SYMPOSIUM D

Electronics on Unconventional Substrates—Electrotextiles and Giant-Area Flexible Circuits

December 2 – 3, 2002

Chairs
Michael S. Shur Rensselaer Polytechnic Inst
Patricia M. Wilson Foster-Miller, Inc
Dick Urban Charles Stark Draper Laboratory

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SESSION D1: ELECTROTEXTILES

Chairs: Carole Winterhalter and Patricia M. Wilson
Monday Morning, December 2, 2002
Room 201 (Hynes)

8:30 AM *D1.1

9:00 AM *D1.2
SIGNAL PROPAGATION AND MULTIPLEXING CHALLENGES IN ELECTRONIC TEXTILES, J.F. Matus, E. Gross, ECE Dept., North Carolina State University, Raleigh, NC; A. Dhawan, A.M. Seyen, T. Ghosh, Department of Textile and Apparel Technology and Management, North Carolina State University, Raleigh, NC.

9:30 AM *D1.3
FORMATION OF TEXTILE STRUCTURES FOR GIANT-AREA APPLICATIONS, Abdelfattah M. Seyen, North Carolina State Univ, Raleigh, NC.

10:00 AM BREAK

10:15 AM *D1.4
COLOR-CHANGE FABRIC AND TOUCH SENSING: THE USE OF FLEXIBLE TEXTILE CIRCUITRY FOR FASHION AND DESIGN APPLICATIONS, Margaret Orth, International Fashion Machines Inc., Cambridge, MA.

10:45 AM *D1.5
MANUFACTURING AND PERFORMANCE ASSESSMENTS OF SEVERAL APPLICATIONS OF ELECTROTEXTILES AND LARGE-AREA FLEXIBLE CIRCUITS, David Cadogan, ILC Dover Inc., Frederica, DE.

11:00 AM *D1.6
DIRECT WHITE FABRICATION OF ELECTRONICS AND SENSOR MATERIALS ONTO TEXTILES AND FLEXIBLE CIRCUITS, Sumayet Islam, Center for Thermal Spray Research, Department of Materials Science and Engineering, State University of New York, Stony Brook, NY.

11:15 AM *D1.7
TEXTILE NETWORKS FOR WEARABLE ELECTRONICS, Patricia Wilson, Jastyna Biwerovskia, Brian Farrell, Jeremiah Shale, Jeremy Bowman, Marty Aggron, Doug Thomas, Foster-Miller, Inc., Waltham, MA; Wendy Horowitz, Ed Tierney, Offray Specialty Narrow Fabrics, LLC, Chester, NJ; Carole Winterhalter, U.S. Army Soldier Biological and Chemical Command-Natick Soldier Center, Natick, MA.

11:30 AM *D1.8
ELECTROLUMINESCENT TEXTILES USING SPUTTER-DEPOSITED AMORPHOUS NITRIDE-RARE-EARTH ION COATINGS, M.E. Kowsar, Ohio University, Department of Physics, Athens, OH; JJH Richardson, Ohio University, Department of Chemistry, Athens, OH.

11:45 AM D1.9
DEVELOPMENT OF WOVEN FABRIC-BASED ELECTRICAL CIRCUITS, A. Dhawan, T.K. Ghosh, A. Seyen, Dept of Textile and Apparel Technology and Management, North Carolina State University, Raleigh, NC; J.F. Matus, ECE Dept, North Carolina State University, Raleigh, NC.

SESSION D2: FIBERS FOR ELECTRONIC AND PHOTONIC APPLICATIONS

Chairs: Elsna Ethridge and Margaret Ann Orth
Monday Afternoon, December 2, 2002
Room 201 (Hynes)

1:30 PM *D2.1
MORPHOLOGICAL EFFECTS AND CONSEQUENCES OF DEVELOPED MICROSTRUCTURE ON THE OPTICAL AND ELECTRONIC PROPERTIES OF CONJUGATED POLYMERIC FIBERS AND FILMS FOR APPLICATION TO SMART FIBERS, Richard V. Gregory, Stephen S. Hardaker, Clemson University, School of Materials Science and Engineering and NSF Center for Advanced Fibers and Films, Clemson, SC.

