

PRELIMINARY PROGRAM

EIGHTH INTERNATIONAL
SYMPOSIUM ON

CONTACT ANGLE, WETTABILITY AND ADHESION

To be held at Université Laval,
Québec City, Québec, CANADA
June 13-15, 2012



SYMPOSIUM HISTORY AND MOTIVATION

In his opening remarks at the first symposium in this series Professor Robert Good pointed out that Galileo in the 17th 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 is 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 are of prime concern.

In addition, a host of applications of the contact angle technique are explored including but not limited to: wettability of powders, fibers, wood products, paper, polymers and monolayers. Further focus is 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.

AUDIENCE AND PARTICIPATION

The primary focus of this symposium is 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.

SUBMITTING A 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 March 31, 2012 to the conference chairman by any of the following methods:

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Regular mail:

Dr. Robert H. Lacombe
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Full conference details and registration via the Internet will be maintained on our web site:

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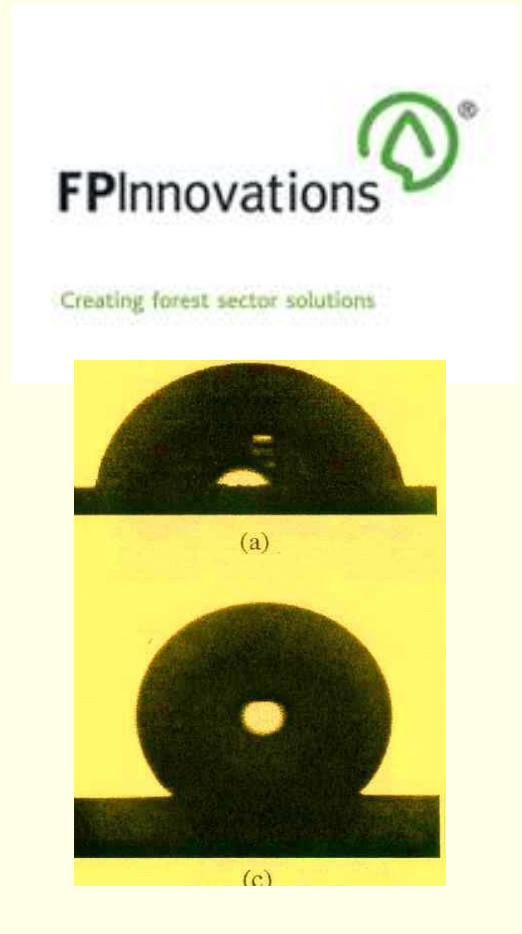
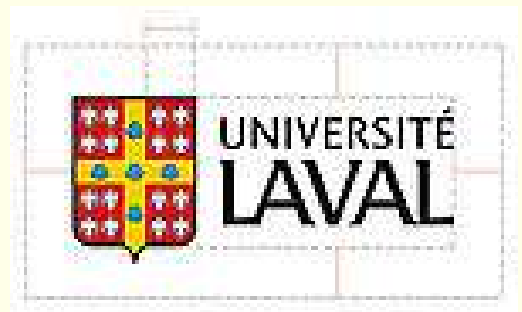
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PRELIMINARY PROGRAM

SUPERHYDROPHOBIC/HYDROPHILIC BEHAVIOR

Edward Bormashenko and Roman Grynyov; Ariel University Center of Samaria, Physics Faculty, 40700, P.O.B. 3, Ariel, ISRAEL; Plasma Treatment Modification of Surfaces of Biological Objects

Zong-Han Yang, Fan-Ching Chien, Chiung-Wen Kuo, Di-Yen Chue, and Peilin Chen; Center for Applied Sciences, Academia Sinica, 128, Section 2, Academia Road, Nankang, Taipei 115, TAIWAN; Interfacial Adhesion of Superhydrophobic Surfaces with Pillar-like Hierarchical Structures

