

LETTERS

BNL Shakeup Tied to 'Usual Medieval Suspects'; Environmental Responsibility Still Needed

I hope that this year's events involving Brookhaven National Laboratory (BNL) and Secretary of Energy Federico Peña will earn more attention than the news story in your June issue (page 65) and the passive reporting of harsh criticism by a congressman from Wisconsin in your August issue (page 43). This is a serious affair, involving science and government and society. It deserves thought and discussion in the physics community.

Recall that on 1 May the secretary abruptly dismissed Associated

Universities Inc (AUI) as the manager of BNL. The timing was uncommonly tactful, because this year marks the golden anniversary of that superb laboratory and is cause to celebrate five decades of first-rate research in science and engineering performed under the auspices of AUI.

Surely, the citizen thinks, AUI's misdeeds must have been outrageous to merit such contemptuous treatment. Did AUI's policies lower the laboratory's morale, hinder its striving for excellence? Hardly. Did the AUI staff lack integrity, embezzle, engage in financial chicanery, incur inappropriate travel expenses, offer photo ops with Nobel laureates for cash? Nonsense.

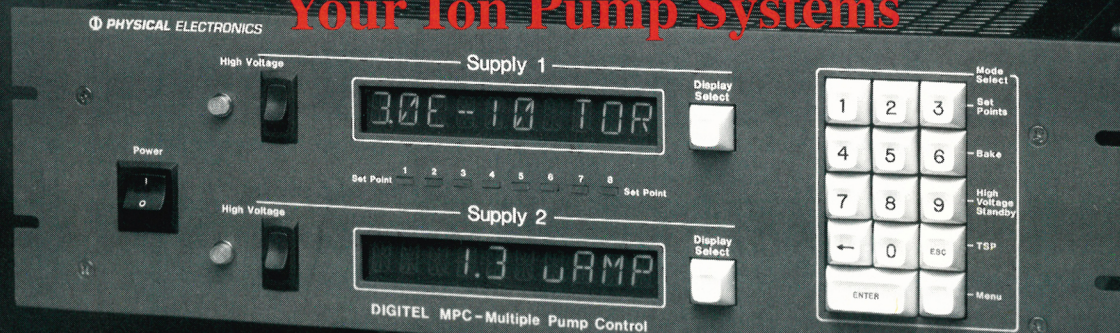
What then? It was the ultimate form of modern-day malfeasance: AUI failed in public relations. But how? Did AUI inhibit BNL from informing the public and the government about its mission and achievements? Not at

all. Did the laboratory refuse to conduct open houses for its neighbors, reject summer students? No.

AUI's failure was that the laboratory was not sufficiently sensitive to the environmental concerns of its neighbors. That was the crime. Not that the physical presence of BNL degraded the environment significantly more than any employer of several thousand would. Not that any significant mishaps had occurred in a half-century. Rather, AUI and BNL were not sufficiently sympathetic to rumors and the irrational concerns of some neighbors—nothing that a scientist would regard as true and serious, merely "perceptions." The usual medieval suspects—the poisoning of air and water by nuclear physicists, and the harmful effects of all radiations—emerged in the public discussions. And, of course, there was no sense of numbers, of magnitudes.

Letters submitted for publication should be addressed to Letters, PHYSICS TODAY, American Center for Physics, One Physics Ellipse, College Park, MD 20740-3843 or to ptletter@aip.acp.org (using your surname as "Subject"). Please include your affiliation, mailing address and daytime telephone number. We reserve the right to edit letters.

The DIGITEL™ MPC – The Intelligent Way to Monitor Your Ion Pump Systems



The NEW DIGITEL MPC (Multiple Pump Controller), is intelligent enough to independently operate, monitor and protect as many as two ion pumps and operate a titanium sublimation pump (TSP) or a non-evaporable getter (NEG) for more advanced system control. A full line of standard features include:

- All DIGITEL functions (autostart, autorun, power loss protection, vacuum loss protection and easy to read display)

- Eight process setpoints
- RS-232/422 (485 available)
- Remote TSP/NEG control (current, voltage and power monitoring)
- 5.25" (3 U) X 19" rack mount

The DIGITEL MPC – A unique power supply providing maximum reliability, innovative features and exceptional value.

PHYSICAL ELECTRONICS

6509 Flying Cloud Drive, Eden Prairie, MN 55344 612-828-6100 FAX: 612-828-6322 e-mail: marketing@phi.com

Circle number 9 on Reader Service Card

At one level, there is nothing new here. Better societies have always consisted of a large body of decent, reasonable people who tolerate a few difficult ones—the credulous, the lunatic and the malicious. What is new is that the difficult ones—for whom perception equals truth—appear to have gained the attention and respect of our government. For whatever inappropriate reason, a senator and a congressman now endorse their bizarre scenarios. The claims of any group—say, Proctologists against Plutonium—appear to carry as much weight with government as do reasoned responses from major science organizations. And not suffering these fools gladly may be grounds for reprimand and dismissal. It's a shameful situation.

