WISE Project Status

R. Cutri - IPAC

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Project Overview

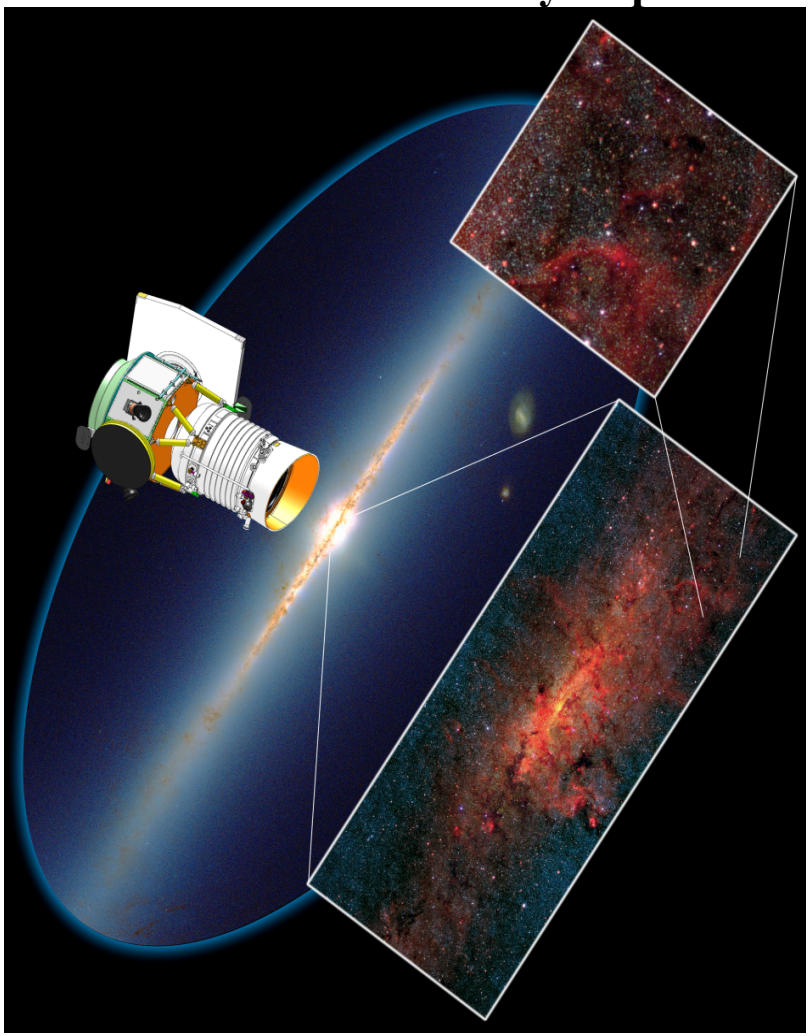
Science

- *Sensitive all sky survey with 8X redundancy*
  - *Find the most luminous galaxies in the universe*
  - *Find the closest stars to the sun*
  - *Provide an important catalog for JWST*
  - *Provide lasting research legacy*

Salient Features

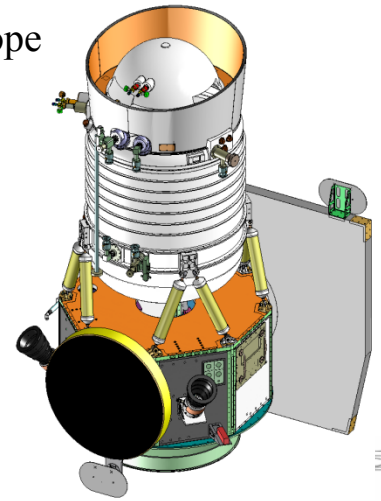
- *4 imaging channels covering 3 - 25 microns wavelength*
- *40 cm telescope operating at <17K*
- *Two stage solid hydrogen cryostat*
- *Delta launch from WTR on December 7, 2009*
- *Sun-synchronous 6am/6pm 500km orbit*
- *Scan mirror provides efficient mapping*
- *Operational life: 7 months (43% margin)*
- *4 TDRSS tracks per day*
- *Category 2; Risk Class C*

Wide-field Infrared Survey Explorer

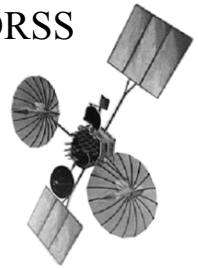


Mission Components

Cryogenic Telescope
(SDL)
Spacecraft
(BATC)



TDRSS



Delta II 7320 VAFB
(KSC)

