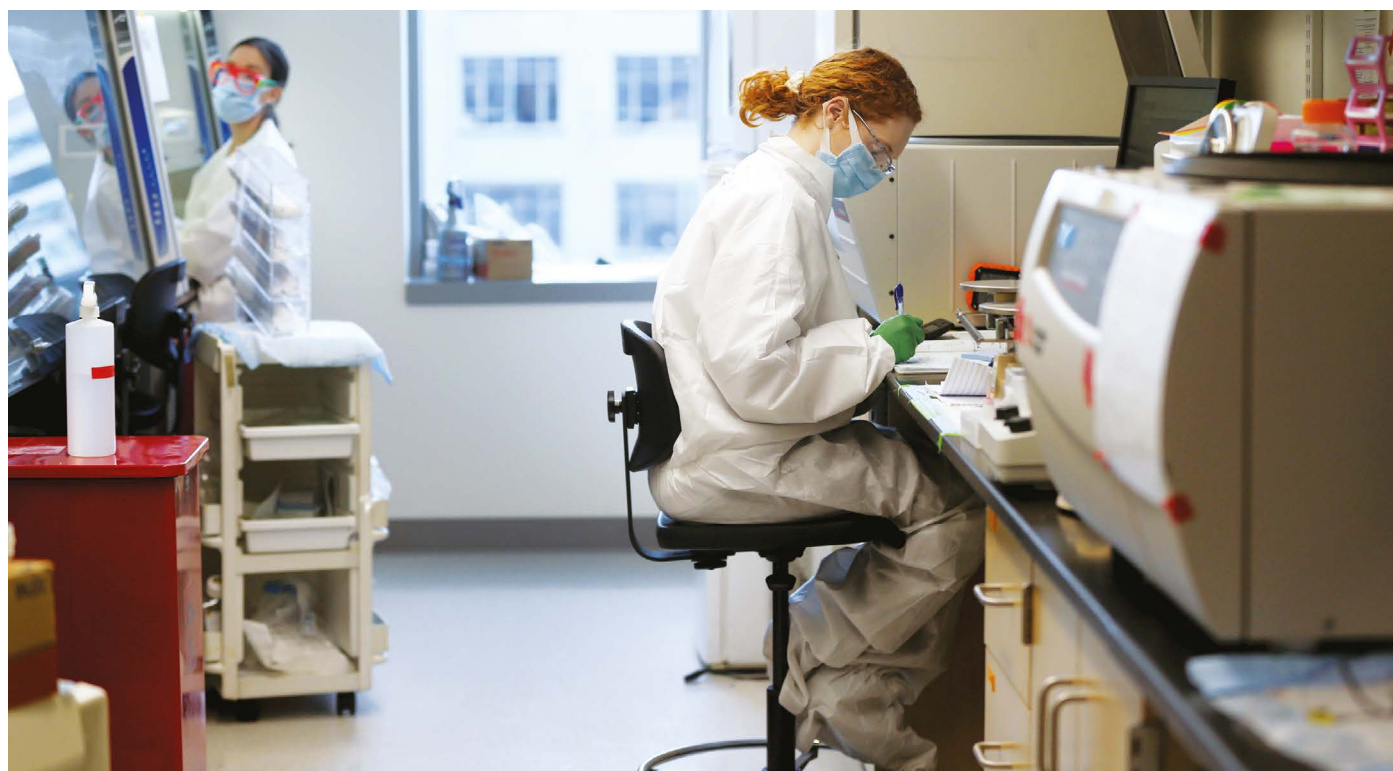




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With many laboratories now closed because of COVID-19, few researchers are lucky enough to be still sharing the same physical work space.

## WE'LL MEET AGAIN: SCIENTISTS' POST-PANDEMIC WISH LIST

Trapped in a holding pattern, and nostalgic for lab lunches and field trips, researchers share their hopes for a lockdown-free future. **By Chris Woolston**

**E**ven in the remote central Brazilian region of Chapada dos Veadeiros, a mountainous land of towering waterfalls and occasional jaguar sightings, science is heavily dependent on people interacting. In 'normal' times, Raísa Vieira, an ecologist at the International Institute for Sustainability in Rio de Janeiro, would regularly visit the residents, known as Kalungas, to help encourage farming practices that could feed communities without imperilling jaguars, tapirs, maned wolves or other wildlife.

