



2022 JOINT CONFERENCE ON ELECTROSTATICS

June 13-15, 2022

Hilton Charlotte University Place, Charlotte, NC USA

General Chair: Maciej Noras, University of North Carolina at Charlotte

Technical Chair: James Chen, University at Buffalo, State University of New York

Day 1, Sunday, June 12.

Tutorials. Sunday, June 12, 10:30 AM

10:30-12:00 **Mark Horenstein.** Boston University, **Maciej Noras.** University of North Carolina at Charlotte

Electrostatic Instruments and Measurements Tutorial

13:30-15:00 **Kelly Robinson.** Electrostatic Answers

Electrostatic Processes and Technologies

15:30-17:00 **Shesha Jayaram.** University of Waterloo, **Akira Mizuno.** Toyohashi University of Technology

Breakdown, Gas Discharges and Plasmas Tutorial

18:00-20:00 **Welcome Reception and Registration**

Day 2, Monday June 13

7:00-8:30 **Breakfast**

Keynote 1. Monday, June 13, 8:30 AM

8:30-9:00 **John Foster.** Department of Nuclear Engineering. University of Michigan

Session A. Measurements and instrumentation Monday, June 13, 9:00 AM

Session Chair: **James R. Phillips III.** NASA Kennedy Space Center

9:00-9:15 **A1 Charles Buhler.** Electrostatics and Surface Physics Laboratory NASA Kennedy Space Center

EDS to the Moon!

9:15-9:30 **A2 Su Meixuan.** Dalian University of Technology

Study on the Motion Property of MgCO₃-charged Particles Based on LiteFlowNet Model

9:30-9:45 **A3 James R. Phillips III.** NASA Kennedy Space Center

Electrostatic Regolith Interaction Experiment (ERIE) Electrometer Instrument Development

9:45-10:00 **A4 Hussein Ahmad.** Brunel University

Electrical Resistivity Measurement of Hydrofluorocarbon Propellants used in Pharmaceutical

10:00-10:15 **A5 Nimmala Pavan Kalyan.** Indian Institute of Technology, Kanpur Uttar Pradesh

Computation of Track Potential in Line to Ground Fault under Maximum Load Conditions

10:15-10:45 **Coffee Break**

Session B. Atmospheric and space applications

Monday, June 13, 10:45 AM

Session Chair: **Dante Rogers**. National Institute for Research and Development in Condensed Matter and Electrochemistry, Timisoara, Romania

- 10:45-11:00** **B1** **Isaac Lenton**. Institute of Science and Technology Austria
Observing individual aerosol particle charging events with optical tweezers
- 11:00-11:15** **B2** **Shakthi Prasad D.** Indian Institute of Technology Goa
Quasi-static AC Surface Charging of Polymeric Insulators at Low Pressure.
- 11:15-11:30** **B3** **Zachary Matzinger**. University of North Carolina at Charlotte
Metasurface Space Antenna
- 11:30-11:45** **B4** **Dante Rogers**. National Institute for Research and Development in Condensed Matter and Electrochemistry, Timisoara, Romania
Properties of EHD Contra Rotating Propellers

11:45-13:00 **Lunch**

Session C. Electrostatic manipulation of particles, droplets, and biological cells + Biological and medical applications + Electrospinning and electro spraying

Monday, June 13, 13:00 PM

Session Chair: **Steven C. Cooper**. The University of Georgia and ByoPlanet International

- 13:00-13:15** **C1** **Aaron Olson**. NASA Kennedy Space Center
Suborbital Lunar Gravity Experiment of an Electrodynamic Regolith Conveyor
- 13:15-13:30** **C2** **Krystal Acosta**. NASA KSC
Evaluation of Coatings for the Electrodynamic Dust Shield Application on Thermal Radiators
- 13:30-13:45** **C3** **Hana Bechkoura**. Institut Pprime, CNRS, Université de Poitiers, ISAE-ENSMA
Numerical study of particle movement in an inclined standing wave electric curtain
- 13:45-14:00** **C4** **Yahaya Ahmad Guji**. Shizuoka University
Tailoring the Chemistry of Plasma-Activated Water (PAW) Using AC Driven Dielectric Barrier Discharge (DBD) Microplasma
- 14:00-14:15** **C5** **Steven C. Cooper**. The University of Georgia and ByoPlanet International
Standard methods for evaluating electrostatic spray charge and deposition of conductive liquids used for surface disinfection