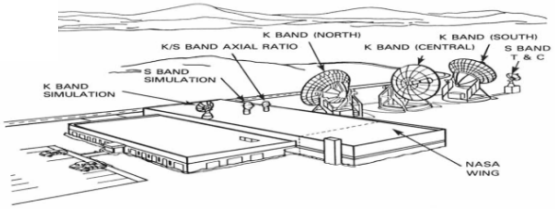
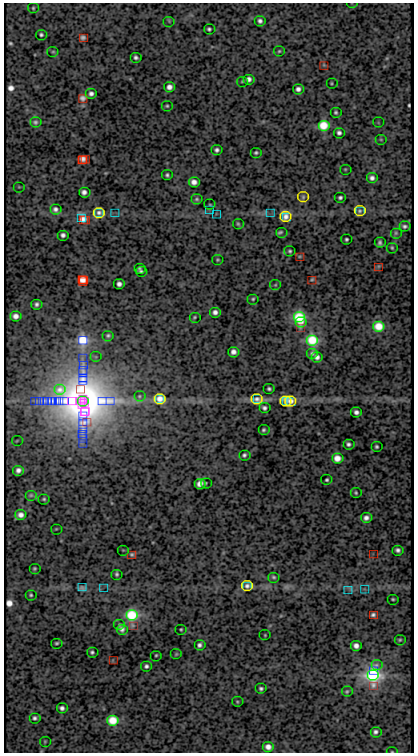


Figure 6–11. White Sands Ground Terminal

White Sands Ground Terminal



Science Data Processing
(IPAC)

Engineering Operations System
(JPL)

Science Survey Planning
(UCLA)

WISE Primary Science Data Products

- WISE Image Atlas
  - Formed by combining all image frames covering each point on the sky
  - ~73,000 calibrated, FITS format, 4 bands registered, 4kx4k pix @ 1.375”/pix.
  - Metadata describing each Atlas Image including depth-of-coverage and noise maps
- WISE Source Catalog
  - ~300 million entries containing attributes of each object detected on combined (Atlas) images
  - Positions and uncertainty error ellipses, fluxes, uncertainties and flux upper limits
  - Source detection and measurement quality flags and parameters (*e.g.* detection statistics, reliability estimate, photometric quality, confusion and contamination)
  - Additional information to enhance usability (*e.g.* association with 2MASS)
- Explanatory Supplement
  - Mission and data product description
  - User’s guide (*e.g.* data formats, access modes)
  - Cautionary notes

WISE Will Also Produce Several Ancillary Products

- Known Solar System Object Association List
  - Asteroids, comets, planets and planetary satellites, known at time of WISE launch, predicted to be within each WISE image FOV
  - Positions and fluxes of WISE detections positionally associated with predicted object positions
- Moving Object Tracklets (NEOWISE)
  - Position/time pairs of candidate moving objects identified by linking non-inertial detections in individual WISE image frames
  - Published to Minor Planet Center within ~20 days of mid-point of WISE obeservations for initial orbit determination
- WISE Single-Epoch (Level 1b) Images (NEOWISE)
  - Calibrated single-exposure frames in 4 WISE bands
  - ~5.7e6 FITS format images, 1kx1k pix @ 2.75”/pix; intensity, noise and bit-mask images
- WISE Single-Epoch Detection Database (NEOWISE)
  - ~1.5e10 entries containing basic attributes of objects detected on single-exposure WISE images
  - Useful for time-domain studies such as source variability, motion, solar system object precovery

