcum, and Foixas Popadimitrakopoulos; “Nanomaterials Optoelectronics Laboratory, Department of Chemistry, Polymer Program, Department of Metallurgy & Materials Engineering, Institute of Materials Science, University of Connecticut, Storrs, CT.

Y8.16 INFLUENCE OF INTERPHASE TEXTURE ON COMPOSITE IMPACT PERFORMANCE. Xiao Ge, University of Delaware Center for Composite Materials (UD/CCM); Department of Materials Science & Engineering, Newark, DE; Joseph M. Deitz, University of Delaware Center for Composite Materials (UD/CCM); John W. Gillette Jr., University of Delaware Center for Composite Materials (UD/CCM); Department of Materials Science & Engineering, Department of Civil and Environmental Engineering, R.E. Jensen, US Army Research Laboratory, Materials Division, Composite and Lightweight Structures Branch, Aberdeen, MD; S.H. Mcknight, US Army Research Laboratory, Materials Division, Polymers Research Branch, Aberdeen, MD.


Y8.18 ASSESSMENT OF ALUMINIUM METALLISATION BY NANOINDENTATION. Sorin Scoar, Steve Bull, Newcastle Univ, School of Chemical Engineering and Atmospheric Materials, Newcastle upon Tyne, UNITED KINGDOM; Alton Horsfall, Jorge Dos Santos, Anthony O'Neill, Nick Wright, Newcastle Univ, School of Electrical and Electronic Engineering, Newcastle upon Tyne, UNITED KINGDOM.

Y8.19 EFFECT OF INDENTER'S SHAPE IN NANOINDENTATION. Beza Mebratu, Pundan Parakhia, Seifollah Nazarzadeh, University of North Texas, Dept of Engineering Technology, Denton, TX; Kun Liu, Center for Advanced Microstructures and Devices/CAMD, Baton Rouge, LA.
Y8.20  A SIMPLE METHOD OF TIP SHAPE CALIBRATION FOR NANO-INDENTATION TEST OF THIN FILMS. Koichiro Hatori, Junshun Xu, Hidetoshi Nakano and Iaco Kojima, Acoustics and Vibration Metrology Division, National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba Central 3, JAPAN.

Y8.21  Nanoindentation of Vacuum Ultraviolet Light-Irradiated Poly(methyl methacrylate) Substrates. Atsushi Hozumi, Yoshiyuki Yokogawa, Tetsuya Kametani, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, JAPAN; Hirokyu Sagimura, Yuinger Wu, Nagoya Univ., Dept. of Materials Processing Engineering, Nagoya, JAPAN; Osamu Takai, Nagoya Univ., Center for Integrated Research in Science and Engineering, Nagoya, JAPAN.

Y8.22  Mechanical Deformation and Contact-Induced Damage in Single-Crystal ZrO2. S.O. Kucheyev, J.E. Bradley, J.S. Williams, and C. Jagadish, The Australian National Univ., Dept. of Electronic Materials Engineering, Research School of Physical Sciences and Engineering, Canberra, AUSTRALIA; M.V. Swain, The University of Sydney, Biomaterials Science Research Unit, Dept. of Mechanical and Mechatronic Engineering and Faculty of Dentistry, AUSTRALIA; P. Munroe, University of New South Wales, Electron Microscope Unit, Sydney, AUSTRALIA; M.R. Phillips, University of Technology, Sydney, Microstructural Analysis Unit, AUSTRALIA.


Y8.24  In Situ Electrical Characterization of Si During Nanoindentation J.E. Bradley and J.S. Williams, The Australian National University, Department of Electronic Materials Engineering, Research School of Physical Sciences and Engineering, Canberra, AUSTRALIA; M.V. Swain The University of Sydney, Biomaterials Science Research Unit, Department of Mechanical and Mechatronic Engineering and Faculty of Dentistry, AUSTRALIA.

Y8.25  Comparison between Load-Controlled and Displacement-Controlled Nanoindentation of Polymers and Metals. O.L. Warren, T.J. Wyrobek, Hysion Inc., Minneapolis, MN.


Y8.27  Fracture Behavior of Thin Film PZT on Silicon MEMS and MEMBRANES. A.L. Olsen, J.L. Skinner, D.P. Birke, C.D. Richards, R.P. Richards, Mechanical and Material Engineering, Washington State University, Pullman, WA.

Y8.28  Simulation of Ion-Beam Surface Damage for Curvature Reduction in Thin Film MEMS. H.T. Johnson, M.C. Moore, University of Illinois at Urbana-Champaign, Dept. of Mechanical and Industrial Engineering, Urbana, IL; J.B. Freund, University of Illinois at Urbana-Champaign, Dept. of Theoretical and Applied Mechanics, Urbana, IL; T.G. Bifano, Boston University, Dept. of Manufacturing Engineering and Aerospace and Mechanical Engineering, Boston, MA.

