A search for brown dwarf companions to Hyades stars using the LOCI PSF-subtraction technique

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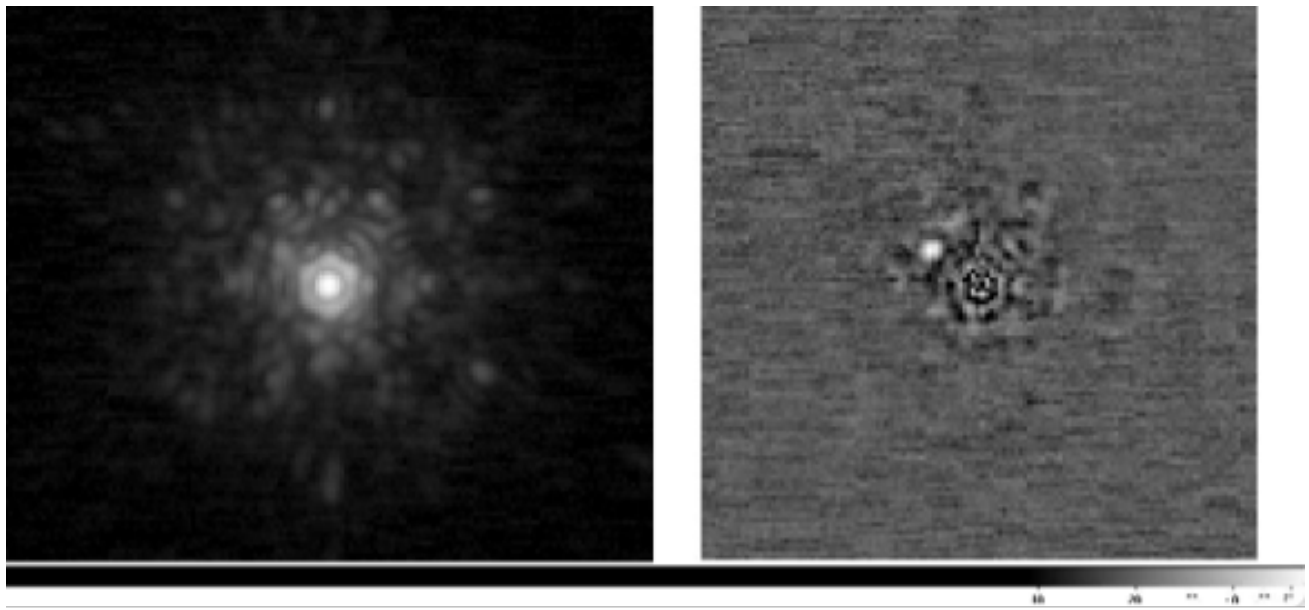
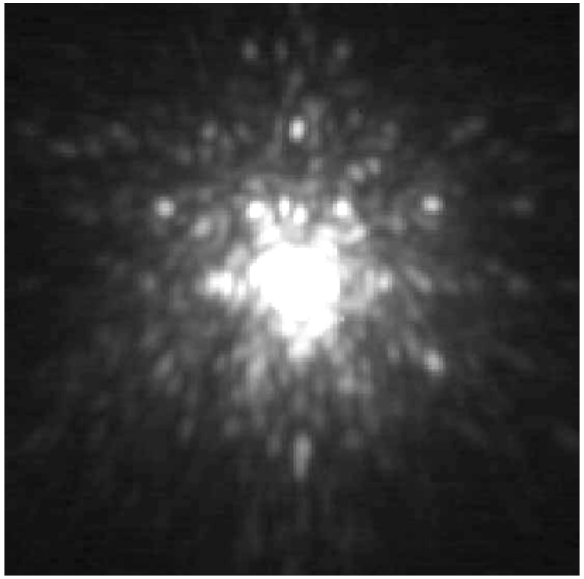


Facilities used: Keck NIRC-2 NGS (near-IR camera with AO)

