FINAL PROGRAM

TENTH INTERNATIONAL SYMPOSIUM ON

CONTACT ANGLE, WETTABILITY AND ADHESION

Stevens Institute of Technology,
Hoboken, New Jersey, USA, July 13-15, 2016

SYMPOSIUM HISTORY AND MOTIVIATION

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

FOR FURTHER DETAILS CONTACT CHAIRMAN ROBERT LACOMBE AT

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Hopewell Junction, NY 12533

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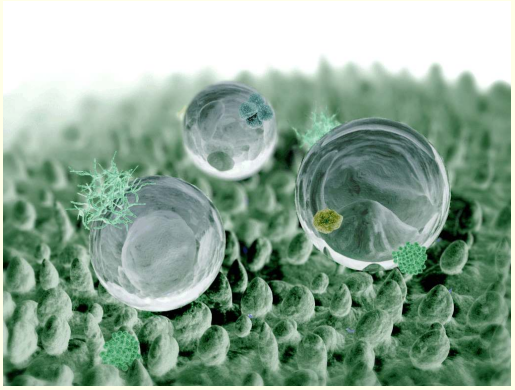
Full conference details and registration via the Internet are maintained on our website:

www.mstconf.com/Contact10.htm

SYMPOSIUM TOPICS:

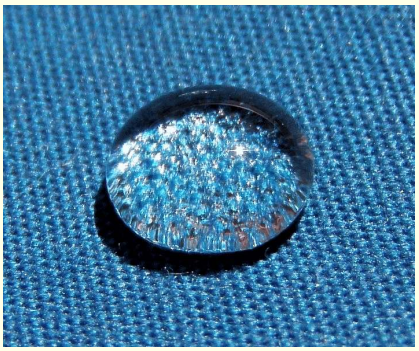
Factors Influencing Contact Angle Measurements:

- 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



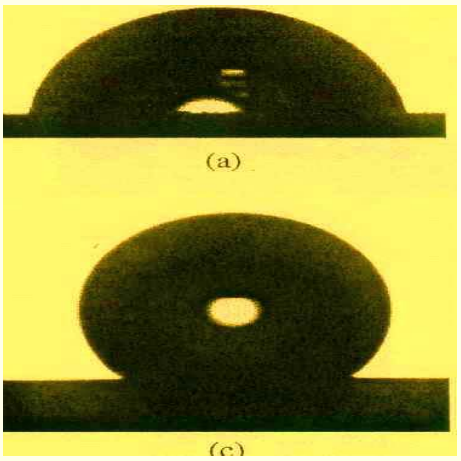
Wettability Behavior and Surface Characterization of Various Materials:

- 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
- Electrowetting



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.



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8:30-8:35: WELCOME AND OPENING REMARKS: Dr. Mo Dehghani, Vice Provost of Research at the Stevens Institute of Technology

SESSION I: WEDNESDAY, JULY 13, 2016

8:35-9:05: Edward Bormashenko, Yelena Bormashenko, Roman Grynyov, Hadas Aharoni, Gene Whyman and Bernard P. Binks; Ariel University, Physics Department, P.O.B. 3, 40700, Ariel, ISRAEL; Self-Propulsion of Liquid Marbles: Leidenfrost-Like Levitation Driven by the Marangoni Flow

9:05-9:35: M. F. Ismail and Prashant R. Waghmare; Interfacial Science and Surface Engineering Lab, Department of Mechanical Engineering, University of Alberta, Edmonton, CANADA, T6G 2G8; Universality in Freezing of Asymmetric Drop

9:35-10:05: Ming Jin, Daniel Frese, Carsten Scheithauer, and Thomas Willers; KRÜSS GmbH, Borsteler Chaussee 85, 22453 Hamburg, GERMANY; Raymond Sanedrin; KRÜSS USA, 1020 Crews Road, Matthews, NC 28105, USA; Replacing the Solid Needle by a Liquid One When Measuring Static and Advancing Contact Angles

10:05-10-35: Michael Schmitt and Florian Heib; Physical Chemistry, Campus B 2 2, Saarland University, 66123 Saarbrücken, GERMANY; Fundamentals of Reproducible/Enhanced Contact Angle Analyses

10:35-10-50: COFFEE BREAK

10:50-11:10: Sara L. Schellbach, Sergio N. Monteiro and Jaroslaw W. Drelich; Department of Materials Science and Engineering, Michigan Technological University, 1400 Townsend Dr., Houghton, MI 49931, USA; A Novel Method for Contact Angle Measurements on Natural Fibers having Non-Uniform Cross Sections and Rough Surface

11:10-11:40: H. Jennissen; Institute of Physiological Chemistry, University of Duisburg-Essen, Hufelandstr. 55, D-45122 Essen, GERMANY; Complex and Imaginary Contact Angles: A Radically New Development for Advancing Our Understanding of Wetting, or Just a Whim of Applied Mathematics?

