Electrostatics Society of America

2017 ANNUAL MEETING OF THE ELECTROSTATICS SOCIETY OF AMERICA

June 13-15, 2017
University of Ottawa, Ottawa, ON, Canada

General Chair: Poupak Mehrani, University of Ottawa, Canada
Technical Chair: Shubho Banerjee, Rhodes College, USA

Monday, June 12th	**90 University, room 140-main floor**
6:00 PM – 8:00 PM	Informal Welcome Gathering & Registration
Tuesday, June 13th	**SITE Building, 800 King Edward Ave.**
7:00 AM – 8:00 AM	Registration & Breakfast
8:00 AM – 8:15 AM	Welcome Address
8:15 AM – 10:00 AM	Session A: Electrically-Induced Flows and Electrokinetics I
10:00 AM – 10:30 AM	*Coffee Break and Poster Session*
10:30 AM – 12:00 PM	Session B: Contact Charging and Triboelectric Effects I
12:00 PM – 1:30 PM	*Lunch*
1:30 PM – 2:15 PM	Session C: Biological and Medical Applications
2:15 PM – 3:00 PM	Session D: Gas Discharges and Microplasmas
3:00 PM – 3:30 PM	*Coffee Break and Poster Session Cont.*
3:30 PM – 4:45 PM	Session E: Measurements and Instrumentation
4:45 PM – 5:45 PM	Session F: Materials Synthesis Processing and Behavior
Wednesday, June 14th	**SITE Building, 800 King Edward Ave.**
7:00 AM – 8:00 AM	Registration & Breakfast
8:00 AM – 9:30 AM	Session G: Breakdown Phenomenon and Discharge
9:30 AM – 10:00 AM	Session H: Safety and Hazards
10:00 AM – 10:30 AM	*Coffee Break*
10:30 AM – 12:00 PM	Session I: Contact Charging and Triboelectric Effects II
12:00 PM – 1:30 PM	*Lunch*
1:30 PM – 3:00 PM	Session J: Atmospheric and Space Applications I
3:00 PM – 3:30 PM	*Coffee Break*
3:30 PM – 5:30 PM	Session K: Electrically-Induced Flows and Electrokinetics II
6:30 PM – 9:00 PM	**Conference Banquet, Recognitions and Awards (DMS 4101, 55 Laurier Ave.)**
Thursday, June 15th	**SITE Building, 800 King Edward Ave.**
7:00 AM – 8:00 AM	Breakfast
8:15 AM – 9:15 AM	Session L: Electrically-Induced Flows and Electrokinetics III
9:15 AM – 10:00 AM	Session M: Contact Charging and Triboelectric Effects III
10:00 AM – 10:30 AM	*Coffee Break*
10:30 AM – 11:30 AM	Session N: Atmospheric and Space Applications II
11:30 AM – 12:30 PM	**Graduate Student Awards**
12:30 PM – 12:45 PM	**Closing Remarks**

Note: *Keynote Lectures are 25 min + 5 min for questions; Invited and Regular Talks are 12 min + 3 min for questions*
Note: *Technical sessions will be in* ***SITE room B0103****; Breakfast, lunch and coffee breaks will be in* ***SITE cafeteria***

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Tuesday, June 13, 2017

8:00 – 8:15 AM **Welcome Address:** Poupak Mehrani (University of Ottawa), General Chair
Shubho Banerjee (Rhodes College, Memphis TN), Technical Chair

Session A: Electrically-Induced Flows and Electrokinetics I — Tuesday, June 13, 8:15 AM

Session Chair: TBA

8:15 – 8:45 **A1** **Keynote Lecture:** H.-T. Charles Fan and Jorge Arinez (General Motors Company), *Full Vehicle Simulation of Electrostatic Paint Spray Simulation.*

8:45 – 9:00 **A2** **Invited Talk:** Feng C. Lai, I. W. Brindle, and F. C. Lai (University of Oklahoma), *Experimental Study of Corona Jet Produced by a Circular Tube Fitted with a Nozzle.*

9:00 – 9:15 **A3** Katsuo Sakai, (Electrostatic Generator Laboratory), *The third trial for the new electrostatic generator that is driven by Asymmetric electrostatic force.*

9:15 – 9:30 **A4** V. Vivacqua[1], M. Ghadiri[1], A. M. Abdullah[2], A. Hassanpour[1], M. J. F. A. Al-Marri[2], B. Azzopardi[3], B. Hewakandamby[3], B. Kermani[4] ([1]University of Leeds, [2]Qatar University, [3]University of Nottingham, [4]Keytech), *Evaluation of a Novel Electrode Design for Separation of Water-in-Oil Dispersions by Electrocoalescence.*

9:30 – 9:45 **A5** Hidemasa Takana and Koyo Saegusa (Tohoku University), *Effect of Pulsed Voltage on Characteristics of Ionic Liquid Electrospray.*

9:45 – 10:00 **A6** Marius Blajan, Akihiko Ito, Jaroslav Kristof, and Kazuo Shimizu (Shizuoka University), 3-D Numerical Simulation of Vortex Generator by Microplasma.

