PROBING THE LOW MASS END OF THE IMF

Rho Ophiuchus Molecular Cloud

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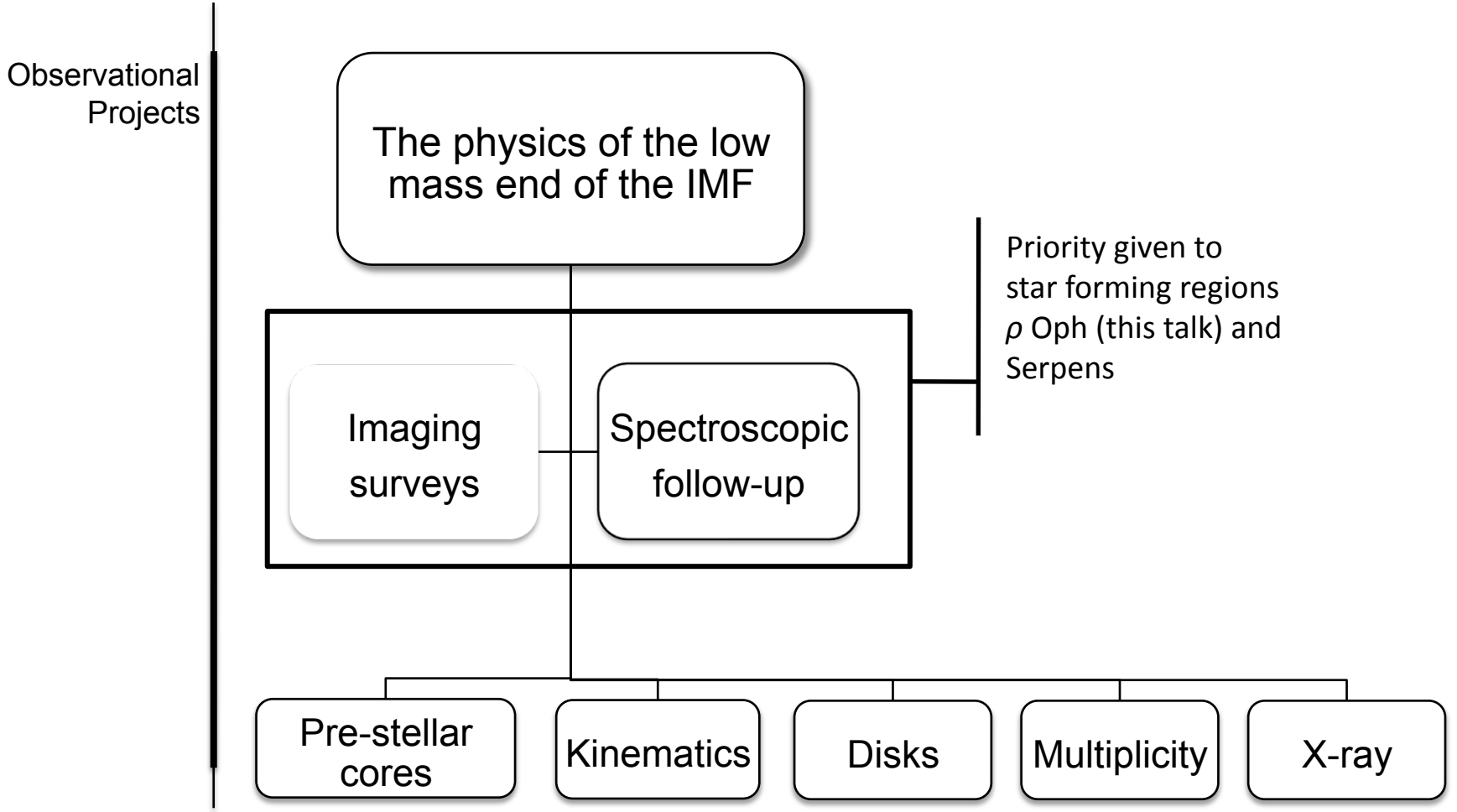
WP 3


Observational Projects
The physics of the low mass end of the IMF
Priority given to star forming regions
ρ Oph (this talk) and Serpens
Imaging surveys
Spectroscopic follow-up
Pre-stellar cores
Kinematics
Disks
Multiplicity
X-ray

Project

Briefing

CHARACTERIZATION OF THE YOUNG STELLAR POPULATION OF ρ Oph down to the planetary mass regime, using multi-wavelength photometric and spectroscopic surveys.

