

# **MATERIALS SCIENCE AND TECHNOLOGY NEWSLETTER**

**Vol. 6, No. 2 SUMMER-FALL 2009**

Dr. Robert H. Lacombe  
Chairman  
Materials Science and Technology  
CONFERENCES, LLC  
3 Hammer Drive  
Hopewell Junction, NY 12533-6124  
Tel. 845-897-1654, 845-227-7026  
FAX 212-656-1016  
E-mail: rhlacombe@compuserve.com

## **FOCUSING ON HIGH TEMPERATURE/HIGH PERFORMANCE POLYMERS**

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## EDITORIAL COMMENTS

This issue of the Newsletter will focus on the technology of HIGH TEMPERATURE/ HIGH PERFORMANCE polymer materials of which the POLYIMIDE materials form a prime example. Of all these materials the polyimides have found the widest range of application in such diverse areas as the aerospace industry, sensor technology and microelectronic components. A unique combination of physical and chemical properties make these materials highly attractive for demanding applications where chemical inertness, high temperature stability, low dielectric constant, mechanical toughness and processability are primary concerns. In addition, their ability to adhere to a range of inorganic materials including metals, ceramics, glasses and semiconductors have made these materials predominant in coating and composite applications. In this regard the issue of adhesion and interaction with other materials will be one of the major focal points of this symposium.

It is also our pleasure to announce that this symposium will be held in collaboration with Prof. Gordon Nelson of the Florida Institute of Technology and Dr. Martha Williams and Trent Smith of the NASA Kennedy Space Center. These individuals have been active in the area of high temperature polymers especially in regard to aerospace applications. Full details of this symposium follow this editorial including the preliminary program plus hotel, travel and registration information. A brief history of the polyimide symposium series has been given in a previous issue of this newsletter. The interested reader can get full details by clicking on the following webpage:

[www.mstconf.com/Vol5No3-2008.pdf](http://www.mstconf.com/Vol5No3-2008.pdf)

We would also like to announce two future symposia which are coming up in April and June of 2010:

**INTERNATIONAL SYMPOSIUM ON SURFACE SCIENCE ASPECTS OF PHARMACEUTICAL SCIENCE, PHARMACOLOGY, COSMETICS AND BIOTECHNOLOGY**, To be held April 19-21, 2010, Danbury Connecticut, USA.

**SEVENTH INTERNATIONAL SYMPOSIUM ON CONTACT ANGLE, WETTABILITY AND ADHESION**; To be held June 23-25, 2010, Danbury Connecticut, USA.

A detailed announcement for each of these symposia is given at the end of the newsletter.

The conference Director Dr. Mittal and I cordially invite all readers of the newsletter to join us at



either or all of the above events.

## PRELIMINARY PROGRAM

**SIXTH INTERNATIONAL SYMPOSIUM ON POLYIMIDES AND OTHER HIGH TEMPERATURE/HIGH PERFORMANCE POLYMERS**; SYNTHESIS, CHARACTERIZATION AND APPLICATIONS; **To be held November 9-11, 2009 , Florida Institute of Technology, Melbourne, FL, USA**

### SYNTHESIS

**Wai Kin Chan**; Department of Chemistry, The University of Hong Kong, Pokfulam Road, Hong Kong, CHINA; **Synthesis of Metal Containing Aromatic Polyamides and Polyesters and Their Properties**

**Myeon-Cheon Choi**, Junji Wakita, Sinji Ando, and Chang-Sik Ha; Department of Polymer Science and Engineering, Pusan National University, Busan 609-735, KOREA; **Highly Transparent and Refractive Polyimides with Controlled Molecular Structure by Chlorine Side Groups**

**Thuy D. Dang\***, Zongwu Bai, Narayanan Venkat, Alexander B. Morgan, Joseph A. Shumaker and Marlene D. Houtz; AFRL/RXBN, 2941 Hobson Way, Wright-Patterson Air Force Base, Dayton, OH 45433, USA; **Novel Rigid-rod Random Copolymers with Flexibilizing Structural Units for Enhanced Flame Resistance and Blast Protection**

