



WFIRST Mission Status

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AAS WFIRST Session
January 5, 2016

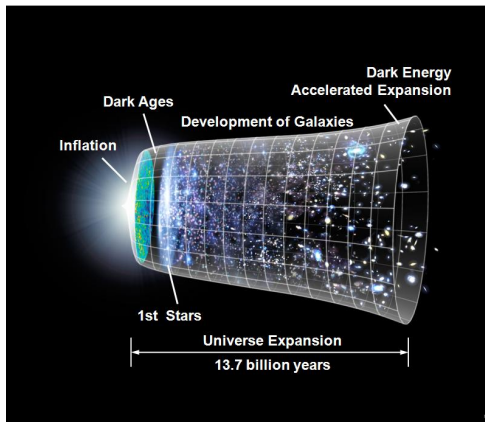


Discovery Science

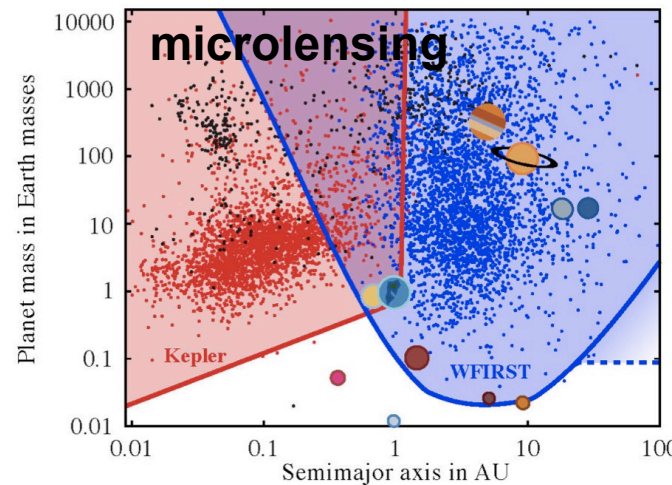


- WFIRST was highest ranked large space mission in 2010 Decadal Survey
- Use of 2.4m telescope enables
 - Hubble quality imaging over 100x more sky
 - Imaging of exoplanets with 10^{-9} contrast with a coronagraph