Y8.29  Decrease in Sliding Friction in a Vacuum with Control of Surface Nano Roughness. Masahiro Tsubo, Tetsuro Oishi, Masahiro Goto and Katsuhiko Yoshihara, National Institute for Materials Science, Tsukuba, JAPAN.

Y8.30  Frictional Behavior of C60 Monolayer Films on Graphite (HOPG). Shunichi Oka, Akikito Matsunaga, Nagoya Univ., Dept. of Micro System Engineering, Aichi, JAPAN; Kozai Miura, Aichi Univ. of Edu., Dept. of Physics, Aichi, JAPAN.

Y8.31  Hybrid Regime Machining of Silicon: Methods and Applications. Tom Jullien, Very Gogotii, Vishalw Damrich, Drexel University, Dept. of Materials Engineering, Philadelphia, PA.


Y8.33  Effects of Large Load, Shear Rate and Temperature Variations on the Friction of a Branched Hydrocarbon Liquid. Ophelie Gressou, Jacob Izenholz, UC Santa Barbara, Dept. of Chemical Engineering and Materials Research Lab., Santa Barbara, CA.

Y8.34  Effect of Crystal Orientation on Microwear of Silicon Single Crystal and the Wear Structure. Makoto Takagi, Teru Imura, Aichi Institute of Technology, Dept. of Mechanical Engineering, Toyota, JAPAN; Norikiy Arima, Graduate School, Aichi Institute of Technology, Toyoda, JAPAN; Hirokyu Iwata, Research Institute for Industrial Technology, Aichi Institute of Technology, Toyota, JAPAN; Kunihiko Sasaki, Hironu Saka, Nagoya Univ., Dept. of Quantum Engineering, Nagoya, JAPAN.

Y8.35  How Atoms Move During a Quantum Corral Construction. Sen-Wai Hs, NANO@Science & Quantum Phenomena Institute, Physics & Astronomy Dept., Ohio University, Athens, OH; Karl-Hohein Rieder, Free University Berlin, GERMANY.


Y8.37  Larger Molecules Acting as Templates on Cu(110). Federico Rosci, Y. Nutsch, M. Schannek, E. Loggaard, I. Steensgaard, and P. Bensenbader, Physics Department and I-NANO, University of Aarhus, DENMARK; P. Jing, A. Guardon, and C. Joachim CEMES/CNRS Toulouse, FRANCE.

Y8.38  Evolution of Faceting on the M-Plane of Alumina. Shelley R. Gillis, Jessica Risterer, C. Barry Carter, University of Minnesota, Dept. of Chemical Engineering and Materials Science, Minneapolis, MN; N. Ravisankar, Indian Institute of Science, Bangalore, INDIA.

Y8.39  Investigation of Surface Grooves from Migrating Boundaries. Nicole E. Mancer, Shelley R. Gillis, N. Ravisankar, C. Barry Carter, University of Minnesota, Department of Chemical Engineering and Materials Science, Minneapolis, MN.

Y8.40  Mechanisms of Stress Corrosion Cracking in Si: A Hybrid Quantum Mechanical/Molecular Dynamics Simulation. Ruchik Bhandari, ACT-JST, Dept. of Applied Sciences, Yamaguchi Univ., Ube, JAPAN; Shoji Ogawa, Dept. of Applied Sciences, Yamaguchi Univ., Ube, JAPAN; Puyuki Shimjo, Fac of Integrated Arts and Sciences, Higashi-Hiroshima Univ., Hiroshima, JAPAN; Aicchi Nakano, Priya Vashishtha, and Rajiv K. Kalin, CCLMS, Louisiana State Univ., Baton Rouge, LA.

Y8.41  Molecular Dynamics Simulations of C M of SiO2. Evgenii Chagunov and James B. Adams, Arizona State University, Dept. of Chemical and Materials Engineering, Tempe, AZ.

Y8.42  A Study of the Structural Phases of the Group 5B and 6B Elements and Their Mechanical Properties. Neem N. Nsukai, Material Science Program, New Jersey Institute of Technology, Newark, NJ; Trevor Tyson, Department of Applied Physics, New Jersey Institute of Technology, Newark, NJ; Lisa Axt, Department of Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, NJ.
HALOGEN CORROSION OF TITANIUM: A FIRST PRINCIPLES INVESTIGATION OF THE INTERACTION OF HALOGEN ANIONS WITH THE NATIVE TiO$_2$ FILM. Leonard A. Harris$^{*,*}$, Judy N. Quang$^*$ and Andrew A. Quang$^*$. *Cornell University, School of Chemical and Biomolecular Engineering, Ithaca, NY; Lawrence Livermore National Laboratory, Livermore, CA.

REACTION ENTHALPIES AS SELECTION CRITERIA FOR BIOLOGICAL COATINGS. Newton Ooi, James Adams, Utzam Singisetti, Arizona State University, Department of Chemical and Materials Science Engineering, Tempe, AZ.