**Roy Odle**; SABIC Innovative Plastics, 1 Lexan Lane, Mt. Vernon, IN 47620; **Synthesis and Structure-Property Relationships of Polyetherimide-Sulfones**

**A. L. Rusanov**, L. G. Komarova, E. G. Bulycheva and M. G. Bugaenko; A. N. Nesmeyanov; Russian Academy of Sciences, 28 Vavilov Str., Moscow, 119991, RUSSIA; **New Sulfonated Polyethers and Polynaphthylimides**

**Jason K. Ward**, Mita Das and William J. Koros; School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA-30332, USA; **Synthesis of 6FDA based Membranes for Olefin Paraffin Separations**

## AEROSPACE APPLICATIONS

**M. Akram**, S. Bhowmik, R. Benedictus and J. A. Poulis; Aerospace Materials and Structures, Faculty of Aerospace Engineering, Delft University of Technology, Kluyverweg 1, 2629 HS Delft, THE NETHERLANDS; **Surface Modification of Polyimide by Atmospheric Pressure Plasma for Adhesive Bonding with Titanium and its Application to Aviation and Space**

Scott Jolley, **Tracy Gibson**, Lilliana Fitzpatrick, ASRC Aerospace, and Martha Williams, NASA, Applied Technology, Kennedy Space Center, Florida; **Physical Properties of Low Melt Polyimides for Aerospace Applications**

**Scott Jolley**, Tracy Gibson, Lilliana Fitzpatrick, ASRC Aerospace and Martha Williams; NASA, Applied Technology, Kennedy Space Center, Florida; **Low Melt Polyimides for Repair and Coatings**

**Luke Roberson**, Martha Williams, LaNetra Tate, Applied Technology and Craig Fortier; Fluids and Propulsion Engineering, Kennedy Space Center, Florida; **Carbon Nanotubes Printing Techniques for Enhanced Conductivity**

**Narayanan Venkat**, Zongwu Bai, Thuy D. Dang\*, Victor K. McNier, Jennifer N. DeCerbo and Jeffery T. Stricker; University of Dayton Research Institute, 300 College Park Drive, Dayton OH 45469, USA; **Design of Polyimide and Other High Temperature Polymer Dielectrics for Aerospace Power Conditioning Capacitor Applications**

## NOVEL AND COMPOSITE FORMULATIONS

Dong-Hee Park and **Won-Kook Choi**; Thin Film Materials Research Center, Korea Institute of Science and Technology, Cheongryang P.O Box 131, Seoul 130-650, KOREA; **Superhydrophilicity of Polyimide Surface Using Direct Reactive High Flux Low Energy Ion Beam Irradiation**

**Alexander Fainleib**, Olga Grigoryeva, Angelika Menner and Alexander Bismarck; Institute of Macromolecular Chemistry of the National Academy of Sciences of Ukraine, Kyiv, UKRAINE; **High Temperature/High Performance polyHIPES Based on Polystyrene/Polycyanurate IPNs**

**Jude O. Iroh**, Wenchao Zhang, and Esther Obonyo; Department of Chemical and Materials Engineering, University of Cincinnati Cincinnati, Ohio 45221-0012; **Hybrid Montmorillonite Clay/polyimide Nanocomposite Membranes**

**J. R. Johnson** and W. J. Koros; School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA; **Torlon® (polyamide-imide) Nanocomposites Containing Laponite® RD Nanoclays for Barrier Membrane Applications**

Camille A. Thorpe, Feng Yang and **Gordon Nelson**; College of Science, Florida Institute of Technology, Melbourne, FL 32901, USA; **Design, Synthesis and Characterization of Novel Ferrocene-Containing Polyimide Copolymers**