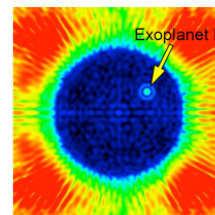
Dark Energy



Exoplanets



coronagraph



Astrophysics



HST

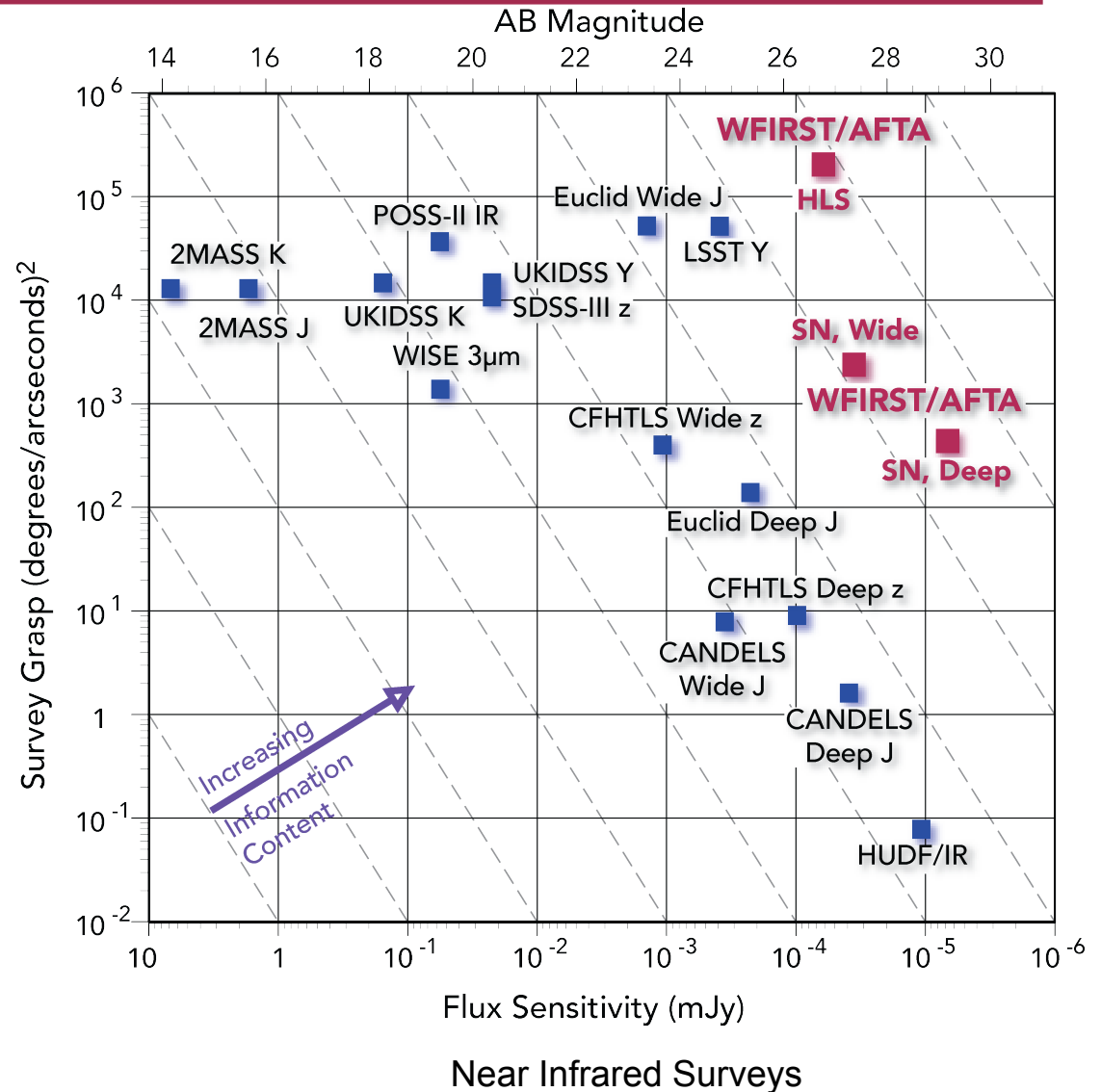
WFIRST



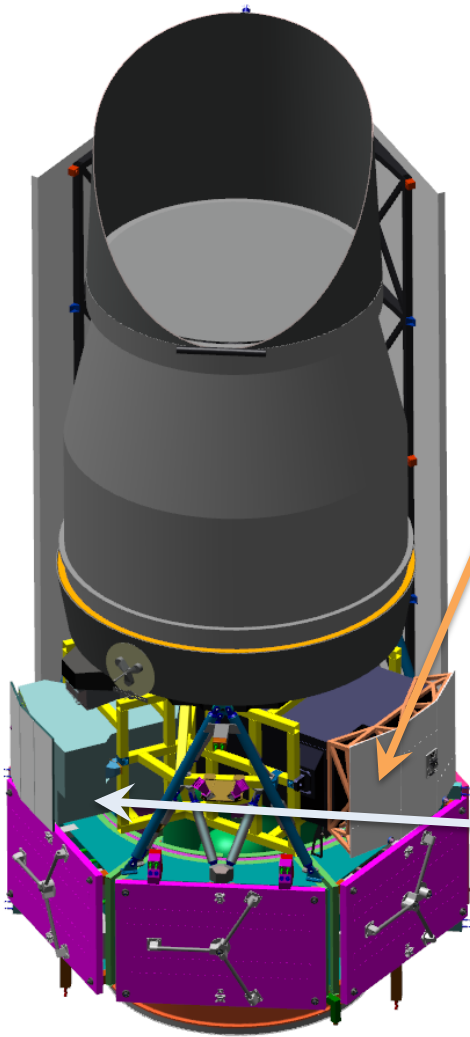
WFIRST Surveys



- Multiple surveys:
 - High-Latitude Survey
 - Imaging, spectroscopy, supernova monitoring
 - Repeated galactic bulge observations for microlensing
 - 25% Guest Observer Program
 - Coronagraph observations
- Flexibility to choose optimal approach



