Stakes Rise in Row over Siting UK Synchrotron Light Source, as Fury Persists over Canceled French Facility

French scientists continue to be outraged by the 2 August decision of education, research, and technology minister Claude Allègre to abandon plans for a state-of-the-art synchrotron light source, and instead to go in on one with the UK. Plans for the UK synchrotron, meanwhile, have stalled over where to site it. As PHYSICS TODAY went to press, an announcement about where the new synchrotron would be built was still imminent—as it had been for months.

The scientific communities in both the UK and France say they need third-generation synchrotrons to replace the aging ones they are currently using. They also say that a single new facility couldn't serve the needs of their combined user communities, whose growing numbers include physicists, chemists, materials scientists, and biologists. Ironically, both in France, where no new synchrotron will be built, and in the UK, where one will be, scientists complain that their governments have shrouded the decision-making process in secrecy.

Baffling secrecy

Scientists in the UK expect to get a new £175 million ($283 million) synchrotron thanks largely to the Wellcome Trust, the world's richest biomedical foundation, which has promised to contribute £110 million, or about one-fifth of the total cost over the machine's lifetime (see PHYSICS TODAY, September 1998, page 50). After Allègre said France would match the UK government's initial £35 million pledge, the idea was to enlarge Diamond, as it's called, and for the three parties to share in the synchrotron's design and management.

Two locations are being considered for Diamond: Daresbury Laboratory, which is near Manchester, is the site of the UK's current synchrotron facility; and the Rutherford Appleton Laboratory, which lies about 160 miles to the southeast, near Oxford, is the site of ISIS, the world's most powerful pulsed neutron source, and other world-class scientific facilities. The negotiations have been aggravated by long-standing tensions between the "poor, hardworking" north and the "rich, spoiled" south of England.

A single synchrotron light source won't suffice for France and the UK.

"It's a matter of whether you stick to a site with existing expertise, or whether there is a scientific benefit to having it at Rutherford, near the neutron source," says Gordon Walker, who oversees both labs for the UK's Central Laboratory for the Research Councils. In Grenoble, France, where the European Synchrotron Radiation Facility (ESRF) and the Institut Laue Langevin are neighbors, the overlap among x-ray and neutron users is only about 10%. Still, there may be scientific arguments for having Diamond and ISIS at one site, says Richard Nelmes, whose groups at Daresbury and Rutherford use both x rays and neutrons for structural studies of materials under high pressure. "But whether they're overriding, I don't know."

Last summer, word spread that Diamond would be built at Rutherford, prompting workers at Daresbury to mobilize a campaign that, for awhile at least, looked like it could be successful in reversing that decision. They lobbied the government and enlisted the support of local members of parliament. Among other things, they argued that the country's synchrotron expertise is at Daresbury; that greater savings would be had by using Daresbury's existing infrastructure; that otherwise up to 500 jobs would be lost; and that putting Diamond at Daresbury would be consistent with the Labour government's policy of encouraging industrial growth in underdeveloped regions. "If Diamond is not built here, the site will eventually be closed," says Graham Bushnell-Wye, a physicist and Daresbury union representative. "The discussion is completely politicized. There seems to be a hidden agenda. The secrecy surrounding this discussion has baffled us all along."

In late November, the Wellcome Trust released a statement publicizing its preference for siting the new synchrotron at Rutherford, because of, among other things, "the potential synergies" of having it at the same site as the neutron source; the areas' strength in genetics and radiobiology; and its concerns about whether Daresbury could provide the "necessary scientific culture and physical environment." Reports earlier that month in *Research Fortnight* and the *Financial Times* went so far as to suggest that if Diamond goes to Daresbury, the Wellcome Trust may pull out, leaving the project in the lurch. "Speculation," a Rutherford lab manager says, noting, however, that both publications "tend to be accurate." It's also said that, for the sake of cheap, convenient travel, the French would prefer to have Diamond at Rutherford—and even that Allègre might use a decision for Daresbury as a face-saving excuse to back out and build Soleil, the canceled French synchrotron light source. The official French position is that the site of Diamond is up to the British.

Trade and industry minister Stephen Byers, meanwhile, in whose hands the decision lies, is said to favor Daresbury. But just after the Wellcome Trust's announcement, he called for studies of the two sites, and of users' views on the matter, and said he would decide on a location in mid-January.

"That's what we've wanted all along—a decision-making process that's in the full glare of publicity, so all issues can be debated," says Victor Suller, the associate director responsible for accelerators at Daresbury. Indeed, scientists in the UK are banking on having more say in designing Diamond than they've had in choosing its location. Says University of Leicester physicist Colin Norris, who chairs the country's synchrotron user forum, "It's been a great problem that the discussion of siting hasn't been open." But most important, he stresses, is that a machine "of the correct energy and specifications" be built. Adds Nelmes, "The bottom line is to get the synchrotron at all."

