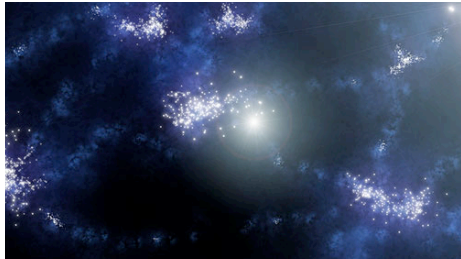
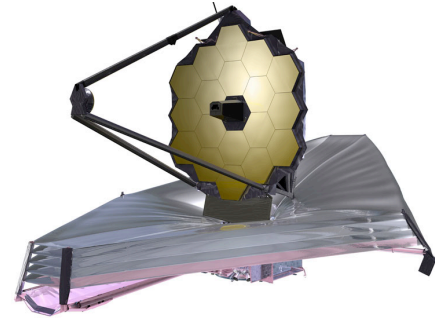


## Scientific discovery with the James Webb Space Telescope

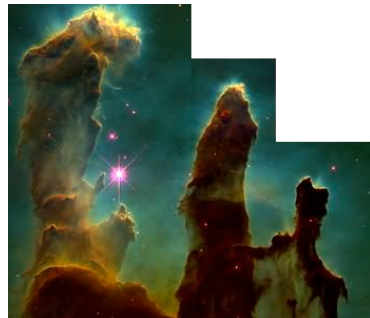
The James Webb Space Telescope (JWST) will ensure US leadership in space science for the next decade. JWST is the successor to the Hubble Space Telescope, and is essential to achieve the scientific aims of the 2000 and 2010 Astronomy Decadal Surveys. No other mission planned by NASA or any other agency can accomplish JWST's science, which is grouped into four themes:



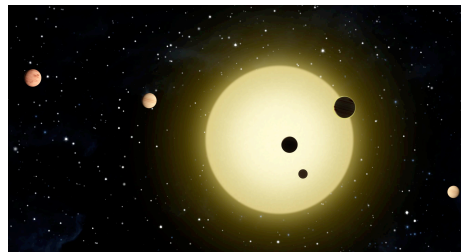
\* **JWST will peer back to the time of “first light”**, when the first generation of stars in newly-formed galaxies lit up the Universe for the first time. Hubble cannot reach the “first light” epoch because its infrared abilities are limited; Spitzer cannot because its mirror is far too small.



\* **JWST will study how galaxies assembled after the Big Bang and evolved** into the galaxies we see today. JWST will chart when stars synthesized the elements of the periodic table, and will find hidden black holes lurking in the centers of galaxies. JWST's large aperture and high-performance instruments uniquely provide the sharp images and spectroscopic capability required.



\* **JWST will study how stars and planetary systems are born.** It will peer into dusty clouds to study how gas clouds collapse to form stars; it will also study the thick disks of gas and dust around those stars. JWST provides the sensitivity and sharp images required to image these disks where planets are forming.



\* **JWST will study planets orbiting other stars.** Kepler has shown that “super-Earths” (planets with masses between Neptune and Earth) are common. JWST has the collecting area and stability to find water (a prerequisite for life) in the atmospheres of super-Earths that transit their stars.

Caption: 1) Artist's concept of the first stars and galaxies; 2) Hubble image of a colliding galaxy; 3) Sites of new star formation in the Hubble “Pillars of Creation”; 4) Illustration of the newly-discovered solar system Kepler-11.

**JWST will be a powerful general-purpose observatory** like Hubble, but far more capable. JWST's capabilities are such a great leap forward that, as with Hubble, many of its most important discoveries may be surprises. JWST's unique capabilities will create the next revolution in astrophysics, bring new understanding as to how galaxies, stars, planets, and ultimately life came to be, and inspire millions, including the next generation of innovators in science and technology.