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Science in Images

By Allison Parshall

captured a rare image of one of these shedding giants, called a Wolf-Rayet star, in the final, fleeting stages of its life.

The star, called WR 124, is 30 times more massive than the sun but losing material quickly as it blasts hot gas into space. “We’ve caught it early,” says Anthony Moffat, who has studied Wolf-Rayet stars for decades and was not involved in the recent JWST measurements. “This is the youngest one I know of.”

Once massive stars have burned through all their hydrogen, they begin fusing helium into heavier elements. These energetic reac-

Giant stars live fast and die young, burning through their fuel in only a few million years before sloughing off their outer layers and exploding in a dramatic supernova. Recently the James Webb Space Telescope (JWST) cap-

tions push stellar winds up to millions of kilometers per hour, flinging the star’s outer layers of gas into space. The burgeoning rings of gas and dust glow with the infrared radiation that JWST can detect, letting the telescope capture WR 124 in stunning new detail.

Researchers know space dust from Wolf-Rayet stars will go on to form planets and birth new stars. But it also presents a mystery: there seems to be more dust in the universe than scientists can explain by cataloging the obvious sources. “It’s always an interesting place to be in science when our theories don’t match our observations—and this is where we are right now with dust,” says Amber Straughn, a JWST project scientist at NASA. The telescope’s vivid views of a dying star’s denouement, as it forges heavy elements and generates copious dust, can help scientists refine their understanding of this foundational process.

Someday WR 124 will explode in a spectacular supernova. The explosion will either leave behind a black hole or stall out as a neutron star; physicists don’t have a great way to predict which with certainty. Moffat guesses it will ultimately transform into a neutron star—but we will never know for sure.

NASA, ESA, CSA, STScI, Webb ERO Production Team