

Science Focus

DO FACE MASKS STILL WORK?

MOON PHOTOGRAPHY MASTERCLASS

THE RACE TO SAVE WHITE RHINOS

TIRED ALL THE TIME?

We're sleepwalking into a health crisis. Here's how you can avoid it



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Psychology

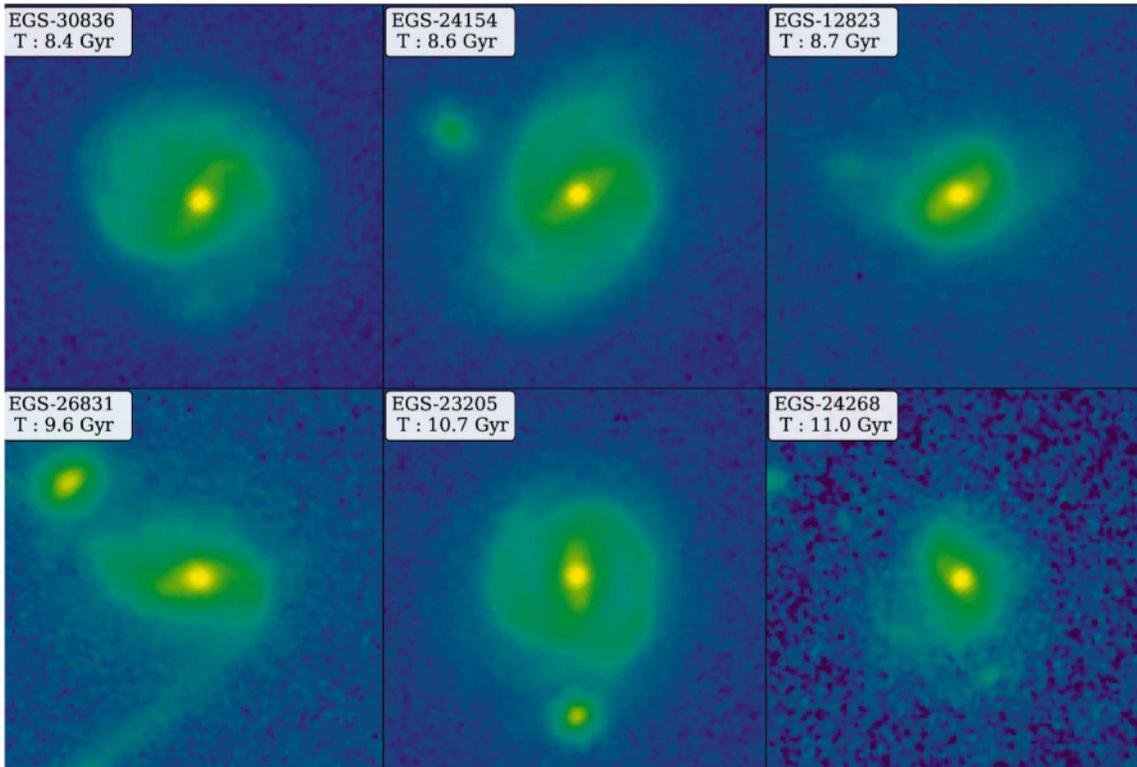
It's time to stop treating the midlife crisis like a joke

Night Sky

Light pollution is drowning out the stars

COVID

All you need to know about the new variant

**6.5M**

The size of the JWST's primary mirror – almost three times that of the Hubble Space Telescope.

\$10BN

The cost to build the JWST. That's roughly four times the amount Elon Musk, one of the world's richest people, earns in a year.

13.6 BILLION YEARS

The JWST can image events that happened as long as 13.6 billion years ago, just a few hundred million years after the Big Bang.

SPACE

JAMES WEBB SPACE TELESCOPE SPOTS GALAXIES LIKE OUR OWN IN THE EARLY UNIVERSE

Their discovery means a rethink of a theories of how galaxies evolve

NASA's James Webb Space Telescope (JWST) has come up with the goods again. Images released by the space agency show some of the oldest barred galaxies ever discovered. The galaxies feature so-called stellar bars – elongated bands of stars that stretch from the galaxies' centres into their outer discs, like those seen in the Milky Way. Two of the six date back to a time when the Universe was just 3.4 billion years old, one-quarter of its current age.

One of the galaxies, EGS-23205, was previously imaged by the Hubble Space Telescope but the resolution was not high enough for astronomers to make out its spiral shape and prominent stellar bar. These fine details are clearly visible in the higher

resolution images produced by the JWST. The structure of a second galaxy, EGS-24268, is also distinguishable.

Both barred galaxies date back to around 11 billion years ago, making them older than any previously discovered, and were found in data collected by the JWST's Cosmic Evolution Early Release Science Survey (CEERS). Four other barred galaxies from more than eight billion years ago were also found in the data.

"I took one look at these data, and I said, 'We are dropping everything else!'" said the study's co-author Prof Shardha Jogee, from the University of Texas at Austin.

"The bars hardly visible in Hubble data just popped out in the JWST image, showing the tremendous power of the JWST to see the underlying structure in galaxies."

Stellar bars play a central role in the evolution of galaxies by transporting gas from the outer regions to the centre. This gas is then rapidly converted into new stars at a rate between 10 and 100 times faster than in the rest of the galaxy. It can also help to fuel the growth of the supermassive black holes found at galaxies' centres.

Finding barred galaxies in the early Universe also raises questions about current theories of galaxy evolution. The team now plans to test different models of galactic evolution to explain their new findings.

"This discovery of early bars means galaxy evolution models now have a new pathway via bars to accelerate the production of new stars at early epochs," said Jogee.