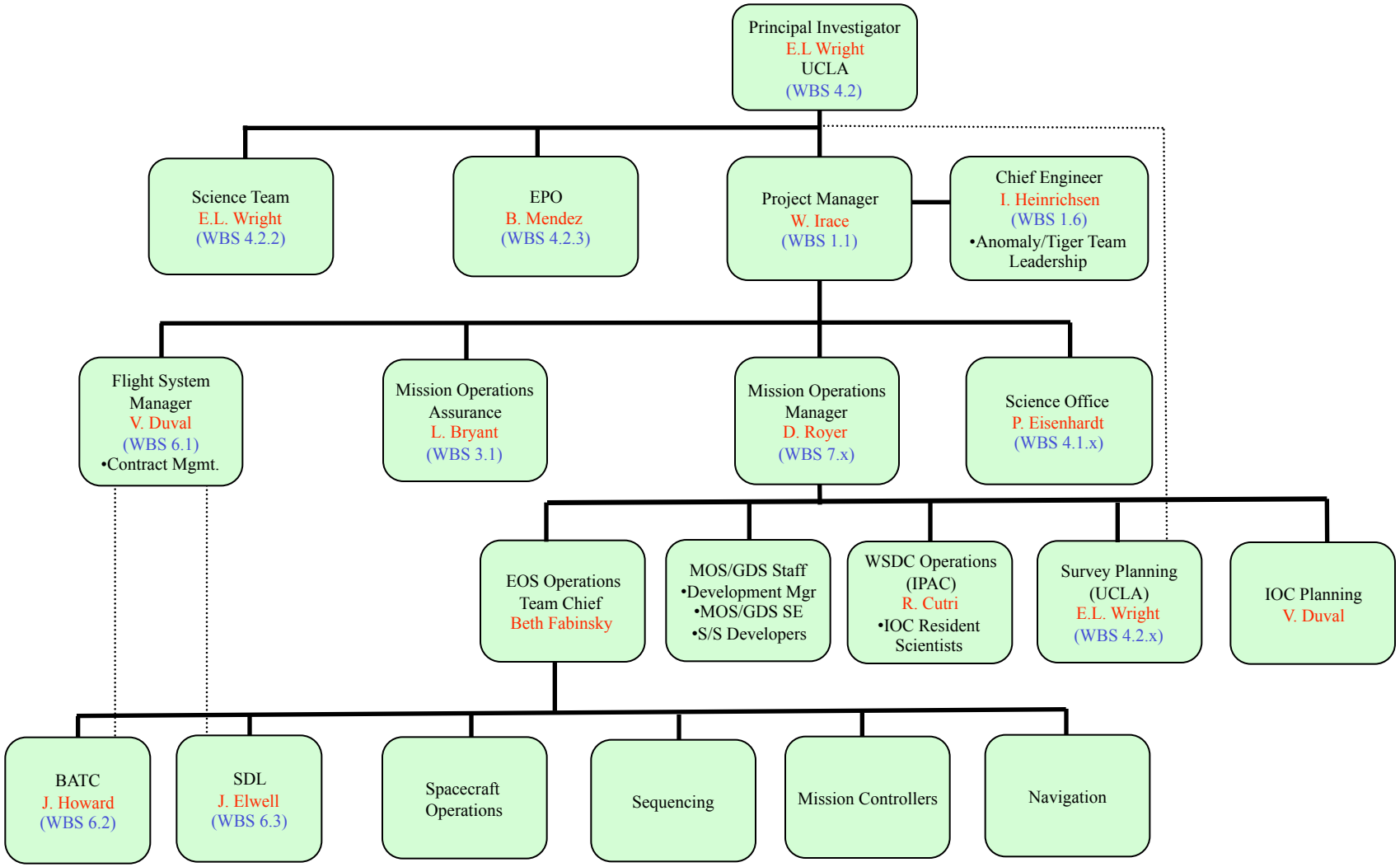
National Aeronautics and Space Administration
Jet Propulsion Laboratory
California Institute of Technology

Wide-field Infrared Survey Explorer (WISE)

