



2022 JOINT CONFERENCE ON ELECTROSTATICS



June 12-15, 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 (Lakeview Room).

Sunday, June 12, 10:30

- 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 (Lakeview Room)**

Day 2, Monday, June 13

7:00-8:30 **Breakfast (Lakeshore Rooms III and IV)**

Conference opening (Lakeshore Rooms I and II).

Monday, June 13, 8:15

8:15-8:30 **David Go.** ESA President, Univ. of Notre Dame, **Maciej Noras.** UNC Charlotte

Keynote 1 (Lakeshore Rooms I and II).

Monday, June 13, 8:30

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

Session A (Lakeshore Rooms I and II). Measurements and instrumentation

Monday, June 13, 9:00

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
Charles Buhler, Mike DuPuis, Jeffrey Dyas, James Phillips III, Jerry Wang, Krystal Acosta, Aaron Olsen, Joseph Toth, Seth Rhodes, Paul Mackey, "EDS to the Moon!"
- 9:15-9:30** **A2 Su Meixuan.** Dalian University of Technology

- Su Meixuan, Li Guofeng, Cai Kewei, Yang Zhipeng, Wang Zhiqiang, "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
James R. Phillips III, Adrienne R. Dove, Kathryn G. Robertson, Krystal L. Acosta, Jerry J. Wang, Jeffrey E. Dyas, Sara Wijas, Richard Wakefield, Lucas Dillon, "Electrostatic Regolith Interaction Experiment (ERIE) Electrometer Instrument Development"
- 9:45-10:00 A4 Hussein Ahmad.** Brunel University
Hussein Ahmad, Nadarajah Manivannan, Wamadeva Balachandran, "Electrical Resistivity Measurement of Hydrofluorocarbon Propellants used in Pharmaceutical Industries"
- 10:00-10:15 A5 Nimmala Pavan Kalyan.** Indian Institute of Technology, Kanpur Uttar Pradesh
Nimmala Pavan Kalyan and Alok Ranjan Verma, "Computation of Track Potential in Line to Ground Fault under Maximum Load Conditions"
- 10:15-10:45 Coffee Break (Lakeshore Rooms III and IV)**

Session B (Lakeshore Rooms I and II). Atmospheric and space applications

Monday, June 13, 10:45

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
Isaac Lenton, Andrea Stoellner, Scott Waitukaitis, "Observing individual aerosol particle charging events with optical tweezers"
- 11:00-11:15 B2 Shakthi Prasad D.** Indian Institute of Technology Goa
Shelly Saini and Shakthi Prasad D., "Quasi-static AC Surface Charging of Polymeric Insulators at Low Pressure"
- 11:15-11:30 B3 Zachary Matzinger.** University of North Carolina at Charlotte
Zachary Matzinger, Dillon Ouimet, Nang Kiim, Kristy Hecht, Mario Junior Mencagli, "Metasurface Space Antenna"
- 11:30-11:45 B4 Dante Rogers.** National Institute for Research and Development in Condensed Matter and Electrochemistry, Timisoara, Romania
Adrian Ieta, Marius Chirita, Virgil Rotaru, Mircea Nicolaescu, Dante Rogers, "Properties of EHD Contra Rotating Propellers"
- 11:45-13:00 Lunch (Lakeshore Rooms III and IV)**

Session C (Lakeshore Rooms I and II). Electrostatic manipulation of particles, droplets, and biological cells + Biological and medical applications + Electrospinning and electrospaying

Monday, June 13, 13:00

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

- 13:00-13:15 C1 Aaron Olson.** NASA Kennedy Space Center
Charles Buhler, Krystal Acosta, Joseph Toth, Jerry Wang, James Phillips III, "Suborbital Lunar Gravity Experiment of an Electrodynamical Regolith Conveyor"
- 13:15-13:30 C2 Krystal Acosta.** NASA Kennedy Space Center
Krystal L. Acosta, Joseph R. Toth III, Tracy L. Gibson, Jerry J. Wang, Aaron D. S. Olson,

James R. Phillips III, Charles R. Buhler, "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
Hana Bechkoura, Miloud Kachi, and Nouredine Zouzou, "Numerical study of particle movement in an inclined standing wave electric curtain"
- 13:45-14:00 C4 Yahaya Ahmad Guji.** Shizuoka University
A.G. Yahaya, T. Okuyama, J. Kristof, M. G. Blajan, K. Shimizu, "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
S. Edward Law and Steven C. Cooper, "Standard methods for evaluating electrostatic spray charge and deposition of conductive liquids used for surface disinfection"

