

ESA Newsletter

Electrostatics Society of America - The Friendly Society

President's Message

I am excited about our ESA 2006 Annual Meeting to be held from June 6-9, 2006 on the campus of the University of California at Berkeley. This year, we have four cosponsoring organizations for the conference:

1. The Electrostatics Society of America, Dr. Kelly Robinson, President
2. The Electrostatic Processes Committee, IEEE Industry Applications Society, Prof. Lucien Dascalescu, Chairman
3. The Institute of Electrostatics Japan (IEJ), Prof. Tetsuji Oda, President
4. Société Française d'Electrostatique (SFE), Prof. Gerard Touchard, President

With this broad participation, our 2006 meeting will likely be the largest general electrostatics conference in North America this year. Scott Gehlke, General Chairman, has done an excellent job in reserving great facilities for us. Peter Gefter and Joe Crowley, Conference Technical Co-Chairs, are working hard with the leaders of our cosponsoring organizations to select papers for presentation, assemble our technical agenda, and organize our sessions.

I apologize to all for the confusion surrounding our meeting. In order to avoid conflicts with other meetings we needed to schedule our conference earlier than normal, thus we had to move the abstract and manuscript deadlines earlier by about 3 weeks. If you had an abstract, I hope that you were successful in submitting it. Note that the deadline for submitting your manuscript is **March 15, 2006**. This is a "hard" deadline that is necessary to allow time to publish our Conference Proceedings. Please work diligently to submit your manuscript on time.

We should observe another "electrostatics milestone." Bill Vosteen, ESA Past President, notes that January 17 was Benjamin Franklin's 300th birthday. Our ESA Logo, the Kite & Key, celebrates one of Ben Franklin's most well known electrostatics experiments. Bill found many Franklin quotes on <http://home.att.net/~howingtons/benf.html>

The Electrostatics Society of America also sponsors the Electrostatics Hall of Fame at the Franklin Institute in Philadelphia. Here, many of the "Founding Fathers" of modern electrostatics science and technology are honored. For example, here are two of the citations from our website.

Benjamin Franklin 1706-1790 - INDUCTED: 1979

Contributed to science with important experiments on electricity. Introduced the concept of positive and negative charge. Discovered the electrical nature of lightning through the famous kite-experiment. Invented the lightning rod.

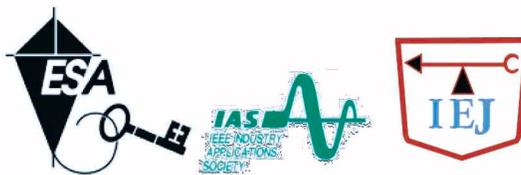
Charles A. Coulomb 1736-1806 - INDUCTED: 1979

French physicist. Research on electricity and magnetism. Invented torsion balance; used this to demonstrate that the force of electrostatic repulsion or attraction is proportional to the product of the charge on each sphere and inversely proportional to the square of the distance between the centers of the spheres (Coulomb's Law).

Recognizing the contributions of gifted individuals and honoring the hard work of our colleagues is one of the many ways that we promote advances in our field and keep electrostatics alive. If you can help us with this important work, please contact me as we are seeking candidates for the ESA Awards Chair.

We are a strong, vibrant organization. I am excited to work with you to make the Electrostatics Society of America more valuable and more important to you.

Kelly Robinson
 ESA President
Kelly.Robinson@SigmaXi.org



Call for Papers

2006 Joint Conference ESA/ IEJ / IEEE-IAS

June 6-9, 2006

University of California at Berkeley

Berkeley, California USA

The 2006 Electrostatic Society of America (ESA), the Institute of Electrostatic Japan (IEJ), and the Institute of Electrical and Electronic Engineers, Industrial Applications Society (IEEE-IAS) electrostatics groups will hold their 7th and 2nd Joint Conferences, respectively, on the campus of the University of California Berkeley, Berkeley, California from June 6-9, 2006. Members of La Société Française d'Electrostatic (SFE), along with others, will be joining us for possibly the largest, most diversified, international gathering of those involved in electrostatics ever in North America. Join us for our technical sessions including comprehensive technical papers, a Student Paper Competition, informal discussions, poster sessions, and electrostatic demonstrations.

