

CPS Plasma Page

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A Word from the Editor

The *Plasma Page* was originally conceived as a means of distributing information about current issues and discoveries in plasma science to members of CPS and the media. We have decided to redirect the *Plasma Page* to focus on Coalition activities.

There will be the occasional exception. For example, we plan to continue to direct readers to some articles of interest. But in general, the *Plasma Page* will bring members up to date on our latest plasma education activities.

We hope the new emphasis will provide our members with a better understanding of what the Coalition is doing on their behalf.

Capitol Hill Seminar and New CPS Publication Explore Plasma and the Environment

In its continuing series of Capitol Hill education seminars, CPS sponsored a luncheon for Members of Congress and their staffers on March 10, 2004. The latest seminar featured Dr. Daniel Cohn of MIT's Plasma Science and Fusion Center speaking on "Environmental Protection and Energy Savings using Plasma Technology."

While providing an overview of environmental applications (water purification, sterilization, cleaning smoke stack

emissions, and environmental monitoring), Cohn focussed on two ways plasma can help the environment: by destroying waste with a plasma furnace and by reducing pollution from diesel vehicles while increasing gasoline efficiency.

Cohn showed how a high temperature plasma in a furnace can disintegrate waste while eliminating pollutants from combustion. In a plasma furnace, waste can be transformed into hydrogen and a molten substance that solidifies into a glassy rock that could be used for construction material or sandblast grit. Such a furnace is being used commercially in Honolulu, Hawaii, to destroy medical waste. Cohn explained that it could also be used to reduce the volume of a radioactive waste and stabilize it, as well as to destroy chemical weapons.

Cohn also spoke about a plasma fuel reformer, dubbed a "plasmatron," that can be installed in diesel trucks and buses to create a cleaner burning fuel. The device could significantly reduce nitrogen oxide emissions, a major contributor to smog. It works by converting a portion of the fuel into hydrogen, which can then be used to convert nitrogen oxide fumes into harmless nitrogen and water. Hydrogen also increases the fuel octane number, which allows higher performance engines. If used in both diesel and light duty vehicles, US gasoline consumption could be reduced by approximately 30 billion gallons/year.



Dan Cohn (right) fields questions from Tina Kaarsberg of the US Congress Science Committee, Energy Subcommittee. Photo by P. Rivenberg



Plasmas can be used to clean and monitor smoke-stack emissions. This and other plasma technologies are explored in the latest CPS "About Plasmas." Image used by permission of Energy Information Administration, U.S. Department of Energy

Supplementing Cohn's talk was CPS's new "About Plasmas" two-pager "Cleaning the Environment." This publication, written with the assistance of MIT's Paul Woskov, provides an overview of environmental applications, including monitoring technologies and water purification. It can be downloaded from the CPS web page. Our next planned publication will focus on plasma display screens.

That might also be the topic for the next CPS luncheon, which is targeted for early autumn. CPS members willing to help with these efforts should contact Lee Berry at berryla@ornl.gov. CPS is always looking for new luncheon seminar topics, and new writers and speakers to help spread the word about plasma.

For more information: Call Toll Free 1-877-752-7627

E-mail us at CPS@plasmacoalition.org

Visit our website at: <http://www.plasmacoalition.org>

CPS Proposes Plasma Science Award at Intel International Science & Engineering Fair

The Coalition for Plasma Science is preparing a proposal to establish a special award at the Intel International Science and Engineering Fair (ISEF) for projects related to plasma science and applications.

Intel describes this event on their website, <<http://www.sciserv.org/isef/>> as “the world’s largest pre-college celebration of science,” bringing together “over 1,200 students from 40 nations to compete for scholarships, tuition grants, internships, scientific field trips and the grand prize:



Winners of the 2004 Intel ISEF enjoy a moment of celebration.

\$50,000 college scholarship and a high-performance computer.”

There are a number of special topical awards. And now, some participants could be competing for a plasma science prize. The primary goal of the award is to encourage the development of student projects with a plasma component. The second goal is to

enhance the knowledge about plasma science and applications within the science fair community - those that evaluate the projects, participants, and awards.

CPS plans to deal with organizational issues, as well as administer and fund the award. Intel requires that each year three to six judges be provided for the plasma award, the specific number depending on the number of eligible plasma-related projects. CPS expects judging assistance to come from a number of supporting member organizations.



CPS hopes sponsoring an award for the ISEF will support students interested in plasma science. Above, Intel ISEF finalists observe their “Rubik’s Robot.”

If the proposal is accepted, a single cash award of at least \$1000 will be given to the best project in the broad area of plasma science and applications. Topics that might be judged include (but are not limited to) plasma-related topics in lighting, displays (televisions), materials processing, solar and astrophysics, terrestrial phenomena (lightning, aurora, etc.), fusion, and plasma science. Criteria include overall scientific merit, understanding of the problem, and approach to the topic

CPS Website Continues to Grow

The CPS website (<http://www.plasma-coalition.org>) continues to be a great access point for current and potential CPS members and other interested parties, including teachers, students, the media, governmental policy-makers and the general public. While there is already a wealth of information on the website, we continue to develop and expand its content.

The webpage contains, for example:

- General information about CPS;
- A Teachers Guide to Plasma Science on the Web;
- Copies of CPS publications, including the CPS brochure and poster “Plasmas are Everywhere,” and the “About Plasmas” series of two-page papers about various plasma topics.

The Teachers Guide is reviewed annually by experienced teachers who evaluate plasma-related web sites with respect to

national teaching standards.

The educational brochure is designed to convey the widespread presence of plasma and plasma applications in a highly visual and easily understandable manner. Its purpose is to introduce people to plasmas, to the widespread presence of plasma in nature, and to the broad range of important plasma applications. The brochure contains a simple definition of plasma as well as contact information for finding out more about plasmas and about CPS. Several thousand copies are distributed annually. The site continues to generate contacts from those wanting to know more about plasmas.

In addition to requests for CPS literature or membership information, a few specific questions are submitted every month. Questions have ranged from what are the hazards of plasma displays in a fire to requests for information about



Educator Caryn Hoffman, center, reviews the education website every year, updating information and adding new sites.

plasma balls for a science fair project.

We expect that this site will continue to develop as an important communication channel for the Coalition’s information about plasmas, about Coalition activities, and about developments in plasma science.