director for the DOD site, explains, "the basic instrument could in many ways be the same [for DOD and NSF], but the location needs are different. We want to operate an incoherent scatter radar in conjunction with a high-frequency transmitter, and the two need to be within about 10 miles of each other." And NSF, in its site-justification report, argues that the planned science can be done only from inside the polar cap. Pointing out that no site in Alaska "does more than brush against the region of interest," Kelley says the research community "didn't consider Gakona for a microsecond." Ironically, he adds, the incoherent scatter radar now in Greenland was moved there about 25 years ago from Alaska to align it longitudinally with NSF's other radars. "It didn't make sense then [for NSF] to have a radar in Alaska, and it doesn't make sense now."

Scientists involved with the PCO suspect that the Senate Appropriations Committee missed the crucial importance of placing the observatory near the magnetic pole. They also fear that the PCO has become mixed up in US–Canadian politics. In particular, they note that a crossborder dispute over salmon fishing was heating up last summer, just when the Senate committee was questioning the need to build the PCO at Resolute Bay. But a Senate insider doubts that an incoherent scatter radar would provide much leverage in the fishing wars. NSF hasn't made a convincing case for why the incoherent scatter radar couldn't still be shared by NSF and DOD by locating it somewhere between Gakona and Resolute Bay, he says, nor for why Canada isn't contributing more to the project. (Canada's main contribution would be the site at Resolute Bay.)

The hope, says Behnke, is to get Congress's blessing to use $5 million from the foundation's FY 1998 geosciences coffers, and to try to "get back on track for the next budget cycle." Half of this initial funding would be for engineering studies, and half for getting the site ready, Behnke says. But that hope slipped another notch in mid-June, when a Senate appropriations subcommittee reportedly struck the PCO from NSF's FY 1999 budget request.

Whatever the reason for the Senate's reluctance to fund the PCO, it has meant missing this year's ship to Resolute Bay. "There is a severe danger that the PCO won't be operational" in time for the next solar maximum, says University of Saskatchewan atmospheric physicist Donald McEwen. "That doesn't make it lose importance, but it loses some of its impetus."

TONI FEDER

Nuclear Waste Shipments Halted in Europe

In May, several European countries suspended all nuclear waste transport in response to revelations of contamination of the shipping containers and their transport vehicles.

Up to a third of the spent fuel shipments that nuclear power companies have sent over many years to Cogema's reprocessing plant in Cap de la Hague, France, have had loose surface radioactivity above the legal limit of 4 Bq/cm^2, with instances recorded of more than 3000 times that. The contaminated trucks, railcars and spent fuel casks have the gamma-emitter cobalt-60 on their exterior surfaces. Government officials in France, Germany and Switzerland, the countries where most of the contaminated shipments originated, claim to have learned of the violations only in recent months, but Cogema and utility operators admit that they've known of them since at least the mid-1980s.

Public outcry over the contaminated shipments has been intense in the countries involved, and particularly in Germany, where the topic has been front-page news since the story broke on 6 May, in the French daily newspaper *Libération*. Germany's federal and state governments have sharply criticized the nuclear power companies, its police and railway workers complain that they have been exposed to radioactivity despite having been reassured otherwise, and the Green and Social Democratic parties are calling for the federal environment minister, Angela Merkel, to resign. Perhaps the scandal's biggest impact—everyone from Greenpeace to Cogema agrees—is the betrayal the public feels, and its consequent loss of trust in the nuclear industry.

"The problem was not kept hidden," insists Catherine Tissot-Colle, of the Cogema subsidiary Transnucléaire. Transports are checked upon arrival for reprocessing, and "each time a discrepancy is found, the customer is informed. We are working with the utility companies to find the best way to stop the contamination," she says. "We treat it as a technical problem because the levels measured have no impact on the public or the environment."

National safety authorities and the International Atomic Energy Agency agree that the excess radioactivity on the transports probably did not pose a health risk, with the possible exception of inhalation or ingestion. But others warn that the risk has not yet been properly assessed. Even Jean-François Lacronique, who heads the Office de Protection contre les Rayonnements Ionisants, the French government body in charge of radiation protection and health issues, says that there is no scientific basis for claiming negligible risk—particularly regarding possible long-term health effects. "We must be prudent. It's a matter of reconstructing doses, and this must still be done," he says.

French National Railways reacted to the news of the contamination by stopping all nuclear waste shipments, and the governments of Germany and Switzerland have banned them. Spent fuel shipments to Europe's other major reprocessing plant, in the UK, at Sellafield, have been found to be similarly contaminated. And shipments from The Netherlands and Belgium have also topped accepted surface radioactivity levels, but the problem in those countries is minimal, as they produce very little nuclear waste, according to André-Claude Lacoste, who heads the Direction de la Sûreté des Installations Nucléaires (DSIN), the government body that oversees civilian nuclear

SPENT FUEL en route to Cogema's reprocessing plant in La Hague, France—before the ban was put in place.

ROUSSELET YANNICK/WISE

safety in France.

It's generally believed that cleaning of the casks, which are immersed in radioactive cooling water when the spent fuel rods are loaded, has been inadequate. And, noting that utility companies' records show that the levels of contamination have gotten worse over time, the Paris-based World Information Service on Energy's Mycle Schneider, who uncovered the story, suggests that cross-contamination between railcars, trucks and casks is also a factor. In a report prepared for the French prime minister, Lionel Jospin, DSIN's Lacoste blames the utility companies for the transgressions. He also notes that his organization gained responsibility for nuclear waste transportation only last summer; before that, government oversight in France had been scanty.

