

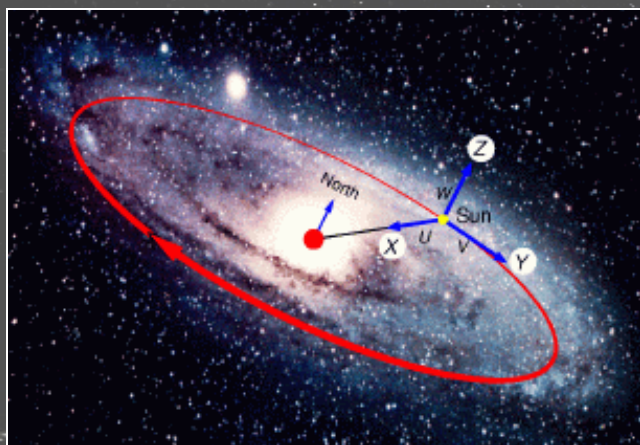
# Searching for Common Proper-Motion Companions in the Local Association and its young kinematic subgroups

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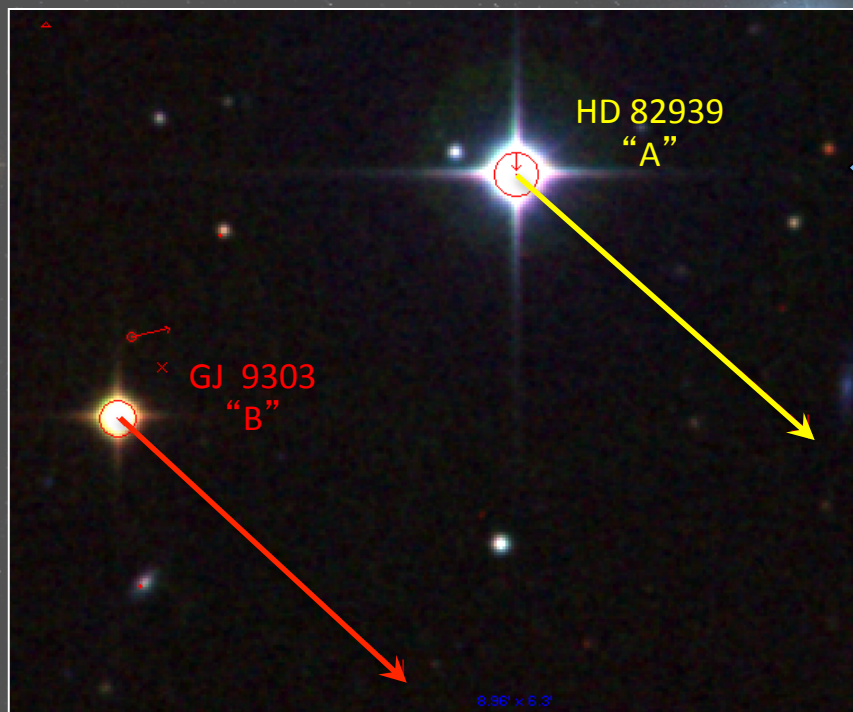
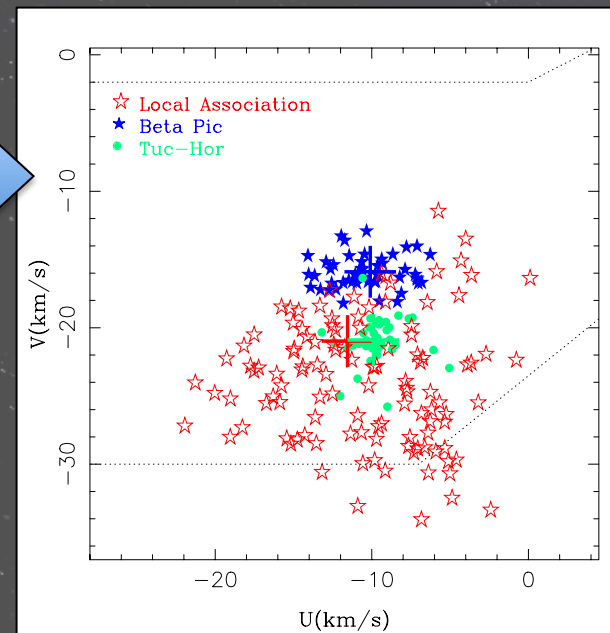
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# Stellar Kinematic Groups & Common Proper-motion Companions



## SKG

- Coherent kinematics
- Common origin:
- Local Association, Castor, Ursa Majoris, Hyades, etc.
- Subgroups:  $\beta$  Pic, Tuc-Hor ... of Local Association



## CPMC

Comes from the same parental cloud

- Same proper motions
- Same distance
- Same chemical composition
- Separation between components from arcsec to degrees