Wei Xu and Chang-Hwan Choi; Department of Mechanical Engineering, Stevens Institute of Technology, USA; Is a Superhydrophobic Surface Really Slippery?: a New Criterion to Determine the Stickiness of Superhydrophobic Surfaces

Angela Duparré; Fraunhofer Institute for Applied Optics & Precision Engineering Albert-Einstein-Straße 7, D-07745 Jena, GERMANY; Assessment Criteria for (Super)Hydrophobic Surfaces with Stochastic Roughness

Herbert P. Jennissen, Steffen Lüers and Markus Laub; Institute of Physiological Chemistry, University of Duisburg-Essen, Hufelandstr. 55, D-45122, Essen, GERMANY; Defining and Quantitating Superhydrophilicity

Miguel Gómez, Enric Bertran and Ricardo Molina; Chemical and Biomolecular Nanotechnology Department, Institute of Advanced Chemistry of Catalonia (IQAC), Consejo Superior de Investigaciones Científicas (CSIC), Jordi Girona 18-26, 08034 Barcelona, SPAIN; Hydrophilic-Oleophobic Coatings by Plasma Assisted Polymerization in Liquid Phase and Fluorosurfactant Complexation

S. T. Picraux, Dongqing Yang, S. G. Choi, P. Aella, Antonio A. Garcia; Center for Integrated Nanotechnologies, Los Alamos National Laboratory, Los Alamos, New Mexico 87545; Design of Nanowire Surfaces with Photo-induced Superhydrophilic to Superhydrophobic Switching

Stefan Seeger; Universität Zürich, Physikalisch-Chemisches Institut, Winterthurerstrasse 190. 8057 Zürich, SWITZERLAND; Wettability Behavior and Surface Characterization of Various Materials, Subtopic Superhydrophobicity

Hong Zhao, Kock-Yee Law and Kyoo-Chul Park; Xerox Corporation, 800 Phillips Road, W147-59B, Webster, NY 14580; Effect of Surface Texturing on Repellency and Wetting Hysteresis of Superoleophobic Surfaces

FUNDAMENTAL STUDIES

Edward Bormashenko; Head of the Laboratory of Polymers, Ariel University Center of Samaria, P.O.B. 3, Ariel 40700, ISRAEL; Physics of Wetting Transitions

Edward Bormashenko; Head of the Laboratory of Polymers, Ariel University Center of Samaria, P.O.B. 3, Ariel 40700, ISRAEL; Novel Investigations of Liquid Marbles

Stéphane Douezan, Randa Naouar, Silvie Dufour, Damien Cuvelier and Françoise Brochard-Wyart; Lab. PCC-UMR168, Institute Marie Curie, 11 rue P. et M. Curie, F-75231 Paris Cedex 05, FRANCE; Wetting Transition of Living Drops

Luisa Coriand, Angela Duparré, and Andreas Tünnermann; Fraunhofer Institute for Applied Optics and Precision Engineering, Albert-Einstein-Strasse 7, 07745 Jena, GERMANY; Investigation of Hydrophilic Optical Coatings with Anti-Fog Behavior

A. M. Emelyanenko, L. B. Boinovich and A.N. Frumkin; Institute of Physical Chemistry and Electrochemistry, 31 Leninsky prospect, 119991 Moscow, RUSSIA; The Analysis of Wettability as an Effective Tool to Study the Physico-chemical Processes at Interfaces

Masao Iwamatsu; Department of Physics, Tokyo City University, Setagaya-ku, Tokyo 158-8557, JAPAN; Heterogeneous Nucleation on a Completely Wettable Substrate

Ri Li and Yanguang Shan; School of Engineering, University of British Columbia, Okanagan Campus, CANADA; Wetting of Contact Line on Textured Hydrophobic Surfaces

Ateeque Malani, Miguel Amat, Anilkumar Raghavanpillai, Ernest Wysong and Gregory Rutledge; Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA; Molecular Modeling of Three Phase Contact for Static and Dynamic Contact Angle Phenomena

