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## CAREER DEVELOPMENT : ARTICLES

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### Taken for Granted: Lost in Space

Beryl Loeff Benderly  
United States  
2 May 2008

Last summer, I attended a workshop at the Massachusetts Institute of Technology that was designed to acquaint journalists with the latest thinking in cosmology and astrophysics. Much that the distinguished professors said about cosmic inflation, the Hubble constant, dark energy, and the rest whizzed by like a comet through a galaxy. But lately, I've had a pair of experiences that give a glimmer of what one abstruse cosmological concept may mean. Following the debate on the state of the scientific workforce these days feels like living in parallel universes.

One day in late March, I attended another symposium, this one at the annual meeting of the [Association of Health Care Journalists](#) (AHCJ) in Arlington, Virginia. A panel of three veterans of the scientific frontlines described their recent experiences with the current U.S. National Institutes of Health (NIH) funding situation. They were a former university

researcher, who told of closing a lab after losing grants; a university medical center official, who recounted efforts to ease scientists' troubles as federal pay lines fall; and an NIH science administrator, who explained steps being considered to ease the pain for NIH-funded scientists.

Two days after this dispiriting discussion, I noticed [an article](#) by Representative Patrick Kennedy (D-RI) about a bill he recently introduced. "As the global competition for talent grows more intense," he wrote, the country needs to attract more innovators like the foreign-born founders of "Google, Intel, Yahoo!, Sun Microsystems, and eBay." We can entice them, he continued, by exempting "anyone receiving a Ph.D. from an American university from numerical immigration limits"--a step, he wrote, that would not "take jobs from Americans, [but would] create jobs for Americans, as foreign-born innovators have done for years."

Could these two events have occurred in the same spacetime continuum? Perhaps. But in the same experience-information continuum? Not likely. This is one of the reasons for the crisis in the American scientific community today: the lack of a shared frame of reference between those making our nation's increasingly incoherent science-workforce policy and those trying to earn a living doing science.

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## STARVING AT THE BANQUET

If there's "a global competition for talent" going on, it would be news to the three panelists who shared their experiences. They all appeared plenty talented, but the only competition they seemed aware of is the brutal one for NIH grants, which unprecedented numbers of scientists of all ages and experience levels are losing out on at an unprecedented rate. NIH-funded researchers who lack assured financial support from their institutions--the many, in other words, on what is oxymoronically called "soft tenure"--are undergoing parlous times as success rates for NIH grants drop to below 10% for new grant applications and to about 30% for renewals. Just a few years ago, the success rate for new grant applications was nearly 30%.

Peter Cariani, who started as a postdoc in auditory neurophysiology in 1990 and won his first substantial NIH grant in 1996, ran several university labs on soft-money faculty appointments but has not been involved academic research since a funding cut in 2006.

With NIH research spending at a near-historic high, exceeding \$28 billion, but success rates near historic lows, scientists are suffering "famine amidst plenty," he said at the AHCJ panel discussion. "The NIH funding crisis is chronic, systemic, and much worse than reported. ... Every research scientist I meet is very worried about continued funding, and a great many scientists--we don't know how many--are being forced out of research because their grants haven't been funded."

Howard Federoff, executive vice president for health sciences at Georgetown University Medical Center in Washington, D.C., next described the difficulties of trying to salvage the situation for at least some of the researchers at an institution that has a good reputation but not the big endowment needed to finance all the deserving labs and scientists losing NIH funds. He has made, he said, "some very hard choices."

Jane Scott, director of the Office of Research Training and Career Development at NIH's National Heart, Lung, and Blood Institute in Bethesda, Maryland, then told of two new hires at her agency, scientists in their 50s who have involuntarily closed university labs after losing their funding. Although delighted to welcome such perfectly qualified and highly experienced new staffers, she suspects that they feel less pleasure at the turn their careers have taken.

The panelists agreed that the current painful shakeout results from the doubling of NIH funding--or more accurately from the way NIH and the universities handled the doubling, using the money to overbuild capacity and take on ever more grad students and postdocs rather than to prepare for a sustainable future when the huge increase inevitably ended.

## LAWS OF SCIENCE

I read Kennedy's piece against this background: It ran on April Fool's Day, but the bill, [H.R. 5634](#), is not a joke. It is real and was referred to committee, although as yet it shows no sign of emerging as legislation.

Kennedy is right about one thing but wrong about just about everything else. It's true that foreign-born scientists have made stellar contributions--from atomic energy to the zipper--to America's technological and economic success. But his argument that allowing any foreign student who earns a Ph.D. to stay would increase innovation and thus employment opportunities for Americans does not pass the most basic level of review. His own evidence condemns his proposal.

None of the companies he mentions has a founder matching the profile he puts forward as the prototypic job creator. Google's Sergey Brin, Yahoo's Jerry Yang, and eBay's Pierre Omidyar all came to the United States as small children, not as graduate students. Neither they nor Sun's two foreign-born founders, Vinod Khosla and Andy von Bechtolsheim, finished their Ph.D.s. Intel was indeed started by two Ph.D.s, but both were native-born. One of their earliest hires, Andrew Grove, is a foreign-born Ph.D., but he entered the United States as a refugee from the 1956 Hungarian Revolution, not as a grad student. He settled here with his family, then attended college and graduate school in the United States.

There certainly are foreign-born Ph.D.s who make innovations that lead to the formation of

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companies employing Americans. [My father was one](#). Most, however, won't, and almost all will do the same thing my dad did when he first came to this country: look for employment.

The real issue is not nationalities but numbers. The problem is not the merits of immigrants but the meaning of the supply-demand curve. As Harvard University economist George Borjas has [persuasively demonstrated](#), influxes of scientists from abroad decrease incomes and opportunities for their contemporaries in the affected field, both native- and foreign-born. At a time when government policy is destroying the careers of homegrown Ph.D.s who had already become established researchers, wishful thinking can't repeal the law of supply and demand.

## SEEING REALITY

Fortunately, not everyone in the U.S. Congress is blind. A few of Kennedy's colleagues have begun asking real questions about the scientific labor force mess. Representative Dana Rohrabacher (R-CA), for example, [raised the issue](#) at a hearing of the House Committee on Science and Technology at which Bill Gates gave the sole testimony. As a member of the minority party, however, Rohrabacher has little power to set priorities. On the other side of the Capitol, senators Charles Grassley (R-IA) and Dick Durbin (D-IL) are also pursuing the issue.

Clearly, something needs to be done about the way the United States deals with its scientific labor force. A system that consumes more than \$30 billion a year should not collapse like a dying star when its budget drops by a few percent points. Cariani doesn't think the NIH grant apparatus can support scientists adequately when the success rate drops below about 30%. But the problem goes much deeper. "The United States is the only major country where scientists have to run around after grants" to assure their own livelihoods, Scott pointed out. "Other countries support scientists in various ways," with their "salaries not dependent on grants."

If the United States really wants to spur innovation, it must salvage science as a career that, although it may demand a long and arduous preparation, can still attract new generations of very able Americans because of the career opportunities it provides. To do that, policymakers must create a system that reliably offers people a reasonable chance of success and a degree of economic security, which many young scientists do not have now (see [this related article](#) and [this letter](#)). This need not require the ironclad sinecure of traditional "hard" tenure, but neither can it be a cycle of repeated boom and bust exacerbated by uncontrolled admission of new competitors.

A sound science labor policy will emerge only if policymakers take heed of the realities in the universe where scientists actually live and then take care not to adopt policies that will make matters worse.

Beryl Lieff Benderly writes from Washington, D.C.	Comments, suggestions? Please send your feedback <a href="#">to our editor</a> .
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