

Close collaborators

Romance often sparks between colleagues, and scientists are no different. *Nature* profiles four super-couples who have combined love and the lab.

BY KERRI SMITH

When physicists Claudia Felser and Stuart Parkin were introduced at a conference on applied magnetism, they felt an immediate attraction. But then, standing outside the Amsterdam conference centre, they started talking shop. It did not go well.

Parkin was interested in finding materials he could use to make miniature data-storage devices. Felser espoused the benefits of her pet topic: Heusler compounds, alloys with modifiable magnetic properties. “But he was not interested!” she laughs. Parkin thought that the compounds sounded as though they would be too difficult to interface with other materials. “So this was not a successful introduction,” Felser says.

But the two kept in touch. And as Felser shared her growing knowledge about the semiconductor and quantum properties of Heusler compounds, Parkin grew more curious about the molecules — and about Felser. At the end of 2009, she decided to take a sabbatical from Johannes Gutenberg University in Mainz, Germany, to work at IBM in San Jose, California, where Parkin worked. “I invited her to stay with me,” Parkin says. They were a couple from then on. “So this was more or less how it started and we’re still working together,” he says.

Felser and Parkin are one of thousands of couples who met through science. According to a 2010 survey by the US National Science Foundation, just over one-quarter of married people with doctorates had a spouse working in science or engineering¹. Such partnerships are on the rise: in 1993, the proportion was one-fifth. More and more institutions are hiring couples. A 2008 survey² of around 9,000 US researchers found that the proportion of hires that went to couples rose from 3% in the 1970s to 13% in the 2000s. And data from the online dating service PlentyOfFish reveal that users with a graduate degree are three times more likely than the average user to form a couple with someone with a similar level of education.

Collaboration is key to the scientific process, but when collaborators are romantic partners, that relationship offers some unique advantages — a deep understanding of each other’s personality and motivations — as well as the risk that work will dominate conversation at the dinner table. Here *Nature* talks to four couples about how they have managed to blend their science and lives.



MARK BAJOHR/MAINZ

MATERIALS AND AIR MILES

After Felser returned from her sabbatical, she and Parkin began racking up air miles. And Parkin’s practical attitude rubbed off on Felser. “As

Claudia Felser and Stuart Parkin in the Gobi Desert in 2011.

a chemist you want to understand bonding, you want to find new synthesis methods. But you don’t think deeply about applications,” she says. Now, she started to also consider the material’s cost and stability. As a result, companies lined up to work with her. “You really learn to think differently,” she says. In 2011, the couple published a paper³ on Heusler compounds and their potential in spintronics, a discipline that makes use of electrical fields to manipulate the spin of electrons.

Over the past few years Felser and Parkin have managed to spend up to one-quarter of their time together. Conferences and meetings became fruitful ways of meeting up. “As soon as people recognized that we are a couple, they started to invite us together to conferences. It was very good,” Felser says.

Felser’s employers — she is now director of the Max Planck Institute for Chemical Physics in Dresden — even realized that they might be able to persuade Parkin to accept a position in Germany. After many years on different continents, he is finally making arrangements to move, having been appointed director of the Max Planck Institute for Microstructure Physics in Halle. In April, he was awarded the Finnish Academy of Technology’s Millennium Technology Prize, and plans to put part of the €1 million (US\$1.4 million) in prize money towards building a house by the river in Halle. They plan to marry in December — on Stuart’s birthday, “so I won’t forget,” he says. It will be their first place together. “Lufthansa and United will be very unhappy,” Parkin says.

NEURONAL CONNECTION

Lily and Yuh-Nung Jan have made their career studying cell division. But they themselves are inseparable. They start their sentences with 'we' or 'our'. Even their labs are joined. They met in 1967 in their native Taiwan when both were studying physics. Yuh-Nung had just got his bachelor's degree and his class was taking a celebratory hiking trip in the mountains. Joining them was a student from the class below: Lily. She had jumped ahead a year, catching up with Yuh-Nung, and was applying for graduate school, too. "I have a theory that quite a lot of her classmates were intimidated by her," says Yuh-Nung. "But I didn't know better."

Both got places studying physics at the California Institute of Technology (Caltech) in Pasadena. They were an item, but spent their first three years in separate dorms. Not long after they started work, a physicist-turned-biologist came to their department to give a seminar, and made them rethink their career choice. "Back in Taiwan we were not exposed to modern biology," says Yuh-Nung. "At Caltech, that was our first time. I guess it was good timing because biology was getting really interesting." Besides, he adds, tongue in cheek, they were over the hill as physicists. "All the great ones do something really important very early in their career, in their twenties, and we'd already reached that age."

