tor to mimic stellar fusion might also go underground. A follow-on to Gran Sasso's LUNA, the accelerator would, in addition to being shielded from cosmic rays, shoot heavy ions onto a light-ion target, thereby keeping reaction products in a narrow angle and upping the signal-to-noise ratio. "We want to simulate the origin of elements in stellar evolution," says University of Notre Dame's Michael Wiescher, one of the project's planners and a member of the underground lab committee. "The reactions are slow, guaranteeing a long lifetime for stars. We need high intensities—we don't have a million years."

All that is just an appetizer. More ideas for experiments are catching hold, fueled by recent spectacular successes in underground physics—notably the 1987 detection of a supernova explosion and strong evidence in 1998 from Super-Kamiokande that neutrinos change flavor. (See the story on page 16.)

The physics successes are also behind the renewed interest in a US underground lab. "The scope of intellectual questions is broader than what can be answered with accelerators [alone]," says Barry Barish, a high-energy physicist at Caltech who is serving on the underground lab committee. "When you move out of accelerators, you cross fields—particle and nuclear physics and astrophysics."

Alfred Mann, a particle physicist at the University of Pennsylvania, spearheaded a failed effort to get a US underground lab in the early 1980s, around the same time that Gran Sasso opened in Italy. "There was not a great deal of interest—there never is when you want to do something new," he says. Things went as far as selecting a site. But when it came time to dole out money for large-scale equipment, says Mann, the idea for an underground lab lost out to accelerator physics.

If the idea has any viability this time, says Barish, "it's because it addresses fundamental questions in several different areas."

**Toni Feder**

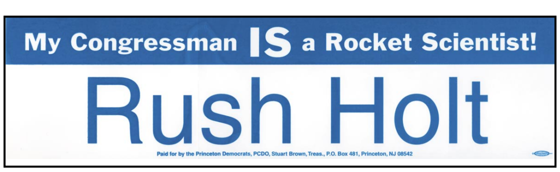
# Holt Holds onto Congressional Seat, Keeps Science in Politics

As Congressman Rush Holt (D-N.J.) looked at the final vote tallies in his unnervingly close reelection bid in November, his thoughts turned to measurement design theory and the role of noise in ballot tabulations. This was political science with a twist, because Holt is the Princeton University plasma physicist who won a seat in the House of Representatives in 1998, and he can't help but approach politics with a great deal of science. Vern Ehlers (R-Mich.) is the only other physicist in Congress.

Holt

Holt kept his seat from New Jersey's 12th district by surviving a strong challenge from Republican Dick Zimmer, who had held the same seat for three terms in the early and mid-1990s. The 30 000 voters in the district gave Holt the victory by a mere 500 votes and, in an echo of the presidential drama in Florida, Zimmer insisted on a recount.

"Each day of the recount I gained votes and when the margin grew from about 500 to 750, he pulled the plug," Holt said of Zimmer. Holt said he has already drawn up legislation calling for a commission to come up with recommendations of ways to standardize voting procedures in federal elections. His goal, he said, is to come up "with a lower noise measurement system" for voters.




Beyond that, Holt said he wants to double federal nondefense R&D spending, make the R&D tax credit permanent, improve and expand programs for science and math education in the public schools, and rekindle the debate over the need for a progressive federal energy policy.

As he watched CNN coverage of the Bush–Gore battle in Florida, Holt explained the difference between hard science and political science: "In science you're supposed to follow the evidence wherever it leads and let the chips fall where they may. But where the chips fall is what politics is all about."

**Jim Dawson**

# UK Boosts Pay, Joins ESO, in Science Spending Spree

The UK government has announced substantial new money for higher education, academic salaries, and research. Over the next three years, the science budget will increase by 26% from £1.7 billion (about $2.5 billion) to £2.15 billion, while education will get an 18% increase to £6.4 billion. The majority of the new science funding will be spent on either life sciences or interdisciplinary programs. However, the Particle Physics and Astronomy Research Council (PPARC) has done particularly well compared to the last spending review three years ago, when it was the only research council that received no funding increase above inflation. Its budget will go up 20% from £194 million to £232 million by 2004. "This new funding will ensure our physicists and astronomers remain at the forefront of international research," says Ian Halliday, PPARC CEO.

Thanks to lobbying by astronomers, £10 million of the new PPARC money will go to joining the European Southern Observatory (ESO) in Chile (see Physics Today, September 2000, page 55). "This is excellent news for UK science and lays the foundation for cutting-edge research over the next 10 years," says Mike Edmunds, chairman of the Astronomy Vision Panel, PPARC's long-term planning committee for astronomy. "British astronomers will be delighted by the government's rapid and positive response to their case."

The money will buy UK astronomers 20% of the time on the Very Large Telescope as well as time on the Atacama Large Millimeter Array being built in Chile. Despite the good news, cuts of more than £5 million a year in the UK's astronomy program will have to be made over the next 10 years to afford the £70 million joining fee that comes on top of the £12 million annual membership dues. Recommendations for the cuts will be made public in February.

PPARC also won a £26 million grant for two projects from the Department of Trade and Industry's "e-science" program. That money will fund research into the creation of Astro-grid, a virtual observatory combining astronomical data from many space- and ground-based observatories, and DataGrid, a network system for analyzing data from CERN's Large Hadron Collider.