14:15-14:30 Coffee Break (Lakeshore Rooms III and IV)

Session D (Lakeshore Rooms I and II). Breakdown, gas discharges and plasmas

Monday, June 13, 14:30

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

- 14:30-14:45 D1 Shakthi Prasad D.** Indian Institute of Technology Goa
Ravi Kumar K N, Avinash Yadav, Shakthi Prasad D, Neelakandan R, "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.** University of Western Ontario
Afshin Shaygani, Kazimierz Adamiak, "The Mean Discharge Model for the Dielectric Barrier Discharge Plasma Actuators"
- 15:00-15:15 D3 Nadarajah Manivannan.** Brunel University
M. Mortazavi, L. Amato, N. Manivannan, M. Abbod, W. Balachandran, "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
Mohammadrafi Marandi, Maciej A. Noras, Joshua Tarbutton, "Experimental Study of Corona Discharge Method in Electrical Poling of Additive Manufacturing Piezoelectric PVDF-TrFE Sensors"
- 15:30-15:45 D5 Gabriel Nicolae Popa.** University of Poitiers, France
Gabriel Nicolae Popa, Lucian Dascalescu, Corina Maria Dinis, "Comparative Analysis of the Collection Efficiency Performances of Cylindrical-Type Electrostatic Precipitators used in Household Applications"

16:30-17:30 IEEE/EPC Council Meeting (Lakeshore Rooms I and II)

17:30-18:30 ESA Council Meeting (Lakeshore Rooms I and II)

18:00-20:00 Poster Session and Demonstrations (Lakeview Room)

- P1 Cecelia Mweka.** Institute of Science and Technology Austria
Cecelia Mweka, Galien Grosjean, Scott Waitukaitis, "Combining acoustic levitation and capacitive sensing to probe same-material tribocharging"
- P2 Adrian Ieta.** National Institute for Research and Development in Condensed Matter and Electrochemistry, Timisoara, Romania
Marius Chirita, Adrian Ieta, Virgil Rotaru, Mircea Nicolaescu, Mihai Marghitas, Liviu

Mocanu, James Weinschreider, "Rotary Ionic Engines with Single and Double Coaxial Propellers"

- P3 Jaroslav Kristof.** Shizuoka University
J. Kristof, R. Yokoyama, A.G. Yahaya, T. Okuyama, J. Kristof, M. Blajan, K. Shimizu, "Absorption of Eosin Y in Stratum Corneum Induced by Iontophoresis and Microplasma Treatment of the Pig Skin"
- P4 Annelisa Esparza.** Florida Institute of Technology
Annelisa B. Esparza, Jeremy A. Riouset, "Unified Model of Lightning & Electrostatic Discharges Across the Solar System"
- P5 David Lund.** Missouri University of Science and Technology
David Lund and Daoru Han, "Kinetic Particle Simulations of Charging of Irregularly-Shaped Dust Grains in Low Temperature Collisionless Plasmas"
- P6 Nicolas Preud'homme.** University of Liège (Belgium)
Nicolas Preud'homme, Geoffroy Lumay and Eric Opsomer, "Numerical simulations of granular materials with the patch model for same materials tribocharging"
- P7 Kelly Robinson.** Electrostatic Answers
Kelly Robinson, "Static Cling of a Sheet to the Top of a Stack"
- P8 Leroy Gonez Rodriguez.** GPS Air
Leroy Gonez Rodriguez, "Controlled conditions for the assessment of air ionizers"

2022 ESA Demonstrations (Lakeview Room)

#	Org	Contact	Topic
1	Steve Cooper	Cooper, Steve	Electrostatic Spray Coating
2	Stonehouse Process Safety	Ebadat, Vahid	Propagating Brush Discharges (remote)
3	Newsom Gale	Puig, Richard	Grounding and Bonding
4	SelecTech Inc.	Ricciardelli, Tom	Static Protective flooring
5	Electrostatic Answers	Robinson, Kelly	ES Fieldmeter Measures Charge Density. Needle-Point Ionizer / Van de Graaff Generator
6	Dave Swenson	Swenson, Dave	Walking Voltage Demo

Day 3, Tuesday, June 14

7:00-8:30 **Breakfast (Lakeshore Rooms III and IV)**

Keynote 2 (Lakeshore Rooms I and II).

