Building A Bridge Between Educators and Plasma Physicists

Come to

Science Teachers Day

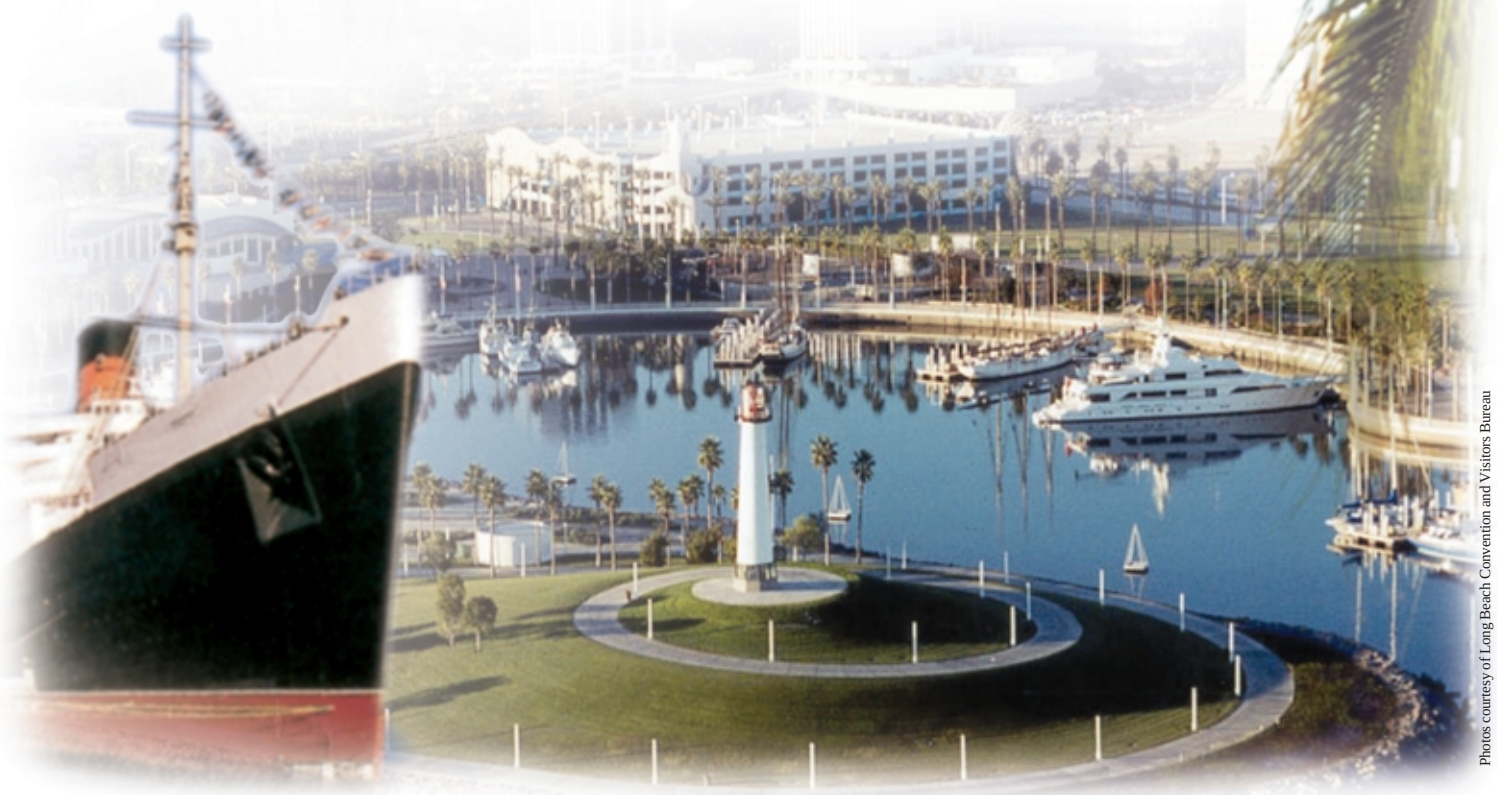
Tuesday, October 30, 2001
Hyatt Regency Long Beach
200 South Pine Avenue

and bring your students to

The Plasma Sciences Expo

Thursday and Friday,
November 1 and 2, 2001
The Long Beach Convention Center
300 East Ocean Boulevard

Hosted by the American Physical Society —
Division of Plasma Physics (APS-DPP)



Photos courtesy of Long Beach Convention and Visitors Bureau

SCIENCE TEACHERS DAY

YOU WILL LEARN

- How does teaching about plasmas satisfy California State Science Standards?
- What are plasmas, and why do I and my students need to know about them?
- What is the current status of fusion energy research around the world?
- How are plasmas being used to improve my life?

YOU WILL RECEIVE

- Free resource and hands-on material for immediate use in the classroom, including:
  – Plasma and fusion wall charts
  – Videotape of "Fusion: Nature's Fundamental Energy Source"
  – Interactive CDs (e.g., NASA's "Dynamic Sun," and "Star Power" by General Atomics)
  – Workbook of classroom curricula, based on Teachers Day workshops
- Training on the use of internet resources about plasmas and fusion
- One-on-one discussion with plasma scientists from national and academic laboratories

TENTATIVE AGENDA

7:30 - 8:00	Registration and Coffee
8:00 - 8:15	Welcome
8:15 - 9:00	Introduction to Plasmas and Fusion
9:00 - 9:15	Coffee Break
9:15 - 11:15	Workshops
11:15 - 12:30	Complimentary Lunch with Scientists
12:30 - 2:30	Workshops
2:30 - 2:45	Discussion/Intro to Poster Session
2:45 - 4:00	APS–DPP Education Outreach Poster Session