WFIRST Instruments



Wide-Field Instrument

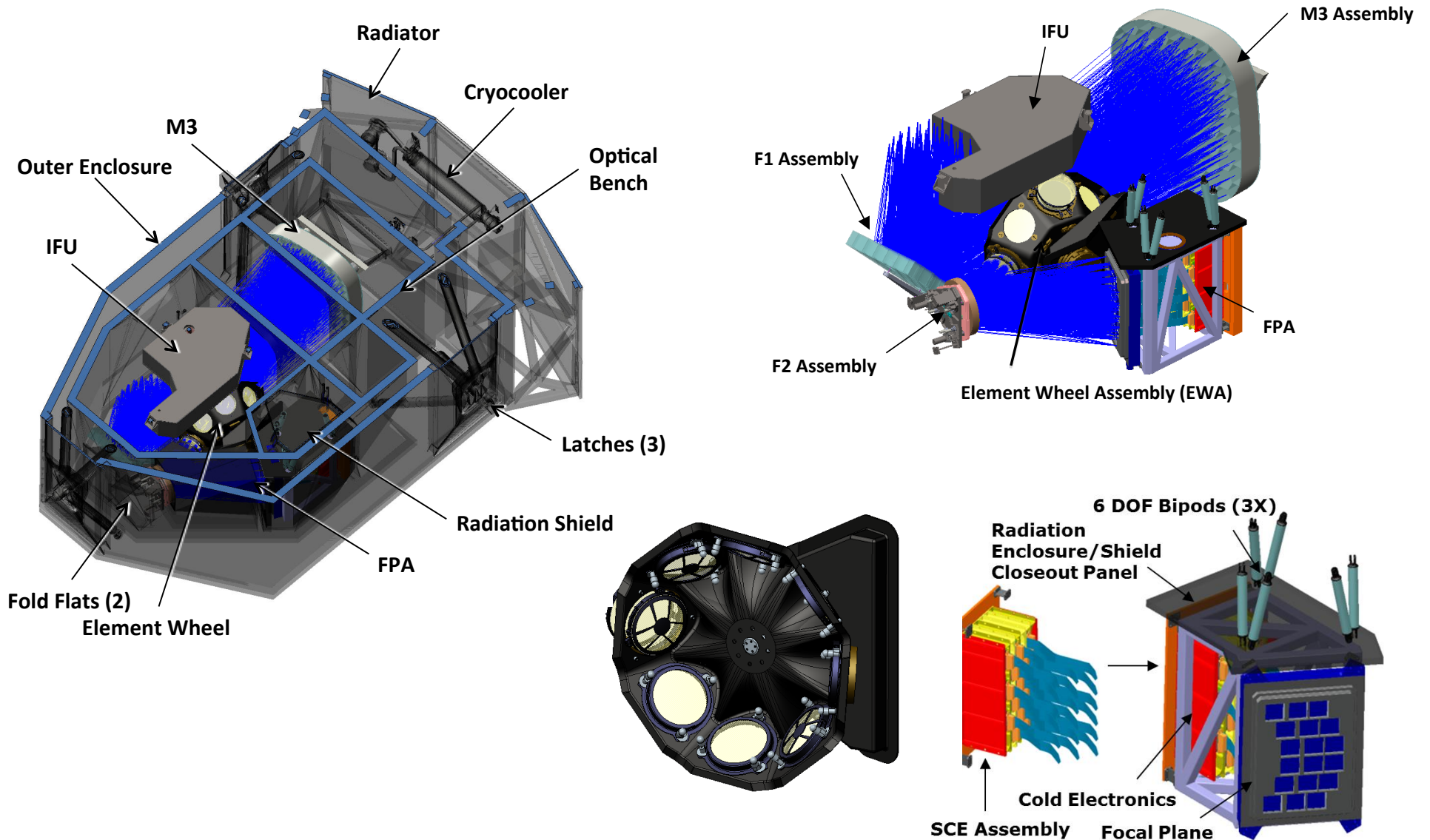
- *Imaging & spectroscopy over 1000s of sq. deg.*
- *Monitoring of SN and microlensing fields*
- 0.7-2.0 mm (imaging), 1.35-1.89 mm (spec.)
- 0.28 deg² FoV (100x JWST FoV)
- 18 H4RG detectors (288 Mpixels)
- 6 filter imaging, grism + IFU spectroscopy

