NOAA Center for Weather and Climate Prediction relocated to UMD's Research Park

Within the University of Maryland’s “M Square” Research Park, adjacent to the American Center for Physics at One Physics Ellipse, is a grand Arc—and new home to NOAA’s Center for Weather and Climate Prediction (NCWCP). With this new facility, NOAA hopes to enhance efforts to secure delivery of critical weather forecasts, warning information, and data to the public. The NCWCP is a joint NOAA and General Services Administration project to replace and consolidate several NOAA-leased facilities—most notably those in Camp Springs, MD, and related divisions in Silver Spring, MD. Two delegations from ACP recently visited our new neighbors to learn more about their work and to look for ways in which we might collaborate.

My group was treated to a glimpse of the Air Resources Laboratory, which conducts R&D in atmospheric dispersion, air quality, climate, and boundary layer science. I and other ACP representatives met scientists who worked with fire tracking, pollution surveillance, precipitation analysis, hurricane monitoring, ocean forecasting, hydrometeorological predication, satellite data monitoring, and more.

The state-of-the-art facility is aesthetically pleasing and energy-efficient, with a green roof and rainwater bioretention. It also has a research library, a 464-seat auditorium for meetings and outreach functions, and a café that is open to the public. NOAA is already developing collaborations with the University of Maryland faculty and students, and the societies within ACP will work to foster a strong relationship with our new neighbors. Given our mutual interest in advancing science, we see many opportunities for collaboration.

Approximately 825 staff—NOAA employees, contractors, and visiting scientists from around the world—occupy the building. Monitoring and alert services are provided 24 hours a day, 365 days a year to monitor the Earth’s weather and atmosphere, always vigilant for extreme events or adverse conditions.
that threaten life or property. For the most part, NOAA’s professional staff are meteorologists and data managers. However, the group did meet a few fellow physicists on the tour. You can read more about the science being done across the street from ACP in this month’s issue of Physics Today. Associate Editor Jermy Matthews’ article, “NOAA Consolidates Its Climate-Modeling Network,” can be found on page 26.

Our tour group was very impressed with the breadth of information that is being collected, analyzed, and distributed worldwide by these NOAA centers. We saw the backbone of the satellite monitoring for the National Weather Service that underpins commercial daily weather forecasts. Fresh from our experience with Hurricane Sandy, we saw where the data from storm-tracking models is collected and distributed to broadcast stations and emergency services. We were shown how atmospheric data is collected, analyzed, and disseminated for transient events like the Fukushima nuclear disaster and last year’s eruption of the Icelandic volcano that disrupted transatlantic and European air travel. NOAA staff track rainfall and a number of other factors to make predictions for seasonable weather variations such as those that occur with El Niño in the central Pacific. We also learned a bit about what’s involved in long-term forecasting, where NOAA’s complex climate models enable them to make predictions about the Earth’s weather into the coming decades.

All of these important and fascinating subjects were components of last week’s technical program for AGU’s fall meeting in San Francisco. (We will cover this event in next week’s issue of AIP Matters.) For the staff of the American Center for Physics, we welcome our new scientific neighbors with their essential mission to monitor and model our planet’s climate.

Publishing Matters

Physicists swirl around AIP’s Physics of Fluids booth at APS Division of Fluid Dynamics meeting

Representatives from AIP’s journal Physics of Fluids (POF) staffed a booth at the American Physical Society’s (APS) Division of Fluid Dynamics (DFD) meeting, held November 18–20 in San Diego, CA. The meeting brought together experts covering all areas of fluid dynamics, with more than 2,200 contributed papers, 120 posters, and 150 entries in the Gallery of Fluid Motion competition, a photo and video contest that showcases the beauty of fluid dynamics research. Authors and researchers made their way to the AIP booth to pick up their copy of the Gallery of Fluid Motion, a special section of POF that features articles on last year’s contest winners. This year’s
winners will be featured in a future Gallery of Fluid Motion special section. Many researchers also stopped by POF’s booth to chat about the latest advances in fluid mechanics. AIP hosted a “Meet the Editor” hour during which editors were available to discuss Physics of Fluids’ publication process. Editors L. Gary Leal and John Kim also led an Editorial Board meeting and discussed possible plans for new initiatives to further develop the journal.

AIP Publishing exhibits at AVS

Mary Griffin, marketing manager, and David Baker, journal manager, took to the road last month to promote AIP’s offerings at the AVS International Symposium & Exhibition. On display at the booth was the complete set of journals published by AIP and its Member Society publishing partners. A special emphasis was placed on the Journal of Applied Physics and AIP Advances. More than 250 meeting goers stopped by the booth to sign up for the iPad raffle. The AIP team was also able to interact with the authors and prospective authors on a social level—inside and outside of the exhibit hall—to help build an affinity. Griffin reported, “It’s always a pleasure to exhibit at AVS, because they do an incredible job of creating opportunities for the exhibitors to interact with researchers through many social events, like wine receptions or mixers. It’s clear keeping their exhibitors happy is important to AVS.”

