



# 2015 ANNUAL MEETING OF THE ELECTROSTATICS SOCIETY OF AMERICA

June 16-18, 2015

California State Polytechnic University, Pomona  
Kellogg West Conference Center and Hotel

*General Chair: Keith Forward, California State Polytechnic University, Pomona*

*Technical Chair: Peter Ireland, University of Newcastle, Australia*

## Monday, June 15<sup>th</sup>

7:00 PM – 9:00 PM

Informal Welcome Gathering & Registration  
Kellogg West's Hospitality Suite

## Tuesday, June 16<sup>th</sup>

7:00 AM – 8:15 AM

Registration & Breakfast

8:15 AM – 8:30 AM

Welcome Address

8:15 AM – 10:00 AM

Session A: Contact Charging and Triboelectric Effects I

10:00 AM – 10:30 AM

*Coffee Break*

10:30 AM – 12:00 PM

Session B: Gas Discharges and Microplasma

12:00 PM – 1:00 PM

*Lunch*

1:00 PM – 2:15 PM

Session C: Measurements and Instrumentation

2:15 PM – 2:45 PM

Session D: Breakdown, Safety and Hazards

2:45 PM – 3:15 PM

*Coffee Break*

3:15 PM – 4:15 PM

Session E: Biological and Medical Applications I

4:30 PM – 5:30 PM

**ESA Governing Board Meeting**

## Wednesday, June 17<sup>th</sup>

7:00 AM – 8:30 AM

Registration & Breakfast

8:30 AM – 10:00 AM

Session F: Electrically-induced Flows and Electrokinetics

10:00 AM – 10:30 AM

*Coffee Break*

10:30 AM – 12:00 PM

Session G: Contact Charging and Triboelectric Effects II

12:00 PM – 1:00 PM

*Lunch*

1:00 PM – 2:45 PM

Session H: Electrospinning and Materials Processing I

2:45 PM – 3:15 PM

*Coffee Break*

3:15 PM – 4:15 PM

Session I: Breakdown Phenomenon and Discharge

6:00 PM – 9:00 PM

**Conference Banquet, Recognitions and Awards**

## Thursday, June 18<sup>th</sup>

8:30 AM – 9:15 AM

Session J: Biological and Medical Applications II

9:15 AM – 9:45 AM

*Coffee Break*

9:45 AM – 10:15 AM

Session K: Electrospinning and Materials Processing II

10:15 AM – 10:45 PM

Session L: Electrically-induced Flows and Electrokinetics II

10:45 AM – 11:05 PM

**Graduate Student Awards**

11:05 AM – 11:15 PM

**Closing Remarks**

**Note:** Keynote Lectures are 25 min + 5 min for questions; Invited and Regular Talks are 12 min + 3 min for questions

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**Tuesday, June 16, 2015**

**8:15 – 8:30 AM**                      **Welcome Address:** Daniel J. Lacks (Case Western Reserve University), ESA President  
Peter Ireland (University of Newcastle), Technical Chair

**Session A: Contact Charging and Triboelectric Effects I**
**Tuesday, June 16, 8:30 AM**

Session Chair: Matti Murtomaa (University of Turku)

- 8:30 – 9:00 AM**            **A1**    **Keynote Lecture:** Zhong-Lin Wang (Georgia Institute of Technology) – *Triboelectric nanogenerator – a new energy technology.*
- 9:00 – 9:15**                **A2**    Moses Holonga, Andrew Wang, Daniel J. Lacks, R. Mohan Sankaran (Case Western Reserve University) – *Effects of plastic deformation on triboelectric charging.*
- 9:15 – 9:30**                **A3**    Thiago A.L. Burgo<sup>1</sup>, Ali Erdemir<sup>2</sup> (National Center for Energy and Materials Research, Brazil<sup>1</sup>, Argonne National Laboratory, USA<sup>2</sup>) – *Triboemission, triboelectrification and friction force of materials along the triboelectric series.*
- 9:30 – 9:45**                **A4**    Daniel Adame, Jonathan Goh, Andrew Shell, Andrew Wasson, Daniel C. Parks, and Keith M. Forward (California State Polytechnic University, Pomona) - *Environmental and Hydrophilic Effects on the Triboelectric Charging of Insulator Materials.*
- 9:45 – 10:00**              **A5**    Arash Sayyah, Mark N. Horenstein, and Malay Mazumder (Boston University) - *Functional analysis of electrodynamic screen.*