11:40-12:00: Masaki Yamaguchi, Tetsuhiro Sakata, Shunsuke Tamura and Kensuke Yokoi; Graduate School of Science & Technology, Shinshu University, 3-15-1 Tokida, Ueda, Nagano 386-8567, JAPAN; Numerical Studies of Dynamic Droplet Moving for Fluid Analysis

12:00-1:00: LUNCH

SESSION II: WEDNESDAY JULY, 13, 2016

1:00-1:30: Meenakshi Annamalai and Thirumalai Venkatesan; Nanoscience and Nanotechnology Institute (NUSNNI) – Nanocore, 5A Engineering Drive 1, T-Lab Building, National University of Singapore, SINGAPORE 117411; Wetting Studies at Macro and Nanoscale

1:30-2:00: Luisa Coriand, Nadja Felde, Susanne Pfeifenbring, and Angela Duparré; Fraunhofer Institute for Applied Optics and Precision Engineering, Albert-Einstein-Strasse 7, 07745 Jena, GERMANY; Investigation of Oleophilic and Oleophobic Nanorough Surfaces Immersed in Air or Water

2:00-2:30: Chunlei Wang; Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Jialuo Road 2019, Jiading Shanghai, Shanghai 201800, CHINA; Ordered Water Monolayer That Does Not Completely Wet Water and Molecular-scale Hydrophilicity at Room Temperature

2:30-3:00: Junqi Yuan, Jian Feng and Sung Kwon Cho; Dept. of Mechanical Engg. & Materials Science, University of Pittsburgh, Pittsburgh, PA 15261; Control of Floating Objects by Di-electrowetting

3:00-3:30: D. Panchanathan, G. Kwon, K. K. Varanasi and G. H. McKinley; Dept. of Mechanical Engg., MIT, Cambridge, MA 02139; Quantifying the Kinetics of Photocatalysis on Nanoporous Titania Surfaces using Contact Angle Goniometry

3:30-3:45: COFFEE BREAK

3:45-4:05: Choongyeop Lee, Seunggeol Ryu and Youngsuk Nam; Department of Mechanical Engineering, Kyung Hee University, Yongin-city, KOREA; Water Penetration Through Copper Mesh During Drop Impact: Influence of Surface Wettability

4:05-4:25: M.-L. Giorgi, J.-M. Mataigne and A. Koltsov; Laboratoire de Génie des procédés et matériaux (LGPM) CentraleSupélec, Université Paris-Saclay, Grande Voie des Vignes, 92295 Châtenay-Malabry Cedex, FRANCE; Influence of Kinetic Energy on Wetting of Steel Surfaces by Liquid Zinc in Two Conditions : Sessile Droplet and Continuous Galvanizing

4:25-4:45: M. Diallo, H. Duval, A. Koltsov, J.-M. Mataigne and M.-L. Giorgi; Laboratoire de Génie des procédés et matériaux (LGPM) CentraleSupélec, Université Paris-Saclay, FRANCE; Wetting Dynamics of Liquid Lead on Silica-patterned Iron

4:45-5:05: Kirill A. Emelyanenko, Alexandre M. Emelyanenko and Ludmila B. Boinovich; A.N. Frumkin Institute of Physical Chemistry and Electrochemistry, Russian Academy of Sciences, Leninsky prospect 31 bldg. 4, 119071 Moscow, RUSSIA; The Description of Wetting Behavior of Alkanes on Water with Accounting for Water Solubility and Image Charge Effects

5:05-5:35: Ajay Kadiyala and Jayashree Bijwe; ITMMEC, Indian Institute of Technology Delhi, INDIA; Micro and Nano SiC Based Polyether Ether Ketone (PEEK) Coating on Stainless Steel: Tribology and Surface Energy Correlation Studies

5:35-5:55: Mikalai Krutsko, Natallia Yakavets, and Olga Opanasenko; The Institute of General and Inorganic Chemistry of the National Academy of Sciences, Minsk, BELARUS; Surface Wetting of Oil Resin-Asphaltene Substances Modified by Surfactants

SESSION III: THURSDAY, JULY 14, 2016

8:30-9:00: Adya Karthikeyan, Sylvain Coulombe and Anne-Marie Kietzig; Chemical Engineering Department, McGill University, Montreal, CANADA; Surface Wetting and Surface Tension of Stable and Unstable Carbon Nanotube Nanofluids

9:00-9:30: Eric Loth; University of Virginia, Room 308 MEC, 122 Engineer's Way, P.O. Box 400746, Charlottesville, VA 22904; Micro-dynamics of Wetting (High Spatial and Temporal Resolution)