Tuesday, June 14, 8:30

8:30-9:00 **Hakjoon Kim.** Department of Environmental Machinery. Korea Institute of Machinery and Metals. South Korea

Session E (Lakeshore Rooms I and II). Dielectrics and insulators

Tuesday, June 14, 9:00

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

- 9:00-9:15** **E1** **Drew Antony.** Corning Incorporated
Drew Antony and Dean Thelen, "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
Darshan Prakash Borthakur and Alok Ranjan Verma, "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
Ashok Narayan Tripathi and Alok Ranjan Verma, "Assessment of Interface Failures in Composite Insulators"
- 9:45-10:00** **E4** **Shesha Jayaram.** University of Waterloo
Khadija Kanwal Khanum, Arathi Mohan Sharma and Shesha H Jayaram, "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
G Nithin Reddy, M-Ramez Halloum and Subba Reddy B, "Electro-Thermal Aging Studies on Polymer Housed ZnO Surge Arresters subjected to Voltage Polarity Reversal"
- 10:15-10:45** **Coffee Break (Lakeshore Rooms III and IV)**

Session F (Lakeshore Rooms I and II). Contact charging and triboelectric effects – 1, Triboelectric nanogenerators and energy harvesters

Tuesday, June 14, 10:45

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

- 10:45-11:00** **F1** **Dean M Thelen.** Corning
Dean M Thelen, Andrew C Antony, "Contact charging of Glass Sheet Surfaces"
- 11:00-11:15** **F2** **Nicolás Mujica.** Universidad de Chile
Nicolás Mujica and Scott Waitukaitis, "Are granular charge distributions really non-Gaussian?"
- 11:15-11:30** **F3** **Felix Pertl.** Institute of Science and Technology Austria
Felix Pertl, Juan Carlos Sobarzo Ponce, Scott Waitukaitis, "Converting KPFM voltage maps to charge density maps"
- 11:30-11:45** **F4** **Diana Lermen.** University of Campinas
Diana Lermen, Leandra P. dos Santos, Andre Galembeck, Fernando Galembeck, "Hygroelectric generators performance improves under higher temperature"
- 11:45-12:00** **F5** **Kelly Schneider Moreira.** Federal University of Santa Maria
Kelly Schneider Moreira, Ezequiel Lorenzetti, Thiago Augusto de Lima Burgo, "Identifying multiple tactile stimulus with a single flexoelectric sensor"
- 12:00-13:00** **Lunch (Lakeshore Rooms III and IV)**

Session G (Lakeshore Rooms I and II). Contact charging and triboelectric effects – 2

Tuesday, June 14, 13:00

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

- 13:00-13:15** **G1** **Juan Carlos Sobarzo Ponce.** Institute of Science and Technology Austria (ISTA)
Juan Carlos Sobarzo Ponce, Scott Waitukaitis, "A triboelectric series for identical"

- materials”*
- 13:15-13:30 G2 Dana Harvey.** Emory University
Dana Harvey, Josh Mendez Harper, and Justin C. Burton, “Charge Decay on Levitated Particles in Atmospheric Conditions”
- 13:30-13:45 G3 Galien Grosjean.** Institute for Science and Technology Austria
Galien Grosjean, Cecelia Mweka, Cécile Clavaud, Huseyin Kaya, Yen-Ting Lin, Lei Chen, Seong H. Kim, and Scott Waitukaitis, “Is water sufficient for contact electrification?”
- 13:45-14:00 G4 Thami Zeghloul.** University of Poitiers
Imed-Eddine Achouri, Abdelkader Mekhalef Benhafssa, Csaba Dany, Mihail Lungu, Thami Zeghloul, Lucien Dascalescu, “Effect of ambient humidity on the tribo-electrostatic separation of granular plastic mixtures”
- 14:00-14:15 Coffee Break (Lakeshore Rooms III and IV)**

Session H (Lakeshore Rooms I and II). Contact charging and triboelectric effects – 3

Tuesday, June 14, 14:15

Session Chair: **Nicolas Preud'homme.** University of Liège (Belgium)

- 14:15-14:30 H1 Nikhil Sridhar.** University of Ottawa
Mohsen Isaac Nimvari, Nikhil Sridhar, Andrew Sowinski, Poupak Mehrani, “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
Joshua Méndez Harper, Robin Bumbaugh, Elias Rheingold, Christopher Hendon, Josef Dufek, “Insights into fracto- and triboelectrification during coffee grinding”
- 14:45-15:00 H3 Joseph Toth.** NASA
Joseph Toth, Krystal Acosta, Jerry Wang, Aaron Olson, James Phillips, and Charles Buhler, “High-vacuum triboelectric charging of space materials”
- 15:00-15:15 H4 Nicolas Preud'homme.** University of Liège (Belgium)
Nicolas Preud'homme, Geoffroy Lumay and Eric Opsomer, “Numerical simulations of granular materials with the patch model for same materials tribocharging”
- 15:15-15:30 H5 Otome Obukohwo** University of Ottawa
Otome Obukohwo, Poupak Mehrani, Andrew Sowinski, Holger Grosshans, “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 (Lakeshore Rooms III and IV)**

