

FINAL PROGRAM

ELEVENTH INTERNATIONAL SYMPOSIUM ON

PARTICLES ON SURFACES: DETECTION, ADHESION AND REMOVAL

This will be the eleventh event in the series of symposia on particles on surfaces initiated as part of the Fine Particle Society meeting in 1986. Particles are yield detractors in the manufacture of sophisticated and sensitive electronic components and are very undesirable in many other technologies. Contamination of optical surfaces and shorting of microelectronic circuits by conducting particles, among other concerns, underscore the importance of particle detection, adhesion and removal. On the other hand, however, in certain instances particle adhesion to surfaces is necessary. The purpose of this symposium is to address the vast ramifications of particles on solid surfaces by bringing together

specialists in many allied fields to discuss their latest findings and to identify areas for further investigation. Various types of substrates and particles --metals, oxides, glass, and polymers-- will be covered. The technical program comprises both invited and contributed papers ranging from topical overviews to original research contributions and industrial applications.

On Wednesday the 16th the PARTICLE symposium is joined with the CONTACT ANGLE symposium for two sessions of mutual interest. Please note that the address given may apply only to the presenting author.

SESSION I: WEDNESDAY, JULY 16, 2008 SUPERHYDROPHOBICITY I

8:00-8:25: Michele Ferrari, Libero Liggieri and Francesca Ravera; CNR-Istituto per l'Energetica e le Interfasi, via De Marini 6, 16149 Genova, ITALY; **Adsorption of Surfactants at Superhydrophobic Surfaces in Air/Water and Oil/Water Systems** (p. 1)

8:25-8:50: Glen McHale, Stephen J. Elliott, Michael I. Newton and Neil J. Shirtcliffe; School of Science & Technology, Nottingham Trent University, Clifton Lane, Nottingham NG11 8NS, UK; **Superhydrophobicity: Localized Parameters and Gradient Surfaces** (p. 2).

8:50-9:15: A. R. Phani¹, P. De Marco, and S. Santucci; NANO-Center for Advanced Technologies S.R.L, Department of Physics, University of L'Aquila, via Vetoio, 67010 Coppito- L'Aquila, ITALY; **Super Hydrophobic Films Based on Organic-Inorganic Hybrid Coatings - Potential Application in Aeronautic, Automotive and Biomedical Applications** (p. 3).

9:15-9:40: Eiji Hosono, Shinobu Fujihara, Itaru Honma, Haoshen Zhou; National Institute of Advanced Industrial Science and Technology, Umezono, 1-1-1, Tsukuba, 305-8568, JAPAN; **Wettability Properties Controlled by the Nanostructured Surface Fabrication** (p. 4).

9:40-10:05: D. K. Sarkar and M. Farzaneh; (INGIVRE) at Université du Québec à Chicoutimi, Québec, CANADA; **Superhydrophobic Binary Structures: Preparation, Characterization and Ice Adhesion** (p. 5).

10:05-10:20: COFFEE BREAK

10:20-10:45: Jairo Garnica, Rossen Sedev, Nikolay Dimitrov, and John Ralston; Ian Wark Research Institute, University of South Australia, Mawson Lakes, SA 5095, AUSTRALIA; **Superhydrophobicity on Metal and Alloy Surfaces** (p. 6).

10:45-11:10: Balamurali Balu, Victor Breedveld, and **Dennis W. Hess**; School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, 311 Ferst Drive, Atlanta, GA 30332; **Superhydrophobic Paper/Cellulose Surfaces Formed by Plasma Processing** (p. 7).

11:10-11:35: Minglin Ma and Gregory C. Rutledge; Chemical Engineering, Institute for Soldier Nanotechnologies, Massachusetts Institute of Technology, Cambridge, MA; **Superhydrophobic Electrospun Nonwovens** (p. 8).

11:35-12:00: Torsten Textor, Boris Mahltig, Horst Böttcher and Eckhard Schollmeyer; Deutsches Textilforschungszentrum Nord-West e. V., Adlerstr. 1, 47798 Krefeld, GERMANY; **Durable Nanosol Coatings for Textiles Combining Hydrophobicity and Antistatic Properties** (p. 9).

12:00-12:25: Peilin Chen; Institute of Applied Science and Engg. Research, Academia Sinica, 128, Section 2, Academia Road, Nankang, Taipei 115, TAIWAN; **Novel Applications of Switchable Superhydrophobic Surfaces** (p. 10).