**10:00 – 10:30 AM**            **Coffee Break**

**Session B: Gas Discharges and Microplasma**
**Tuesday, June 16, 10:30 AM**

Session Chair: Michael Sean June (Western Carolina University)

- 10:30 – 10:45 AM**        **B1**    **Invited Talk:** Paul Rumbach<sup>1</sup>, R. Mohan Sankaran<sup>2</sup>, David M. Bartels<sup>1</sup>, David B. Go<sup>1</sup> (University of Notre Dame<sup>1</sup>, Case Western Reserve University<sup>2</sup>) - *Direct Optical Measurements of Solvated Electrons at a Plasma-liquid Interface*
- 10:45 – 11:00**            **B2**    A.D. Srinivasan, R Rajagopala, N Jagadisha (Sri Jayachamarajendra College Of Engineering) - *Pulsed Discharge Plasma based Techniques for removal of NOx from Engine Exhaust: Effect of type of fuel, exhaust nature and operating scheme.*
- 11:00 – 11:15**            **B3**    Janusz Podlinski, Artur Berendt, Jerzy Mizeraczyk (Polish Academy of Sciences) - *Time-Resolved Investigations of Electrohydrodynamic Flow Evolution in Needle-to-Plate Positive Corona Discharge*
- 11:15 – 11:30**            **B4**    Michael J. Johnson<sup>1</sup>, Mark MacDonald<sup>2</sup>, David B. Go<sup>1</sup> (University of Notre Dame<sup>1</sup>, Intel Corporation<sup>2</sup>) - *Low Voltage Ionic Wind Generation using Piezoelectric Transformers.*
- 11:30 – 11:45**            **B5**    Joseph R. Toth, Daniel J. Lacks, and R. Mohan Sankaran (Case Western Reserve University) - *Direct conversion of methane by an atmospheric-pressure dielectric barrier discharge (DBD) microplasma.*
- 11:45 – 12:00 PM**        **B6**    Peyman Dordzadeh, Kazimierz Adamiak, G.S. Peter Castle (University of Western Ontario) - *Numerical simulation of Trichel pulses in air for the needle-plane geometry.*

**12:00 – 1:00 PM**            **Lunch**

**Session C: Measurements and Instrumentation**
**Tuesday, June 16, 1:00 PM**

Session Chair: Tatsushi Matsuyama (Soka University)

- 1:00 – 1:30 PM**            **C1**    **Keynote Lecture:** Matti Murtomaa, Janne Peltonen, Jarno Salonen (University of Turku) - *Coaxial induction probe: theory and measurements.*
- 1:30 – 1:45**                **C2**    Janne Peltonen, Matti Murtomaa and Jarno Salonen (University of Turku) - *Simulating a coaxial induction probe for measuring the charge, size and distance of a passing object.*
- 1:45 – 2:00**                **C3**    Maciej Noras (University of North Carolina, Charlotte) - *Use of non-contacting electric and magnetic field sensors in operation and health monitoring of power grids.*

- 2:00 – 2:15      C4    Shubho Banerjee, Stefan J. McCarty, and Evan F. Nelsen (Rhodes College) - *Exact and approximate expressions for the force between a charged conducting sphere and infinite grounded plane.*

### Session D: Breakdown, Safety and Hazards

Session Chair: Eli Van Cleve (Tribogenics)

- 2:15 – 2:30      D1    Kelly Robinson (Electrostatic Answers) - *Static Control for a Roll-to-Roll Manufacturing Process.*
- 2:30 – 2:45      D2    Mohammad Saleh Moonesan, Shesha Jayaram, Edward Cherney (University of Waterloo) - *Effect of Temperature and Humidity on Surface Discharges under High Voltage Unipolar Pulses.*
- 2:45 – 3:15 PM      **Coffee Break**

### Session E: Biological and Medical Applications I

Tuesday, June 16, 3:15 PM

Session Chair: Charles Buhler (CRB High Field, LLC)

