

New Scientist

WEEKLY 4 November 2023

A NEW WAY TO THINK ABOUT THE ORIGINS OF LIFE

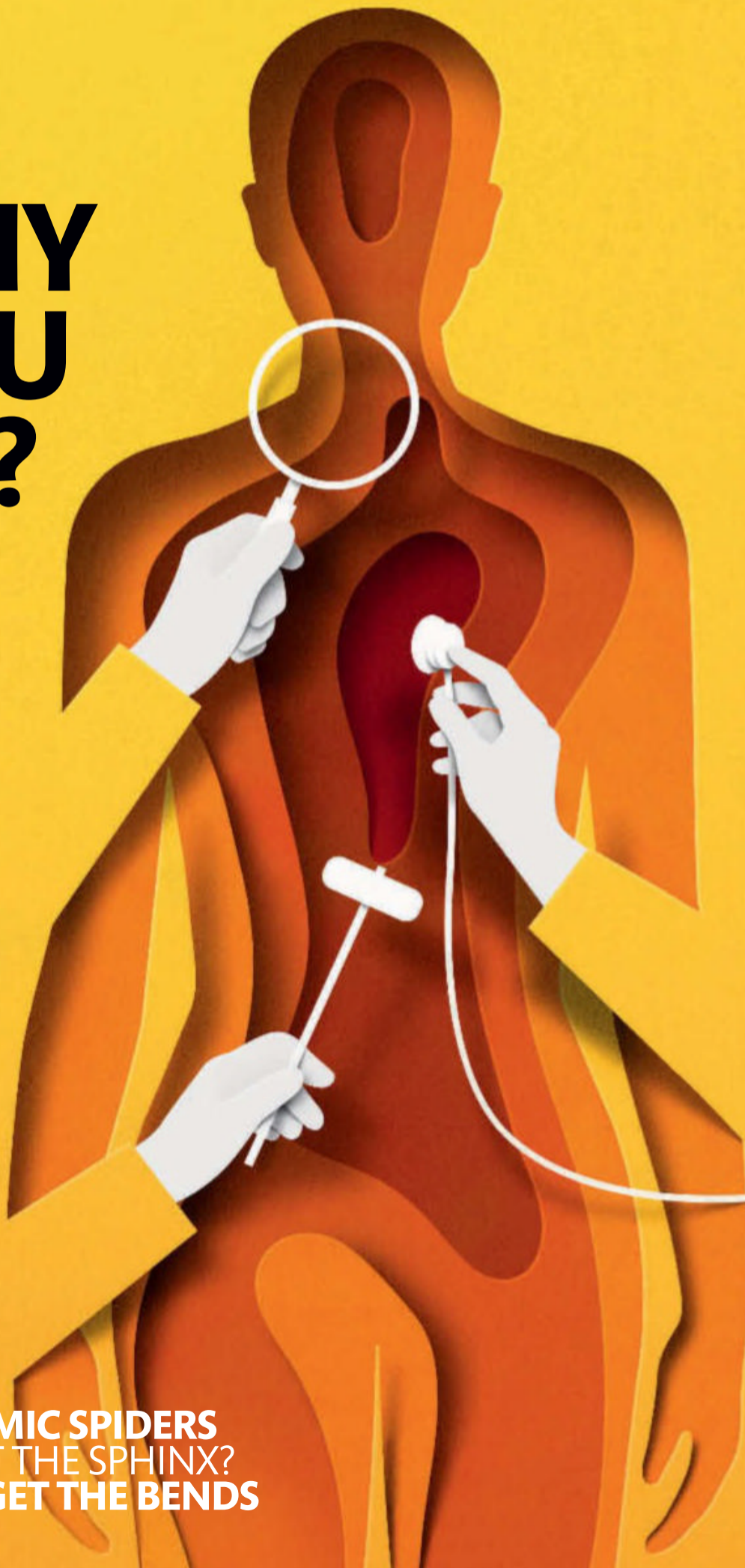
FIRST GLIMPSE OF A BLACK HOLE BEING BORN

WHY A STARFISH HAS NO BODY, JUST A HEAD

LARGEST QUANTUM COMPUTER EVER

HOW HEALTHY ARE YOU REALLY?

The new tests that can finally give you the answer



MACHINE UNLEARNING

Can we ever teach an AI to forget?