Physics Resources Matters

Introductory physics at 2- and 4-year institutions

How many college students take physics each year? The AIP Statistical Research Center (SRC) staff estimates that in the fall semester of 2011, about 555,000 students were enrolled in postsecondary physics classes, with another 81,000+ students enrolled in physical science classes. While the majority of these students took physics classes in four-year schools in degree-granting physics departments, more than 20% of these students were enrolled in physics classes in two-year colleges (TYCs). One student in nine (11%) that was enrolled in an introductory calculus-based physics class was at a TYC. TYCs enrolled almost 20% of the students taking introductory algebra-trig-based courses, and more than one-fourth of those taking conceptual physics. These data are depicted in the accompanying figures.

![Bar chart showing the distribution of students in different types of physics classes at 4-year and 2-year institutions.](image-url)
Total enrollment in introductory physics classes by type of class

<table>
<thead>
<tr>
<th>Type of Class</th>
<th>4-yr (2010)</th>
<th>2-yr (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calc-based</td>
<td>89%</td>
<td>11%</td>
</tr>
<tr>
<td>Alg/Trig-based</td>
<td>81%</td>
<td>19%</td>
</tr>
<tr>
<td>Conceptual</td>
<td>74%</td>
<td>26%</td>
</tr>
<tr>
<td>Physical Science</td>
<td>61%</td>
<td>39%</td>
</tr>
<tr>
<td>Total</td>
<td>79%</td>
<td>21%</td>
</tr>
</tbody>
</table>

**Proportion of total enrollment in introductory physics classes by type of school**

Notes:

1. The enrollments shown are for the first semester of any course with a sequence for the fall semester in the given year.
2. The most recent data for four-year schools is for the fall semester of 2010. SRC has fall semester 2011 data for two-year schools. SRC staff do not believe the difference in academic years affects the interpretation of these data significantly.

If you have any questions regarding these data, please contact Susan White. The reports can be accessed through the SRC website.

AIP honors Anna Rothschild for science communications with new media

For nearly 45 years, AIP has partnered with its Member Societies to present its Science Communication Awards at venues where the science is complementary. AIP’s tradition of recognizing excellence in science communication is well established, but 2012 marked the first time that the institute made an award for the category of “new media.” This new category distinctly draws attention to creative ways in which science communicators use new tools on the web to educate in exciting ways.

In an award ceremony at last month’s AVS International Symposium, AIP honored Anna Rothschild for her fun and informative web feature, *The Amazing Atomic Clock*. This animated NOVA video was produced to support NOVA’s four-part series “The Fabric of the Cosmos,” with Brian Greene. In it, Rothschild communicates not only the physics of precision time keeping, but also the real-world value of atomic clocks and how they keep our world running smoothly. The video addresses what seems like a straightforward question: “How do you
measure a second?” Precision time pieces are necessary to keep our wireless and web communications, electrical grid, and GPS systems running smoothly. Atomic clocks are also essential tools for fundamental scientific research, as so recognized by this year’s Nobel Prize in Physics. Rothschild is a production assistant for NOVA; her online videos tell engaging science stories to a web-savvy audience. For more information, see the AIP press release.

Member Society Spotlight

AVS meets in Tampa

AVS is about “developing a fundamental understanding of surfaces and interfaces through core programs in electronic and magnetic materials, micro- and nanoelectromechanical systems, nanoelectronics, nanometer science and technology, plasma science and technology, surface science to interfacial phenomena, surface engineering, thin films, and vacuum science and technology,” according to AVS 2012 Symposium organizers Charles Eddy, Jr. (program chair) and James Fitz-Gerald (vice-program chair). When the members of AVS gathered in Tampa, FL, last month, they were treated to a rich scientific program that featured on the order of 140 oral sessions, 1,300 talks, 250 invited speakers, and two evenings of poster presentations. Despite the fact that Hurricane Sandy was bearing down heavily on New York, putting part of the AVS headquarters underwater, the meeting unfolded as planned. AIP’s Media Services staff had the pleasure of helping to publicize the exciting research presented and discussed during the symposium. Among the news releases were stories on how scientists are protecting catalysts for better biofuel production, making materials that block bacteria from sticking, and using nanotechnology to help keep silver artifacts shiny. Scientific American featured two stories from the meetings on their “60-Second Science” podcast series: “Atom-Thick Layer Keeps Silver Shiny” and “Nonstick Surface on Med Devices Could Keep Bacteria at Bay.” Congratulations to AVS for a successful symposium!

Coming Up

Through December 10

- Toys for Tots drive (Melville)

Wednesday, December 12

- Staff birthday breakfasts (Melville and College Park)

Thursday, December 13

- Milestone awards presentation and quarterly all-staff update (Melville)
- Holiday party (Melville)
Wednesday, December 19

- Holiday party (College Park)

Through December 19

- ACP holiday gift drive (College Park)