

CAREERS

TURNING POINT Helping people motivates bioengineering PhD student **p.251**

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EQUALITY

Standing out

Welcoming lab environments and networking organizations help lesbian, gay, bisexual and transgender scientists to excel.

BY CAMERON WALKER

Looking up from a courtyard at the College of New Jersey in Ewing, passers-by can see a rainbow pride flag in the window of chemist Benny Chan. He has not always been so open. Chan came out as gay to just a few people in graduate school, and although he did not hide his sexual orientation once he

started working at the College of New Jersey, he decided not to be vocal about it until he met the requirements for tenure. His past advisers and the administration at his new job were supportive, he says, but “there’s always that little bit of doubt in my head” — one uncomfortable or discriminatory colleague could cause problems.

Scientists do not always share their personal

sides in the lab. Deciding whether to be open about one’s identity can be an acute issue for lesbian, gay, bisexual and transgender (LGBT) researchers. Unlike some other minorities, LGBT people “have the ability to conform, because it’s not always a visible trait”, Chan says. But hiding something as basic as sexual orientation or gender identity can be detrimental to mental health and work. “You need to spend a lot of extra energy if you feel like you need to hide a part of your life,” says Chan.

Researchers may have trouble finding colleagues who share their experiences — which can be anything from overt or subtle discrimination to complete comfort in the workplace. Many want to know how best to support younger LGBT scientists, who might not know where to turn for mentoring.

As broader awareness of LGBT scientists grows and more of the science community starts to appreciate the issues that affect them — including same-sex marriage and anti-discrimination laws — groups are convening to foster a sense of community and, in some cases, to develop best-practice guidelines. These organizations aim to ensure that LGBT researchers get the support they need so that isolation does not keep them from being effective scientists.

GATHERING DATA

There is a growing body of research on women and ethnic minorities in science, but the number and experience of LGBT researchers has been less widely studied. To address this, Jeremy Yoder, an evolutionary-biology postdoc at the University of Minnesota, Twin Cities, and Allison Mattheis, an educational researcher at California State University, Los Angeles, gathered more than 1,400 responses to the ‘Queer in STEM’ survey, which examined sexual diversity among people working in science, technology, engineering and maths (STEM) and how their identities might affect their careers. Most were from the United States, but there were also responses from Canada, the United Kingdom and India, among other countries.

Preliminary results suggest that participants who rated their workplaces as safe and welcoming and whose employers supported LGBT-specific needs — such as health-care benefits for same-sex partners in the United States — were more likely to be open with their colleagues about their identities. However, Yoder and Mattheis found that where respondents lived made no difference to how ‘out’ they were to colleagues or students, even if the ►

► researchers were in big cities or in regions thought to be LGBT-friendly.

Yoder and Mattheis hope that their survey results, which they are in the process of writing up for submission, will make other scientists more aware of and welcoming to LGBT researchers. The pair contend that when heterosexual researchers know about their colleagues' identities, they are more likely to support policies such as partner benefits and expanding equal-opportunity employment to cover sexual orientation and gender identity. And the authors expect that more information about the community will encourage LGBT people to enter STEM. "By making queer folk working in STEM more visible, we can help prompt STEM workplaces, professional societies and university departments to take LGBT-specific needs into consideration in policy," Yoder says.

CREATING SAFE SPACES

LGBT researchers can turn to a growing number of support and networking groups (see 'Safe meeting spaces'). Some groups are working on best-practice guidelines to help academic departments to deal better with LGBT issues. Elena Long, a postdoc in nuclear physics at the University of New Hampshire in Durham who started the LGBT+ Physicists group in 2009, has worked with colleagues to create a guide for physics departments.

These guidelines range from changes that can be made quickly — such as using gender-neutral language in the classroom and lab or

inviting LGBT speakers to campus — to those that require long-term, department-wide efforts, such as adding non-discrimination statements to job announcements and making diversity training available to faculty members and staff.

Many institutions offer on-campus training about LGBT issues (often called 'safe zone' training). This usually consists of a several-hour session in which participants learn about resources for LGBT students and the community itself. They may receive stickers that they can place on their office doors to identify safe spaces in which people are welcome to discuss LGBT issues. Some institutions have diversity offices that run these programmes. Independent organizations such as the Diversity Trust, based in the United Kingdom, also offer training.

