K2 Campaign 0 Target Proposal

Title: **Nearby, high proper motion M dwarfs for the Kepler K2 mission.**

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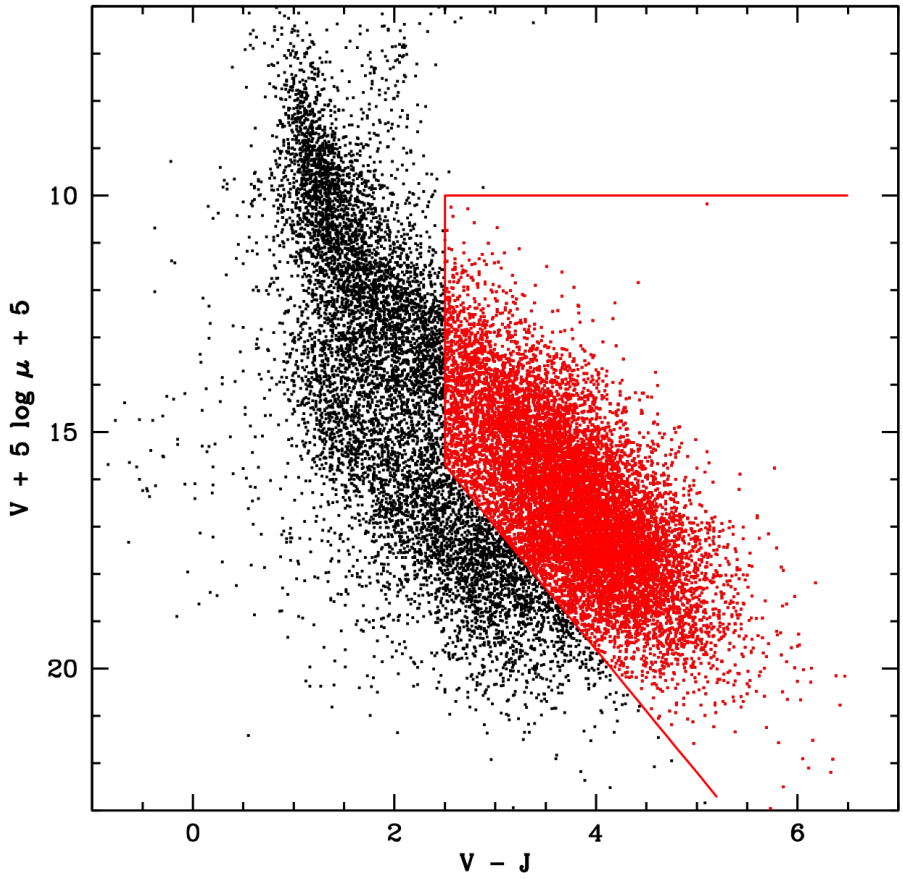

Scientific Justification: M dwarfs continue to be targets of high priority for exoplanet surveys because of the higher probability for detecting Earth-size planets orbiting these smaller, low-mass stars. Nearby M dwarfs make the best targets as they have brighter apparent magnitudes which makes the smallest of then (mid-type to late-type M dwarfs) accessible for high S/N photometric monitoring. Here we propose to include nearby M dwarfs selected from high proper motion, which comprise the majority of M dwarfs within 100pc of the Sun, with zero contamination from background giants (thanks to the proper motion selection).

The K2 campaign 0 field has been entirely searched for high proper motion stars as part of the SUPERBLINK proper motion survey (e.g. Lépine & Shara 2005, AJ 129, 1483; Lépine & Gaidos 2011, AJ 143, 138), which lists 21,443 stars with proper motion $\mu > 40$ mas/yr within 12 degrees radius of the proposed field center. A reduced proper motion diagram (see figure) identifies the bulk of the stars as low-mass M dwarfs ($V-J > 2.5$). A total of 12,661 M dwarf candidates are identified based on color and reduced proper motion cuts (red dots). The final 105 sq. deg. K2 field should therefore contain about 2,900 M dwarf targets.

Many of these targets will likely be identified by the KEPLER team (or other groups) based on fa color selection of the 2MASS catalog. It is however imperative that the present SUPERBLINK list be compared to the KEPLER target list, to make sure that no nearby M dwarf is to be overlooked. Any additional targets from the present list should be included.