WISE: The Wide-Field Infrared Survey Explorer

A MIDEX Mission

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The WISE Survey

- WISE will provide an all-sky survey from 3.5 to 23 microns up to 1000x more sensitive than IRAS

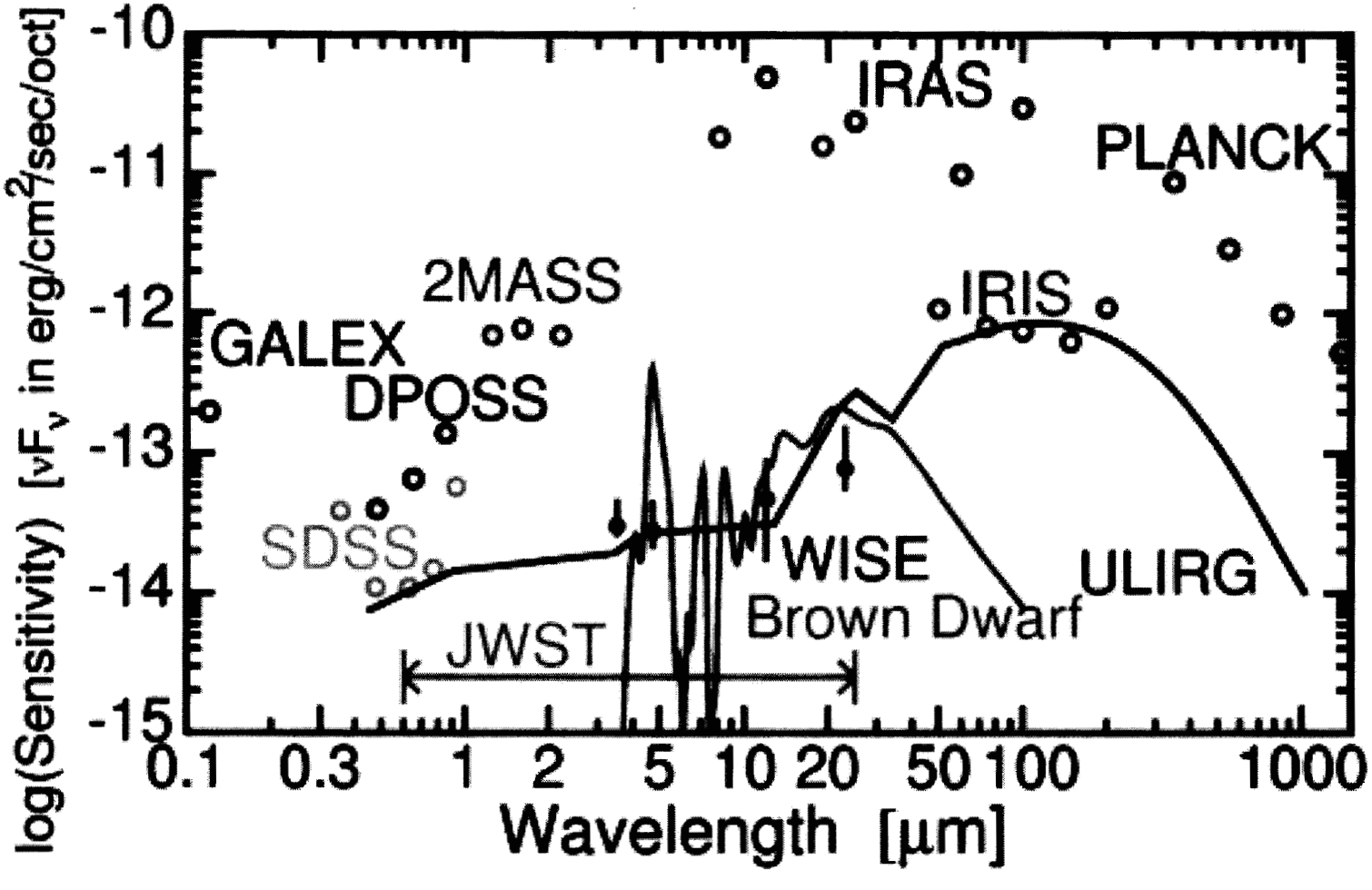
- Science goals:
  - Find the most luminous galaxies in the Universe
  - Find the closest stars/brown dwarfs to the Sun
  - Detect most main belt asteroids larger than 3 km
  - Extend 2MASS survey into thermal IR
  - Provide catalog for JWST

