

A meeting of the biotechnology firm Biogen in Boston, Massachusetts, on 26 February was linked to 70 cases of COVID-19, the disease caused by the coronavirus, in Massachusetts alone. Public gatherings are being discouraged or banned worldwide in a bid to halt the spread of the virus.

Many organizers and participants have turned to online platforms as a way to share work, creating virtual conferences that mimic at least some parts of a physical meeting. These could be the beginning of a shift to more accessible conferences, says Ezequiel Ferrero, a physicist at Bariloche Atomic Centre in San Carlos de Bariloche, Argentina. Prohibitive costs had meant that Ferrero was unable to travel to Denver, Colorado, to attend the American Physical Society (APS) March Meeting earlier this month. But that meeting, for which 11,000 people had registered, was abruptly cancelled just two days before it was due to begin on 2 March.

Some APS divisions had already begun discussing ways to build a virtual community, says Ferrero. And many of them rapidly set up platforms to hold virtual sessions for the meeting, inviting their speakers to present by webcam or to upload their presentations to online repositories. Researchers who hadn't been in a position to fly to Denver found themselves able to participate from afar in what became the Virtual APS March Meeting. "I was not attending and then, suddenly, I was," says Ferrero.

"If anything, the talk quality was easier to see," says Karen Daniels, a physicist at North Carolina State University in Raleigh. "Nobody's head was blocking your way." Daniels, who spearheaded the effort to move the soft-matter-physics talks online, says that after some minor hiccups in reformatting the meeting, everything went very smoothly. One of the sessions she organized had about 100 virtual attendees.

Inclusivity advantage

But these aren't the only benefits. "There's a lot of reasons that we should have virtual meetings," Daniels says. Meeting spaces that are inaccessible to some disabled scientists, health considerations, a lack of access to childcare and travel restrictions can all end up alienating potential attendees from physical conferences. "This may be the thing that convinces us" to give virtual meetings a try, Daniels says.

All these factors mean there's a "large appetite" for alternative conference set-ups, says Divya Persaud, a planetary scientist at University College London (UCL). She and Eleanor Armstrong, a UCL sociologist of space science, have a grant from their university to hold an experimental virtual conference, called Space Science in Context, in May. The conference aims to improve accessibility, cut down on researchers' carbon footprints and reach a wider audience than a conventional meeting could. Participants will watch recorded talks ahead of time and then join in online

conversations on the day of the conference.

Persaud also points out that many of the adjustments that conferences are making – such as introducing virtual participation – are accommodations for which disability activists have been clamouring for years, and it's a shame that it took a global health crisis to make them happen. "It's a bittersweet thing," she says.

"Institutional feet have been dragged" in making meetings more inclusive, agrees Juniper Simonis, a quantitative ecologist in Portland, Oregon, who is an activist and advocate for disabled scientists. They point out that legal frameworks such as the 1990 Americans with Disabilities Act are already supposed to ensure reasonable accommodations for

those who need them. "In terms of hearing and responding to those requests," Simonis says, "conferences need to do better."

Still, as conference organizers are finding out, making these changes – especially on short notice – is no easy feat. The European Geosciences Union (EGU) general assembly is scheduled for 3–8 May in Vienna, and session leaders are making contingency plans in case it is cancelled. "It would be very hard to recreate the experience of a big meeting like EGU online," says Joanne Williams, a scientist who studies sea-level changes at the UK National Oceanography Centre in Liverpool. "But I want to make best use of the work we've put in already."

CHINA'S MARS MISSION ON TRACK DESPITE CORONAVIRUS OUTBREAK

The mission team has had to adjust how it works, but says the launch can go ahead.

By Smriti Mallapaty

China's first journey to Mars is one of the most anticipated space missions of the year. But with parts of the country in some form of lockdown because of the coronavirus, the mission teams have had to find creative ways to continue their work.

Researchers involved in the mission remain tight-lipped about its key aspects, but several reports from Chinese state media say that the outbreak will not affect the July launch – the only window for another two years.

"The launch is so important politically that they will make it happen," says Raymond Arvidson, a planetary geologist at Washington University in St. Louis, Missouri, who has been



China's Long March 5 rocket will carry its Mars probe into space.

involved with several US Mars missions.

The centenary of the founding of the Chinese Communist Party is in 2021, and a successful launch will be a “100-year anniversary gift”, says Wang Chi, a space physicist and director general of the National Space Science Center (NSSC) in Beijing, who is in charge of the scientific payloads involved in the mission.

Two other international teams are planning Mars launches in July. NASA plans to deploy a rover named Perseverance, and the United Arab Emirates will send a probe called Hope. The European and Russian space agencies were planning to send a probe to Mars this year, but announced on 12 March that the launch will be delayed by two years so that they can finish important tests, and partly because of the coronavirus pandemic (See p324).