12:25-1:30: LUNCH

**SESSION II: WEDNESDAY, JULY 16, 2008
SUPERHYDROPHOBICITY II**

1:30-1:55: Abdullah A. Kafi, Christopher J. Hurren, and Bronwyn L. Fox; Centre for Material and Fiber Innovation, Deakin University, Geelong, VIC 3217, AUSTRALIA; **Improvement of Wettability and Fiber-Matrix Adhesion of Natural Fibre Monitored by Wettability Time, Coefficient of Friction (COF), Atomic Force Microscopy (AFM), ATR-FTIR and XPS for Biocomposites Applications** (p. 11).

1:55-2:20: M. Thieme, C. Blank, A. Pereira de Oliveira, H. Worch, R. Frenzel, S. Höhne, F. Simon, H. Pryce Lewis, and A. J. White; Technische Universität Dresden (TUD), Institut für Werkstoffwissenschaft, Dresden, GERMANY; **Superhydrophobic Aluminum Surfaces: Preparation Routes, Properties and Artificial Weathering Impact** (p. 12).

2:20-2:40: Neeharika Anantharaju, **Mahesh V. Panchagnula**, and Srikanth Vedantam; Department of Mechanical Engineering, Tennessee Technological University, Cookeville, TN 38505; **Effect of Length Scale on Wettability of Chemically Heterogeneous Surfaces: Modeling Contact Angle Hysteresis Using Phase Field Theory** (p. 13).

2:40-3:05: Hiroshi Yabu, Miki Kojima, Yuji Hirai and Masatsugu Shimomura; Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai 980-8577, JAPAN; **Honeycomb Films: Their Unique Structures and Surface Properties** (p. 14).

3:05-3:30: Athanassia Athanassiou; NNL-National Nanotechnology Laboratory, INFN-CNR, Via Arnesano, 73100 Lecce, ITALY; **Reversible Transition from Hydrophobicity to Hydrophilicity of Photon Responsive Surfaces: From Photochromic Molecules to Nanocrystals** (p. 15).

3:30-3:45: Lei Jiang; Center of Molecular Sciences, Institute of Chemistry, Chinese Academy of Sciences, Beijing 100080, CHINA; **Design and Creation of Bioinspired Surfaces with Special Wettability**(p. 16).

SESSION III: THURSDAY JULY 17, 2008

8:30-8:35: Introductory remarks

8:35-9:05: John B. Durkee and Anselm Kuhn; POB 847 Hunt, TX 78024; **Measuring Particulate Surface Contamination in an Industrial Setting** (p. 17).

9:05-9:35: Isabelle Tovenca Pecault, Guillaume Basso and François Gensdarmes ; CEA/DAM CESTA, DLP/SCAL/LPO, BP 2, 33114 Le Barp, FRANCE; **Qualification of Particle Surface Probes: Requirements and Development of a Test Bench** (p. 18).

9:35-10:05: J. C. J. van der Donck, M.F. Dekker, A.E. Duisterwinkel and B. van Someren, TNO Science and Industry, P.O. box 155, 2600 AD Delft, THE NETHERLANDS; **On-line Monitoring of Particle Deposition** (p. 19).

10:05-10:20: COFFEE BREAK

10:20-10:50: Mathieu Guingo, and Jean-Pierre Minier; LEMTA - UMR 7563 CNRS, ESSTIN, Université Henri Poincaré-Nancy I, 2, rue Jean Lamour, 54519 Vandoeuvre-lès-Nancy, , FRANCE; **A Stochastic Model to Simulate Particle Resuspension in Turbulent Flows** (p. 20).

10:50-11:20: M. K. Mazumder; Department of Applied Science, ETAS 575, College of System Engineering and Information Science, University of Arkansas at Little Rock, 2801 South University Avenue, Little Rock, AR 72204; **Dust Hazard Mitigation Methods for Mars and Lunar Missions** (p. 21).

11:20-11:50: F. Wali, D. M. Knotter , J. J. Kelly , F. Michel , and M van Straten; University of Twente, Twente, THE NETHERLANDS; **Preparation of Mono-disperse Silica Particles with Metal-ion Tracer** (p. 22).

11:50-12:20: E. Kesters, M. Claes, Q.T. Le, K. Barthomeuf , M. Lux, G. Vereecke, **T. Bearda** and J. B. Durkee; IMEC, 75 Kapeldreef, 3001 Leuven, BELGIUM; **Selection of ESH Solvents for Cleaning Applications in Semiconductor Manufacturing** (p. 23).

12:20-1:30: LUNCH

SESSION IV: THURSDAY, JULY 17, 2008

1:30-2:00: Thomas Bahners and Eckhard Schollmeyer; Deutsches Textilforschungszentrum Nord-West e. V., Adlerstr. 1, 47798 Krefeld, GERMANY; **Electrospun Nanofibers – A Way to Improved Wet Filtration Efficiency of Deep-bed Filters** (p. 24).

