

ASSESS

CENTER FOR NEAR-EARTH OBJECT STUDIES (CNEOS)



SEARCH, DETECT & TRACK

National Aeronautics and Space Administration
GROUND-BASED OBSERVATORIES, MINOR PLANET CENTER (MPC), INTERNATIONAL ASTEROID WARNING NETWORK



PLANETARY DEFENSE

MITIGATE

DOUBLE ASTEROID REDIRECTION TEST (DART), FEMA EXERCISES



CHARACTERIZE

INFRARED TELESCOPE FACILITY, GOLDSTONE SOLAR SYSTEM RADAR, NEOWISE



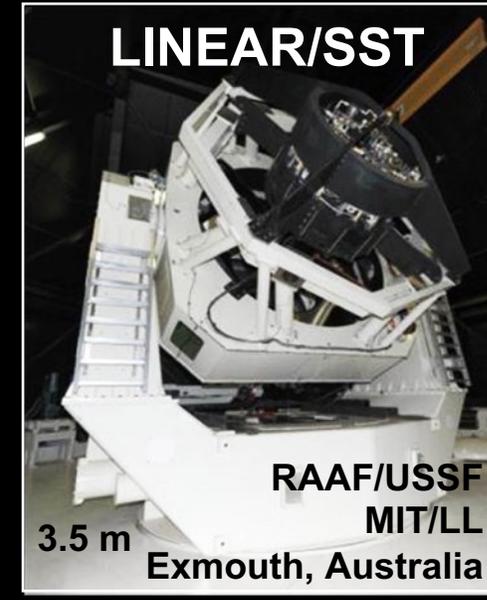
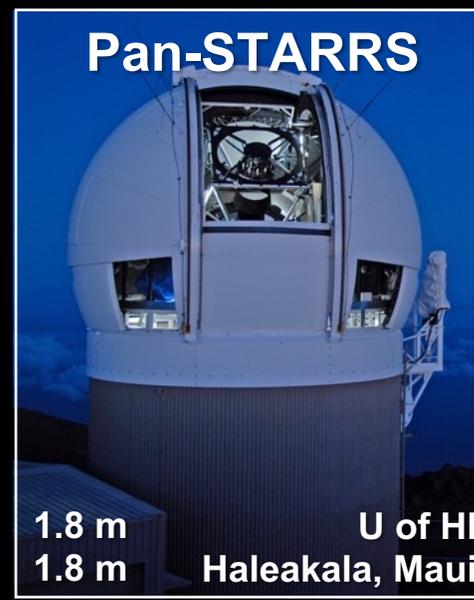
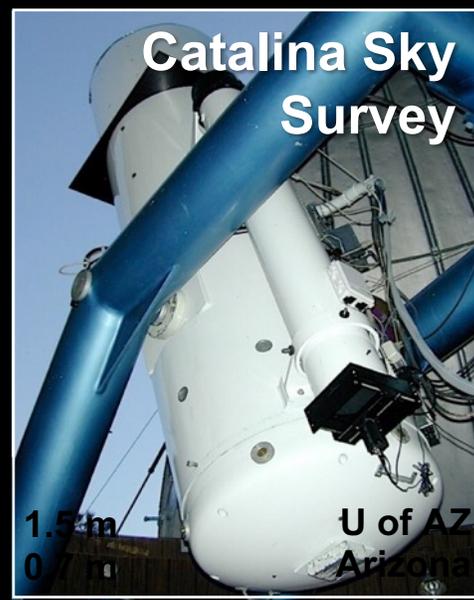
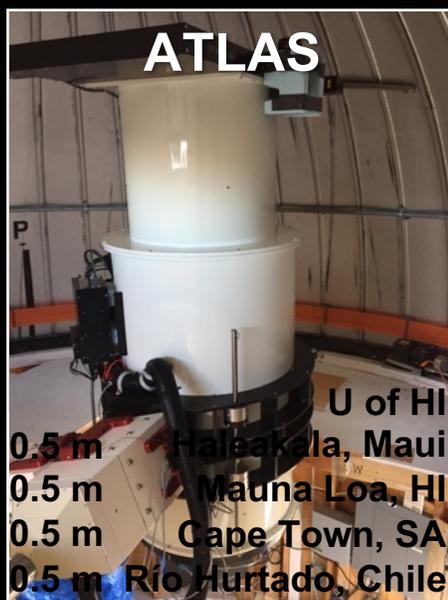
PLAN & COORDINATE

