

Following the rise of dust & metals in galaxies and the path of water across cosmic time to Earth and other habitable planets

Tracing the Signatures of Life and the Ingredients of Habitable Worlds

Origins will trace the trail of water through the stages of star and planet formation, to Earth itself and other planetary systems, while also characterizing water and greenhouse gases in potentially habitable worlds.



Unveiling the Growth of Black Holes and Galaxies over Cosmic Time

Origins will reveal the co-evolution of super-massive black holes and galaxies, energetic feedback, and the dynamic interstellar medium from which stars are born.



Origins will trace the metal enrichment history of the Universe, probe the first cosmic sources of dust, the earliest star formation, and the birth of galaxies.



Charting the Rise of Metals, Dust, and the First Galaxies

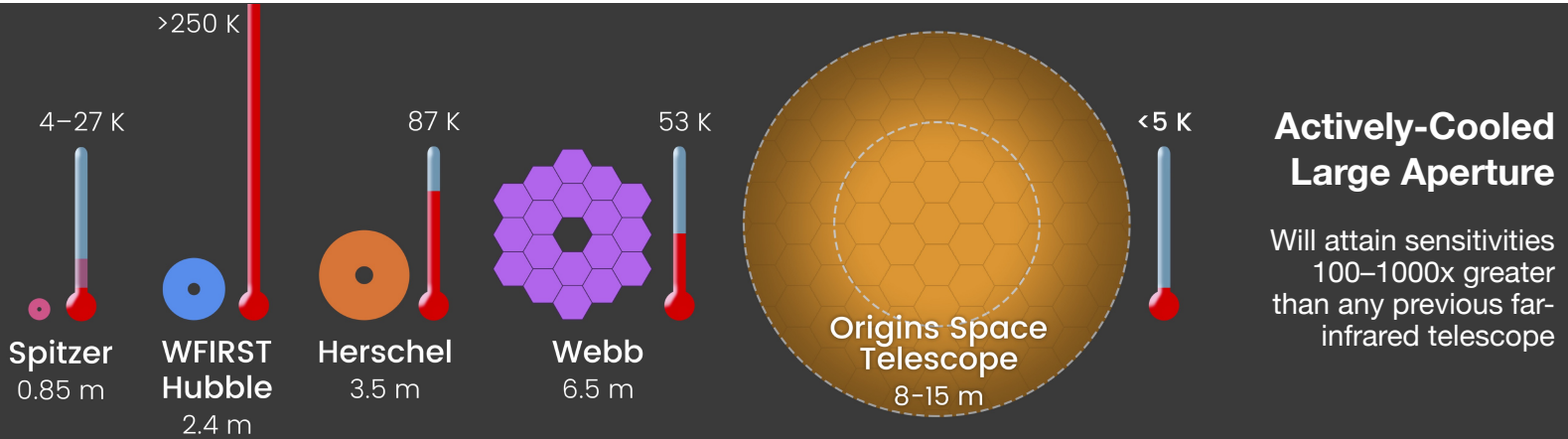
Origins will chart the role of comets in delivering water to the early Earth, and survey thousands of ancient Trans Neptunian Objects at distances greater than 100 AU and down to sizes of less than 10 km.



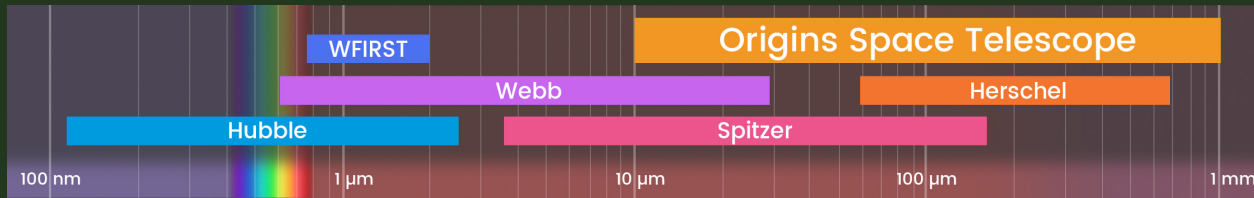
Characterizing Small Bodies in the Solar System

Origins is planned to be a large aperture, actively-cooled telescope covering a wide span of the mid- to far-infrared spectrum. Its spectrographs will enable 3D surveys of the sky that will discover and characterize the most distant galaxies, exoplanets and the outer reaches of our Solar System. The Science and Technology Definition Team would like to hear your science questions and goals for this mission.

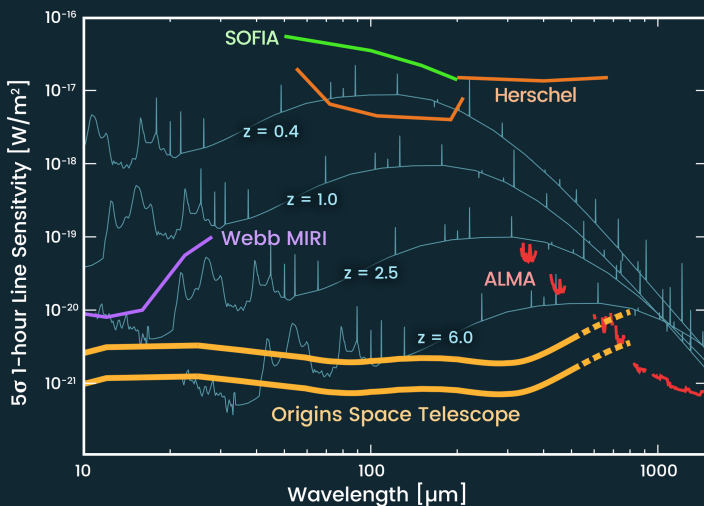
Contact us at: firsurveyor_info@lists.ipac.caltech.edu



Potential Wavelength Coverage from 10 μm –1 mm



Enables observations of biosignatures in the atmospheres of transiting Earth-like planets, mid- and far-infrared diagnostic lines in galaxies out to redshifts of 10, and characterization of water from the Solar System to the ISM.



Unprecedented Sensitivity

Fast mapping speed with hundreds or thousands of independent beams will enable 3D surveys of large areas of sky, pushing to unprecedented depths to discover and characterize the most distant galaxies to the outer reaches of our Solar System.



Timeline of IR Space Telescopes