

SCIENTIFIC COOPERATION

African Physicists Set Their Sights on Mammoth Scope

DAKAR—At times, it has looked more like a scene from the movie *Braveheart* than a science conference. “Together we are stronger!” intoned Charles McGruder III to a room packed with physicists from across Africa, who applauded and pumped their fists in the air. McGruder, an astronomer from Western Kentucky University in Bowling Green and a past president of the U.S. National Society of Black Physicists (NSBP), was calling on the scientists here to show a united front in Africa’s bid to host what would be the world’s largest scientific instrument, the Square Kilometre Array (SKA) radio telescope. Last week’s meeting* in the Senegalese capital not only was the first physics conference spanning the continent but also became a rally for African science, including the establishment of a new African Physical Society.

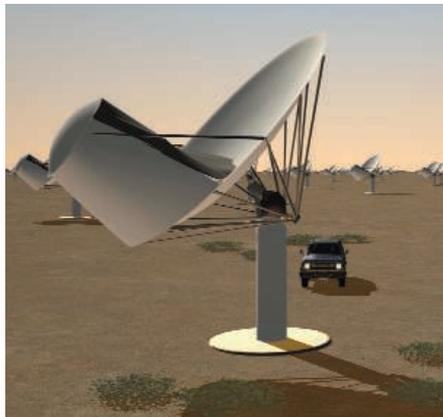
On the minds of many here was SKA, a next-generation radio telescope that will probe gas clouds in the early universe with a collecting area 100 times that of the Very Large Array in Socorro, New Mexico. A lengthy site-selection process has already eliminated China and South America, leaving just Africa and Australia (*Science*, 29 September 2006, p. 1871), with a final decision by the 19 SKA member states due in 2012. “Five years ago, everyone assumed that Australia was sure to get the SKA,” says Phil Charles, director of the Southern African Large Telescope (SALT), an 11-meter optical instrument in Sutherland, South Africa. Australia has long been “a giant” of radio astronomy, he says, whereas Africa had almost no radio telescopes.

But then in 2006, the government of South Africa committed \$250 million to constructing an array of radio dishes as a precursor to the African SKA. Seven of the planned 80 dishes of the array—known as MeerKAT—have now been built. “Now people are taking our bid seriously,” Charles says. Meanwhile, Australia is building up its own seed array of dishes, called ASKAP.

The African bid faces unique political challenges. Whereas Australia would host the entire tele-

scope within its own borders, in Africa the massive array of dishes would be spread across nine countries, with the core in South Africa. Coordinating its construction, use, and maintenance across those borders would require unprecedented regional scientific cooperation. Civil wars and border disputes are serious hurdles. “I put the chances at 50–50” for the African bid, says physicist Cingo Ndimiso, manager of South Africa’s National Laser Centre. “The biggest problem is putting the legal framework in place in each state” so that information and researchers can move freely.

But the benefits of building SKA in Africa far outweigh the difficulties, argues McGruder: “Just the construction alone of the SKA will improve Internet access and help Africa enter the knowledge economy.”



Continental reach. The Square Kilometre Array will require thousands of dishes like the one depicted (*top*), arranged in 30 stations. A possible African configuration is shown above.

McGruder hopes that such arguments will help African researchers persuade their governments to work together to win the SKA bid.

The scientists at the meeting took a first step by founding the African Physical Society. An African Astronomical Society is now in the works. Having pan-African scientific organizations will be “crucial” for reducing governmental red tape, says the conference organizer, Ahmadou Wagué, a physicist at the University of Dakar. “Mobility is a huge problem. This has been the first time that many of us scientists have met each other face to face” due to visa difficulties. McGruder adds that having pan-African science groups will also help with finances. “Funding from outside for African science currently goes through the African Union,” he says. “Scientists need to have control of that money.”

In spite of the good will at the meeting, there was no consensus on the African bid’s chances of success, nor even of SKA’s benefits. “I worry that it would worsen the problem of brain drain from the other African countries to South Africa,” says a European physicist at the meeting, who did not want to be identified because of his collaborations in Africa. Others dismissed such worries. “This meeting makes it clear that Africa has achieved the critical mass of scientists,” says Sune Svanberg, a physicist at Lund University in Sweden. “The SKA belongs here.”

Between now and 2012, the lobbying will be intense. The total construction cost for SKA is estimated at more than \$2 billion, says McGruder, and the United States may provide one-third of that. Because of this, McGruder’s influence could be pivotal, says SALT’s Charles. Where SKA ends up will be largely determined by “the people with the deepest pockets,” he says. McGruder adds that “bringing the SKA to Africa is [the] top priority” of NSBP. “We have a real kinship.”

The ultimate lobbying moment could come this summer when South Africa hosts the World Cup football tournament. “If Obama comes for a visit, we’re going to take him to SALT and MeerKAT,” says Charles with a twinkle in his eye. “We want him to see cutting-edge African astronomy for himself.”

—JOHN BOHANNON

*The LAM International Workshop on Optics and Lasers in Science and Technology, Dakar, 11–16 January 2010.