2:00 PM *D2.2
METAL FIBER TECHNOLOGIES, Doug Watson, Bekaert Fibre Technologies, Marietta, GA.

2:30 PM *D2.3
ARACON®MF: AN ENABLING TECHNOLOGY FOR SMART TEXTILES, John D. Ross, DuPont Advanced Fibers Systems, Richmond, VA.

3:00 PM BREAK

3:15 PM *D2.4
THE MATERIALS AND PROCESSES FOR NOVEL ELECTRIC CONTACTS FROM PAN FIBER-BASED COMPOSITES, Joseph A. Swift, Stanley J. Wallace, Xerox Corporation, Wilson Center for Research and Technology, Webster, NY.

3:45 PM *D2.5
AMORPHOUS SILICON THIN FILM TRANSISTORS ON KAPTON FIBERS, Eitan Bandnerer, Sigurd Wagner, Dept. of Electrical Engineering, Princeton University, Princeton, NJ; Zhigang Suo, Dept. of Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ.

4:00 PM *D2.6
PREPARATION AND CHARACTERIZATION OF NANOMETER-SCALE TiO2 COATED POLYCARBONATE FIBERS, Jariina Stremmel, Changmo Sung, Univ of Massachusetts Lowell, Dept of Chemical Engineering, Lowell, MA; Christopher Drew, Univ of Massachusetts Lowell, Dept of Chemistry, Lowell, MA.

4:15 PM *D2.7
ELECTROSPINNING NONFIBERS OF POLYANILINE/PANI/PMMA AND PANI/POLYESTER BLENDS, Keyur Desai, Changmo Sung, University of Massachusetts Lowell, Dept. of Chemical Engineering, Center for Advanced Materials, Lowell, MA.

4:30 PM *D2.8
DEPOSITION, RECRYSTALLIZATION, AND EPITAXY OF SILICON, GERMANIUM, AND GaAs ON FIBERS AND METAL WIRE FOR OPTOELECTRONIC DEVICE APPLICATIONS, Michael G. Mazal, Bryan W. Feyock, Jeremy E. Balliet, Todd R. Ruffins, AstroPower, Inc, Newark, DE.

4:45 PM *D2.9

5:00 PM *D2.10
METAL OXIDE COATED ELECTROSPUN FIBERS AS ELECTRODES IN PHOTOLUMINESCENT CELLS, Christopher Drew, Xinmeng Wang, Ferdinando Bruno,*, Lynne Samieko,*, Jagyot Kumar, University of Massachusetts Lowell, Dept. of Chemistry and Chemical Engineering, and Center for Advanced Materials, Lowell, MA; *Natick Soldier Center, U.S. Army Soldier, Biological, Chemical Command, Natick, MA.
D3.1 WASHING OF ELECTROTEXTILES. Marty Aggon-Kraus, Jeremy Bowman, Andrew Rieck, Tom Tiano, Shirley Carey, and Patricia Wilson, Foster-Miller, Waltham, MA; Wendy Horowitz, Waltham, MA; Edward Tierney, C.M. Offray, Wauwatosa, PA; Carole Winterhalter, U.S. Army Soldier Systems, Nutick RD&E Center, Nutick, MA.

D3.2 MECHANICAL TESTING OF ELECTROTEXTILE CABLES. Jeremiah Slade, Brian Farrell, Justyna Teverovska, Jeremy Bowman, Marty Aggon-Kraus, Patricia Wilson, Foster-Miller, Waltham, MA; Wendy Horowitz, Edward Tierney, C.M. Offray, Wauwatosa, PA; Carole Winterhalter, U.S. Army Soldier Systems, Nutick RD&E Center, Nutick, MA.

