News in brief

NEW VARIANT HITS COVID-RAVAGED CITY

A coronavirus variant detected in the Brazilian city of Manaus might be driving reinfections and the city's second wave of COVID-19.

During the first wave of the pandemic, Manaus experienced one of the world's highest infection rates: an estimated two-thirds of residents were infected by October 2020, leading some researchers to predict that population-wide immunity might cause new infections to tail off. But in January 2021, researchers identified a new coronavirus variant, called P.1, during a period of rising hospitalizations in the city and linked the variant to a few cases of reinfection.

To characterize the variant further, Nuno Faria at Imperial College London and his colleagues analysed viral genomes collected from 184 human samples in Manaus between November and December (N. R. Faria *et al*. Preprint at https://go.nature.com/3sor3jj; 2021). The variant harbours 17 mutations that alter SARS-CoV-2 proteins.

By modelling the spread of P.1 and its possible effects during the second wave in Manaus, the researchers estimated that the variant was 1.4–2.2 times more transmissible than other lineages and that it was able to evade some of the immunity conferred by previous infections.

L TO R: MICHAEL DANTAS/AFP/GETTY; KYUNGDUK KIM

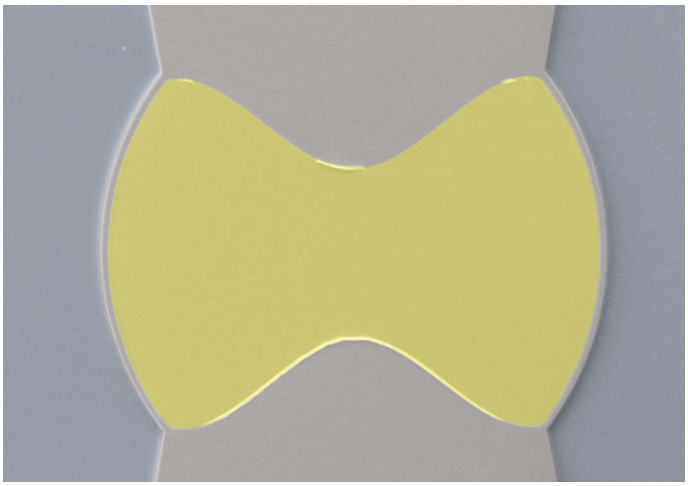
PLAN TO CREATE 'UK DARPA' LACKS DETAIL, SAY RESEARCHERS

The UK government has released more information about its plans to launch an independent research agency that will focus on funding high-risk, high-reward science. The agency is modelled on the United States' Defense Advanced Research Projects Agency (DARPA), which helped to develop pioneering technologies such as the Internet and GPS.

On 19 February, the UK government said that the new body — to be called the Advanced Research and Invention Agency (ARIA) — will free scientists from the checks and balances of the conventional grant system so that research can be funded quickly and flexibly. It says ARIA will be led by "visionary researchers" who will "identify and back the most ambitious, cutting-edge areas of research and technology". The agency will be exempt from 'freedom-of-information' rules, and will trial different mechanisms for allocating funding, such as programme grants, seed funding and prize incentives.

Researchers and science-policy experts have welcomed the update, but warn that the plan still lacks detail, and that the new funding body's purpose is unclear.

"No doubt ARIA will do interesting and exciting things at the project level — it's just not likely to be transformative by itself," says Kieron Flanagan, a science and technology policy researcher at the University of Manchester, UK.



THE FASTEST RANDOM-NUMBER GENERATOR EVER BUILT

Researchers have built the fastest random-number generator ever made, using a simple laser. It exploits fluctuations in the intensity of light to generate randomness at the rate of 250 trillion bits per second, and could lead to devices that are small enough to fit on a single computer chip.

True randomness is a coveted resource in applications such as data encryption and scientific simulations, but it is surprisingly difficult to come by. Algorithms in conventional computers can produce sequences of numbers that seem random at first, but over time these tend to display patterns, which makes them vulnerable to being decoded.

To make encryption safer, researchers have turned to quantum mechanics, where the laws of physics guarantee that the results of certain measurements — such as when a radioactive atom decays — are genuinely random. A popular way to tap into quantum randomness is to exploit fluctuations in how photons are emitted by the materials used in lasers. Typical laser devices are designed to minimize these fluctuations to produce light of steady intensity: they make the light waves bounce around inside the material to force its atoms to emit more and more photons in sync with each other.

But for random-number generation, researchers aim for the opposite. "We want the intensity to fluctuate randomly, so we can digitize the intensity to generate random numbers," says Hui Cao, an applied physicist at Yale University in New Haven, Connecticut.

Cao and her team made their laser material — a translucent semiconductor — in the shape of a bow tie (pictured). Photons bounce between the curved walls of the bow-tie device multiple times, before coming out as a scattered beam. The researchers can then capture the light with an ultrafast camera. They recorded the light output of 254 independent pixels, which together produced random bits at a rate of around 250 terabits per second — several orders of magnitude faster than previous such devices (K. Kim *et al*. *Science* **371**, 948–952; 2021).

The invention "represents a major leap in performance of random-number generators", says Krister Shalm, a physicist at the US National Institute of Standards and Technology in Boulder, Colorado.