AIP Matters

Monday, July 26, 2010

Director's Matters

By H. Frederick Dylla, Executive Director & CEO

Exciting the imagination

Within every scientist is the drive to understand how things work and to discover new ways of doing things. Yet the fervor for discovery is cultivated by strong mentors who encourage, steer, and challenge the budding scientist until (and often well beyond) he or she becomes a professional scientist. My own fascination with science was fueled by the invention of the laser and guided by scientists who took a personal interest in my curiosity—mentors who had a tremendous impact on my life and career.

When Theodore Maiman introduced the ruby laser on May 16, 1960, with pulses of bright, coherent red light from his laboratory at Hughes Research, I was an 11-year-old "Sputnik" kid playing dangerously with homemade rockets and radio circuits. Although I was too young to pay much notice then, I got hooked on lasers two years later when I read an article in *Popular Science* magazine titled The Incredible Ruby Ray (scroll to page 89). It thoroughly captivated me—I just had to make a laser for myself! The trouble with such a venture for a 13-year-old boy was the required equipment; a cigarette-sized ruby crystal and a high-energy flashtube far exceeded my discretionary funds. Cash from delivering papers and mowing lawns could keep a junior scientist stocked with chemicals and radio parts, but the components for a pulsed ruby laser would require a major bequest from a rich relative. I didn't have one.

After I had read the article in *Popular Science*, I started reading any article I could find on lasers and spending afternoons and weekends in the library of Philadelphia's Franklin Institute. I needed to find someone who would lend me the required ruby crystal. By 1963 a small number of companies in the United States were making those precisely grown crystals, but the price for the required two-inch-long specimen was well over a $1,000. I wrote letters to every such company that I could identify, explained my plans, and inquired whether I could borrow a ruby crystal. To my delight, a research team at RCA's engineering research facility in Camden, NJ, wrote me back and invited me for a visit. I took that to mean that they wanted to check me out before offering to help. I left the RCA laboratory with not one but two laser crystals, in addition to lots of advice on how to build my first laser. The engineers I met during my first visit to RCA stayed in touch with me during what became my four-year venture as my lasers became increasingly sophisticated (and better working) and my ability to ask better questions matured.

My third laser, completed in 1965 (shown in the photo), was a reasonable scientific tool for

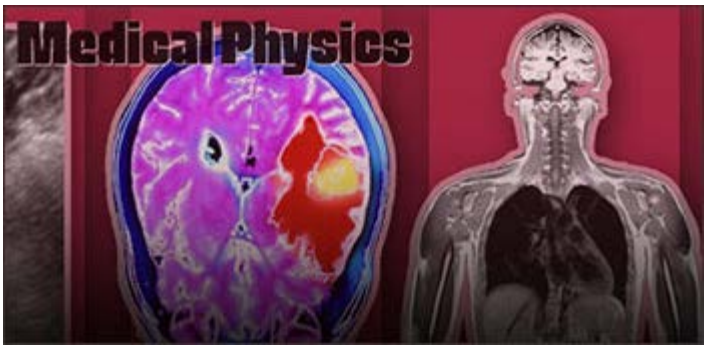
the time. Making good use of a scientific tool for discovery is an important component of a scientist's education. While pondering what to do with my laser, another venture in letter writing served me well. I wrote a letter to Hermann Muller, a professor emeritus at Indiana University who had won the 1946 Nobel Prize for Physiology or Medicine by showing that exposures to sufficient quantities of x-rays causes damage to biological cells and eventually leads to mutations. I asked Muller to speculate on whether the unique characteristic of laser light (spectral purity and ability to tightly focus) might have novel effects on biological systems. To this day I marvel at the three-page response he sent back to me, a 15-year-old high-school freshman at the time. Muller's letter included ruminations on my query, suggestions for my experiments, background tutorials, and a long list of suggested reading. His recommendations led me to do a series of experiments with my model 3 laser that involved controlled exposures of frog eggs harvested from the backyard pond and onion roots dug up from the garden. My experiments won me some minor awards in the regional science fair in Philadelphia, but, more importantly, the experience taught me how to do experiments. Ten years later with a freshly minted PhD in physics, and ever since, I have tried to be generous with my time whenever a young student sends me an inquiry or asks me for advice or for a loan of scientific gadgetry. I remember how the RCA engineers and Professor Muller took interest in me and how they influenced my career in a positive way.