**Rohitkumar H. Vora**; Advanced Polymers Research & Technologies, 8080 Heritage Drive, Alburtis, PA 18011 USA; **Designing of Next Generation of High Performance CeramImide® Type Nanocomposite Materials for Aerospace and Defense Applications**

## SPECIAL APPLICATIONS

**Anne Jonquieres**; Laboratoire de Chimie Physique Macromoléculaire, ENSIC, B.P. 20451, F-54001 Nancy, FRANCE; **New Polyurethaneimides Containing Lewis Bases for Gas Microsensor Applications**

**Brigitte Mutel**, Philippe Supiot, Adil Essakhi, Axel Löfberg, Sébastien Paul, Véronique Le Courtois and Elisabeth Bordes-Richard; (GÉPIFRÉM), EA 3571, USTL, Villeneuve d'Ascq, FRANCE; **Coating of Structured Reactors by Plasma Assisted Polymerization of TMDSO**

Javier Parrondo and **B. Rambabu**; Solid State Ionics and Surface Science Laboratory, Department of Physics, Southern University and A&M College, Baton Rouge, Louisiana 70813, USA; **Polybenzimidazole Membranes (PBI) for HT-PEMFCs: Synthesis, Fuel Cell Performance and Substantiate with That of Commercial High Temperature PEMS**

**W. M. Shan Wickramanayake**, R.P. Lively, R. R. Chance, W. J. Koros, D.G. Peiffer, B. Carstensen and R. S. Polizzotti; Georgia Institute of Technology, 311 Ferst Drive, Atlanta, GA 30332; **Hollow-Polyimide Spheres: Fabrication and Industrial Applications**

**Yasuharu Yamada** and Tomoyuki Suzuki; Kyoto Institute of Technology, KIT Liaison Center, Department of Biomolecular Engineering, Matsugasaki, Sakyo-ku, Kyoto 606-8585, JAPAN; **Hyperbranched Polyimide-silica Hybrids for Gas Separation Membranes**

## ELECTRONIC APPLICATIONS

**E. T. Kang**, C. X. Zhu and K. G. Neoh; Dept. of Chemical & Biomolecular Engineering, National University of Singapore, Kent Ridge, Singapore 119260; **Electrical Bistability and Random Access Memory Effects in Functionalized Polyimides**

**R. Khazaka**, S. Diahm, M. L. Locatelli and B. Despax; Université de Toulouse, UPS, INPT, 118 route de Narbonne, F-31062 Toulouse cedex 9, FRANCE; **Oxidative Thermal Aging Effect on the Electrical Properties of BPDA/PDA Polyimide Films With and Without Oxygen Barrier Layers**

**Rakesh Kumar**; Specialty Coating Systems, 7645 Woodland Drive, Indianapolis, IN 46278; **Parylene HT: a High Temperature Vapor Phase Polymer for Electronics Applications**

**Masataka Murahara**; Tokyo Institute of Technology, Innovation Propellant Department, Tokyo, JAPAN; **Polymer Coating Surface Change into Ceramic Layer <Photo-oxidized Silicone Oil Layer for High Temperature and High Electric Insulation Resistance**

**Joung-Man Park**, Zuo-Jia wang, Joel GnidaKouong, Ga-Young Gu, Woo-Il Lee, Jong-Kyoo Park and K. Lawrence DeVries; Gyeongsang National University, Jinju 660-701, KOREA; **Interfacial Aspects and Self-Sensing of Carbon Fiber/CNT-Phenol Nanocomposites using**

**Electro-Micromechanical Techniques and Wettability**

**Luke Roberson**, Chris Immer, Shanju Zhang, and Satish Kumar; NASA, Applied Technology, Kennedy Space Center, Florida; **Carbon nanotube fiber filaments for lighting applications"**

