

Electrostatics
Society of America



2008 ANNUAL MEETING OF THE ELECTROSTATICS SOCIETY OF AMERICA

June 17-19, 2008

Ramada Mall of America, Minneapolis, MN, USA

General Chair: Albert E. Seaver

Technical Chair: Daniel J. Lacks, Case Western Reserve University

Tuesday, June 17

11:00 AM – 1:00 PM	Welcome Reception
1:00 PM – 2:20 PM	Session A. Devices I
2:20 PM – 2:40 PM	Coffee Break
2:40 PM – 3:40 PM	Session B. Materials Processing
3:40 PM – 4:00 PM	Coffee Break
4:00 PM – 5:00 PM	Session C. Breakdown and Discharge I
5:00 PM – 6:00 PM	ESA Governing Board Meeting

Wednesday, June 18

7:15 AM – 8:00 AM	Continental Breakfast
8:00 AM – 9:20 AM	Session D. Conductors
9:20 AM – 9:40 AM	Coffee Break
9:40 AM – 10:40 AM	Session E. Flows
10:40 AM – 11:00 AM	Coffee Break
11:00 AM – noon	Session F. Atmospheric and Space Applications
noon – 1:00 PM	Lunch
1:00 PM – 2:00 PM	Session G. Particles I
2:00 PM – 2:20 PM	Coffee Break
2:20 PM – 3:20 PM	Session H. Devices II
3:20 PM – 3:40 PM	Coffee Break
3:40 PM – 4:40 PM	Session I. Materials Interfaces
5:00 PM – 9:00 PM	Mississippi River Cruise

Thursday, June 19

7:15 AM – 8:00 AM	Continental Breakfast
8:00 AM – 9:20 AM	Session J. Breakdown and Discharge II
9:20 AM – 9:40 AM	Coffee Break
9:40 AM – 10:40 AM	Session K. Environmental Applications
10:40 AM – 11:00 AM	Coffee Break
11:00 AM – noon	Session L. Materials: Contact Electrification
noon – 1:10 PM	Lunch
1:10 PM – 2:20 PM	Session M. Particles II
2:20 PM – 2:40 PM	Coffee Break
2:40 PM – 3:40 PM	Session N. Biological Applications
3:40 PM – 4:00 PM	Coffee Break
4:00 PM – 5:00 PM	Session O. Applications to Space Exploration
6:00 PM – 7:00 PM	Banquet Reception
7:00 PM – 10:00 PM	Banquet, with speaker Glenn Schmieg, "Creating More Science Nerds"

Technical Sessions, Coffee Breaks, Breakfasts, Welcome Reception: Shoshonee Room
Lunches, Banquet Reception, Banquet: East Menominee Room

Session A. Devices I

Tuesday, June 17, 1:00 PM

Session Chair: D. J. Lacks, Case Western Reserve University

- 1:00-1:20 A1 M. Horenstein*, S. Cornelissen, J. Tang.** Boston University
Electrostatic Micromirrors for Retro-Reflective Optical Communication
- 1:20-1:40 A2 I. A. Krichtafovitch, S. V. Karpov*, N. E. Jewell-Larsen, J. L. Oharah, V. A. Korolev.**
Kronos Air Technologies
EFA Loudspeakers
- 1:40-2:00 A3 J. R. Robison*, R. Sharma, J. Zhang, M. K. Mazumder.**
University of Arkansas at Little Rock and Boston University
Computer Simulation of Electrodynamic Screens for Mars Dust Mitigation
- 2:00-2:20 A4 B. P. Seaver**
Analysis of a Novel Electrostatic Particle Display Device

Session B. Materials Processing

Tuesday, June 17, 2:40 PM

Session Chair: C. I. Calle, NASA Kennedy Space Center

- 2:40-3:00 B1 F. C. Lai*, C. C. Wang.** University of Oklahoma
Drying of Partially Wetted Materials with Corona Wind and Auxiliary Heat
- 3:00-3:20 B2 I. I. Inculet*, M. A. Bergougnou.** University Western Ontario
Temperature Gradients in an Electrostatically Applied Powder Coating Layer While Cured with Infrared Radiation
- 3:20-3:40 B3 I. Ramirez*, S. Jayaram, E. Cherney, M. Gauthier.** University of Waterloo
Study of Laser Ablation and Mechanical Properties of Silicone Rubber Nanocomposites

Session C. Breakdown and Discharge I

Tuesday, June 17, 4:00 PM

Session Chair: R. Sundararajan, Purdue University

- 4:00-4:20 C1 C. Buhler*, C. I. Calle, J. S. Clements, S. Trigwell, M. Ritz.**
NASA Kennedy Space Center and Appalachian State University
New Techniques to Evaluate the Incendiary Behavior of Insulators
- 4:20-4:40 C2 L. Zhao* and K. Adamiak.** Gannon University and University of Western Ontario
Numerical Simulation of Corona Discharge in Compressed Gases with the Effect of EHD Flow
- 4:40-5:00 C3 A. Poornima, H. Mithila, B. Adnan, D. Subhankar, T. C. Balachandra, T. Asokan*.**
GE India Technology
Electrical Discharge Characteristics of 1-D Plane Electrodes

