President’s Message

The Electrostatics Society of America is a group of diverse individuals with broad interests and special skills. This depth makes our annual meetings unique and enjoyable. I am very excited about our Annual Meeting on the University of California at Berkeley campus, June 6-9. This year is special because the 2006 meeting is a Joint Electrostatics conference with 4 sponsoring organizations:

✔ The Electrostatics Society of America (ESA)
✔ The Institute of Electrostatics Japan (IEJ)
✔ The IEEE-IAS Electrostatic Processes Committee (EPC)
✔ La Société Française d’Electrostatique (SFE)

Over 100 papers have been accepted for presentation and with active participation from Asia, Europe, Africa, and North America. I expect that our 2006 Joint Conference will be one of the largest electrostatics meetings in ESA history. We have a unique opportunity in June to learn new things, greet old friends, and establish new friendships with people that share your passion for electrostatic technologies and applications. Please review the conference preliminary program and registration information enclosed in the newsletter, or view it on-line at http://www.electrostatics.org. I look forward to welcoming you to Berkeley California in June.

Learning new things about ancient electrostatics is one of the greatest benefits of my membership in the ESA. I missed a wonderful opportunity to share this experience when I was invited to prepare a short lesson in electrostatics for first, second and third grade students at my daughter’s elementary school. As I pondered electrons, fields and forces, I realized that all of my presentations and seminar had been prepared for practicing engineers or graduate students. Now, I was to face a classroom full of young, curious and energetic students. There is a great space between boundary value problems and the ABC’s. Where could I turn for advice, guidance and resources?

The ESA has many members who are professional educators with extensive teaching experience. Who better than us to develop an electrostatics curriculum, lesson plans and demonstrations to ignite the interest of a 6 year old or feed the curiosity of a 9 year old? The ESA could develop an Electrostatics Resource Center on our website where anyone could find designs for demonstrations, suggestions for science fair projects and lessons for kids. We could have links to suppliers of inexpensive kits and to other educational resources. There are a many good resources already available, including,

✔ Benjamin Franklin and Electrostatics, Created and Collected by Robert A. Morse, Wright Fellow 2004 http://www.tufts.edu/asa/wright_center/fellows/bob_morse_04/

Today, the ESA is a strong, vibrant organization. We need a few volunteers to help introduce electrostatics to young students. Would you be willing to help? I am excited to work with you to make the Electrostatics Society of America a more valuable resource for our members and for a new generation.

Kelly Robinson
ESA President
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EDITORIAL DISCLAIMER:

In the last issue I printed excerpts of an article entitled “Evidence Bubbles Over To Support Tabletop Nuclear Fusion Device”. I also added the following statements of my own at the end of the article: “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.” These statements have caused some controversy that I regret. I overstated the case by saying the experiments have “demonstrated fusion ...” as this implies a definitive result. As you will see in the response below from ESA member Tom Prevenslik, these experimental results have come into question.

I want to make it clear that articles, or excerpts thereof, appearing in this newsletter, are selected based on their presumed interest to the readership. These selections should in no way be taken as an endorsement of reported results as that is not the function of this newsletter nor its editor. There is no agenda, hidden or otherwise, behind the selection of articles other than that of trying to present topics of interest, typically with some tie-in to electrostatics. The reader is encouraged to pursue these topics to further depths, if so inclined, and is provided some references to do so.

I hope this clarifies the environment in which these articles are selected. Please feel free to help in this process of providing newsletter content and send articles that you feel may be of general interest to me at mark.zaretsky@kodak.com.

Mark Zaretsky
ESA Newsletter Editor

Questioning Bubble Collapse and Nuclear Fusion Results

Recently, articles have appeared presenting (ed.) the false physics that sonoluminescence, better known as SL, can initiate nuclear fusion because of the high temperatures in bubble collapse based on computer calculations over the past decade of SL researchers Putterman, Lohse, and Taleyarkhan. The false physics may be summarized by: “Researches estimate that temperatures inside the imploding bubbles reach 10 million degrees and pressures comparable to 1,000 million earth atmospheres at sea level.” Id. Because the SL researchers promoted the notion that a collapsing bubble produces high temperatures initiate fusion, this falsity is now thought correct by the public, the significance of which is that in the manner of sophistry, the truth is now denied by false public opinion. To wit, the bubbles do not collapse at high temperature. This is so, because the collapsing bubbles are only filled with water vapor that does not increase in temperature and pressure as the volume vanishes, and except for some non-equilibrium effects the vapor condenses without any temperature and pressure change. In contrast, the SL researchers erroneously assumed the water vapor is a non-condensable gas in reaching their high temperature estimates currently, anywhere from 5,000 to 2 million degrees. The problem is their reputations are at risk if their high temperature hoax is exposed, as evidenced by the recent allegations of fraud by Taleyarkhan in the cover-up of bubble fusion experiments at Purdue University. See for example “Purdue Initiates Objective Review Of 'Bubble’ Fusion” http://news.uns.purdue.edu/UNS/html3month/2006/060308_Mason.fusion.html or perform your own web search on bubble fusion.

