

"Despite extensive questioning, we did not get a clarification as to how [the policy] is being interpreted," says Joseph Birman, Distinguished Professor of Physics at City College of New York and chair of the NYAS Committee on Human Rights of Scientists. "For example, while 'quantum chemists' was a deniable category, 'physical chemists' or 'environmental chemists' may not be." He points out that during the cold war, Soviet physicists routinely were granted visas by the US. "Basically, what I think we achieved was revealing the arbitrariness of our government's actions in this area."

How will this policy affect the US's eligibility to host international meetings? Meeting organizers seeking IUPAP sponsorship, for example, must be able to show that all qualified scientists will be welcome. The denial of visas to attend an IUPAP-sponsored meeting can result in the union's recommending that "no conferences be held in the country in question" until the offending policy is changed. As a precaution, IUPAP urges meeting attendees to apply for visas at least three months before they intend to travel.

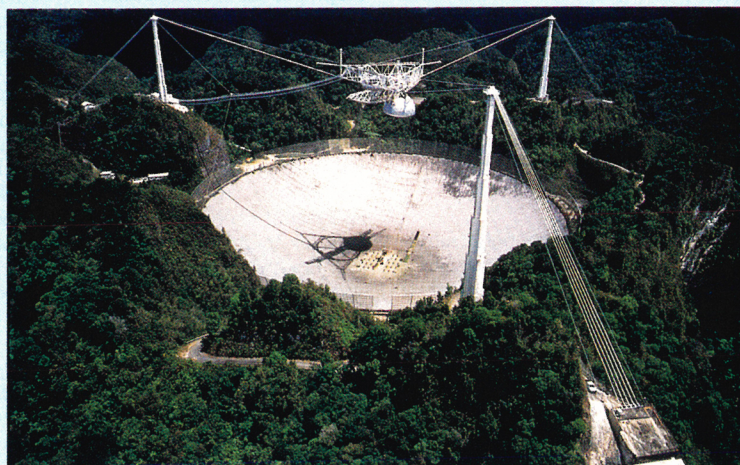
Birman and Lerch recommend that any US researcher who is inviting Cuban colleagues should forward as much information as possible to the State Department's Office of Cuban Affairs, to clarify that the visit is for bona fide scientific activity with no foreseeable military implications. "This is not saying it will help," Birman says. "But it might."

A cancelled trip

During their thwarted March trip, Montero and his colleagues had planned to attend the Sanibel Symposium on quantum chemistry in St. Augustine, Florida, and to meet with researchers in Georgia and New York. Montero has had "fruitful scientific exchanges" with researchers in Sweden, Spain and Germany, and he hopes to do the same in the US. The March visit, he says, was meant "to build bridges for future exchange, by showing who we are and what we are doing in science to an academic community which is fairly far from us, even though it is the nearest geographically."

Yngve Öhrn of the University of Florida, who was head organizer of the Sanibel Symposium, says that about 35 countries were represented at this year's meeting, with a number of participants from Latin America, as well as the former Soviet Union and China; only the Cubans were barred from attending. That is unfortunate, Öhrn says. "Quantum chemistry is a truly international field, and the total number of people in it is very small. So

Arecibo Telescope Is Upgraded



DAVID PARKER, 1997/SCIENCE PHOTO LIBRARY

The dome suspended above the telescope dish is 26 meters in diameter and weighs about 75 tons. Inside it, among other things, are 22- and 8-meter mirrors and electronics—the new Gregorian focusing system and cryogenically cooled receivers installed at the National Astronomy and Ionosphere Center's Arecibo Observatory in Puerto Rico. Hoisted 150 meters above the bottom of the 300-meter-diameter radio-radar dish in mid-May, the dome is part of a \$25 million upgrade, paid for by NASA and the National Science Foundation.

The fixed, spherical dish can be focused by positioning the dome along a suspended track. And focusing signals by using mirrors (rather than the line feeds previously used) has increased the telescope's sensitivity by about 3 to 20 times, according to Tor Hagfors, now at the Max Planck Institute for Aeronomy in Katlenburg-Lindau, Germany, who headed the upgrade design team, and Don Campbell, a planetary astronomer at Cornell University, who supervised the project. The new setup also extends the instrument's observable frequency range to 10 GHz; with the line feeds, 3 GHz was the maximum. To shield from thermal ground radiation, a 15-meter-high steel fence has been added around the telescope's perimeter, and a new 1 MW transmitter, housed in the dome, more than doubles the power that can be transmitted for radar astronomy experiments.

The world's largest single-dish telescope, Arecibo Observatory is used for radio pulsar research, planetary and asteroid astronomy and studies of the ionosphere, interstellar matter and distant galaxies.

TONI FEDER

when you have a meeting like this, it's important to have as wide a representation as possible."

Montero and his colleagues had also planned to visit Clark Atlanta University's Center for Theoretical Studies of Physical Systems and Cornell University, where they'd been invited by Nobel laureate Roald Hoffmann, Paul Houston and Andreas Albrecht as a follow-up to trips the three Cornell professors had made to Montero's lab.

Like everyone else in Cuba, the University of Havana group must contend with the long-standing US trade embargo, which makes it difficult to get computer parts and other research equipment. Still, Albrecht says, their work is impressive: "They've adapted and optimized available quantum chemical codes to run on their PCs. They have their own approaches that are very interesting." That includes computational studies of hypersurfaces of solute-solvent supermolecules for

modeling environmental effects on calculated molecular properties; application of the Bardeen-Cooper-Schrieffer approach to correlation energy in molecules; and theoretical models of interactions between proteins and antibiotic enzyme inhibitors.

The cancellation of Montero's trip was "horribly disappointing," says Albrecht. "The message is that the US can do whatever it wants with respect to Cuba. But we wouldn't dare do the same thing with China, because of the economics."

JEAN KUMAGAI

Government Employs Physicists in Many Ways

A recent study of physicists in government finds that "government is not a homogeneous entity." Indeed, wide variations in age, education and work activities are seen among government physicists depending on where