10:00 – 10:30 AM **Coffee Break and Poster session**

Session B: Contact Charging and Triboelectric Effects I — Tuesday, June 13, 10:30 AM

Session Chair: TBA

10:30 – 10:45 **B1** Daniel J. Breton, Emily Asenath-Smith, and Nathan Lamie (Cold Regions Research and Engineering Laboratory), *Tribocharging and Materials Analysis of Firearm Propellants.*

10:45 – 11:00 **B2** Joshua Méndez-Haper, George McDonald, Josef Dufek, Mike Malaska, and Devon Burr (Georgia Tech), *Electric Titan: A world molded by electrostatics.*

11:00 – 11:15 **B3** Tatsushi Matsuyama, Junichi Ida, and Hideo Yamamoto (Soka University), *A discussion on the maximum charge held by a single particle limited by gas discharge.*

11:15 – 11:30 **B4** Li Xie and Jun Zhou (Lanzhou University), *Contact electrification of particles considering effect of relative humidity.*

11:30 – 11:45 **B5** Mark Horenstein, Ryan Eriksen, and Malay Mazumder (Boston University), *Quasi Three-Phase Traveling Wave Generation for an Electrodynamic Screen Via Snake Electrode Pattern with No High-Voltage Crossover Connections.*

11:45 – 12:00 **B6** Mizuki Shoyama and Shuji Matsusaka (Kyoto University), *Charging and Levitation of Small Particles by Mesh Electrode.*

12:00 – 1:30 PM **Lunch**

Session C: Biological and Medical Applications — Tuesday, June 13, 1:30 PM

Session Chair: TBA

1:30 – 2:00 **C1** **Keynote Lecture:** Philip Chi Lip Kwok (The University of Hong Kong), *Electrostatics of pharmaceutical aerosols.*

2:00 – 2:15 **C2** **Invited Talk:** Emil Alexov (Clemson University), *Modeling electrostatics in molecular biology: application to motor domain motion along microtubule*.

Tuesday, June 13, 2:15 PM

Session D: Gas Discharges and Microplasmas

Session Chair: TBA

2:15 – 2:30	**D1**	Chaoao Shi, Kazimierz Adamiak, and G. S. Peter Castle (Western University), *Investigation of Characteristics of Dielectric Barrier Discharge Using a Numerical Model.*
2:30 – 2:45	**D2**	N. Manivannan, W. Balachandran, G. Agozzino1, M. Jayamurthy, D. Brennen, and M. Abbod (Brunel University), *NOx abatement form the exhaust of a diesel engine with non-thermal plasma and Ag/Al2O3 catalyst.*
2:45 – 3:00	**D3**	Xiaozhou Shen, Xiaozhou Shen, Joseph Toth, R. Mohan Sankaran, Daniel Lacks (Case Western Reserve University), *Direct Non-Oxidative Methane Conversion by Dielectric Barrier Discharge – a Modeling Study.*

3:00 – 3:30 PM **Coffee Break and Poster Session contd.**

Session E: Measurements and Instrumentation — Tuesday, June 13, 3:30 PM

Session Chair: TBA

3:30 – 3:45	**E1**	Matti Murtomaa, anne Peltonen, and Jarno Salonen (University of Turku), *Development of a four electrode induction probe for charge measurements in fluidized beds.*
3:45 – 4:00	**E2**	Michael Reznikov (Physical Optics Corp.), *A fixed surface potential probe with the swing capacitive electrometer compared to the vibrating Kelvin probe.*
4:00 – 4:15	**E3**	Toshiyuki Sugimoto, Yuki Yoshida, and Nobuo Nomura (Yamagata University), *Estimation of paint thickness from measured surface potential charged by corona discharge.*
4:15 – 4:30	**E4**	Janne Peltonen, Matti Murtomaa, Kelly Robinson, and Jarno Salonen (University of Turku), *Measurements of binary powder mixture resistivities.*
4:30 – 4:45	**E5**	Norimitsu Ichikawa (Kogakuin University), *Measurement of electrostatically induced voltages in two metal boxes by using spark gap and electromagnetic wave sensor.*