Topics of Interest Include:

Atmospheric Electricity	Electrostatic Drug Delivery	ESD Prevention and Detection
Biological applications	Electrostatic Painting	Ionization and Charge Control
BioMEMS and BioFluidics	Electrostatic Powder Coating	MEMS Devices
Breakdown and Discharges	Electrostatic Micro-encapsulation	Non-thermal Plasmas
Charge Neutralization	Electrophoresis	Nano-electrospray applications
Computational Methods	Electroviscous effects	Particle Control & Transport
Display Devices	Electrostatic Printing	Precipitators and Cleaners
Electrets	Electrostatic Propulsion	Safety and Hazards
Electrohydrodynamics	Electrostatics Demonstrations	Sprays and Droplets
Electrophotography	Electrostatics Education	Triboelectrification

Deadlines:

February 3, 2006: Titles, Paper Summary and name of 1 – 2 relevant subject area from the list above are due for submission on this web site.

Mid-February: Registration and Detailed conference information will be available on this web site.

February 15, 2006: Notification of Paper Acceptance.

March 15, 2006: Final Manuscripts Due. Instruction for authors will be available on this web site along with templates for MS Word and Latex.

Journal Publication: Authors may request their manuscripts be considered for publication in either the *Journal of Electrostatics* or *IEEE Transactions on Industry Applications*.

Student Paper Competition:

To encourage participation by student researchers, all presentations (either in the main session or poster session) that have a student as the presenter and first author will be considered for the student paper competition. Undergraduate and graduate students are eligible. Papers will be judged on their technical merit and the cogency of their presentation. Please indicate at submission that the abstract is to be considered for the student paper competition, and list all student authors.

Please watch the ESA website (<http://www.electrostatics.org>) for the most up to date information.

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ESA OFFICERS

President	Kelly Robinson, Eastman Kodak
Vice President	Sheryl Barringer, Ohio State Univ
Executive Council	John Gagliardi, Rutgers Univ. Steve Cooper, Mystic Tan Nathaniel Green, U. of Bloomsburg

WANTED: ESA Webmaster

The Electrostatics Society of America is currently seeking a Webmaster to join our leadership team. Our website is one of the most important communication channels for the ESA to reach our members and extend an invitation to all to learn about electrostatics. Our Webmaster position is responsible working closely with the ESA Executive Council to plan the growth of our website, implementing new features, and make necessary revisions to our existing content. Serving as the ESA Webmaster would be excellent experience and would help the ESA better serve our diverse members.

For further information, please contact: Kelly Robinson, Kelly.Robinson@SigmaXi.org

WANTED: ESA Awards Chair

The Electrostatics Society of America is currently seeking a person to run the awards nomination process. Awards are presented at our yearly June conference and are given for several important reasons including 1) recognition of significant achievements in the advancement of electrostatics, 2) excellence in teaching, and 3) service to the ESA. A complete listing may be found at <http://www.electrostatics.org/awards/index.htm>

For further information, please contact: Kelly Robinson, Kelly.Robinson@SigmaXi.org

WANTED: Book Reviewer

I have received a book entitled **Electrostatic Experiments** by G.W. Francis, an updated reprint by Oleg Jefimenko of Francis' earlier work. I am in search of someone willing to review this book for the ESA. If interested, please contact me at mark.zaretsky@kodak.com

NANOSTATICS LLC

John Robertson and Ashley Scott have partnered to form a new company called NanoStatics LLC which focuses on the spinning of nanofibers from Taylor cones. The key innovation is the ability to produce hundreds of stable spinning cones within a simple array. This makes it possible to create production throughput coating machines. A coater with 8000 spraying cones has been quoted. See <http://www.nanostatics.com> or contact John at jr@infosight.com.

Journal of Electrostatics

Reminder: The ESA is again offering a reduced price subscription to the Journal of Electrostatics. A lot of ESA members took advantage of this great deal last year. This super-low subscription rate is being offered to ESA members for personal copies of the Journal.