9:30-10:00: D.G. Waugh, J. Lawrence, A. Gillett and C.H. Ng; Laser Engineering and Manufacturing Research Group, Faculty of Science and Engineering, University of Chester, Thornton Science Park, Pool Lane, Ince, Chester CH2 4PU, UK ; Laser Surface Treatment: Modulating Wettability Characteristics of Materials to Control Biological Cell Adhesion and Growth

10:00-10:30: Digvijay Singh and Robert Baier; State University of New York at Buffalo, Buffalo, NY; Contact Angle and Wettability Correlations for Bioadhesion to Reference Polymers, Metals, Ceramics and Tissues

10:30-10:45: COFFEE BREAK

10:45-11:05: Edward Bormashenko; The Ariel University Center of Samaria, 40700 Ariel, ISRAEL; Cold Plasma Treatment of Liquid Surfaces

11:05-11:25: Edward Bormashenko; The Ariel University Center of Samaria, 40700, Ariel, ISRAEL Electrical Charging of Surfaces under the Cold Plasma Treatment

11:25-11:55: Thomas Bahners , Milan Kelch, Jochen S. Gutmann and Jörg Müssig; Deutsches Textilforschungszentrum Nord- West gGmbH, Krefeld GERMANY; Improvement of Fiber-Matrix Adhesion and Damping in Cellulose/Polyolefin Composite Materials by Means of Photochemical Fiber Surface Modification

11:55-1:00: LUNCH

SESSION IV: THURSDAY, JULY 14, 2016

1:00-1:30: Lasse Makkonen; VTT Technical Research Centre of Finland, Box 1000, 02044 VTT, FINLAND; A Quantitative Theory of Contact Angle Hysteresis

1:30-1:50: Youhua Jiang, Wei Xu, Mohammad Amin Sarshar and Chang-Hwan Choi; Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, New Jersey, USA; A Generalized Model of Advancing and Receding Contact Angles for Patterned Surfaces

1:50-2:10: Lasse Makkonen; VTT Technical Research Centre of Finland, Box 1000, 02044 VTT, FINLAND; Young's Equation Revisited

2:10-2:30: Birgitt Boschitsch Stogin, Xianming Dai, and Tak-Sing Wong; Department of Mechanical and Nuclear Engineering and the Materials Research Institute, The Pennsylvania State University, University Park, PA, USA; Wenzel Wetting on Slippery Rough Surfaces

2:30-3:00: Frank M. Etzler, School of Pharmacy, LECOM, 1858 W. Grandview Blvd., Erie, PA 16509; Statistical Considerations for the Evaluation of Surface Free Energies from Contact Angle Data

3:00-3:30: Konrad Terpiłowski Marta Tomczyńska-Mleko, Stanisław Mleko and Emil Chibowski; Department of Physical Chemistry-Interfacial Phenomena, Maria Curie Sklodowska University, Lublin, POLAND; The Surface Properties of Biopolymers Obtained with the Presence of Gluten

3:30-3:45: COFFEE BREAK

3:45-4:05: Lasse Makkonen; VTT Technical Research Centre of Finland, Box 1000, 02044 VTT, FINLAND; Determining the Surface Energy of a Solid by Contact Angles

4:05-4:25: Hana Sourková; Technical University of Liberec, Faculty of Mechatronics, Informatics and Interdisciplinary Studies, Studentská 1402/2, Liberec: 461 17, CZECH REPUBLIC; Surface Tension Characterization of Plasma Treated Powders as a Process Control for Industrial Application

4:25-4:45: Davide Rossi , Antonio Bettero, Nicola Realdon and Paola Pittia; Department of Pharmaceutical and Pharmacological Sciences, University of Padova, ITALY; Development of a Method for Contact Angles Measurements at Perfluoropolyether/perfluoropolyether Interface Employing Fomblin HC/25 PFPE as " Fluid Film " for Surface Energy Characterization of Some Water Solutions

4:45-5:15: D. K. Sarkar; Centre Universitaire de Recherche sur l'Aluminium (CURAL), Université du Québec à Chicoutimi, 555 Boulevard de l'Université, Chicoutimi, Québec, CANADA G7H 2B1; Studies of Corrosion Properties of Nanostructured Superhydrophobic Thin Films on Metals

5:15-5:45: Kock-Yee Law; Research and Innovative Solutions, 27 Valewood Run, Penfield, NY 14526; Wettable Slippery Surfaces. Self-cleaning Effect and Mechanism

5:45-6:05: Daniel Scholz; DataPhysics Instruments GmbH, Raiffeisenstrasse 34, 70794 Filderstadt, GERMANY; Measuring Adhesive Forces of Liquids on Solid Surfaces using a Tensiometer

