

(see PHYSICS TODAY, November 2008, page 22). Phase-one SBIR grants of up to \$150 000 go to technology feasibility studies. Once those are completed, a company becomes eligible to apply for a phase-two grant of up to \$1 million to develop the technology through the prototype stage. Grant sizes vary somewhat by agency, and NIH and DOD in particular have routinely awarded multimillion-dollar phase twos.

"How do you go from a prototype in a laboratory or a demonstration process, from making a one-off, usually requiring some pretty sophisticated hands-on integration, to something that can be automated and sold in the millions at low enough cost to penetrate the market?" asks Johnson. "That's what we are trying to fund."

The trouble is, the SBIR kitty is off-limits for phase-three commercialization funding. Though phase three has been an explicit component of SBIR since its establishment in 1982, no funding for it has ever been set aside. Government-wide, SBIR now collects more than \$2 billion, including \$150 million at DOE. But any funding for phase three is expected to come from the private sector or other, unspecified federal sources.

While he supports the concept of phase-three awards, Jere Glover, executive director of a trade group for SBIR awardees, says his members are concerned that tapping the SBIR set-aside fund to pay for a relatively small number of expensive commercialization grants will "crowd out" small companies that are seeking grants for the earlier SBIR phases.

At DOE, Johnson and her colleagues located their phase-three funding source in a provision of the 2005 Energy Policy Act that instructs the agency to spend a minimum of 0.9% of its clean energy R&D on commercialization.

Turning up the heat

Composite Technology Development Inc (CTD) in Lafayette, Colorado, won a \$1.9 million DOE phase-three grant to commercialize a new electrical insulation material for motors used in geothermal energy systems and other high-temperature applications. Mike Tupper, CTD executive vice president, says that if the project succeeds, it will likely attract \$3 million from his customers to adapt the product for their applications.

"Assuming everything goes well from a technical standpoint, I believe we have the resources to put this thing on the market, where without the phase three, it would have been a lot more questionable," Tupper says. The award

also turned up the heat on CTD's customers, suppliers, and manufacturers to commit to their respective parts in bringing the product to market. "Fortunately in this case, they all said we're in," he notes.

Tupper knows something about SBIR grants, given that CTD has won 58 phase-one and phase-two grants since 2000 from DOD, DOE, NASA, and NSF and may snare a few more before the year ends. In 2009 two-thirds of the company's \$5.8 million in revenues were supplied by the federal government, with two-thirds of that from SBIRs, he says. CTD is hardly alone among small companies in winning serial SBIRs; there is no limit on the number of SBIR grants a company can receive.

Johnson doesn't have a problem with that: "In my view, if there is an innovation that, for example, DOD needs, and you've got a crackerjack engineering team that can solve the problems faster than otherwise, why wouldn't you want them to continue to work?"

David Kramer

news notes

African Americans in physics. The already tiny fraction of US physics bachelor's degree recipients who are African American has gone down in recent years. At the PhD level, however, the proportion is creeping up, according to a 2008 survey

conducted by the American Institute of Physics (AIP).

African Americans earned 144 physics bachelor's degrees, or 2.9% of the total, in 2008. The number was lower than two years earlier; the AIP report says that finding is "especially troubling as the total number of physics bachelor degrees awarded to all students has increased dramatically over the last decade."

Across all fields, that growth is true for African Americans, despite the slip in their numbers in physics. In the seven states where African Americans constitute 21% or more of the total population (compared with 12.4% nationwide), 19% or more of recent bachelor's degree recipients were African American. In 2008 the national average was 9%, of which 66% were women.

A total of 35 400 PhDs were awarded in physics from 1979 to 2008. Just 288 went to African Americans, but 30% of those were awarded in the last six years of the three-decade period. A similar trend is seen in the geosciences.

In 2008, 85% of US physics departments had no African Americans on their faculties.

These and other findings are available in the report, *African Americans Among Degree Recipients in Physics and Geoscience*, which can be viewed at <http://www.aip.org/statistics/trends/reports/blacks2010.pdf>. TF ■

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