



FINAL PROGRAM
EIGHTH INTERNATIONAL SYMPOSIUM ON
POLYMER SURFACE MODIFICATION
RELEVANCE TO ADHESION

June 20-22, 2011 Danbury, Connecticut, USA

SYMPOSIUM HISTORY AND MOTIVATION

This eighth symposium in the series which continues the tradition set by the first in the series entitled: "Polymer Surface Modification: Relevance to Adhesion" which was held in Las Vegas, NV, 1993. As with its predecessors, this symposium is concerned with the technological areas where surface modification is a key technology which allows for the processing and manufacture of products which would otherwise be unobtainable.

Proper adhesion characteristics are vital to the success of any practical implementation of polymer materials. Though polymers are generally not very adhesionable, careful surface modification can result in greatly improved adhesion without altering bulk properties.

MONDAY JUNE 20, 2011

SESSION I: ATMOSPHERIC PLASMA

9:00-9:05am: INTRODUCTORY REMARKS

9:05-9:35: Christian Buske and Andy Stecher; Plasmatrete GmbH, Bisamweg 10, 33803 Steinhagen, GERMANY; **Recent Development in Atmospheric Plasma Relevant Technologies, Such as New App Devices and Interesting New Applications in Industry**

9:35-10:05: J. Dutroncy, E.Jouvet and T.Sindzingre; AcXys Technologies, 148 rue des vingt Toises, 38950 St Martin le Vinoux, FRANCE; **Atmospheric Pressure Plasma Devices and Processes for a Wide Range of 3D Products**

10:05-10:35: Y. Kusano, S.V. Singh, K. Norrman, J. Drews, F. Leipold, P.K. Michelsen, P. Morgen, A. Bardenshtein and N. Krebs; Risø National Laboratory for Sustainable Energy, Technical University of Denmark, 4000 Roskilde, DENMARK; **Advanced Plasma Processing at Atmospheric Pressure**

10:35-11:00: COFFEE BREAK

11:00-11:30: Victor Rodriguez-Santiago, Andres A. Bujanda, Robert E. Jensen, and Daphne D. Pappas; **Atmospheric Plasma Processing of Polymers: A Review of Plasma-Surface Interactions and Applications**

11:00-12:00: Joseph DiGiacomo; Flynn Burner Corporation, 425 Fifth Avenue New Rochelle, New York 10902; **Flame Plasma Surface Treating System Applied to a High Speed Coating Line**

12:00-1:30pm: LUNCH BREAK

MONDAY, JUNE 20, 2011

SESSION II: ATMOSPHERIC PLASMA (CONTINUED)

1:30-2:00: O. Levasseur, L. Stafford, N. Gherardi, N. Naudé, and V. Blanchard; Department of Physics, University of Montreal, Montreal, Quebec H3C 3J7, CANADA; **Formation of Superhydrophobic Wood Surfaces Using an Atmospheric Pressure Dielectric Barrier Discharge in He/HMDSO Mixtures**

2:00-2:30: Luc Stafford, J. Prégent, O. Levasseur, L. Lapointe, F. Busnel, V. Blanchard, and B Riedl; Department of Physics, University of Montreal, Montreal, Quebec H3C 3J7, CANADA; **Functionalization of Wood Surfaces in the Afterglow of an Atmospheric Pressure Dielectric Barrier Discharge**

2:30-3:00: Robert F. Hicks; Thomas S. Williams and Hang Yu; University of California at Los Angeles, Department of Chemical and Biomolecular Engineering, P.O. Box 951592, Los Angeles, California 90095-1592; **Atmospheric Pressure Radio Frequency Plasma Activation of Polymers and Composites for Adhesive Bonding**

3:00-3:30: COFFEE BREAK

3:30-4:00: N. Satyanarayana, R. Arvind Singh and Sujeet K. Sinha; Department of Mechanical Engineering, National University of Singapore, 9 Kent Ridge Drive 7, Singapore 117576; **Plasma Surface Modification and Nanolubrication of Polymer Films for MEMS Applications**

4:00-4:30: Travis Kemper, Patrick Chiu, Simon Phillpot, and Susan B. Sinnott; Department of Materials Science and Engineering, University of Florida, Gainesville, FL, 32605; **Molecular Investigation of Plasma Treatment of Interfacial Polymer Adhesion**

TUESDAY JUNE 21, 2011

SESSION III: NOVEL APPLICATIONS

9:00-9:30am: Jas Pal Badyal; Chemistry Department, Durham University, Durham DH1 3LE, UK; **Multi-Functional Nanocoatings**

