

Exo-C: A Design Study of a Probe-scale Space Mission to Directly Image and Spectroscopically Characterize Exoplanetary Systems using an Internal Coronagraph


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Concept Study of a Kepler-like mission for exoplanet direct imaging; < \$1 B backup plan to AFTA/WFIRST mission.

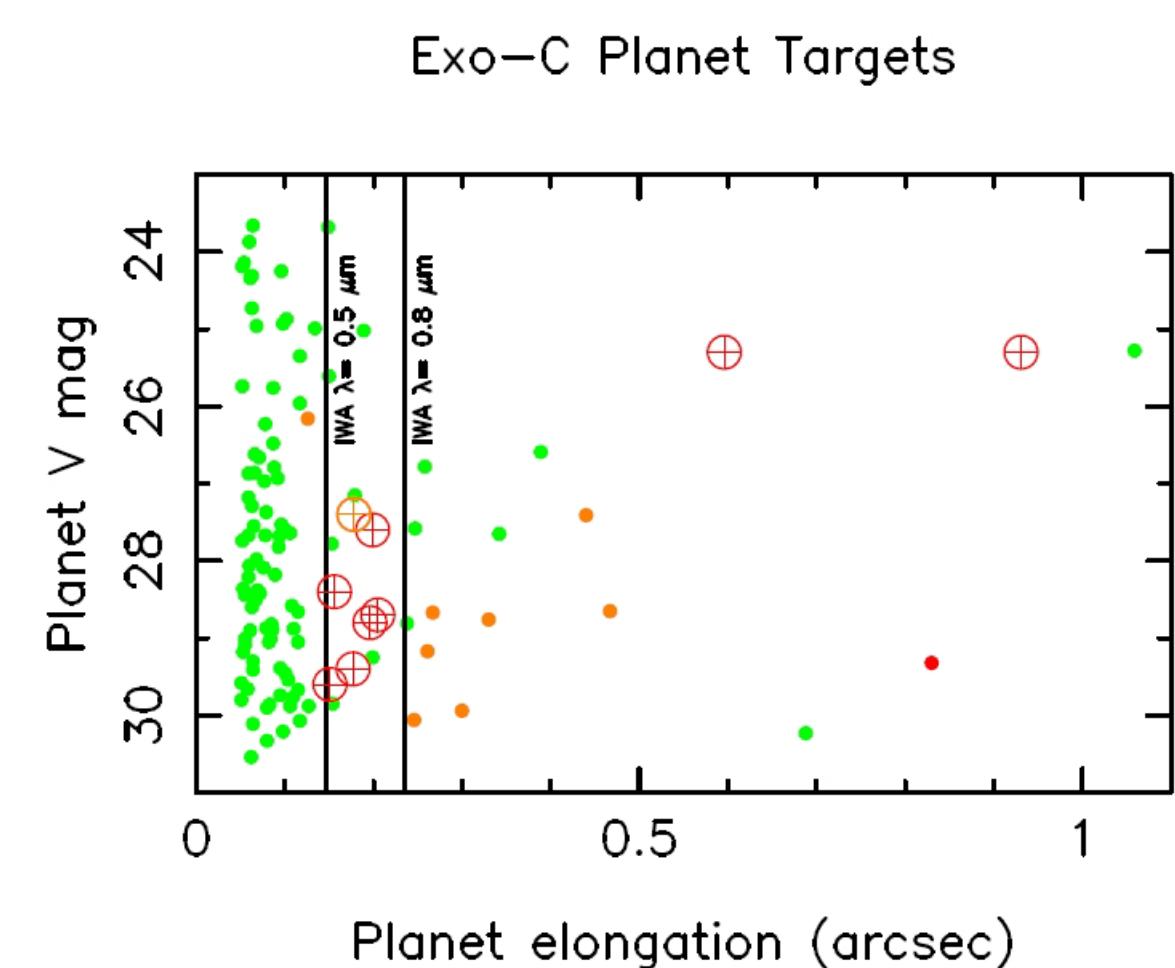
Design study started spring 2013, completes Jan 2015. Interim report now available. Key parameters :