PLUS MOTHS THAT MIMIC SPIDERS
DID WIND HELP SCULPT THE SPHINX?
WHY WHALES DON'T GET THE BENDS

No3463 £6.95 CAN\$9.99



We may have seen a black hole's birth

Strange light undulations from a supernova blast could be evidence of a black hole's creation

Alex Wilkins

WE MAY have witnessed a black hole being born from a dying star, according to an analysis of an unusual rhythmic supernova.

When a star runs out of the fuel it needs for nuclear fusion, it goes supernova and collapses in on itself, falling onto the core and blasting out material in a bright explosion.

Astronomers have evidence linking extremely massive supernovae to the formation of ultra-dense remnants like neutron stars and black holes, collectively called compact objects, but this is from long after the star has exploded. A star has never been caught in the act of going supernova and birthing a dense descendant.

Now, Thomas Moore at Queen's University Belfast, UK, and his colleagues think they may have glimpsed evidence of a neutron star or black hole being born from a supernova, called SN 2022jli, because it has strange undulations in the light it gives off. "We've never seen anything

quite like this," says Moore.

Unlike normal supernova explosions, which tend to fade once they reach their peak after about a month, SN 2022jli faded before growing bright again, at 1 per cent of its maximum brightness. This continued in a pattern of periodic brightening and fading around every 12 days for more than six months, which hasn't been seen in any other supernovae.

SN 2022jli, which looks to have come from a massive star collapsing while in orbit around another star, has other unusual properties too. These include an extremely bright first peak to the explosion, and spectroscopic measurements of it show strong light from elements that don't fit with the normal timeline of such supernovae, says Moore.

This evidence suggests that the supernova either had an unusual parent, such as an extremely stripped-back star called a Wolf-Rayet star, or has given birth to a compact object, which is making

the supernova appear unusual, says Moore. However, his team doesn't have enough evidence to make a conclusion either way (*The Astrophysical Journal Letters*, doi.org/k23h).

Another group – Ping Chen at the Weizmann Institute of Science

Artist's illustration of a black hole born from a supernova



CHRISTOPHER BURGSTEIN/SCIENCE PHOTO LIBRARY/ALAMY

in Israel and his colleagues – has separately observed SN 2022jli and has detected emissions of hydrogen late in the supernova's lifetime. These researchers think the emissions come from the remaining star in the pair having material sucked away and then ejected by the neutron star or black hole. They also detected gamma rays from the direction of the supernova, which could be from the compact object too (arXiv, doi.org/k23j).

While astronomers are fairly sure that supernovae form compact objects, understanding what kind of star went supernova and how it happened could give us crucial information on how black holes and neutron stars are born, says Justyn Maund at the University of Sheffield, UK.

The combination of observations suggests that we really are witnessing the birth of a compact object, he says. "They've tried to make this complete picture, which I think is very convincing." ■

Technology

AI brings John Lennon's vocals to new Beatles' song

THE Beatles have released what is said to be their last ever song, pieced together from recordings spanning more than four decades, in a feat that was possible due to artificial intelligence.

On 2 November, the iconic band released *Now and Then*, a song edited from a recording of the late John Lennon playing piano and singing at home in 1979. AI was used to extract usable sections from that noisy tape.

These were combined with

guitar tracks from the late George Harrison, recorded in 1995 when efforts were made to finish the song. Reportedly, the endeavour was initially called off due to poor sound quality, an issue solved by AI.

Finally, new recordings made earlier this year by Paul McCartney and Ringo Starr were added. The single bookends the band's career by also including *Love Me Do*, their first single, as a B-side.

McCartney has teased the song in interviews for months and said in a statement: "There it was, John's voice, crystal clear. It's quite emotional. And we all play on it, it's a genuine Beatles recording."

Film director Peter Jackson's

production company WingNut Films is credited for "source separation". The firm also made the documentary *Get Back*, featuring footage of The Beatles recording *Let it Be*.

When creating *Now and Then*, engineers at WingNut worked on 60 hours of recording captured by a single microphone that picked up the musicians' instruments in a noisy jumble. The microphone also caught background chatter, making much of the recording unusable.

The team used AI to separate

"There it was, John's voice, crystal clear. And we all play on it, it's a genuine Beatles recording"

the dialogue from other noises, also isolating the sound of each instrument being played.

Jess Aslan at Goldsmiths, University of London, says The Beatles' track was done with the blessing of the living members of the band, but adds that AI also presents risks to artists.

"One significant issue is that generative AI is squeezing the already extremely narrow creative job market," she says. "Another is that of ownership, in that these large-scale models are in effect bypassing copyright laws and reconfiguring artists' data without consent." ■

Matthew Sparkes