Session I (Lakeshore Rooms I and II). Electrostatic precipitation

Tuesday, June 14, 15:45

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

- 15:45-16:00 I1 Hirotoshi Sugiyama.** Kanagawa Institute of Technology
Hirotoshi Sugiyama, Akinori Zukeran, Yu Zengjian, Nobuaki Ohguri, Yuji Hayase, Noboru Matsumoto, “Inactivation effect of MS2 using electrostatic precipitator with ultraviolet LED”
- 16:00-16:15 I2 Yeawan Lee.** Korea Institute of Machinery & Materials
Yeawan Lee, Ye-Sle Kim, Haneol Lee, Bangwoo Han, Yong-Jin Kim, Hak-Joon Kim, “Retrofit of air handling unit by a two-stage electrostatic precipitator”
- 16:15-16:30 I3 Shakthi Prasad.** Indian Institute of Technology Goa
Shivam Gupta, Shakthi Prasad D. and Bidhan Pramanick, “Analysis of Fast Charging

- 16:30-16:45 I4** *Current Profiles for Lithium-ion Batteries Using a Simplified Electrochemical Model*
Dae Hoon Park. Korea Institute of Machinery & Materials
Dae Hoon Park, Sungjae Park, Jung-ho Hwang, Yeawan Lee, Yong-Jin Kim, Bangwoo Han, Hak-Joon Kim, "Evaluation of Antiviral Electrostatic Precipitator with Cu coated Collection Plates against Aerosolized Virus"
- 16:45-17:00 I5** **Yuki Kijima.** Kanagawa Institute of Technology
Yuki Kijima, Ryota Tamura, Yoshihiro Kawada, Tomohiro Taoka, Akinori Zukeran, "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)
Siddharth Rajupet, Soleiman Bourrous, Francois Gensdarmes, Mamadou Sow, "Coulombic force contribution to nano scale aerosol capture by a wire grid"

Day 4, Wednesday, June 15

7:00-8:30 **Breakfast (Lakeshore Rooms III and IV)**

Keynote 3 (Lakeshore Rooms I and II).

Wednesday, June 15, 8:30

8:30-9:00 **Michael Mascagni.** Department of Computer Science, Florida State University
 Michael Mascagni, "Stochastic Computational Electrostatics and Applications: Computing Capacitance"

Session J (Lakeshore Rooms I and II). Special Session - Stochastic Computational Electrostatics and Applications

Wednesday, June 15, 9:00

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

- 9:00-9:15 J1** **Walid Keyrouz.** National Institute of Standards and Technology (NIST)
Walid Keyrouz and Derek Juba, "Accelerating a Monte-Carlo Capacitance Computation by 10,000x"
- 9:15-9:30 J2** **W. John Thrasher.** University of South Carolina Beaufort
W. John Thrasher, Michael Mascagni, "Restarting a Monte Carlo Method for Estimating Electrostatic Free Energy"
- 9:30-9:45 J3** **Wei Cai.** Southern Methodist University
Wei Cai, "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)
John P. Nolan, Jack Douglas, Debra Audus, "Sample path estimates of non-Newtonian capacity"

10:15-10:45 **Coffee Break (Lakeshore Rooms III and IV)**

Session K (Lakeshore Rooms I and II). Electrostatic processes and technologies

Wednesday, June 15, 10:45

Session Chair: **Monayem Mazumder.** Saginaw Valley State University

10:45-11:00 K1 **Faramarz Farahi.** UNC Charlotte

- Faramarz Farahi, "Application of Soft Ionization in Improving Indoor Air Quality"*
- 11:00-11:15 K2 Siowling Soh.** National University of Singapore
Siowling Soh, "Preventing the Generation of Electrostatic Charge on Nonconductive Materials by Contact Electrification"
- 11:15-11:30 K3 Rajesh Sharma.** Arkansas State University
Rajesh Sharma, "Electrostatic processes in photo-electrochemical hydrogen production"
- 11:30-11:45 K4 Nouredine Zouzou.** Institut Pprime, CNRS, Université de Poitiers, ISAE-ENSMA
Hamza Louati, Nouredine Zouzou, "Effect of particles' electric charge on the separation process using an electro-adhesion actuator"
- 11:45-13:00 Lunch and IEEE IAS EPC Awards Ceremony (Lakeshore Rooms III and IV)**

