



ESA Newsletter

Electrostatics Society of America - The Friendly Society

President's Message

Dear ESA Colleagues:

As I begin my term as ESA President, I take this opportunity to tell you a little about myself and how I became involved in electrostatics. I am a professor of chemical engineering at Case Western Reserve University, in Cleveland. I have been at Case for 8 years now, and before this I was a professor at Tulane University in New Orleans for 9 years. Although my faculty positions have been in chemical engineering departments, my Ph.D. is in physical chemistry. Outside of work, my main interest is tennis.

Electrostatics is somewhat of a 'second career' for me, that I began about 7 years ago. My previous research focus was in the molecular modeling of materials – that is, predicting macroscopic properties of materials from the first principles physics of atomic interactions. Since I began graduate school in 1987, this had been my research focus.

Shortly after I moved to Case, I received a research contract to study issues a company was having with triboelectric charging in their fluidized bed reactors. I knew absolutely nothing about this topic, but I didn't see this as a problem – with my expertise in the physics of materials and chemical engineering, I felt I could read the relevant scientific literature to learn how triboelectric charging occurs, and then apply this knowledge to the materials and processes used by the company. After focusing on reading the scientific literature for several months, I did become knowledgeable in the state-of-the-art understanding of triboelectric charging.

But I was very surprised to find out that there is very little understanding of the physical basis of triboelectric charging. Answers to the most basic scientific questions remain unknown and highly controversial. For example, the identity of the species transferred to generate charge when materials rub is still being debated – some researchers argue that it is electrons, others that it is ions, and yet others that it is bits of material. The purpose of the rubbing is also unknown – does it just increase the contact between the two surfaces, or does the energy from rubbing play a role in the process?

It's exciting to carry out research in an area where the answers to the most basic questions are unknown, and so I continued research on electrostatics after my project with the company ended. I roped in a colleague in my department, Prof. Mohan Sankaran, to collaborate on experimental studies; electrostatics is a 'second career' for Mohan as well. Our work, which is supported by a grant from the National Science Foundation, addresses a range of issues in triboelectric charging.

I became involved in ESA in 2007, when I attended the annual meeting held at Purdue University. What drew me to the ESA was the chance to interact with the leading experts in particle charging, such as Peter Castle and Malay Mazumder, whose papers had a big impact on my research directions. I've been to every ESA meeting since – the technical interactions have helped my research progress, and I've also enjoyed the personal interactions.

Finally, I'd like to thank our previous president, Raji Sundararajan, for the great job she has done over the past 3 years. Everything has gone very smoothly with her at the helm. And personally, I have appreciated how welcoming Raji was when I showed up at my first ESA meeting (which she hosted), and how encouraging she has been in regard to my participation in ESA.

Dan Lacks,
President, ESA
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ESA 2012: Electrostatic Demonstrations Workshop

At the upcoming joint ESA/IEJ/IAS/SFE Meeting set for June 14-16, 2012, in Waterloo, Ontario, Canada, plans are afoot for a special half-day workshop devoted to electrostatics demonstrations. Though the format is yet to be decided upon, the goal will be to assemble electrostatics experts from around the world and representing the diverse field of safety training, consulting, and education to present their favorite demonstrations. After each short presentation, there will be time scheduled to discuss the demonstration, focusing on the principles and practical lessons it conveys. The last part of the session will be an open discussion intended to engage all attendees in development of some strategies for promoting electrostatics demonstrations as a way to re-instill fun and enthusiasm in science learning at all levels. An effort will be made to schedule a special evening presentation for area high school science teachers looking for ways to excite their students with new enthusiasm for electrostatics.

If you have a favorite demonstration to share or have an idea for a new one, this is the event for you. Please direct questions and suggestions for this session to me. I am open to your ideas.

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ESA 2011 Photos

Some pictures taken at ESA-2011 have already been sent to Al Seaver for posting on the web. These pictures can be viewed at <http://electrostatics.us/page.jsf?id=5>. If others have taken pictures at the ESA 2011 Meeting and are willing to share them with the ESA Membership you can contact Al Seaver at aseaver@electrostatics.us and set up a time to send the pictures to him. His service provider has a limit of 10 MB per e-mail so you will have to break up the pictures into groups that do not exceed 10 MB. Al can automatically clear his e-mail box every minute so it does not take very long to send many pictures.

Calendar

- ✓ IEEE-IAS Annual Meeting, Electrostatic Processes Committee, Oct. 9-13, 2011, Orlando, FL, Contact: Lucien Dascalescu, lucian.dascalescu@univ-poitiers.fr, website: <http://ewh.ieee.org/soc/ias/2011/home.htm>
- ✓ 2nd ISNPEDADMSA (New electrical tech. for environment), Nov. 14-19, 2011, Noumea, New Caledonia, Contact: Gerard Touchard, gerard.touchard@univ-poitiers.fr, website: <http://lea.sp2mi.univ-poitiers.fr/noumeameeting/>
- ✓ ESA-2012, Joint ESA/IEJ/IAS/SFE Meeting, June 12-14, 2012, Univ. of Waterloo, Waterloo, Ontario, Canada, Contact: Shesha Jayaram, jayaram@uwaterloo.ca, website: <http://www.electrostatics.org>

ESA Officers

President:

Dan Lacks, Case Western Reserve Univ.

Vice President

Shesha Jayaram, Univ. of Waterloo

Executive Council

Sheryl Barringer, Ohio State Univ.

