

Exploring the planetary-mass population in the Upper Scorpius association

Nicolas Lodieu (IAC, Tenerife)

We aim at identifying very low-mass isolated planetary-mass member candidates in the nearest OB association to the Sun, Upper Scorpius (145 pc; 5–10 Myr), to constrain the form and shape of the luminosity function and mass spectrum in this regime. We conducted a deep multi-band ($Y = 21.2$, $J = 20.5$, $Z = 22.0$ mag) photometric survey of six square degrees in the central region of Upper Scorpius. We extend the current sequence of astrometric and spectroscopic members by about two magnitudes in Y and one magnitude in J , reaching potentially T-type free-floating members in the association with predicted masses below 5 Jupiter masses, well into the planetary-mass regime. We extracted a sample of 57 candidates in this area and present infrared spectroscopy confirming two of them as young L-type members with characteristic spectral features of 10 Myr-old brown dwarfs. Among the 57 candidates, we highlight 10 new candidates fainter than the coolest members previously confirmed spectroscopically. We do not see any obvious sign of decrease in the mass spectrum of the association, suggesting that star processes can form substellar objects with masses down to 4–5 Jupiter masses.