AN OPTICAL MODEL FOR VISUAL PERCEPTION OF SCRATCHES ON AUTOMOTIVE EXTERIORS. Maitreyee Sinha, Pratima Rangarajan, Vicki Watkins, and Martha Gardner, GE Global Research Center, Niskayuna, NY.

ELECTRON BEAM INDUCED CARBON DEPOSITION AND ETCHING. Yungming Sun, Jason Ekund, Qi Wang, Darren Gay, Chris Clino and John Mike White, Center for Materials Chemistry, Texas Materials Institute, University of Texas at Austin, Austin, TX.

SESSION V9: SURFACE ENGINEERING ISSUES FOR BIO/MICROELECTRONICS APPLICATIONS

8:30 AM V9.1 NANOSCALE CONTROL OF FRICTION AND CHEMISTRY ON SILICON SURFACES. Mark C. Hersam, Northwestern Univ, Dept of Materials Science and Engineering, Evanston, IL.

9:00 AM V9.2 SYNTHESIS AND CHARACTERIZATION OF MAGNETIC POLYMERIC NANOSPHERES FOR BIOMEDICAL APPLICATIONS. D.K. Kim$^*$, M. Mikhalova$^*$, M. Toprak$^*$, A. Guys$^*$, Y.K. Jeong$^*$, M. Muhammed$^*$. "Dept. of Material Science and Engineering, Royal Institute of Technology, Sweden; KICET (Korea Institute of Ceramic Engineering and Technology), Seoul, Korea.


9:30 AM V9.4 IMPROVING BIOCOMPATIBILITY OF NANOPOROUS SILICON MEMBRANES FOR BIOSENSOR APPLICATIONS WITH POLY(ETHYLENE GLYCOL): IN VIVO EVALUATION STUDIES. Sushitha Srivastava, Department of Bioengineering, University of Illinois at Chicago, Chicago, IL; Tejal A. Desai, Department of Biomedical Engineering, Boston University, Boston, MA and Department of Bioengineering, University of Illinois at Chicago, Chicago, IL.

9:45 AM V9.5 CROSS-LINKED CHITOSAN AND POLY(ALILY AMINE) THIN FILMS. Caroline L. Schaser, Francie S. Ligler, Paul E. Schoen, Naval Research Lab, Center for Bio/Molecular Science and Engineering, Washington, DC.

10:00 AM V9.6 VAPOR DEPOSITED POLY(ETHYLENE GLYCOL) INTERFACES: AN APPROACH FOR ENHANCED PERFORMANCE OF MICROFLUIDIC SYSTEMS. Ketul C. Pogar, Department of Bioengineering, University of Illinois at Chicago, Chicago, IL; Tejal A. Desai, Department of Biomedical Engineering, Boston University, Boston, MA.

10:15 AM BREAK

10:30 AM V9.7 INVESTIGATION OF METROLOGY ISSUES IN Cu/LOW-k CHEMICAL MECHANICAL PLANARIZATION PROCESSES FOR ADVANCED INTEGRATED CIRCUIT MANUFACTURING. Parsharum B. Zanzade$^{*,*}$, Nivedita Golani$^{*,*}$, Arun K. Skoder$^*$, Swetha Thagella$^*$, and Ashok Kumar$^{*,*}$. "Department of Mechanical Engineering, Center for Microelectronics Research, University of South Florida, Tampa, FL.

10:45 AM V9.8 CHARACTERIZATION AND APPLICATION OF SEGMENTED POLYURETHANE SURFACE STRUCTURE, MORPHOLOGY, AND MECHANICAL RESPONSE. J.E. Romadel$^*$, S. Seal, University of Central Florida, Advanced Materials Processing and Analysis Center (AMPAC), Orlando, FL.

11:00 AM V9.9 INCOMPRESSIBLE POROUS EFFECT ON THE MECHANICAL BEHAVIOR OF LOW-k DIELECTRIC FILMS. Alex A. Valinsky, Manuel-Luis B. Palacios, William W. Gerberich.

11:15 AM V9.10 STRESS-DRIVEN TEXTURE DEVELOPMENT OF COPPER THIN FILMS. Hanchen Huang, Department of Mechanical, Aerospace & Nuclear Engineering, Rensselaer Polytechnic Institute, Troy, NY; Chung Ho Woo, Helin Wei, Huiyi Liang, Yuxin Wang, Department of Mechanical Engineering, PolyU, HONG KONG; Xuefang Zhang, Department of Physics, UST, HONG KONG.


11:45 AM V9.12 SURFACE AND INTERFACE CHARACTERIZATION OF ION BEAM RE-CRYSTALLIZED Si, P-K. Salvo, V.N. Kulkarni, S. Day, Dept of Physics, Indian Institute of Technology Kanpur, INDIA; B. Suresh, P.V. Suryan, T. Som, Institute of Physics, Bhubaneswar, INDIA.