



# PRELIMINARY PROGRAM ELEVENTH INTERNATIONAL SYMPOSIUM ON CONTACT ANGLE, WETTABILITY AND ADHESION

Stevens Institute of Technology,  
Hoboken, New Jersey, June 13-15, 2018

## SYMPOSIUM HISTORY AND MOTIVATION

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, paper, 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.

## AUDIENCE AND PARTICIPATION

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.

## SUBMITTING A PAPER

This symposium is being organized under the direction of Dr. K. L. Mittal, Editor, Reviews of Adhesion and Adhesives and by MST Conferences. 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 May 15, 2018 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;  
845-592-1963

Full conference details and registration via the Internet will be maintained on our web site:

[www.mstconf.com/Contact11.htm](http://www.mstconf.com/Contact11.htm)

## SYMPOSIUM TOPICS:

### Factors Influencing Contact Angle Measurements:

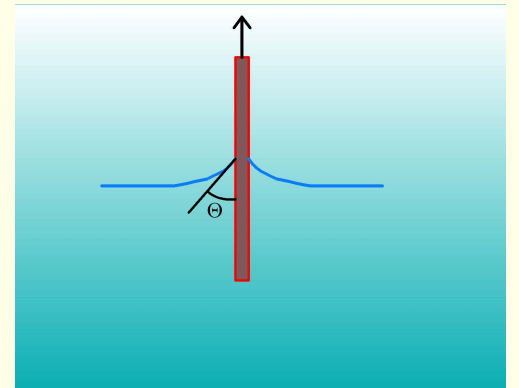
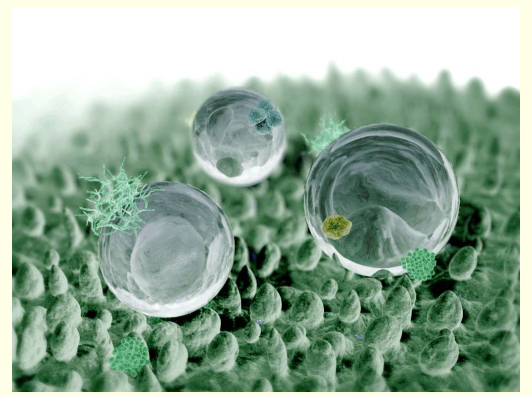
- ◆ Static and dynamic contact angles, effect of surface flaws and surface roughness on wetting.
- ◆ Effect of pore size distribution
- ◆ Effects of velocity and viscosity of liquid on solid-liquid interfacial behavior.
- ◆ Interaction forces including: van der Waals, Acid-Base, Hydrogen bonding, ...etc

### 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, superhydrophilicity
- ◆ 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.



## ORGANIZERS AND CONTACT INFORMATION

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## THE FOLLOWING IS A SAMPLE OF THE PAPERS TO BE PRESENTED:

### MEASUREMENT METHODS

Alidad Amirfazli; Department of Mechanical Engineering 437 Bergeron Bldg York University 4700 Keele St, Toronto, ON, M3J 1P3; Novel Approaches to Measure Contact Angles

P. Cherukupally, A. Kondor, D. R. Williams, A. M. Bilton, and C. B. Park; University of Toronto, 5 Kings College Rd, Toronto M5S 3G8 - Ontario - CANADA; Inverse Gas Chromatography for Porous Media Characterization: Surface Heterogeneity and Surface Energy Profiles

Frank M. Etzler; School of Pharmacy, Lake Erie College of Osteopathic Medicine, 1858 W. Grandview Blvd., Erie, PA 16509; Statistical Considerations for the Determination of Surface Free Energy Components Using Contact Angles and Inverse Gas Chromatography

V. Liimatainen, M. Vuckovac, V. Jokinen, V. Sariola, M.J. Hokkanen, Q. Zhou, R.H.A. Ras; Aalto University, School of Science, Department of Applied Physics, FI-00076 AALTO, FINLAND; Droplet Adhesion Measurements in the Wetting Characterization of Topographically Complex, Repellent Surface

Tingyi "Leo" Liu; Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst, MA; Measuring Contact Angles on Super-repellent Surfaces with a Consistent Accuracy

Davide Rossi, Paola Pittia and Nicola Realdon; Department of Pharmaceutical and Pharmacological Sciences, University of Padova, ITALY; Determination of the Surface Free Energy of Water Solutions by Solid like Method

Antonio Bettero and Davide Rossi; Department of Pharmaceutical and Pharmacological Sciences, University of Padova, ITALY. From a Tensiometric Versus Skin (Tvs) Modeling to Tvs Skin Test

