

INSPIRING LEADERS
OF TOMORROW INTERNATIONAL
WOMEN'S DAY

Addressing the gender gap in STEM professions

“Having a workplace that is diverse and equitable is in the best interests of everybody. We still have a long way to go in terms of reaching parity.”

TICH-LAM NGUYEN

These three women are among the pioneers leading the way for girls to embrace STEM careers, writes Sian Powell.

A mathematical biologist specialising in evolutionary theory, Dr Xia Hua has forged an impressive career in a field long dominated by men.

“I kind of see myself as a bridge between the maths department and the biology department,” she says.

“When my colleagues in biology have a problem that needs maths for a solution, they contact me and I will find the appropriate person in the maths department who can help solve their problem.”

Now a senior lecturer at the Australian National University's Mathematical Sciences Institute, Hua found she needed a thorough understanding of maths for her doctorate in biology, which focused on macro-evolution and macro-ecology.

“While working on my PhD thesis I realised I couldn't solve the problems I wanted to solve without using mathematics,” she says.

Hua is one of the Australian women succeeding in a range of science, technology, engineering and mathematics (STEM) fields, which have long failed to reach gender parity. These pioneering women have led the way for generations of girls to embrace STEM careers.

Originally from Shanghai, Hua thinks China's controversial one-child policy meant parents encouraged their children, both boys and girls, to pursue careers in all professions, including those dominated by men in the West.

Schoolgirls had largely equal gender representation in maths and the hard sciences in China, she says. Maths subjects were also a requirement in many undergraduate courses in China, she adds, so “most undergrad students were already quite good at maths”.

Yet as Hua progressed in her chosen field, her women peers in mathematics fell away. She has lived in Australia for 11 years now, and says men still outnumber women at most senior levels in the field of mathematics.

The gender balance is now fairly equal at the post-doctoral level, she says, adding: “But the further up the ladder, the lower the ratio.” The ANU maths department has a gender parity target, and Hua believes there has been progress in recent years.

Still, she has recently had a baby, and she is not sure how time away from work will affect her career and her future funding success.

“Australian Research Council government funding is heavily dependent on how many papers you have published,” she says.

“I published zero papers this year because of being a mother. I don't know if that will have an active impact on my funding success in the future.”

Like Hua, mathematician Dr Sophie Calabretto has noticed a dramatic shortage of women in senior positions in her chosen field. An applied mathematician who uses maths to solve real-



From left: Mathematical biologist Dr Xia Hua, mathematician Dr Sophie Calabretto and FLEET chief operating officer Dr Tich-Lam Nguyen.

world problems in fluid mechanics, she says she became accustomed to being one of a handful of women in a crowd of men in her senior university years.

“Generally, in my discipline, to be considered as good as the men around me I need to out-perform them in a really aggressive way,” she says.

She saw a gender balance in her first few years of university. “But as you progress, more and more women seem to disappear,” she adds. “By third year and honours, there were very few women.”

Children and family responsibilities tend to carve holes in resumes, and some institutions in the academic sector still find it difficult to take into account years-long gaps in publication history and grant history.

“A lot of the organisations are getting better at acknowledging that, but still, on paper, you are behind a man at the same level potentially,” Calabretto says.

After accepting a position lecturing at a Sydney university, she found that because there were so few women in her department, she was routinely asked to join many time-consuming interview panels, committees and outreach efforts. These responsibilities ate into the time she had for research.

“Academic merit is often measured by research output,” Calabretto says. “Forty per cent of my time was meant to be dedicated to research, but realistically it was five per cent. Research is the thing I really, really love, and it was

the thing I was getting no support to do and I had no time to do.”

So she left the university and joined the defence department's Defence Science and Technology Group, and she has now been seconded to the Defence Innovation Network to foster collaborations between defence, industry and academia. She expects to return to full-time research in 2025.

“Defence seems to be really good about acknowledging career breaks and acknowledging people for their skills and what they've done in the time they've had to do it,” Calabretto says.

For her part, Dr Tich-Lam Nguyen has taken steps to help redress the gender imbalance in the organisation she runs.

With a doctorate in chemistry and a master's degree in management, she is the chief operating officer of FLEET (Future Low Energy Electronics Technologies), an Australian Research Council Centre of Excellence and a collaboration between seven universities and 13 international research bodies.

Only about 30 per cent of FLEET's 100 or so research fellows are women, so Nguyen and her colleagues created a few women-only research positions.

“It's one of the initiatives I'm personally very proud of,” she says.

“We were able to allocate strategic funding to create three post-doctoral fellowships of three years each specifically for women.”

The recipients could choose to work in any one of seven universities, she adds, as long as their research aligned with the centre's program.

Nguyen, who came to Australia from Vietnam when she was 12 years old, says there were few female role models in her field who she could look up to during her post-doctoral years.

“As a young researcher, you really start to see the number of role models, women in leadership positions, people you can really look up to, are fewer and fewer,” she says.

The numbers are still tilted toward men, Nguyen says, adding: “In chemistry, you're looking at 30 per cent, if that, at higher leadership levels at university departments.”

She welcomes the widespread and increasing awareness of gender disparity in STEM fields, and the burgeoning discussions on possible remedies.

“These are problems that we're all facing and that we need to address right now,” Nguyen says.

She hopes that organisations and institutions will improve their flexibility and their ability to support those women who want to meet their family responsibilities as well as progressing in their careers.

“Having a workplace that is diverse and equitable is in the best interests of everybody,” Nguyen says.

“We still have a long way to go in terms of reaching parity.”