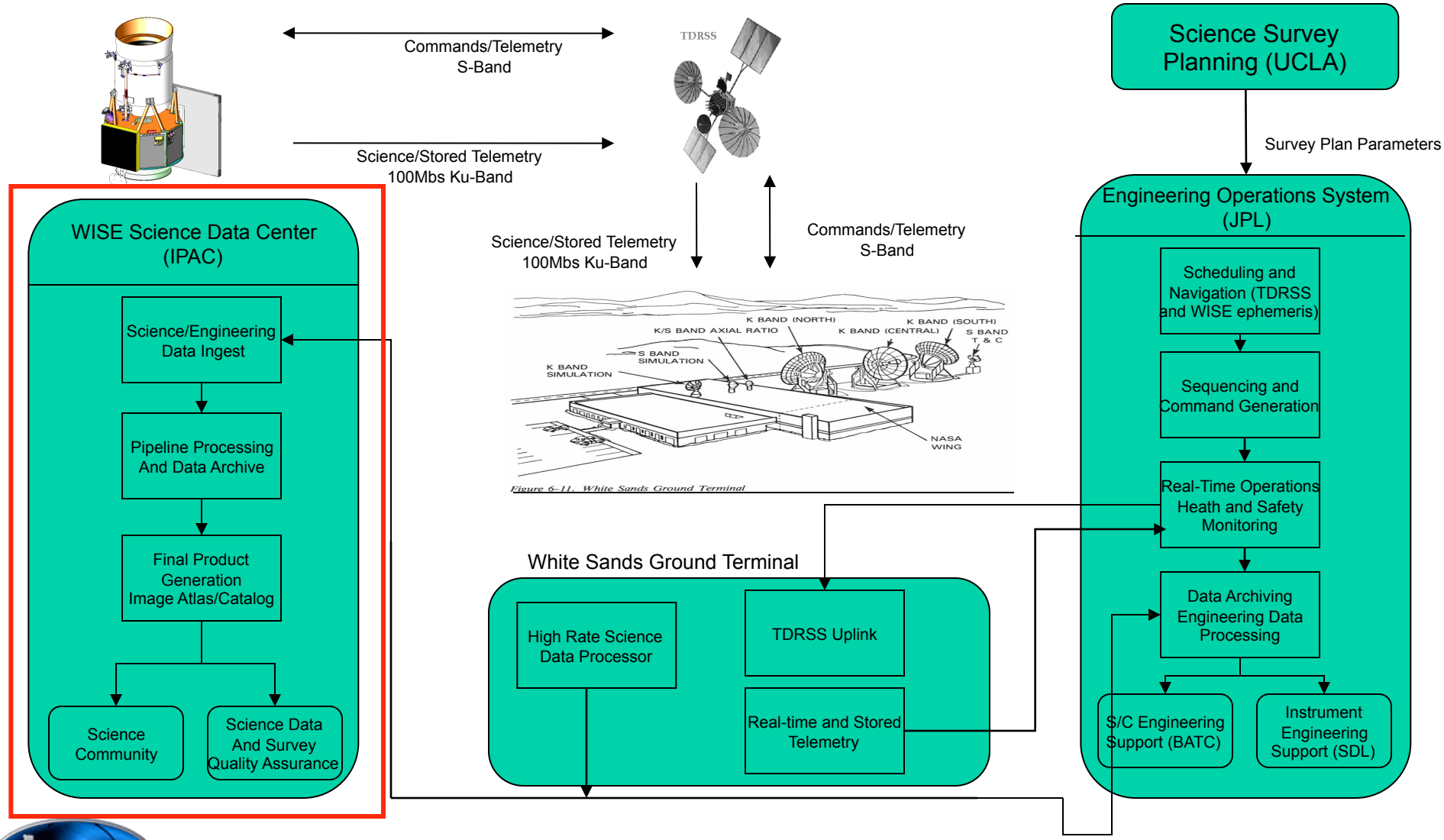
WISE Project Organization

Flight Operations (Effective at liftoff)