Coronagraph

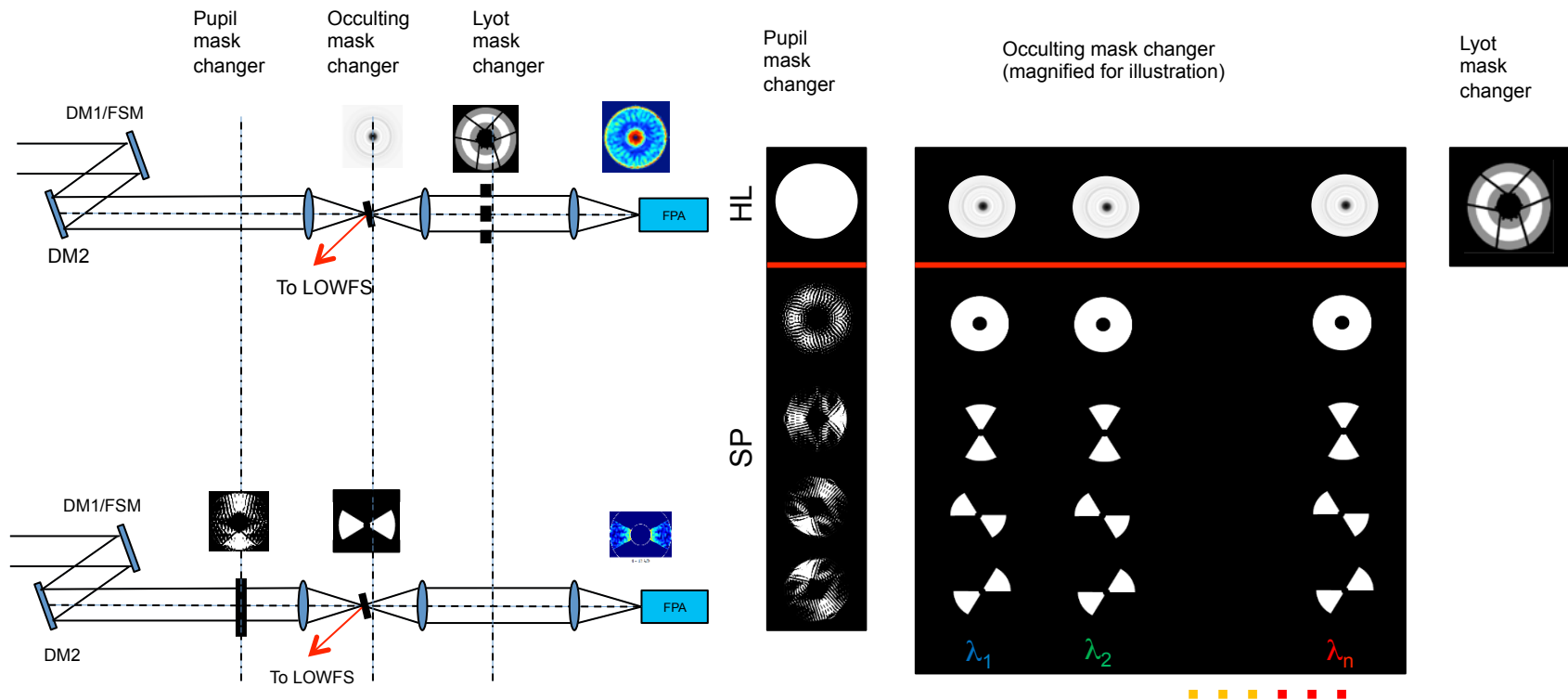
- *Image and spectra of exoplanets from super-Earths to giants*
- *Images of debris disks*
- 430 – 970 nm (imaging) & 600 – 970 nm (IFS spec.)
- Final contrast of 10⁻⁹ or better
- Exoplanet images from 0.1 to 1.0 arcsec