Session F: Materials Synthesis Processing and Behavior — Tuesday, June 13, 4:45 PM

Session Chair: TBA

4:45 – 5:00	**F1**	Rajesh Sharma, Samuel King, Mesut Yurukcu, and Tansel Karabacak (Arkansas State University), *Multijunction thin film electrodes for photoelectrolysis.*
5:00 – 5:15	**F2**	Mahdi Elghazali, Mahdi Elghazali, and Manoj Sachdev, Ajoy Opal (University of Waterloo), *Design methodology for ESD power supply clamps in advanced CMOS technologies.*
5:15 – 5:30	**F3**	Patrick S. Hogan and Keith M. Forward (California State Polytechnic University), *Heat and Mass Transport in the Electrospinning Process.*
5:30 – 5:45	**F4**	Katarina Guzman, Thai Nguyen, Uyen Phan, Jack Lift, Hovhaness Gregorchuk, and Keith M. Forward (California Polytechnic University Pomona), *Free Surface Electrospinning of Microemulsions Containing Fenofibrate.*

Poster Session

Tuesday, June 13
10:00 – 10:30 AM and 3:00 – 3:30 PM

- Outi Alanen, Matti Murtomaa, and Jarno Salonen (University of Turku), *A novel method for mass production of coaxial electrospun fibers.*
- Imed Eddine Achouri, Thami Zeghloul, Hamou Nouri, Abdelkader Mekhalef Benhafssa, Gontran Richard, Karim Medles, and Lucian Dascalescu (University of Poitiers), *Tribo-aero-electrostatic separation of micronized waste plastics.*
- Ahlem Ben Ab, Gontran Richard, Ana-Maria Delisor, Amar Tilmatine, Lucian Dascalescu, Thami Zeghloul (University of Poitiers), *Selective electric charging and sorting of PP and HIPS from mm-size granular waste plastics using a roll-type tribo-electrostatic separator.*
- Chen Li, Zifan Wanga, Xiaoyan Huanga, Farzaneh Jalalinejada Kwangseok Choib, and Lifeng Zhanga (University of Saskatchewan), *Characterization of Tribocharging Behaviour of Pharmaceutical Granules in a Turbulent Flow Tribocharger.*
- Li Liangliang, Li Yipeng, Liu Quanzhen, Gao Xin, SUN Lifu (SINOPEC Research Institute of Safety Engineering), *Experimental study on the electrostatic risk factors in the process of refueling and uploading meanwhile at petrol stations.*
- He Meng (SINOPEC research institute of safety engineering), *Electrostatic hazards of applying foam to protect exposed flammable product pools.*
- W. Mike Arnold (Callaghan Innovation), *The Cell Membrane Conductivity Disparity.*
- Angela Antoniu, *Electrical dipoles, extracellular signals, and surface measurements: an example.*
- Khandakar Nusrat Islam and Mark Gilmore (University of New Mexico), *Characterization of methods of surface charge removal for the reduction of electrostatic discharge events in explosive environments.*
- Zerin Mahzabin Khan (University of Ottawa), *Recent Innovations in Electromyography for Biomedical Applications: A Systematic Literature Review.*

Wednesday, June 14, 2017

Session G: Breakdown Phenomenon and Discharge — Wednesday, June 14, 8:00 AM

Session Chair: TBA

8:00 – 8:30 **G1** **Keynote Lecture:** Elyse Rosenbaum (University of Illinois at Urbana-Champaign), *Breakdown phenomena and discharges.*

8:30 – 8:45 **G2** Michael Hogue, Rachel Cox, Jaysen Mulligan, Jayanta Kapat, Kareem Ahmed, Jennifer Wilson, and Luz Marina Calle (NASA Kennedy Space Center), *Revision of Paschen's Law Relating to the ESD of Aerospace Vehicle Surfaces.*

8:45 – 9:00 **G3** Jiann-Lin Su and Tsrong-Yi Wen (National Taiwan University of Science and Technology), *Nanoparticle Collection Using Electrostatic Precipitator with Spike Corona Electrode.*

9:00 – 9:15 **G4** Sara Mantach, Kazimierz Adamiak, and G. S. Peter Castle (University of Western Ontario), *DC Corona Discharge in Wire-Cylinder Configuration – Validity of Peek's Formula.*

9:15 – 9:30 **G5** Zahirul Hasan Khan[1], George D. Bouzianas[2], Theodoros K. Koumbis[2], Vasileios N. Zagkanas[2] ([1]HRZ Research & Consultancy, [2]Fieldscale), *A Comparative Study of Experimental and Simulation Results of Sieving Electrostatic Precipitator.*

