



# FINAL PROGRAM

## EIGHTH INTERNATIONAL SYMPOSIUM ON SILANES AND OTHER COUPLING AGENTS

June 22-24, 2011 Danbury, Connecticut, USA

### SYMPOSIUM HISTORY AND MOTIVATION

This symposium continues the tradition set by the first symposium in this series: "Silanes and Other Coupling Agents" which was hosted in 1991 by the Dow Corning Corporation in honor of Dr. Edwin P. Plueddemann. As with its predecessors, this symposium is concerned with the technological areas where the use of surface primers such as silanes is critical to the success of many technologies.

Historically the silanes have been used as coupling agents for thin films in the microelectronics industry and in glass fiber composites where the use of silanes has been an enabling factor in the success of many manufactured products. Quite surprisingly, silanes have also found a role in biotechnology as specific coupling agents for bonding polynucleotides to the so-called "gene chips" and also in cosmetic applications.

### WEDNESDAY, JUNE 22, 2011

#### SESSION I: BIOMEDICAL APPLICATIONS

(JOINT SESSION WITH POLYMER SURFACE MODIFICATION)

**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 II: BIOLOGICAL APPLICATIONS  
(CONTINUED)**

(JOINT SESSION WITH POLYMER SURFACE  
MODIFICATION)

**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**

**SESSION III: THURSDAY, JUNE 23, 2011**

**NOVEL APPLICATIONS OF SILANES**

**9:00-9:05: INTRODUCTORY REMARKS**

**9:05-9:35: Bret Chisholm,** Partha  
Majumdar, Shane Stafslie, and David  
Christianson; Center for Nanoscale Science  
and Engineering, North Dakota State  
University, Fargo, ND; **An Investigation of  
Antimicrobial Coatings Derived from  
Quaternary Ammonium-Functional  
Alkoxysilanes Using Combinatorial/High-  
Throughput Methods**

**9:35-10:05: A. Ansarifar;** Materials  
Department, Loughborough University,  
Leicestershire LE11 3TU, UK;  
**How a Sulfur-Bearing Bifunctional  
Organosilane Changed the Shape of  
Rubber Formulation**

**10:05-10:35: W. Dierkes,** M. Tiwari, R. Datta,  
A. Talma, J. Noordermeer and W. van Ooij;  
University of Twente, Faculty of Engineering  
Technology, Department of Elastomer  
Technology & Engineering, Enschede, THE  
NETHERLANDS; **Improving Compatibility and  
Interaction of Polymers and Additives in  
Rubber by Surface Modification in a Plasma  
Polymerization Process**

**10:35-11:00: COFFEE BREAK**

**11:00-11:30: Gon Seo;** School of Chemical  
Engineering, Chonnam National University,  
Gwangju 500-757, Korea; **Improved Tensile  
and Dynamic Properties of SBR Compounds  
Reinforced with Networked Silicas Prepared  
Using Silanes as Connecting Materials**

**11:30-12:00: A Babik** and V. Cech; Institute  
of Materials Chemistry, Brno University of  
Technology, Purkynova 118, CZ-61200 Brno,  
CZECH REPUBLIC; **Self-assembled  
Monolayers of Vinyltriethoxysilane and  
Vinyltrichlorosilane**

**12:00-12:30: Roy U. Rojas Wahl;**  
Momentive Performance Materials, 769 Old  
Saw Mill River Road, Tarrytown, NY 10591;  
**The Reaction Between  
Organoalkoxysilane Esters And 1,3-Diols  
To Form Cyclic Silane Esters**

**12:30-2:00: LUNCH**

**SESSION IV: THURSDAY, JUNE 23, 2011**

**SILANES IN ADHESION AND BONDING**

**2:00-2:30: A. N. Rider** and N. Brack; DSTO,  
Melbourne, AUSTRALIA; **The Influence of  
Surface Roughening and Plasma Treatment  
on the Environmental Resistance of Epoxy  
to Titanium Adhesive Bonds**