Problematic

Is the formation, mass distribution, and properties of young brown dwarfs and isolated planetary mass objects intrinsically different from that of their stellar neighbours, and across various star forming regions?

Objectives

Identify and confirm the BD and IPMO population of ρ Oph to estimate the IMF in the substellar regime, working towards a better understanding of the physics behind their formation.

Dataset

CFHT

WIRCAM large program: ultra-deep YJHKs survey (J ~ 24.5 and H, K ~19.5)

PSF photometry to improve quality of detection of faint sources

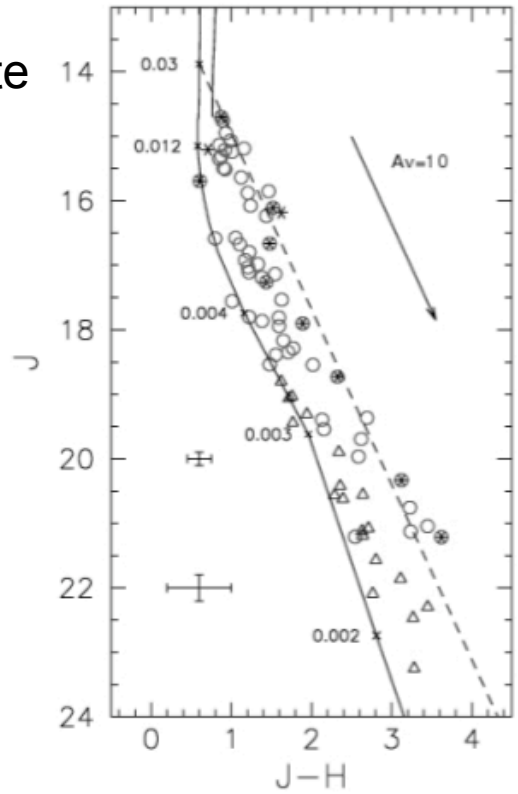
ρ Oph :
~1Myr
~300 members
d=120pc

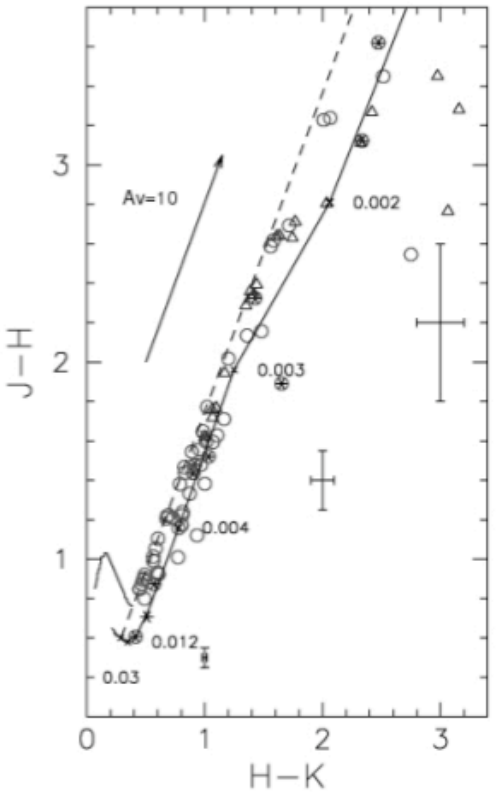
Results

CMDs

Selection of candidate BDs and IPMO with masses < 30 M_{jup}

