

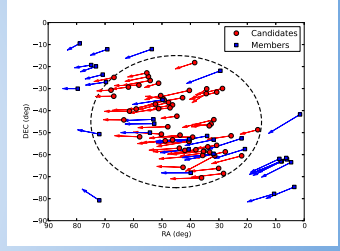
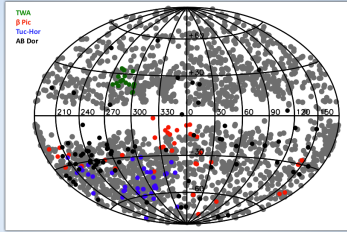
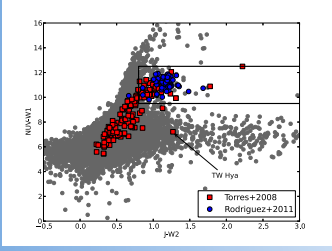
# The GALEX Nearby Young-Star Survey



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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. 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 recent release of the all-sky WISE catalog has opened up a new frontier 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 many candidate young, low-mass stars. Early spectroscopic results confirm the youthful nature of our candidates. This suggests that our technique is capable of identifying the many low-mass stars that remain to be found among the nearby young moving groups.  
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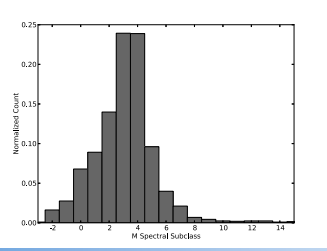
## Finding Young, Low-Mass Stars Near Earth



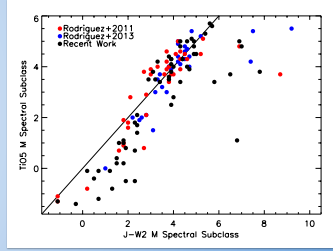
To find the missing population of young M-dwarfs in young moving groups near Earth, we have initiated the GALEX Nearby Young-Star Survey (GALNYSS; Rodriguez et al. 2013). With ultraviolet (GALEX) and near-infrared (WISE & 2MASS) color selection criteria (top left Figure), estimated photometric distances, proper motions, and a UVW velocity analysis we have identified over 2000 candidate young, low-mass stars spread across the whole sky (top center Figure).

With a grouping algorithm, we can identify clusters of GALNYSS stars sharing similar kinematics and distance estimates. The Figure above shows 58 GALNYSS stars in the vicinity of the ~30 Myr-old Tucana-Horologium Association (Torres et al. 2008).

## Characteristics of GALNYSS Stars

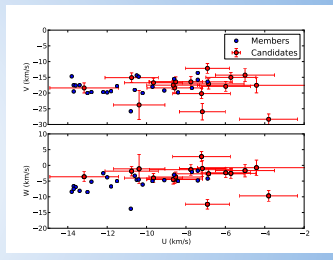
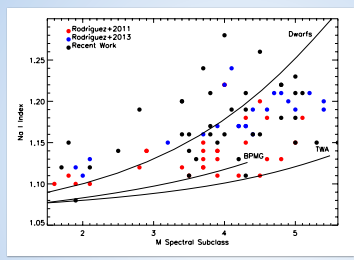
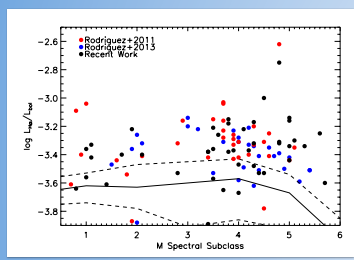


WISE-2MASS colors, such as J-W2, can be used to estimate the spectral type of the GALNYSS stars (Rodriguez et al. 2013). The distribution of spectral types is shown at left. While most studies have missed the early to mid M-dwarf population, the GALNYSS selection criteria are most sensitive to these.



The tail towards late M's and early L's (ie, spectral subclass >10) is a result of disks of warm dust grains contributing to the WISE flux. A comparison with spectral types computed with the TIOS index (Reid et al. 1995) is shown at right; there is good agreement in the early to mid M-dwarf range. Clear outliers with red J-W2 colors are evident and dusty disks are known around several (Schneider et al. 2012a,b).

## Confirming Young Ages



Radial velocities and photometric and/or kinematic distance estimates can be used to derive Galactic space velocities (UVW) of candidate young stars. At left we show preliminary results for TWA candidates compared to the members listed in Schneider et al. (2012a).

On-going spectroscopic observations are being carried out to identify signatures of youth. At top left, we compare the H-alpha luminosity of GALNYSS stars with the average of West et al. (2004; solid line with the 1-sigma uncertainty as dashed lines). While most M-dwarfs exhibit some H-alpha emission, these UV-excess stars show luminosities higher than the average for older field dwarfs. At top center, we show the Na I index for the 8200 angstrom doublet. The strength of this surface gravity-sensitive line for many GALNYSS stars is typically between that observed for old field dwarfs and ~10 Myr-old groups like TW Hya Association and the beta Pic Moving Group (Lawson et al. 2009; solid lines).

### References

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- Schneider et al. 2012a, ApJ, 754, 39
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Presented by **David R. Rodriguez**  
Questions? Look for me!

You can find a copy of this poster, and additional information, here:  
<http://www.das.uchile.cl/~drodrigu/galnyss.html>