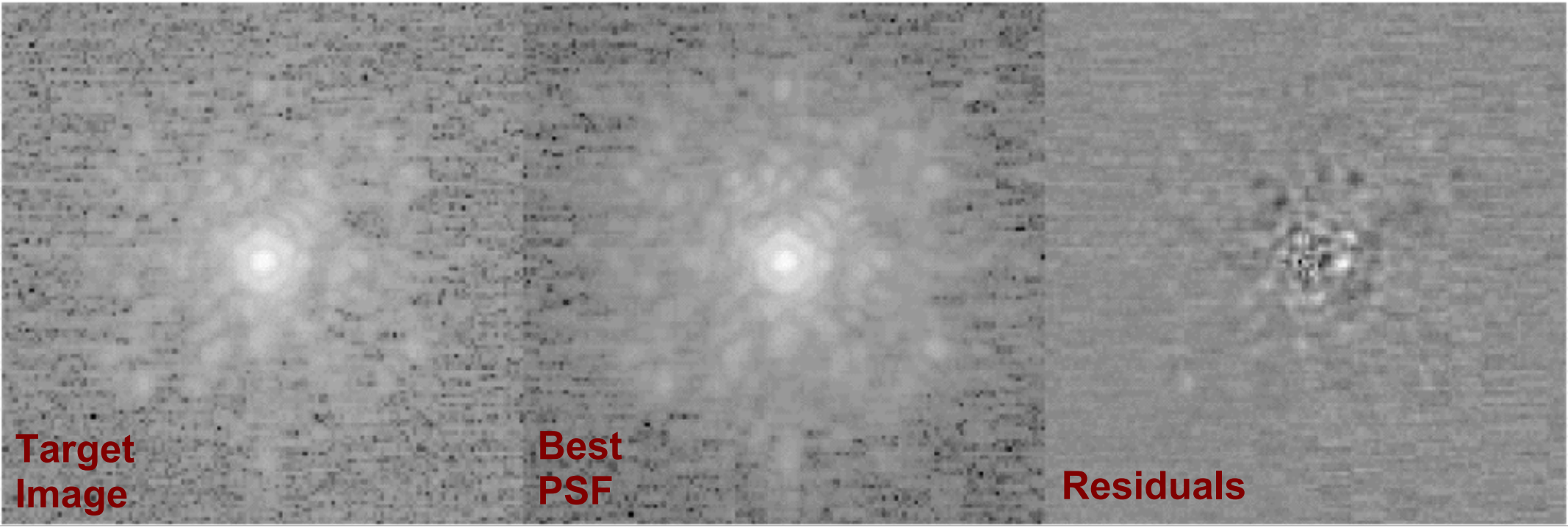
Questions:

1. What are the magnitudes and colors of BDs at the Hyades' age?
2. What is the mass function, down to brown-dwarf masses?
3. What is the companion mass function of the Hyades?



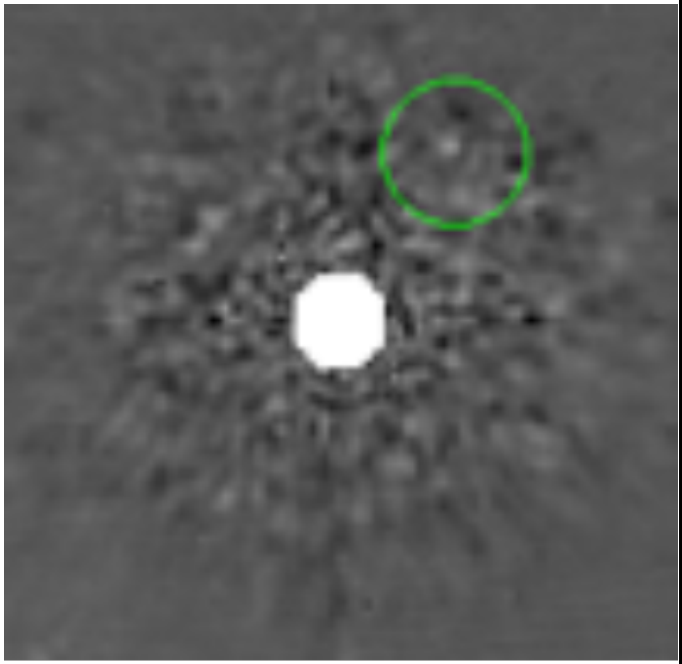
Speckles and photon noise limit the detectability of faint companions in high-contrast AO imaging.