75 candidates for spectroscopic follow-up





Results

Multi-wavelength information

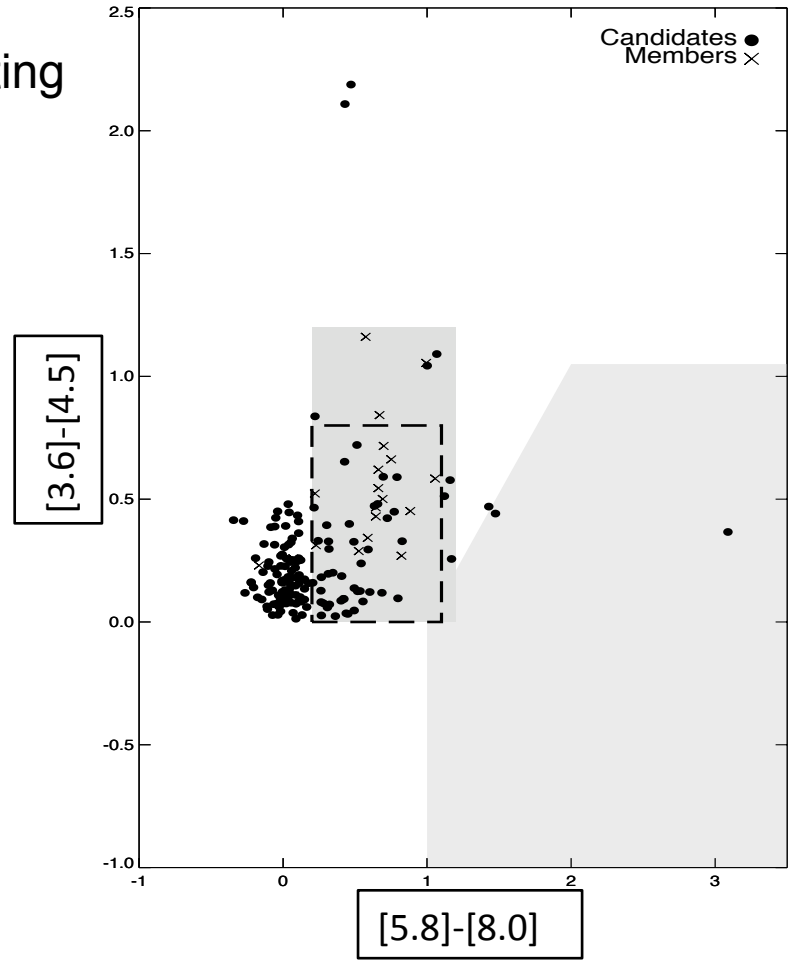
Combine near-IR results with existing multi-wavelength data

Mid-IR excess

Cross-correlation with Spitzer data (IRAC & MIPS)

X-rays

DROXO survey (Palermo): compare IR survey with X-ray results



On-going

Spectroscopic follow-up

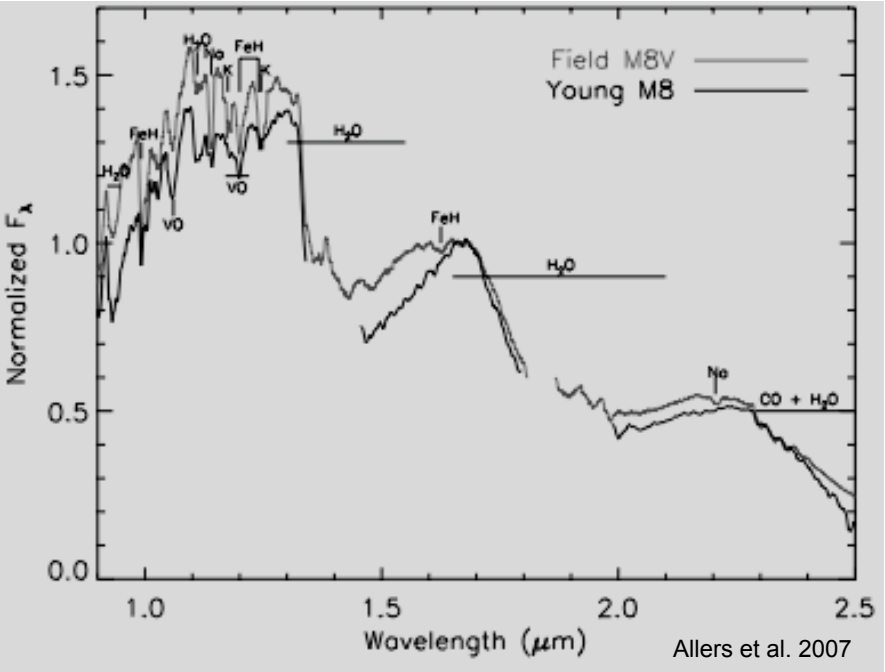
Near-IR low-resolution spectroscopy (JHK):

- TNG (completed)
- NTT (completed)
- VLT (on-going)

Aim

Determine Spectral type and low-gravity signatures to confirm the membership and youth of the candidate members

Using models: estimate the mass function



Allers et al. 2007

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