James Webb Space Telescope

As we can see the heading, the writing is about a telescope. But the issue is, it isn’t a normal telescope which we use to observe celestial object standing on the Earth’s grounds, it’s a space observatory specifically designed to observe astronomical objects from outer space. These are common, presumable facts if the reader uses his/her brain, however I’m writing these as we can’t just go straight to the main article topic without an introduction.

James Webb Space Telescope is a very powerful, astronomical observatory set with high resolution, high sensitivity instruments which allows it to conduct infrared astronomy. It is the successor of Hubble Space Telescope, which complements and extends Hubble's observations, becoming the world's newest premiere space observatory, launched on December 25, 2021 on an Ariane 5 rocket from Europe's Spaceport in French Guiana, on the northern coast of South America. It is named after James E. Webb, the NASA administrator during the Apollo program era, the JWST (the abbreviation of James Webb Space Telescope) is designed to study the universe in infrared wavelengths, enabling scientists to peer back in time to the early universe, study the formation of stars and galaxies, and characterize the atmospheres of exoplanets. Ever since it has been launched, it has been taking way clear, way more informative pictures of stars, galaxies and nebulas than the Hubble telescope. It is made with the potential for discovering whatever resides out there amidst the vast ocean of the unknown cosmos. James Webb Telescope is now one of the burning discussion topic of recent times, so to me, it would be a bit surprising if you don’t know about this (at least you might have heard the name). Anyway, I should continue. the JWST is predicted to be the largest and most powerful space telescope ever launched with a primary mirror spanning 6.5 meters (about 21 feet) in diameter. It features a suite of cutting-edge scientific instruments, including cameras, spectrographs, and coronagraphs, designed to capture high-resolution images and spectra of celestial objects across a wide range of wavelengths. Now, nobody would like to read such a huge article on a topic a good number of people will find boring, let me enlighten you with some interesting facts on JWST.

* Despite of being way more advanced, it is actually lighter than its predecessor, Hubble Telescope.
* James Webb’s mirrors are the lightest large telescope mirrors of all time.
* The JWST features a sunshield the size of a tennis court!
* The JWST's sunshield was inspired by the art of origami. It is made up of five layers of a special material called Kapton, which fold and unfold like a delicate accordion during deployment in space.
* Although the mirrors of JWST appear gold, it is literally made of Beryllium and the total amount of gold used in it is less than 48 grams.
* The space telescope can cool itself enough to make nitrogen liquefy.
* The JWST is on its way of discovering some of the earliest galaxies formed after the Big Bang, providing insights into the universe's early evolution.
* The JWST can see back in time. The longer and further light travels, the more it shifts into the infrared spectrum.
* As the JWST captures images using infrared sensors, it’s able to capture the light of the first stars that formed like no telescope before it could.
* It can also see right through clouds of space dust!
* The JWST’s launch and deployment went so smoothly that its expected mission length was doubled.
* The James Webb Space Telescope is a collaborative project between NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA) where a Bangladeshi astrophysicist named Lamia Ashraf is working in this project under CSA. (She is a great inspiration).

It has been a long time since Hubble Telescope was launched, but to highlight it greatness there is some comparative analysis between Hubble telescope and JWST:

* The Hubble Space Telescope was primarily designed to observe the universe in visible, ultraviolet, and near-infrared wavelengths where James Webb is upgraded for infrared observations.
* The Hubble Space Telescope was placed into low Earth orbit (LEO) at an altitude of about 340 miles, where in case of JWST, it is placed at nearly 1 million miles from Earth’s surface.
* Hubble's primary mirror is made of a single piece of glass with a diameter of 2.4 meters, with no sunshield facilities where JWST's primary mirror is composed of 18 hexagonal segments that unfold after launch, creating a mirror with a total diameter of 6.5 meters.
* The JWST’s instruments allow it to capture images of objects 100 times less bright than the Hubble Space Telescope could.

Okay, I think I have made this too long, but in my opinion, everyone should know about it because the technologies used in this telescope will make a revolutionary change the way the technologies used in APOLLO mission is now used in our day to day life. In conclusion, the James Webb Space Telescope represents a monumental achievement in space exploration and promises to unlock the mysteries of the cosmos like never before. With its unparalleled capabilities and ambitious scientific objectives, the James Webb Space Telescope represents a giant leap forward in our quest to unravel the mysteries of the cosmos and explore the origins of our universe.

*(All the data used in this article is collected from NASA website, web sources and newspapers I’ve read)*

From: Mahiyat Intisar

Class: IX ,Section: Venus (EV), Roll: 19