entists from the Middle East and the Mediterranean, who have little experience running a large research facility or using synchrotron radiation. Winick announced in Paris that he's received positive preliminary feedback about bringing scientists from the region to work at the US Department of Energy's four synchrotrons. (However, scientists from some participating countries could have trouble gaining entry to US labs due to DOE's recent security woes.)

Science large and small

Then there are the questions of whether a big project is the best way to boost science in the Middle East, and whether the region has enough potential synchrotron users to sustain a large facility like BESSY IA. "If everybody knew they needed a machine, it would be easier," says UNESCO's Siegbert Raither. The advantage of this particular project, he continues, "is the opportunity—the Germans are making a gift. It's a large project, in terms of cost, size, and sophistication. But the fact that you can do tabletop experiments is a powerful argument in its favor."

Khaled El-Shuraydeh, of Jordan's Council for Science and Technology, guesses that about a dozen scientists from his country would use the synchrotron. That's Assaf's estimate for the number of potential Palestinian users, too—out of 400 science PhDs, including 70 physicists, he notes. That's enough, says Schopper. "We don't have to start big." And the region's scientists hope that the center would lure home their colleagues, many of whom are working in the US and Europe.

At the end of the Paris meeting, the participants set up committees to look into the scientific, technical, and financial aspects of the proposed Middle East facility. An Israeli nominated a Palestinian to serve on one of them, which "wouldn't have happened ten years ago," observes Israel's Rabinovici, a string theorist who says his main interest in the project is its potential for fostering peace. About the hurdles ahead, Rabinovici sums up, "We have to make sure we have the human resources in the region. We have to build a first-class machine that will attract people from around the world. And we have to raise the finances. None of these obstacles is insurmountable. But it's important to me that if we do this, it should succeed." Or, as Palestinian physicist Ghassan Saffarini puts it, "We don't want to end up with a cathedral in the desert."

Toni Feder

Germany Narrows Reactor Fuel Choices

Converting the Technical University of Munich's new research reactor, the FRM2, to burn low enriched uranium (LEU) instead of highly enriched uranium (HEU) is feasible. That is the key finding of a six-member panel commissioned by Germany's Social Democrat–Green coalition government in its effort to reduce the risk of nuclear proliferation (see Physics Today, March, page 78).

In its 21 June report, however, the panel ruled out converting the FRM2 to burn LEU (less than 20% uranium-235 enrichment) with the originally planned neutron flux of 8×10^{14} cm^{-2} s^{-1}, since the changes would require upping the reactor power from 20 MW to 32 MW, which would be tantamount to starting over.

The panel outlined other conversion options that would not require increasing the power. The reactor could be refitted before startup to burn LEU or a medium enriched uranium (MEU, 26% ^{235}U), and later be switched to burn a new type of LEU. Specifically, low enriched uranium molybdenum alloys, with higher uranium densities than the uranium silicide fuels currently used, are expected to become available around 2005. Or the reactor could be started up in 2001 with weapons-usable HEU (93% ^{235}U) as originally planned, and eventually be switched to burn high-density LEU or MEU (50% ^{235}U).

Not surprisingly, the FRM2 team is pushing for the HEU-to-MEU option. Requiring the least modification, it would be the cheaper choice (DM 12 million, or about $6.2 million), and operations would barely be disrupted, says Klaus Böning, the FRM2's deputy head. Using MEU (50% ^{235}U) would reduce the neutron flux by 7%. "We are not very happy about that, but we could accept it," says Böning. With the LEU options, on the other hand, the neutron flux would drop by about 25%, resulting in a great loss for cutting-edge experiments, he claims. Depending on who's calculating, converting the FRM2 before startup, as most of the panel members favor, would cost less than DM 100 million or as much as DM 300 million—the panel and the FRM2 team disagree about the cost, as well as the neutron flux reduction and time delays associated with the conversion options.