Although a sticker may seem like a small effort, a study of the Safe Zone programme at Iowa State University in Ames in 2002 suggests that these programmes can improve the climate on campus by visibly affirming that the needs of



"You need to spend a lot of extra energy, if you feel like you need to hide a part of your life."

Benny Chan

LGBT students are valid, and increasing heterosexuals' awareness of both the LGBT community and their own biases (N. J. Evans *J. College Student Dev.* 43, 522–539; 2002).

The best-practices guide from LGBT+ Physicists also offers some measures to ease the path for transgender researchers. On a departmental level, simplifying the process of name changes on campus records — and indicating that changes will not affect someone's job, tenure or award applications — can be particularly meaningful for transgender people, who may have elected to transition to or have started identifying as their preferred gender during graduate studies. The CV can be a minefield: many transgender people "face an extremely difficult choice when applying to a new position", says Long. "Either risk discrimination by outing yourself as trans, or risk discrimination by leaving out a significant chunk of your past work under a different name."

FINDING COLLEAGUES

Meeting researchers with similar backgrounds and concerns is becoming easier. LGBT researchers have been convening an informal networking dinner at meetings of the American Astronomical Society (AAS) for more than 20 years, but "you had to know it existed", says Jane Rigby, an astrophysicist at NASA.

After several members of this group wrote a charter, the AAS Council created an official working group on LGBTIQ Equality (the I stands for 'intersex' and the Q for 'queer' or 'questioning'). The group's networking and other events now appear in the AAS conference programme. The working group is also collaborating with LGBT+ Physicists on joint best-practice guidelines.

There are also online physics and astronomy 'out' lists, to which LGBT researchers have voluntarily added their names and, in many cases, contact information so that they can be helpful to others. Both lists also include non-LGBT researchers who support the community. Some institutions, such as the University of California, San Francisco, have their own out lists.

Many institutions have LGBT networks. At CERN, Europe's particle-physics lab near Geneva, Switzerland, an LGBT group hosts social events and weekly lunches in the cafeteria to promote visibility, which is potentially helpful for LGBT visitors.

Young LGBT scientists can find both community and professional networking through mentoring. The US-based non-profit National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP), which provided funding for the Queer in STEM survey, offers eight-month mentoring programmes for members. Through a partnership with MentorNet, an online STEM mentoring network, it matches undergraduate and graduate students, postdocs and other early-career professionals with mid- or later-career scientists in academia or industry. The goal

LGBT EVENTS

Safe meeting spaces

Several organizations worldwide hold conferences and events specifically aimed at lesbian, gay, bisexual and transgender (LGBT) scientists.

- Since 2010, the US National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP) has put on Out to Innovate, a biennial two-day career summit that includes a career fair, workshops and speakers. In 2014 it will be in Atlanta, Georgia, and will be co-hosted with Out in STEM, a national society supporting LGBT students. The summit will facilitate mentoring and include industry representatives and tours of local companies.
- The non-profit organization Out for Work in Washington DC, which assists LGBT students with career development, runs annual conferences.
- Ecologists have been attending an informal networking LGBT lunch at the Ecological Society of America meeting since the late 1990s.

- A group of geoscientists holds an independent dinner for LGBT researchers during the annual American Geophysical Union meeting in San Francisco, California.
- The UK Gay and Lesbian Association of Doctors and Dentists has an annual conference for students and holds educational events. It also facilitates networking.
- The Australian Lesbian Medical Association in South West Rocks supports lesbian doctors and medical students, and their partners. It offers social events, mentoring and an annual meeting.
- Workplace Pride in Amsterdam holds an annual conference aimed at improving the workplace for LGBT people.
- Sticks & Stones, a diversity-focused career fair that bills itself as Europe's largest for LGBT and straight people, will be held in Berlin in 2014. Last year, several pharmaceutical and technology companies attended. **C.W.**

is to keep LGBT people in STEM careers and to provide someone for students to talk to if they feel that they cannot discuss their personal lives with their advisers, says Rochelle Diamond, who is the chair of the NOGLSTP's board of directors and manages two labs at the California Institute of Technology (Caltech) in Pasadena.

LGBT MOBILITY

Changes to marriage laws in some countries may influence acceptance of LGBT people in society at large, and improve the prospects of scientists looking for the right department fit (see *Nature* **454**, 132–133; 2008). In the United States, for example, there is still a patchwork of state laws that forbid same-sex marriage. But last June, the US Supreme Court declared that the section of the Defense of Marriage Act that prohibited federal recognition of same-sex marriage was unconstitutional. That may boost the immigration of LGBT scientists, who can now sponsor foreign-born spouses for permanent-resident status. It can also help US-based researchers and their spouses. Rigby and her wife and child are now on the same insurance plan; combined with other benefits that are now permitted, they may save several thousand dollars this year.

