

CPS Plasma Page

Published by the Coalition for Plasma Science, Vol.8., No.1, March 2005

Plasma TV is Focus for Capitol Hill and New CPS Literature

The Coalition for Plasma Science (CPS) presented another in its series of Congressional Luncheons on October 12, 2004: "Plasma TV: Large Screen Television for Today and the Future." Approximately 80 Congressional representatives and their staffs enjoyed an entertaining and educational presentation about plasmas in relation to the latest TV screens and display monitors. Larry Weber, former President and CEO of Plasmaco, Inc., introduced the attendees to plasmas in the universe, such as auroras and lightning, before focusing on display panels.

Describing a plasma display panel (PDP) simply as "red, green, blue phosphors and a few electrodes," Weber explained just where the plasma is inside those giant screens, and what is happening to it. He further detailed the pluses and minuses of the technology, particularly when compared to Liquid Crystal Displays (LCDs).

The major advantage of PDPs over LCDs is size. With plasma it is possible to get good definition over a larger area. The largest plasma display panel available is 71 inches, with an 80 inch prototype by Samsung not yet on the market. Liquid Crystal Displays have reached only 51 inches so far.

Among other advantages of PDPs, Weber noted that they have a greater life expectancy and consume 20% less power than LCDs. They are also brighter when seen under the lighting of a typical living room. He also pointed out that both technologies depend on plasmas, since the lamps in LCDs use plasma.

A new two-page document about PDPs, produced by CPS, supplemented the talk. Written with the help of Leanne



Larry Weber discussed the advantages and disadvantages of plasma screens during his Congressional luncheon talk in October. Photo by Paul Rivenberg

Pitchford and Jean-Pierre Boeuf of the Centre de Physique et de Plasmas et de leurs Applications de Toulouse (CPAT), this publication details how a PDP works. It can be viewed on the CPS website.

Plasma Science Award to Debut at Intel International Science & Engineering Fair

When the Intel International Science and Engineering Fair (ISEF) takes place the week of May 8 - 13, student projects on plasma-related topics will be eligible for the Coalition for Plasma Science Award for Excellence. This event, which will be held in Phoenix, Arizona, presents more than 900 individual and team awards in categories ranging from Behavioral and Social Sciences to Zoology. This year, for the first time, CPS will be offering a cash award of \$1000 to the student with the best presentation related to the topic of plasma science or applications.

CPS will provide four judges for the event, drawn from two main CPS sponsors – The American Physical Society Division of Plasma Physics and IEEE

Plasma Science & Applications Group – as well as from other CPS-related groups. These volunteers will meet on Tuesday, May 8 in the Phoenix Civic Plaza Convention Center to review over 1000 finalists and identify which are eligible for the award. Interviews with those selected will determine which student is awarded the prize on Thursday, May 10.

This year's topics were not available at press time, but a look through the 2004 entries reveals some intriguing titles: Efficiency Enhancement of Plasma Loudspeaker; Sunspots and Active Solar Magnetic Regions Using a Novel Measurement Method; The Relationship Between Sunspots and Solar Flares; Stellar Classification of First Magnitude Stars Through

Spectral Imaging; Hydrocarbon Production Through Electrical Ionization; The 2p-3d Electron Transition Multiplet of Ar+13; A Stellar Density Diagnostic; Sunspots Move Across the Visible Side of the Sun at a Rate of 14.6 Degrees per Day; Investigating Stars and Nebulae Through the Construction and Operation of an Astronomical Spectrograph. CPS judges can expect similarly diverse topics in 2005.

CPS has committed to funding the Plasma Science Award for three years. The Coalition hopes to encourage student projects with a plasma component, and to enhance knowledge about plasma science and applications within the science fair community.

APS-DPP Plasma Sciences Expo Attracts Thousands in Savannah Area

On November 18 and 19, 2004, CPS took part in the Plasma Sciences Expo at the Savannah International Trade and Convention Center, as part of the American Physical Society - Division of Plasma Physics (APS-DPP) Annual Meeting. The free event attracted a record 3400 students, teachers, parents and members of the general public.

The Expo introduced the students and the local community to the excitement of plasmas and the benefits of plasma research. Scientists from around the country and the world were there, ready to engage participants in lively hands-on demonstrations and explorations. Those attending were able to create arcs of lightning, manipulate a glowing plasma with magnets, watch an electromagnetic wave demonstration, and confine a plasma in a tokamak video game.

CPS was on hand with special “glasses” with diffraction gratings instead of lenses. The outside of the glasses are designed around the CPS web site address, while the inside includes a definition of plasma



A Savannah student, with CPS diffraction grating glasses perched on his head, learns about plasma from MIT's Mr. Magnet, Paul Thomas. The event attracted 3400 students over a two-day period. Photo by Paul Rivenberg

and an explanation of what to expect when looking at a plasma through the diffraction gratings (i.e., different gases will reveal different colors or wavelengths related to the gas used to create the plasma).

The glasses proved to be very popular, and were seen atop the heads of most of the participants at one time or another.

CPS will distribute the glasses at future educational events.

CPS Chair Lee Berry will be traveling to Savannah in March 2005 to present a follow-up demonstration about plasmas to one of the high schools attending the November event.

CPS Requests Help with “Teachers Guide” Expansion

When teachers seek to find someone in their local community who can talk about plasmas in the classroom, or who could lead a tour of a plasma-related experiment or company, where do they turn? They could get a head start by consulting the CPS website's “Teachers Guide to Plasma Science on the Web.” CPS has recently

updated the “Plasma Outreach Program Near You” page <<http://www.plasma-coalition.org/edu-outreach.htm>> to include almost every state in the US.

The page, which directs teachers to websites featuring local plasma-related outreach and experiences, now includes Minnesota, Montana, Nebraska, Nevada,

North Carolina, Oregon, Utah, Vermont and Wyoming. The additional outreach possibilities have lengthened the page so much that CPS has made it possible to simply “Choose a State” at the top of the page, so browsers can immediately find outreach in their local areas. Only teachers in North and South Dakota and Rhode Island will be disappointed.

To remedy this, CPS is asking readers of the Plasma Page to help find outreach programs in these three missing states, or as-yet-unlisted programs in any state.

In researching these sites, CPS has depended heavily on educa-

tional institutions. Often they have a “Society of Physics Students” that will do local outreach on a number of topics even if the school itself has no specific focus on plasma. We have also found that many states and cities do have observatories or planetariums, which can be a great introduction to space plasmas.

Much harder to find are companies or manufacturers who use plasmas and are interested in sharing how the fourth state of matter relates to their work and their lives. In many cases a teacher may only need to call such a company and ask if a talk or a tour is possible. If any reader knows of a company that does such outreach in any state, please contact the editor.

Along with the Outreach Program page, CPS will be updating and expanding the entire “Teachers Guide” this summer, adding new education sites that have been evaluated against national science standards. Readers are welcome to suggest sites for consideration as the CPS education site continues to expand.



Observatories like The Morehead Planetarium and Science Center in Chapel Hill, NC, are sometimes the only source of plasma-related education in a community. Photo from Morehead Observatory Image Gallery. <http://www.moreheadplanetarium.org/>