Project Status



WISE Science Data Center (WSDC) is Part of MOS Architecture

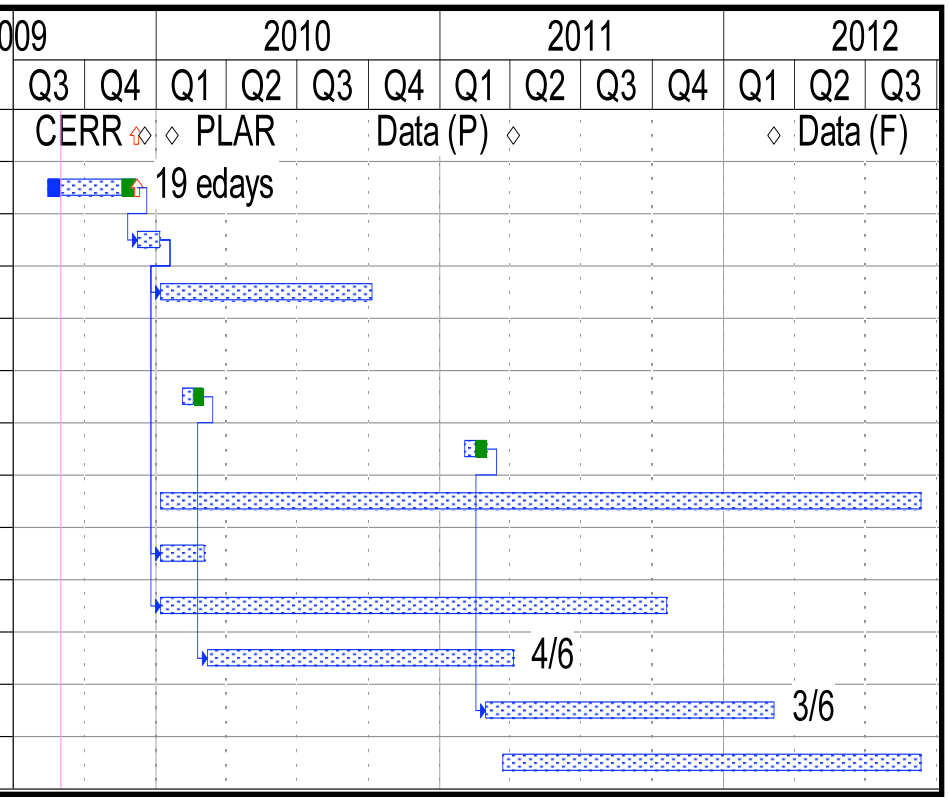


IPAC is the WSDC

- The WSDC is an independent *task* at IPAC
  - Analogous to 2MASS, NHSC, IRSA, NED
  - IPAC/WISE Task Lead reports to IPAC Executive Director, George Helou, and works with IPAC Manager, Suzanne Dodd, to organize staff and resources to perform task
  - Administrative, facilities and common infrastructure cost shared with all IPAC projects
  - WSDC uses dedicated hardware that is integrated into IPAC network structure
  - Resources and expertise shared with other IPAC tasks along with the Spitzer Science Center and NASA Exoplanet Science Institute which reside under a common administrative umbrella at the "Greater IPAC"

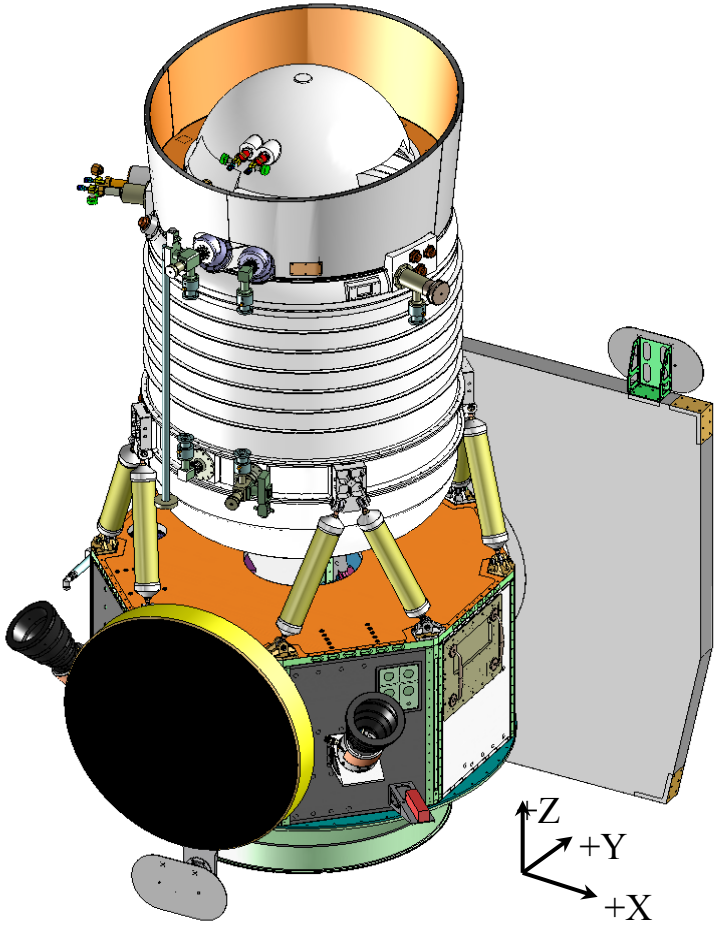
Top Level Schedule

Task Name	Start	Finish
Major Milestones CDR SIR	**8/04**	**3/6/12**
Launch Vehicle Integration / Launch	**8/15/09**	**12/7/09**
IOC	**12/8/09**	**1/6/10**
Survey Ops	**1/7/10**	**10/6/10**
WSDS Development	**2/4/10**	**3/2/11**
WSDS v3.5	**2/4/10**	**3/2/10**
WSDS v4.0	**2/2/11**	**3/2/11**
Operations and Data Processing	**1/7/10**	**9/11/12**
Prelim Processing	1/7/10	3/4/10
WISE Moving Object Pipeline System Ops	1/7/10	10/20/11
Prelim Data Release	**3/8/10**	**4/6/11**
Final Data Release	**3/1/11**	**3/6/12**
User Support & IRSA Hand-Off	3/23/11	9/11/12



- Critical path (red) through the Spacecraft
- Funded schedule reserve (green) distributed throughout (meets JPL FPP standards)

Flight System at VAFB



Key Recent and Upcoming Events

• ORR	10/7-8
• Begin final cryogenic operations	10/21
• LVRR	10/26
• FRR	10/29
• MRB	11/16
• Transport to SLC2	11/20
• Launch	12/7
• CERR	12/22 (TBR)
• PLAR	January (TBR)

Backup Slides

WISE Project Organization

Post-Flight Operations (Effective at End-of Survey +1 month)