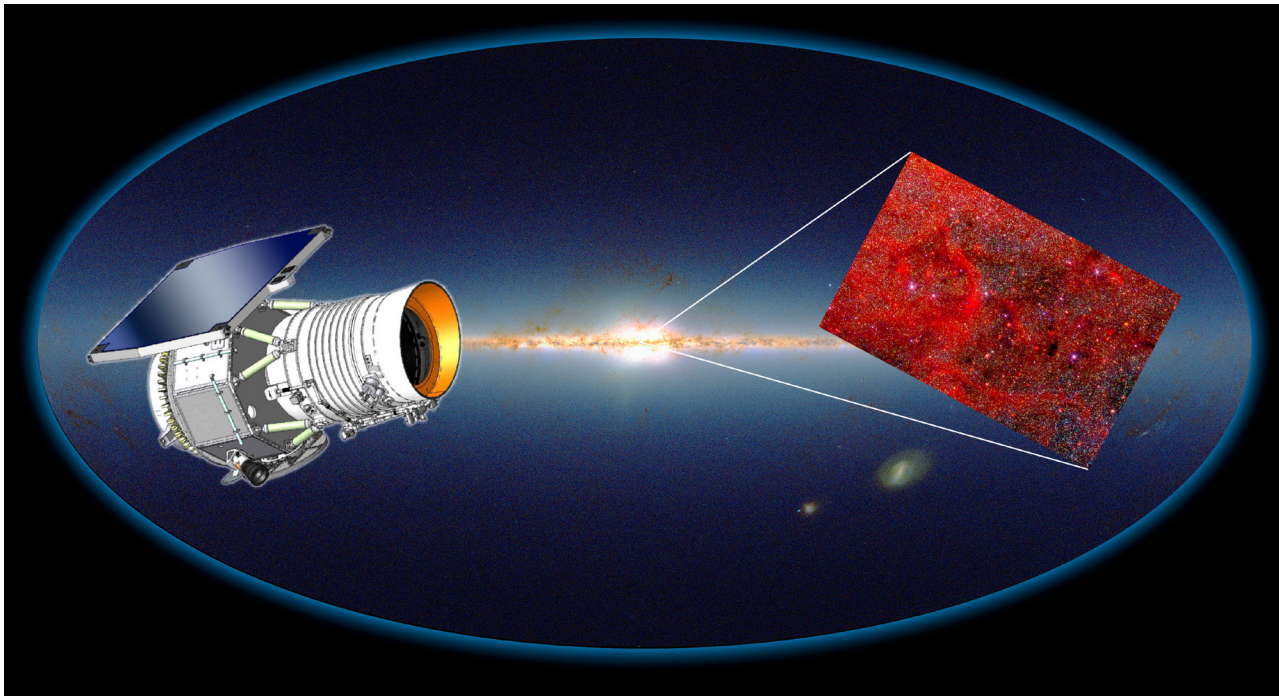


WISE

Mapping the Infrared Sky



Wide-field Infrared Survey Explorer

Science Objectives

WISE will provide an all-sky survey from 3 to 25 μm with 500,000 times the sensitivity of COBE/DIRBE and hundreds of times that of IRAS. The survey will help search for the origins of planets, stars, and galaxies and create an infrared atlas whose legacy will endure for decades.

WISE will:

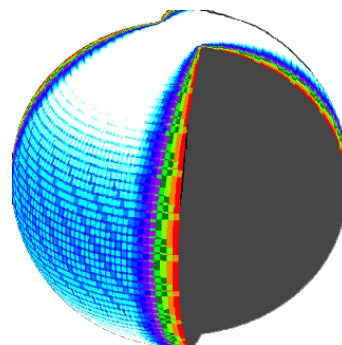
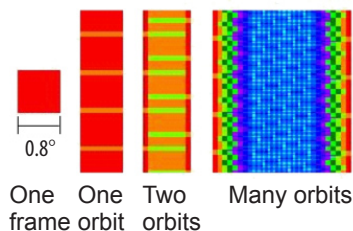
- Find the most luminous galaxies in the Universe.
- Find the closest stars to the Sun.
- Detect most Main Belt asteroids larger than 3 km.
- Enable a wide variety of studies ranging from the evolution of planetary debris discs to the history of star formation in normal galaxies.
- Provide an important source catalog for JWST.

Mission Overview

Launch: 2009 Dec. 14 at 6:09am PST

- Direct injection launch on a Delta II rocket into a circular, 525-km, Sun-synchronous orbit.
- 6-month survey of entire sky following a 1-month checkout, with estimated cryogen lifetime allowing 3 additional months of survey.
- Sky-pointing instrument.
- 11-second data-taking exposure cycle synchronized with orbit to provide total sky coverage with overlap between orbits.
- 8 or more independent exposures at each position over more than 99% of the sky.

Survey Strategy



Science Payload

The WISE instrument is a four-channel imager which operates in a single mode, taking overlapping snapshots of the sky. It includes:

- A 40-cm telescope and reimaging optics.
- A scan mirror to stabilize the line-of-sight while the spacecraft scans the sky.
- A 47 arcminute field of view.
- HgCdTe and Si:As 1024^2 detector arrays at 3.4, 4.6, 12, and 22 μm with a plate scale of $2.75''/\text{pixel}$.
- A resolution of $6''$ ($12''$ at 22 μm).
- A two-stage solid-hydrogen cryostat with an expected 10-month lifetime, to cool focal planes and optics.



Infrared (left) and optical views of WISE launch from Vandenberg Air Force Base in California.

Education & Public Outreach

A nationwide partnership led by UC Berkeley, the WISE E/PO program includes public and student asteroid searches, multi-media presentations for science museums and planetaria, classroom lesson plans for grades 6-12, professional development for teachers, and outreach kits for amateur astronomers.



The WISE payload showing the telescope with cover removed, during assembly at the Space Dynamics Lab in Utah.

Mission Management

The Principal Investigator for WISE is **Edward Wright** of UCLA, data team head for COBE and WMAP, and interdisciplinary scientist for Spitzer. The WISE Science Team includes world leaders in ULIRGs (Ultra-Luminous Infrared Galaxies), Brown Dwarfs, IR Instrumentation, JWST, and all-sky survey design and data processing.

JPL is responsible for project management, system engineering, mission operations, and mission assurance.

Complementing the science team are industry and university team members selected for their expertise in each area:

Space Dynamics
Laboratory

DRS, Teledyne
Lockheed Martin
SSG

Ball Aerospace

IPAC/Caltech

UC Berkeley

Instrument Systems Engineering,
Electronics, & Testing

Focal Planes
Cryostat
Telescope, Optics, Scan Mirror

Spacecraft, System Testing,
Operations Support

Data Processing and Archiving

Education & Public Outreach

Visit the WISE Website at:
<http://wise.astro.ucla.edu>

