



PHYSICS AND ASTRONOMY COLLOQUIUM

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“Exploring 10000 of the Nearest Star Systems”

Abstract

The nearest stars and their companions provide the fundamental framework upon which all of stellar astronomy is based, for individual stars, stellar multiples, and entire stellar populations. We live in exciting times, as our map of the Sun's neighbors becomes enriched with details of other solar systems that will ultimately play key roles in our search for life elsewhere.

The RECONS (REsearch Consortium On Nearby Stars, www.recons.org) team endeavors to understand the nature of the Sun's nearest stellar neighbors, both individually and as a population. We reveal "missing" members of the (very) local neighborhood, focusing on the 10 parsec sample, a distance horizon that corresponds to 32.6 light years. To date, we have found 44 new star systems in this sphere, accounting for one of every seven systems in the sample. In the process, we have learned that 75% of all stars are the Sun's smaller, cooler cousins known as red dwarfs of spectral type M that dominate our Milky Way Galaxy.

As leaders of the SMARTS Consortium, RECONS uses telescopes at the Cerro Tololo Inter-American Observatory located in the foothills of the Chilean Andes for two long-duration surveys of K and M dwarfs. We are revealing key astrophysical insights about the nearest stars, including the orbital architectures of multiple systems, the long-term variability of red dwarfs, and the identification of young stars near the Sun. One ultimate goal is to understand how the populations of companions to stars --- stellar, brown dwarf, and planetary --- relate to one another. In particular, while many planets have yet to be detected, we now know that the solar neighborhood is dominated by small stars that are potentially orbited by many small, as yet unseen, planets.

Wednesday, September 18, 2019

3:30 p.m.

Bob Wright Centre A104