## STRUCTURE PROPERTY STUDIES

**Jude. O. Iroh**, Jandro Abot, Harikrishna Boddu, Huabin Wang, Marlene Hourz, **Loon-Seng Tan** and Gary Price; Department of Chemical and Materials Engineering, Department of Aerospace Engineering, University of Cincinnati, Cincinnati, Ohio 45221-0012; **Damping Behavior of Carbon Nanofiber/polyimide Nanocomposites**

**Gennady Mikhailov**; 13/1-161, Olga Forsh Street, 195269, St. Petersburg, RUSSIA; **Interrelation Between Chemical Structure, Super-molecule Organization and Properties of the Polyarimide Fibers**

**Musto Pellegrino**, Mariangela Leo, Giuseppe Mensitieri and Marino Lavorgna; Institute of Chemistry and Technology of Polymers (ICTP), National Research Council of Italy, via Campi Flegrei, 34, Pozzuoli (Na), ITALY; **Molecular Mechanism of Diffusion of H<sub>2</sub>O and Methanol in PMDA-ODA Polyimide: a Time-resolved FTIR Study**

**Francette Thominette**; LIM ENSAM, 151 Bd de l'Hopital, 75013 Paris, FRANCE; **Hygrothermal Aging of Nafion<sup>®</sup>**

### TOPICS OF INTEREST INCLUDE:

1. Chemistry, synthesis and characterization
2. Surface chemistry and surface modification

### OTHER HIGH TEMP./HIGH PERFORMANCE MATERIALS

3. Examples include
  - a. Aramids
  - b. Carbon nanotubes
  - c. Poly phenylenes
  - d. High. temp. epoxies
  - e. Fluorinated materials
  - f. etc.

### PHYSICO-CHEMICAL PROPERTIES

4. Thermal-mechanical properties
5. Electrical properties
6. Adhesion properties and adhesion improvement
  - a. Surface treatment
  - b. Use of coupling agents
  - c. Controlling stress level
7. Encapsulation and barrier properties
8. Effects of aging and environment on long term stability, reliability and durability

### APPLICATIONS

9. Polyimides as adhesives and insulators.
10. Polyimides as dielectrics, photoresists and encapsulants in microelectronic and biomedical structures
11. Metallization of polyimide and investigation of interfaces.
12. Composite applications

### CHARACTERIZATION

13. Chain architecture
14. Bulk morphology
15. Surface morphology
16. Surface chemistry

### NOVEL AND ADVANCED FORMULATIONS

17. Ultralow dielectric materials, low thermal expansion liquid crystals, polyimide blends, nanocomposites, copolymers, foams,... etc.

This symposium is being organized by MST Conferences, LLC under the direction of Dr. K. L. Mittal, Editor-in-Chief, Journal of Adhesion Science and Technology. All authors are invited to submit their manuscript for publication in the journal Polymer Engineering and Science edited by Prof. Robert Weiss of the University of Akron. Please indicate whether you plan to publish in the Journal and will have your manuscript ready at the time of the symposium. Those interested in publishing will be contacted by Prof. Weiss directly. Please notify the conference chairman of your intentions to present a paper as early as possible. An abstract of about 200 words should be sent by **October 15, 2009** to the conference chairman by any of the following methods:

E-mail: [rhl@mstconf.com](mailto:rhl@mstconf.com)

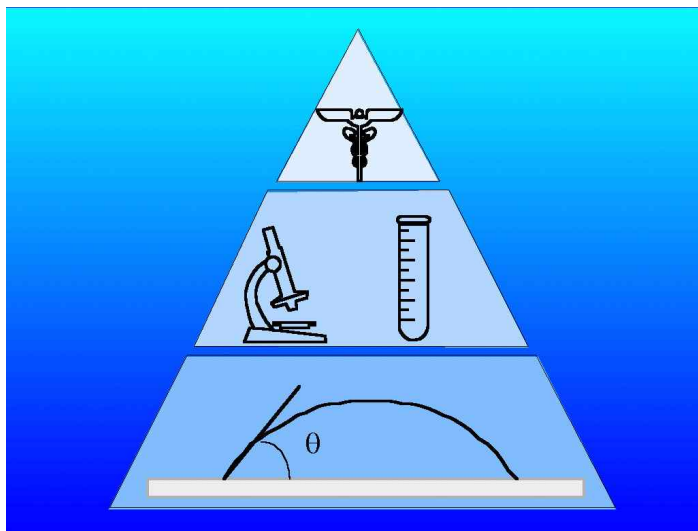
FAX: 212-656-1016

Regular mail:

