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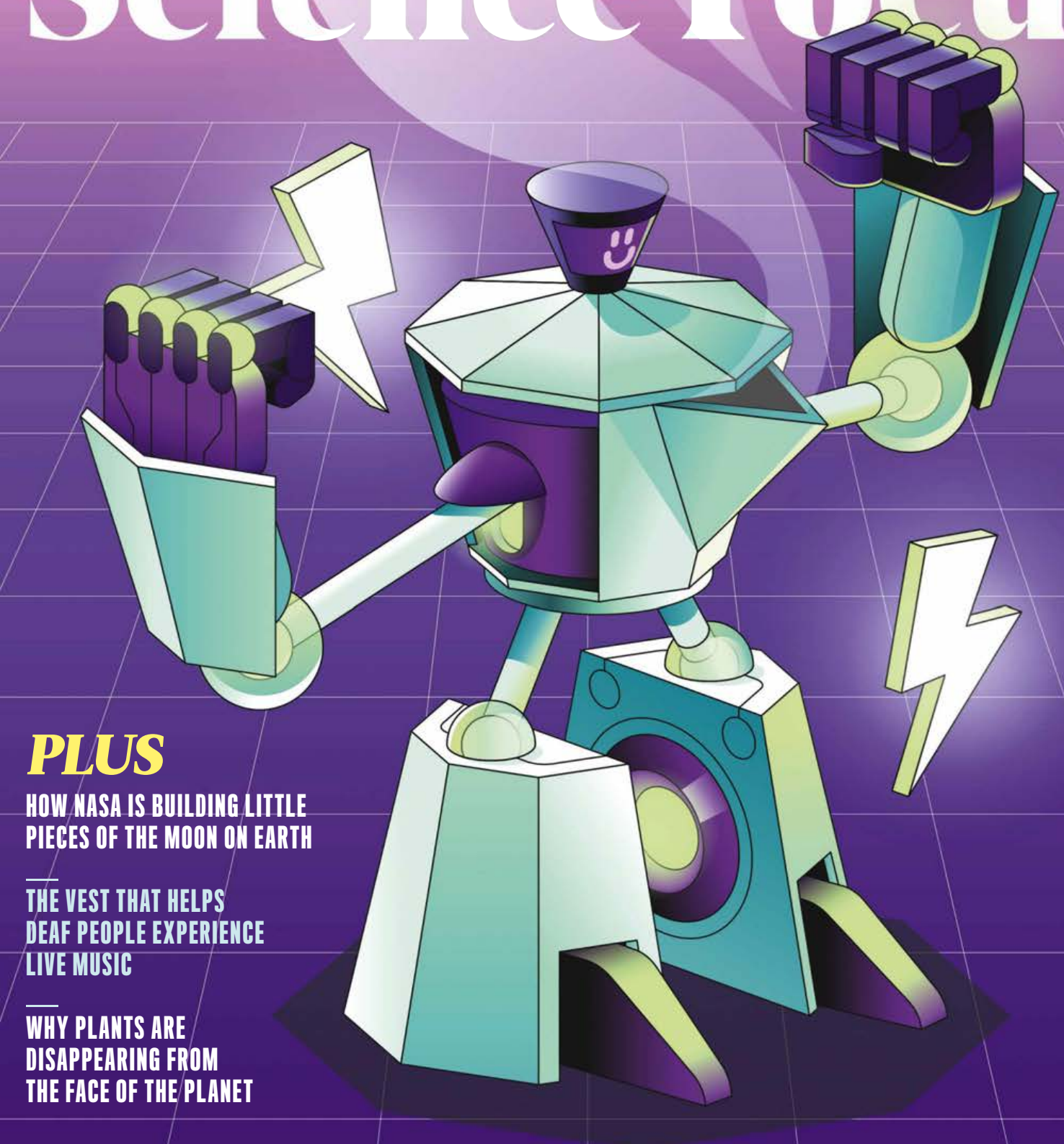

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RETHINKING CAFFEINE

HOW THE RIGHT AMOUNT UNLOCKS LIFELONG BENEFITS FOR YOUR BRAIN AND BODY

NEUROSCIENCE

HITTING THE SNOOZE BUTTON MAY BOOST BRAIN FUNCTION

Good news for snoozers: new research reveals that if you snooze, you *don't* lose

You can stop feeling guilty for snoozing your alarm: a new study by scientists in Sweden suggests that hitting snooze may actually help you become more alert after finally waking.