SESSION V: FRIDAY, JULY 15, 2016

8:30-9:00: G. Paz-Gómez, M.J. Otero-Díaz, J.A. del Caño-Ochoa, Clara Moyano, G.R. Guerrero, M.A. Cabrerizo-Vílchez and M.A. Rodríguez-Valverde; Biocolloid and Fluid Physics Group, Department of Applied Physics, University of Granada, SPAIN; Water-Repellent Non-stick Coatings

9:00-9:30: Hernando S. Salapare III and Frédéric Guittard; Université de Nice-Sophia Antipolis, CNRS, Laboratoire de Physique de la Matière Condensée (LPMC), UMR 7336, Parc Valrose, 06100 Nice, FRANCE; Superhydrophobicity of Candle Soot Film Deposited on Rf Plasma-treated Poly(ethylene glycol-co-1,3/1,4 cyclohexanedimethanol terephthalate) (PETG)

9:30-10:00: Savvas G. Hatzikiriakos; Department of Chemical and Biological Engineering, The University of British Columbia, Vancouver BC, V6T 1Z3, CANADA; Controlled-Superhydrophobicity on Metallic Substrates Using Fs Laser Ablation

10:00-10:30: Michele Ferrari, Francesca Cirisano, Alessandro Benedetti, Libero Liggieri, Francesca Ravera and Eva Santini; CNR – Istituto per l' Energetica e le Interfasi, 16149 Genova, ITALY; Amphiphobic Coatings for Protection in Seawater Environment

10:30-10:45: COFFEE BREAK

10:45-11:15: Ludmila Boinovich and A.Emelyanenko; Institute of Physical Chemistry & Electrochemistry, Leninsky Prospect 31, Moscow 119991, RUSSIA; Surfactant Induced Deviation in Wetting Behaviour of Superhydrophobic Surfaces

11:15-11:35: Alexandre M. Emelyanenko, Ludmila B. Boinovich, Kirill A. Emelyanenko, and Alexandr G. Domantovsky; A.N. Frumkin Institute of Physical Chemistry and Electrochemistry, Russian Academy of Sciences, Leninsky prospect 31 bldg. 4, 119071 Moscow, RUSSIA; Nanosecond Laser Micro and Nanotexturing for the Design of Superhydrophobic Coatings Robust to Long-term Contact with Water, Corrosion Active Medium, Cavitation, and Abrasion

11:35-11:55: Ali Kibar, Ridvan Ozbay, and Chang-Hwan Choi; Department of Mechanical and Material Technologies, Kocaeli University, Arslanbey Campus, Kocaeli 41285, TURKEY; Air Bubble Detachment on Superhydrophobic Surfaces

11:55-1:00: LUNCH

SESSION VI: FRIDAY, JULY 15, 2016

1:00-1:20: Junghoon Lee, Youhua Jiang and Chang-Hwan Choi; Department of Mechanical Engineering, Stevens Institute of Technology, Castle Point on Hudson, N J 07030; Oil-Impregnated Anodic Aluminum Oxide Layers for Omniphobic Surfaces

1:20-1:40: Ridvan Ozbay, Ali Kibar, and Chang-Hwan Choi; Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, N J 07030; Bubble Adhesion on Superaerophobic Surfaces: Effects of Surface Morphology

1:40-2:00: Mohammad Amin Sarshar, Chris Swartz and Chang-Hwan Choi; Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, NJ 07030; Icephobicity of Superhydrophobic Surfaces: Effects of Environmental Conditions

2:00-2:20: Pan Guo, Yusong Tu, Jinrong Yang, Chunlei Wang, Nan Sheng, and Haiping Fang; College of Physics Science and Technology, Yangzhou University, 88 South University Ave., Yangzhou, Jiangsu 225009, P.R. CHINA; Water-COOH Composite Structure with Enhanced Hydrophobicity Formed by Water Molecules Embedded into Carboxyl-Terminated Self-Assembled Monolayers

2:20-2:40: Salma Falah Toosi, Sona Moradi, Narges Hadjesfandiari, Jayachandran N. Kizhakkedathu, and Savvas G. Hatzikiriakos; Department of Chemical and Biological Engineering,The University of British Columbia, Vancouver BC, V6T 1Z3, CANADA; The Effect of Superhydrophobicity on the Bacterial Adhesion on Polymeric Surfaces

2:40-3:00: Keun Park and Hyun-Joong Lee; Department of Mechanical System Design Engineering, Seoul National University of Science and Technology, Seoul, KOREA; Development of Superhydrophobic/Hydrophilic Hybrid Surface by Selective Micropatterning and Electron Beam Irradiation

3:00: CLOSING REMARKS