Dr. Robert H. Lacombe  
Conference Chairman  
3 Hammer Drive  
Hopewell Junction, NY 12533

Contact by phone: 845-897-1654; 845-227-7026

Full conference details, abstract submission and registration via the Internet will be maintained on the conference web site: <http://mstconf.com/polyimd6.htm>



## CALL FOR PAPERS

### INTERNATIONAL SYMPOSIUM ON SURFACE SCIENCE ASPECTS OF PHARMACEUTICAL SCIENCE, PHARMACOLOGY, COSMETICS AND BIO-TECHNOLOGY

April 19-21, 2010 in Danbury, Connecticut,  
USA

The staff of MST CONFERENCES are happy to announce the inaugural symposium in a planned series on the surface science aspects of pharmaceutical science, pharmacology, cosmetics and bio-technology. The scope of the program will deal, among others, with all aspects which are critically dependent on understanding the nature of surface interactions which control the behavior and biological activity of therapeutical formulations as well as cosmetic and biomedical technologies such as bio-adhesives, drug delivery systems, cosmetic formulations and gene chip arrays.

The overall focus of the symposium will of necessity be multi-disciplinary in nature involving researchers engaged in developing new drugs to surface scientists concerned with the detailed nature of surface interactions and their accurate measurement. It is indeed a prime objective of the symposium to bring these normally disparate groups together within a forum where needs, ideas and methodologies can be discussed and mutually beneficial collaborations encouraged.

It is well recognized that a wide range of critical biological interactions occur at or across surfaces including drug absorption, cellular adhesion, autoimmune reactions, skin inflammation and cell growth to name a few.

Thus in order to control or modify these processes it is first critical to understand the fundamental nature of the surface interactions which control

them. It is at this level that the surface scientist and the bio-technologist can collaborate to develop innovative technologies for drug delivery, cellular and bone repair, cosmetic formulations and advanced diagnostic methods such as gene chip arrays.

On the one hand, the pharmaceutical scientists and bio-technologists can elucidate the problems and methods of their disciplines with regard to issues relating to delivery and adsorption of drug metabolites, interactions leading to inflammation or implant rejection and adverse immune system response to medical treatments. The surface scientist, on the other hand, can demonstrate how the methods of surface analysis and measurement can be brought to bear on the problem of understanding the basic surface chemistry which controls these processes. As an example, the bio-technologist might explain the problems associated with a topical skin treatment whereas the surface scientist can demonstrate how contact angle measurements can be used to evaluate the wettability characteristics of skin and how this affects the absorption of and reaction with topical medications.

### SYMPOSIUM TOPICS:

#### Needs of the Biomedical, Pharmaceutical and Cosmetic industries:

1. Interaction of biologically active molecules with tissue substrates.
2. Problems of drug delivery in vivo
3. Drug interactions with cellular surfaces relating to immune system response and implant rejection
4. Interactions with biomaterial surfaces
5. Biocompatibility
6. Problems relating to drug encapsulation in capsules or tablets
7. Skin surface chemistry and interactions

#### Tools and Methodologies of Surface Science:

1. Surface analytical methods
  - a. ESCA, AUGER, SIMS ...
  - b. Atomic Force Microscopy
  - c. Contact Angle Goniometry
  - d. Surface Micro-Calorimetry
2. Theoretical concepts of Surface Science
  - a. Hamaker theory
  - b. JKR theory
  - c. Surface thermodynamics
  - d. Acid-Base interactions