Session D. Conductors

Wednesday, June 18, 8:00 AM

Session Chair: L. Zhao, Gannon University

- 8:00-8:20 D1 J. M. Crowley.** Electrostatic Applications
Force on a charged conducting sphere near a conductor
- 8:20-8:40 D2 C. F. Gallo.** Superconix Inc.
Work Function of Metals: Correlation Between Classical Model and Quantum Mechanical Treatment
- 8:40-9:00 D3 K. Sakai.** Electrostatic Generator Research Center
An experimental result which confirms the fourth electrostatic force
- 9:00-9:20 D4 A. E. Seaver**
Some Comments on the Charge Decay Paradox in Metals

Session E. Flows

Wednesday, June 18, 9:40 AM

Session Chair: M. Horenstein, Boston University

- 9:40-10:00 E1 N. E. Jewell-Larsen, S. V. Karpov*, I. A. Krichtafovitch, V. Jayanty, C.-P. Hsu, A. V. Mamishev.** Kronos Air Technologies and University of Washington
Modeling of electrohydrodynamic flow with COMSOL
- 10:00-10:20 E2 J. Zhang* and F. C. Lai.** University of Oklahoma
Electric Field in a Rectangular Channel with an Electrohydrodynamic Gas Pump
- 10:20-10:40 E3 Cancelled**

Session F. Atmospheric and Space Applications

Wednesday, June 18, 11:00 AM

Session Chair: D. J. Lacks, Case Western Reserve University

- 11:00-11:40 F1** **Keynote Lecture: N. O. Renno.** University of Michigan
Electric activity and dust lifting on Earth, Mars, and beyond
- 11:40-12:00 F2** **S. J. Snyder*, P. E. Hintze, J. L. McFall, C. R. Buhler, J. S. Clements, C. I. Calle.**
NASA Kennedy Space Center and Appalachian State University
Triboelectric Charging of Dust and its Relation to Organic Degradation on Mars

Session G. Particles I

Wednesday, June 18, 1:00 PM

Session Chair: K. Forward, Case Western Reserve University

- 1:00-1:20 G1** **M. D. Hogue*, C. I. Calle, D. R. Curry, P. S. Weitzman.**
NASA Kennedy Space Center and DEM Solutions
Discrete Element Modeling (DEM) of Triboelectrically charged Particles: Revised Experiments
- 1:20-1:40 G2** **N. Toljic*, K. Adamiak, G. S. P. Castle.** University of Western Ontario
Determination of Particle Charge to Mass Ratio in Electrostatic Applications: A Brief Review
- 1:40-2:00 G3** **J. W. Stark*, M. K. Mazumder, J. Zhang, R. Sharma, A. J. Adams.**
University of Arkansas at Little Rock and Boston University
Measurements of Electrostatic charge and Aerodynamic Diameter of Sub-Micron Particles by the ESPART Analyzer

Session H. Devices II

Wednesday, June 18, 2:20 PM

Session Chair: A. R. Akande, University of Botswana

- 2:20-2:40 H1** **C. Buhler*, C. I. Calle, J. S. Clements, R. Cox, M. Ritz.**
NASA Kennedy Space Center and Appalachian State University
Electrostatic Precipitation in nearly pure Gaseous Nitrogen
- 2:40-3:00 H2** **M. C. Zaretsky*, R. R. Quiel.** Eastman Kodak
Electrostatic Assist Using a Patterned Backing Roller for Slide Hopper Coating
- 3:00-3:20 H3** **D. Campbell, J. Harper, V. Natham, F. Xiao, R. Sundararajan*.** Purdue University
A Compact high Voltage Nanosecond Pulse Generator

Session I. Materials Interfaces

Wednesday, June 18, 3:40 PM

Session Chair: D. J. Lacks, Case Western Reserve University

- 3:40-4:00 I1** **H. Ishihara*, J. Zhang, R. Sharma, M. K. Mazumder.**
University of Arkansas at Little Rock and Boston University
Control of Surface Charge Density of Microtoner for High Resolution Imaging
- 4:00-4:20 I2** **K. Robinson*, R. Brearey, J. Szafraniec.** Electrostatic Answers and Carestream Health
Voltage Diffusion in an Insulating Sheet with a Conductive Layer - Part 1: Equivalent Circuit Model
- 4:20-4:40 I3** **J. Szafraniec*, R. Brearey, K. Robinson.** Electrostatic Answers and Carestream Health
Voltage Diffusion in an Insulating Sheet with a Conductive Layer - Part 2: FEM Model and Experimental Results

