

as C++ programming and networking software is also available.

According to Daniel White, a career counselor with Scientific Career Transitions, a nonprofit group based in New York City that provides advice to scientists who want to switch careers, "Organizations hire temps to do work that's not their core business." So, for example, a bank might bring in a contractor to upgrade its computer network. "There's a growing tendency to view employees not just as labor, but as intellectual capital. When you hire a temp, you just want [his or her] labor—you don't need to own the expertise."

White sees some advantages to temporary work arrangements, especially when a company is considering hiring a permanent employee. "It's very expensive to bring people on staff, so it's important that the person fits in. It's sort of a 'try before you buy' approach." On the down side, temps have less job security. "You have to live with not knowing where you'll be in six months," White says.

Consulting

Although temp agencies are still a novelty in science employment, the kind of work and lifestyle they may offer physicists is similar to the self-employed consultant's. Physicist Steve McClain has been an optical design consultant for the past year and a half. He does some work from his home in Tucson, Arizona, and he also travels regularly to his main client's plant near Allentown, Pennsylvania. Being single and with no dependents, he enjoys the autonomy and can support himself by working part-time, although he says, "I tend to put in more hours than I charge for."

"I miss learning new science," McClain says. "But I made a conscious decision to leave academia when I saw that you had to be not only a good teacher and a good researcher but also a good money raiser. I figured I could do two out of three, but not all three." After earning his PhD from Cornell University in 1992, he spent three years as a research scientist at the University of Alabama in Huntsville, where he met members of the group he's working for now. Good contacts are a necessity, he says, and "some fields of physics definitely lend themselves to this type of work." Given the current growth in optics, he believes he could find a staff position "fairly easily," but has so far resisted the move. McClain has seen a few peers leave physics altogether, frustrated with the lack of opportunities. "I'm happy with what I'm doing. But it's not the way I'd imagined it would be."

Those sentiments are shared by An-

drew Lazarewicz, a PhD geophysicist who's worked as a consultant since being laid off three years ago, at the age of 43. His consulting firm, Science Resources Network, has stayed afloat financially, but it hasn't been easy, he says. Being a businessman is something that physics didn't prepare him for. "We've been taught how to solve technical problems, but not how to make money." What's more, he says, "there are a lot of people like me—there's a lot of competition." These days, he works part-time for Boston College, under a contract with the Nuclear Regulatory Commission to assess

the seismic hazards around nuclear power plants. The rest of his time is spent developing new leads, to see him beyond next summer when the NRC money runs out.

Lazarewicz has tried finding work through employment agencies "without much luck. They tend to work in the mainstream rather than with specialties." The AIP-Manpower agreement "sounds like a good idea," he says, and expressed the hope that the scientific societies will continue to find ways of supporting their members who are consultants.

JEAN KUMAGAI

Swiss Neutron Source Starts Up

The neutron beams at Switzerland's new spallation source, SINQ, will be started up this month for testing and alignment of instruments. Experiments are scheduled to begin next spring.

Located in Villigen, SINQ is part of the Paul Scherrer Institute (PSI), which in October hosted the well-attended first European Conference on Neutron Scattering. (The name SINQ—pronounced "sin-q"—is derived from that of the former Swiss Institute for Nuclear Research, one of PSI's two predecessors, and from *Quelle*, the German word for source.)

The government of Switzerland—incidentally, the country with the most neutron users per capita—has paid 85 million Swiss francs (about \$70 million, representing more than 4% of the Swiss annual science budget) toward building the neutron source and experimental setups. PSI will cover SINQ's operational costs. In addition, SINQ will use PSI's existing 600 MeV accelerator. In so doing, it will join other facilities such as the neutron spallation sources at Los Alamos and Argonne National Laboratories in the US, and ISIS at Rutherford Appleton Laboratory near Oxford, England (which has the highest peak neutron flux), which have been economizing by adapting high-energy equipment to other uses.

In spallation, neutrons are released from heavy metal target nuclei in collisions with highly accelerated protons. Reactors, the more common neutron source, produce a continuous flux of neutrons from fission chain reactions. In contrast, the four currently operating spallation sources—in the US, England and Japan—produce short neutron pulses (20–50 Hz). This pulsed mode is generally better suited to time-of-flight measurements of structure and dynamic processes of materials

than is the continuous-flux mode.

At the Swiss spallation source, however, the bombarding proton pulses from PSI's accelerator will be so close together that the resulting neutron flux will be nearly continuous. SINQ's flux of about 10^{14} n/cm² s will be comparable to that of a medium-flux reactor. Since SINQ won't be able to exploit the pulsed mode, a major emphasis will be on low-energy, or "cold," neutrons ($T = 25$ K, or about 2 meV, at SINQ). Furthermore, a cryogenic moderator for producing cold neutrons can be positioned where the neutron flux is highest, "which is not possible with a reactor, because of the heating from increased gamma radiation," explains PSI neutron physicist Albert Furrer, who is responsible for instrumentation and the scientific program at SINQ.

Cold neutrons are finding increasing importance in scattering studies of submicrometer structures such as polymers and biological molecules and for very-high-resolution micro electron volt spectroscopic studies of slow dynamics of such materials, as well as for the study of magnetic materials using polarized neutrons. "We expect SINQ to be competitive with the world's best cold neutron source—the reactor at the Institute Laue-Langevin in Grenoble [France]," says Furrer. He adds that "SINQ may provide a useful prototype for the eventual replacement of nuclear reactors" for neutron physics.