Tom Prevenslik

Mysterious Ball Lightning Created in the Lab
By Ker Than, LiveScience Staff Writer

Ball lightning is one of the most mysterious phenomena in nature. Now scientists have created a laboratory version of the eerie floating orbs using technology taken from a common microwave oven.

In the wild, the little bundles of energy are typically only a few centimeters across, although some have been reported to be the size of beach balls or larger. They are closely associated with regular lightning and thunderstorms and have been seen in many different colors. Witnesses report hissing sounds and an acrid ozone odor when the lightning balls appear. The vivid apparitions normally hover or float around for only a few seconds before vanishing suddenly, either silently or with an explosive bang.

Eli Jerby and Vladimir Dikhtyar from the University of Tel Aviv in Israel created a laboratory version of ball lightning using a “microwave drill.” The device consists of a 600-watt magnetron taken from a domestic microwave oven and uses a powerful microwave beam to bore through solid objects. The researchers aimed the beam through a pointed rod and into a solid object made from glass, silicon and other materials. The energy from the drill created a molten hot spot in the solid object; when the drill was pulled away, it dragged some of the superheated material along with it, creating a fire column that then collapsed into a bright fireball that floated and bounced across the ceiling of the metal enclosure.

The glowing object measured just slightly over an inch across and lasted only about 10 milliseconds. The work was detailed earlier this month in the journal Physical Review Letters. "Our experiment confirms to some extent the theory that ball lightning originates from hot
Current Events (cont’d.)

spots in the ground created by normal lightning,” Jerby told LiveScience.

According to one popular theory, ball lightning forms when lightning strikes the ground and vaporizes mineral grains in the soil. The vaporized nanoparticles could then link together into chains and form a fluffy ball of silicon that floats on the wind. The particles react with oxygen in the air and release light as they burn.

Jerby thinks that his laboratory lightning balls could one day find practical uses in industry. “My imagination leads me to speculate on applications like ‘bulb-less’ light sources, coating and deposition or energy production,” he said.

(Excerpted from http://www.livescience.com/forcesofnature/060223_ball_lightning.html )

Creating biocompatible fibers

Researchers at Virginia Polytechnic Institute and State Univ. (Virginia Tech), Blacksburg, have developed a single-step process for creating nonwoven fibrous mats from a small organic molecule—creating a new nanoscale material with potential applications where biocompatible materials are required. The research was carried out by Matthew McKee, a recent PhD graduate in chemical engineering and chemistry professor Timothy Long.

“Phospholipids, which are the main component of cell membranes in the human body, are exquisite in terms of their ability to self-organize,” says Long.

The researchers used a natural mixture of phospholipids and neutral lipids called lecithin. These materials will spontaneously organize into cylindrical or worm-like strands to form membranes. McKee studied this self-assembly and conducted experiments to fundamentally understand the association of small molecules, and determined that once phospholipids form an entangled network, they can be treated similarly to higher weight molecules and electrospun into fibers.

The researchers fabricated lecithin into a sub-micron fiber by using electrospinning, a polymer processing technique. “Clothing fibers, such as polyesters and nypons, are composed of large molecules,” explains Long. “Now, we are fabricating fibers from small molecules—ones with low molecular weight.”

Under the microscope, the resulting mat shows a porous nonwoven structure. The size of the mat is limited only by the amount of material, such as lecithin.

“IT HOLDS TONS OF SONGS, BUT IT’S BEEN STUCK ON THE THEME TO ‘THE BRADY BUNCH’ ALL DAY...

(Random Charges

courtesy of Glenn Schmeig)
ESA OFFICERS

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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

CALENDAR

ESA Annual Meeting, Jointly with IEEE-IAS, IEJ and SFE, June 6-9, 2006, Berkeley, California, Contact: Kelly Robinson, Tel: 585-477-4951, Kelly.Robinson@SigmaXi.org, website: http://www.electrostatics.org


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


Historical Electrostatics

Recently our member Anne Benninghoff forwarded an article on old scientific equipment which is displayed at Harvard. As you would expect, there are pieces related to time-keeping, astronomy, and optics. But also electrostatics.

One picture shows an airpump and flywheel which was used by the Abbe Nollet to rub objects together in vacuum. He did this in Paris about 1746. Jean-Antoine Nollet was well known at the time of Benjamin Franklin.

Glenn Schmieg
ESA Information
ESA Home Page: http://www.electrostatics.org

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Joint with IEEE-IAS, IEJ, & SFE
June 6-9, 2006
University of California at Berkeley
Berkeley, California, USA
Preliminary Program & Registration Form Enclosed