Luca Mazzola; University "Roma Tre", Italy, Dipartimento di Ingegneria Meccanica e Industriale, Mechanical and Industrial Engineering Department, Via della Vasca Navale 79 - 00146 Rome, ITALY; Determination of the Surface Free Energy at Nanoscale via Atomic Force Microscopy Without Altering the Original Morphology

Rafael Tadmor; Dan F. Smith Dept. of Chemical Engineering, Lamar University, P. O. Box 10053 Beaumont TX 77710; Approaches in Wetting Phenomena

Michael Nosonovsky; College of Engineering & Applied Science; University of Wisconsin-Milwaukee, Milwaukee, WI 53211, U.S.A.; Contact Angle Hysteresis and Wetting Transitions in Underwater Oleophobic Metallic Surfaces

Muhammad Osman and Roger A. Sauer; Aachen Institute for Advanced Study in Computational Engineering Science (AICES), RWTH Aachen University, Aachen, GERMANY; Computational Aspects of Self-Cleaning Surface Mechanisms

P.G. Rouxhet, M.J. Genet, J. Landoulsi, S. Fleith, V.G. Baldovino, F.A. Denis, S. Derclaye and Y. Adriaensen; Institute of Condensed Matter and Nanosciences, Université Catholique de Louvain, Croix du Sud 1 / Box L7.04.01, B-1348 Louvain-la-Neuve, BELGIUM; How Clean Is a Cleaned Surface? Contact Angle Measurements vs Surface Chemical Analysis

D. Seveno, J. Conti and J. De Coninck; Laboratory of Surface and Interfacial Physics, University of Mons, Place du Parc, 20, 7000 Mons, BELGIUM; Which Is the Best Wetting Theory?

Fco. Javier Montes Ruiz-Cabello, Miguel A. Rodríguez-Valverde, Miguel A. Cabrerizo-Vílchez; Biocolloid and Fluid Physics Group, Department of Applied Physics, University of Granada, SPAIN; New Advances in the Measurement of the Most Stable Contact Angle

Emil Chibowski, Konrad Terpilowski and Lucyna Holysz; Department of Physical Chemistry-Interfacial Phenomena Faculty of Chemistry, Maria Curie-Skłodowska University, 20-031 Lublin, POLAND; Effect of Relative Humidity on Contact Angle and its Hysteresis on Phospholipid DPPC Bilayer Deposited on Glass

Pierre Letellier and Mireille Turmine; Laboratoire Interfaces et Systèmes Electrochimiques, CNRS, UPR15 LISE, Université Pierre et Marie Curie Paris 6, Case 133, 4 place Jussieu, 75252 Paris Cedex 05, FRANCE; Bubble Wettability and Solubility: non Extensive Thermodynamics Approach

BEHAVIOR OF WATER AND ICE

Athanassia Athanassiou, Athanasios Millionis, Luigi Martiradonna, George C. Anyfantis, Ilker S. Bayer and Despina Fragouli; Control of the Water Wettability and Adhesion on Micropillars Using Combined Geometrical and Chemical Surface Design

L.B. Boinovich, A.M. Emelyanenko and A.N. Frumkin; Russian Academy of Sciences; The Mechanisms of Anti-icing Resistance of Superhydrophobic Surfaces

Chang-Hwan Choi; Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, NEW JERSEY; Ice Adhesion on Superhydrophobic Surfaces

Golrokh Heydari, Mikael Järn and Per M. Claesson; Department of Chemistry, Surface and Corrosion Science, Royal Institute of Technology, SE-100 44 Stockholm, SWEDEN; Measurement of Contact Angle at Sub-zero Temperatures and Implication for Ice Formation

I. Mira, A. Swerin, M.A. Javed, M. Järn and K. Johansson; YKI, Institute for Surface Chemistry, P.O. Box 5607, SE-11486 Stockholm, SWEDEN; Surface Modifications at YKI for Improved Water and Ice Repellence

Anne Kietzig; Department of Chemical Engineering, McGill University, 3610 University Street, Montreal, Quebec H3A 2B2, CANADA; Water Harvesting on Surfaces with Defined Hydrophobic-Hydrophilic Patterns