WORKSHOPS

Workshops are selected to respond to **California State Science Standards**, such as:

- Grade 8: Structure of Matter; Earth in the Solar System; Periodic Table
- Grade 9–12: Heat and Thermodynamics; Waves; Electric and Magnetic Phenomena; Atomic and Molecular Structure; Nuclear Processes; Earth's Place in the Universe; Energy in the Earth System; Investigation and Experimentation

Workshops deal in depth with a number of plasma-related topics, including:

- The electromagnetic spectrum
- How to teach fusion energy and plasma physics in high schools
- Bringing real time fusion data into the classroom via the internet

WHAT IS PLASMA PHYSICS AND WHY DO I NEED TO KNOW?

Although most students can name three states of matter, - solid, liquid and gas - relatively few would be able to explain that a fourth state exists - the plasma state - and that it makes up the majority of the visible universe. Lightning, neon and fluorescent lights, the aurora borealis, all are examples of plasma, an ionized gas with unique behavior that presents problems and possibilities for scientists today and in the future. Plasma physics studies this behavior, the interaction of a large number of charged particles with electric and magnetic fields, in an attempt to understand plasmas and ultimately use them in scientific research and industrial applications, including:

- Energy research (magnetic and inertial fusion)
- Space science research
- Semiconductor and materials plasma processing
- Etching computer chips
- Industrial coatings
- Environmental remediation

Science Teacher's Day is your opportunity to find out about recent and important applications of physics to space science and energy research, including a world-wide effort to develop electrical fusion power plants. The fusion program is one of the great challenges in science and technology, comparable in scope to putting a man on the moon, and it has made exciting progress over the past decade. This effort is of particular interest in California, where the limitations of current energy sources are becoming more apparent every day. Presentations are designed for teachers and will include resource materials to take back to the classroom. You will have an opportunity to interact with scientists who work in research centers, laboratories, academia and industry.

HOW DO I PARTICIPATE IN THESE EXCITING EVENTS?

There are three ways to register: on-line, by mail, or by fax (see attached application form).

The deadline for returning the application is June 1, 2001.

There is limited space for attendance. You will be notified of acceptance by June 15, 2001

THE PLASMA SCIENCES EXPO

BRING YOUR STUDENTS TO THE PLASMA SCIENCES EXPO

NOVEMBER 1 AND 2, 2001

AT LONG BEACH CONVENTION CENTER
300 EAST OCEAN BOULEVARD
LONG BEACH, CA

This Exhibition focuses on hands-on science education, engaging students at all levels, parents, teachers and the general public. Make lightning with a Van de Graaff generator. Observe your fluctuating body temperatures on a special monitor. Manipulate plasma with magnets. Watch an electromagnetic wave demonstration. Learn how to confine plasmas magnetically in a fusion device by participating in a computer simulation. Check out the latest interactive physics CD Roms. Discover what NASA is learning about plasmas in space. Meet and talk with professionals in the field of plasma physics and visit their displays to learn about current research in this cutting edge field.

Contributing laboratories, industries and academic institutions include: University of Southern California, San Diego; General Atomics; Lawrence Livermore National Laboratory; Princeton Plasma Physics Laboratory; Massachusetts Institute of Technology Plasma Science and Fusion Center; Oak Ridge National Laboratory; Contemporary Physics Education Project (CPEP); U.S. Department of Energy's Office of Fusion Energy Sciences, and many more.

Thursday and Friday, November 1 and 2 — 8:30 a.m. to 2:00 p.m. *(special days for teachers and students)*

Special public Expo times: Thursday, November 1 — 6:30 p.m. — 8:30 p.m. *(students, teachers, general public)*

THREE WAYS TO REGISTER

Online
http://fusion.gat.com/teachers

Fax
Application form to
202-659-1110

Mail
Application form to
General Atomics
2001 Pennsylvania Ave. NW #650
Washington, DC 20006-1823

APPLICATION FORM

These opportunities are open to middle school and high school teachers; and are free of charge.
The cost of these events has been underwritten by participating institutions.
Priority will be given to those who register by June 1, 2001.
Applications received after that date will be considered if space is available.
You will be notified of acceptance no later than **June 15, 2001**.

_____ _____
Teacher Name School Name

_____ \ _____
School Address, Street, Town, Zip Code District

(___)_____ (___)_____ (___)_____
School Phone Fax (important) Home Phone

_____ \ _____ _____
Subject(s) Taught Grade Level(s) e-mail

Will you attend Science Teachers Day, October 30, 2001? Yes___ No___

Will you bring students on November 1 or November 2 to the Plasma Sciences Expo?
(Teachers Day attendance not required)

Yes ___ No ___ Number of students I plan to bring _____

I prefer to bring students: Thursday November 1 _____ Friday November 2 _____

Please check the time you and your students would like to arrive at the Expo:

___ 8:30 a.m. ___ 9:00 a.m. ___ 9:30 a.m. ___ 10:00 p.m. ___ 10:30 a.m. ___ 11:00 a.m.

___ 11:30 a.m. ___ 12:00 p.m. ___ 12:30 p.m. ___ 1:00 p.m. ___ 1:30 p.m.

Estimate of travel time _____

Some funding for buses may be available: If so, do you need funding?

Yes___ No___ Estimated bus expense_____

_____ _____
Teacher's Signature Principal's Signature

For further information contact Linda Norman at 202-496-8212 or norman@ga.radix.net