Technical readiness for FY 17 start, 2024 launch Stable Earth-trailing orbit 1.5m unobscured telescope

Coronagraph: Hybrid Lyot baseline; PIAA-CMC and Vector vortex options $2\lambda/D$ inner working angle

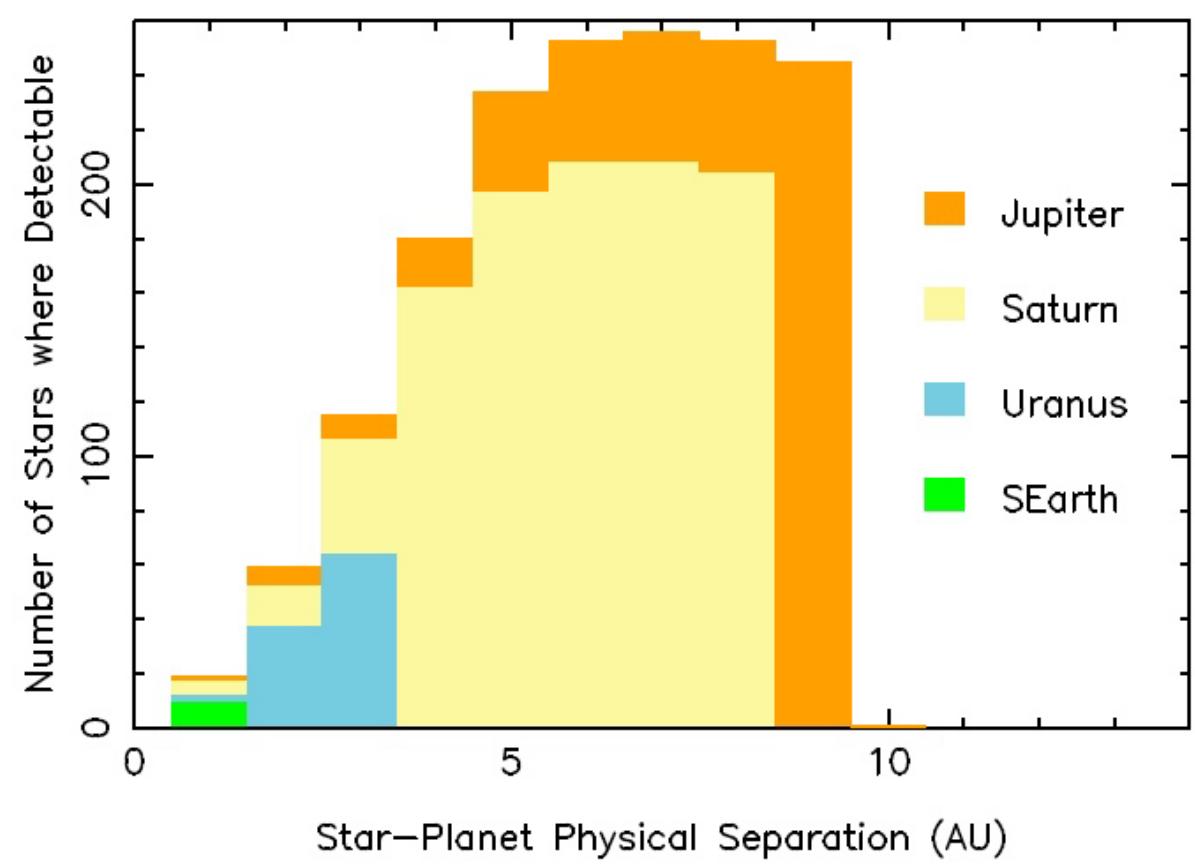
Active wavefront control with two 48x48 deformable mirrors, 0.4-1.0 μm imaging and $R= 70$ spectroscopy

Bright science target star provides reference for precision pointing and compensation of low-order wavefront drifts