Philseok Kim, Tak-Sing Wong, Jack Alvarenga, Michael J. Kreder and Joanna Aizenberg; Wyss Institute for Biologically Inspired Engineering, Harvard University, Cambridge, MA USA; Slippery Icephobic Coatings on Aluminum

Peichun Amy Tsai; Complex Fluids Group, Dept. Mechanical & Aerospace Engineering, Princeton University, Princeton, NJ; Evaporation and Impact of Water Droplet on Superhydrophobic Surfaces

NOVEL APPLICATIONS

Chang Seon Bang, Jin Gyu Kim and Dai Gil Lee; Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, ME3221, Guseong-dong, Yuseong-gu, Daejeon 305-701, REPUBLIC OF KOREA; Role of Contact Angle in the Performance Improvement of Adhesively Bonded Metal Joints at Cryogenic Temperatures

E. Fadeeva, J. Koch, S. Schlie, and B. Chichkov; Laser Zentrum Hannover e. V., Hollerithallee 8, 30419 Hannover, GERMANY; Wettability Controlled by Ultrashort Pulse Laser Ablation

Q.V. Bui, K.S. Kim and S.B. Jung; School of Advanced Materials Science and Engineering, Sungkyunkwan University, 300 Cheoncheon - Dong, Jangan - Gu, Suwon 440-746, KOREA; Wettability, Interfacial Reaction and Ball Shear Strength of Sn-1.0Ag-XCe Solders on ENEPIG Surface Finish

Anne Kietzig; Department of Chemical Engineering, McGill University, 3610 University Street, Montreal, Quebec H3A 2B2, CANADA; Adjustable Surface Wettability of Metallic Surfaces by Femtosecond Laser Irradiation

Jin Gyu Kim, Ilbeom Choi and Dai Gil Lee; School of Mechanical Aerospace & Systems Engineering, KAIST, ME3221, Guseong-dong, Yuseong-gu, Daejeon 305-701, REPUBLIC OF KOREA; Contact Angle and Wettability of Hybrid Surface Treated Metal Adherends

G.C. Pirlot, O. Debaisieux, A. Goedel, A. Lacroix, B. Nysten, P.G. Rouxhet; Institute of Condensed Matter and Nanosciences, Université catholique de Louvain, Croix du Sud 1 / Box L7.04.01, B-1348 Louvain-la-Neuve, BELGIUM; Aluminum Adherence to Polypropylene Films Used for Food Packaging : Input and Limitation of Contact Angle Measurements

Daryl R. Williams; Surfaces and Particle Engineering Laboratory, Department of Chemical Engineering, Imperial College London, South Kensington Campus, London, SW7 2AZ, U.K.; The Surface Energy of Pharmaceutical Solids- Its Importance in Solids Processing

Shuseng Peng, Liping Ying, Xin Zhang, Wanqiang Ding, Qunji Xue, and Xuedong Wu; Ningbo Institute of Materials Technology and Engineering, Chinese Academic of Sciences, Ningbo, PR China 315201; A Unique Wetting State with Oleophobic and Hydrophilic Characteristics

OIL RECOVERY AND MINING APPLICATIONS

Nahid Pour Khiabani, Alireza Bahramian and Zahra Fakhroueian; Institute of Petroleum Engineering, School of Chemical Engineering, University of Tehran, Tehran, IRAN; Wettability Alteration of Carbonate Rocks Using MgO Nanofluids

Javad Paktinat and Bill O'Neil, Trican Well Service, Calgary, AB, CANADA; Nano Surfactant System Improves Post Frac Oil and Gas Recovery in Hydrocarbon Rich Gas Reservoirs

Yu Zheng and Dandina N. Rao; Craft & Hawkins Department of Petroleum, Engineering, Louisiana State University, Baton Rouge, LA 70803, USA; Dependence of Wettability, Spreading and Adhesion on Brine Salinity and Composition in Gas-Condensate Reservoirs

