
Kevin Hardegree-Ullman

The Near-Infrared Transit Explorer (NITE)

The M dwarf habitable zone Earth finder.

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Why should we have a dedicated infrared (M dwarf) transit survey mission?

Add your thoughts here!

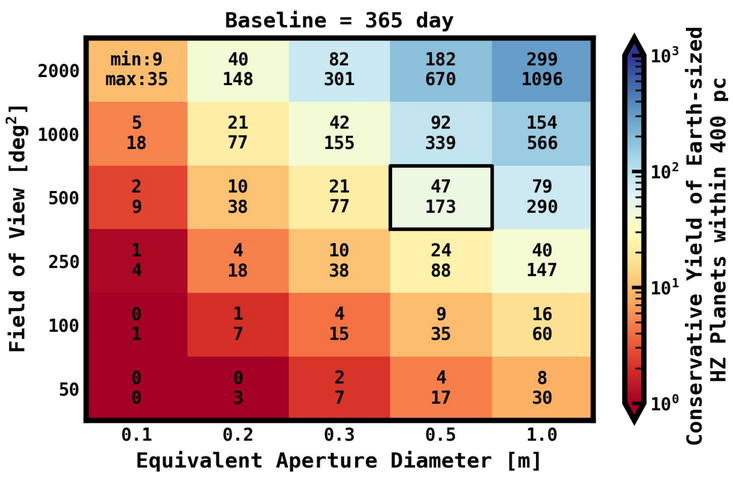
What is NITE?

NITE is a transiting exoplanet survey mission concept. It will have a near-infrared bandpass (0.9–1.8 μm) optimized to detect >100 Earth-sized habitable zone (HZ) planets around nearby M dwarfs.

Join Our Team!

Help with the mission (science or technical) or just stay up to date!

Expected HZ yields inform telescope and FOV



A 0.5-m telescope with a 500 deg^2 field-of-view could yield ~100 HZ Earths orbiting M dwarfs in 1 year.

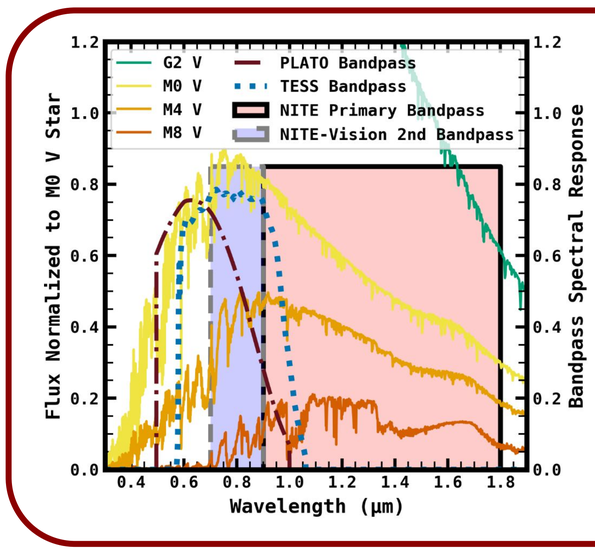
NITE Concepts

NITE	FOV (deg^2)	Bandpass(es) (μm)	Observing Seasons (days)
Lite	500	0.9–1.8	365x5
Vision	500	0.7–0.9 0.9–1.8	365x5
Owl	500 2000	0.9–1.8	365x5 90x21

★ NITE-Lite fulfills our basic science goals.

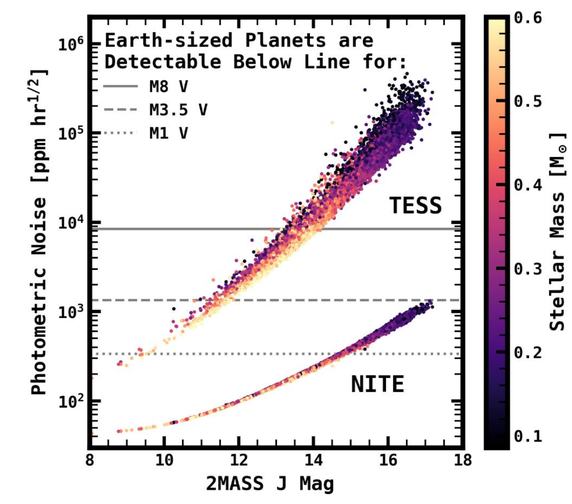
★ NITE-Vision adds a second bandpass to aid planet validation, probe stellar variability and activity, and enhance studies of more massive stars.

★ NITE-Owl adds a second wide-field telescope to survey the entire sky over 5 years with 90 day observing seasons.



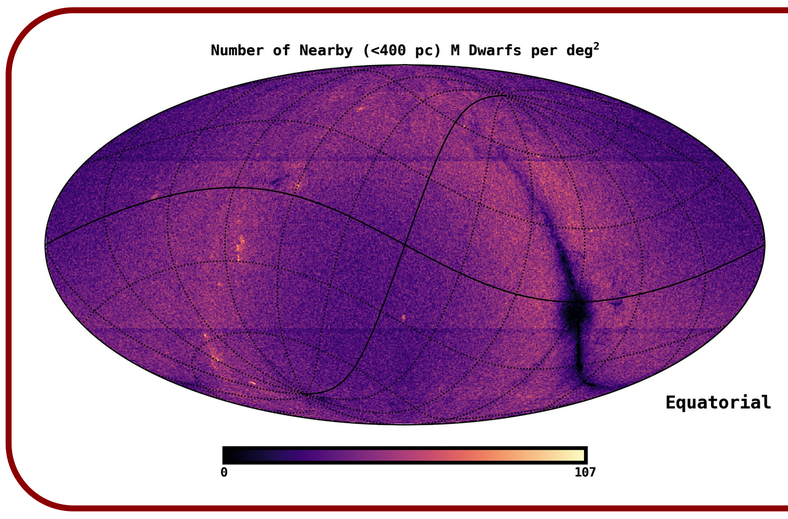
Sensitivity to M dwarfs

The infrared bandpass(es) for NITE are optimized to study M dwarfs, unlike the optical Kepler, TESS, and PLATO bandpasses more sensitive to FGK stars.



Sensitivity to Earths

NITE will be significantly more sensitive to Earth-sized planets around M dwarfs than TESS. NITE will enhance demographic studies of M dwarf planets down to the size of Mars.



Observing Fields

NITE fields will be chosen to optimize the number of nearby M dwarfs surveyed within a 500 deg^2 FOV.