

MOVERS

Eric Betzig, group leader, Janelia Farm Research Campus, Howard Hughes Medical Institute, Leesburg, Virginia



2002-05: Owner, New Millennium Research, Okemos, Michigan

1996-2002: Vice-president of research, Ann Arbor Machine Company, Chelsea, Michigan

1988-94 Member of technical staff, AT&T Bell Laboratories, Murray Hill, New Jersey

Eric Betzig sums up his career in one word: failure. This might be true because he actually set out to revolutionize optical microscopy, but by any other standard, his career has been quite the opposite. In fact, a better word to describe it might be 'unconventional'.

As a graduate student in applied physics at Cornell University in Ithaca, New York, Betzig achieved what many deemed an impossible feat — proving that resolution limits of optics were not written in stone, which launched near-field optics. That work helped garner him a coveted spot at Bell Labs in Murray Hill, New Jersey.

Betzig spent the early 1990s churning out papers, including one describing the first single-molecule microscope. But once he began to realize the real limits to the technology and others started to crowd the field, he lost interest. "I hate driving a bandwagon," he says.

Feeling the need for a radical career move, he succumbed to his father's urging and joined the family machine-tool company in Michigan as vice-president of research and development. He wanted to apply cutting-edge technology to reduce the time spent machining parts. He achieved his technical goal, but found that the industry wasn't ready for such advanced tools. "I couldn't sell the thing," he says.

Now seven years out of Bell Labs, Betzig began looking for a new niche for his talents. He spent two years at home working out a theory for making dynamic super-high-resolution imaging practical. But how was he going to convince someone to pay him to turn his idea into reality?

An invitation from his former Bell Labs boss, Nobel laureate Horst Störmer, to give a seminar at Columbia University was Betzig's first step back to academia. Soon, he was in touch with the leaders of the Howard Hughes Medical Institute's new Janelia Farm Research Campus near Leesburg, Virginia — known as the 'biological Bell Labs'. Now a group leader at Janelia, Betzig is on track to push the boundaries of optical microscopy once again. "I'm spoiled," he says. "All of my adult jobs have left me with complete freedom to come up with what I wanted."

At Janelia, they share his view of how to do research, providing a free, interdisciplinary and collaborative environment in which to take on high-risk projects. Even though he can't believe his luck, Betzig knows the clock is ticking. "With the level of resources I have at Janelia, I'm going to rip through these ideas in six years." ■
Virginia Gewin

SCIENTISTS & SOCIETIES

Taiwan's international expansion

In 2002, the Academia Sinica, one of Taiwan's top research institutes, collaborated with national universities to launch the Taiwan International Graduate Program (TIGP) in a bid to open up graduate education to international students. About 100 PhD students from 15 countries, including India, Canada, Malaysia and Sweden, are working in eight different programmes, ranging from molecular biophysics and cell biology to nanotechnology.

The TIGP has become an alternative for many Asian students, including myself, who have had difficulty entering the United States owing to visa restrictions since 11 September 2001. But this is not the only reason. Taiwan, in recent years, has been investing in biotechnology and genomic-medicine research with state-of-the-art facilities. These growing sectors demand researchers at all levels.

With the growth of this new student population, TIGP students last year founded the Graduate Student Association to augment academic and cultural activities and to voice students' concerns. Among the activities it plans are launching a graduate magazine, organizing international workshops, establishing a recruitment centre, and hosting career fairs.

The association has also been

advocating on behalf of international students in an education system not accustomed to students who don't speak Chinese. Classes are taught in English, but inability to communicate outside the classroom can lead to feelings of isolation. For example, announcements and notices are available only in Chinese, making foreigners over-dependent on local personnel. My early days at the academy were overwhelming at times, mostly because of my inexperience in a non-English setting.

Some faculty members have recognized the problem and conduct lab meetings in English. This decision was met with hesitation by some Taiwanese students. But it became exciting as they started talking freely in English and everyone enjoyed being part of the discussion. Progress rests on the willingness of the local students and advisers to internationalize their labs.

These issues also arise in many other non-English-speaking nations with foreign graduate students. The Academia Sinica has demonstrated a commitment to dealing with them. That, along with the programme and the excellent infrastructure, I believe makes Taiwan an attractive destination for research. ■

Gopi Kuppuraj is an international graduate student at Academia Sinica in Taiwan.

GRADUATE JOURNAL

Life of Riley?

The life of a first-year graduate student may seem relaxed to outsiders. No pressure to publish, time to learn new techniques, a chance to adapt to lab life. Not much is expected of you because you've only just started, and your project is not yet final, so if things don't work it's nothing to get stressed about. You're young and enthusiastic, and enjoy immersing yourself in all your new life has to offer.

But things aren't always so simple. You want to prove to others and yourself that you're worth your PhD place, and are not taking things easy. Before the hard work you envisage in later years, you join many societies, which demand time. You are trying to get a foothold on the literature and you wish people would stop publishing so quickly. You visit every seminar and lecture, but worry that any questions you ask are irrelevant, obvious or just plain stupid.

More seasoned graduate students seem more knowledgeable and don't appear to be intimidated by the presence of eminent scientists. They know the mini-prep protocol by heart and can walk late into lectures without batting an eyelid. Nothing seems to faze them.

I know that next year I shall be the same, telling the new students how to make external phone calls and where to find the salmon-sperm DNA. I'll have a laid-back nonchalance, confident like that kid on the back seat of the bus. But at the moment they can have their bravado. My thesis deadline is three years away. ■
Mhairi Dupré is a first-year PhD student in evolutionary developmental biology at the University of Oxford, UK.