Session L (Lakeshore Rooms I and II). Electrostatic processes and technologies

Wednesday, June 15, 13:00

Session Chair: **Shesha Jayaram.** University of Waterloo

- 13:00-13:15 L1 László Székely.** Budapest University of Technology and Economics, High Voltage Laboratory of BME
László Székely, Gwak Donghyeok, István Kiss, Richárd Cselkó, "Separation of conductive and insulator objects in centimeter-range using electrostatic separator"
- 13:15-13:30 L2 Lucian Dascalescu.** University of Poitiers
Imed-Eddine Achouri, Gontran Richard, Karim Medles, Lucien Dascalescu, Thami Zeghloul, "New vibrating-table-type tribo-electrostatic separator for selective sorting of granular plastic wastes"
- 13:30-13:45 L3 Shesha Jayaram.** University of Waterloo
Chitral J Angamma, Shesha H Jayaram, "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
Ahlem Benabderrahmane, Karim Medles, Thami Zeghloul, Farida Tomasella, Lucien Dascalescu, "Effect of humidity on the tribo-aero-electrostatic separation of granular insulating mixtures containing brominated flame retardants"

14:00-14:15 Coffee Break (Lakeshore Rooms III and IV)

Session M (Lakeshore Rooms I and II). Electrohydrodynamics

Wednesday, June 15, 14:15 PM

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

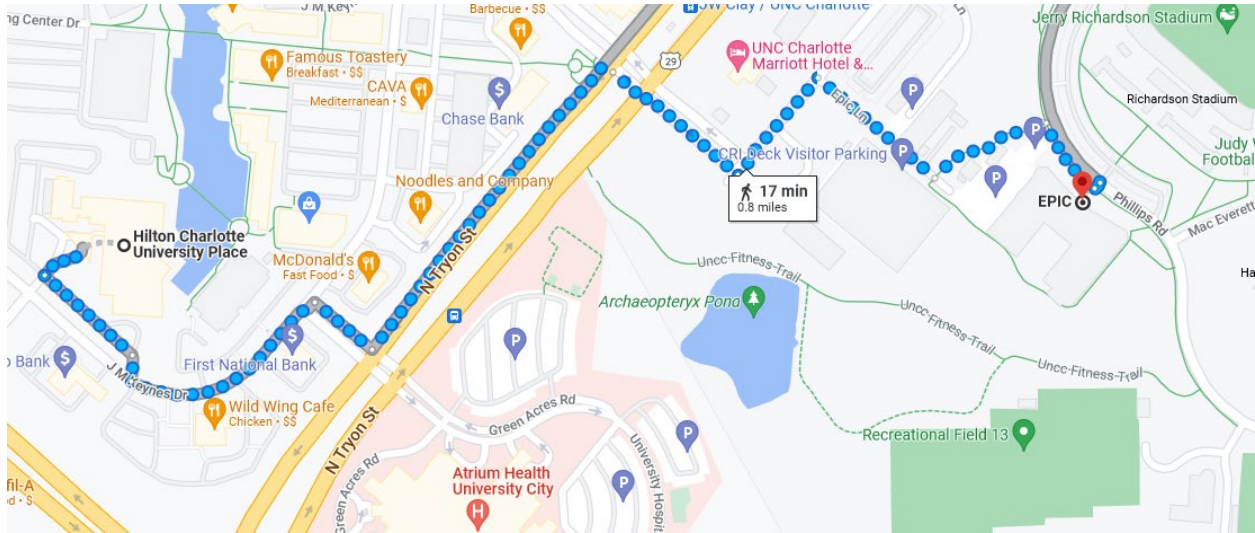
- 14:15-14:30 M1 James Kribs.** North Carolina A&T State University
James Kribs, Hunter Jordan, M. Sean June, "Local Flame Suppression Using High Potential Electric Fields"
- 14:30-14:45 M2 Sheam-Chyun Lin.** National Taiwan University of Science and Technology
S. C. Lin, B. L. Huang, S. H. Liou, and F. C. Lai, "An EHD Swirling Flow Generator in a Square Channel"
- 14:45-15:00 M3 Sooik Im.** North Carolina State University
Sooik Im, Jan Genzer, Michael D. Dickey, "Stability of contact-electrified charges on self-assembled monolayers"
- 15:00-15:15 M4 AKM Monayem H Mazumder.** Saginaw Valley State University
AKM Monayem H Mazumder, "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)**



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