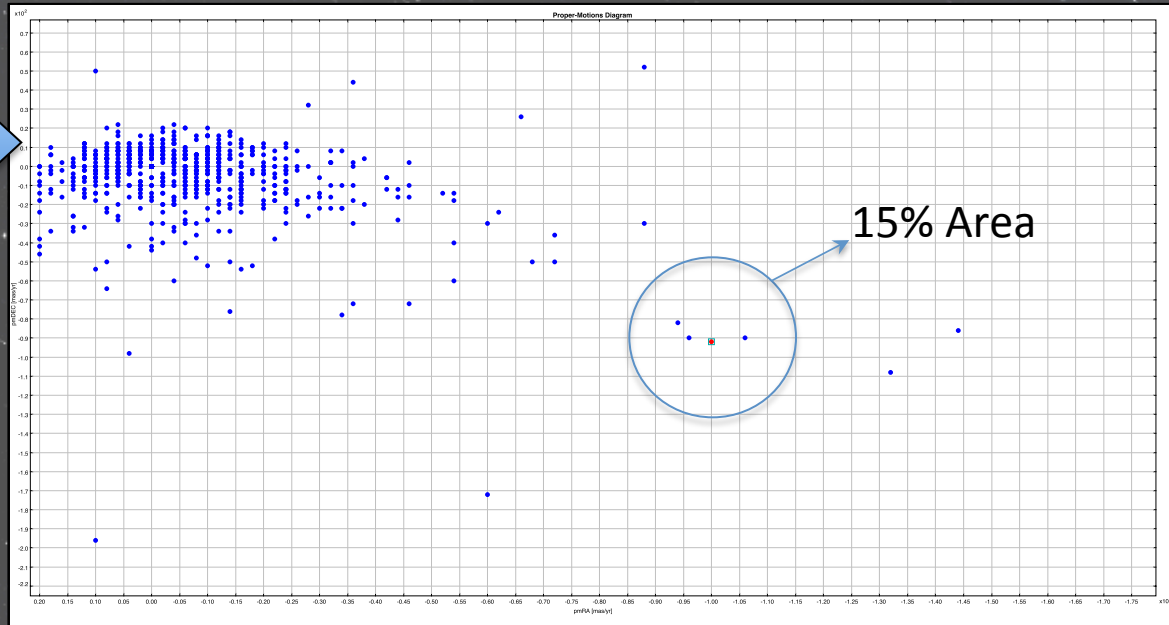


# Search & Confirmation

## Candidates

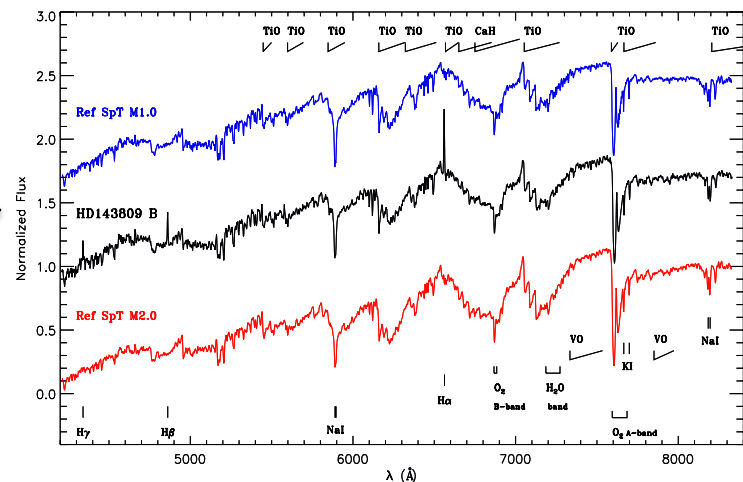
Virtual Observatory tool, **Aladin v7**:

- 30 arcmin radius search around each target
- Proper-motion diagrams from **2MASS, USNO-B1/PPMXL** cross-matches
- Candidates separated by less than 15% in proper motion



## Confirmation

- Precise astrometry
- Spectro-photometric analyses



# General Results

## Local Association

**166** studied members (Montes et al. 2001b; Torres et al. 2008)

**19** multiple system candidates confirmed:

- **16** known CPMCs
- **3 unknown CPMCs**. The secondary of HD 143809 AB had never been described before in the literature

## Tucana-Horologium

**75** studied members (Montes et al. 2001b; Torres et al. 2008; Kiss et al. 2011; Zuckerman et al. 2011)

**47** CPMC candidates outside the Tucana-Horologium core:

- **11** known CPMCs
- **11** CPMCs candidates with secondaries in Simbad
- **23** CPMCs candidates with unknown secondaries (under investigation)
- **2 unknown CPMCs** up to now