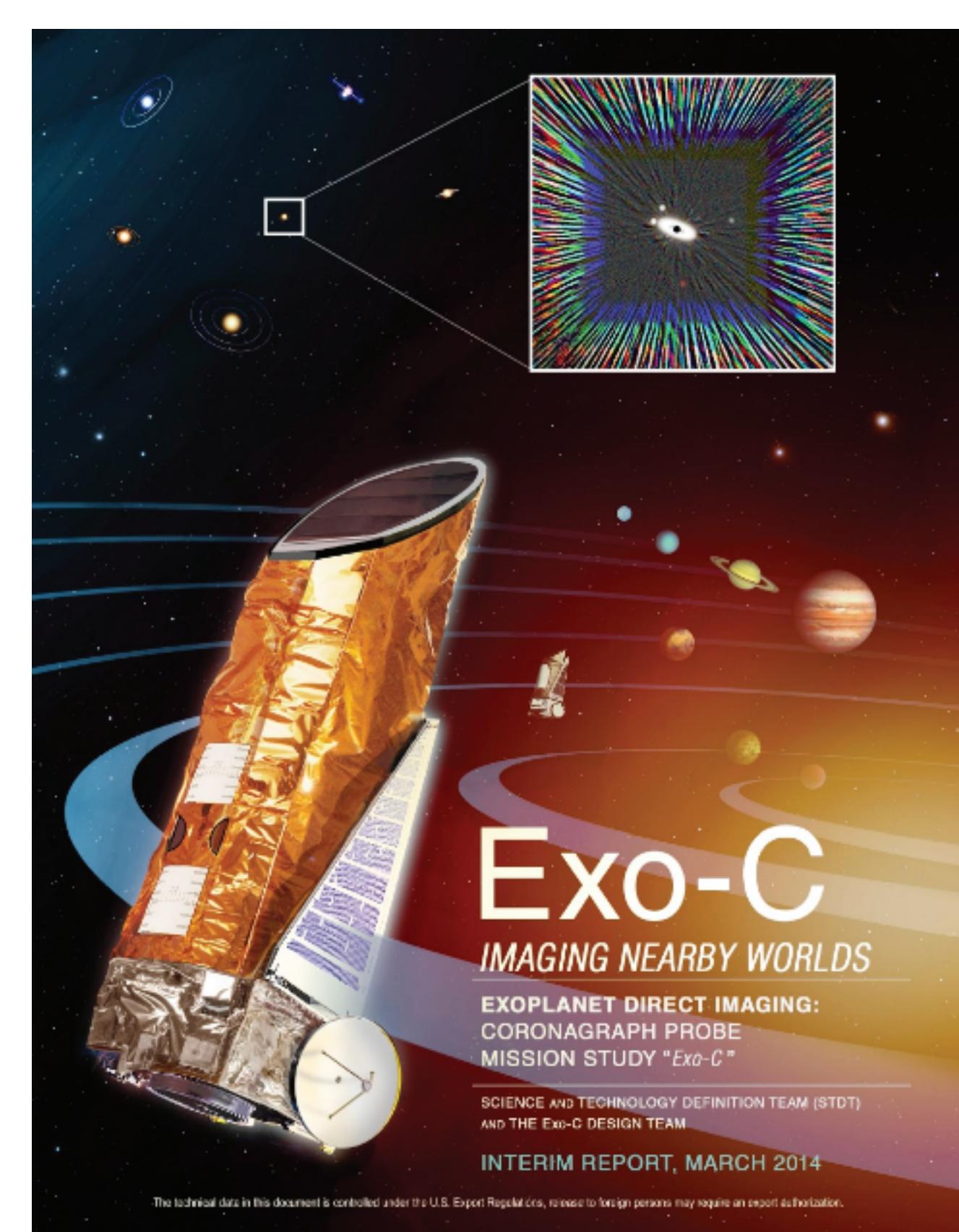
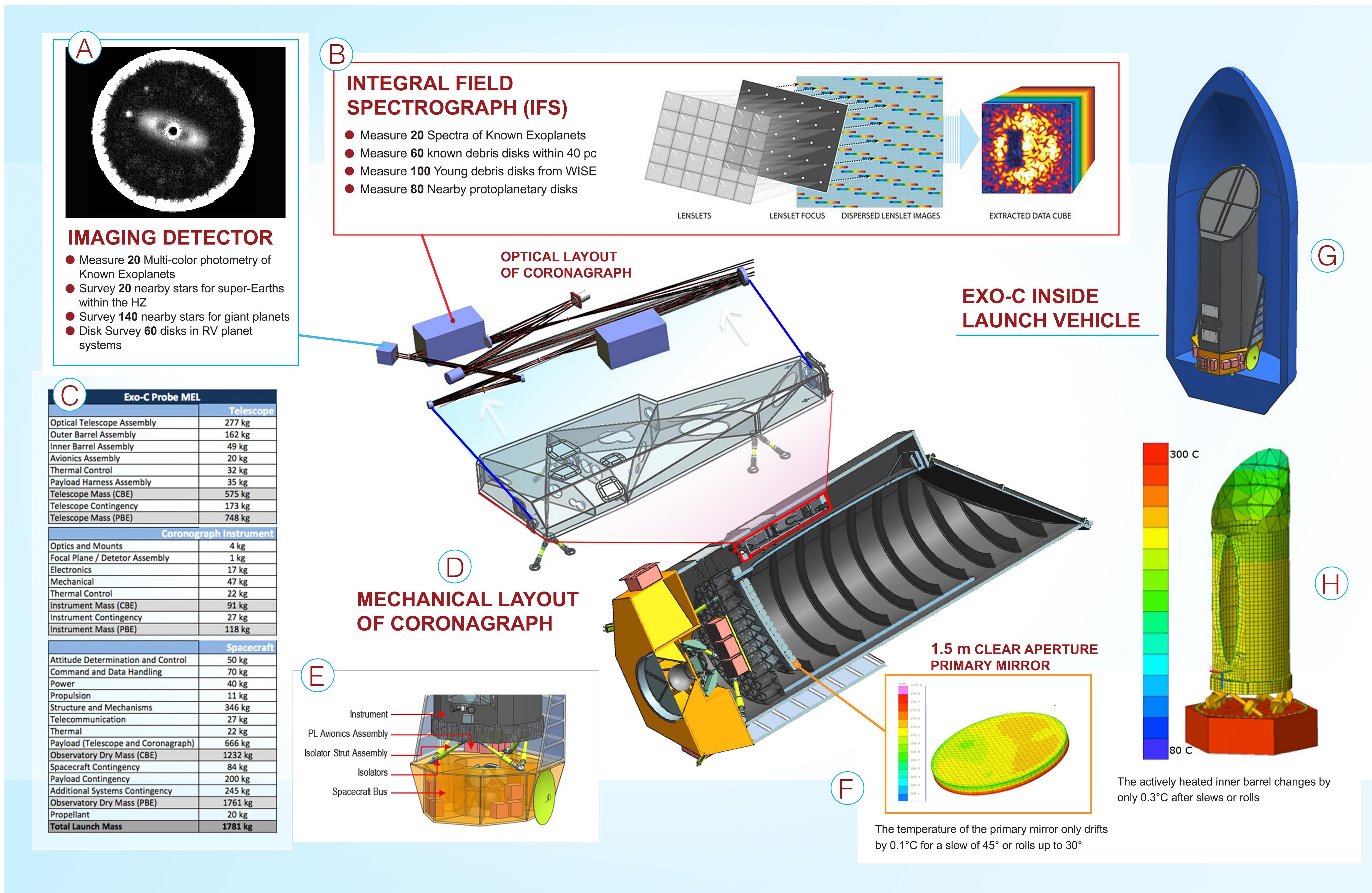


Above: Known RV planets (points) and HZs accessible to Exo-C.
Color codes for contrast difficulty.

Below: Exo-C imaging search space for planets of nearby stars, as a function of planet size and orbit



Interim Report
<http://exep.jpl.nasa.gov/stdt/exoc>



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