Nuclear waste shipments will resume only after the cause of the contamination has been determined, and procedures implemented to remedy the situation, say German, French and Swiss officials. **TONI FEDER**

Eastman Exits Argonne

On 30 June, Dean E. Eastman stepped down from the directorship of Argonne National Laboratory to join the physics faculty at the University of Chicago, which runs Argonne for the Department of Energy. Eastman plans to resume research in condensed matter physics after nearly 20 years in technology administration, mostly at IBM Corp, where he worked before moving to Argonne two years ago.

As director of Argonne, Eastman worked to strengthen funding for the lab's core science and technology capabilities, including computer science, nuclear physics, energy and environmental research. He also made changes in administrative practices. "The result was that I moved more than $20 million per year from the administrative side of the lab to the programmatic side," he says.

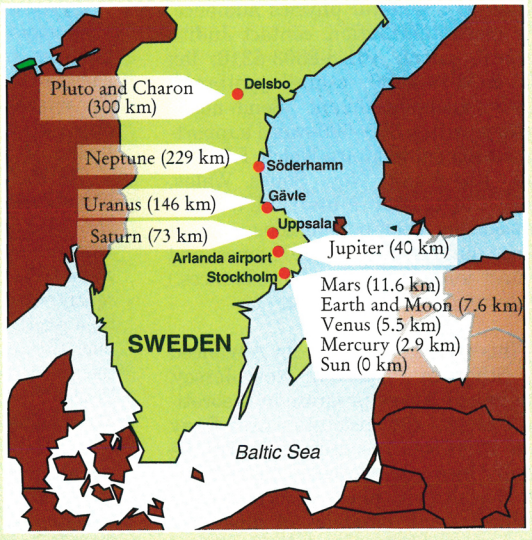
"Maintaining a quality lab with good job satisfaction under the continued pressure on discretionary funding is the greatest challenge in leading Argonne—as with other government-funded research institutions," says Eastman. He introduced new performance-based appraisal and compensation policies, so that Argonne employees now work more closely with their supervisors to define job expectations, and compensation is clearly linked to performance, he says. "To me, coming from the private sector, it was obvious that you want to have a system that both creates performance incentives and is viewed as fair. It helps the quality of the workplace."

Having gotten "pretty far" with his goals for the lab, Eastman says, he decided to step down. "Some months ago I reached the conclusion that I would really like to have a better balance between my professional and personal interests."

An interim director had not yet been named when PHYSICS TODAY went to press.

Sweden Recreates the Solar System

The next time you're in Stockholm picking up that Nobel, you could check out the Sweden Solar System, the world's largest model of our planetary system. Created on a scale of 1:20 million, the SSS is centered at Stockholm's Globe Arena, an 85-meter-high spherical building that represents the Sun and its corona. From there, the planets are arrayed along a mostly northerly line, with Mercury, Venus, Earth and Mars falling within Stockholm city limits, and Pluto lying some 300 kilometers distant.



Scaled models of the planets and accompanying exhibits are being installed at each site, says Gösta Gahm, an astronomy professor at Stockholm Observatory who, with plasma physicist Nils Brenning of the Royal Institute of Technology, has led the project. In May, a 62 cm diameter model of Venus was unveiled during the 250th anniversary celebration of Stockholm's Old Observatory. Last month, at a folk festival in the tiny burg of Delsbo, sculptor Bergsteinn Asbjornsson presented his model of Pluto (12 cm) and its satellite Charon (6 cm). Inspired by the pair's unusual synchronous rotation, he has depicted them as crystal orbs revolving around one another in tiny sandstone and basalt boats. The remaining planets will be completed over the coming year or so. "At this scale, one gets the direct feeling of how empty and desolate space is, how small and far away the planets are," notes Gahm.

The SSS first occurred to Brenning about four and a half years ago, as he prepared to give a talk at his daughter's grade school. Paging through back issues of *Sky and Telescope*, he happened to spot the article "Modeling the Universe in Your Mind," by Hugh Downs. "At that instant, the idea came ready-made into my mind to use the Globe Arena for the Sun," Brenning recalls. "I pulled out a map in the telephone directory and soon found that I could fit the inner planets quite nicely into the city of Stockholm." He continued to toy with the idea, and about a year later, he posed it to Gahm, who's known in Sweden as a science popularizer and served as director of the Swedish Museum of Natural History in the 1980s. As Brenning remembers, "Gösta simply said, 'Nice idea, let's do it!' " And so they set about selecting sites, drumming up interest and, not least of all, raising money.

So far, the project has been budgeted about $750 000 from various sources, with additional costs being borne by each site and defrayed by a lot of volunteering, by Gahm, Brenning and others. Although still unfinished, the SSS has received wide coverage in the Swedish press, and public interest is "already enormous," Gahm says. Indeed, adds Sven Lorentzi of the Stockholm Information Service, it promises to become a major tourist attraction—for those who want to travel the Solar System without leaving Sweden. **JEAN KUMAGAI**

IN BRIEF

The Australian Institute of Physics is accepting nominations for its second annual Women in Physics Lecturer. The award will go to a woman who has made a significant contribution to physics research and who has also demonstrated public speaking ability. The winner will give a lecture tour in Australia for 2–3 weeks next