Kelly Robinson, Electrostatic Answers, LLC

Rajeswari Sundararajan, Purdue Univ.

2012 ELECTROSTATICS JOINT CONFERENCE

June 12-14, 2012

HOLIDAY INN CAMBRIDGE HESPELER GALT

Cambridge, Ontario, Canada



Institute of
Electrostatics
Japan



Electrostatics
Society of America

INTERNATIONAL
ELECTROSTATIC
ASSEMBLY
(IEA)

International
Electrostatics
Assembly



IEEE-IAS
Electrostatic
Processes
Committee



Societe Francaise
d'Electrostatique

The scope of the conference ranges from the fundamental physics underlying electrostatics to applications in industry, atmospheric and space sciences, medicine, energy, and other fields.



Niagara Falls

For more information, see
<http://www.electrostatics.org/conferences.html>

Deadline for abstracts: March 1, 2012.
Submit abstracts online at conference website.

General Chair: Shesha Jayaram
jayaram@uwaterloo.ca

Technical Committee Chair: Noras, Maciej
mnoras@uncc.edu



Technical sessions

- Atmospheric and space applications
- Biological and medical applications
- Breakdown and discharge
- Electrostatic forces and fields
- Electrostatics in flowing liquids
- Materials behavior and processing
- Measurement and instrumentation
- Particle control and charging
- Safety and hazards



Toronto Downtown

ESA 2011

The 2011 ESA Meeting was held June 14-16 on the campus of Case Western Reserve University. The conference was chaired by Dan Lacks and Mohan Sankaran, both professors at Case. We had 70 attendees, coming from every continent – the farthest countries include New Zealand, Botswana, Brazil, Israel, India and Japan.

We thank MT Industries, Keithley, and Trek for their generous contributions and Case Western Reserve University for the use of facilities.

The venue – Case Western Reserve University

Our university was formed by a merger, in 1967, between two adjacent institutions – the Case Institute of Technology and Western Reserve University.

The ESA technical sessions were held in the Pyette science complex. The building is on the site of the 1887 Michelson-Morley experiment, which showed that the speed of light is independent of the frame of reference, providing the basis for the theory of relativity. For this work, Albert Michelson was the first American to win a Nobel prize (in 1907).

Conference housing was in dormitories on the other side of campus. The walk between the housing and the technical sessions passed through some of the nicer parts of our campus, with both stately century-old buildings and a modern Frank Gehry designed building.



Technical Program

Technical Program Chair Keith Forward put together a great program, which included 53 talks. The topics of these talks ranged from the fundamental physics and chemistry underlying electrostatics, to new instrumentation for measuring electrostatic phenomena, to applications of electrostatics in materials processing, atmospheric and environmental science, space exploration, and medicine.

The physical basis of triboelectric charging was a focus of the meeting, with several technical sessions addressing this topic. This is an exciting scientific area, as the most basic question – the identity of the charged species being transferred – is still being debated. Most of the world's leading researchers on this topic were at the meeting including Keynote Speakers Fernando Galembeck (Univ. of Campinas, Brazil) and Chongyang Liu (Univ. of Texas), as well as Troy Shinbrot (Rutgers Univ.), Bartosz Grzybowski, Bilge Baytekin and Tarik Baytekin (Northwestern Univ.), Sam Thomas (Tufts Univ.), and Meir Lahav and Silvia Piperno (Weizmann Inst., Israel).



Our other Keynote Speakers described applications of electrostatics ... in very different fields.

Davide Mariotti (Univ. of Ulster, UK) described developments in the use of microplasmas in materials synthesis. Jim Leary (Purdue Univ.) presented his break through work that uses electrostatic interactions to guide tailored nanoparticles specifically to diseased cells for drug or gene delivery.

The program also featured two 'Before-Lunch Lectures', which combine technical content with a light-hearted twist. Mark Horenstein (Boston University), the Editor of the Journal of Electrostatics, gave a great talk entitled "What's Touching It? Ants, Eagles, and the Curious World of Electrostatics". Bill Wayman (Xerox) brought a Xerox copier from the 1950's, and demonstrated its use, and showed memorable Xerox TV commercials from the past 50 years – this was a highlight of the conference.

Student Paper Competition

The student paper competition has been sponsored by MT Industries for many years. Sixteen students presented papers at the conference, and the first place winners of the student paper competition were:

Poornima Agoramurthy, Purdue University, "Analysis of Electric Field Distribution of Large Tumors using Multiple Needle Electrodes"

Radu Beleca, Brunel University, "Bipolar Charge Measurement of Dipolar Spherical Particles Using Phase Doppler Anemometry"

Jeremy Stark, Boston University, "Electrostatic Charging of Particles on Electrodynamic Screens by Low Frequency Electric and Dielectrophoretic Excitations"

Scott Waitukaitis, University of Chicago, "Direct Measurement of Size Dependent Charging in Chemically Identical Grains"



The Banquet

The banquet was held at the Crawford Auto Aviation Museum, just off the Case campus. The museum features antique cars, including some from as early as the 1890's.



The Banquet (cont'd.)

Glenn Schmieg gave the banquet presentation, and as usual, it was a big hit. The topic this year was “Tornados and Vortices”.



**Electrostatics
Society of America**



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ESA Information

ESA Home Page: <http://www.electrostatics.org>

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ESA-2012 Annual Joint Meeting

ESA/IEJ/IEEE-IAS EPC/SFE

June 12-14, 2012

University of Waterloo, Waterloo, Ontario, Canada