Globe Talk: Students meet innovation needs

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Summer may seem an eternity away for those still struggling to weather the bleak winter season, but for college students, the race to snag a spot with some of the hottest internships around is already well under way. And for science majors, the federal government might well be providing one of the most generous positions both financially and academically.

The National Institute of Standards and Technology's summer undergraduate research fellowship will be looking to fill about 100 slots once again this year, for those interested in fields including materials science, manufacturing engineering, physics and information technology. For 12 weeks students will have at least one of the 2,000 or so researchers on staff at NIST -- which includes two Nobel Prize-winning scientists -- mentoring them on a particular issue, and at the end of their internship they will be expected to make a presentation on their summer's findings to all staff members who want to listen as well as fellow interns.

"This is an intense program ... it's real work," said Lisa Jean Fronczek of the manufacturing engineering laboratory and coordinator of the program. Far from simply doing odd jobs and occasionally helping out in the labs, students are expected to hit the ground running as young research scientists. The internship program has become increasingly competitive over the years since it was first started in 1993, with only one in about three qualified students actually winning a position.

The fact that there is so much interest from undergraduates nationwide should be music to the ears of the Bush administration. After all,

President Bush made a point at his latest State of the Union address Tuesday to stress that advances in the sciences was in the national interest of the United States, and went so far as to launch a so-called American competitiveness initiative.

Moreover, Bush's plan to double federal funding from current levels for R&D in the physical sciences over the next decade by giving more money to the National Science Foundation, the Department of Energy's office of science, as well as NIST; offer tax incentives to private companies engaging in cutting-edge technological research; and bolster the number of math teachers in high schools is likely to be one of the few initiatives to that might enjoy bipartisan support, unlike the president's more controversial policies such as the war in Iraq that continues to divide the nation.

Such fears about losing the competitive edge on innovation come even at a time when the World Intellectual Property Organization reported this week that patents filed from the United States accounted for nearly 34 percent of the total, followed by Japan with about 19 percent, while Germany came in third with 12 percent.

Until recently, few U.S. policymakers and corporate leaders thought that they would "lose out ... in advanced technology" against foreign competition, "but it is already happening," according to Joel Popkin, an economist at the National Manufacturers Association and author of a study released Wednesday entitled "U.S. Manufacturing Innovation At Risk." He pointed out that while the United States held about 13 percent of the global market share in high-tech exports in 2003, that figure had dropped to 10 percent by 2005. In addition, Popkin said that Germany has overtaken the United States as the country with the biggest export market share in the sector.

In short, while many may fear the rapid rise of China and India as

economic giants, few fear that emerging markets would challenge U.S. innovation and productivity any time soon, while rival industrialized countries appear to be entrenched in a system that was more costly and less nimble. That belief, however, may well be false and the administration has made clear its commitment to bolster funding to the domestic scientific community. Currently, about one-third of all scientists in the world are employed in the United States, while roughly one-third of global R&D expenditure is spent in the United States.

"As the global economy continues to expand and other countries become more technologically advanced, the United States will face new challenges. To ensure our continued economic and technological leadership in the world, the American competitiveness initiative builds on ... with new investments," the White House stated.

Given that NIST comes under the auspices of the Department of Commerce, much of their research is expected to have practical applications, even in the basic sciences. For instance, the institute has a fair share of projects that are commissioned by the Department of Homeland Security, such as developing radiation detectors that can be used by border control authorities and building robots for urban search-and-rescue missions in the event of a disaster.

So as a public institution, NIST's research efforts are publicly accountable too, and it undoubtedly faces pressures to meet the government's timely needs.

For students, though, politics plays little part in their research activities, and the three-month period is an opportunity for them to see what research conditions are like outside of the college environment.

"The lab equipment, the environment ... it's just so different, and so much better," said Michelle Hammond, a former intern while a student

at Southern University in Baton Rouge and now a full-time researcher with the agency. "It teaches you how the real world (of scientific research works), and it's inspiring," she added.

The deadline to apply for this year's NIST internship program is Feb. 15.