D3.3 IMPROVING ELECTROTTEXLE WEARABILITY USING STIFFNESS TESTING METHODS. Jeremiah Slade, Brian Farrell, Justyna Teverovska, Douglas Thompson, Jeremy Bowman, Marty Aggon-Kraus, Patricia Wilson, Foster-Miller, Material Technology Group, Waltham, MA; Carole Winterhalter, Nutick RD&E Center, Nutick, MA; Wendy Horowitz, Edward Tierney, C.M. Offray & Son, Wauwatosa, PA.

D3.4 TEXTILE CIRCUITS – DECONSTRUCTING THE DEVICE. Jeremy Bowman, Jeremiah Slade, Brian Farrell, Douglas Thompson, Patricia Wilson, Foster-Miller, Waltham, MA.

D3.5 CHANGE CHARGES IN ELECTROSPUN NANOFOBERS. Veli Kalpakci, Pradeep Pradhan, Steve Werner, Yong Kim, University of Massachusetts, Department of Textile Sciences, North Dartmouth, MA.

D3.6 ION DEPOSITION OF METALS FOR CONDUCTIVE FIBERS. Patricia Wilson, J. Teverovska, B. Farrell, J. Bowman, and M. Aggon, J. Slade, and D. Thomson, Foster-Miller, Inc., Waltham, MA; Rod Ward, Ionic Fusion Corporation, Longmont, CO.

D3.7 AN ACOUSTIC ARRAY AS EXAMPLE OF A LARGE-SCALE ELECTROSPIN FABRIC. K.A. Lusti, J. C. Brady, I. S. Matos, E. Grant, J. F. Muth, ECE Dept., North Carolina State University, Raleigh, NC; K. Natarajan, A. Dixit, T. Ghosh, A. Seryan, Department of Textile and Agro, Technology and Management, North Carolina State University, Raleigh, NC.


D3.9 TEXTILE BASED ANTENNAS. Justyna Teverovska, Patricia Wilson, Brian Farrell, Jeremiah Slade, Jeremy Bowman, Marty Aggon, Doug Thompson, Foster-Miller, Inc., Waltham, MA; Wendy Horowitz, Ed Tierney, Offray Specialty Narrow Fabrics, LLC, Chester, NJ; John Pedersen and Joe Merrida, BAE Systems, Greenlawn, NY; Carole Winterhalter, U.S. Army Soldier Biological and Chemical Command-Nutick Soldier Center, Nutick, MA.

D3.10 ELECTRO TEXTILES: PRESENT AND FUTURE. Kathleena Natarajan, North Carolina State Univ, Raleigh, NC.
WORN ELECTRONICS. Joseph McDermott and Paul C. Beattner, Infinite Power Solutions, Littelfon, CO.

2:00 P.M. D5.2
FLUORESCENT FIBERS COUPLED TO MONOLITHIC PHOTOVOLTAIC ARRAYS FOR SOLAR CONVERSION. Oleg V. Salmin, Jeffrey A. Cox, Paul E. Sim, Michael G. Mack, AstroPower Inc., Newark, DE.

2:15 P.M. D5.3

2:30 P.M. D5.4
IONIC LIQUID-BASED GEL ELECTROLYTE COMPOSITIONS FOR DYE SENSITIZED SOLAR CELLS. K.G. Chitlurabu, S. Hydjabirou, Konark Technologies, Lowell, MA.

2:45 P.M. D5.5
POWER GENERATION FROM PIEZOELECTRIC LEAD ZIRCONATE TITANATE FIBERS. Parham Mohammadi, Ajmal Khan, and Richard B. Cruz, Advanced Cerametrics, Inc., Lamberville, NJ.