Session H: Safety and Hazards — Wednesday, June 14, 9:30 AM

Session Chair: TBA

9:30 – 9:45 **H1** Choi Kwangseok[1], Yuta Endo[1], Naoto Nogera[2], Teruo Suzuki[2] ([1]National Institute of Occupational Safety and Health, Japan), *Electrostatic discharges inside storage silo during loading of polypropylene powders.*

9:45 – 10:00 **H2** Kelly Robinson (Electrostatic Answers), *Solvent Exposure Compromises Some Antistatic Containers.*

10:00 – 10:30 AM **Coffee Break**

Session I: Contact Charging and Triboelectric Effects II — Wednesday, June 14, 10:30 AM

Session Chair: TBA

10:30 – 10:45 **I1** Joseph Toth and Matti Murtomaa (University of Turku), *Triboelectric charging through particle-particle contact using acoustic levitation.*

10:45 – 11:00 **I2** Gontran Richard, Abdelkader Nadjem, Karim Medles, Miloud Kachi, Thami Zeghloul, and Lucian Dascalescu (University of Poitiers), *Tribocharging of PP and PVC granules after exposure to a dielectric barrier discharge (DBD). Effect of DBD exposure duration, voltage amplitude and frequency.*

11:00 – 11:15 **I3** U. Zafar, M. Ali, F. Alfano, and M. Ghadiri (University of Leeds), *Evaluation of a New Method for Assessing Triboelectric Charging Propensity of Particles.*

11:15 – 11:30 **I4** Xing Jin and Jeffrey S. Marshall (University of Vermont), *The Role of Fluid Turbulence on Contact Electrification of Suspended Particles.*

11:30 – 11:45 **I5** Ladislav Konopka, Simon Jantac, Jarmila Kucerova, and Juraj Kosek (University of Chemistry and Technology Prague), *Triboelectrification of Polymers.*

11:45 – 12:00 **I6** Dylan Carter and Christine Hartzell (University of Maryland), *A Method for Measuring Charge Separation in Granular Mixtures in Vacuum.*

12:15 – 1:30 PM **Lunch**

Session J: Atmospheric and Space Applications I — Wednesday, June 14, 1:30 PM

Session Chair: TBA

1:30 – 2:00 **J1** **Keynote Lecture:** Karen Aplin (Oxford University), *Electrical processes in planetary atmospheres.*

2:00 – 2:15 **J2** Carlos I. Calle, (NASA Kennedy Space Center), *Electrostatic Charge Relaxation of Dust Particles in the Martian Atmosphere.*

2:15 – 2:30 **J3** Giles Harrison, Keri Nicoll, and Karen Aplin (University of Reading, UK), *Remote sensing of cloud base charge.*

2:30 – 2:45	**J4**	Paul J. Mackey, J. R. Phillips III, M. R. Johansen, R. E. Cox, J. S. Clements, and C. I. Calle (NASA Kennedy Space Center), *Modified Millikan Experiments in a Simulated Martian Environment*.
2:45 – 3:00	**J5**	Jesus A. Dominguez, J. R. Phillips III, P. J. Mackey, M. D. Hogue, M. R. Johansen, R. E. Cox, and C. I. Calle (Vencore Inc.), *Comprehensive Modeling of Surface Dust Removal via Electrostatic and Dielectrophoretic Forces in Planetary Exploration Missions.*

3:00 – 3:30 PM **Coffee Break**

Session K: Electrically-Induced Flows and Electrokinetics II — Wednesday, June 14, 3:30 PM