14:15-14:30 **Coffee Break**

Session D. Breakdown, gas discharges and plasmas

Monday, June 13, 14:30 PM

Session Chair: **Shakthi Prasad D.** Indian Institute of Technology Goa

- 14:30-14:45** **D1** **Shakthi Prasad D.** Indian Institute of Technology Goa
Fast Computation of Lightning-Induced Voltages on the Transmission Lines over a Lossy Ground by Implementing Zero Padding Technique
- 14:45-15:00** **D2** **Afshin Shaygani**. Western University (UWO)
The Mean Discharge Model for the Dielectric Barrier Discharge Plasma Actuators

- 15:00-15:15** **D3 N Manivannan.** Brunel University
NOx Abatement using DBD Nonthermal Plasma: Analysis of Reactor Configurations, applied potential and frequency
- 15:15-15:30 **D4 Mohammadrafi Marandi.** University of North Carolina Charlotte
Experimental Study of Corona Discharge Method in Electrical Poling of Additive Manufacturing Piezoelectric PVDF-TrFE Sensors
- 16:30-17:30** **IEEE/EPC Council Meeting**
17:30-18:30 **ESA Council Meeting**
- 18:00-20:00** **Poster Session and Demonstrations**
- P1 Gabriel Nicolae Popa.** University of Poitiers, France
Comparative Analysis of the Collection Efficiency Performances of Cylindrical-Type Electrostatic Precipitators used in Household Applications
- P2 Cecelia Mweka.** Institute of Science and Technology Austria
Combining acoustic levitation and capacitive sensing to probe same-material tribocharging
- P3 Adrian Ieta .** National Institute for Research and Development in Condensed Matter and Electrochemistry, Timisoara, Romania
Rotary Ionic Engines with Single and Double Coaxial Propellers
- P4 Jaroslav Kristof.** Shizuoka University
Absorption Of Eosin Y in Stratum Corneum Induced by Iontophoresis and Microplasma Treatment of the Pig Skin
- P5 Jared Nelson.** Florida Institute of Technology
Electrical discharges in air and CO2 in non-planar geometries
- P6 Annelisa Esparza.** Florida Institute of Technology
Unified Model of Lightning & Electrostatic Discharges Across the Solar System
- P7 David Lund.** Missouri University of Science and Technology
Kinetic Particle Simulations of Charging of Irregularly-Shaped Dust Grains in Low Temperature Collisionless Plasmas
- P8 Nicolas Preud'homme.** University of Liège (Belgium)
Numerical simulations of granular materials with the patch model for same materials tribocharging
- P9 Kelly Robinson.** Electrostatic Answers
Static Cling of a Sheet to the Top of a Stack

Day 3, Tuesday June 14

7:00-8:30 **Breakfast**

Keynote 2.

Tuesday, June 14, 8:30 AM

8:30-9:00

Hakjoon Kim. Department of Environmental Machinery. Korea Institute of Machinery and Metals. South Korea

Session E. Dielectrics and insulators

Tuesday, June 14, 9:00 AM

Session Chair: **Ashok Narayan Tripathi**. Indian Institute of Technology, Kanpur, Uttar Pradesh, India

- 9:00-9:15** **E1** **Drew Antony**. Corning Incorporated
Electronic scale modeling of charge transfer during metal/glass contact
- 9:15-9:30** **E2** **Darshan Prakash Borthakur**. Indian Institute of Technology, Kanpur Uttar Pradesh
India
*Variation of Partial Discharge Parameters of HVDC Cable under Polarity Reversal with
Different Loading Conditions*
- 9:30-9:45** **E3** **Ashok Narayan Tripathi**. Indian Institute of Technology, Kanpur, Uttar Pradesh, India
Assessment of Interface Failures in Composite Insulators
- 9:45-10:00** **E4** **Shesha Jayaram**. University of Waterloo
*Dielectric Properties of Silicone-silica micro- and nano- composites under Combined
Effects of Pressure and Temperature*
- 10:00-10:15** **E5** **G Nithin Reddy**. Indian Institute of Science
*Electro-Thermal Aging Studies on Polymer Housed ZnO Surge Arresters subjected to
Voltage Polarity Reversal*
- 10:15-10:45** **Coffee Break**