3:00 P.M. BREAK

SESSION D6: PRINTING FOR ELECTRONICS
Chair: Howard E. Krauz
Tuesday Afternoon, December 3, 2002
Room 201 (Hynes)

3:30 P.M. D6.1

3:45 P.M. D6.2
POLYMERIC POLYMER STAMPING ON MICRO- AND NANO-SCALES. Shoshana R. Gourion, Paula T. Hammond, MIT, Department of Chemical Engineering, Cambridge, MA; Seth Coe, Vladimir Bulovic, MIT, Department of Electrical Engineering and Computer Science, Cambridge, MA.

4:00 P.M. D6.3
AN APPROACH TOWARDS THE PRINTING OF POLYMER CIRCUITS. Alexander Knobloch, Adolf Berends, Wolfgang Clemens, Siemens Corporate Technology, Erlangen, GERMANY.

4:15 P.M. D6.4
LARGE AREA DRY PRINTING OF ORGANIC TRANSISTORS. Graciela R. Brancati, J.A. Rogers, Yih-Lin Loo, F. Cao, C.R. Fincher, "DuPont, Central Research, Wilmington, DE; Bell Laboratories, Lucent Technologies, Murray Hill, NJ.

4:30 P.M. D6.5
SOFT CONTACTS BY LAMINATION AND NANOTRANSFER PRINTING FOR PLASTIC ELECTRONICS. Yih-Lin Loo, John A. Rogers, Bell Laboratories, Lucent Technologies, Murray Hill, NJ.

4:45 P.M. D6.6
ACTIVE MATRIX DISPLAYS BASED ON ALL-ORGANIC ELECTROCHEMICAL SMART PICTURES ON PRINTED PAPER. Peter Anderson, David Nilsson, Per-Olof Svensson, Moxioning Chen, Linkoping Univ., Dept of Science and Technology, Norrkoping, SWEDEN; Anna Maksimov, Timmi Remen, Thomas Kugler, Acro Institute, Norrkoping, SWEDEN; Magnus Berggren, Linkoping Univ., Dept of Science and Technology, Norrkoping, SWEDEN.

SESSION D7: POSTER SESSION
ELECTRONICS ON FLEXIBLE SUBSTRATES
Chairs: Sigurd Wagner and Paula T. Hammond
Tuesday Evening, December 3, 2002
8:00 PM
 Exhibition Hall D (Hynes)

D7.1
GIRF NANOPARTICLE/METAL-ORGANIC INKS FOR PRINTABLE ELECTRONICS. Doug Schlu, Ceramem Corporation, Wakefield, MA.

D7.2
Abstract Withdrawn

D7.3
HIGH PERFORMANCE POLYMER THIN FILM TRANSISTORS ARRAY PRINTED ON A FLEXIBLE POLYCARBONATE SUBSTRATE. Sung Kyu Park, Jeong Ik Han, Dae Gyu Moon, Won Kyeon Kim, Yong Ho, Kim, Korea Electronics Technology Institute, Information Display Research Center, Pyungtaek, KOREA.

D7.4
PHOTOVOLTAIC DEVICES CONSTRUCTED WITH LAYER-BY-LAYER ASSEMBLED POLYELECTROLYTE FILM. Haruki Takahashi, Paula T. Hammond, Massachusetts Institute of Technology, Dept of Chemical Engineering, Cambridge, MA.

D7.5
COMPARISON OF GATE DIELECTRIC LAYERS FOR ORGANIC THIN FILM TRANSISTORS FOR FLEXIBLE DISPLAYS. G.Y. Kim, J.I. Hong, S. Hong, J. Kang, D.Y. Yoon, Seoul National Univ, Seoul, KOREA; S. Hwang, Y.C. Joo, Seoul National Univ, School of Materials Science and Eng, Seoul, KOREA.

D7.6
BETTER CONTACTS BETWEEN METAL ELECTRODES AND ORGANIC SEMICONDUCTORS USING SELF-ASSEMBLY MONOLAYERS. Seong Hyun Kim, Yong Seik Yang, Jeong-E Lee, Hye Young Lee, Hye Yong Chung, Telecommunication Research Institute (ETRI), Daejeon, KOREA.