Stipends for physics graduate students will go up 23% by 2004 to £9000. "We have got to send a clear signal to young people that research should no longer be seen as a Cinderella career," said a spokesperson for the government's Office of Science and Technology.

The 10% increase above inflation in the higher education budget has three main goals: to modernize university facilities, expand student numbers by at least 8%, and increase the pay of academics. Despite the funding boost to education, the UK still spends less as a proportion of its gross national product than most members of the Organization for Economic Co-operation and Development. To bring higher education up to the OECD average would cost an additional £7.5 billion per year.

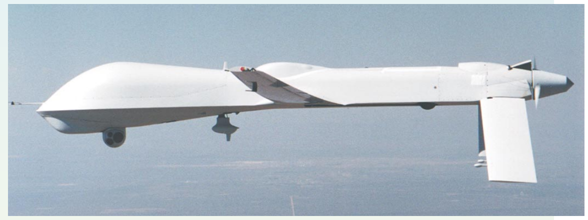
Roughly one third of the new education cash (£330 million) is earmarked for salaries. The money is in addition to any nationwide pay increase negotiated with trade union leaders in the next few months. Universities have been told they can use the money for recruiting new staff or to break the national payscale and increase existing salaries at their institutions. "Universities and colleges have to compete internationally to recruit the best staff," says Brian Fender, CEO of the Higher Education Funding Council for England, which distributes public money to universities and colleges. "This funding settlement is a major step in helping them do that."

Currently an English literature professor earns the same salary as a physics professor anywhere in the country, but the pay raises are expected to change that. "There is now an acknowledgment amongst the government and some university institutions that it is no longer relevant to have a nationwide payscale," says Peter Cotgreave from Save British Science, a UK pressure group. "It should reflect national priorities." Science and technology are among those priorities, and low pay is widely believed to be the main reason for a UK academic "brain drain" both to industry and abroad.

**PAUL GUINNESSY**

## AIP Forum Focuses on Energy and Defense

The annual Industrial Physics Forum, sponsored by the American Institute of Physics' Corporate Associates, was hosted by General Atomics (GA) in San Diego on 6–7 November. Some attendees opted to arrive a day early to participate in an academia–industry outreach workshop, which focused on training students for industry, designing a professional master's degree program, and forming collaborations between universities and industry. The forum was held in cooperation with *The Industrial Physicist* and the APS Forum on Industrial and Applied Physics. Additional sponsors of the workshop included several corporations and professional coalitions.



**THE UNMANNED PREDATOR AIRCRAFT** features synthetic aperture radar and stays airborne for up to 40 hours.

The theme of the forum was "Physics, Energy, and Defense: Synergistic Interactions." To reinforce the theme topics, the roughly 150 industrial and academic physicists in attendance toured two GA facilities. One was the DIII-D National Fusion Facility, housing GA's experimental tokamak, which has a D-shaped plasma. The other facility toured was the GA Aeronautical Systems, Inc, production facility for the Predator (see photo) and other remotely operated aircraft that are used for surveillance in combat operations.

At the banquet, held on Monday night at the Scripps Institution of Oceanography, the crowd was addressed by Robert Dynes, chancellor of the University of California, San Diego, and by two local Congressional representatives: Randall "Duke" Cunningham and Robert Filner. AIP then presented its 2000 Award for Science Writing by a Scientist to Charles H. Townes of the University of California, Berkeley, for *How the Laser Happened* (Oxford University Press, 2000).

Next year's forum is slated for 22–23 October 2001, at the Xerox Wilson Center for Research and Technology in Webster, New York. The theme will be "Color Documents in the Internet Era."

## Stirling to Head European Synchrotron

William Stirling, a physicist at the University of Liverpool in England, began a five-year stint this month as director general of the European Synchrotron Radiation Facility (ESRF) in Grenoble, France. He succeeds Yves Petroff, who has led the ESRF since before its first beam lines opened in 1994. Petroff is initially taking one year of sabbatical leave.

**STIRLING**

Leading the ESRF is a chance to help shape science, Stirling says. "It's one of the most exciting jobs in Europe for a physical scientist." He has worked in Grenoble before: from 1973 to 1987 at the neighboring Institute Laue Langevin's high-flux neutron research reactor.

The ESRF has 16 member countries, whose annual dues provide the facility's budget of Fr 420 million (about $55 million). "Over the last 10 years, the ESRF has been very successful at building and developing new beam lines," says Stirling. "It is now a very fine machine indeed." But that space is limited, he adds, "Almost everywhere you can put an instrument has been taken."

A challenge now, he says, is how to keep developing the facility. In particular, Stirling will continue Petroff's move to let scientists concentrate on their science, rather than on the mechanical details. For example, planned automation means that aligning a protein crystal will soon take seconds rather than minutes. Other aspects of data collection, such as powder diffraction, are also in line for automation.

The ESRF is used for research in physics, chemistry, materials science, and, increasingly, biology and medicine—for example, to do experiments on imaging human tissues. "Personally, as a physicist, I'm looking forward to getting to know more about the life sciences," says Stirling. His research as a condensed matter physicist involves x-ray investigations of magnetic structures and phase transitions of magnetic materials. **LYNLEY HARGREAVES**

## AAS Reviews Education Strategy

When news got out this past May that the American Astronomical Society was closing its Chicago education office, Bruce Partridge, chair of the AAS's astronomy education board