Aleksey Baldygin, Ryan Baily, Ali-Reza Salehi, Muhammed Khan, Md Farhad Ismail, Megnath Ramesh, Nigel Rodrigues, Thomas, Prashant R. Waghmare; Interfacial Science and Surface Engineering Lab (iSSELab), Department of Mechanical Engineering, University of Alberta, Edmonton, CANADA, T6G 2G8; Drop Deposition Technique under Microgravity Conditions: from Concept to the Working Model

### APPLICATIONS TO BIOLOGICAL STRUCTURES: WOOD, COSMETICS, ..ETC

Hy Bui; Applied Research, R&I, 111 T, Terminal Ave, Clark 07066, LOREAL USA; Evaluation Long Lasting Property of Cosmetic Products by Contact Angle Measurement

Pouria Rezaee Niaraki and Andreas Krausea; Centre of Wood Science and Technology, University Hamburg, Hamburg 21031, GERMANY; Characterizing the Wettability of Wood Surfaces Based on Their Polar-dispersive Properties

Jure Žigon, Marko Petrič and Sebastian Dahle; University of Ljubljana, Biotechnical Faculty, Department of Wood Science & Technology, Jamnikarjeva 101, 1000 Ljubljana, SLOVENIA; Wettability of Wood Surfaces with Waterborne Acrylic Lacquer Stains Adjusted by Dbd Plasma in Air at Atmospheric Pressure

Nicola Realdon and Davide Rossi; Department of Pharmaceutical and Pharmacological Sciences, University of Padova, ITALY; Evaluation of *in Vitro* and *in Vivo* Drug Release and Skin Absorption after the Treatment with Formulations for Topical Use by Contact Angle Method

H. Souzandeh and A. N. Netravali; Dept. of Textiles and Apparel, Cornell University, Martha Van Rensselaer Hal, Room 289, Ithaca NY; Sisal Fiber/zein Resin Interface: Effect of Plasticizer and Cellulosic Reinforcement

D.G. Waugh and J. Lawrence; School of Mechanical, Aerospace and Automotive Engineering, Faculty of Engineering, Environment and Computing, Coventry University, Gulson Road, Coventry, CV1 2JH, UK; On the Use of Laser Surface Engineering to Modulate Bacterial Adhesion

## THEORETICAL STUDIES

Chang-Jin "CJ" Kim; Micro and Nano Manufacturing Lab; California NanoSystems Institute, Mechanical and Aerospace Engineering Department; Bioengineering Department, University of California, Los Angeles (UCLA); Generalized Dynamic Cassie-Baxter Model

Daniel Lewis; Materials Research Center, Room 110, Rensselaer Polytechnic Institute, 110 8th Street, Troy, NY 12180; A Framework to Study Heterogeneous Factors that Influence Grain Growth

Farhad Ismail, Raymond G. Sanedrin, Thomas Willers, Prashant Waghmare; KRÜSS GmbH, Borsteler Chaussee 85, 22453 Hamburg, GERMANY; Theoretical Modeling of the Novel Liquid Needle Dosing Method for Contact Angle Measurements

## HYDROPHOBIC/HYDROPHILIC BEHAVIOR AND APPLICATIONS

Junhui He; Functional Nanomaterials Laboratory, Center for Micro/Nanomaterials and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Zhongguancundonglu 29, Haidianqu, Beijing 100190, CHINA; Multi-functional Self-cleaning Coatings with Good Robustness, High Transmittance and Superamphiphobicity

Youhua Jiang, Yujin Sun Jaroslaw W. Drelich, and Chang-Hwan Choi; Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, New Jersey 07030, USA; Droplet Adhesion on Patterned Hydrophobic Surfaces in a Fakir State: Topography-Dependent Effective Contact Line

Zhiwei Liao; University of Pennsylvania, Chemical and Biomolecular Engineering, Philadelphia PA 19104; Robust Superhydrophilic, Underwater Anti-oil Fouling Coatings from Spray-coated Assemblies of Polymer Grafted Silica Nanochains



Jack Panter; Durham University,  
Department of Physics, South  
Road Durham, Durham DH1 3LE UK;  
Multifaceted Design Optimisation for  
Superoleophobic Surfaces

Kaiwu Huang and Roe-Hoan Yoon;  
Center for Advanced Separation  
Technologies, Virginia Tech, Blacksburg,  
VA 24061; Hydrophobic Forces in  
Wetting Films: Measurement and  
Thermodynamic Analysis

