



Academics in London join a three-day nationwide strike over pay and pensions in December.

## THE SCIENTIFIC WORKPLACE IN 2021

The impact on careers of a lingering pandemic and industrial unrest faced working scientists in the past 12 months. **By Chris Woolston**

**T**he past year delivered challenges as well as opportunities to working scientists around the world. Every week brought new developments: changes in funding (for better or worse), disruptions from a lingering pandemic, fresh warnings about inequity and toxicity in the workplace, and other reminders that careers in science remain dynamic and rewarding, but can also be daunting.

COVID-19 continued to shape science. Surveys of researchers conducted in the first few

months of 2021 confirmed that the pandemic had hampered the productivity and strained the mental health of researchers in the United States and the United Kingdom. The disruptions were especially harmful to female scientists, according to a report by the US National Academies of Sciences, Engineering, and Medicine. A separate survey broadened that to anyone with childcare duties. Shortages of reagents, pipette tips and other supplies forced researchers to scramble and adapt. More than 40% of those who responded to *Nature's* global salary and

job satisfaction survey in June and July reported that the pandemic had negatively affected their career prospects. Despite all the downsides, some researchers still saw a pandemic silver lining. The results of another *Nature* poll, published in March, found wide support for the continuation of virtual conferences.

### Prospects

Job security remained a leading concern, especially for scientists in academia. In *Nature's* 2021 salary and job satisfaction survey, just

over 40% of respondents in academia felt positively about their career prospects, compared with more than 60% of respondents in industry. “Academia is turning into a milling machine with no regard for life–work balance and fair compensation,” said one respondent.

There is reason to worry. In April, a survey of faculty members by the American Association of University Professors documented falling salaries and job losses at US universities. A survey published in July found widespread anger among UK academics over university job losses and funding cuts. In December, lecturers at 58 universities launched a 3-day strike over pensions and pay. In May, the Organisation for Economic Co-operation and Development, an international coalition of 38 nations, warned that universities and research institutions around the world must redouble efforts to expand training for PhD students and postdoctoral researchers to prepare them for jobs outside academia. Job insecurity and pressure to publish papers are deep-rooted issues in China, so much so that they might have been involved in a high-profile killing of a member of the mathematics faculty at Fudan University, Shanghai, in June.

### Funding and evaluation

Government support (or otherwise) of science made headlines throughout the year. Researchers in the United States anticipated billions of extra dollars in federal funding from President Joe Biden’s administration – a cash injection that raised concerns about a glut of new PhD students and postdocs, as well as hopes of a resurgence of US research – but scientists elsewhere were coping with disappointment. In October, researchers in Brazil decried crippling cutbacks in government funding, and researchers in the United Kingdom lamented that funding was growing much more slowly than hoped.

The year saw increased scrutiny of the process of researcher evaluation. Citations are often seen as the currency of success, but a study published in February found that a few elite researchers rack up an outsize share of citations. Utrecht University in the Netherlands announced in June that it was doing away with the journal impact factor when assessing a candidate’s publication record for hiring and promotion, three months after the University of Liverpool, UK, drew criticism for its use of metrics to identify academics at risk of losing their positions through job cuts.

The Declaration on Research Assessment, (DORA), a global initiative to reform the evaluation of researchers, announced a new project to develop an online dashboard that will track hiring and promotion metrics used at institutions around the world. It is due to launch in mid-to-late 2022.

Deciding which researchers deserve grants proved to be complicated. A study of grants

awarded by the European Research Council, posted as a preprint in March, suggests that simply sharing an institutional affiliation with certain panellists gives an applicant a better chance of success. A plan by the Australian Research Council to ban any mention of preprints or other non-peer-reviewed publications in grant applications was quickly abandoned after an outcry. A Swiss funder took a simpler approach: determine grant winners by the luck of the draw.

### Publishing and politics

Publishing took steps towards improved access and transparency, sometimes with a nudge from the outside. UK Research and Innovation, the country’s largest public funder, announced that, starting in April 2022, all grant recipients must make papers immediately available on open-access platforms after publication. To further improve access to research findings, US technologist Carl Malamud created a free, searchable online database of words and phrases from more than 100 million journal articles, including many currently locked behind paywalls.

The forces of global politics continued to affect daily life in the laboratory. Senior research officers in the United States noted that they spend large chunks of time completing tasks intended to protect research integrity and to prevent espionage by foreign



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countries, particularly China. Against that backdrop, polls of researchers of Chinese descent based in the United States found concerns about racial bias that deterred many from collaborating with institutions in China. Thousands of Chinese scientists have returned to their home country, driven partly by unease about China in the countries they worked in. In February, scientists in Russia protested about a new law that they feared could impede international collaboration.

Research integrity remained a hot topic. In September, a coalition of publishers announced an initiative to crack down on doctored images. There’s clearly work to do: a poll published in July found that 8% of researchers in the Netherlands admitted to fabricating data. China took steps to crack down on fake publishers, but some scammers

still found ways to fool academics, often by impersonating guest editors.

### Diversity, equity and inclusion

The move towards greater equality in science picked up momentum in 2021 with renewed calls for action (by UK Members of Parliament, among others) and fresh evidence of disparities. *Nature’s* salary and satisfaction survey found that only 40% of respondents felt that their employers were doing enough to promote diversity, down from 51% in 2018. One respondent said: “Academics like to think of their community as free spirited and innovative, but there is massive systemic discrimination and power hierarchies that ruin people and careers.”

Gender inequity was a particular focus. An analysis of top science prizes awarded over the past decade found that women were less lauded than men. The pay gap between male and female researchers in North America has widened, and men won an outsize proportion of medical awards in Australia. Last month, researchers at Germany’s Max Planck Institute raised concerns about the treatment of women research leaders there. A survey of astronomers found that reports of discrimination and harassment were common, with women and people from minority ethnic groups the most frequent targets.

The issue of racial equality continued to make headlines. A US survey of nearly 20 million workers found only modest gains in the representation of minority ethnic groups in STEM fields (science, technology, engineering and mathematics). An analysis of grants awarded by Cancer Research UK found that members of minority ethnic groups were less likely to receive funding. The American Physics Society announced that it would no longer hold conferences in cities with a history of racist police practices. Historically Black colleges and universities in the United States, major incubators of scientific talent, anticipated substantial funding increases thanks to a series of legal settlements and promises of increased federal support.

### Mental health

In these stressful times, mental health is a priority. The US National Academies of Sciences, Engineering and Medicine urged universities to invest more in graduate mental health. The chair of the committee that produced the report told *Nature* that the problem is “greater than it’s ever been”. *Nature’s* salary and satisfaction survey found that more than 40% of respondents had accessed professional help for anxiety or depression caused by their work, or had wanted to do so. That’s a jump from 2016, when just over 30% had sought or wanted help.

Next year will undoubtedly bring new developments that will change the way science is done. Stay tuned.

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