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THE GALEX NEARBY YOUNG-STAR SURVEY

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The census of young stars among nearby moving groups is far from complete, particularly at the low-mass end. To this end, we have initiated the GALEX Nearby Young-Star Survey (GALNYSS; Rodriguez et al. 2013). This survey utilizes the GALEX all-sky database and incorporates WISE and 2MASS as well as kinematic information. Over 2000 candidate nearby young M-dwarfs have been identified in this work. Early spectroscopic results confirm the youthful nature of our candidates suggesting that our technique is capable of successfully identifying the many low-mass stars that remain to be found among the nearby young moving groups.

Over the last few decades, many 10-100 Myr-old stars have been identified in moving groups located closer than 100 parsecs to Earth. For direct imaging searches of extrasolar planets these stars represent the best targets and they will be continuously observed during the coming decades as new imaging systems and larger telescopes are commissioned. Recent work has shown that near-IR surveys, like 2MASS, combined with ultraviolet data from GALEX can be used to identify additional members in these moving groups (Shkolnik et al. 2011, Rodriguez et al. 2011, 2013). In particular, this methodology is well suited to searching for low-mass stars, which are generally lacking in moving group member statistics. Initial searches for young stars relied on optical identification (such as with Tycho and Hipparcos) and X-ray detection with ROSAT. The release of the all-sky WISE catalog has added a powerful new tool, alongside GALEX and 2MASS, in the search for nearby, young, low-mass stars. We have carried out an all-sky cross correlation between the GALEX, WISE, and 2MASS databases and identified over 2000 candidate young, low-mass stars on the basis of their ultraviolet and infrared colors as well as kinematic information (Rodriguez et al. 2013).

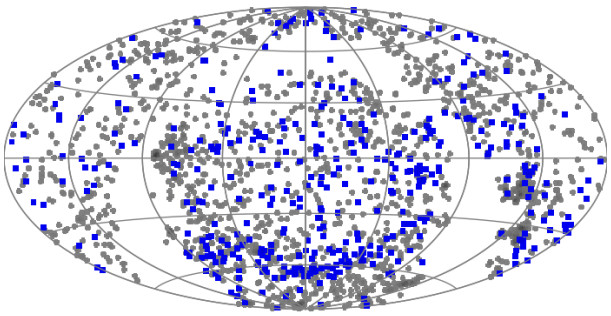

Fig. 1. Aitoff projection of GALNYSS stars (grey). Those for which we have obtained spectra are in blue squares.

Follow-up observations of GALNYSS targets consists of spectroscopy in order to (1) determine spectral types, (2) search for signatures of youth (e.g., Li absorption, low surface gravity, emission lines), and (3) measure radial velocities. Thus far we have obtained over 500 spectra for about 400 targets (see Figure 1) consisting of low-resolution optical (∼260), low-resolution near-IR (∼120), and high-resolution optical data (∼160) at observatories in Chile, the US, and Australia. These observations will allow us to characterize our sample and confirm youthful ages for our targets. Already, we have found many promising young stars (Rodriguez et al. 2011, 2013, Vican et al., in prep).

This ongoing project is expected to reveal a large number of nearby, young, low-mass stars among the field star population. These identifications are essential to fully characterize the mass functions of nearby moving groups, to better understand the early evolution of low-mass stars, and to provide a sample of high-quality targets for direct imaging and transit searches for young exoplanets.

REFERENCES

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