At conferences, Carolyn Brinkworth, an astronomer at the Infrared Processing and Analysis Center at Caltech, wears a rainbow sticker with the words 'Safe Space', or a badge from an LGBT youth organization for which she volunteers. Young scientists have approached her to say that they have not felt comfortable being out at work. "It's rare that they tell me the climate is hostile," she says. More often, she says, these researchers do not want to think about introducing a potential new source of work stress by coming out, or are not sure how their advisers or peers will react to their identity.

But Chan has found that being out proved better not only on a personal level, but also on a professional one. A volunteer for the American Chemical Society (ACS), Chan discussed being gay in an ACS publication after his tenure decision. Later he received multiple e-mails from colleagues whom he knew from ACS meetings. Most were e-mails of support, but one colleague also asked him about his single-crystal X-ray diffractometer. The two have now collaborated on multiple papers.

And at an LGBT reception at an ACS meeting, Chan also met a researcher who may host his sabbatical. "Being out has really helped me," he says. "It frees you up to think of your research, and your scholarship." ■

Cameron Walker is a freelance writer based in Santa Barbara, California.

TURNING POINT

Eleni Antoniadou

PhD student Eleni Antoniadou co-founded the London-based start-up Transplants Without Donors in 2009 to develop tissue-engineered organs. Antoniadou, who also blogs for The Huffington Post, was shortlisted in September in the science category of the 2013 Women of the Future Awards, Britain's industry-funded search for successful early-career women.

What led you to tissue engineering?

I was working at a hospital as an undergraduate and saw that prosthetics had limitations. I wanted to do research that could give patients something better. I found regenerative medicine and tissue engineering to be promising fields.

What was your first tissue-engineering project?

While studying for a master's in nanotechnology and regenerative medicine at University College London, I worked on neural generation — testing biomaterials that could become artificial nerves. I also got involved in developing a business plan for an artificial trachea. I felt overwhelmed when it was successfully received by a patient. It was proof that tissue engineering could be applied in clinical practice.

So you launched the start-up soon afterwards?

While in London, I joined several physicians and scientists to co-found Transplants Without Donors so that we could work on tissue-engineering scaffolds for several different organs. In launching this company, I came to appreciate the complexity of the science behind tissue engineering. In 2010, after receiving a scholarship from the Fulbright Program and the Institute of International Education, I came to the University of Illinois at Urbana-Champaign to get a master's in bioengineering, with a focus on developing artificial skin. This is challenging, yet is a product that many patients need.

What has been the start-up's main challenge?

Securing financial support. But it was also challenging to find people with the appropriate multidisciplinary background. We had to learn how to design experiments so that all the scientists on our 25-member team could contribute to and understand them. We are hoping that the products we launch next year — mostly tissue-engineering scaffolds and bioreactors for different organs — will be used by other researchers. Sharing products throughout labs could really help to move the field forward.

You spent time at NASA recently. How did that influence your research?

I was beginning a PhD at the University of



Illinois when the European Space Agency and NASA selected me to work at the biosciences division of NASA's centre for nanotechnology for several months. That was a turning point in my career: it was the most innovative place I'd ever been. I saw the importance of tackling big, risky projects.

How did you start blogging for *The Huffington Post*?

After being nominated for the award, I was invited to write for the blog to raise awareness of the future of technology and of women in science. So far, I've written about the future of tissue-engineered organs and the importance of space exploration. Thanks to my posts, I've had scientists approach me to collaborate on projects and heard from people who are curious about tissue engineering.

Name a pivotal moment in your career.

In the past few years, I've been to Peru and Costa Rica to volunteer with the Foundation for the International Medical Relief of Children, a non-profit organization based in Philadelphia, Pennsylvania, that sends out teams to perform operations or offer health care. We gave vaccinations and pharmaceuticals to sick kids, including those victimized by the illegal organ trade. It was really fulfilling and has helped to drive everything we do in the lab.

What do you plan to do after you get your PhD?

I would like to do research in the lab, working full-time at Transplants Without Donors to bring products to market. We need to develop a legislative framework for tissue-engineering products — one that will be universal. ■

INTERVIEW BY VIRGINIA GEWIN