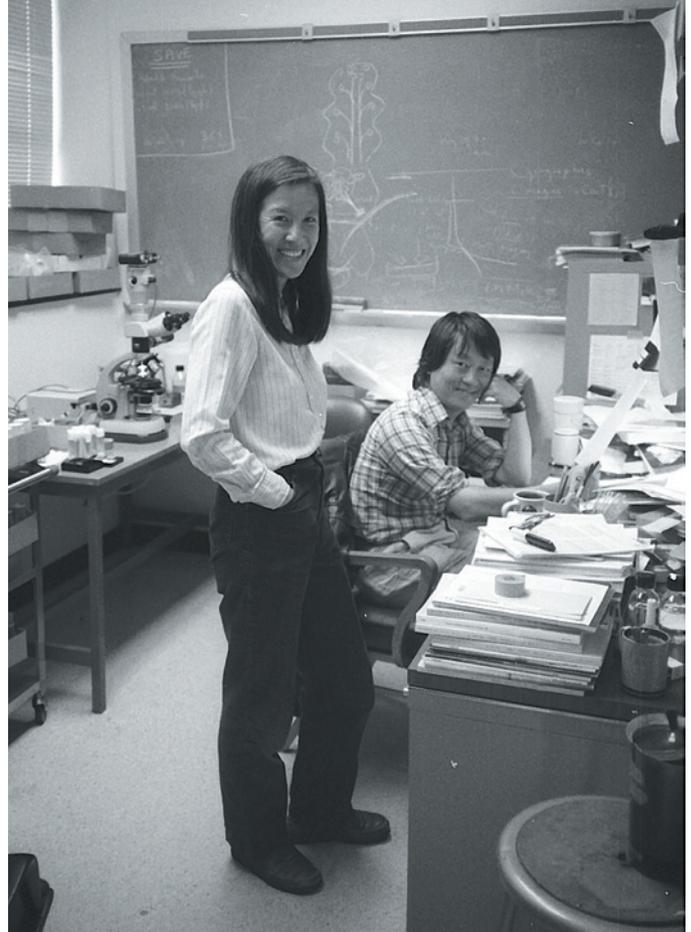
In a month they had made the switch to cell biology, and after pursuing separate thesis projects, began to collaborate. In 1971, they married. It was a very low-key ceremony at the Los Angeles courthouse — costing just US\$6 for the licence and parking — and they celebrated by going camping and hiking in Yosemite National Park.

In 1979, they moved to the University of California, San Francisco. And having spent several years working in the same labs on similar projects, it was natural for them to run a lab together.

There were cases of too many cooks spoiling the broth. "In the very beginning, we both would sit with a postdoc or a student, and that certainly didn't work because no two people have the same idea," says Lily. "It very quickly evolved into an argument. The student was just looking back and forth."

Their interests overlapped heavily, but were sufficiently different that it made sense for Lily and Yuh-Nung to take the lead on different strands of the same problem: how brain cells divide. They now run adjoining labs, supervise 29 researchers and consistently produce publications in top journals. Lily focuses on ion channels and Yuh-Nung on cell morphology and, increasingly, function.

The Jans feel that being a couple gives them benefits over and above

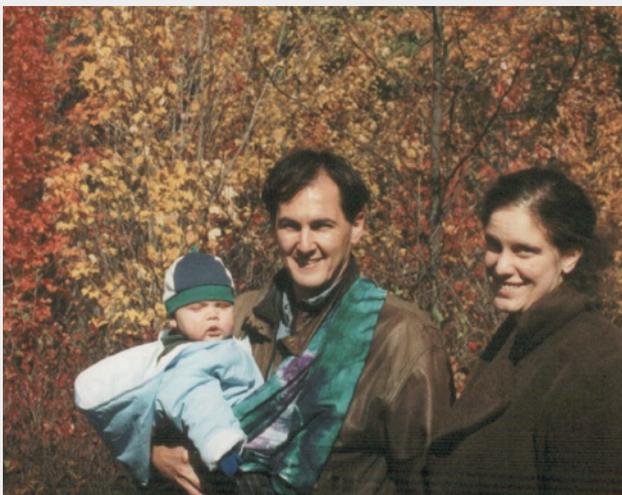


Yuh-Nung and Lily Jan in their shared office in the early 1980s.

non-romantic collaborators. "It's not the sum of two parts, it's much better than that," says Lily. She puts their success down to "very consistent long-term camaraderie". And the pairing is certainly convenient. "Because whenever you think

of something," she says, "it could be at home or at work, you can more easily discuss the questions." Yuh-Nung adds, "We've been together more than 40 years and I feel very lucky to have her as a partner."

Their relationship seems to have served as a template for their colleagues. "There were some romances that started in the lab," says Lily. "More than one," Yuh-Nung says. "There have been kids born during the time their parents were in our lab, he says. "We lost track, but at some point we're going to put together an album."



FAMILY TREES

Few researchers can claim to have established a new field of science — let alone to have done so with their spouse. But that is exactly what evolutionary biologist Mark Pagel and anthropologist Ruth Mace did. They are the pioneers of using phylogenies — evolutionary trees — in anthropology, seeking to explain human cultures and behaviour as if they were evolving species.