The research, published in the *Journal of Sleep Research*, involved two studies. The first established the general profile of the 1,732 adults who participated: 69 per cent of whom confirmed they used the snooze function on their alarms.

The snoozers tended to be younger than non-snoozers; they also had later chronotypes, meaning their natural sleep/wake pattern made them 'night owls', rather than 'morning larks'. Snoozers were also more likely to sleep for a shorter amount of time and to experience morning drowsiness.

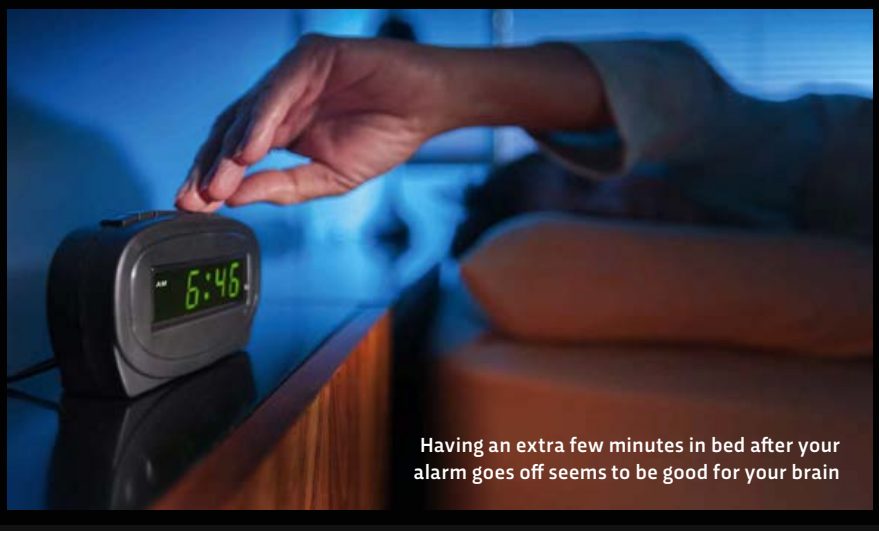
Only regular snoozers were examined in the second study, which took place over two nights in a sleep lab. One morning, the participants were allowed to snooze for 30 minutes; the other, they were made to rise abruptly. They then had to perform arithmetic and memory tests as soon as they woke up and at various points throughout the day.

When participants were gifted an extra 30 minutes of snoozing, they performed better on most of the tests. The researchers believe this may be because snoozing allows you to reach a lighter sleep stage that's easier to wake up from than slow-wave/rapid eye movement sleep, which your first alarm is likely to catch you in.

The benefits of snoozing disappeared after 40 minutes, however. At this point, your performance on cognitive tasks won't be affected whether you snooze or wake up immediately, the study suggests.

As the study highlights, snoozing generally shortens total sleep time, compared to setting your alarm later and waking up instantly. Nevertheless, the study found that snoozing had no clear impact – positive or negative – on stress hormone levels, mood, morning drowsiness or overnight sleep quality.

"The findings indicate that there's no reason to stop snoozing if you enjoy it, at least not for snooze times of around 30 minutes," said Dr Tina Sundelin, one of the study's authors. "In fact, it may even help those with morning drowsiness to be slightly more awake once they get up."



Having an extra few minutes in bed after your alarm goes off seems to be good for your brain