3. Surface Chemistry Modification
  - a. Silane adhesion promoters
  - b. Chemical grafting
  - c. Plasma and radiation modification

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

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

**HOTEL:**

Please make room reservations directly with the Danbury Plaza Hotel. A block of rooms has been set aside for conference registrants until March 15, 2010. After this date the hotel will accept reservations on a space available basis and they cannot guarantee that the special conference rate of \$99/night will apply. 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 Laguardia and Kennedy airports

**TO SUBMIT AN ABSTRACT OR GET ON CONFERENCE MAILING LIST:**

This symposium is being organized by MST Conferences under the direction of Dr. K. L. Mittal, Editor-in-Chief, Journal of Adhesion Science and Technology and in collaboration with the technical staff of the Boehringer Ingelheim and Corning corporations. It is planned to publish papers presented in this symposium in the Journal of Adhesion Science and Technology, edited by the conference director Dr. Mittal. Please notify the conference chairman of your intentions to present a paper as early as possible. An abstract of about 200 words should be sent by **December 15, 2009** to the conference chairman by any of the following methods:

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

**ONLINE:**

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

**BY MAIL:**

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

**Applications:**

1. Drug Delivery Systems
  - a. Delivery through fabrics made with surface modified fibers
  - b. Advanced capsule and tablet technologies
  - c. Delivery using surface activated particles
  - d. Drug screening, label free detection
2. Advanced adhesives for mending bone fractures
3. Gene chip arrays
4. Immobilization strategies of biomolecules on solid surfaces
5. Cosmetic applications

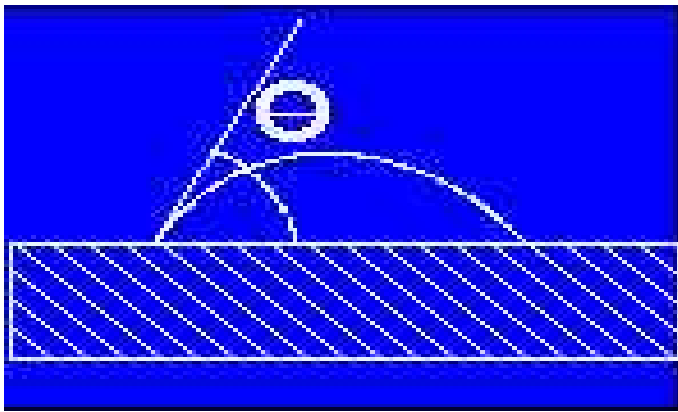
**Cross-Disciplinary Studies:**

1. Use of Atomic Force Microscopy to study biological surfaces
2. Contact angle measurements on skin and dental tissues
3. Bioadhesives such as hydrogels
4. Advanced adhesive applications employing the GECKO effect
5. Applications of superhydrophobicity and the LOTUS LEAF effect
6. Micro/Nano Technology; e.g. smart implants using MEMS

**April 19-21, 2010:  
 INTERNATIONAL SYMPOSIUM ON SURFACE  
 SCIENCE ASPECTS OF PHARMACEUTICAL  
 SCIENCE, PHARMACOLOGY, COSMETICS AND  
 BIO-TECHNOLOGY**

**LOCATION:**

DANBURY PLAZA  
 Hotel & Conference Center  
 18 Old Ridgebury Road  
 Danbury, CT 06810  
 Tel. 203-794-0600  
 FAX. 203-798-7735



## SYMPOSIUM TOPICS:

### Factors Influencing Contact Angle Measurements:

- ◆ Static and dynamic contact angles, effect of surface flaws and surface roughness on wetting.
- ◆ Effect of pore size distribution
- ◆ Effects of velocity and viscosity of liquid on solid-liquid interfacial behavior.
- ◆ Interaction forces including: van der Waals, Acid-Base, Hydrogen bonding, ...etc