When they first met, in the zoology department at the University of Oxford, UK, in the late 1980s, their work had little overlap. Mace was working on animal biology and Pagel was developing ways to analyse species relatedness. Both were heavily influenced by the evolutionary biology they were studying. British evolutionists, particularly, were

known for their views on the power of adaptation and natural selection to explain behaviour. "We're both out of that church," says Mace. They first met at the department morning ▶

Ruth Mace, Mark Pagel and their son Thomas in 1994.

► break, which provided ample time to discuss their ideas. “Those were the days,” Mace recalls. “The entire department would have massive amounts of coffee for an hour.”

Several years later, Pagel and Mace co-authored a paper⁴ that used phylogenetic methods to analyse human cultures, and argued that just as zoologists use genetics to look at species evolution, anthropologists could use languages to study human cultural evolution. The same year, their first son was born, adding a twig to their own tree of life.

Although they still collaborate on articles and research projects

— Mace estimates that about 10% of their work is joint — they retain separate research identities. Both have academic interests outside their phylogeny work. But working in overlapping domains can lead to some awkward situations — especially because they have different surnames. Sometimes, one is asked to review the other’s paper or a competing grant application — offers that they refuse with an explanation of the conflict of interest. “Being in the midst of two fields that have a history of ‘robust’ discussion, for want of a better word”, Pagel is grateful to have someone who is on the same side.



Boris Worm and Heike Lotze at Maasholm field station in 1998.

ecosystems. “Heike’s perspective grounded my ideas and gave them wheels, and maybe I have provided some wider context for the questions she was asking,” he says.

They worked together throughout their PhDs — even using the same study site, Maasholm field station on the Baltic Sea. “There was an old rocket-launching station from the cold war, and part had been bought by our institution as a field site. We had the whole place to ourselves,” says Worm. Because their experiments were often closely related, they had to do a little untangling before submitting their work for publication. “We had to sit down and say, OK, this is what I will publish and this is what you will publish,” Lotze says.

They published their first big paper⁵ together in 2002 — a grand synthesis of their PhD projects on the cumulative effects of various influences on marine ecosystems — and continue to publish together often. Perhaps their most controversial paper, produced as part of a large team in 2006, was a gloomy forecast of global fish stocks⁶. Worm and Lotze were dismayed by how much the media focused on “the end of seafood”; they had wanted to emphasize the rippling effects on species that are not harvested by humans. “The focus of the paper was different to what came out in the media,” Lotze remembers. The phone rang constantly, and each found it helpful to have the other for support. “You understand what the other person is going through,” says Lotze. “I’m a much more shy person, so for me to deal with those media — it was a storm, really. Boris was more riding the wave.”

They are aware that their different personalities sometimes lead to Worm getting more attention than Lotze for their joint work. “Boris was more often the first spokesperson about our ideas,” Lotze says. “For a while I kept a bit more in the background. People saw Boris more than me.” But Lotze eventually started to step forward. “I didn’t like being in the shadow, I had to fight that and get out of my shell,” she says. They are occasionally told that they should differentiate their work, and have made a conscious effort not to co-author all their publications.

But last year, the couple won their first joint honour, the Peter Benchley Ocean Award for Excellence in Science. “It’s not very often the connection gets recognized officially,” Worm says. “It felt really wonderful to have that highlighted.”

Official recognition is one thing, but for Lotze and Worm the greatest benefits of collaborating with a partner are less tangible. A romantic partner knows how to motivate, how to comfort when a grant proposal doesn’t go your way and how to rein in the loopy ideas. As Lotze says, “Your partner is your best critic.” ■

Kerri Smith writes for *Nature* in London.

DREAM TEAM

Sometimes during his graduate work in marine ecology, Boris Worm would solve problems in his sleep. On waking, he would tell his partner, Heike Lotze, about his dream. A marine ecologist herself, Lotze served as a sleepy sounding board. “You know how you forget dreams in the morning. But if there’s somebody next to you, you can tell them right away,” says Worm.

The ecologists believe that their relationship has helped them to shape the early phases of their work in ways that would not be possible in a non-romantic collaboration. “We can share ideas as they emerge, very raw, very unfinished and some of it not useful but still interesting,” Worm says. “I often have creative, intuitive ideas,” adds Lotze. “Then I feel like I’m handing this raw thing over to Boris and he shapes it a bit.”

Worm and Lotze met in the mid-1990s during their graduate study in Germany. Their fields overlapped, but they were pursuing different directions. Lotze was interested in the human influence on the sea and was studying nutrient pollution, thought to be the cause of algal blooms. She puts her practical mindset down to the fact that she was brought up on a farm. By looking after calves and baling hay, she routinely faced the connection between humans and the natural world, and how one changes the other. Worm’s background is more analytical; his outlook more theoretical. The son of a psychologist and a professor of education, he grew up thinking a lot about relationships and communities. His PhD was on species interactions, particularly predation in

COURTESY OF BORIS WORM AND HEIKE LOTZE

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