## $\beta$ Pictoris

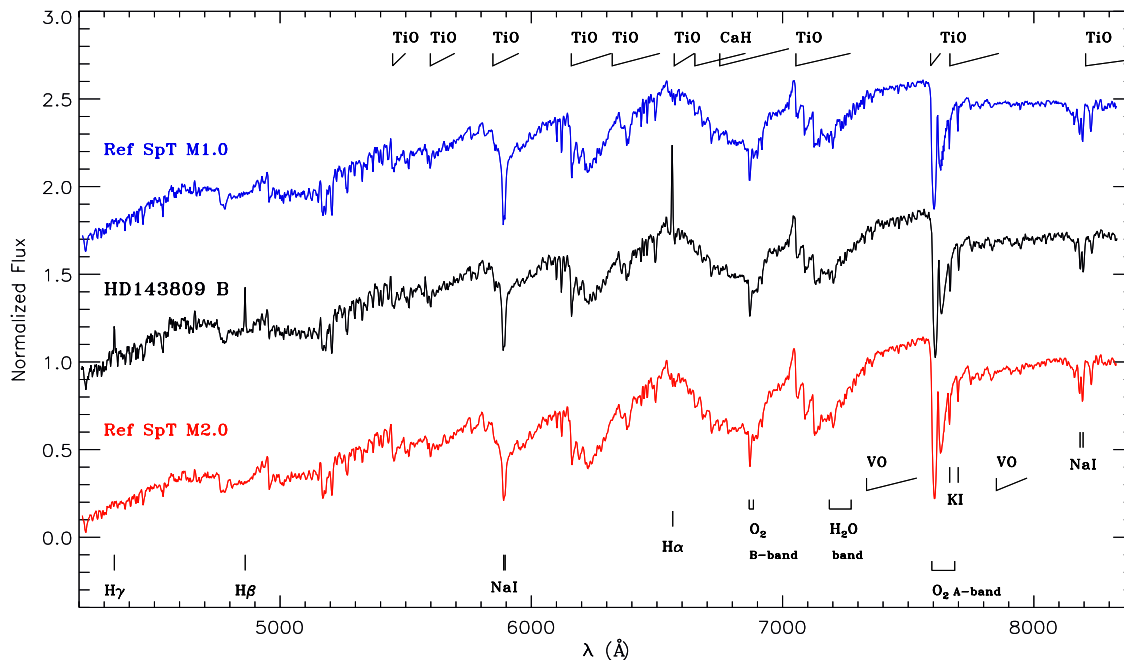
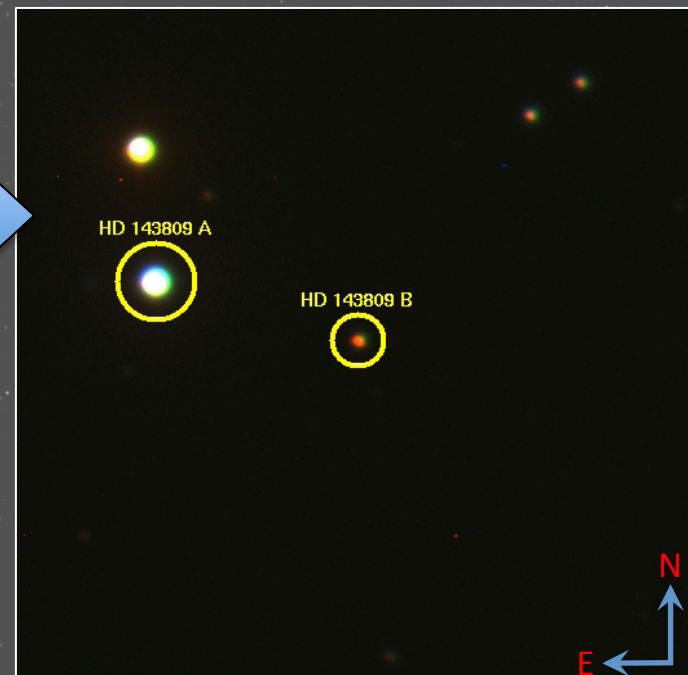
Under investigation:

- **2 unknown CPMCs** in a preliminary search:  
HD 173167 & TYC 9073-762-1  
HD 199143 AB & AZ Cap

# HD 143809 AB

## HD 143809 AB Data

- $\rho = 1.44$  arcmin (6700 AU)
- $\mu_{\alpha} \cos \delta_B = -51.0 \pm 1.3$  mas/a
- $\mu_{\delta B} = -40.7 \pm 1.3$  mas/a
- $\Delta\mu = 2.9 \pm 2.5$  mas/a



## Spectro-Photometry

- CAFOS @ 2.2m Calar Alto
- M1.5 Ve
- $pEW(H\alpha) = -5.7 \pm 0.4$  Å
- *BVRi ugr JHKs* photometry agrees with inferred distance  
 $d_B \sim 74$  pc  $\sim d_A = 78 \pm 8$  pc

$EW(Li) = 103$  mÅ (López-Santiago et al. 2010),  $\tau \approx 80$ -120 Ma (Montes et al. 2001)



# Tucana-Horologium Core

## Core

### 15 Stars:

- 7 B-A-F and 4 K-M already known stars (Shaya & Olling 2011, in blue boxes)
- 4 early and mid-M stars proposed here (in yellow); the faintest ones are close to the substellar boundary