Session F. Contact charging and triboelectric effects – 1 + Triboelectric nanogenerators and
energy harvesters

Tuesday, June 14,

10:45 AM

Session Chair: **Dean M Thelen**. Corning

- 10:45-11:00** **F1** **Dean M Thelen**. Corning
Contact charging of Glass Sheet Surfaces
- 11:00-11:15** **F2** **Nicolás Mujica**. Universidad de Chile
Are granular charge distributions really non-Gaussian?
- 11:15-11:30** **F3** **Felix Pertl**. Institute of Science and Technology Austria
Converting KPFM voltage maps to charge density maps
- 11:30-11:45** **F4** **Diana Lermen**. University of Campinas
Hygroelectric generators performance improves under higher temperature
- 11:45-12:00** **F5** **Kelly Schneider Moreira**. Federal University of Santa Maria
Identifying multiple tactile stimulus with a single flexoelectric sensor
- 12:00-13:00** **Lunch**

Session G. Contact charging and triboelectric effects – 2

Tuesday, June 14, 13:00 PM

Session Chair: **Juan Carlos Sobarzo**. Institute of Science and Technology Austria (ISTA)

- 13:00-13:15** **G1** **Juan Carlos Sobarzo**. Institute of Science and Technology Austria (ISTA)
A triboelectric series for identical materials
- 13:15-13:30** **G2** **Dana Harvey**. Emory University
Charge Decay on Levitated Particles in Atmospheric Conditions
- 13:30-13:45** **G3** **Galien Grosjean**. Institute for Science and Technology Austria

13:45-14:00 **G4** *Is water sufficient for contact electrification?*
Lucian Dascalescu. University of Poitiers
Effect of ambient humidity on the tribo-electrostatic separation of granular plastic mixtures

14:00-14:15 **Coffee Break**

Session H. Contact charging and triboelectric effects – 3
Session Chair: **Nicolas Preud'homme.** University of Liège (Belgium)

Tuesday, June 14, 14:15 PM

- 14:15-14:30** **H1** **Nikhil Sridhar.** University of Ottawa
Effect of Fluidization Gas on the Degree of Wall Fouling and Electrostatic Charge Generation in an Atmospheric Gas-Solid Fluidized Bed
- 14:30-14:45** **H2** **Joshua Méndez Harper.** University of Oregon
Insights into fracto- and triboelectrification during coffee grinding
- 14:45-15:00** **H3** **Joseph Toth.** NASA
High-vacuum triboelectric charging of space materials
- 15:00-15:15** **H4** **Nicolas Preud'homme.** University of Liège (Belgium)
Numerical simulations of granular materials with the patch model for some materials tribocharging
- 15:15-15:30** **H5** **Otome Obukohwo** University of Ottawa
The effect of generated charge on solid velocity in pneumatic conveying systems: A preliminary computational fluid dynamics study using pafIX.

15:30-15:45 **Coffee Break**

Session I. Electrostatic precipitation
Session Chair: **Hak-Joon Kim.** Korea Institute of Machinery and Materials

Tuesday, June 14, 15:45 PM

- 15:45-16:00** **I1** **Hirotooshi Sugiyama.** Kanagawa Institute of Technology
Inactivation effect of MS2 using electrostatic precipitator with ultraviolet LED
- 16:00-16:15** **I2** **Yeawan Lee.** Korea Institute of Machinery & Materials
Retrofit of air handling unit by a two-stage electrostatic precipitator
- 16:15-16:30** **I3** **Shakthi Prasad .** Indian Institute of Technology Goa
Analysis of Fast Charging Current Profiles for Lithium-ion Batteries Using a Simplified Electrochemical Model
- 16:30-16:45** **I4** **Dae Hoon Parki.** Korea Institute of Machinery & Materials
Evaluation of Antiviral Electrostatic Precipitator with Cu coated Collection Plates against Aerosolized Virus
- 16:45-17:00** **I5** **Yuki Kijima.** Kanagawa Institute of Technology
Simulation of relationship between collection efficiency and input power in a spike-to-plate type electrostatic precipitator
- 17:00-17:15** **I6** **Mamadou Sow.** Institut de Radioprotection et de Sûreté Nucléaire (IRSN)
Numerical Study on the Induced Flow Created by a Two-Stage EHD Gas Pump with Uneven Applied Voltages