Indeed, although spallation technology lags behind reactor technology, many neutron scientists seem to share the view of Laue-Langevin director Reinhard Scherm, who says that "spallation is the way to higher peak flux." One advance that will be developed at SINQ is the use of high-density liquid metal targets with convective cooling. Such targets will be able to absorb higher proton currents—and

thus produce higher neutron fluxes—than the solid metal or metal alloy targets currently used. (SINQ's proton current will be 1.5 mA, nearly an order of magnitude greater than ISIS's.) And SINQ will be the first neutron source to fully implement supermirrors. Produced at PSI, these coatings for neutron guides consist of up to 900 layers of nickel and titanium. The layered structure has a higher angle of reflectivity than the widely used pure nickel coatings, so the transmitted beam intensity is higher.

"Perhaps SINQ will be most important as a playground for developing targets for the next-generation spallation source," says Gerry Lander, a neutron physicist and head of basic actinide research at the European Institute for Transuranium Elements in Karlsruhe, Germany, and editor of the quarterly magazine *Neutron News*. Such a role may prove crucial: Spallation sources avoid some of the safety and nuclear proliferation problems that come with using fissile materials. Moreover, says Furrer, "whereas the power of research reactors has reached an upper limit that would be very difficult and costly to overcome, spallation technology has the potential to top current neutron fluxes."

TONI FEDER

EPS Moves to France, Makes Other Changes

The European Physical Society is moving from Geneva, to take up new headquarters in Mulhouse, in the Alsace region of France, on 1 January.

The main reason for the move is financial. EPS sought a less expensive city than Geneva, and also wanted to relocate to a European Union country, explains EPS secretary-general Gero Thomas. Salaries for the all-new staff will be lower in Mulhouse. But the savings will come largely from the support offered by Mulhouse: 10 years' rent-free office space and a full-time secretary.

The arrangement is part of the city of 110 000's efforts to become an international center. Mulhouse offered the University of Haute-Alsace money for a new physics building—but only if the university succeeded in attracting an international body to Mulhouse. Last May the deal with EPS came through, and once the new building is ready, EPS will share quarters with the physics department there. Until then, the city will house EPS in a business complex.

The move will free up an estimated 25–30% of EPS's annual budget of

about one million Swiss francs (about \$830 000) which, says Thomas, will be used to support programs outlined in a strategy plan adopted by the EPS council last spring. Key activities will include helping young physicists by disseminating information and financial support, improving ties between academic and industrial physicists, supporting exchanges between physicists in western Europe and former eastern bloc countries and lobbying the European Commission in Brussels for more support for physics.

EPS's *Europhysics News* will move to Mulhouse with the EPS secretariat. Since last January the bimonthly magazine has been published in cooperation with Springer-Verlag, and a new managing editor will come on board after the move. *Europhysics Letters*, which has shared office space and administrative staff with EPS since it was launched 11 years ago, will stay in Geneva.

And in September, at EPS's tenth triennial general conference, held in Seville, Spain, the society's 11-member executive committee announced the appointment of the UK's Jeffrey Huw Williams to succeed Thomas as secretary-general. The two will share duties until August 1997, when Thomas, who has held the post since 1975, retires. Thomas will continue as business manager of *Europhysics Letters*.

Williams earned his bachelor's degree in chemistry from the University College of Wales in Aberystwyth in 1977, and his PhD in theoretical chemistry from the University of Cambridge in 1981. He was physical sciences editor in the European office of *Science* for two years, and he will leave his current position as deputy executive secretary of the International Union of Pure and Applied Chemistry to join EPS.

TONI FEDER

Gross Will Be Next Director of ITP

David J. Gross of Princeton University has been named the new director of the Institute for Theoretical Physics (ITP) at the University of California, Santa Barbara. He succeeds James B. Hartle, who will return to full-time teaching and research at UCSB. Gross will start his new job on 1 July, and will also join the Santa Barbara physics faculty in January.

With funding from the National Science Foundation (\$2.4 million this year) and the University of California, the ITP sponsors four major study programs a year, each lasting from four to six months and drawing about 40



DAVID J. GROSS

ROBERT MATTHEWS/PRINCETON

participants, who come to the institute for periods of a few weeks to several months to explore specific topics in physics. The two programs currently under way, for example, are looking at quantum computing and new ideas in particle accelerators. According to Hartle, the institute hosts several hundred visiting scientists each year, as well as postdoctoral fellows and a permanent faculty of six.

Gross, a leading string theorist, has been a member of the physics faculty at Princeton since 1969 and is currently the Thomas D. Jones Professor of Mathematical Physics. He earned a bachelor's degree from the Hebrew University of Jerusalem and a PhD in physics from the University of California, Berkeley, and was a 1987 recipient of a MacArthur Foundation "genius" fellowship. In recent years, Gross has been exploring the possibility of constructing a string representation of quantum chromodynamics.

JEAN KUMAGAI

Maiani To Head CERN Council

The governing council of CERN has elected Italy's Luciano Maiani to be its next president. The council, which is made up of scientific and political delegates from CERN's 19 European member states, is responsible for approving all scientific programs and funding at CERN; it is also the interface between CERN's member states and the organization's managers and scientists. One issue that will continue to be of key importance is the future of CERN's Large Hadron Collider project (see *PHYSICS TODAY*, May 1996, page 61).

Maiani, a theoretical physicist at