A bigger machine

Assuming Diamond goes ahead, the design still needs to be firmed up. Because of the Wellcome Trust's hefty contribution, it's being designed to suit protein crystallography studies,

TRANSPORT AND GENERAL WORKERS UNION

PROTESTING THE CANCELLATION of the French synchrotron light source Soleil (French for sun), scientists proclaim (top) that "Soleil will eclipse Allègre." In the UK, people are up in arms over where to site a planned synchrotron, Diamond.

and will have a machine energy of between 3 and 3.5 GeV, providing x rays in the range of 12—14 keV. "That optimizes right in the ballpark the biologists want—they want high flux and high brightness for the selenium edge, to identify molecular structures," says Walker. (Soleil was planned as a 2.5 GeV machine.)

With the French on board, the number of planned experimental stations would be increased, and Diamond would have either 20 or 24 straight segments (up from 16), where undulators and wigglers could be inserted to produce the hallmark higher brilliance of third-generation synchrotron radiation sources.

European scale

When Soleil was nixed by Allègre, it had been on the drawing board for eight years. Says Allègre's deputy, Vincent Courtillot, "We were applying a general decision that all large-scale equipment should be undertaken at the European scale—for financial economies, and, at least as important, in order to forge European science that balances North American and Asian science. We don't think that Soleil as a national machine, for French scientists only, on French territory, is required, given the money we have, and given our other priorities." The detailed proposal for Soleil is technically of high quality, admits Courtillot, "but we are not ready for that amplitude." Money saved by joining the UK synchrotron project, he adds, will go to boost base funding for French research labs.

But only about one-third of France's synchrotron needs would be met by Diamond. And the ministry's solution for meeting the shortfall—buying time on facilities in Germany, Italy, and Switzerland—is widely seen as unrealistic. In particular, straight segments, where insertion devices can be used, are in short supply. Says François Wuilleumier, who is in charge of plans to locate Soleil near the existing synchrotron at the Laboratoire pour l'Utilisation du Rayonnement Electromagnétique (LURE) in Ile de France, one of several regions vying to host the facility, "There is no interest in bending magnets—which may be available. You don't build a third-generation machine for that." At BESSY 2, Berlin's new synchrotron light source, for example, scientific director Wolfgang Gudat says French scientists may compete for time, collaborate with German researchers, or rent experimental space for limited periods. But the competition is tough, he says: "Most experimental stations at insertion devices at every synchrotron lab are overbooked these days."

What's more, critics doubt that Allègre's approach will save money. As much as two-thirds of Soleil's construction (Ff1 billion, or $158 million) would have been paid by local, rather than federal, money. And buying extra beam time and keeping the LURE synchrotron open for longer—Soleil could go on-line sooner than Diamond—would come on top of the money promised for Diamond's construction. In total, says Yves Farge, who carried out a cost comparison and is an adviser to the National Center for Scientific Research (CNRS), which, jointly with France's Atomic Energy Commission (CEA), will oversee French participation in Diamond, "Soleil is just a bit more expensive. But for the federal treasury, Soleil is much cheaper" than joining Diamond. Per experimental station, Farge figures, Soleil would cost only one-fourth as much.

Unhappy with Allègre

But most upsetting to French scientists is that the cancellation decision was made without their involvement. Allègre is believed to have based his decision on a report comparing money spent on synchrotron radiation in the US and Europe. The report, by Paul Clavin, a physicist, but not a synchrotron expert, is secret. "When it was requested, it was to be confidential, to keep it more honest," says Courtillot. Yves Petroff, director of the ESRF and one of a handful of scientists to have seen the Clavin report, says, "It's not serious. Almost everything he quoted was incorrect—this report was done to please the minister." Beyond the question of Soleil, adds Petroff, "Can you accept that the minister takes such a decision without consulting the community?"

Claude Cohen-Tannoudji, for one, doesn't accept it. In protest, he, along with two other scientists, quit Allègre's science advisory committee in October. "Important questions were raised after the decision had been taken, and not before," says Cohen-Tannoudji (who was replaced on the committee by fellow physics Nobelist Georges Charpak). "I am for European and international collaboration—every scientist is—but I am afraid that the decision was taken without thinking things through. In scientific matters, one should have open debate."

At LURE, the management protested Allègre's decision by blocking the radiation, preventing experiments for nearly two months. Early on, the lab also collected more than 2000 signatures from its users for a letter to France's prime minister, demanding that the government withdraw from Diamond and that Soleil be built.

To be sure, no one actually expects

the minister to change his mind. But French scientists haven't given up hope for Soleil. Says LURE director Robert Comes, "Allègre is not eternal. If we have to wait until he leaves, we will wait." To counter delays, Comes says France may start building instruments intended for use on Soleil that, in the meantime, could be used either at LURE or other facilities. The best compromise now, he says, "would be to build Diamond and Soleil—both as international facilities." **TONI FEDER**

UMinn Faculty Teach Each Other Science

The University of Minnesota's Twin Cities campus is trying to get its physical and life sciences faculty members talking, and working, together. New programs at the university, says biophysicist Victor Bloomfield, "are in the broader context of mathematicians and physicists making a serious effort to learn something about modern biology."

