Mathematician Gang Tian did not expect a standing-room-only crowd last week when he gave a lecture at Beijing University (Beida) on the Poincaré conjecture. But not all were there for the math. Reporters and others had come for a glimpse of the man at the center of a tempest engulfing Chinese academia. Tian is a premier example of a controversial phenomenon: a Chinese-born researcher with a full-time faculty position overseas who gets paid handsomely for short working stints in his homeland.

Resentment against part-timers boiled over last July, when Shing-Tung Yau, a Harvard University mathematician and Tian’s former mentor, dismissed the “majority” of Beida’s overseas recruits as “jiade,” or “façade,” in comments in the Chinese magazine Nanfang Renwu Zhoukan. Beida officials fired off a series of rebuttals in which they termed Yau’s remarks “irresponsible” and a “distortion of facts” and ratted off achievements—papers in prestigious journals and patents, for instance—by talent returned from overseas.

The university’s attempts at damage control, however, only intensified debate about professors such as Tian, who has been listed among Beida’s full-time faculty for several years. Beida nominated Tian to membership in the Chinese Academy of Sciences (CAS), an honor reserved for scientists who expend at least half their effort in China. Thanks to Beida’s backing, Tian—who was then also listed as a full-time professor at the Massachusetts Institute of Technology (MIT)—was elected in 2001 by a margin of one vote. Last spring, Tian left MIT to become a full-time professor at Princeton University.

After the Poincaré lecture, reporters pressed Tian about his employment status in China. He said that he now spends more than 4 months a year at Beida and “hopes to be a full-time professor later on,” perhaps after Beida builds a $13 million international institute of mathematics, which Tian will direct.

Some proponents consider part-time academic appointments a critical means of stanching China’s loss of scientific talent. Universities and government agencies are boosting quotas for part-timers and upping the ante to entice more top guns to return. Several universities have created “million-yuan professorships” with stratospheric—for China—annual salaries equivalent to $125,000. Most returnees are midcareer scientists who accept more modest offers (see sidebar on p. 1722).

Critics, however, contend that part-timers often are less important as professors than as tools in the battle for prestige and resources. Yau claims that researchers who parachute in can hardly contribute in a substantive way to China’s scientific development. But the trend seems almost unstoppable, says Shigang He, a neuroscientist currently at CAS’s Institute of Biophysics in Beijing: “I don’t think universities will really seriously control this, because they benefit.”

Offers too good to refuse?

Overseas academics began returning to China in the late 1990s, drawn by programs to woo talented scientists back (Science, 21 January 2000, p. 417). The Ministry of Education’s Changjiang Scholars Program and CAS’s One-Hundred-Talent Plan intended initially to recruit people to work at least 9 months a year—essentially full-time—in China. But top-notch researchers who signed up wanted to help their homeland and keep their jobs overseas: “If you have a tenured professorship [in the United States], it does not make sense to give up the position,” says Jun Liu, a statistician at Harvard.

The education ministry quickly took a new tack, creating a category of part-time Changjiang scholars: jiangzuo, or lecture chairs, for associate professors or higher. They are required to spend no fewer than 3 months—or two, “under special circumstances”—in China. But universities eager to attract stars are willing to make exceptions. Ying Xu, a bioinformatics researcher at the University of Georgia, Athens, says he turned down a couple of invitations to apply for a jiangzuo post, citing time constraints. University officials have told him that a 3-month commitment could be met by arriving at the end of the first month and leaving at the beginning of the third—but Xu says “his conscience did not allow” him to play that game. (Such overtures, other scientists say, are typical.) Xu chose instead to organize a weeklong symposium in China each summer.

Other part-timers say they are unaware of a time requirement. Liu accepted a jiangzuo post at Beida in 2002, but he acknowledges that he spends only about 1 month a year in China. Gary Becker, a Nobel laureate in economics at the University of Chicago in Illinois who recently joined Beida as a Changjiang jiangzuo, says, “What I will do is not precise; it will be mainly up to me.”

Incentive programs have stirred controversy before. CAS began a crackdown after an open letter in 2003 publicized one extreme case of a full-time researcher then at the University of Wisconsin who held grants from three programs and fulfilled a pair of 9-month and one 6-month commitments concurrently. According to CAS’s Li HeFeng, the academy so far has canceled the awards of 166 recipients (out of 1005 overseas recruits) and demanded the money back.

Despite allegations that the system is rife with cheating, universities covet part-timers and have lobbied for an expansion of the programs. In 2004, the education ministry raised its annual quota of jiangzuo from 10 to 100. Last year, Beida for the first time appointed
Many Overseas Chinese Researchers Find Coming Home a Revelation

SHANGHAI—“When I left China to study abroad, I thought I had left China for good,” says neuroscientist Shigang He. Yet, after earning his Ph.D. and landing a permanent research position in Australia, He started having second thoughts. A visit to a Chinese institute astounded him. Labs were bulging with new equipment and feverish with activity. And funding for individual researchers was nearly on a par with his in Australia. He made several trips back to China, he says, “to make sure I wasn’t deluded.” Then he did something once unthinkable for a Chinese scientist established abroad: He resigned from the University of Queensland, sold his house in Brisbane, and joined the Institute of Neuroscience in Shanghai, a part of the Chinese Academy of Sciences (CAS).

