dashboard for tracking the prevalence of the virus in cities and towns across the United States, so that people and officials can make evidence-based decisions about socializing, or opening offices and schools. And his plan pledges to modernize data systems used within the US health-care system, which are often painfully outdated.

Hamilton is pleased with that goal, but cautions that it won't be realized until funding is in place. "We need a serious investment in resources to build data superhighways," she says.

She and Chu are concerned that simply having more data, and even regular press briefings from the US Centers for Disease Control and Prevention — another part of Biden's plan — won't overcome the ocean of misinformation surrounding COVID-19. People who want evidence-based answers about the reliability of tests, vaccine safety and other questions struggle to find them online, says Hamilton. "We really need to tackle how to provide really plain information to the public."

Turbocharging vaccination efforts

Chasing an ambitious goal of administering 100 million shots to US residents in its first 100 days in office, the Biden team proposes creating 100 vaccination centres run by the federal government and mobile vaccination units in under-served areas, and using grocery stores and stadiums as vaccination venues. The ramp-up includes growing the ranks of vaccinators with retired or foreign-trained doctors, as well as medical students, and by directing staff such as nurses, physician assistants and doctors at various federal agencies to assist US states.

This multitude of new players will need clear instructions, says Saad Omer, a vaccinologist who is director of the Yale Institute for Global Health in New Haven, Connecticut. For instance, at the start of the US vaccine rollout, most vaccination centres did not receive guidance on how to allocate unused doses left over at the end of the day, a predictable development because people who make vaccination appointments don't always keep them, he says. Now, some states are beginning to provide those instructions.

There will be unanticipated hitches unique to a location — and health officials should be prepared to respond to those, too. "Immunization programmes sink or swim based on local 'microplanning'," says Omer.

The Biden plan also emphasizes equity in health care. The president has already established a COVID-19 Health Equity Task Force to ensure an "equitable pandemic response". In the United States, COVID-19 is 2.8 times more likely to kill Hispanic and Black people, and 2.6 times more likely to kill Native American people, than white, non-Hispanic people.

This task force must work in sync with the entire federal response team, and have a clear sense of its goals, says Jewel Mullen, associate dean for health equity at Dell Medical School at the University of Texas at Austin. "Equity needs to inform every aspect of the operation."

Separate from the task force, the strategy lists ways to get vaccines and information to high-risk groups and communities of colour. And it states an intent to back "equitable reopening" of colleges, noting that students from low-income families were more likely in the past year to cancel plans to attend college.

"We need a serious investment in resources to build data superhighways."

But moving the needle on health-care access will take time, wrote Rachel Hardeman, who researches reproductive-health equity at the School of Public Health at the University of Minnesota in Minneapolis, in an e-mail to *Nature*. "COVID-19 has exacerbated and highlighted inequities and systemic racism in our systems that has been there in some way, shape or form for 400 years," she says. "COVID response and relief must be a starting point for building new systems and structures that lead with equity."

Another area of focus for the Biden plan is rejoining global efforts to fight the pandemic. Last July, Trump began withdrawing from the World Health Organization (WHO), after he accused it of ignoring reports of the virus spreading in China. Soon after, 750 global-health experts wrote a letter to the US Congress saying the accusations were unfounded and that the "withdrawal will likely cost lives".

Biden's COVID-19 strategy states that the United States will rejoin, fund and help to reform the WHO so that it's better equipped to respond to health emergencies in the future. The plan also states that the country will join the WHO's COVAX initiative, which aims to provide vaccines around the globe. And Biden will attempt to prevent future pandemics by launching a National Center for Epidemic Forecasting and Outbreak Analytics.

Morrison says that joining the WHO and COVAX is a "terribly important step", but he notes a long path ahead in getting vaccines to low- and middle-income countries. "How much of a priority will that be when we have cascading crises domestically — the US pandemic, the economic crisis, racial strife and a grave proportion of Americans who don't believe that Biden won the election?"

'LIFE ON VENUS' CLAIM FACES STRONGEST CHALLENGE YET

Studies knock down a controversial report observing phosphine gas in the planet's atmosphere.

By Alexandra Witze

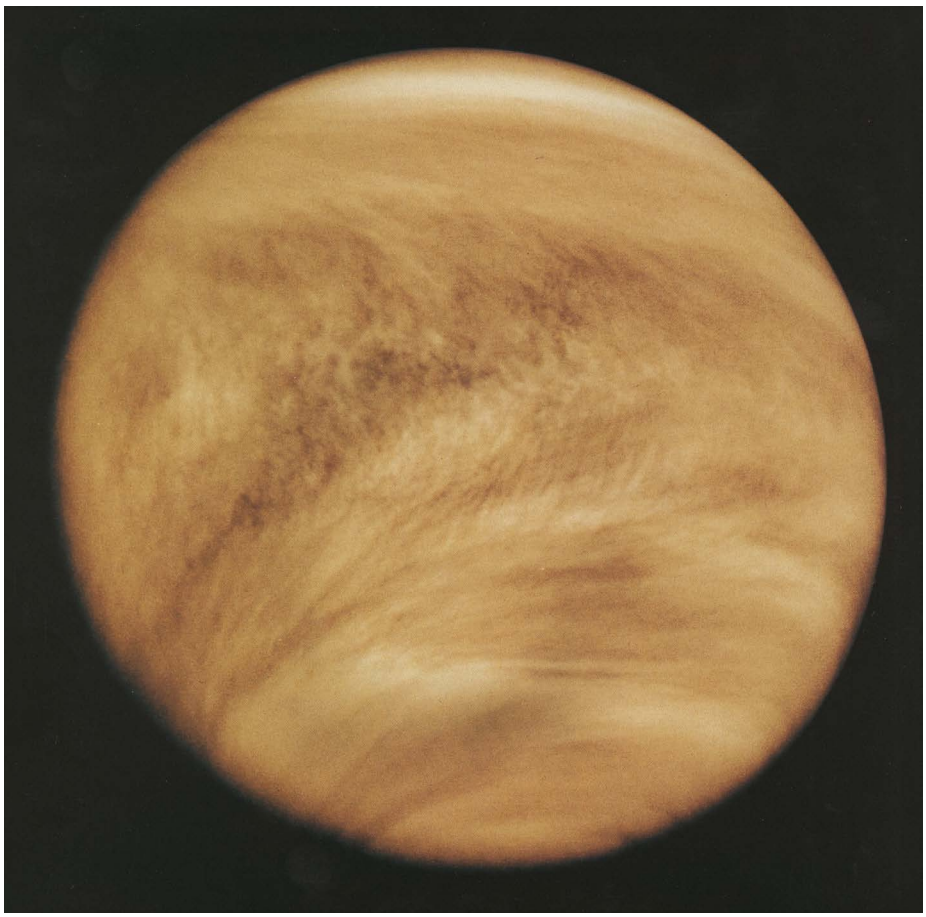
Two papers have dealt a fresh blow to the idea that Venus's atmosphere might contain phosphine gas — a potential sign of life.