**2:30-3:00: E.H.N. Pow** K.K.C. Yeung and J.P.  
Matinlinna; Oral Rehabilitation, Faculty of  
Dentistry, The University of Hong Kong, HONG  
KONG; **HEMA and Silane Blend Effects on  
Resin-Titanium Bonding**

**3:00-3:30:** L. Hoferek, E. Palesch and **V. Cech**; Institute of Materials Chemistry, Brno University of Technology, Purkynova 118, CZ-61200 Brno, CZECH REPUBLIC; **Plasma-polymerized Films Based on Tetravinylsilane Monomer**

**3:00-4:00: COFFEE BREAK**

**4:00-4:30:** **Hari T Deo**; Institute of Chemical Technology Deemed University, Mumbai, INDIA; **The Enhanced Interfacial Adhesion Phenomena Using Ti-based Polymeric Surface-modifying Formulations**

**4:30-5:00:** **Tsutomu Furuta** and Akira Nakajima; Department of Metallurgy & Ceramics Science, Graduate School of Science & Technology, Tokyo Institute of Technology, 2-12-1, Ookayama, Meguro-ku, Tokyo 152-8552, JAPAN; **Evaporation and Sliding of Water Droplets on Fluoroalkylsilane Coatings with Nanoscale Heterogeneity**

**5:00-5:30:** **M. Masudul. Hassan**, Marco Mueller, Diana J. Tartakowska and Manfred H. Wagner; Department of Chemistry, M C College, National University, Sylhet-3100, BANGLADESH; **Grafting of Gycidyl Methacrylate onto Isotactic Polypropylene Used as a Compatibiliser For Composite Preparation**

**SESSION V: FRIDAY, JUNE 24, 2011**

**SILANE CHEMISTRY AND NANOSTRUCTURES**

**9:00-9:30:** Yun mi Kim, Janis Matisons and **Barry Arkles**; Gelest Inc., 11 East Steel Road, Morrisville, PA 19067; **Evaluating the Hydrolytic Stability of Silane, Titanate and Phosphate Coupling Agents on Metallic and Silicious Substrates**

**9:30-10:00:** **Bhanu P. S. Chauhan**, Leon Prasanth K, Ramani Thekkathu, Ankita Shah, Hardika Shukla, Vanessa Comerón and Tamar Lesnoy; Engineered Nanomaterials Laboratory, Department of Chemistry, William Paterson University, 300 Pompton Road, Wayne, NJ 07470-2103; **Hydrosilanes as Coupling Agents for "Living" Metal Nanoparticles Surfaces**

**10:00-10:30:** Guo Liang Li, K. G. Neoh and **E. T. Kang**; Department of Chemical & Biomolecular Engineering, National University of Singapore, Kent Ridge, Singapore 119260; **Silane-Promoted Synthesis of Functional Hollow Polymeric and Hybrid Micro- and Nanostructures**

**10:30-11:00:** L. Wang, C. Huang, E. T. Kang and **K. G. Neoh**; Department of Chemical and Biomolecular Engineering, National University of Singapore, Kent Ridge, Singapore 119260; **Designing Functionalized Magnetic Nanoparticles via Silane Anchors for Biomedical Applications**

**HOTEL AND TRAVEL INFORMATION FOR THE DANBURY PLAZA HOTEL**

**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](http://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 offers door to door service.

**Go Airport Shuttle** - Shuttle Van  
Georgianna Lemelin  
Tel: 203-891-1280  
E-mail: [sales@ToTheAirport.com](mailto:sales@ToTheAirport.com)

**Gateway Limousine Inc.**-Town Car  
Rich Daddona  
Tel: 800-942-8392

**Enterprise Care Rental** - Car Rental with an International Drivers License  
David Capasso  
Tel: 203-423-9334 Cellular Phone  
E-mail: [David.a.capasso@erac.com](mailto:David.a.capasso@erac.com)

All of the above vendors service the international 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.

