# News in brief

## FIRST MISSION TO JUPITER'S ASTEROIDS LIFTS OFF

A NASA spacecraft has begun its journey to a realm of the outer Solar System that has never before been visited: a set of asteroids orbiting the Sun near Jupiter. The rocks are "the last unexplored but relatively accessible population of small bodies" circling the Sun, says Vishnu Reddy, a planetary scientist at the University of Arizona in Tucson.

The US$981-million Lucy mission, which launched from Cape Canaveral, Florida, on 16 October, will spend the next 12 years performing gravitational gymnastics to swoop past six of the asteroids, known as Trojans, to snap photos and determine their compositions. Scientists think the Trojans will reveal information about the formation and evolution of the Solar System. The mission's name reflects their hopes: Lucy is the 3.2-million-year-old hominid fossil unearthed in 1974 in Ethiopia that unlocked secrets of human origins.

Powered by two 7.3-metre-wide solar panels, Lucy will whizz past each asteroid at 6 to 9 kilometres per second. It won't reach its first target, the asteroid Eurybates, until 2027. Whatever the mission finds will almost certainly rewrite textbook entries on the Trojan asteroids, Reddy says. "We might throw all our formation models out the window."

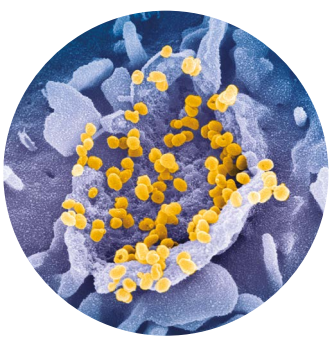
## COVID REINFECTIONS LIKELY WITHIN ONE OR TWO YEARS

People who have been infected with SARS-CoV-2 can expect to become reinfected within one or two years, unless they take precautions such as getting vaccinated and wearing masks. That's the prediction of modelling based on the genetic relationships between SARS-CoV-2 and other coronaviruses (J. P. Townsend *et al*. *Lancet Microbe* https://doi.org/gmzj22; 2021).

Researchers combined genetic data from SARS-CoV-2, three endemic coronaviruses and the closely related coronaviruses SARS-CoV and MERS-CoV to build a viral family tree. They used that tree to model how viral traits have evolved over time, and to estimate the decline in antibody levels after SARS-CoV-2 infection.

The results suggest that the average reinfection risk rises from about 5% four months after initial infection to 50% by 17 months. Natural protection seems to last for less than half as long as it does for the three common-cold coronaviruses. The findings also suggest that people could be reinfected in just a few months if they are not vaccinated.

Further, long-term data will be necessary to show precisely how long natural immunity lasts.



## IVORY POACHING DRIVES EVOLUTION OF TUSKLESS ELEPHANTS

African elephants have evolved towards tusklessness in an area where they were intensively hunted for ivory, finds a study of elephants' traits and genetics in Mozambique (S. C. Campbell-Staton *et al*. *Science* **374**, 483–487; 2021).

The finding could have implications for the recovery of elephant populations in the country.

Ivory trading was used to finance a civil war in Mozambique from the late 1970s to early 1990s. Poaching caused the elephant population in the country's Gorongosa National Park to crash by more than 90%, from more than 2,500 animals down to around 200 in the early 2000s.

Before the war, about 18.5% of females were naturally tuskless – a trait that made them undesirable to poachers. Among the 91 female elephants that have been born since the war, the researchers show, that fraction has risen to 33%.

Mathematical modelling has confirmed that this shift is the result of hunting pressure: the selective killing of elephants with tusks has led to the birth of more tuskless offspring.

The team noted that tusklessness is seen only in female elephants. This, and the pattern of inheritance of the trait, suggested that it is caused by a mutation on the X chromosome that is fatal to males and dominant in females – just one copy of a mutation is needed to cause it. The researchers searched through the elephants' genomes looking for regions on the X chromosome that differed between those with and without tusks, and that showed signs of recent selection pressure. They identified two likely candidate genes: *AMELX* and *MEP1a*. In humans, these genes are known to be involved in the growth of incisor teeth (the human equivalent of tusks).

For the elephants, selection for tuskless females could have knock-on effects. By looking at DNA in elephant dung, the researchers learnt that tusked and tuskless animals eat different plants. Elephants are keystone species, so a change in their diet could potentially alter the landscape. And because the tuskless trait is fatal to male offspring, it is likely that fewer elephants will be born overall, which could slow population recovery even though poaching has now been stopped in the park.

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