I draw your attention to the mentors of our own Society of Physics Students summer interns. Join me in applauding their efforts to guide these undergraduate students in their studies and contribute to the field of physics. Hats off to John Suehle, Christina Hacker, and Nhan Nguyen (NIST); Larry Evans (NASA Goddard); Gary White and Kendra Redmond (SPS); Becky Thompson-Flagg and Ed Lee (APS); Greg Good (AIP); Bruce Mason (AAPT/ComPADRE); Kristin Kopshever and Dahlia Sokolov (US House Committee on Science and Technology); Donna Hammer (UMD MRSEC); Barbara Hutchison and Kathryn Amatrudo (OSA); Brie Welzer (Scientists and Engineers for America); and Corey Solow (Representative Bill Foster's office).

PUBLISHING MATTERS

Medical Physics migrates to Scitation C³

From the AIP press release: On July 8, AAPM's journal *Medical Physics* went live on Scitation C³, AIP's next-generation hosting platform. This move is the first in a projected plan by AIP to migrate all its publishing partner journals to Scitation C³ by year's end. AIP has made significant upgrades to the platform this year,



particularly by incorporating MarkLogic Server and a Polopoly web content management system, which provide users with an XML-enabled functionality that significantly reduces discovery and reading time. Penny Slattery, AAPM's Journal Manager stated, "We're very pleased that the migration of *Medical Physics* has given the journal a fresh new look and brought Scitation C³'s innovative features and tools to our members and subscribers." The new *Medical Physics* homepage features a "Just Published" RSS feed and "Editor's Picks" articles, while abstracts include links for "Related Content" and access to article objects (figures, tables, multimedia, etc.). Subscribers find added tools for article objects, including the ability to export figures to PowerPoint. For more details, read the full release.

PHYSICS RESOURCES CENTER MATTERS

Sharing expertise on virtual pressrooms

One challenge in promoting the latest developments in scientific research is the trend of dwindling media coverage of scientific association meetings. This trend seems to parallel the decline in the numbers of journalists and their travel budgets. How do scientific societies ensure adequate media coverage of meetings even when reporters cannot attend? Enter the virtual pressroom. During the 2010 meeting of the Council of Engineering and Scientific Society Executives (CESSE), July 13–16, in Pittsburgh, PA, Jason Bardi (AIP Manager of Member Society Media Services) teamed up with Peter Weiss (AGU Public Information Manager) to organize the session *Reporters Gone from Your Meeting? Take the Meeting to Them.* Bardi and Weiss convened participants in the CESSE Marketing & Communications and Public Affairs tracks for the purpose of exchanging information and best practices, including the "slidecasting" of press conferences (real-time broadcast of speakers' slides and audio over the Web) and attracting reporters to virtual pressrooms.

MEMBER SOCIETY SPOTLIGHT

ACA meets in Chicago

From the featured posting in *Physics Today Online*'s We Hear That column; press release written by ACA Council Member and Local Meeting Chair Bernie Santarsiero:

> "The three recipients of the 2009 Nobel Prize in Chemistry will be attending the 60th annual meeting of the American Crystallographic Association (ACA) at the

Sheraton Chicago Hotel and Towers on July 24–29, 2010.

Highlights of the meeting include plenary lectures by the three Nobel Laureates, Venkatraman Ramakrishnan of Cambridge University, Thomas Steitz of Yale University, and Ada Yonath of the Weizmann Institute. Their lectures will describe their ground-breaking structural studies over the past decades of the ribosome, a large, complex biological machine in all living things that translates the DNA code into functional proteins that carry out various cellular tasks.

A thousand structural scientists from the Americas and around the world will discuss all aspects of academic and industrial research in X-ray and neutron crystallography, scattering, and diffraction. Crystallography is the study of all matter—chemical, biological, physical—at the atomic level, and therefore encompasses researchers from the biological, chemical, geological, health, and physical sciences, engineering, mathematics, and medicine."

See We Hear That for a detailed description of the week's agenda. The meeting program is packed with exciting research on such topics as molecule-based materials exhibiting the property of bulk magnetism; the structural aspects and roles of fiber-like aggregations associated with diseases such as Alzheimer's, Parkinson's, and mad cow; and the nature of magnetic frustration, "spin-ice," and how magnetic monopoles emerge from this very special magnetic material. A special workshop for high-school teachers will provide hands-on experience with elements of crystallography and structure determination, and activities to bring back to their classrooms.