



**T**HE JAMES WEBB SPACE TELESCOPE LAUNCHED from Kourou, French Guiana, on Christmas Day, December 25, 2021. Over 30 years in the making, JWST involved the space agencies of the US, Canada and the EU. Completed in 2016 after many setbacks and at a cost of \$10 billion, its launch was repeatedly delayed as tests and analyses examined hundreds of questions. Any failure could have proven catastrophic.

Astronomy is in a new golden age, with projects like the Square Kilometre Array radio telescope being built in South Africa and Australia already delivering fantastic insights into distant space and promising much more to come. Yet even by those standards, the JWST was an audacious undertaking.

Unlike its predecessor, the Hubble Space Telescope, JWST is designed for infrared light, which allows it to more clearly detect even much fainter objects, even through interstellar dust. To do that, it must be kept very cold, protected from local heat sources like the sun. So scientists sketched out plans for a distant orbit and a diamond-shaped five-layer shield the size of a tennis court that serves as a giant beach umbrella. Its eye is a 21-feet-wide mirror, a

**A tiny slice of the deep sky, the width of a grain of sand held at arm's length, shows a cluster of thousands of galaxies as it appeared 4.6 billion years ago. The gravity of the cluster forms a lens that bends the light of even older galaxies behind it, creating the arcs in this image.**

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honeycomb of 18 gold-coated hexagons. All of that had to be carefully unfolded, origami-like, and tested during the near-million-mile voyage. When the much smaller Hubble was activated in 1990, a devastating flaw in its mirror was discovered, requiring a second mission to repair it. With JWST, there are no do-overs. Its location is so remote that repairs are out of the question. Every step was a nail-biter.

And it all worked.

On July 12, 2022, the first public images proved a revelation: stunningly beautiful portraits of nearby planets and remote objects—many never seen before and none in this level of detail. Already JWST has expanded our knowledge of space and our awareness of our power as explorers.

Perhaps most inspiring are the countless entire galaxies, some so far away that their light must travel through space for more than 10 billion years to reach us. We on Earth are seeing galaxies as they were when Earth itself didn't even exist. As a species, the view inspires and humbles us. For all our accomplishments, we are yet enisled on a small blue planet lit by an unremarkable star, adrift in a vast universe and looking up with wonder at the night sky. ♦