But in a nation ravaged by the COVID-19 pandemic and seized by lockdowns and travel restrictions, times are far from normal. Vieira's laboratory and office space are closed, and she hasn't visited Chapada dos Veadeiros for more than a year. As much as she misses

her lab-mates and her office space, she most deeply longs to mingle with the Kalungas. Descendants of once-enslaved people who escaped to the wilderness generations ago, they built their own culture and their own approach to farming and survival. "When you get to know those people and how they see the world, you realize that our own vision is limited," she says. "It's important for ecologists to see different views."

The pandemic has changed some of the ways in which science is done. But as vaccines are slowly distributed to many parts of the world, researchers everywhere are gearing up to eventually return to life as normal, or something like it. *Nature* asked six scientists from South America, Africa, the United States and Europe what they miss most about

pre-pandemic science and what they're most looking forward to when – and if – the scientific enterprise finally and fully restarts.

### The human side

The pandemic has struck at the heart of scientific life. Researchers are eager to restart stalled experiments and return to neglected field sites, but, above all, they're looking forward to returning to the human side of science. "I really miss the daily visits with lab members and collaborators," says Fernando Maestre, an ecologist at the University of Alicante in Spain. "Personal interactions are a crucial part of the job."

Maestre, who studies soil quality and biodiversity, has also had to cut back on fieldwork. He can visit sites in his immediate region, but, since late January 2021, travel to other parts of

Spain has once again been prohibited. With the help of collaborators who were already in those parts, Maestre says that his research has more or less stayed on track, despite the pandemic. In January, Maestre and his colleagues published a paper detailing the importance of crop cover for protecting the soil (G. Garland *et al. Nature Food* 2, 28–37; 2021).

The pandemic might not have greatly affected Maestre's productivity, but it still took a toll. During the 2020 lockdown, a time of great isolation and uncertainty, he struggled with bouts of anxiety. He still does most of his work from home, but visits his lab and office once or twice a week to check in with team members at a safe distance. Those brief visits help him to stay connected, but they pale in comparison with the interactions that he had treasured. "I used to have lunch every day with my lab members," he says. He wants to stay optimistic, but he doesn't expect to have a pre-pandemic-style lab lunch until 2022. "We won't recover some normalcy until we get vaccinated," Maestre says. "I hope things will be better next year."

Like Maestre, Elena Tobolkina, an analytical chemist at the University of Geneva in Switzerland, is looking forward to casual face-to-face conversations in the lab. She works at the university a couple of times a week, but the lab is eerily quiet because many colleagues are either working from home or keeping odd hours to stay socially distant. "I barely ever see the PhD students or master's students," she says. "And if I happen to pass them in the corridor, we can't stop and talk like we used to."

As a single parent with two children, Tobolkina says that she needs time outside the house to truly focus on her work. But the pandemic has greatly complicated that option. Childminders in Switzerland are very expensive, she says, and minders from other nations, who might charge more reasonable fees, cannot easily enter the country. Her mother was able to visit briefly from her home country of Russia, but it was only a temporary fix. "I need to find a solution," she says. "We don't have any choice but to adapt."

The pandemic has taken a large toll in South Africa, particularly with a new SARS-CoV-2 variant now dominant. But Regina Maphanga, a physicist at the Council for Scientific and Industrial Research (CSIR) in Pretoria, has been able to keep her research up to speed without leaving home. Since the first lockdown, last March, she has visited her office just once, for a photo shoot. "I'm doing computational modelling, so my ability to do my research didn't change much," she says. Colleagues who run lab-based experiments had to basically shut down their research for several months, she says. Her employers at the CSIR helped to ensure that she had the software and computing power to continue her work and connect with other researchers for meetings and group projects.