The Journal of Electrostatics is published in three volumes per year (4 issues per volume.) The aim of the Journal is the dissemination of knowledge relating to static electricity and targets a wide audience that includes physicists, electrical, mechanical, chemical, and aeronautical engineers, chemists, biologists, and individuals working in medicine and meteorology. The topics covered in the journal include electrostatic fundamentals, theory, modeling, applications, biotechnology, microengineering, computational methods, and electrostatic hazards. More detailed information about the readership, authors, aims, and scope of the journal can be found at <http://www.elsevier.com/locate/elstat>

If you are interested in receiving the Journal in 2006 please don't delay subscribing. The cost is \$115 US per year for ESA members. (Note that the normal subscription rate for non ESA members is over \$1,000).

To subscribe (or renew your last years subscription) please mail a check for \$115 to Steve Cooper - 540 Morton Road - Athens GA - 30605. Include your name and mailing address. Or you can return the subscription form on the ESA website:

<http://www.electrostatics.org/links/jestatlet.html>.

If you received the Journal last year and wish to receive it again in 2005 you must renew to avoid a disruption in your subscription.

CALENDAR

- ✎ ESA Annual Meeting, Jointly with IEEE-IAS, IEJ and SFE, June 6-9, 2006, Berkeley, California, Contact: Scott Gehlke, Tel:501-704-2613, sgehlke@ion.com, website: <http://www.electrostatics.org>
- ✎ ISEI 2006, IEEE Int'l. Symp. on Elec. Insul., June 11-14, 2006, Toronto, Ontario, Canada, Contact: Dr. Howard Sedding, Tel: +1 416 207 6000, ext. 6172, website: <http://www.deis.nrc.ca/isei2006.htm>
- ✎ 2006 ISEHD, 2006 Int'l. Symp. on Electrohydrodynamics, Dec. 4-6, 2006, Buenos Aires, Argentina, website: http://www.fi.uba.ar/isehd2006/2006%20EHD%20International%20Symposium_archivos/frame.htm
- ✎ SFE 2006, Aug. 30-31, 2006, Grenoble, France, Contact: Prof. Pierre Atten, Tel: 33 476 88 11 71 (or 73), pierre.atten@grenoble.cnrs.fr

Current Events

Simple Experiment Creates Surprising State of Matter

By Robert Roy Britt

Physicists at the University of Chicago essentially dropped a marble into loosely packed sand, producing a jet of sand grains that briefly behaves like a special type of dense fluid.

"We're discovering a new type of fluid state that seems to exist in this combination of gas — air in this case — and a dense arrangement of particles," said lead researcher Heinrich Jaeger. "It's just a most amazing phenomenon."

How it works: Strange states of matter are sometimes created in super-cold conditions approaching absolute zero. Things get weird there. But this experiment was done at room temperature. "The jet acts like an ultra-cold, ultra-dense gas, not in terms of ambient temperature, but in terms of how we define temperature via the random motion of particles," Jaeger explained. "Inside the jet there is very, very little random motion."

A group led by Detlef Lohse at the University of Twente in The Netherlands used high-speed video and computer simulations to suggest the jet was caused by gravity as material rushed in to fill the void left behind by the impacting object. The researchers made X-ray images at 5,000 frames per second. They conclude that air compressed between the sand grains provides most of the energy to drive the jet, since the same experiment performed at artificially low air pressure does not produce a significant jet.

"The result is totally unexpected," said Lohse. "One would think that the effect of air would weaken the jet, but what is the case is just the opposite." The jet is broken into two distinct segments, one solid and the other a stream of droplets.

"One of the biggest questions that we have still not solved is why this jet is so sharply delineated," Jaeger said. "Why are there these beautiful boundaries? Why isn't this whole thing just falling apart?"