- 3:15 – 3:30 PM      E1    W. Mike Arnold (Callaghan Innovation) - *Improved biological membrane measurements from diverse populations of cells.*
- 3:30 – 3:45      E2    Raji Sundararajan and Arutselvan Natarajan (Purdue University) - *Curcumin-Encapsulated Nanoparticles delivery aided with electrical pulses to treat aggressive breast cancer cells.*
- 3:45 – 4:00      E3    Taewon Han, Gediminas Mainelis (Rutgers University) - *Development of Electrostatics-based Collectors to Capture Biological Aerosols.*
- 4:00 – 4:15      E4    Fatima Islam, Kelly Linck, Juana Rodriguez, Nancy Rodriguez and Keith M. Forward (California State Polytechnic University, Pomona) - *Free Surface Electrospinning of Microemulsions Containing Vitamin E.*
- 4:30 – 5:30      **ESA Governing Board Meeting**

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## Wednesday, June 17, 2015

### Session F: Electrically-induced Flows and Electrokinetics

Wednesday, June 17, 8:30 AM

Session Chair: Poupak Mehrani (University of Ottawa)

- 8:30 – 9:00 AM      F1    **Keynote Lecture:** Leslie Yeo (MIT University) - *From Electrostatics to Piezoelectrics: A Decade-Long Journey in the Development of Microscale Centrifugation and Lab-on-a-Disc Platforms.*
- 9:00 – 9:15      F2    A. Ieta, J. D'Antonio, M. Chirita, P. D'Antonio (SUNY Oswego) - *Harnessing corona wind for electrostatic motors.*
- 9:15 – 9:30      F3    Charles Buhler (CRB High Field, LLC) - *The strange world of Magnetic Currents.*
- 9:30 – 9:45      F4    Mohammadreza Ghazanachaei, Kazimierz Adamiak, G. S. Peter Castle (University of Western Ontario) - *Investigation on dielectric barrier discharge actuator to control airflow boundary layer.*
- 9:45 – 10:00      F5    M.Reznikov, M.Salazar, M. Lopez, M. Rivera-Sustache (Physical Optics Corporation) - *Electrically enhanced harvesting of water vapor from the air.*
- 10:00 – 10:30 AM      **Coffee Break**

### Session G: Contact Charging and Triboelectric Effects II

Wednesday, June 17, 10:30 AM

Session Chair: Peter Ireland (University of Newcastle)

- 10:30 – 10:45 AM      G1    **Invited Talk:** E. Van Cleve, E. W. Wong, C. G. Camara (Tribogenics) - *Measurements of the effect of strain on contact electrification.*

- 10:45 – 11:00**      **G2**    Xiaozhou Shen, Daniel J. Lacks (Case Western Reserve University) - *Contact charging between insulators: A theoretical study.*
- 11:00 – 11:15**      **G3**    Victor Lee, Scott R. Waitukaitis, Marc Z. Miskin & Heinrich, M. Jaeger (University of Chicago) - *Direct Observation of Particle Interactions and Clustering in Charged Granular Streams.*
- 11:15 – 11:30**      **G4**    Tatsushi Matsuyama, Ayako Murakami, Junichi Ida, Hideo Yamamoto (Soka University) - *Charge relaxation between polymer and metal surface during separation process after contact.*
- 11:30 – 11:45**      **G5**    Di Song, Poupak Mehrani (University of Ottawa) - *Influence of fluidizing operating pressure on the extent of polyethylene resin electrostatic charging.*
- 11:45 – 12:00**      **G6**    Andrew E. Wang, Daniel J. Lacks, and R. Mohan Sankaran (Case Western Reserve University) - *Contact Charging Studies of Single Crystal Insulators.*

**12:00 – 1:00 PM**                      **Lunch**

### **Session H: Electrospinning and Materials Processing I**

**Wednesday, June 17, 1:00 PM**

Session Chair: Keith Forward (California State Polytechnic University, Pomona)