Burning HEU would be bucking an international trend: Last fall, for example, the Institut Laue-Langevin in Grenoble, France, announced plans to convert its reactor, the world's premier neutron source, to LEU. Panel members argue that switching the FRM2 to LEU now would not only best meet international nonproliferation goals, but would also be safer and cheaper than modifying a "hot" core; the fuel would be available; and the spent fuel could be disposed of. Indeed, notes panel member Peter Armbruster, of the Heavy Ion Research Center in Darmstadt, "Germany cannot get rid of the HEU spent fuel—this has to be safely stored in a now nonexisting long-term deposit for HEU fuel. The Technical University of Munich may be surprised to see the future fuel bill eating up the necessary investment budget for the FRM2." And if the FRM2 starts off using HEU, worries panel member Wilfried Krull, director of the Geestacht Research Center reactor, "conversion will never take place even if there are political commitments. There will be enough reasons to delay and delay."

Germany's federal government, together with the Bavarian state government, which has put up most of the DM 800 million for the FRM2, is expected to decide among the conversion options by the end of the year.

Toni Feder

Bean Counting Begins in UK Universities

Universities and colleges in the UK must now account for how they spend their money, a requirement the government attached to a budget hike last year, and for which it adopted a plan this past June.

The so-called transparency review requires academic staff time to be attributed to teaching, research, or administrative and other activities, and for funds from public and private sources spent in those categories to be tracked separately. Says Jim Port, whose consulting firm in Bristol devised the procedures to be followed, "We tried to come up with something that is sufficiently rigorous and auditable to satisfy government, but at the same time is sensitive—academic time is a rather more subtle thing than other commodities."

The plan is for heads of departments to ensure that their colleagues' time is tallied retrospectively at least once a year, with surveys or diaries being filled out periodically as validation. The costs of maintaining infrastructure such as buildings, libraries, and computing facilities are also supposed to be folded into the ledgers. Eight universities will test the new record keeping this coming academic year, followed in 2000–1 by the country's 30 most research-intensive universities, with the remaining 140 or so colleges and universities starting in academic year 2001–2.

How burdensome will the new accounting be for academics? "It's the validation mechanism that worries me," says Robin Jackson, a policy adviser to the Committee for Vice Chancellors and Principals, a body that represents UK universities. "And the timetable is very compressed. There will need to be time to iron out problems that may arise with the pilots." Like everyone else, Ian Crawford, who is coordinating implementation of the new record keeping system for the University of Bristol, one of the pilot institutions, expects academics' concerns—about having to spend time detailing how they spend their time—to be the biggest challenge: "It requires a change of culture within universities," he says. "We always feel rightly nervous about increased bureaucracy," adds Ken Pounds, a physicist at the University of Leicester and former head of the UK's Particle Physics and Astronomy Research Council. "The advantage is that complete transparency may help researchers at the bench get the intended funding out of their university administration."

And it's pretty clear, Jackson says, "that if we want to hold the funding level, or argue for a further increase, as we probably will want to, we must meet the requirement on transparency."

TONI FEDER

Cablecar Tragedy at Alps Observatory Claims 20 Lives

News of the tragic cablecar accident on 1 July at the Institute of Millimetric Radioastronomy's (IRAM) interferometer observatory in the French Alps has shocked and saddened the radioastronomy community. At press time, investigators had yet to identify what caused the car to come loose from its cable shortly after beginning its climb up to the Bure plateau, where IRAM's five-antenna millimeter-wave array sits. All 20 passengers were killed, including five technicians from IRAM; the rest were workers hired to clean the station and to install communications equipment and tracks for a new 15 m antenna.

The Bure facility, currently the world's largest millimetric interferometer, is used by researchers throughout the world for millimeter-wave spectral line and continuum observations, including star and planet formation, circumstellar envelopes, and galaxy structure.

The cablecar had provided the only regular access to the plateau. At present, personnel and some supplies are being ferried to and from the site by helicopter. Completion of the new antenna, originally set to go on-line later this year, will be delayed by a few months. A remaining concern is how the facility will be staffed and maintained into the winter months, as the weather turns more severe.