Session J. Breakdown and Discharge II

Thursday, June 19, 8:00 AM

Session Chair: K. Adamiak, University of Western Ontario

- 8:00-8:20 J1** **O. I. Kondratov*, Y. K. Bobrov, I. V. Zhuravkov, E. I. Ostapenko, V. V. Starikov, Y. V. Yurgelenas.** All-Russian Electrotechnical Institute and Russian Academy of Science
Application of a breakable micro-discharger for improvement of lightning protection
- 8:20-8:40 J2** **P. Gefter.** MKS-Ion Systems
Double side charging of glass substrates
- 8:40-9:00 J3** **H. Mithila, A. Poornima, B. Adnan, D. Subhankar, T. C. Balachandra, T. Asokan*.**
GE India Technology
Partial Discharge Characteristics of Micro-gaps
- 9:00-9:20 J4** **W. A. Dela Cruz*, M. L. M. Abalos, J. D. Concordia.** Intel Technology Philippines
A Case of Arcing Damage at Wafer Saw and Wash Process Caused by Polyimide Thinning and Removal on RF device and how it was solved

Session K. Environmental Applications

Thursday, June 19, 9:40 AM

Session Chair: M. D. Hogue, NASA Kennedy Space Center

- 9:40-10:00 K1 M. K. Mazumder*, R. Sharma, P. P. Das, M. Misra.** University of Arkansas at Little Rock, Boston University, and University of Nevada at Reno
Interfacial Charge Transfer in Photo-electrochemical Generation of Hydrogen from Water
- 10:00-10:20 K2 I. A. Krichtafovitch, V. G. Yuzbashev, T. Myatt, S. V. Karpov*.** Kronos Air Technologies, Disinfection Research Institute and Environmental Health and Engineering, Inc.
EFA air disinfection using Kronos based air purifiers
- 10:20-10:40 K3 T. Yamamoto*, H. Fujishima, T. Kuroki, M. Okubo, K. Yoshida, K. Otsuka.** Musashi Institute of Technology
Pilot-Scale NOx Removal from Boiler Emission Using Plasma-chemical Process

Session L. Materials: Contact Electrification

Thursday, June 19, 11:00 AM

Session Chair: D. J. Lacks, Case Western Reserve University

- 11:00-11:40 L1 Keynote Lecture: B. A. Grzybowski.** Northwestern University
Contact electrification: Mechanism(s) and Applications
- 11:40-12:00 L2 A. R. Akande.** University of Botswana
Annealing effects on the charge transfer in metal/polymer contact

Session M. Particles II

Thursday, June 19, 1:00 PM

Session Chair: C. R. Buhler, NASA Kennedy Space Center

- 1:10-1:40 M1 Keynote Lecture: G. S. P. Castle.** University of Western Ontario
Contact Charging Between Particles: Some Current Understanding
- 1:40-2:00 M2 M. T. Carvajal.** Purdue University
Contribution of electrostatic interactions to the dispersion of powders for inhalation
- 2:00-2:20 M3 K. Forward*, D. J. Lacks, R. M. Sankaran.** Case Western Reserve University
Triboelectric Charging of Binary Granular Mixtures due solely to Particle-Particle Interactions

Session N. Biological Applications

Thursday, June 19, 2:40 PM

Session Chair: M. Noras, University of North Carolina, Charlotte

- 2:40-3:00 N1 M. M. Zheng, M. Nichols, I. G. Camarillo, N. Lenarduzzi, T. Salameh and R. Sundararajan*.** Purdue University
Enhanced Drug uptake in Normal and Malignant cell lines using Electrical Pulses
- 3:00-3:20 N2 R. J. Prance*, S. Beardsmore-Rust, A. Aydin, C. J. Harland, H. Prance.** University of Sussex
Biological and medical applications of a new electric field sensor
- 3:20-3:40 N3 L. J. Gagliardi.** Rutgers University
Electrostatic Force in Furrowing of Biological Cells

Session O. Applications to Space Exploration

Thursday, June 19, 4:00 PM

Session Chair: D. J. Lacks, Case Western Reserve University

- 4:00-4:20 O1 C. I. Calle*, J. L. McFall, C. R. Buhler, S. J. Snyder, E. E. Arens, A. Chen, M. L. Ritz, J. S. Clements, C. R. Fortier, S. Trigwell.** NASA Kennedy Space Center, Oklahoma Baptist University and Appalachian State University
Dust Particle Removal by Electrostatic and Dielectrophoretic Forces with Applications to NASA Exploration Missions
- 4:20-4:40 O2 J. Bock*, J. Robison, J. Zhang, M. Mazumder.** University of Arkansas at Little Rock, Boston University
An Efficient Power Management Approach for Self-Cleaning Solar Panels with Integrated Electrodynamical Screens
- 4:40-5:00 O3 L. Zhao*, K. Adamiak, M. Mazumder.** Gannon University, University of Western Ontario, University of Arkansas at Little Rock and Boston University
Numerical and Experimental Studies of the Electrohydrodynamic Pump for Sampling System on Mars