Speckles are subtracted using the locally-optimized combination of images (LOCI) algorithm, which finds the PSF that best minimizes the residuals when it is subtracted from the target image.

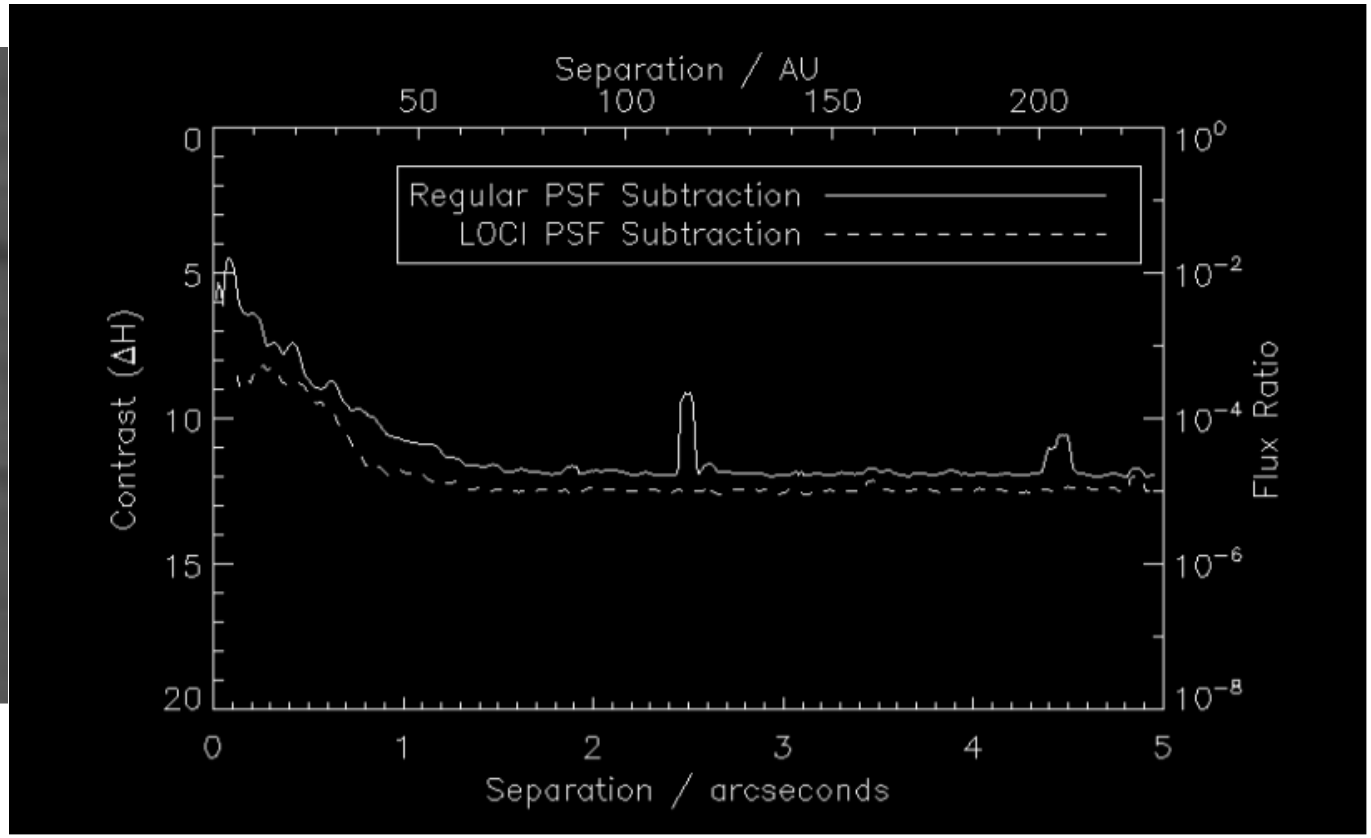


Racine et al 1999 PASP

Lafreniere et al 2007 ApJ 660



candidate brown dwarf



Next: Follow-up (second epoch) observations at Lick and Keck.

Conclusions:

- LOCI algorithm used to analyze deep-imaging AO data
  - Best contrast ΔH~12 from 5–250 AU
- If brown dwarf is found:
  - Characterize and compare to models
- In any case:
  - Companion mass function and cluster mass function