Headquartered in Grenoble, France, IRAM is run by France's National Center for Scientific Research (CNRS), Germany's Max Planck Society, and Spain's National Geographical Institute. In addition to the Bure array, IRAM operates a 30 m millimeter-wave telescope on Pico Veleta in the Spanish Sierra Nevada. The institute is also a participant in ALMA, the Atacama Large Millimetre Array project, which aims to build a vast array in South America. ALMA would have a collecting area of up to 7000 m^2, roughly seven times that of the Bure interferometer.

JEAN KUMAGAI

IN BRIEF

On 2 July, the World Conference on Science ended its six-day meeting in Budapest by adopting a "Declaration on Science" and a "Framework for Action." Cosponsored by the International Council for Science (ICSU) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the conference was the first of its kind in 20 years and drew some 1800 scientists, policymakers, and activists from 150 countries. The resulting statements address a wide platform of issues—science's role in development, research ethics, gender inequality, and intellectual property rights, among other things—but are nonbinding and so broadly worded that, as one delegate put it, "Who's going to disagree with them?" For example, the framework urges governments to commit "adequate" funds for science and technology education and research but gives no specific figures. The real test lies ahead: UNESCO and ICSU plan to convene

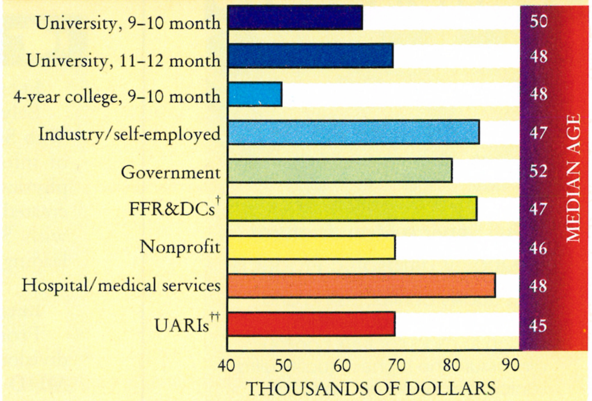
Salaries Rise, Unemployment Falls among PhD Physicists

The median annual salary for PhD physicists in the US was $70 000 in 1998, up 8% since 1996, and PhD unemployment was down to 0.7%, the lowest rate in a decade. These are among the findings of the latest American Institute of Physics salary survey of members belonging to its ten member societies. (The graph shows a salary breakdown for PhDs by employment sector; the data do not include postdocs.)

Respondents with master's degrees and bachelor's degrees in physics, who together constitute about one-fifth of AIP member society membership, reported annual median salaries of $57 000 and $54 000, respectively, reflecting increases of 4% and 8% since 1996.

Not all salaries kept pace with inflation. The $45 000 median salary for high school teachers with master's degrees, for example, was only 3% higher than in 1996; the two-year inflation rate was 3.8%. And the median salary for university professors on 11–12 month contracts was 1% lower than in 1996; that decline, however, can be attributed to the respondents' lower median age and fewer years of experience, the survey report concludes.

PhD salaries by major employment sector, 1998.



†Federally funded research and development centers.
††University-affiliated research institutes.

Among respondents who received their PhDs within the past five years, median salaries varied widely: $35 000 for postdocs, $44 900 for assistant professors on 9–10 month contracts, $60 000 for federal government employees, $68 300 for industry workers, and $70 000 for those working at federally funded R&D centers. Earnings within certain employment sectors also varied; in industry, for example, salaries among recent PhDs ranged from $50 000 to $83 000.

Single copies of *1998 Salaries: Society Membership Survey* are $15 each ($10 for multiple copies) and can be ordered from AIP, Education and Employment Statistics Division, One Physics Ellipse, College Park, MD 20740; e-mail stats@aip.org; Web http://www.aip.org/statistics/trends/emptrends.htm.