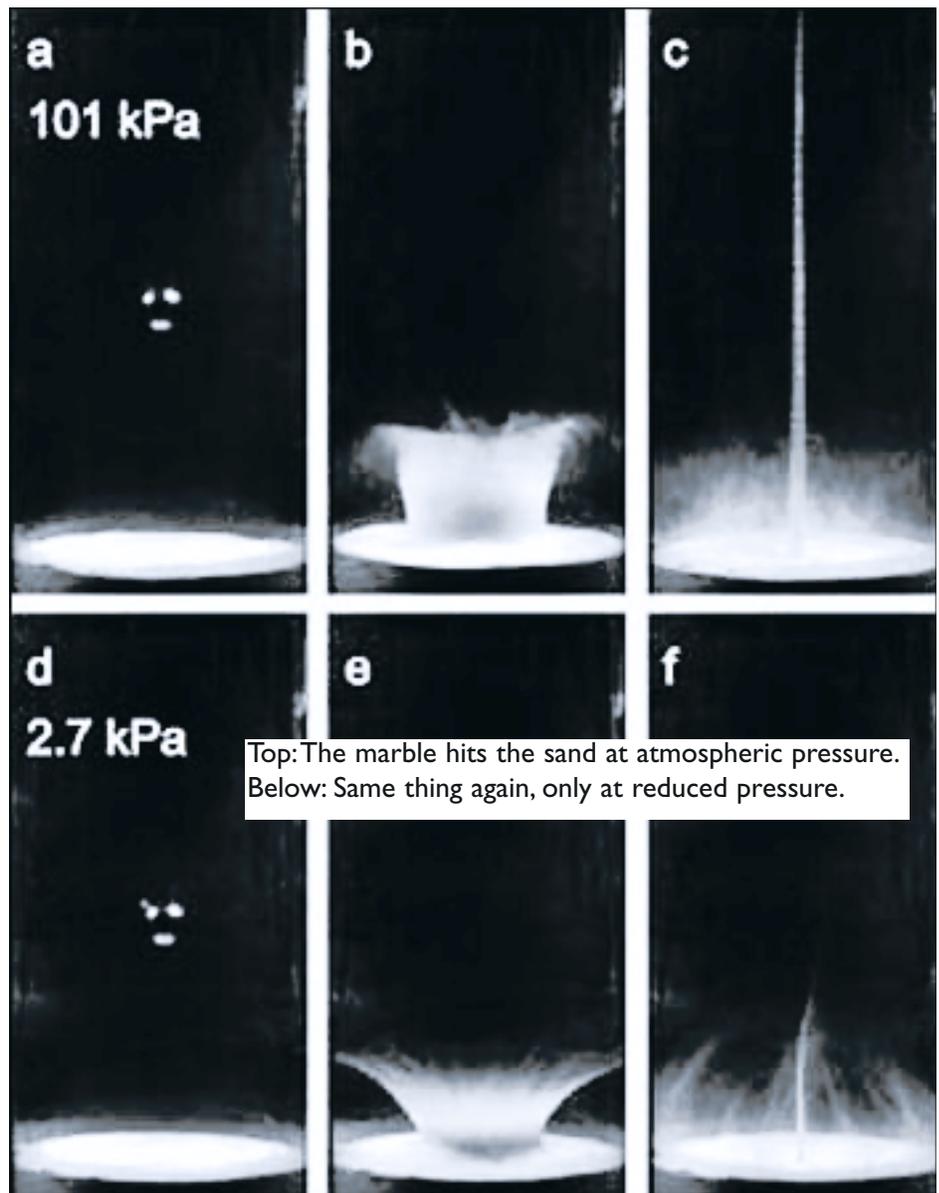
You can do it: The basics of the experiment can be repeated at home, though without all the government funding and a fancy X-ray imager, you probably won't get the full effect.

Pour a cup of powdered sugar into another container to ensure it is loosely packed, Jaeger explains. Drop a marble into the cup. "Once you drop that marble in there, you see that jet emerging, but you have to look fast," he advised.

The discovery is detailed in the December issue of the journal *Nature Physics*.

(Ed. note: Given the nature of tribocharging of small particles, particularly in dry environments, I wonder how big a role electrostatics plays, or could play, in this phenomena.)

From <http://www.foxnews.com/story/0,2933,177859,00.html>



Current Events

Ioning your way to cleaner clothes

By Julie Clothier for CNN

Designers behind a washing machine that does not require water or detergent to clean clothes say the idea could be a common household appliance one day. The idea is the brainchild of two Singaporean design students who won top honors at the recent International Electrolux Design Lab awards in Stockholm for their "Airwash" washing machine.