## WETTING BEHAVIOR AND APPLICATIONS

Meenakshi Annamalai and T  
Venkatesan; Nanoscience and  
Nanotechnology Institute (NUSNNI) –  
Nanocore, 5A Engineering Drive 1, T-Lab  
Building, National University of Singapore,  
Singapore 117411; On the Nature of  
Wettability of Rare-Earth Oxide Thin  
Films

Umesh Marathe and Jayashree Bijwe;  
ITMMEC, Indian Institute of Technology,  
Delhi INDIA; Exploitation of Contact  
Angle Measurement Technique to  
Quantify the Removal Process of  
Sizing Agent on Graphite Fibres

Edward Bormashenko; Ariel University,  
Engineering Faculty, Chemical Engineering,  
Biotechnology and Materials Department,  
P.O.B. 3, 40700, Ariel, ISRAEL; Plasma  
Treatment of Silicone Oil-Infused  
Surfaces Switches Impact of Water  
Droplets from Bouncing to Tanner-Like  
Spreading

Manuel Chamerois; SCR/R&D, TOTAL  
E&P - Avenue Larribau, 64018 Pau Cedex -  
FRANCE; Oil Reservoir Wettability  
Specificities

A. Irannezhad, M. A. Nobakhti, N.  
Momtaheni, M. H. Fereydoni, S. F. Chini;  
Mechanical Engineering Department,  
University of Tehran, Tehran, IRAN; Huge  
Enhancement of Lift to Drag Ratio of  
Hydrofoils Using Piecewise Wettability  
Change

Chang-Hwan Choi; Department of  
Mechanical Engineering, Stevens Institute  
of Technology, Castle Point on Hudson,  
Hoboken, NJ 07030, USA; Spontaneous  
Spreading of a Droplet on a Solid  
Surface: the Fundamental Role of  
Advancing Contact Angle

Hongyao Geng and Sung Kwon Cho;  
Integration of Liquid Infused Porous  
Surface (SLIPS) with Electrowetting  
and Liquid Dielectrophoresis

Weerapha Panatdasirisuk; University of  
Pennsylvania, Materials Science and  
Engineering, Philadelphia PA 19104;  
Wettability and Absorbability of  
Electrospun Yarns for Sweat Sensor  
Smart Cloth

Prashant Pendyala, Hong Nam  
Kim, Sung-Wook Yang, Il-Joo Cho, Eui-  
Sung Yoon; Center for BioMicrosystems,  
Korea Institute of Science and Technology  
(KIST), Seoul 02792, Republic of KOREA;  
Directional Wetting Transitions During  
Evaporation on Microcavity Surfaces

Gerald Takacs and Katerine Vega; RIT,  
School of Chemistry & Materials Science,  
Lomb Memorial Drive, Rochester, NY  
14623; Enhancing the Wettability of  
Polybenzimidazole (PBI) to Improve  
Fuel Cell Performance

## NOVEL EFFECTS AND APPLICATIONS

Edward Bormashenko; Ariel University, Engineering Faculty, Chemical Engineering, Biotechnology and Materials Department, P.O.B. 3, 40700, Ariel, ISRAEL; New Investigations of Self-Propulsion: Self-Propelled Rotator Driven by the Marangoni-Flow

Edward Bormashenko and Mark Frenkel; Ariel University, Engineering Faculty, Chemical Engineering, Biotechnology and Materials Department, P.O.B. 3, 407000, Ariel, ISRAEL; Magnetic Field Inspired Contact Angle Hysteresis Drives Floating Polyolefin Rafts

Kevin Golovin; Faculty of Applied Science, School of Engineering, UBC-Okanagan EME 4271, CANADA; Designing Durable Icephobic Surfaces

Wilfried Konrad, Christoph Neinhuis, Jörg Adam and Siegfried Konietzko; Technische Universität Dresden, Institute for Botany, Zellescher Weg 20 B, 01062 Dresden, GERMANY; To Melt or Not to Melt - High Temperature Application Based on Structured Surfaces

J. Lawrence and D.G. Waugh; School of Mechanical, Aerospace and Automotive Engineering, Faculty of Engineering, Environment and Computing, Coventry University, Gulson Road, Coventry, CV1 2JH, UK; Surface Engineering for the Control of Polyethylene Terephthalate (PET) Wettability Characteristics Using Laser Beam Wavelength

Naoto Shiomura, Takashi Sekine and Dehua Yang; Dehua Yang; Ebatco, 7154 Shady Oak Road, Eden Prairie, MN 55344, USA; Contact Angle Hysteresis of Pressure Sensitive Adhesives due to Adhesion Tension Relaxation