Session Chair: TBA

3:30 – 3:45	**K1**	**Invited Talk:** Lei Yang and Jamal Seyed-Yagoobi (Worcester Polytechnic Institute), *Liquid-Phase Flow Distribution Control in Meso-Scale with Directionally Reversed Electrohydrodynamic Conduction Pumping Configuration.*
3:45 – 4:00	**K2**	Janusz Podliński, Magdalena Danowska, Tomasz Izdebski, and Mirosław Dors (Institute of Fluid Flow Machinery, Polish Academy of Sciences), *Electrohydrodynamic pump with bipolar corona discharge supplied by unipolar DC voltage.*
4:00 – 4:15	**K3**	Feng C. Lai, J. H. Lin, and S. C. Lin (University of Oklahoma), *Performance of an Electrohydrodynamic Gas Pump Fitted in a Nozzle*
4:15 – 4:30	**K4**	Yoshio Higashiyama and Masafumi Kamada (Yamagata University), *Dehumidification by fine charged droplets ejected by corona discharge from a water droplet.*
4:30 – 4:45	**K5**	Keiichiro Yoshida, Michael J. Johnson, and David B. Go (Osaka Institute of Technology), *Evaluation on ionic wind generated with a ring-shaped DBD device having an exhaust nozzle.*
4:45 – 5:00	**K6**	Farhana A. Khan, Stefan Andrei, A. K. M. Monayem H. Mazumder, Ramesh K. Guduru (Lamar University), *Performance of Electrohydrodynamic Gas Pump in a Square Channel*.
5:00 – 5:15	**K7**	Vladimir Chirkov, Aleksandr Lashko, and Marina Reznikova (St. Petersburg State University), *The investigation of the transition from electrical coalescence to non-coalescence of two water droplets.*
5:15 – 5:30	**K8**	Michal Talmor, Lei Yang, and Jamal Seyed-Yagoobi (Worcester Polytechnic Institute), *Numerical study of directional EHD conduction driven flow distribution control in small scales in the presence of external pressure loads.*

Conference Banquet, Recognitions and Awards — Wednesday, June 14, 6:30 PM

Banquet talk: Dr. Mark Horenstein, Boston University, USA

Thursday, June 15, 2017

Session L: Electrically-Induced Flows and Electrokinetics III — Thursday, June 15, 8:15 AM

Session Chair: TBA

8:15 – 8:30 **L1** Adrian Ieta[1], Sohrab Gousheh[1], Kyle Zeller[1], Justin D'Antonio[1] and Marius Chirita[2] ([1]SUNY Oswego, [2]NIRDECM, Timisoara), *Improved Data Acquisition System for the Study of EHD-Air Flow Induced Rotational Motion.*

8:30 – 8:45 **L2** Maciej Noras and Alzarrio Rolle (University of North Carolina at Charlotte), *Influence of electric and magnetic fields on behavior of electrosprays in an elevated pressure environment.*

8:45 – 9:00 **L3** A. K. M. Monayem H. Mazumder, Farhana A. Khan, Ali Beheshti, Ramesh K. Guduru (Lamar University), *Electrohydrodynamic Gas Pump in a Square Channel with Two-Stage Corona Wind Generator.*

9:00 – 9:15 **L4** Rezaur Rahman, A. K. M. Monayem H. Mazumder, Jenny Zhou (Lamar University), *Electrical Characteristics of Electrohydrodynamic Gas Pump in a Square Channel*.

Session M: Contact Charging and Triboelectric Effects III — Thursday, June 15, 9:15 AM

Session Chair: TBA

9:15 – 9:30 **M1** Matthew Ibbotson, E. Van Cleve, A. L. Collins, and C.G. Camara (Tribogenics), *Novel non-contact macroscopic triboelectric and tribological device*.

9:30 – 9:45 **M2** Eli Van Cleve, M. Ibbotson, A. L. Collins, and C. G. Camara (Tribogenics), *Simulation of non-contact macroscopic triboelectric and tribological device.*

9:45 – 10:00 **M3** Fahad Chowdhury, Alberto Passalacqua, Andrew Sowinski, and Poupak Mehrani (University of Ottawa), *An Euler-Euler CFD Model for Gas-Solid Fluidized Beds Incorporating Electrostatic Charging due to Particle-Wall Collisions.*

10:00 – 10:30 AM **Coffee Break**

Session N: Atmospheric and Space Applications II — Thursday, June 15, 10:30 AM

Session Chair: TBA

10:30 – 10:45 **N1** Mark Horenstein (Boston University), *Ultra-Sensitive Electric-Field Sensor for Underwater Object Detection.*

10:45 – 11:00 **N2** M. R. Johansen, J. R. Phillips III, P. J. Mackey, Rachel E. Cox, S. J. Clements, C. I. Calle (NASA), *Numerical Simulations of an Electrostatic Precipitator for Mars In-Situ Resource Utilization.*

11:00 – 11:15 **N3** Carlos I. Calle, P.J. Mackey, J.R. Phillips III, M.R. Johansen, M.D. Hogue, and R.E. Cox (NASA), *Electrodynamic Dust Shield Demonstration on the International Space Station*.

11:15 – 11:30 **N4** Shubho Banerjee, Yi Song, and Blake Wilkerson (Rhodes College), *The mathematics behind the close approach of two equal-sized charged spheres.*

11:30 – 12:30 **Graduate Student Awards:** Shubho Banerjee (Rhodes College), Technical Chair

12:30 – 12:45 **Closing Remarks:** Sheshakamal Jayaram (University of Waterloo), ESA President

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