2:00-2:30: G. Lefèvre, M. Fédoroff, G. Cote, O. Dégardin, Lj. Čerović, S. Delaunay, E.-M. Pavageau, C. Mansour, H. Catalette, A. Jaubertie and A. Douce; ENSCP - LECA - CNRS UMR 757511, Rue Pierre et Marie Curie, F-75231 Paris Cedex 05, FRANCE; **Studies on the Deposition of Metallic Oxides Particles - Application to Cooling Circuits of Pressurized Water Reactors** (p. 25).

2:30-3:00: Mario Mosbacher, Andreas Elben, Stephan Häfner, Johannes Reiner and Paul Leiderer; NWTeam, Fürstenberg-Gymnasium, Humboldt-Str. 1, D-78166 Donaueschingen, GERMANY; **A Novel Method for the Determination of Adhesion Forces of (Sub-) Micrometer Particles on Surfaces** (p. 26).

3:00-3:15: COFFEE BREAK

3:15-3:45: Frank M. Etzler, Boehringer Ingelheim Pharmaceuticals. 900 Ridgebury Rd., Ridgefield, CT 06877; **Measurement of Adhesion Forces using SPM: Some Applications to Pharmaceutical Products** (p. 27).

3:45-4:15: Hubert Gojzewski, Arkadiusz Ptak and Michael Kappl; Max Planck Institute for Polymer Research, Ackermannweg 10, 55128 Mainz, GERMANY; **Adhesion on Self-assembled Thiol Monolayers by Means of High-Rate Dynamic Force Spectroscopy** (p. 28).

4:15-4:45: David Grojo and Philippe Delaporte; National Research Council, Steacie Institute for Molecular Sciences, 100 Sussex Drive, Ottawa, ON K1A 0R6, CANADA; **Laser-particle Processing: from Decontamination to Nanofabrication** (p. 29).

4:45-5:15: Luigi Scaccabarozzi; ASML, De Run 6501, 5504 DR Veldhoven, THE NETHERLANDS; **Specifications and Prospects for Cleaning and Inspection of EUV Reticles** (p. 30).

8:30-9:00: Rajiv Kohli; The Aerospace Corporation, NASA Johnson Space Center, 2525 Bay Area Blvd, Ste 600, Houston, TX 77058; **The Removal of Micro and Nanosize Contaminant Particles from Surfaces** (p. 31).

9:00-9:30: Uwe Schlosser, Thomas Bahners and Eckhard Schollmeyer; Deutsches Textilforschungszentrum Nord-West e. V., Adlerstr. 1, 47798 Krefeld, GERMANY; **Some Remarks on the Removal of Adhering Particles by Oscillating Air Flows** (p. 32).

9:30-10:00: Marco L. Zoetewij, J. C. J. van der Donck, A. M. Klinkenberg and R. Versius; TNO Science and Industry, P.O. Box 155, 2600 AD Delft, THE NETHERLANDS; **Particle Removal in Linear Shear Flow: Model Prediction and Experimental Validation** (p. 33).

10:00-10:15: COFFEE BREAK

10:15-10:45: Sandip Halder, Twan Bearda, Karine Kenis, Tom Janssens, Toan-Le Quoc, Kurt Wostyn, Peter Leunissen, and Paul Mertens; IMEC, Kapeldreef 75, B-3001 Leuven BELGIUM; **Particle Removal Efficiency and Damage Analysis of Patterned Wafers in Different Solvents after Megasonic Cleaning** (p. 34).

10:45-11:15: Donald Gray and Charlotte Fredrick; ChE Dept, University of Rhode Island, Kingston, RI; **Surface Cleaning of Particles Using Nucleating Bubbles** (p. 35).

11:15-11:45: Mario Mosbacher; NWTeam, Fürstenberg-Gymnasium, Humboldt-Str. 1, D-78166 Donaueschingen, GERMANY; **New Laser Cleaning Method, Fundamentals of the Liquid Ablation in Steam Laser Cleaning** (p. 36).

11:45-12:15: Jin W. Lee, Kwang-seok Kang, Ki-hyun Lee, Min-young Yi, and Mi-jung Lee; Dep't of Mech. Eng., Pohang Univ. of Sci. & Tech. Hyoja 31, Pohang, SOUTH KOREA; **Removing 20nm Particles Using a Supersonic Argon Particle Beam Generated with a Contoured Laval Nozzle** (p. 37).