9:30-10:00: Yiping Qiu; College of Textiles, Donghua University, 2999 North Renmin Road, Songjiang District, Shanghai 201620, P.R.CHINA; **Hydrophobic Plasma Treatment of Cellulose Fiber Surface for Bonding to Polypropylene Matrix for Green Composites**

10:00-10:30: Yves Grohens, Gijo Raj and Eric Balnois; Laboratoire d'Ingenierie des Matériaux de Bretagne (LIMAT B), Equipe Polymères et Composites, Université de Bretagne Sud, Lorient, FRANCE; **Colloidal Force Measurements Between Cellulose and Polylactic Acid to Mimic Interface Adhesion in Biocomposites**

10:30-11:00: COFFEE BREAK

11:00-11:30: John D. Clay; Battelle Advanced Materials Applications, National Security Global Business, 505 King Avenue, Columbus, OH 43201-2693; **Polymer Surface Modification Using Roll-to-Roll Nanoimprint Lithography (R2RNIL)**

11:30-12:00: Tao Cai, K. G. Neoh and E. T. Kang; Department of Chemical & Biomolecular Engineering, National University of Singapore, Kent Ridge, SINGAPORE 119260; **Surface-Functionalized and Surface-Functionalizable Poly(vinylidene fluoride) Membranes via Click Chemistry and Atom Transfer Radical Polymerization**

12:00-1:30pm: LUNCH BREAK

TUESDAY, JUNE 21, 2011

SESSION IV: SURFACE CHEMICAL METHODS

1:30-2:00: Arthur J. Coury; 154 Warren Avenue, Boston, MA; **Hydrogels for Beneficial Modification of Implantable Device and Tissue Surfaces**

2:00-2:30: David Cameron; ASTRaL, Lappeenranta University of Technology, Prikaatinkatu 3E, 50100 Mikkeli, FINLAND; **Atomic Layer Deposition Processes and Their Effect on Adhesion to Polymers**

2:30-3:00: David Schaubroeck, Emilie Van Den Eeckhout, Johan De Baets, Peter Dubrueel, Luc Van Vaeck and André Van Calster; Centre for Microsystems Technology (CMST)/ELIS, IMEC, Ghent University, Technologiepark 914A, B-9052 Ghent -Zwijnaarde, BELGIUM; **Surface Modification of a Photo Definable Epoxy Resin with Polydopamine to Improve Adhesion with Electroless Deposited Copper**

3:00-3:30: COFFEE BREAK

3:30-4:00: P. Munzert, C. Präfke, U. Schulz and N. Keiser; Fraunhofer Institute of Applied Optics and Precision Engineering, Albert-Einstein-Str. 7, 07745 Jena, GERMANY; **Vacuum Deposition of Optical Coatings on PMMA and Polycarbonate**

4:00-4:30: Satoru Iwamori, Kiyoshi Yoshino, Hiroyuki Matsumoto and Kazutoshi Noda; School of Engineering, Tokai University, 4-1-1, Kitakaname, Hiratsuka, Kanagawa 259-1292, JAPAN; **Monitoring of Active Oxygen Generated under Ultraviolet Irradiation Using a Quartz Crystal Microbalance (QCM) with Sputter-coated and Spin-coated Poly(tetrafluoroethylene) Thin Films**

4:30-5:00: L. Wang, J. M. Xue, S. Yan, and Y. G. Wang; State Key Laboratory of Nuclear Physics and Technology, School of Physics, Peking University, Beijing, CHINA; **Surface Modifications of Polymer Nanopores with Atomic Layer Deposition Method and Measurement of Their Conductance Properties**

WEDNESDAY, JUNE 22, 2011

SESSION V: BIOMEDICAL APPLICATIONS

9:00-9:30am: Stephen Coulson; P2i Ltd., 127 North, Milton Park, OX14 4 SA, Abingdon, Oxfordshire, UK; **Plasma Surface Modification for Increased Hydrophilicity**

9:30-10:00: Mikko Tuominen, Hannu Teisala, Mikko Aromaa, Milena Stepien, Jyrki M. Mäkelä, Jarkko J. Saarinen, Martti Toivakka and Jurkka Kuusipalo; Paper Converting and Packaging Technology, Tampere University of Technology, P.O. Box 541, FI-33101 Tampere, FINLAND; **Generation and Stimulation of Liquid Flame Spray (LFS) Coating**

10:00-10:30: Saswati Datta; Procter and Gamble, Miami Valley Innovation Center, 11810 East Miami River Road, Cincinnati OH 45252; **"Skin Mimic": Surface Modification of Polymers to Mimic Human Skin**

