ABSTRACT

Low-mass stars are the most common stars in the galaxy and are prime targets to search for and characterize small, Earth-like planets. These stars are highly active, exhibiting frequent flares and energetic particle emission that can be detrimental to planetary habitability. We have developed a program to obtain multiwavelength observations (UV, X-ray, radio) simultaneous with TESS using a variety of ground and space-based facilities. TESS’ long-baseline, high-cadence observations for many hundreds of nearby low-mass stars is going to revolutionize our understanding of M star activity.

FIRST LOOK AT M DWARF LIGHT CURVES

The above collage of light curves provides just a hint of the diversity and complexity of the variable phenomena observed in the M dwarf sample. A quick look analysis of all currently available 2 minute cadence light curves reveals candidate eclipsing binaries, rapid rotators, extreme flare activity, and other intriguing morphologies.

M DWARF FLARES & PLANET HABITABILITY

We are observing a wide range of M dwarfs with TESS 2-minute cadence data, including stars with ages from 10 Myr to 10 Gyr and masses from 0.1 to 0.7 solar masses. The multiwavelength observations simultaneous with TESS will enable us to probe correlations between flare energy and particle flux. We will explore how space weather changes over time and how the cumulative effects of this radiation impact exoplanet habitability.