How should the community of scientists respond, when it can no longer count on government for mediation, for thoughtful disinterested support? Of course, some of us will respond well, next election day. But perhaps sympathetic outreach is the answer. Should the American Institute of Physics host conferences for flat-earthers? Should PHYSICS TODAY begin publishing accounts of survivors of abductions by aliens? Or let us have the American Physical Society finally create a division of astrology and necromancy—to show that we care. I am sure that the Department of Energy would be impressed. What does the membership think?

NOEL CORNGOLD

*California Institute of Technology
Pasadena, California*

I am not surprised to learn that the environmental problems at Brookhaven National Laboratory have long existed, as revealed in your May issue (page 45), in that for several years during the early 1970s I was an environmental consultant for the Town of Southampton and other entities concerned with environmental and water supply problems in Suffolk and Nassau Counties on Long Island.

Individuals in the sanitary engineering and public health professions have failed to face reality about public health problems that stem from an inadequate understanding of the natural geological and biological environments. On Long Island, for example, no action was taken for decades to limit nitrate contributions made by residential septic systems to the island's sole-source aquifers and connected surface waters, because only phosphates were considered to be deleterious. Consequently, algae blooms have continued to build up in streams, ponds and estuaries, as increasing amounts of high-nitrate sep-

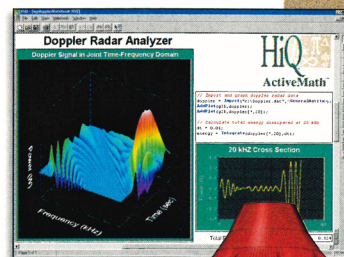
tic system effluent have created multiple plumes of contamination that discharge to surface waters.

I wonder what was behind the published statement made by Brookhaven's long-time director Nicholas Samios in 1988 (and quoted in your story) that not only was the national lab deeply committed to protecting the environment but "After all, we live here too." (Curiously, that same phrase was used this past May by another scientist regarding radiation and chemical leaks and accidents at Los Alamos National Laboratory.) Was Samios's coining a result of ignorance of environmental dangers? Or was it merely a reflection of a greater concern for remaining comfortably employed in a beautiful rural environment? Of course, it could be argued that living near the Brookhaven or Los Alamos labs is less hazardous than living in Manhattan or the Bronx, or in any number of other large urban areas.

In an early New York State nuclear regulatory agency hearing on the Shoreham nuclear reactor, I testified that the marine cooling water effluent, with whatever contaminants and waste heat it might contain, would recirculate from Long Island Sound under certain common conditions and exceed the temperature limits calculated by the utility's expert witness (a prominent specialist from academia). Under cross examination, the expert claimed that he studied only the near-field effects, and so he couldn't comment on what were far-field effects (although I knew him to be sufficiently knowledgeable about far-field effects to teach and write texts about them). Even so, the regulatory agency allowed the plant to be completed. Nevertheless, despite the expenditure of billions of dollars, the plant never went into commercial operation. Why? Partly because of the objections of a few activist and elite neighbors, but primarily because the utility failed to meet the Environmental Protection Agency's requirements for an adequate evacuation plan for a million or so island residents in the event of a serious accident.

Professionals (including physicists) have an ethical responsibility to learn the truth about both the long-run and short-run effects of their projects. They should campaign vigorously in their communities and regions for public funds to pay for the identification and management of environmental problems. And if business people and residents balk at paying the additional levies needed to cover such problems arising from community growth, those professionals should in-

Get Integrated! With NEW HiQ 3.1



Solve real-world problems through interactive analysis, data visualization, and report generation in a single, intuitive HiQ® environment.

- Powerful math and data analysis functions
- OpenGL 3D data visualization
- Interactive technical report generation
- Problem Solver notebooks
- OLE connectivity with Microsoft Office
- Intelligent data import/export wizards
- ActiveX technology
- HiQ-Script™ programming language for analysis
- Add-on analysis toolkits
- Direct link to LabVIEW® for data acquisition



**For your FREE
HiQ evaluation
software kit, call
(800) 433-3488
(U.S. and Canada)**



**NATIONAL
INSTRUMENTS®**
The Software is the Instrument®

U.S. Corporate Headquarters
Tel: (512) 794-0100 • Fax: (512) 794-8411
info@natinst.com • www.natinst.com
Worldwide network of direct offices and distributors.

© Copyright 1997 National Instruments Corporation. All rights reserved. Product and company names listed are trademarks or trade names of their respective companies.

Circle number 11 on Reader Service Card

sist on such growth being restricted to what the taxpayers are willing to fund.

