



The US National Science Foundation has decided to give the ALMA Vertex Prototype Antenna, which can probe the Universe using sub-millimetre-wavelength radio waves, to an institute in Taiwan.

## ASTRONOMY

# Antenna decision makes waves

*Procedural transparency is at issue as a US agency transfers a high-precision radio dish to an international partner.*

BY EUGENIE SAMUEL REICH

Free to a good home: one 12-metre radio antenna, perfect for high-resolution sub-millimetre-wavelength astronomy. Pick it up yourself; no guarantees. Estimated value: US\$10 million to \$15 million.

It was nearly that straightforward. Last year, the US National Science Foundation (NSF) put out a call for expressions of interest in a prototype antenna that it had funded to test specifications for the Atacama Large Millimeter Array (ALMA), a 66-dish radio observatory now nearing completion in Chile. But what began as an opportunity for some cutting-edge science now has some US bidders crying foul after the NSF told them in early January that it is giving the Alma Vertex Prototype Antenna to an institute in Taiwan.

“We’ve tried to find out why the NSF made the decision and we’ve been given only generalities,” says Lucy Ziurys, an astrochemist at the University of Arizona in Tucson and the principal investigator for one of the US bids. Any suggestion of improper decision-making

would be sensitive for the NSF at a time when government agencies are bracing for scrutiny from a budget-conscious Congress — and the donation of a major piece of research hardware outside the United States could raise uncomfortable questions.

The antenna is valuable to astronomers because it is designed to probe the Universe using radio waves with wavelengths shorter than 1 millimetre — an under-explored region of the electromagnetic spectrum. Ziurys and her colleagues had proposed to put it on Kitt Peak, 60 kilometres southwest of Tucson, where it would be used to study the composition and dynamics of interstellar clouds, including star and planet formation. Instead, the dish will go to the Academia Sinica Institute of Astronomy and Astrophysics (ASIAA) in Taipei.

Ziurys says that a group convened by the US National Radio Astronomy Observatory (NRAO) — which runs the facility near Socorro, New Mexico, where the antenna is currently located — ranked the University of Arizona’s bid above ASIAA’s for technical merit. But that was not enough to sway Vernon Pankonin, deputy

division director for astronomical sciences at the NSF, who says that he chose ASIAA as the winning bidder after consulting with an anonymous assessment group internal to the NSF. The group considered the NRAO recommendation, but concluded that ASIAA’s bid was superior when several other factors, including scientific merit, were taken into account. The decision was not subject to an external peer review as an NSF grant would be. “It is a transfer of property completely independent of the NSF’s grant and award process,” says Pankonin.

At the NSF’s direction, the original call for bids was issued by the NRAO, whose director, Fred Lo, is chairman of ASIAA’s advisory panel and is friends with Paul Ho, director of the institute. Lo acknowledges the friendship and says that he may have discussed the antenna with Ho. He also says that he drafted the call for expressions of interest, which noted that proposals for the dish would be considered not only from the United States, but also from “the communities that form the North American ALMA region (i.e. Canada and Taiwan)”. Lo says that the sentence was included at the request of the NSF; Pankonin says the process of deciding to include it was “interactive” between the NSF and NRAO. Lo says that after the call, he stayed out of the decision-making. “Precisely because of the potential charge of conflict of interest, the NRAO was quite careful. It took an objective process,” he says.

Christine Boesz, a former inspector-general of the NSF, says that no matter what the final decision was, it could be seen as problematic for a person who could be partial to one bidder to write a call for expressions of interest. “You could raise the question of is it really arms-length decision-making,” she says. Zachary Kurz, spokesman for the Republican majority of the House Committee on Science, Space and Technology in the US Congress, says that committee staff are “starting a dialogue with the NSF” about a possible conflict of interest.

Officially, the antenna is being given to the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, which collaborated with ASIAA on the proposal, so on paper it will remain a US asset, says Pankonin. Nevertheless, the proposal makes it clear that ASIAA will take responsibility for the antenna, which it plans to use for very-long-baseline interferometry (VLBI) — a technique in which data from radio telescopes continents apart can be combined to produce high-resolution images. The group’s primary targets include the centre of the galaxy M87, which contains the only supermassive black hole beyond the Milky Way whose perimeter could potentially be imaged using VLBI. A location for the antenna has not yet been confirmed, but ASIAA is interested in an NSF site known as Summit Station, at the peak of the Greenland ice sheet, where the cold, dry air would allow the telescope to see even shorter wavelengths than are detectable at Kitt Peak. ■