The claim that there is phosphine on Venus rocked planetary science last September, when researchers reported spotting the gas's spectral signature in telescope data[1]. If confirmed, the discovery could mean that organisms drifting among Venusian clouds are releasing the gas. Since then, several studies have challenged the report.

Now, a team of scientists has published the biggest critique yet. "What we bring to the table is a comprehensive look, another way of explaining this data that isn't phosphine," says Victoria Meadows, an astrobiologist at the University of Washington in Seattle who helped to lead the latest studies. Both papers have been accepted for publication in *Astrophysical Journal Letters* and were posted on the arXiv preprint server on 26 January.

In one study, Meadows and her colleagues analysed data from one of the telescopes used to make the phosphine claim — and could not detect the gas's spectral signature[2]. In the other, the scientists calculated how gases would behave in Venus's atmosphere — and concluded that what the original team thought was phosphine is actually sulfur dioxide (SO_2), a gas that is common on Venus and is not a sign of possible life[3].

The papers pretty clearly show that there is no sign of the gas, says Ignas Snellen, an astronomer at the University of Leiden in the Netherlands who has published a different critique of



NASA's Pioneer Venus Orbiter captured this ultraviolet image of Venus's clouds in 1979.

NASA

the phosphine claim[4]. "This makes the whole debate about phosphine, and possibly life in the atmosphere of Venus, quite irrelevant."

Jane Greaves, an astronomer at the University of Cardiff, UK, who led the team that made the original phosphine claim, says she and her colleagues will comment after they've finished evaluating the new papers.

The stakes for confirming phosphine's presence on Venus are huge. On Earth, the gas can come from industrial sources such as fumigants, or from biological sources such as microbes. When first reporting the discovery of phosphine on Venus, Greaves and her colleagues said that its existence might mean there was life on the planet, because other origins for the gas weren't obvious.

But the claim rests on a chain of observations and deductions that other scientists have been chipping away at in recent months.

Greaves's team first used the James Clerk Maxwell Telescope (JCMT) in Hawaii to observe a spectral line in Venus's atmosphere at a frequency of 266.94 gigahertz – around the frequency where both phosphine and SO_2 absorb light. The scientists confirmed the existence of the line using the Atacama Large Millimeter/submillimeter Array (ALMA) in Chile. With ALMA, they looked for other spectral signatures that they would expect to see if the line came from SO_2, and did not find them. This, they said, suggested that the line at 266.94 gigahertz came from phosphine.

But it turned out that the ALMA data the team had used had been processed incorrectly by the observatory. After the debate over phosphine on Venus began, managers at ALMA realized the mistake, reprocessed the raw data and released the reworked batch in November. Greaves and her colleagues analysed the reprocessed data and concluded that they were still seeing phosphine – albeit at a much lower level than they had reported at first[5].

Those reprocessed ALMA data are at the heart of one of the new studies challenging the claim. A team including Meadows and led by Alex Akins, a research technologist at the Jet Propulsion Laboratory in Pasadena, California, aimed to replicate the work of Greaves's group. But the researchers didn't observe phosphine's spectral line when they analysed the reprocessed data released to the public. "We just weren't able to see it," says Akins.

The second study explores the 266.94-gigahertz feature, as seen by the JCMT. Andrew Lincowski, an astronomer at the University of Washington, led Meadows, Akins and others in modelling the structure of Venus's atmosphere at various altitudes. They found that the JCMT observation was best explained by the presence of SO_2 more than 80 kilometres above the planet's surface – not by phosphine at 50–60 kilometres above the surface, as Greaves's team claimed.

Still, although the new studies argue against the presence of phosphine, they can't entirely rule it out. "There's enough wiggle room there," says Meadows.

Ultimately, says Akins, the debate can be resolved only with fresh observations of Venus, many of which are planned in the coming months and years.

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FAMED CHINESE SCIENTIST CLEARED OF PLAGIARISM AND FRAUD

But Cao Xuetao will face ramifications for 'misused' images found in his group's papers.

By David Cyranoski

A distinguished Chinese immunologist, Cao Xuetao, has been cleared of significant wrongdoing, more than a year after the government launched an investigation to review 63 manuscripts he co-authored that contained suspected problematic images. The investigating committee found that none of the papers contained plagiarized or fabricated data, but that some had images that had been "misused", which "reflected a lack of rigorous laboratory management". Cao must now correct those papers and has been barred from applying for grants or recruiting students for a year.