Andrei S. Zelenev; CESI Chemical, a Flotek Company, 8701 New Trails Dr., Suite110, The Woodlands, TX 77381; Characterization of Mineral Rocks from Oil and Gas Reservoirs with Respect to Their Wettability and Surface Free Energy

Ning Zhao, Liang Zhang and Jian Xu; Beijing National Laboratory for Molecular Sciences, Laboratory of Polymer Physics and Chemistry, Institute of Chemistry, Chinese Academy of Sciences, Beijing, 100190, P. R. CHINA; Oil-Water Separation Based on the Superhydrophobicity

L. Ziyan, V. Gaudefroy, V. Ferber and F. Hammou; PRES LUNAM Ifsttar, Route de Bouaye, CS4, 44344 Bouguenais Cedex, FRANCE; Wettability of Mineral Surfaces by Bituminous Binders: Applications to Road Industry

CONTACT ANGLE IN MICRO AND NANO TECHNOLOGY

Athanassia Athanassiou, Francesca Villafiorita-Monteleone, Claudio Canale, Elisa Mele, Silvia Dante, P. Davide Cozzoli, Dario Pisignano, Despina Fragouli and, Roberto Cingolani; Polymers/TiO₂ Nanorods Nanocomposites with UV-Enhanced Wettability for Novel Applications: from Microfluidic Systems to Selective Cell Growth

Spiros H. Anastasiadis, E. Stratakis, M. Barberoglou, V. Zorba, A. Mateescu, D. S. Achilleos, D. Petousi, M. Vamvakaki and C. Fotakis; Institute of Electronic Structure and Laser, Foundation for Research and Technology – Hellas, 711 10 Heraklion Crete, GREECE; Hierarchically Structured Smart Polymer Surfaces

Thomas Bahners, Lutz Prager and Jochen S. Gutmann; Deutsches Textilforschungszentrum Nord-West e.V., Adlerstr. 1, 47798 Krefeld, GERMANY; Super-hydrophilic Surfaces by Photo-induced Micro-Folding

Guotao Duan, Jingjing Wang, Yue Li and Weiping Cai; Key Lab of Materials Physics, Anhui Key Lab of Nanomaterials and Nanotechnology, Institute of Solid State Physics, Chinese Academy of Sciences, Hefei, 230031, Anhui, P. R. CHINA; Morphology-Controlled Gold Hierarchically Micro/Nanostructured Arrays and their Structurally Correlated Wettability

Mikael Järn, Qian Xu and Mika Lindén; YKI, Institute for Surface Chemistry, Drottning Kristinas väg 45, SE-114 86, Stockholm, SWEDEN; Wettability Studies of Selectively Functionalized Nanopatterned Surfaces

A.A. Kafi and B. L. Fox; Composite Research Group, Centre for Materials and Fibre Innovation, Deakin University Geelong Victoria 3217, AUSTRALIA; Mapping the Surface Properties of PAN based Carbon Fibres

Kwang-Seok Kim, Quoc Vu Bui, Yongil Kim, Yong-Ho Choa and Seung-Boo Jung; SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University, Suwon, 440-746, Republic of KOREA; Contact Angle Analysis on the Printed Pattern Shapes Controlled by Viscosity of Cu Nanopaste

Md. A. Rahman, and Anthony M Jacobi; Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana 61801; Wetting Anisotropy on Brass Surfaces With Parallel Microgrooves

Yue Li, Naoto Koshizaki and Weiping Cai; Institute of Solid State Physics, Chinese Academy of Science (CAS), Hefei 230031, Anhui, CHINA; Hierarchical TiO₂ Nanorod Array Films Based on Colloidal Monolayer Templates and Their Superamphiphilicity Without UV Irradiation