Wide Field Instrument Layout

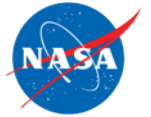


- Primary Architecture: Occulting Mask + Shaped Pupil
- SP and HL masks share very similar optical layouts
- Small increase in overall complexity compared with single mask implementation





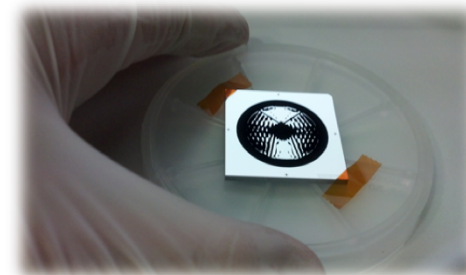
What's Happening with WFIRST



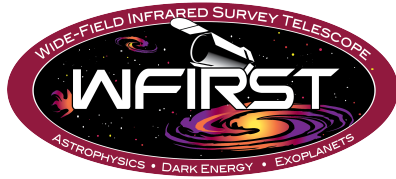
- Huge progress on WFIRST in past 2 years
- \$106M in FY14 & 15 has enabled major steps forward
 - Detector & coronagraph development
 - Design cycles, Project work
- \$90M in FY16
- SDT 2014 & 2015 studies completed
- ROSES community studies funded, \$2M
- **Science teams selected!**
- Conferences in 2014 & 2016
- Special sessions at AAS's & IAU
- Mission Concept Review successfully passed
- KDP-A planned for January 26
- Significant international interest
- ExoPAG, COPAG, PhysPAG interest
- **Exciting times for WFIRST**



H4RG-10 mounted
in EDU structure

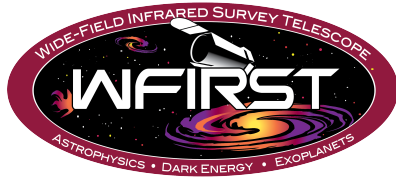


coronagraph
shaped pupil
mask



Selected SIT PIs & Topics

- David Spergel WFI Adjutant Scientist
- Jeremy Kasdin CGI Adjutant Scientist
- Olivier Doré Weak lensing and galaxy redshift survey
- Saul Perlmutter Supernovae
- Ryan Foley Supernovae
- Scott Gaudi Microlensing
- Bruce Macintosh Coronagraphy
- Margaret Turnbull Coronagraphy
- James Rhoads GO science, cosmic dawn
- Brant Robertson GO science, galaxy formation & evolution
- Benjamin Williams GO science, nearby galaxies
- Alexander Szalay GI science, archival research



Formulation Science Working Group



- FWSG is the science executive committee of WFIRST
- Membership
 - Project Scientist Chair, Adjutant Scientists Co-Chairs
 - PIs and some Deputy PIs from Science Investigation Teams
 - Program Scientist (ex-officio)
 - GSFC and JPL Deputy Project Scientists (ex-officio)
 - Science Center Leads (ex-officio)
- 24 members
- First meeting February 9-11, 2016
- 3-4 meetings per year
- 1 meeting per year of full Science Team



Summary



- Good funding for WFIRST has allowed significant progress in technology maturation and risk reduction
- WFIRST with the 2.4-m telescope and coronagraph meets / exceeds goals of NWNH
- Great opportunity for astronomy and astrophysics discoveries. Broad community support for WFIRST.
- WFIRST will enter Phase A in February with newly selected science teams.
- Current schedule has launch in 2024

