

# The Most Powerful Space Telescope Ever Built Will Look Back In Time To The Dark Ages Of The Universe

The Webb Telescope will launch into orbit later this year, ushering in a new era for astronomy. The telescope will make it easy for experts to know when the first galaxies and stars were formed, which ones came first and why that happened.

Some experts have referred to NASA's James Webb Telescope as the 'telescope that ate astronomy'. The Webb Space Telescope is the most powerful orbiting telescope ever developed, making it a sophisticated piece of mechanical origami expected to push the limits of human engineering. This telescope will be unveiled on 18th December 2021, after facing delays for several years and spending billions of dollars in overruns.

The Webb Telescope will launch into orbit later this year, ushering in a new era for astronomy. According to astronomers who have been observing distant galaxies for the last three decades, this complex piece of machinery will answer some of the greatest questions about our universe related to its early years. The telescope will make it easy for experts to know when the first galaxies and stars were formed, which ones came first and why that happened.

Picture 1 of The Most Powerful Space Telescope Ever Built Will Look Back In Time To The Dark Ages Of The Universe

## The Dark Ages Of Our Universe

Scientific evidence shows that our universe started 13.8 billion years ago with an event known as the Big Bang, leaving it in an ultra-dense and ultra-hot state. The universe then started expanding after this event and began cooling as it did so.

A second after this big bang, the universe was around 100 trillion miles across and with an average temperature of an amazing 10 billion degrees Celsius (18 billion degrees Fahrenheit). Over 400,000 years later, the universe had expanded to 10 million light-years across, with the temperature cooling down to 3000 degrees Celsius (5,500 degrees Fahrenheit). That means the universe would have been glowing like a huge heat lamp if anyone was around to see it.

Throughout this time, the space was occupied by a smooth soup of helium, hydrogen, radiation, and high-energy particles. There wasn't any structure and as the universe continued expanding, it got colder and the soup thinned out as everything else faded to black. That was the beginning of what astronomers refer to as the Dark Ages and since the soup wasn't perfectly uniform, tiny portions of gas started clumping together due to gravity and became denser.

The smooth universe continued being lumpy and these gas clumps of dense gasses became the eventual seeds for the formation of galaxies, stars, and everything around the universe. That shows how important the dark ages were to our evolution, although there wasn't anything to see.

## Searching For The First Light

The dark ages came to an end after gravity formed the first galaxies and stars, eventually beginning to emit the first light. However, astronomers aren't sure when the first light occurred, but their best guess is that this event happened several hundred million years ago following the Big Bang. Astronomers are also yet to know which galaxies or stars were formed first.

The existing theories are based on the way gravity forms structures, when dark matter is dominating a universe as small objects like star clusters and stars, are likely to be formed first, followed by dwarf galaxies. These first stars were most likely extreme objects compared to the stars existing today, but a million times brighter and with short lives.

Modern astronomers have been looking to study this important era of our universe, but detecting the first light has been incredibly challenging. That's because the first objects were quite small compared to today's massive galaxies and the universe has continued stretching the wavelength of the light getting through it over the millions of years.

## The Webb Telescope as a Time Machine

Telescopes like the James Webb Telescope are excellent time machines to study the origin of our universe. For instance, if a star is 10,000 light-years away from earth, it will take light 10,000 years to hit our earth's surface. That means that the further in space that astronomers can look, the further they'll be looking back in time.

Engineers have optimized the James Webb Telescope for detecting faint infrared light from the earliest galaxies and stars. In comparison to the Hubble Telescope, the James Webb telescope has a wider field of view by 15 times on its camera, allowing it to collect six times more light. Its sensors have also been designed to become highly sensitive to infrared lights.

The strategy will involve looking deeply at a single patch on the sky for a long time and collecting as much information and light from the oldest and most distant galaxies in range. This data might make it possible to know how and when the Dark Days ended, alongside other important discoveries that scientists are curious about. For instance, unraveling the story of when the Dark Ages ended might help to explain Dark Matter's nature, a mysterious matter that occupies around 80% of our universe in mass.

The James Webb is technically the most difficult mission for NASA this far, but the scientific results the project will yield are worth the effort. Astronomers are also eagerly waiting for data to start coming in any time in 2022.

You finished reading the article "**The Most Powerful Space Telescope Ever Built Will Look Back In Time To The Dark Ages Of The Universe**" edited by the [TipsMake](#) team. We hope this article has provided you with many useful tech tips and tricks. You can search for similar articles on tips and guides. Thank you for reading and for following us regularly.