JPL

About WISE

- Single WISE instrument is a four-channel imager which will take overlapping snapshots of entire sky in 6 months
  - HgCdTe and Si:As 10242 arrays at 3.5, 4.6, 12, and 23 microns with 2.2" pixels
  - Two stage solid hydrogen cryostat to cool detectors and optics
  - 50 cm primary mirror and reimaging optics
  - Scan mirror to stabilize line-of-sight while the spacecraft scans the sky
  - Project managed by JPL for P.I. Ned Wright (UCLA)

WISE Sensitivity



How WISE compares to other missions

WISE and Brown Dwarfs

- With bands 1 and 2 centered over 3.6 micron methane feature and continuum, WISE will detect lots of new brown dwarfs, likely including the closest star/brown dwarf to our Sun

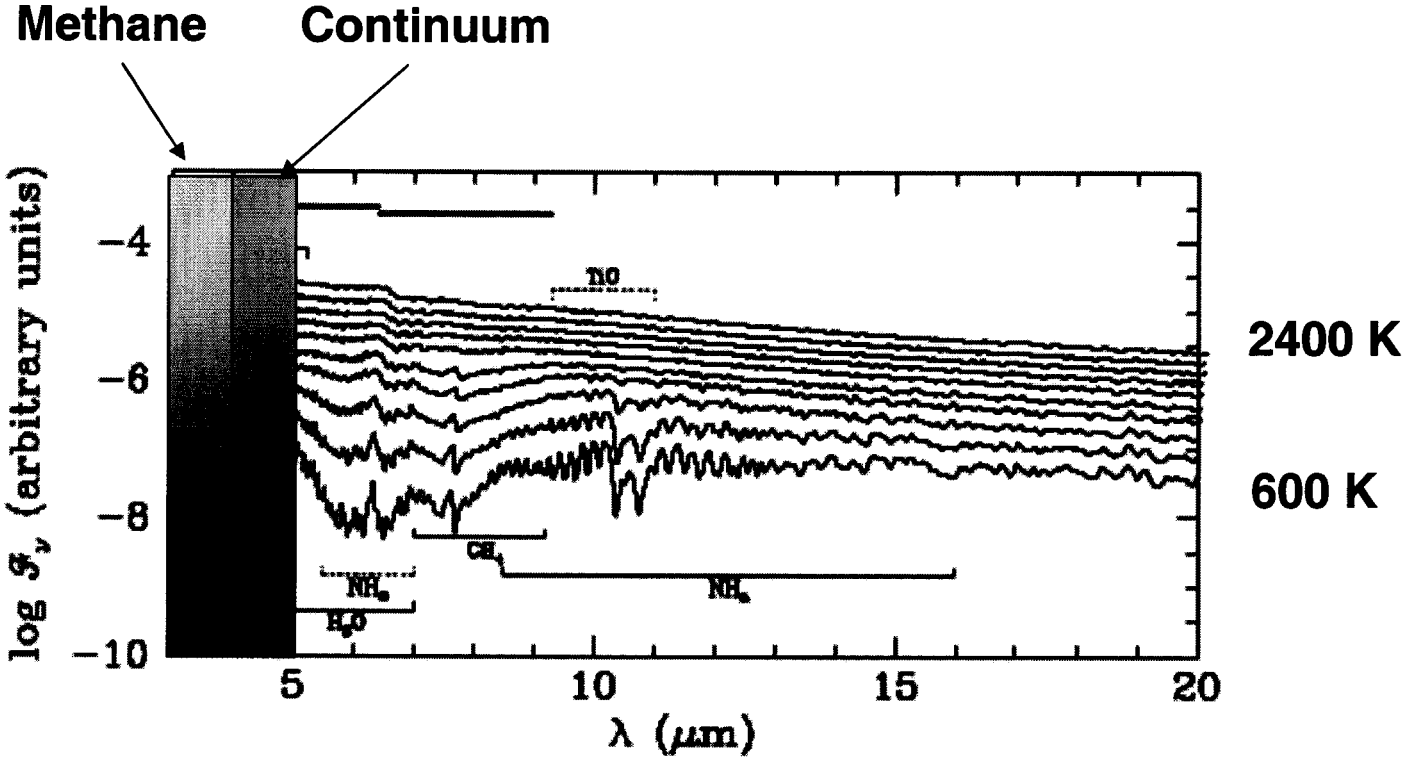


Figure from Saumon, D., Marley, M. S., Lodders, K., astro-ph/031085