Day 4, Wednesday June 15

7:00-8:30 Breakfast

Keynote 3. Wednesday, June 15, 8:30 AM

8:30-9:00 Michael Mascagni. Department of Computer Science, Florida State University

Session J. Special Session - Electrostatic processes and technologies Wednesday, June 15, 9:00 AM

Session Chair: W. John Thrasher. University of South Carolina Beaufort

9:00-9:15 J1 Walid Keyrouz. National Institute of Standards and Technology (NIST)
Accelerating a Monte-Carlo Capacitance Computation by 10,000x

9:15-9:30 J2 W. John Thrasher. University of South Carolina Beaufort
Talk title: Restarting a Monte Carlo Method for Estimating Electrostatic Free Energy

9:30-9:45 J3 Wei Cai. Southern Methodist University
An Iterative Probabilistic Method For Mixed Problems of Laplace Equations with the Feynman-Kac Formula Of Killed Brownian Motions

9:45-10:00 J4 John P. Nolan. American University and National Institute of Standards and Technology (NIST)
Sample path estimates of non-Newtonian capacity

10:15-10:45 Coffee Break

Session K. Electrostatic processes and technologies Wednesday, June 15, 10:45 AM

Session Chair: Katsuo Sakai. Electrostatic Generator Laboratory

10:45-11:00 K1 Katsuo Sakai. Electrostatic Generator Laboratory
A new electrostatic generator driven by an electric field of an electret.

11:00-11:15 K2 Siowling Soh. National University of Singapore
Preventing the Generation of Electrostatic Charge on Nonconductive Materials by Contact Electrification

11:15-11:30 K3 Rajesh Sharma. Arkansas State University
Electrostatic processes in photo-electrochemical hydrogen production

11:30-11:45 K4 Noureddine Zouzou. Institut Pprime, CNRS, Université de Poitiers, ISAE-ENSMA
Effect of particles' electric charge on the separation process using an electro-adhesion actuator

11:45-13:00 Lunch

Session L. Electrostatic processes and technologies Wednesday, June 15, 13:00 PM

Session Chair: Shesha Jayaram. University of Waterloo

13:00-13:15 L1 István Kiss. Budapest University of Technology and Economics, High Voltage Laboratory of BME
Separation of conductive and insulator objects in centimeter-range using electrostatic separator.

13:15-13:30 L2 Gontran Richard. University of Poitiers
New vibrating-table-type tribo-electrostatic separator for selective sorting of granular plastic wastes

- 13:30-13:45** **L3** **Shesha Jayaram.** University of Waterloo
Developing an Additive for Applications in Electrostatic Discharge Protection using High Aspect Ratio Multi-walled Carbon Nanotubes
- 13:45-14:00** **L4** **Lucian Dascalescu.** University of Poitiers
Effect of humidity on the tribo-aero-electrostatic separation of granular insulating mixtures containing brominated flame retardants

14:00-14:15 **Coffee Break**

Session M. Electrohydrodynamics

Wednesday, June 15, 14:15 PM

Session Chair: **Lin, Sheam-Chyun.** National Taiwan University of Science and Technology

- 14:15-14:30** **M1** **James Kribs.** North Carolina A&T State University
Local Flame Suppression Using High Potential Electric Fields
- 14:30-14:45** **M2** **Lin, Sheam-Chyun.** National Taiwan University of Science and Technology
An EHD Swirling Flow Generator in a Square Channel
- 14:45-15:00** **M3** **Sooik Im.** North Carolina State University
Stability of contact-electrified charges on self-assembled monolayers
- 15:00-15:15** **M4** **AKM Monayem H Mazumder.** Saginaw Valley State University
Numerical Study on the Induced Flow Created by a Two-Stage EHD Gas Pump with Uneven Applied Voltages

17:00-18:00 **ESA Presidents Reception**
18:00-20:00 **Conference Banquet**

Day 5, Thursday June 15

9:00-11:00 **UNC Charlotte laboratories tour (EPIC building)**