### Wettability Behavior and Surface Characterization of Various Materials:

- ◆ Contact angle interpretation and hysteresis.
- ◆ Wettability of various material surfaces including but not limited to: wood, elastomers, silicon wafers, pharmaceutical powders, metals, polymers, paper, particles, fibers... etc.
- ◆ Surface treatments to modify wettability behavior.
- ◆ Superhydrophobicity

### Wettability, Adhesion and Applied Aspects of Contact Angle Measurements:

- ◆ Effect of surface energetics on adhesion.
- ◆ Biological applications including protein and bacterial adhesion.
- ◆ Fine particle adhesion and control of dust.
- ◆ Other technological applications including: printing, agriculture, pharmaceuticals, textiles and paper.

This symposium is being organized under the direction of Dr. K. L. Mittal, Editor-in-Chief, Journal of Adhesion Science and Technology by MST Conferences. Authors are encouraged to submit their manuscripts for publication in the Journal of Adhesion Science and Technology. Please notify the conference chairman of your intentions to present a paper as early as possible. An abstract of about 200 words should be sent by **January 15, 2010** to the conference chairman by any of the following methods:

E-mail: [rhl@mstconf.com](mailto:rhl@mstconf.com)

FAX: 212-656-1016

Regular mail:

Dr. Robert H. Lacombe  
 Conference Chairman  
 3 Hammer Drive  
 Hopewell Junction, NY 12533

Contact by phone: 845-897-1654; 845-227-7026  
 Full conference details and registration via the Internet will be maintained on our web site:

<http://mstconf.com/contact7.htm>

## CALL FOR PAPERS

### SEVENTH INTERNATIONAL SYMPOSIUM ON CONTACT ANGLE, WETTABILITY AND ADHESION; To be held in Danbury, Connecticut USA, June 23-25, 2010

In his opening remarks at the first symposium in this series Professor Robert Good pointed out that Galileo in the 17<sup>th</sup> century was quite likely the first investigator to observe contact angle behavior with his experiment of floating a thin gold leaf on top of a water surface. Since that time contact angle measurements have found wide application as a method for determining the energetics of surfaces. This, in turn, has a profound effect on the wettability and adhesion of liquids and coatings to surfaces.

This symposium will be concerned with both the fundamental and applied aspects of contact angle measurements. Issues such as the applicability and validity of various measurement techniques and the proper theoretical framework for the analysis of contact angle data will be of prime concern.

In addition, a host of applications of the contact angle technique will be explored including but not limited to: wettability of powders, fibers, wood products, papers, polymers and monolayers. Further focus will be on the use of contact angle data in evaluating surface modification procedures, determining relevance of wettability to adhesion, the role of wettability in bioadhesion, ophthalmology, prosthesis and in the control of dust in mining and milling applications. The primary focus of this symposium will be to provide a forum for the discussion of cutting edge advancements in the field and to review and consolidate the accomplishments which have been achieved thus far.



# REGISTRATION INFORMATION

## DATES:

**NOVEMBER 9-11, 2009: SIXTH INTERNATIONAL SYMPOSIUM ON POLYIMIDES AND OTHER HIGH TEMPERATURE POLYMERS**

**NOVEMBER 12, 2009: SHORT COURSE ON ADHESION MEASUREMENT METHODS** ([CLICK HERE FOR COURSE SYLLABUS](#))

**NOVEMBER 13, 2009: SHORT COURSE ON DURABILITY OF ADHESIVE JOINTS** ([CLICK HERE FOR COURSE SYLLABUS](#))

## LOCATION:

Florida Institute of Technology  
Melbourne, FL 32901  
[www.fit.edu](http://www.fit.edu)

## HOTEL

### The Jameson Inn of Palm Bay

890 Palm Bay Rd NE  
Palm Bay, FL 32905

Ph 321-725-2952  
FAX 321-768-1759

\$69/night plus tax - Double Non-Smoking or King Non-Smoking

\$74/night plus tax - Double Non-Smoking Premium or King Non-Smoking Premium

[http://www.jamesoninns.com/Hotel\\_Detail.asp?PHotelID=SJ1425](http://www.jamesoninns.com/Hotel_Detail.asp?PHotelID=SJ1425)