D7.7
HIGH PERFORMANCE ORGANIC FIELD EFFECT TRANSISTOR WITH A NOVEL TOP-AND-BOTTOM CONTACT (TBC) STRUCTURE. Minoh Chi, Sei Ushiyama, Satoshi Hoshino, Taketomi Kodama, satoshi Harada and toshihide Kumar, Photonics Research Institute, National Institute of Advanced Industrial Science and Technology, Tsukuba, JAPAN.

D7.8
EFFECT OF PROCESS VARIABLES AND DOPANTS ON CHARACTERISTICS OF ELECTROCHEMICALLY DEPOSITED PEDOT FILMS. Mohi A. Oka, Stephen S. Hardiker, Farhad Niazi, Richard V. Gregory, School of Materials Science and Engineering, Clemson University, Clemson, SC; Keith R. Brenneman, Philip M. Lessner, KEMET Electronics Corporation, Greenville, SC.

D7.9
SYNTHESIS AND CHARACTERIZATION OF 2,5-DHS[3,4-ETHYNYLIDOXYTHIOPHENE][THEN-2YL]-3-SUBSTITUTED THIOPHENES. Michael F. Pegatine, Stephen S. Hardiker, kalyn Encarnacion, and Richard V. Gregory, NSF Center for Advanced Engineering Fibers and Films, School of Materials Science and Engineering, Clemson University, Clemson, SC.

D7.10
INFLUENCE OF GATE DIELECTRIC LAYERS ON THE MOBILITY OF ORGANIC THIN FILM TRANSISTORS FOR FLEXIBLE DISPLAYS. G.Y. Kim, J. Kang, J.I. Hong, S. Hong, D.Y. Yoon, Seoul National Univ, School of Chemistry, Seoul, KOREA; S. Hwang, Y.C. Joo, Seoul National Univ, School of Materials Science and Eng, Seoul, KOREA.

D7.11
HISPHERPHENYL-SUBSTITUTED THIOPHENE OLMOMERS. ORGANIC SEMICONDUCTORS WITH COMPLEMENTARY-TYPE CARRIER MOBILITY. Antonio Picchiotti, Howard Krauz, Tobin J. Marks.

D7.12
C-V CHARACTERIZATION OF PULSED PLASMA ALIYAMINE DIELECTRICS. Yifei Xu, Department of Electrical Engineering, The Ohio State University, Columbus, OH; Paul R. Berger, Department of Electrical Engineering, Department of Physics, The Ohio State University, Columbus, OH; Jia Cho and Richard B. Timmons, Department of Chemistry and Biochemistry, University of Texas, Arlington, TX.

D7.13
HOMOGENOUS SYNTHESIS OF WATER SOLUBLE CONDUCTIVE POLYPYRROLE AND POLY[3,4 ETHYNYLIDNOXYTHIOPHENE]. Fardmoe F. Brung, Lynne A. Samuelson, Materials Science Team, Natick Soldier Center, U.S. Army Soldier and Biological Chemical Command, Natick, MA; Jacqueline M. Fortier, Rameswary Nataraj, Jayant Kumar, Departments of Physics and Chemistry, Center for Advanced Materials, University of Massachusetts Lowell, Lowell, MA.
D7.14
CONDUCTING POLYMER FOR COATING ON LARGE-AREA
FLEXIBLE SUBSTRATES. Zhexing Tang, Ping Ren, Neil Alvarez,
Robert Clark, See C. Yang, Dept of Chemistry, Univ of Rhode Island,
Kingston, RI.

D7.15
VT-SHIFT COMPENSATING AMORPHOUS SILICON PIXEL
CIRCUITS FOR FLEXIBLE AMOLED DISPLAYS. Kapil Sakariya,
Peyman Servati, Denis Strikhilev, Arkin Nathan, Univ of Waterloo,
Dept of Electrical and Computer Engineering, Waterloo, Ontario,
CANADA.