ZANE SPIEGEL
Santa Fe, New Mexico

Solar Irradiance: A Force to Be Reckoned with, a Story to Tell

It is surprising that none of the discussions of changes in Earth's climate that have appeared in *PHYSICS TODAY* over the past year or so have included coverage of the role played by solar irradiance variations. Since it was first noted 20 years ago that the Little Ice Age coincided with the Maunder Minimum,¹ evidence has been steadily accumulating that such variations do indeed affect Earth's climate significantly. As of 1996, the Sun's signature had been seen in the global temperature record of the last few centuries, in ocean basin temperatures of the past 50 years and in ice cores.² The correlation between the reconstructed solar irradiance and the global temperature of the last 400 years is particularly striking. A 1996 study even claimed that during the period 1880–1993, the solar irradiance variations dominated carbon dioxide variations in altering the global temperature.³

The history of solar irradiance research during the 20th century is at least as interesting as the history of the greenhouse effect presented in your January 1997 issue (page 34). Although it is true that the concept of solar forcing came close to extinction in the 1950s, it is clearly experiencing a resurgence at present, and its story deserves to be told.

References

1. J. A. Eddy, *Sci. Am.*, May 1977, p. 80.
2. R. A. Kerr, *Science* **271**, 1360 (1996).
3. W. H. Soon, E. S. Posmentier, S. L. Baliunas, *Astrophys. J.* **472**, 891 (1996).

GUILLERMO GONZALEZ
(gonzalez@astro.washington.edu)
*University of Washington
Seattle, Washington*

The Mbone's Connected to the School Zone

The physics community is plagued by low morale amongst faculty members and by a substantial reduction in the number of students entering undergraduate physics programs. At major universities, the reduction in grant monies has adversely affected research facilities and graduate programs. At smaller universities, faculty members are usually isolated

from new developments and current activities in the field of physics. Such isolation has a negative effect on how well faculty members perform in the classroom, as well as on their ability to convey to students the exciting work now going on at the frontiers of physics.

I propose that major research universities use the Internet-based interactive conferencing service known as the Multicast Backbone (Mbone) network to disseminate seminars, conferences and other events that take place on their campuses.

The existence of such programming on the Internet would certainly facilitate and enhance the recruitment of students into our dwindling physics programs. Faculty members would benefit considerably from viewing well-known physicists reporting on their own research and giving seminars on current fields of interest. Such seminars could also stimulate the research efforts of other physicists.

I believe the cost of Mbone dissemination would not be great and the fruits of such efforts would greatly enhance general interest in and knowledge of physics.

MOORAD ALEXANIAN
(alexanian@uncwil.edu)
*University of North Carolina
at Wilmington*

Oscillator Discussion Reflects Laser-Faire Attitude to History

I enjoyed Daniel Kleppner's light-hearted but informative piece, "A Beginner's Guide to the Atom Laser" (*PHYSICS TODAY*, August, page 11), and appreciate his effort to address the knotty issue of what defines a laser.

He states that "a host of devices such as klystrons and magnetrons can produce radiation in the coherent state. In fact, all oscillators produce radiation in the coherent state. Nobody would dream of calling these devices lasers. . . . [A]nyone who can't tell a laser from an oscillator should not be giving scientific advice to neighbors."

The relationship of masers and lasers to other oscillators was also of interest to the inventors of those systems. Maser inventors Charles H. Townes and colleagues coined the acronym "maser" in 1953, and laser inventor Gordon Gould coined "laser" in 1957.¹ At a 1959 conference, Gould made the following observations: "Professor Townes has mentioned an early electron maser, the triode. The Barkhausen-Kurz oscillator is more easily understood. Electrons oscillate ap-

continued on page 90

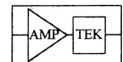
World's Smallest MCA



Size: 6.5" x 2.8" x 0.8"
(165mm x 71mm x 20mm)
Weight: <300 grams (including batteries)

The **MCA8000A** is a full featured, low power **Multichannel Analyzer** intended to be used with a wide variety of detector systems.

- ⊙ 16k data channels
- ⊙ Storage of up to 128 different spectra
- ⊙ 24 hours of continuous data acquisition from two 1.5V AA batteries
- ⊙ Successive-approximation ADC: Conversion time $\leq 5 \mu s$ (≥ 200 cps)
Two stage input analog pipeline
Sliding-scale linearization
- ⊙ Maximum counts per channel 4.29 billion
- ⊙ 115.2 kbps serial interface
- ⊙ Selectable real/live timer preset up to 1.7×10^6 seconds
- ⊙ Differential nonlinearity $\pm 0.6\%$
- ⊙ Integral nonlinearity $\pm 0.02\%$
- ⊙ Gain stability ≤ 10 ppm/ $^{\circ}C$, Zero drift ≤ 3 ppm/ $^{\circ}C$
- ⊙ Two TTL compatible gates
- ⊙ Serial ID number via software
- ⊙ Password data protection
- ⊙ Free Windows & DOS software



AMPTEK INC.

6 De Angelo Drive, Bedford, MA 01730-2204 U.S.A.
Tel: +1 (781) 275-2242 Fax: +1 (781) 275-3470
e-mail: sales@amptek.com www.amptek.com

Circle number 13 on Reader Service Card