“I’ve never regretted it,” says He, who is now with the CAS Institute of Biophysics in Beijing. “For my research, and personally, it was a good decision.”

He’s not alone. Although numbers are hard to come by, repatriated scientists are multiplying. Officials at the Institute of Health Sciences, a part of CAS’s Shanghai Institutes for Biological Sciences (SIBS), say a third of the two dozen primary investigators who have joined the institute since its founding 4 years ago had given up permanent jobs overseas. “It is definitely a new trend, not only at SIBS but throughout China,” says SIBS President Gang Pei.

Those returning to their roots say the trend indicates how far Chinese science has come in catching up with the West. “It is no longer true that a faculty position in China is less competitive than one in the U.S.,” asserts Jianmin Zhou, a molecular plant biologist who left an associate professorship at Kansas State University, Manhattan, for a position at the National Institute of Biological Sciences in Beijing. In China, midcareer returnees bridge a gap between young scientists trained abroad and high-profile veterans who spend a few months a year in China as advisers. “These midcareer people help China” with their experience and administrative skills, says Pei.

The returnees so far, however, are not superstars. Few “are from first-tier universities and/or doing first-rate work,” says Li Jin, a population geneticist who relinquished a full professorship at the University of Cincinnati to become dean of life sciences at Fudan University.

Deciding to come home usually starts with a realization of how quickly more Changjiang part-time (11) than full-time professors (10). Many universities have set up their own programs for illustrious part-timers—“Nobel laureates” and “internationally famous scholars,” as Zhejiang University’s announcement puts it. Whereas Zhejiang is still hoping to snare a Nobel laureate, Beida, in rebuking Yau, touted three among its jiangzuo ranks: “One can well imagine their contributions to education and research,” the university stated.

A fair compromise?

Many academics feel that the prestige that comes with hiring part-timers is superficial. “Some high-profile papers appear to come from China, even though the science didn’t really take root [there],” says Mu-Ming Poo, a neuroscientist at the University of California, Berkeley. Chinese universities turn a blind eye to absentee professors as long as they list their Chinese affiliation on papers, adds He.

Indeed, the number of publications with Chinese authors listing multiple affiliations is on the rise. For example, Zhong Lin Wang, a nanotechnology researcher at Georgia Institute of Technology in Atlanta, has three affiliations on recent papers in Science: Georgia Tech, Beida, and the National Center for Nanoscience and Technology in Beijing. Wang is part-time director at both Chinese institutions, which hailed his publications on their Web sites. Wang acknowledges that the work was done solely at Georgia Tech. Similar cases abound.

At the same time, some part-timers downplay their moonlighting. Zhensu She, a mathematician at the University of California, Los Angeles, lists in his CV on UCLA’s Web site his full-time Changjiang professorship at Beida as an “award” in 1999—it was a 5-year contract—and does not mention that he is director of the Key State Laboratory of Turbulence and Complex Systems and deputy director of the Center of Theoretical Biology, both at Beida.

UCLA policy states that “compensated teaching or research at another institution while employed as a full-time faculty member” requires “prior written approval of only the Chancellor or Executive Vice Chancellor.” As Science went to press, UCLA had not clarified whether She or seven other faculty members with similar positions in China obtained such approval. She did not respond to requests for an interview; a source in UCLA’s math department says he is on sabbatical.

Teaming up—or outsourcing?

To many Chinese scientists, the bottom line is not how much time is spent on Chinese soil but whether one contributes to the country’s science. Poo helped create the Institute of Neuroscience (ION) in Shanghai in 1999 and since then has been its part-time director. He views his role as enabling young Chinese scientists to gain international recognition based on their own projects and publications. Although Poo spent about 80 days in Shanghai last year, and ION covers his expenses, he does not receive an ION salary. “I do not have any problems with people like Mu-Ming...
the research landscape in China is improving. “Support for research by most agencies in China doubled this year,” says Jin. “The pressure for getting grants [abroad] is one of the major reasons that drives people back to China.” The funding now offered a new scientist to set up a lab in China roughly matches that of a U.S. university, adds He. Individual grants may be smaller, but money goes further in China too. Scientists also rave about the quality of students. “Many Chinese faculty … have better students than their peers in the U.S.,” says Zhou. Part of the appeal is helping shape China’s science future. Guo-Tong Xu, once an assistant professor at the University of North Texas Health Science Center in Fort Worth and now deputy director of SIBS’s Institute of Health Sciences, boasts that his institute is the first in China dedicated to translational research, bridging the gap between basic and clinical research.

