



DOE Young Investigator Awards Announced

The Department of Energy has selected five physicists for funding under its new Plasma Physics Junior Faculty Development Program. The scientists will receive a total funding of about \$1.8 million over the next three years.

This recently established program aims to support outstanding plasma researchers, thereby helping to improve university plasma research and assure a high level of teaching in plasma physics and related disciplines.

The Department of Energy started this new program as a direct response to a 1995 report issued by the National Research Council. The report called for increased interagency coordination of plasma science and called for more DOE support for university plasma research and teaching.

For further information please contact Ronald McKnight, Office for Fusion Energy, Dept. of Energy, Germantown, MD 20874, phone (301) 403-4597, email: ronald.mcknight@mailgw.er.doe.gov.

Making More Durable Metals

A plasma-source ion implantation chamber recently developed by the Los Alamos National Laboratory provides a new method to harden material surfaces. This treatment extends the lifetime of a variety of products, such as industrial press plates and machinery tools, as much as one hundred fold.

This technology is the result of a laboratory-

university-industry partnership which includes the University of Wisconsin, General Motors and ten other companies.

An enormous number of industries, e.g. producers of machine tools and automobiles, will benefit from the new technology. The US Navy uses the facility to make its defense systems more durable.

The material to be hardened is immersed in a plasma. Ions from the plasma are accelerated and implanted into the surface, thereby improving resistance to wear.

The new method is faster and more cost effective than existing procedures and enables the treatment of materials which have low-melting-temperature. Moreover, it is environmentally friendly. Further tests of the method are under way, and first commercial units are already being deployed.

For further information please contact Dr. Blake P. Wood, Plasma Physics, Los Alamos National Laboratory, phone (505) 665-6524, email: bwood@lanl.gov.

Plasma Rivers Discovered on the Sun

Scientists from Stanford University recently discovered enormous flows of hot, electrically charged plasma beneath the surface of the Sun.

Just as the earth has weather patterns, the Sun seems to have its own kind of tempests, a totally unpredicted phenomena. Jet-like plasma streams are circulating the poles, with a volume equal to 4 percent of the total Sun.

The discoveries have been made using the ESA/NASA's SOHO spacecraft, which can peer below the Sun's surface and detect movements hidden from normal telescopes. The findings could

herald a new era of solar meteorology and could help explain the life cycle of sunspots and associated increases in solar activity which regularly interfere with radio communications on Earth.

In the future scientists hope to be able to predict these activities accurately enough to give advanced warning. Similar to today's weather forecast for the Earth, a Sun's weather forecast could be issued and communication disruptions could be predicted.

For further information please contact Donald Savage, NASA Headquarters, Washington D.C., phone (202) 358-1547.

Plasma Source Benefits Industry

A new clean and low-cost device that applies thin films on surfaces by using plasma sources has won the prestigious R&D 100 Award.

These devices are used for a variety of applications, e.g. for the production of all kinds of semiconductors and in the production process of LCD displays used in notebooks.

Existing models operate either at high energies, thereby damaging fragile structures, or sell at a high price.

However, the new applicator developed at Berkeley can run with virtually any gas and is able to work at near room temperature. It can be used ideally for numerous applications, e.g. to coat potato chip bags, to manufacture diodes used in the next generation of CD players, and to produce inexpensive, self-tinting glass used in cars.

Today, self-tinting glass sells at a high price and is only offered in luxury cars. Moreover, the new applicator could lead to a break-through in the production of rechargeable lithium batteries, thereby boosting the electric-car market.

The R&D Magazine has honored great inventors and scientists around the world since 1963.

For further information please contact Kate Bannan, Government Relations Specialist of Lawrence Berkeley National Laboratory, 1523

New Hampshire Ave, Washington D.C., phone (202) 588-0080, email: kathryn.bannan@ucop.edu.

JET Sets New World Records in Fusion Research

The UK based Joint European Torus (JET), an EU funded fusion research site, produced more than 13 megawatts of fusion power during a recent experiment, thereby setting a new world record. The ratio of fusion power produced to the power consumed in plasma heating reached a record setting 60 percent, about twice that of earlier experiments.

In the JET reactor, a plasma confined by a magnetic "bottle" is heated up to extremely high temperatures, comparable to the inside of the sun. This process demands an advanced knowledge of plasma science.

Since the US Tokamak fusion test reactor (TFTR) at Princeton University was closed down earlier this year, JET is the only experiment worldwide able to operate with the fuel mixture of a possible future commercial power station. It also comes nearest in scale to the planned International Thermonuclear Experimental Reactor (ITER).

Scientists predict that fusion could be a key energy source in the future. It can provide virtually inexhaustible amounts of energy in a clean and safe way, possibly replacing exhaustible sources like oil and coal in the long-run.

For further information please contact JET Public Relations Group, Abingdon, Oxfordshire OX14 3EA, United Kingdom, phone +44 (0) 1235 528822, email: jet.pubr@jet.uk.

Plasma Science Articles Needed

If you are aware of plasma science related research or applications which you think are worthy of being highlighted in the CPS Plasma Page, please send or e-mail a three to five paragraph description to: Paul Rivenberg, Editor, CPS Plasma Page, The MIT Plasma Science and Fusion Center, Room NW16-284, 77 Massachusetts Ave., Cambridge, MA 02139-4307; e-mail: rivenberg@psfc.mit.edu. Be sure to include in the description the funding source for the research and a contact name for more information.