SPACE MISSION PLANNING ADVISORY GROUP, PLANETARY IMPACT EMERGENCY RESPONSE WG, PLANETARY DEFENSE IWG



NASA Planetary Defense Coordination Office (PDCO): established 2016

NASA-funded Near-Earth Object Survey (Discovery) Telescopes



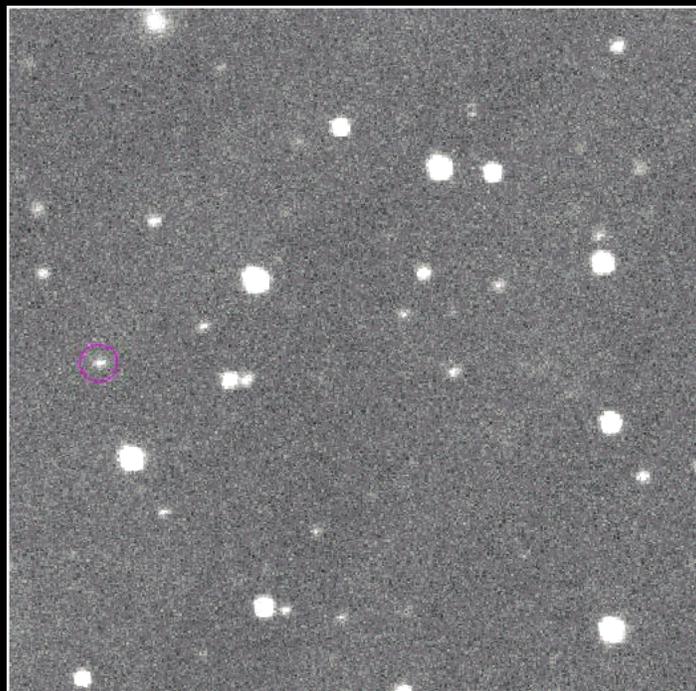
Also analysis of Zwicky Transient Facility (ZTF) data

