



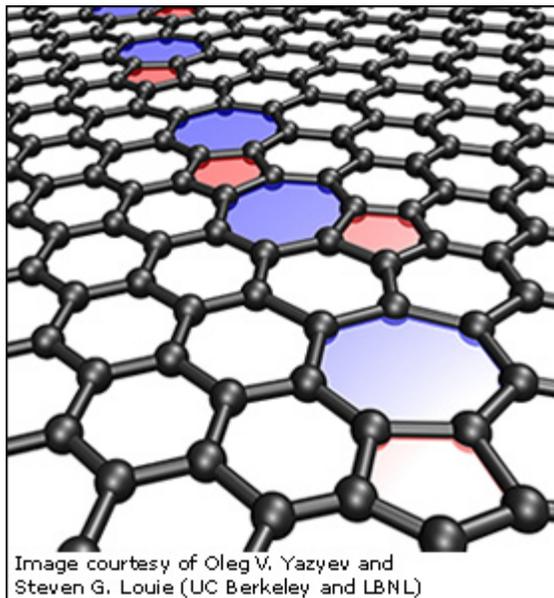
Director's Matters

By H. Frederick Dylla, Executive Director & CEO

Nobel nod to co-discoverers of graphene

The awarding of the Nobel Prizes in the first week of October every year is always eagerly anticipated by the scientific community. Here at AIP, we pay particular attention to the physics prize, which [this year](#) went to Andre Geim and Konstantin Novoselov from the University of Manchester. The award, for their discovery and investigation of graphene, a novel two-dimensional form of carbon, is noteworthy since it is rare that a Nobel Prize is awarded so soon after the prize-winning work—in this case the initial discoveries were in 2004.

The 2010 prize recognizes a very special form of carbon—a crystalline layer only one carbon atom thick that has been very difficult to isolate, even though it can be made from the common form of carbon we see every day in pencil lead or flame soot. The prize winners learned to isolate graphene flakes and used the samples to demonstrate



its unique properties. Two of those properties promise an array of practical applications. Graphene, as a near-perfect conductor of electricity at room temperature, portends a new family of microelectronics with faster switching speeds and less power consumption. Also, one of the strongest materials known, graphene could be embedded in a new class of composite materials to strengthen them.

The work leading up to this prize is an example of the scientific discovery process in full bloom. In 1996 Richard Smalley, Robert Curl, and Harold Kroto won the Nobel Prize in Chemistry for their discovery of a related form of carbon, fullerenes. Although widely available in nature, fullerenes were never isolated until the 1980s when those men published papers on the soccer-ball-shaped conformations of carbon more affectionately called "buckyballs," from the geodesic domes pioneered by architect Buckminster Fuller.

In the past two decades still another form of carbon became famous. Scientists learned to produce tiny tubes of carbon only a nanometer across. Those carbon nanotubes burst on the scene, launching an entirely new field of study owing to their interesting physical and chemical properties. Possible near-term applications are expected in electronics, pharmaceuticals, and the development of new materials.

Graphene, nanotubes, and buckyballs are all related. Unwrapping a buckyball or splitting open a single-walled nanotube generates a small sheet of graphene. But there was no reproducible way of making graphene until Geim and Novoselov combined sophisticated micro-handling techniques with the dexterous use of Scotch tape.

In Congress and in corporate R&D laboratories the relative merits of basic versus applied research are often debated. I have always been uncomfortable with these labels. The isolation of graphene is a good example of the narrow gulf between basic and applied research. Here we can plainly see that fundamental physics and the development of useful devices are not separate interests but intimately related. It is precisely graphene's strange quantum properties—including the fact that an electron's speed through graphene is the same no matter how much energy the electron has—that might lead to smaller, cheaper, and faster electronics, helping to extend Moore's law (according to which computing power doubles about every 18 months) for many years to come.

Our 2010 Nobel Prize winners did not launch their scientific investigation of flaky carbon in order to build a better switch or light bulb. Instead they were curious about the ability to isolate this ubiquitous but long-hidden form of carbon. Now just a few years later, the fruits of their curiosity are more abundant than they could have dreamt—not just in the recognition of the Nobel committee, but in all the new switches, materials, and light sources in our future that will have graphene at their core.

» [Access AIP journal and magazine articles by Andre K. Geim and Konstantin S. Novoselov.](#)

PUBLISHING MATTERS

Partnership agreement makes AIP publisher of *Journal of Laser Applications*

From October 1 [press release](#):

AIP signed a strategic partnership agreement with the [Laser Institute of America](#) (LIA) to publish its flagship publication, *Journal of Laser Applications* (JLA). The agreement reached with LIA closely mirrors that of other partnerships AIP is currently pursuing with a number of society publishers.

"After a dozen years as a publishing partner, AIP's excellent track record made the decision to take our partnership to the next level an easy one," said LIA Executive Director Peter Baker. "What really cinched it for us were AIP's upgrades to staff, the further enhancements they made to their already robust Scitation platform, and the strong global presence they can offer JLA."



PHYSICS RESOURCES CENTER MATTERS

IPF for Laserfest

AIP and the Optical Society of America are excited to be co-hosting the upcoming Industrial Physics



Forum (IPF), which will be held October 25–26, in conjunction with the [Frontiers in Optics/Laser Science](#) meeting in Rochester, NY. This year's IPF—part of the 2010 celebration of [Laserfest](#)—will feature three sessions exploring applications of laser technology: Biomedical Applications of

Lasers, Environmental Applications of Lasers, and Laser Applications in Metrology. In addition, there will be a Frontiers in Physics session featuring four speakers whose research is on the cutting edge of scientific discovery. One of these talks will address graphene—perfect timing with the Nobel Prize this year. For a full program description, visit the

[IPF website](#). As in past years, *Physics Today Online* will host a blog, so you can follow the meeting even if you can't be there in person. Furthermore, the 16 invited talks will be captured on video and made available online. These measures will help AIP reach a wider audience, thus amplifying the value of the event.

Segrè, the photographer

This month the [Emilio Segrè Visual Archives](#) features images from the [collection](#) of Emilio Segrè, its namesake. Although Segrè was best known for his Nobel Prize–winning work in nuclear and high-energy physics, he was also an avid photographer and author of books on the history of modern physics. The photos include images taken by Segrè himself as well as those collected over a lifetime spent in the physics community. Especially notable are the intimate portraits of his fellow physicists.



Wolfgang Pauli (left) and Chien-Shiung Wu

WHAT'S HAPPENING THIS WEEK

Events at ACP (College Park, MD)

October 11–14

- Scholastic Book Fair, Conference Room A, 12:00–1:00 p.m.
The ACP Child Care Center will host this event featuring books from more than 150 publishers, for infants through 8th graders.



Thursday, October 14

- Flu vaccination clinic, 1:00 – 3:00 p.m.

Events at the Publishing Center (Melville, NY)

Thursday, October 14

- Milestone Luncheon for those NY-based employees reaching 5-, 10-, 15-, 20-,

25-, and 30-year anniversaries of working for AIP, 12:00 – 2:00 p.m.

Friday, October 15

- AIP Journal Editor's Conference, 8:00 a.m. – 4:00 p.m.

We invite your feedback to this newsletter via email to ajpmatters@ajp.org.

For past issues of this newsletter, visit the [AIP Matters archives](#).