APPLICATIONS TO WOOD SCIENCE AND TECHNOLOGY

Niklas Nordgren, Petra Nordqvist, Farideh Khabbaz, Eva Malmström and Malin Bergensträhle-Wohlert; YKI Institute for Surface Chemistry, Drottning Kristinas väg 45, Box 5607, SE-114 86 Stockholm, SWEDEN; A Multiscale Approach to Evaluate Bio-Adhesives for Wood

M. Petriè, A. Kutnar, L. Rautkari, K. Laine, M. Hughes; University of Ljubljana, Biotechnical Faculty, Department of Wood Science & Technology, Ljubljana, SLOVENIA; Dynamic Wettability Behaviour of Wood Modified by Surface Densification

Bouddah Poaty, Bernard Riedl, Pierre Blanchet, Vincent Blanchard, and Luc Stafford; Centre de Recherche sur le Bois, Pavillon G.-H. Kruger, Université Laval, Québec (QC), G1V 0A6, CANADA; Improved Water-repellency of Black Spruce Wood Surfaces after Treatment In Carbon Tetrafluoride Plasmas

B. Riedl, C. Anghel, P. Blanchet and V. Blanchard; Département Des Sciences du Bois et De La Forêt, Université Laval, Québec, QC, CANADA; Influence of Atmospheric Pressure Plasma on North-American Wood Surfaces

Maziar Sedighi, Mikael Järn, Per M. Claesson, Magnus Wälinder and Agne Swerin; YKI, Ytkemiska Institutet AB/Institute for Surface Chemistry, Box 5607, SE-114 86 Stockholm, SWEDEN; Comparison of Different Methods for Studying Wood Wettability and Liquid Penetration

Luc Stafford; Department of Physics, University of Montreal, Montreal, Quebec H3C 3J7, CANADA; Grafting Dynamics of Hydrophobic Functional Groups on Wood Surfaces Using Atmospheric-Pressure, Organosilicon Containing Plasmas

Fabio Tomczak and Bernard Riedl; Université Laval, Centre de Recherche sur le bois, Pavillon Gene-H.-Kruger, Quebec City, G1V0A6 QC, CANADA; Wettability of Canadian Woods

Fabio Tomczak and Bernard Riedl; Université Laval, Centre de Recherches sur le bois, Pavillon Gene-H.-Kruger, Quebec City, G1V0A6 QC, CANADA; ZnO Deposition on Wood by Plasma: the Effect on Wettability

ELECTROWETTING BEHAVIOR AND APPLICATIONS

Jia Zhou; Dept. Microelectronics, Fudan Univ., 220 Handan RD, Shanghai, China, 200433; Electrowetting Aspects of Microfluidic Device with On-Chip Electrochemical Detection

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SHORT COURSES ON APPLIED ADHESION MEASUREMENT METHODS (June 11, 2012) AND DURABILITY OF ADHESIVE JOINTS (June 12, 2012) :

Associated with this symposium 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.

OVERVIEW OF TOPICS COVERED IN ADHESION MEASUREMENT METHODS COURSE I INCLUDE:

1. Basics of adhesion measurement
2. Role of residual stress and material mechanical properties on adhesion
3. Problem of setting adhesion requirements for coating applications
4. Adhesion measurement at atomic and molecular level (fundamental adhesion)
5. Applications

OVERVIEW OF TOPICS COVERED IN ADHESIVE JOINTS COURSE I INCLUDE:

1. Two Aspects of Adhesive Action
2. Durability of Adhesive Joints
3. Direct Measurement of Joint strength
4. Tests That Measure Practical Adhesion Between Adhesive and Adherend
5. Measuring Adhesive Thermal-Mechanical Properties

6. Role of Residual Stress
7. Nondestructive Inspection

Audience: Scientists and professional staff in R&D, manufacturing, processing, quality control/reliability involved with adhesion aspects of coatings or laminate 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 THIS COURSE:

- ▶ Understand advantages and disadvantages of a range of adhesion measurement 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 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 May 20, 2012. 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.

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Short Course on Durability of Adhesive Joints (June 11,2012)	\$695
Short Course on Applied Adhesion Measurement Methods (June 12,2012)	\$695
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