NASA-funded Near-Earth Object Survey (Discovery) Telescopes



NEOWISE





Catalina Sky Survey four-image sequence

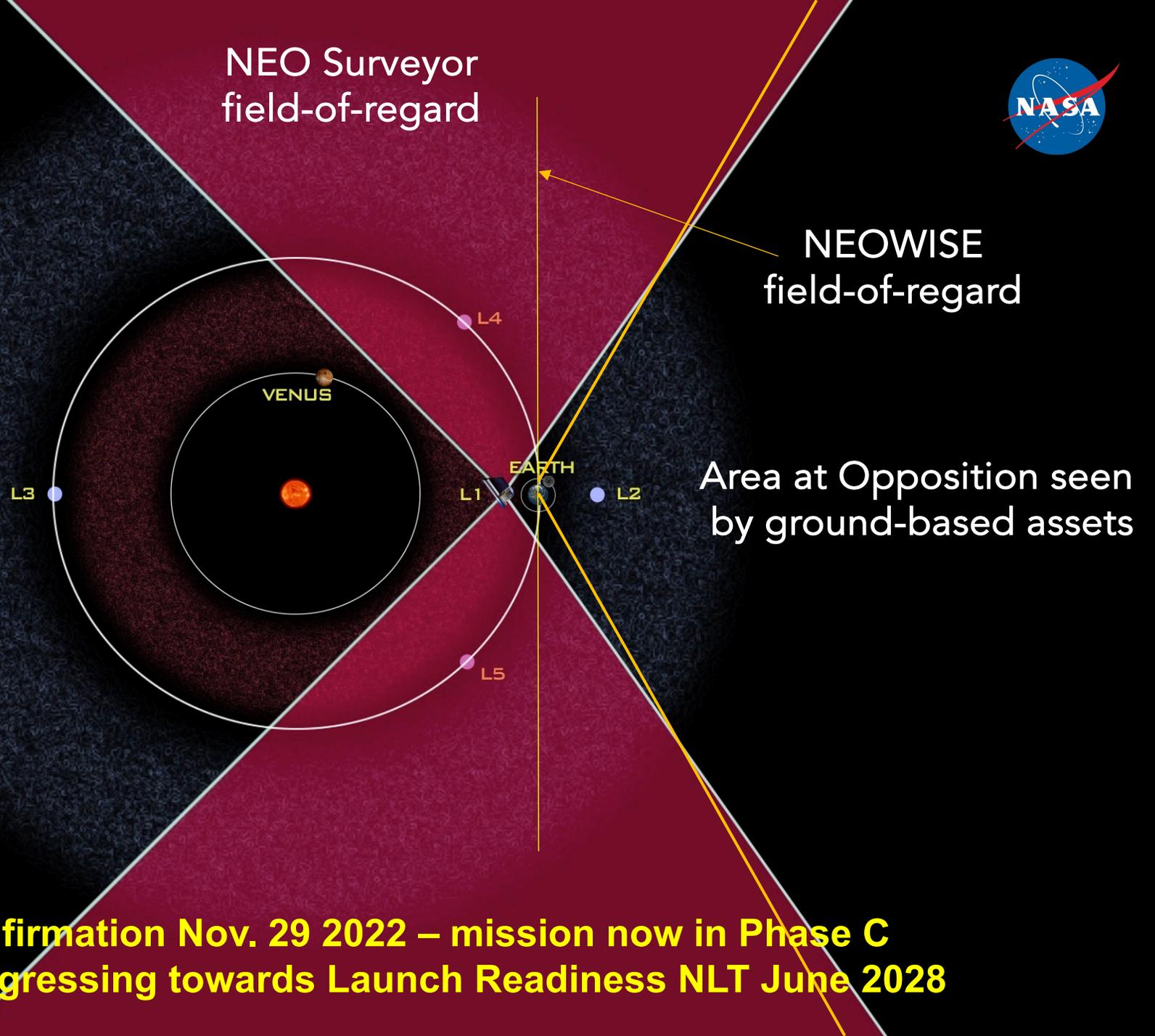
- Most asteroids, including NEAs, are best found and observed in the dark night sky and not at dawn/dusk
- Only NEAs with orbits interior to Earth's are best observed in the dawn and dusk sky by ground-based telescopes; that population is predicted to be small (the current known population is only 0.1% of known NEAs)
- NEO surveys, as moving object surveys, have been disentangling natural from artificial moving objects for a long time, so the current impact to them is minimal

- A streak does not ruin an entire image for NEO survey
- Even if a streak goes directly through an asteroid in one image, NEO survey cadence is such that there are multiple images of a field taken so that an asteroid will be detected multiple times, for characterizing its motion through space
- There is currently little impact to ground-based NEO survey by satellite constellations; that is not to say there is not a concern about having more artificial moving objects to manage in NEO survey images in the future

NEO Surveyor



- Space-based infra-red telescope
- Objectives:
 - Find 65% of Potentially Hazardous Asteroids (PHAs) >140 m in 5 years (>90% in 10 years)
 - Better estimate object sizes



- **KDP-C Confirmation Nov. 29 2022 – mission now in Phase C**
- **Project progressing towards Launch Readiness NLT June 2028**