

# NASA launches space telescope to chart the sky and millions of galaxies

## ASU astronomers part of the vivid journey through cosmic time

By Kim Baptista, ASU News

March 12, 2025

California's Vandenberg Space Force Base was the site for Tuesday's 8:10 p.m. launch of the [NASA SPHEREx](#) mission aboard a [SpaceX](#) Falcon 9 rocket.

The SPHEREx (Spectro-Photometer for the History of the Universe, Epoch of Reionization and Ices Explorer) mission is not just a brief endeavor. It's a two-year mission that will survey hundreds of millions of galaxies near and far, some so distant their light has taken 10 billion years to reach Earth. In the Milky Way, the mission will search for water and organic molecules — essentials for life, as we know it — in stellar nurseries, regions where stars are born from gas and dust, and disks around stars where new planets could be forming.

The SPHEREx mission is an international collaboration, with science team members from around the world, including a number of people from Arizona State University — [School of Earth and Space Exploration](#) astronomy professors [Phil Mauskopf](#), [Rogier Windhorst](#); Associate Research Professor [Sean Bryan](#); [Pao-Yu Wang](#), postdoctoral research scholar; [Delondrae Carter](#), graduate research associate; [Ayan Barekzai](#), research technician; [Sarah Peterson](#), PhD student; and [Danielle Rivera](#), graduate associate — all working in partnership with NASA's [Jet Propulsion Laboratory](#).

This global team oversees the survey planning software, a crucial component of the SPHEREx mission. Additionally, science team members will identify the most suitable galaxy clusters from the past 5 billion years for gravitational lensing studies using the James Webb Space Telescope. Launched in 2021, JWST will operate alongside SPHEREx and potentially extend well beyond its

mission duration.

(Video: <https://vimeo.com/1060542735?ts=0&share=copy>)

Every six months, SPHEREx will survey the entire sky using technologies adapted from Earth satellites and interplanetary spacecraft. The mission will create a map of the entire sky in 102 different color bands, far exceeding the color resolution of previous all-sky maps. It also will identify targets for more detailed study to support missions, such as NASA's Nancy Grace Roman Space Telescope and the JWST.

As the telescope scans the sky, collecting images and data of the entire sky from low-Earth orbit, only a limited area of the sky is observable because it must avoid excess heat and light from Earth, the moon or the sun.

During the mission, SPHEREx will periodically pause for data downlink, a vital process for its success. Efficiently mapping the entire sky within the constraints of a two-year mission makes data collection a critical priority.

As a [NASA Astrophysics](#) mission, the agency selected SPHEREx as a [Medium-Class Explorers](#) mission in February 2019 to address the agency's three core astrophysics goals: probe the origin and destiny of the universe, explore whether planets around other stars could harbor life, and explore the origin and evolution of galaxies.

The SPHEREx mission is managed by NASA's Jet Propulsion Laboratory in Southern California for NASA's Astrophysics Division in the Science Mission Directorate at NASA Headquarters in Washington, D.C. The mission's principal investigator is based at Caltech in Pasadena, California, which also developed the payload in collaboration with JPL. BAE Systems supplied the spacecraft. The Korea Astronomy and Space Science Institute is an instrument and science partner for the mission. Data will be processed and archived at IPAC at Caltech, which manages JPL for NASA. In addition to scientists from Caltech, JPL and KASI, the scientific analysis will include scientists from numerous institutions.

*This story originally appeared on [ASU News](#).*

## Main image



NASA's SPHEREx (Spectro-Photometer for the History of the Universe, Epoch of Reionization and Ices Explorer) observatory and PUNCH (Polarimeter to Unify the Corona and Heliosphere) satellites lift off on a SpaceX Falcon 9 rocket from Vandenberg Space Force Base in California on March 11. Photo courtesy of SpaceX