**IF TRAVELING BY RENTAL CAR PLEASE REFER TO THE FOLLOWING MAP AND DIRECTIONS:**

[http://www.danburyplaza.com/map\\_and\\_directions/](http://www.danburyplaza.com/map_and_directions/)

**CLICK BELOW FOR DETAILED WRITTEN DIRECTIONS IF TRAVELLING BY CAR:**

[DanburyPlazaWritenDirections.htm/](#)

**Local Attractions**

Relaxing New York City Area Hotel Lodging , Near Prominent Businesses & Attractions. Escape to a relaxed and comfortable environment at the Danbury Plaza Hotel, formerly the Sheraton Danbury. One of the most accessible New York City area hotels, this first-class lodging offers stylish accommodations, exceptional meeting facilities, and close proximity to key businesses and leisure attractions. Call on clients at the nearby Ridgebury Office Center. Or board the Metro North train and arrive in midtown Manhattan in about an hour. For added value, check out the affordable deals at this convenient New York area hotel lodging.

- \* **Grand Prix NY Race Track (20.0 mi.)**
- \* **Connecticut Jazz Festival**
- \* **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](http://www.mstconf.com/surfmod8.htm)

**JUNE 22-24, 2011: EIGHTH INTERNATIONAL SYMPOSIUM ON SILANES AND OTHER COUPLING AGENTS**  
[www.mstconf.com/silanes8.htm](http://www.mstconf.com/silanes8.htm)

## LOCATION:

### DANBURY PLAZA HOTEL AND CONFERENCE CENTER

18 OLD RIDGEBURY ROAD  
DANBURY, CT 06810

Tel: 203-794-0600  
FAX: 203-798-7735

**E-mail:** [aweber@danburyplaza.com](mailto:aweber@danburyplaza.com)

**Web Site:** [www.danburyplaza.com](http://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

## TO REGISTER FOR SYMPOSIUM:

BY PHONE: 845-897-1654; 845-227-7026  
BY FAX: 212-656-1016  
E-mail: [rhl@mstconf.com](mailto:rhl@mstconf.com)

## REGISTER ONLINE:

[www.mstconf.com/RegMST.htm](http://www.mstconf.com/RegMST.htm)

## BY MAIL: SEND COMPLETED FORM TO:

Dr. Robert Lacombe  
Chairman  
MST Conferences  
3 Hammer Drive  
Hopewell Junction, NY 12533-6124, USA

## SHORT COURSES ON APPLIED ADHESION MEASUREMENT METHODS (June 25, 2011) AND DURABILITY OF ADHESIVE JOINTS (June 26, 2011)

: 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. The effects of material elastic properties and residual stress are considered as well as environmental influences which affect coating adhesion and joint durability.

**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 course 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**

EIGHTH INTERNATIONAL SYMPOSIUM ON POLYMER SURFACE MODIFICATION, June 20-22, 2011 (speaker/student)	\$395
EIGHTH INTERNATIONAL SYMPOSIUM ON POLYMER SURFACE MODIFICATION, June 20-22, 2011 (regular attendee)	\$595
EIGHTH INTERNATIONAL SYMPOSIUM ON SILANES AND OTHER COUPLING AGENTS, JUNE 22-24, 2011 (speaker/student)	\$395
EIGHTH INTERNATIONAL SYMPOSIUM ON SILANES AND OTHER COUPLING AGENTS, JUNE 22-24, 2011 (regular attendee)	\$595
Sub Total	
Deduct additional 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
<b>TOTAL REGISTRATION FEE</b>	

**METHOD OF PAYMENT, CHECK WHICH METHOD YOU PREFER**

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<b>CHECK: Make check payable to MST Conferences, LLC and mail to:</b> Dr. Robert H. Lacombe Conference Chairman 3 Hammer Drive Hopewell Junction, NY 12533-6124, USA	

**CREDIT CARD INFORMATION**

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