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SPACE

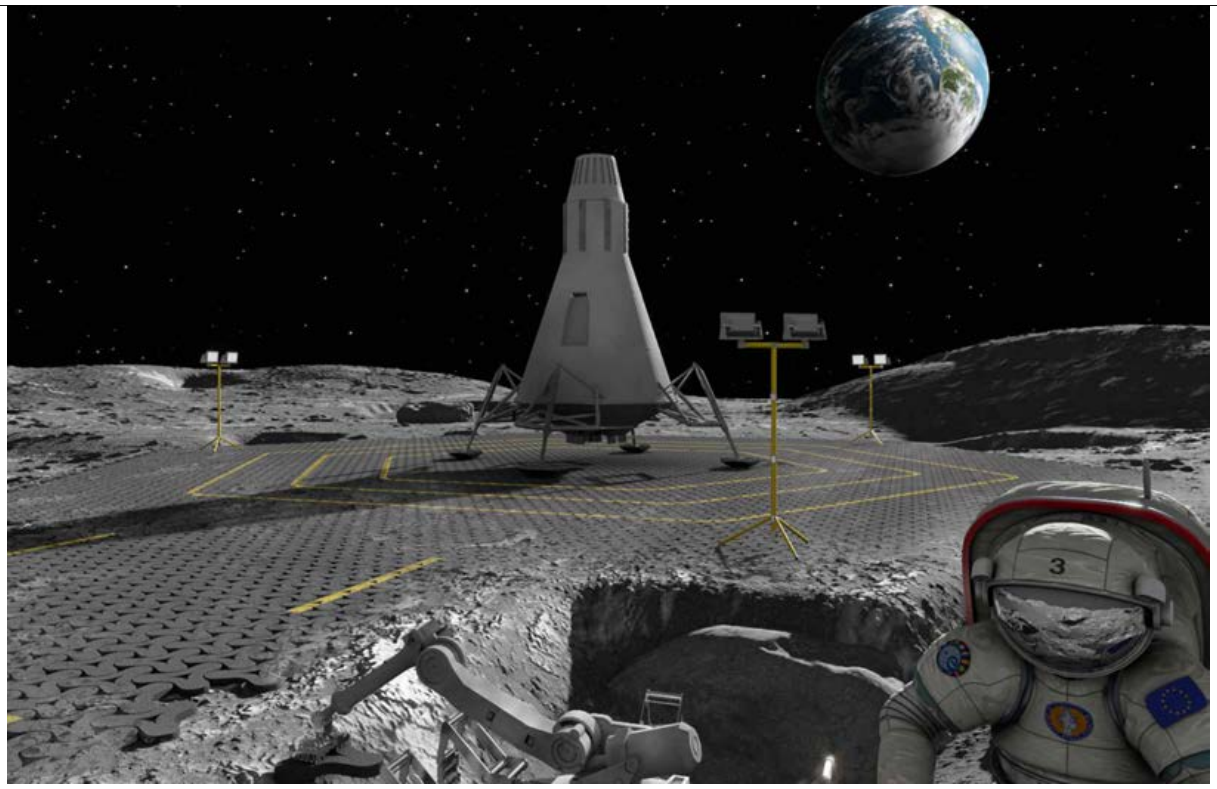
SCIENTISTS PLAN TO MELT MOON DUST TO LAY LUNAR ROADS

Triangular 'paving stones' could be made on the Moon using the Sun's rays and might solve the problems caused by Moon dust

Any human feat of exploration usually requires roads at some point, and that applies even on the Moon. But how can we build lunar roads? By using sunlight and the Moon's dust, which up until now has presented a problem for lunar explorers and equipment.

The low levels of gravity on the Moon means that any movement on its surface kicks up dust, which can take hours to settle. This dust is ultra-fine and abrasive enough to damage equipment if it gets inside it (lunar dust eroded the Apollo missions' spacesuits).

For transport systems on the Moon to be successful, solid roads and landing pads will be essential. But sending road-building materials to the lunar surface is expensive. So



CLOCKWISE FROM TOP LEFT The triangular 'paving stones' interlock to create solid surfaces; how the roads could look; a single melt layer is approximately 2cm deep; melting simulant Moon dust using a carbon-dioxode laser beam

researchers at Aalen University, Germany, have discovered that by melting Moon dust they can create solid, robust slabs that holds this extremely fine dust in place.

These slabs will make it easier for rovers to travel across the Moon's surface, but also reduce soil dislodged by rocket thrusters from vehicles landing and launching.

For the study, published in *Scientific Reports*, the researchers used a Moon dust substitute called EAC-1A, which the European Space Agency developed for this type of testing.

The researchers, working on Earth, melted the EAC-1A using a carbon dioxide laser. On the Moon, this laser will be replaced with focused solar radiation: a giant lens of 2.37m^2 (25.5ft^2) will concentrate sunlight to melt Moon dust into 20cm-wide triangular slabs to make paving stones.

"A giant lens will concentrate sunlight to melt Moon dust into paving stones"

"We were able to consolidate material up to a depth of more than 20mm, which is quite massive," Prof Jens Günster, the study's corresponding author, told *BBC Science Focus*. "We were very happy with the mechanical properties of the consolidated material."

Once the solar lens is sent to the Moon, the road-building process will only use lunar resources.

Further research is required to refine the process before it's capable of being reproduced on the Moon. Günster believes it could be possible within the next decade, however – in time for missions such as those in NASA's Artemis programme, which includes plans for the first crewed Moon landing since Apollo 17 in 1972, and for Gateway, a new space station that will be built in orbit around the Moon.