

Brewer, Mooradian, and Stoicheff reply: We attributed the first demonstration of laser emission in organic dyes to the two independent work groups led by Peter Sorokin and Fritz Schäfer (reference 7 in our article).

We also erroneously attributed tunability to them. Although Schäfer and coauthors noted that the laser wavelength of each dye was tunable over a great part of its fluorescence band with changing dye concentration, that was not the narrowband tunability suitable for sweeping over an atomic or molecular spectrum.

Indeed, Bernard Soffer and B. B. McFarland first showed that pulsed dye laser radiation could be tuned with a reflective diffraction grating at one end of the laser cavity; that generally more useful method provided tuning over 400 Å in rhodamine 6G with the requisite narrow output of 0.6 Å (50 GHz).

Later, others replaced the grating with an echelon or Lyot filter to generate much narrower output. However, the technique used most frequently for precision spectroscopy was the extremely monochromatic (MHz) and tunable dye laser emission produced by using the grating at grazing incidence, a method still in use. Also, continuous-wave and broadly tunable dye lasers with linewidths as low as 50 kHz have been observed by frequency-offset locking the dye frequency to a stable reference.

Currently, broad tunability in the near-IR and visible regions with narrow linewidths between 50 and 300 kHz is obtained with a continuous-wave diode laser—a semiconductor chip—using an external cavity that consists of a diffraction grating and a retroreflector. Resolution of this magnitude has permitted precision measurements in fundamental investigations.

Richard G. Brewer
(rgbrewer1@sbcglobal.net)
Stanford University
Stanford, California

Aram Mooradian
(aram@novalux.com)
Novalux Inc
Sunnyvale, California

Boris Stoicheff
(borisstoicheff@yahoo.ca)
University of Toronto

Science and the White House

John Rigden's article in the June 2007 issue of PHYSICS TODAY (page 47), recapitulating the relationships between

American presidents and the scientific community in the past 50 years, is particularly timely in relation to the current intense campaign for that office.

Rigden is unstinting in praising President Dwight D. Eisenhower and his affection for those he called "my scientists," but more is involved in Eisenhower's affection than accidents of personalities.

As a West Point graduate, Eisenhower had a science education that far surpassed that of any other recent American president. To his scientific record should be added his initiative for the Geneva conferences, beginning in 1955, on the peaceful uses of atomic energy.

Without visible evidence to the contrary, it seems no current candidate for the office, except perhaps John McCain, has even a smattering of science education. Most prominent by far in the current crop of presidential aspirants are lawyers. And what do lawyers know about science? I put the following question to a lawyer who is widely recognized as one of the brightest in the profession: What would happen to any law school that imposed a science requirement as a condition for admission? He answered, "It would soon close its doors for lack of applicants."

It is encouraging to know that Angela Merkel, the German chancellor, is a physicist. But that makes the current crop of American presidential candidates look particularly undereducated and therefore questionably qualified to lead history's greatest world power in a scientific age.

Lawrence Cranberg
(info@lawrencecranberg.org)
Austin, Texas

Rigden replies: I agree with Lawrence Cranberg's concern about the lack of science in the education of US leaders; however, he does not identify what he means by "science education." He mentions German chancellor Angela Merkel, who has a PhD in physics—a robust science education indeed. Cranberg surely cannot hold that as a standard.

Except in the rarest of instances, the only way departments of physics touch future national leaders is through introductory physics courses. Those equation-driven courses do not, in my judgment, qualify as a science education. I suggest that the value of an introductory physics course, six months after the final exam, is negligible. Specifically, I wager that adults who

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once took an algebra- or calculus-based introductory physics course are unable to discuss common physics phenomena and cannot demonstrate a better understanding of basic physical concepts than can those adults who never saw the inside of a physics classroom.

Physicists talk about the need for a science-literate public, but I fear they squander their only opportunity to work toward that goal.

John S. Rigden

(jrigden@aip.org)

Washington University in St. Louis
St. Louis, Missouri

Folksinger's father famous as physicist

The passing of Albert Baez (see his obituary on page 75) recalls a beautiful encounter. At a dinner party in 1982, I asked him how it was being the father of a famous person. He replied that he had gotten used to being eyed at conferences and inevitably being asked, "Are you any relation to [folk musician] Joan Baez?" On one occasion, as he saw a young physicist approach, he was

sure he knew what was coming. But this time it was different. "I was astounded," Baez said, "and thrilled, when he asked, 'Are you Albert Baez, the inventor of the x-ray telescope?'"

Robert W. Schmieder

(schmieder@nanologic.org)

NanoLogic Inc

Walnut Creek, California

Advocating real-world physics classes

I agree that more physics needs to be offered in US high schools (PHYSICS TODAY, March 2007, page 32). All high-school students should be required to take at least one physics class. However, that class should have real-world application.

The physics that is now taught in high schools is for the few students who will go into high-energy research and is of little value to most other students. A local physics teacher told me that he had a class of "A" students and did not want any "C" students.

Judging by most physics textbooks, the authors do not know how to teach

the basic physics of people's homes. Textbook authors should learn, and then could teach, the physics involved in electrical wiring, structural support, insulation, and the safe use of electricity. For example, a student who learns that a white roof can save on the air-conditioning bill has learned something of value, without the need to calculate the rate of heat transfer.

It is a shame, too, that there is so much confusion about centrifugal and centripetal forces. Some authors use the word "centrifugal" correctly, but some think it doesn't even exist. Rotation never moves anything inward toward its center.

Let's give high-school students some physics that they can use in their daily lives.

James F. Jackson

(jjackson@airnwire.com)

Carlisle, Indiana

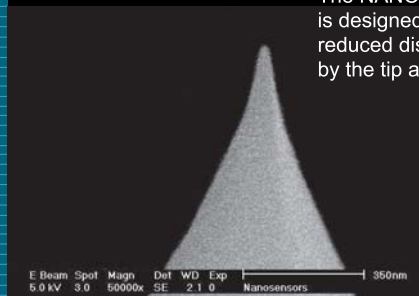
Correction

October 2007, page 5—In the caption for the cover illustration, the second sentence should read "The patterns the birds form change shape and density when a predator attacks." ■

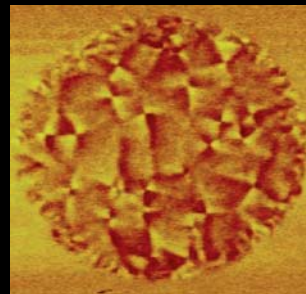
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