10:30-11:00: COFFEE BREAK

11:00-11:30: Shubhra Gangopadhyay, Venu Korampally, Singdha Praharaj, Vamsi Mamidi, Bryant Harris, Luis Polo Parada, Sangho Bok and Keshab Gangopadhyay University of Missouri, Columbia, MO; **Polymethyl Silsesquioxane Nanoparticles, their Surface Modifications and Applications in Microsystems**

11:30-12:00: N. De Geyter, R. Morent, T. Jacobs, S. Van Vlierberghe, P. Dubruel and Christophe Leys; Research Unit Plasma Technology (RUPT), Department of Applied Physics, Faculty of Engineering, Ghent University, Jozef Plateaustraat 22, 9000 Gent, BELGIUM; **Medium Pressure Plasma Treatment of Biodegradable PLA and PCL**

12:00-12:30: Kerry A. Wilson, Craig A. Finch, Phillip Anderson, James J. Hickman and Frank Vollmer; NanoScience Technology Center, University of Central Florida, 12424 Research Parkway, Orlando FL 32828; **Quantification and Structure Evaluation of Protein Adsorbed at Defined Interfaces and its Effect on Subsequent Cell Culture**

12:30-2:00: LUNCH BREAK

WEDNESDAY, JUNE 22, 2011

SESSION VI: BIOLOGICAL APPLICATIONS (CONTINUED)

2:00-2:30: Shantanu Bhattacharya; Department of Mechanical Engineering, IIT Kanpur, INDIA; **Plasma Modification of Polymer Surfaces and Their Utility in Building Biomedical Microdevices**

2:30-3:00: X. F. Hu, F. Zhang, E. T. Kang and K. G. Neoh; Department of Chemical and Biomolecular Engineering, National University of Singapore, Kent Ridge, Singapore 119260; **Exploiting Surface Chemical Modification of Natural Biopolymers for Selective Bio-interactivity with Bacteria and Bone Cells in Orthopedic Applications**

3:00-3:30: K. Fricke, K. Duske, A. Quade, B. Nebe, K. Schröder and Th. v. Woedtke; Leibniz Institute for Plasma Science and Technology (INP Greifswald e.V.), Greifswald, GERMANY; **Comparison of Low-temperature Plasma Processes on the Surface Properties of Polystyrene and Their Impact on the Growth of Osteoblastic Cells**

The staff of MST CONFERENCES gratefully acknowledge the support of the **PlasmaTreat** company for helping to make this symposium a success.

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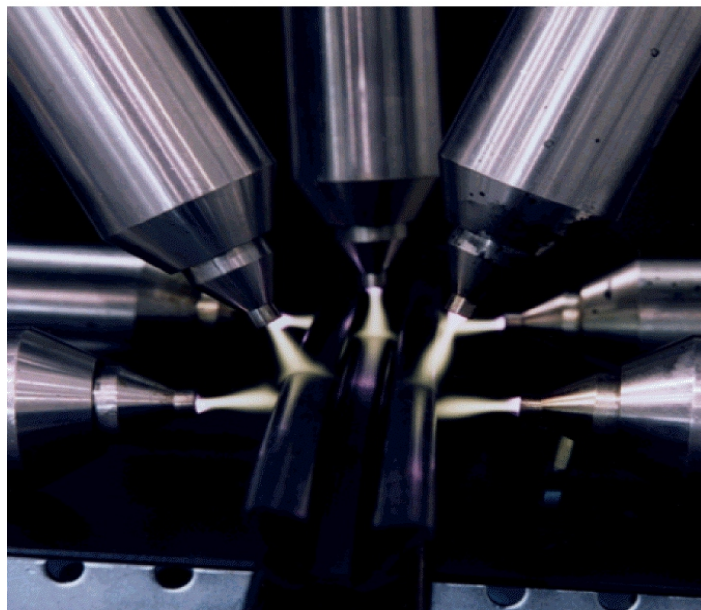
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THE SYMPOSIUM WILL BE HELD AT THE DANBURY PLAZA HOTEL AT THE FOLLOWING ADDRESS:

**Danbury Plaza
Hotel and Conference Center
18 Old Ridgebury Road
Danbury, CT 06810
Tel: 203-794-0600
Web site: www.danburyplaza.com**

TRANSPORTATION: Limousine and shuttle service is available from Laguardia and Kennedy airports.

The hotel recommends the following services for Airport Transportation arrangements. Each of these vendors offer door to door service.

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All of the above vendors service the airports both in CT and NY. Please remember that each airport has Taxi Stands with Taxi Service available from each airport to the hotel destination. Taxi service cannot be pre-arranged.