### Crowne Plaza Melbourne Oceanfront Hotel

2605 N. A1A  
Indialantic, FL 32903

Ph: (321) 777-4100  
FAX (321) 773-6132

Attendees should ask for the FIT Rate.  
\$119/night plus tax - House Room  
\$129/night plus tax - Partial View  
\$159/night plus tax - Studio Kitchenette  
[www.cpmelbourne.com](http://www.cpmelbourne.com)

## AIRPORT AND TRAVEL:

Airports: There are 2 airports close by.

Melbourne International Airport (MLB) is 10 minutes from campus; <http://www.mlbair.com/>. Taxi's should be readily available outside the terminal.

Orlando International Airport (MCO) is 1 hour from

campus;

<http://www.orlandoairports.net/main.htm>

## Orlando Airport Shuttles:

<http://www.orlandoairports.net/ops/shuttle.htm>

Below are the shuttle choices from Orlando:  
Service Zone 2  
SOUTHEAST  
Brevard County & The Beaches

AAA Access Transport . . . . . (407) 832-1650  
Busy Traveler Transportation . . . (800) 496-7433  
Cali Express Transportation . . . .(407) 383-5963  
Cocoa Beach Shuttle . . . . . (888) 784-4144  
Melbourne Airport Shuttle . . . . . (800) 826-4544

## REGISTRATION:

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

## ON CAMPUS HOUSING

On-Campus Housing rooms are available for conference participants. They will be either single rooms or 2/room. These are dorm rooms with a community bath. Cost is \$145/week or \$50/night plus \$12/bed for linen cleaning. Interested attendees are advised to contact Anthony Skevakis, Director of Housing, directly via email at [askevakis@fit.edu](mailto:askevakis@fit.edu) (321-674-8033) to reserve rooms.

## TO REGISTER FOR SYMPOSIA:

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## REGISTER ONLINE AT:

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

## MAIL: SEND COMPLETED FORM TO:

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

**CANCELLATIONS:** Registration fees are refundable, subject to a 15% service charge, if cancellation is made by **Oct. 15, 2009**. **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 either the symposium 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

<b>POLYIMIDES AND OTHER HIGH TEMPERATURE POLYMERS</b> November 9-11, (speaker/student)	\$395
<b>POLYIMIDES AND OTHER HIGH TEMPERATURE POLYMERS</b> November 9-11, (regular attendee)	\$595
Sub Total	
Short Course on <u>Applied Adhesion Measurement Methods</u> : November 12, 2009	\$595
Short Course on <u>Durability of Adhesive Joints</u> : November 13, 2009	\$595
<b>TOTAL REGISTRATION FEE</b>	

### METHOD OF PAYMENT CHECK WHICH METHOD YOU PREFER

<b>CREDIT CARD: Check here and fill out box below</b>	
<b>BANK WIRE TRANSFER: Please contact the Conference Chairman Dr. Lacombe at the address below or by any of the following methods for details:</b>  <b>Phone: 845-897-1654; 845-227-7026</b> <b>FAX 212-656-1016</b> <b>E-mail: rhlacombe@compuserve.com</b>	
<b>CHECK: Make check payable to MST Conferences, LLC and mail to:</b> <b>Dr. Robert H. Lacombe</b> <b>Conference Chairman</b> <b>3 Hammer Drive</b> <b>Hopewell Junction, NY 12533-6124, USA</b>	

**CREDIT CARD INFORMATION**

- VISA
- MASTER CARD
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- DISCOVER

Expiration Date: \_\_\_\_\_  
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ADDRESS INFORMATION	
NAME:	
ADDRESS:	
E-mail:	
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**Card holder name:** \_\_\_\_\_

**Card Number:** \_\_\_\_\_