For example, in a seminar series launched this past fall, physical scientists, engineers, and biologists are discussing their current research; the topics touched on so far include mathematical models of bacterial chemotaxis, microbial growth, and metabolic pathways. Hosted jointly by several departments, the seminars are presented by both in-house and visiting scientists, and are intended to stimulate new collaborations. An earlier seminar series that focused specifically on math and physiology, "led us to believe that there is a great deal of interest on both sides to pursue this," says UMinn physiologist Robert Miller. "We discovered that many times when biologists would present material, mathematicians didn't have enough background to know where it was going. We want to try to get to a level where people can talk about research at the cutting edge."

This March, Miller and others will be offering a weeklong intensive course in molecular biology and neuroscience—"areas where we felt physicists and engineers would benefit most from the exposure," Miller says.

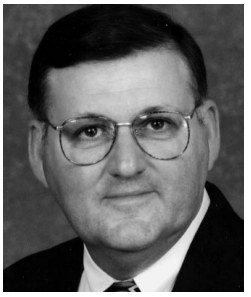
There's "a scientific and cultural need-to-know," says biologist Harvey Lodish, who organized a similar course at MIT a few years ago. "There was a period when engineering undergraduates were conversant in biology—but their professors were not." Many of the participants were already working in cross-disciplinary areas, Lodish says. "They were doing tissue engineering without knowing molecular biology. It was a crash course to get them up to speed." Ever since, he adds, biologists at MIT have been "pestering the engineering school to offer us such a course—to teach us about imaging, microfabrication, silicon wafers, DNA chips."

UMinn's new faculty-to-faculty cross-disciplinary seminar series and intensive course are both being funded largely through the graduate school with $10 000 from the McKnight Foundation. "The university is putting a special emphasis on enhancing the growth of the life sciences, and there are new sources of funding for bioengineering research," notes Miller. Among other efforts to boost interdisciplinary science at UMinn is a PhD degree program in computational neuroscience launched last year; a new graduate minor in bioinformatics is also in the works. Says Miller, "Biological sciences will be a dominant theme for the next century. We have to make sure that people know enough. This effort is both educational, and to open dialogue." **TONI FEDER**

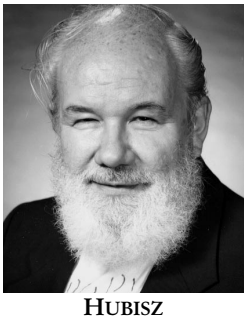
Chiaverina and Hubisz Join AAPT Presidential Line

At the winter meeting of the American Association of Physics Teachers, Chris Chiaverina, a physics teacher at New Trier Township High School in Winnetka, Illinois, will become the association's vice president. AAPT will also get a new president-elect, John Hubisz of North Carolina State University. Ruth Howes of Ball State University is AAPT's president for 2000; she assumed the position following the untimely death last April of the association's president-elect, Robert Sears Jr (see his obituary in the October issue, page 106).

Hubisz, who holds a PhD in physics and space science from York University, has been a physics professor at North Carolina State since 1993. Prior to that, he was a professor at College of the Mainland in Texas City, Texas, for 22 years, and from 1955 to 1971, he was at Francis Xavier University. A long-time member of AAPT, he has served on and chaired numerous committees within the association, including the pre-high school committee (which he helped found) and the committee on physics in two-year colleges. Hubisz, who is also an ordained minister, received an award last year from the Templeton Foundation for a science and religion course that he created.



CHIAVERINA



HUBISZ

Chiaverina, the new vice president, holds an MS in physics education from Northern Illinois University. He has been teaching high school since 1968 and has received a number of teaching awards. He has also been active in organizing amusement park physics programs and other projects designed to make physics more accessible to a broad audience.

In other results of the AAPT elections, Alexander Dickison of Seminole Community College was reelected treasurer, and Carolyn Haas of Salem Community College was elected member-at-large for two-year colleges.

Sartwell Is AVS President-Elect for 2000

Members of the American Vacuum Society recently elected Bruce Sartwell to be their next president-elect. Sartwell, who took office on 1 January, succeeded Paula J. Grunthaner, AVS's president for 2000.

A research physicist at the Naval Research Laboratory in Washington, DC, Sartwell holds an MS in materials engineering from the University of Maryland, College Park. From 1973 to 1982, he worked at the Bureau of Mines' metallurgy research center in College Park. He then joined NRL's condensed matter division, where he conducted studies on the effects of energetic ions on the growth of thin films. In 1994, he transferred to the lab's chemistry division. Sartwell currently manages several Department of Defense programs, including one to replace chrome plating with thermal spray coatings on military aircraft components, another to set up a production-scale system for treating hazardous wastes using plasma arc technology, and a third to demonstrate improved material performance using ion implantation.

In addition to Sartwell, AVS members reelected Joseph Greene (Uni-