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- * **Litchfield Hills Connecticut**
- * **Danbury Fair Mall (1.0 mi.)**
- * **Danbury Dining and Entertainment District (5.0 mi.)**
- * **Military Museum of Southern New England (5.0 mi.)**
- * **Kent Falls (35.0 mi.)**
- * **New York City Attractions (50.0 mi.)**
- * **Foxwoods Resort Casino (90.0 mi.)**
- * **Mohegan Sun Resort Casino (90.0 mi.)**
- * **Brewster Sports Arena**
- * **Centennial Golf Course**

REGISTRATION INFORMATION

DATES:

JUNE 20-22, 2011: EIGHTH INTERNATIONAL SYMPOSIUM ON POLYMER SURFACE MODIFICATION: RELEVANCE TO ADHESION
www.mstconf.com/surfmod8.htm

JUNE 22-24, 2010: EIGHTH INTERNATIONAL SYMPOSIUM ON SILANES AND OTHER COUPLING AGENTS
www.mstconf.com/silanes8.htm

LOCATION:

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Web Site: www.danburyplaza.com

REGISTRATION:

Speaker/student \$395 each; regular attendee \$595 each. A 10% discount applies if more than 1 person is participating from the same organization.

HOTEL: Please make room reservations directly with the Danbury Plaza Hotel. Make your reservations early and be sure to mention that you are attending the MST symposium in order to receive the reduced conference hotel rate.

TRANSPORTATION: Limousine and shuttle service is available from Laganardia and Kennedy airports

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SHORT COURSES ON

APPLIED ADHESION MEASUREMENT METHODS (June 25, 2011)
www.mstconf.com/AdhMeasCourse.pdf

AND

DURABILITY OF ADHESIVE JOINTS (June 26, 2011)
www.mstconf.com/AdhesiveJointsCourse.pdf

Associated with these symposia MST gives short courses on adhesion related topics. Since nearly all of the MST symposia have some relation to adhesion phenomena, the ability to quantify the adhesion of one material layer to another is clearly one of the unifying themes. These courses are designed to mesh with the topical symposia by presenting an overview of the most useful techniques for evaluation of the adhesion of coatings and the durability of adhesive joints. Emphasis is given to methods which can be carried out in a manufacturing environment as well as in the lab and which give results that are directly relevant to the durability and performance of coatings, adhesive joints and other bonded laminate structures.

Audience: Scientists, technical and professional staff in R&D, manufacturing, processing, quality control/reliability involved with the durability and reliability of coatings, laminates and other bonded structures.

Level: Beginner to Intermediate

Prerequisites: Elementary background in chemistry, physics or materials science.

Duration: 1 day

Registration fee: \$695: Includes course notes, handouts and a copy of the newly published handbook and reference volume: **ADHESION MEASUREMENT METHODS: THEORY AND PRACTICE** (CRC Press, 2006).

How You Will Benefit From These Courses:

- ▶ **Understand advantages and disadvantages** of a range of adhesion measurement and joint testing techniques.
- ▶ **Gain insight** into mechanics of adhesion testing and the role of intrinsic stress and material properties
- ▶ **Learn optimal methods** for setting adhesion strength requirements for adhesive joints and coating applications.
- ▶ **Learn how to select** the best measurement technique for a given application.
- ▶ **Gain perspective** from detailed discussion of actual case studies of product manufacturing and development problems.

CANCELLATIONS: Registration fees are refundable, subject to a 15% service charge, if cancellation is made by June 1, 2011. **NO** refunds will be given after that date. All cancellations must be in writing. Substitutions from the same organization may be made at any time without penalty. MST Conferences reserves the right to cancel any of the symposia or the short courses if it deems this necessary and will, in such event, make a full refund of the registration fee. No liability is assumed by MST Conferences for changes in program content.

REGISTRATION FORM: CHECK ALL THAT YOU WANT TO ATTEND

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EIGHTH INTERNATIONAL SYMPOSIUM ON POLYMER SURFACE MODIFICATION, June 20-22, 2011 (regular attendee)	\$595
EIGHTH INTERNATIONAL SYMPOSIUM SILANES AND OTHER COUPLING AGENTS, JUNE 22-24, 2011 (speaker/student)	\$395
EIGHTH INTERNATIONAL SYMPOSIUM SILANES AND OTHER COUPLING AGENTS, JUNE 22-24, 2011 (regular attendee)	\$595
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Deduct 10% if more than 1 participant from same institution	
Short Course on <u>Applied Adhesion Measurement Methods</u> (June 25, 2011)	\$695
Short Course on <u>Durability of Adhesive Joints</u> (June 26, 2011)	\$695
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