

NASA's Wise Gets Ready to Survey the Whole Sky (w/ Video)

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This artist's conception shows NASA's Wide-field Infrared Survey Explorer, or WISE, mapping the whole sky in infrared. The mission will unveil hundreds of thousands of asteroids, and hundreds of millions of stars and galaxies. Image credit: Ball/NASA/JPL-Caltech

(PhysOrg.com) -- NASA's Wide-field Infrared Survey Explorer, or Wise, is chilled out, sporting a sunshade and getting ready to roll. NASA's newest spacecraft is scheduled to roll to the pad on Friday, Nov. 20, its last stop before launching into space to survey the entire sky in infrared light.

Wise is scheduled to launch no earlier than 6:09 a.m. PST (9:09 a.m. EST) on Dec. 9 from Vandenberg Air Force Base in California. It will circle Earth over the poles, scanning the entire sky one-and-a-half times in nine months. The mission will uncover hidden cosmic objects, including the coolest stars, dark asteroids and the most luminous galaxies.

"The eyes of Wise are a vast improvement over those of past infrared surveys," said Edward "Ned" Wright, the principal investigator for the mission at UCLA. "We will find millions of objects that have never been seen before."

The mission will map the entire sky at four infrared wavelengths with sensitivity hundreds to hundreds of thousands of times greater than its predecessors, cataloging hundreds of millions of

objects. The data will serve as navigation charts for other missions, pointing them to the most interesting targets. NASA's Hubble and Spitzer Space Telescopes, the European Space Agency's Herschel [Space Observatory](#), and NASA's upcoming Sofia and [James Webb Space Telescope](#) will follow up on Wise finds.

"This is an exciting time for space telescopes," said Jon Morse, NASA's Astrophysics Division director at NASA Headquarters in Washington. "Many of the telescopes will work together, each contributing different pieces to some of the most intriguing puzzles in our universe."

Visible light is just one slice of the universe's electromagnetic rainbow. Infrared light, which humans can't see, has longer wavelengths and is good for seeing objects that are cold, dusty or far away. In our solar system, Wise is expected to find hundreds of thousands of cool asteroids, including hundreds that pass relatively close to Earth's path. Wise's infrared measurements will provide better estimates of asteroid sizes and compositions -- important information for understanding more about potentially hazardous impacts on Earth.

"With infrared, we can find the dark asteroids other surveys have missed and learn about the whole population. Are they mostly big, small, fluffy or hard?" said Peter Eisenhardt, the Wise project scientist at NASA's Jet Propulsion Laboratory in Pasadena, Calif.

Wise also will find the coolest of the "failed" stars, or brown dwarfs. Scientists speculate it is possible that a cool star lurks right under our noses, closer to us than our nearest known star, Proxima Centauri, which is four light-years away. If so, Wise will easily pick up its glow. The mission also will spot dusty nests of stars and swirling planet-forming disks, and may find the most luminous galaxy in the universe.

To sense the infrared glow of stars and galaxies, the *Wise* spacecraft cannot give off any detectable [infrared light](#) of its own. This is accomplished by chilling the telescope and detectors to ultra-cold temperatures. The coldest of *Wise*'s detectors will operate at below 8 Kelvin, or minus 445 degrees Fahrenheit.

"*Wise* is chilled out," said William Irace, the project manager at JPL. "We've finished freezing the hydrogen that fills two tanks surrounding the science instrument. We're ready to explore the universe in infrared."

Provided by JPL/NASA ([news](#) : [web](#))

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