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ASTRONOMY

TARANTULA NEBULA PHOTOGRAPHED IN UNPRECEDENTED DETAIL

Newly released mosaic from the James Webb Space Telescope peers through the cosmic dust to reveal never-before-seen young stars

Although the wispy swirls of clouds give a sense of serenity, the Tarantula Nebula is actually one of the largest and most violent star-forming regions in our Local Group, which is the collection of galaxies in our cosmic neighbourhood.

The Tarantula Nebula is home to some of the hottest and most massive stars known to astronomers, and in the centre, sparkling blue with



NASA/ESA/CSA/JAMES WEBB SPACE TELESCOPE

massive young stars, is the star cluster R136.

“R136 far exceeds anything in our own Milky Way. It contains almost half a million solar masses [one solar mass = the mass of our Sun],” said Prof Mark McCaughrean, from the European Space Agency.

“It’s possible this region is a proto-globular cluster, and its huge cumulative luminosity is what lights up the Tarantula Nebula.”

Blistering radiation has blown away the dusty cocoons that once surrounded these young stars. Left behind is only the densest material, sculpted into pillars.

This image, captured with JWST’s Near-Infrared Camera (NIRCam), is 340 light-years across, although the nebula’s total width exceeds 1,000 light-years.

“The JWST image of the Tarantula Nebula was created using

mosaics made through four separate infrared filters,” said McCaughrean.

The Tarantula Nebula is of special interest as it has a similar chemical composition to the gigantic star-forming regions known to exist when the Universe was only a few billion years old. Astronomers hope that the crisp images of the nebula produced by NIRCam will help them shed further light on the process of star formation.