China’s probe, called Huoxing, will include an orbiter, a lander and a rover – the first Mars probe to include all three. The project will have 13 scientific payloads, including several cameras, subsurface radar imagers and particle analysers, as well as a magnetometer and magnetic-field detector. The mission’s scientific goals include studying the Martian morphology, geology, soil and water-ice distribution.

Wang says the coronavirus outbreak has affected the way his team works, but has not yet caused delays.

Last week, the team had to move six scientific payloads for the orbiter from Beijing to Shanghai, where they will be assembled. Instead of risking the team members getting infected on a plane or high-speed train, 3 people drove the 6 payloads in a car – a journey that took more than 12 hours.

To limit physical contact between employees, the NSSC has introduced a flexible work policy that allows researchers and engineers to come into the office only in the mornings or the afternoons. Basic scientists can work from home. “We just want to reduce the population in the centre,” says Wang.

Travel has been minimized, but researchers who need to visit the NSSC for essential project testing can get approval to stay at the centre’s guest rooms without quarantining themselves for the required two weeks. “Because this is a big national project, usually the local government office gives us a green light,” says Wang.

More than 20 research teams and some 70 scientists across China are involved in the development of the craft’s instruments and scientific investigations, says Wang. To ensure communication between these teams during the coronavirus outbreak, technical evaluations have been done through virtual meetings, he says.

Another impact of the outbreak is that no guests will be allowed to attend the launch in July, says Wang. At the late 2018 launch event for China’s lunar probe, Chang’e-4, the teams responsible for the payloads invited some 100 guests, including international collaborators.

CLIMATE DEBATES START TO TAKE SHAPE AHEAD OF 2020 US ELECTION

Climate looms larger than ever before in a presidential election – for both Democrats and Republicans.

By Jeff Tollefson

A key debate on climate change is coming into focus for November’s US presidential election. Voting last week in Michigan and several other states cemented former vice-president Joe Biden’s lead over Bernie Sanders as the person to take on President Donald Trump.

Although both Biden and Sanders, the latter a Democratic senator from Vermont, have embraced the idea of a ‘green new deal’ to address the challenge of global warming, their proposed policies are worlds apart. Meanwhile, Republican leaders, seeing the rise of public support for action on climate change, are beginning to discuss the need to devise their own strategies.

The escalating issues with COVID-19 could take centre stage, but climate policy still might have its largest role yet in a US presidential election, says David Victor, a political scientist at the University of California, San Diego. “The Democratic base is fired up and fed up,” he says.

Whose deal?

Sanders’s plan had generated lots of excitement, but also concern. He anticipates the government taking charge of the energy system and investing more than US\$16 trillion to ramp up renewable-energy production. He would aim to eliminate emissions from electricity generation and transport by 2030, and achieve carbon neutrality by mid-century.

Biden’s plans are less clear, but he, too, has promised to put the United States on a course to carbon neutrality by 2050. He talks about investing in clean-energy innovation, incentivizing the deployment of low-carbon technologies and advancing regulations on greenhouse-gas emissions – programmes that would revive and extend the policies of former president Barack Obama. Biden has also said he supports a federal carbon tax, which Sanders has rejected as insufficient.

Conservatives are also feeling the pressure to act on climate change. Businesses are increasingly calling for a coordinated federal climate policy, and Republican leaders have begun talking about plans. “The party is at risk of haemorrhaging younger voters on climate,” says Ted Halstead, chair of the Climate



Presidential hopeful Joe Biden celebrates a victory in South Carolina.

Leadership Council, a bipartisan climate coalition that includes senior Republican politicians, environmental groups and major corporations – among them oil companies such as BP and ExxonMobil.

In February, this group released a detailed outline of its proposal, which centres on a tax-and-dividend programme that would put a price on greenhouse-gas emissions and return the revenue to the public.

But even with pressure from voters mounting, many observers are sceptical about whether the current generation of Republicans will actually raise their hands and vote for a carbon tax.

“I remain dubious,” says Sam Ricketts, a senior fellow at the Center for American Progress, a progressive think tank in Washington DC. If Biden is elected, Ricketts says, he might have to develop a broader agenda on less controversial fronts, including green infrastructure and jobs programmes that run alongside aggressive new clean-energy requirements.

But first, he needs votes. Victor says Biden’s next challenge will be to bring Sanders’s supporters on board and make sure they don’t sit out the election in protest. One way to do that is to flesh out his policies and make it clear that climate change is a top priority, Ricketts says. “This is an opportunity for him to speak to the progressives and young voters.”