Even though she has remained productive, Maphanga misses the routine and camaraderie of office life. "There are a lot of challenges working at home," she says. "If you go to the office, you can smile when you get there. At home, I have a lot of time to cry." She would like to get back to normal soon, but she worries that widespread scepticism about vaccines in her country could slow the process. "There are people who believe that the vaccine is meant to destroy the nation," she says.

When she does eventually return to the CSIR, the facility won't be as full as it once was: two of Maphanga's CSIR colleagues have died of COVID-19. Although she didn't work with them directly, the loss is palpable.

Hector Aguilar-Carreno, a virus researcher at Cornell University in Ithaca, New York, worked entirely from home during the first few months of the pandemic, but he's starting to spend more time back on campus. Partly thanks to

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a rigorous COVID-19 testing programme that has kept infection rates low at the university, many labs are open, albeit at a limited capacity. Aguilar-Carreno says his own lab is only half full at any given moment. When someone on campus tests positive for COVID-19, anyone who has been in close contact with that person for more than ten minutes has to quarantine. To avoid having to do that, Aguilar-Carreno spends no more than ten minutes in all in-person conversations. "I spend as little time in the lab as possible," he says.

Aguilar-Carreno says he'll know that science has taken a huge step towards normality when he can walk into an actual classroom and see actual faces. For now, Cornell is operating on a hybrid model. Smaller classes are being held in person, but large classes remain online. Aguilar-Carreno generally teaches about 100 students at a time, and his classes have been completely online since April 2020. "I can see only about four faces on my screen at a time," he says. "I have no idea how the rest of them are doing. They could be asleep." As an instructor who thrives on feedback, he says that he'll embrace in-person teaching as soon as it's an option. "I'm hoping we'll be back in the classrooms by this September."

Although he has managed to stay productive, the pandemic has complicated Aguilar-Carreno's work in unexpected ways. Because of global disruption in manufacturing and delivery, he's had to scrounge for lab supplies. "Yesterday, my lab manager told me we're almost completely out of pipette tips," he says. "I have no clue how we can get them.

I contacted ten companies. Nobody has any." Gloves, he says, are also in critically short supply. He's looking forward to a time when he can get back to science without worrying about those details that he used to take for granted.

### 'Longer thoughts' in real meetings

When scientists look back on the pandemic period, one of the most enduring memories will be of logging on to Zoom or another digital platform to attend a conference. Virtual conferences have their upsides, including easier access for those in developing nations, but John Tregoning, an infectious-disease researcher at Imperial College London, hopes to personally attend the British Society for Immunology conference that is scheduled for late November this year. For him, walking into an actual conference room with other attendees would be an unmissable sign that science is moving back to normal. "There's a family feel to it," he says. "I really miss breaking bread with people. Meeting intelligent people who are interested in the same thing as you is a real pleasure. It's part of what makes the job worth doing."

Tregoning will continue attending virtual conferences when necessary, but he admits that his mind has a tendency to wander as he stares at a presentation on a screen. For him, physically travelling to another city and sitting in a room makes it easier to become fully immersed in the experience. "I'm more engaged if I'm sitting in a hall," he says. "I can have longer thoughts."

Vieira says that personal interactions – whether they're in a conference room, a lab in Rio de Janeiro or a Kalunga village – make science worthwhile. She misses long lab lunches and chats over coffee, the kinds of conversation that can spark ideas. "Science can be so strict and formal, but you need creativity too," she says. "You need casual moments to chat."

But Vieira worries that many of her colleagues won't be around to continue those conversations. Her country has been economically ravaged by the pandemic, and she says that the Brazilian government has been unable or unwilling to support higher education. "Many labs are no longer being funded," she says. "Scholarships are being cut and many students have given up on the idea of having a degree. Many researchers are moving abroad. I'm afraid it's going to be kind of a ghost town around here."

And when she can return to her field sites at the Chapada dos Veadeiros, Vieira hopes to find that the Kalunga people have weathered the pandemic and continued their way of life. For farmers and scientists alike, there's no guarantee that life will ever completely return to normal. "I'm a hopeful person, but I see a sad future," she says.

**Chris Woolston** is a freelance writer in Billings, Montana.