Some scientists return to pursue opportunities that are illegal or not encouraged in the United States and other countries because of ethical concerns. Hui Zhen Sheng returned in 1999 after 10 years at the U.S. National Institutes of Health when the Shanghai government made an offer “too good to decline”: to fund a stem cell lab for her at Shanghai Second Medical University. Sheng is working on therapeutic cloning of human embryonic stem cells using animal eggs. Similarly, stem cell research brought Hongkui Deng back. Deng left China in 1989 to study immunology at the University of California, Los Angeles, and later became research director for ViaCell Inc., a biotech firm in Cambridge, Massachusetts. Finding the corporate world “quite restrictive,” Deng in 2001 joined Beijing University, where he is trying to coax human embryonic stem cells to differentiate into beta cells for treating diabetes. “Stem cell biology is a new field, so China is at the same starting line as everybody else,” says Deng.

Some scientists try to keep a foot in both worlds, before deciding that China is where they want to be. In 1997, Jin set up a field station at Fudan, his alma mater, to collect DNA from China’s diverse populations. In 2003, he was made dean and began splitting his time between continents. “It was really stressful to maintain two laboratories,” he says. In 2005, Jin resigned from Cincinnati and moved with his family to Shanghai.

There are downsides for midcareer returnees. Salaries are smaller, for example, although a low cost of living can compensate. And whereas Chinese universities grant tenure to all faculty members, at many CAS institutes new researchers must pass reviews after several years before getting a permanent job, even if they gave up a tenured position in the West.

Middle-aged scientists also typically have families to consider. Xu recalls that his elder son had a tough time adjusting to fifth grade when the family returned from the United States in 1997. Xu’s colleague, geneticist Ji Zhang, who gave up a tenured job at the University of Nebraska Medical Center in Omaha in 2002, left his wife and 17-year-old son in the States so the boy could continue his education there. “It would be difficult for my son now to adapt to life in China,” Zhang says.

Lifestyle issues cut both ways. Jin says, half-jokingly, that he returned for the food. The best Chinese restaurants in Cincinnati can’t match Fudan’s student cafeteria, he notes. On the other hand, he and his family squeezed into an apartment one-tenth the size of their Cincinnati home. “I’ve been trying to convince my kids that it’s not quite right for just a few people to have lived in such a big house,” he says. For Jin and other midcareer returnees, cramped apartments are a small price to pay for big opportunities in China’s growing research enterprise.

—DENNIS NORMILE

Poo,” says He. “He is really dedicated, working hard, and doing a good job.”

But critics maintain that part-timers such as Poo are rare; many appear to leverage their own projects by taking advantage of China’s abundant student labor. In the late 1990s, Xingwang Deng, a molecular biologist at Yale University, proposed using Beida’s “human resources” to search for all the genes of the model plant Arabidopsis. The idea appealed to Gu Xiaocheng, a senior biologist, and Chen Zhangliang, then a Beida vice president; the university provided lab space and seed funds. At Yale, Deng taught a young Beida scientist, Qu Li-jia, how to make Arabidopsis mutants.

For his efforts, Deng was appointed a 9-month Changjiang professor by Beida, although he made clear he could not work full-time in China. To reconcile his commitments to Yale and Beida, Deng came up with a “win-win solution,” says Gu: Deng persuaded Yale and Beida to establish the Peking-Yale Joint Center for Plant Molecular Genetics and Agro-biotechnology. Under Deng’s directorship, the center has been generating data for the Arabidopsis Mutants Database and papers, most of which list Deng as senior author.

Given China’s “low level” of science, Gu says, this kind of arrangement can be beneficial. “You may call it outsourcing,” she says, but the resulting exchanges might not have happened otherwise. Qu adds that before the Peking-Yale Center was set up, “we did not even know how to grow Arabidopsis, but now seven labs at Beida do related work.”

Other part-timers are following Deng’s example. In 2002, Tian Xu, a Howard Hughes Investigator at Yale and a Changjiang jiangzuo at Fudan University in Shanghai, created the Fudan-Yale Biomedical Research Center, which now employs 20 grad students, one postdoc, and more than 40 staff to screen for genes in fruit flies and mice. And UCLA’s Shuo Lin, a Changjiang jiangzuo at Beida since 2004, has retained a dozen grad students there to trowal for zebrafish genes.

With these successes, China seems unlikely to wean itself of its part-timer dependence anytime soon. CAS is even spawning a new breed: “innovation teams” including five or six senior academics from abroad who will take turns spending a year in China and share a pot of $750,000 for research.

But Yau and other critics insist that the popularity of these programs does not justify the expense. Rather than lavish money on part-time academics, they argue, Chinese institutions should raise stipends of students and young researchers from their present paltry levels of $30 to $160 a month. “The Chinese government does not pay enough attention to young people,” Yau says. As long as the brightest young minds seek greener pastures outside China, the brain drain—and the hunger for overseas talents—will continue.

—HAO XIN