National University of Singapore industrial design students Gabriel Tan and Wendy Chua's prototype uses negative ions, compressed air and anti-bacterial deodorants to clean clothes. The unit uses no water or detergents, and can be placed in any room of a home. Clothing is placed on a rack, which slides inside the device.

"It's a bit like a car wash," Tan told CNN. "The clothing goes on a rack which is placed inside the machine. The clothing then gets a good blast. It's a substitute for taking items to the dry cleaner."

He said the cleaning process was much gentler on clothes than conventional methods, and was particularly useful for expensive clothing that could lose its shape and color through washing with water and detergents.

By using atmospheric air and negative ions, a natural cleansing agent, it fights dirt and bacteria with nature's own weapon, he said. The Airwash cleans one piece of clothing at a time, with each item taking between three and 12 minutes to complete the process. "In a poetic sense, we are using nature's weapons, nature's cleansing agents, to solve a problem," Tan said. Chua told CNN that she and Tan had taken technology and processes commonly used in air conditioning and air purifying units and adapted it for an alternative use.

At this stage the Airwash is a concept prototype but she believed it could one day become a commercial reality. "Our dream would be to see it on the market one day, not for personal pride, but because we genuinely believe it will be good for the environment and have a positive impact on the lives of people -- be it as a consumer product or as a replacement for today's commercial dry cleaners."

Judges at the competition said the "Airwash" won the award because of: "its intuitive, ecological and beautiful design. Airwash also does away with the expensive, time-consuming task of going to the dry cleaner." The competition is organized annually by the Electrolux Group and aims to encourage students from around the world to design household appliances for the future.

<http://www.cnn.com/2005/TECH/12/20/spark.airwash/index.html>

Evidence Bubbles Over To Support Tabletop Nuclear Fusion Device

Researchers are reporting new evidence supporting their earlier discovery of an inexpensive "tabletop" device that uses sound waves to produce nuclear fusion reactions. The researchers believe the new evidence shows that "sonofusion" generates nuclear reactions by creating tiny bubbles that implode with tremendous force. "What we are doing, in effect, is producing nuclear emissions in a simple desktop apparatus," said Rusi Taleyarkhan, the principal investigator and a professor of nuclear engineering at Purdue University.

The device is a clear glass canister about the height of two coffee mugs stacked on top of one another. Inside the canister is a liquid called deuterated acetone. The acetone contains a form of hydrogen called deuterium, or heavy hydrogen, which contains one proton and one neutron in its nucleus. The researchers expose the clear canister of liquid to pulses of neutrons every five milliseconds, causing tiny cavities to form. At the same time, the liquid is bombarded with a specific frequency of ultrasound, which causes the cavities to form into bubbles that are about 60 nanometers in diameter. The bubbles then expand to a much larger size, about 6,000 micrometer - large enough to be seen with the unaided eye. "The process is analogous to stretching a slingshot from Earth to the nearest star, our sun, thereby building up a huge amount of energy when released," Taleyarkhan said.

Within nanoseconds these large bubbles contract with tremendous force, returning to roughly their original size, and release flashes of light in a well-known phenomenon known as sonoluminescence. Because the bubbles grow to such a relatively large size before they implode, their contraction causes extreme temperatures and pressures comparable to those found in the interiors of stars. Researches estimate that temperatures inside the imploding bubbles reach 10 million degrees Celsius and pressures comparable to 1,000 million earth atmospheres at sea level. At that point, deuterium atoms fuse together, the same way hydrogen atoms fuse in stars, releasing neutrons and energy in the process. The process also releases a type of radiation called gamma rays and a radioactive material called tritium, all of which have been recorded and measured by the team.

(taken from <http://www.sciencedaily.com/releases/2004/03/040303080222.htm>. Ed. note: I thought this might be of interest given past presentations on sonoluminescence at several ESA conferences. Recent experiments have demonstrated fusion without the use of an external neutron source. For further info. do a web search on sonofusion.)

Electrostatics
Society of America



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

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