- 1:00 – 1:30 PM**      **H1**    **Keynote Lecture:** Kim Woodrow (University of Washington) - *Sustaining drug release from electrospun antiviral fibers.*
- 1:30 – 1:45**        **H2**    Myriam Paredes Olguín, Chitral J. Angamma and Shesha H. Jayaram (University of Waterloo) - *Modeling the role of Interphase in Silica filled Silicone Nanocomposites.*
- 1:45 – 2:00**        **H3**    Thomas Hogarth, Rene Ferrer III, Merielle Haw, Daniel Decker, Arash Rashidi, Brian Hensley and Keith M. Forward (California State Polytechnic University, Pomona) - *Free Surface Electrospun Polyvinylidene Fluoride Membranes for Direct Contact Membrane Distillation.*
- 2:00 – 2:15**        **H4**    Bruce Y. Decker, Sinclair Calderon, Yong X. Gan (California State Polytechnic University, Pomona) - *Thermoelectric property of bismuth telluride filled silicone processed under high-voltage electric field.*
- 2:15 – 2:30**        **H5**    Arash Sayyah, Mark N. Horenstein, and Malay Mazumder (Boston University) - *Experimental investigation of influential parameters in the dust particles' charge in electrodynamic screen application.*
- 2:30 – 2:45**        **H6**    Victoria R. Medinilla, Fransisca Oei, Cynthia V. Jimenez, Susana Vargas, and Keith M. Forward (California State Polytechnic University, Pomona) - *Development of Ceramic Metal Oxide Membranes by means of Reactive Electrospinning.*

**2:45 – 3:15 PM**                      **Coffee Break**

### **Session I: Atmospheric and Space Applications**

**Wednesday, June 17, 3:15 PM**

Session Chair: Shesha Jayaram (University of Waterloo)

- 3:15 – 3:30 PM**      **I1**    Daan Stevenson, Don Pettit (University of Colorado Boulder) - *Electrostatic Model Applied to ISS Charged Water Droplet Experiment.*
- 3:30 – 3:45**        **I2**    Masato Adachi, Takumi Kojima, Hiroyuki Kawamoto (Waseda University) - *Electrostatic Sampler for Collecting Large Regolith Particles on Asteroids.*
- 3:45 – 4:00**        **I3**    Joseph M. Crowley (Electrostatic Applications) - *Formulas for force on an insulative sphere near a conductive wall.*
- 4:00 – 4:15**        **I4**    Joshua S. Méndez Harper, Josef Dufek (Georgia Institute of Technology) - *Volcanic lightning: The effects of fracto-emission and triboelectric charging.*

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**Thursday, June 18, 2015**
**Session J: Biological and Medical Applications II****Thursday, June 18, 8:30 AM**

Session Chair: Shubho Banerjee (Rhodes College)

- 8:30 – 8:45 AM**      **J1**    W. Mike Arnold (Callaghan Innovation) - *Membrane properties of giant cells formed by electrofusion.*
- 8:45 – 9:00**        **J2**    Tian Hao, Rich Leopold, Matt Browne, Jesse Huss, Heather Chaillier, and Michelle Moyer (Nutrilite Health Institute) - *Electrostatic Properties of Botanical Extracts: A Preliminary Investigation.*
- 9:00 – 9:15**        **J3**    R. Sarathi. S. Rayala, Praveen Kumar, C. Vignesh, Raji Sundararajan (Purdue University) - *Arresting the uncontrolled growth of Pancreatic cancer cells using Electrical pulses and low dose Cytotoxic agent.*

**9:15 – 9:45 AM**      **Coffee Break****Session K: Electrospinning and Materials Processing II****Thursday, June 18, 9:45 AM**

Session Chair: Maciej Noras (University of North Carolina, Charlotte)

- 9:45 – 10:00 AM**      **K1**    **Invited Talk:** Indrani Bhattacharyya, Gregory C. Rutledge (Massachusetts Institute of Technology) - *Developing Electrospinning for Continuous Manufacturing of Pharmaceuticals.*
- 10:00 – 10:15**        **K2**    Shavini Wijesuriya, Krishna Burugapalli, Ruth Mackay, Wamadeva Balachandran (Brunel University) - *Insoluble electrospun membranes for analyte pre-concentration in saliva.*

**Session L: Electrically-induced Flows and Electrokinetics II****Thursday, June 18, 10:15 AM**

Session Chair: Indrani Bhattacharyya (MIT)

- 10:15 – 10:30 AM**      **L1**    **Invited Talk:** Michael Sean June (Western Carolina University) - *Flow and Efficiency Measurement for Ionic Air Moving Devices, and a Call to Collaboration*
- 10:30 – 10:45**        **L2**    Igor Krichtafovitch, Alex Mamishev (Pacific Air Filtration) - *Visualization of dust collection and particle trajectories on porous collecting electrodes.*
- 10:45 – 11:05 PM**      **Graduate Student Awards:** Peter Ireland (University of Newcastle), Program Technical Chair
- 11:05 – 11:15 PM**      **Closing Remarks:** Keith Forward (California Polytechnic State University), General Chair
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