Early Results from The *CASTOFFS* Survey

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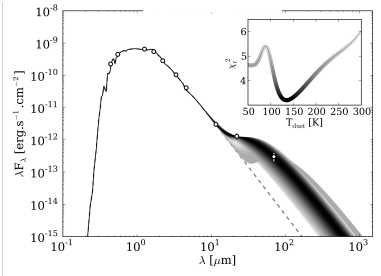
Want to know more? Find me at PPVI, email schlieder@mpia-hd.mpg.de, or check out these papers: Deacon et al., 2013, MNRAS, accepted; Schlieder et al., 2013, ApJ, submitted.

References: [1] Lestrade et al., 2006, A&A, 506, 1455. [2] Currie et al., 2008, ApJ, 672, 558. [3] Lépine et al., 2009, AJ, 137, 4109. [4] Law et al., 2006, MNRAS, 368, 1917. [5] McLean et al., 2011, ApJ, 741, 27. [6] Tinney & Reid, 1998, MNRAS, 301, 1031. [7] Burrows et al., 1997, ApJ, 491, 856. [8] Chabrier et al., 1996, ApJ, 459, L91.

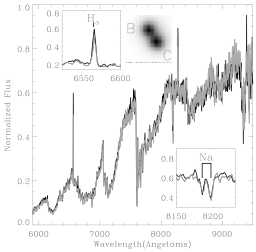
The ***C***ool ***A***strometrically ***S***elected ***T***argets ***O***ptimal ***F***or ***F***ollow-up ***S***pectroscopy (*CASTOFFS*) survey aims to identify and characterize young, low-mass stars in the Solar neighborhood. We identify candidates of young kinematic groups via proper motion, photometry, and activity. Follow-up spectroscopy provides further kinematic and age constraints to identify true group members and other interesting systems. Here we present two novel systems identified in the framework of the survey and provide a status update.

A Triple with a Disk

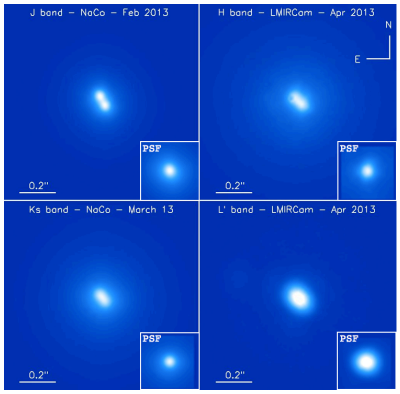
- TYC 5241-986-1ABC is a hierarchical triple at 60-90 pc identified in a common proper motion companion search of the CASTOFFS sample
- 20–120 Myr old from activity, lithium, and gravity sensitive features
- Primary is a rare, late-type star with a debris disk



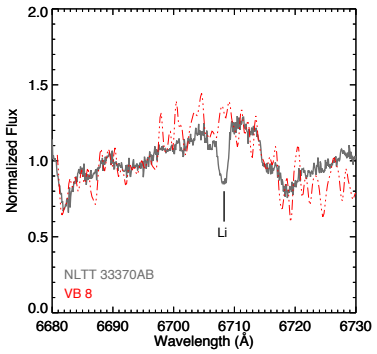
- Optical to Mid-IR spectral energy distribution of the TYC 5241A.
- *WISE* 22 μm and *Herschel* 70 μm excesses are best fit by a black body at 120-150 K.
- Debris disks are rarely detected around late-type stars with ages >20 Myr[1,2].



- CAHA-CAFOS spectra of TYC 5241B (black) and TYC 5241C (gray).
- Both exhibit strong Hα emission and slightly weak Na I doublets.
- Inset image shows resolved components in SDSS *z*-band.



- VLT-NaCo and LBTI-LMIRCam *JHK$_s$L'*-band images of NLTT 33370 A and B.
- The separation of the components is 76±5 mas (1.24±0.11 AU).
- The position angle changes ~10° each month, revealing the rapid orbital motion of the binary.



- Magellan-MIKE integrated light optical spectrum of NLTT 33370AB compared to a field M7[5,6].
- The lithium 6708 Å line equivalent width is ~500 mÅ.
- An age of ~100 Myr is inferred from comparison to Li depletion in evolution models[7,8].

A Benchmark Binary

- NLTT 33370AB is a nearby (16.4 pc), active, pair of late-M dwarfs[3,4]
- 30-150 Myr old from lithium and gravity sensitive features
- A young, low-mass, benchmark, binary

SURVEY STATUS

- High resolution spectra obtained for nearly half of the *CASTOFFS* sample (>190 stars).
- Bright ($V \leq 14$), southern subsample complete and analyses are ongoing.

- FEROS spectra of late-type β Pictoris moving group (12 Myrs old) candidates that exhibit Li absorption.
- Measured radial velocities are consistent with group membership.