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New nearby young star cluster candidates within 200 pc

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Abstract. I briefly describe two new young star cluster candidates found within 200 pc of the Sun, associated with the 4th-magnitude stars μ Oph and 32 Ori. The μ Oph group (d $\simeq$ 170 pc) has a space motion and age ($\sim$120 $\pm$ 25 Myr) suspiciously similar to the Pleiades, but lies in the opposite side of the sky behind $\sim$0.9 mag of visual extinction in Ophiuchus. The 32 Ori group is a nearby ($d \simeq 90$ pc) loose aggregate of $\sim$25-Myr-old post-T Tauri stars co-moving with the massive binary 32 Ori (B5V+B7V) in northern Orion. The 32 Ori group accounts for part of the population of "isolated" Li-rich RASS pre-MS stars in northern Orion.

Keywords. Galaxy: open clusters and associations, solar neighborhood, stars: pre–main-sequence

1. Summary

Given the order of magnitude difference between the formation rate of embedded clusters ($\sim$4 Myr^{-1} kpc^{-2}) and open clusters ($\sim$0.3 Myr^{-1} kpc^{-2}; Lada & Lada 2003, ARA&A, 41, 57), and the recent identification of several new nearby young stellar aggregates at surprisingly close distances (d $<$ 200 pc; e.g. η Cha, TW Hya groups; Zuckerman & Song 2004, ARA&A, 42, 685), one should not be surprised to find additional poor, young stellar groups within a few hundred pc of the Sun.

The μ Oph group (Mamajek 2) is described in detail in Mamajek (2006; AJ, in press, astro-ph/0609064). The group was first noticed as a swarm of 9 B- and A-type systems co-moving with the bright ($V = 4.6^m$) B8 giant μ Oph. μ Oph has three bright common proper motion companions ($\mu_{\alpha*}$, μ_δ = –12, –21 mas yr^{-1}) in close proximity (within 10'; $\sim$0.5 pc projected) which appear to constitute the "nucleus", including HD 160037 (A0V), HD 160038 (B9V), and HD 159874 (B9IV/V). The proper motions, parallax data, and color-magnitude diagram positions for the nine systems are consistent with having a distance of $\sim$170 pc and age of 125 $\pm$ 25 Myr. The heliocentric space motion (U, V, W = –12, –24, –4 km s^{-1}) and age are close to that of the Pleiades, α Per, and AB Dor groups, and show the cluster to be unassociated with the Gould Belt system (<60 Myr).

The 32 Ori group (Mamajek 3) was noticed as a group of X-ray-bright late-type stars from the *ROSAT All-Sky Survey* (e.g. Alcalá *et al.* 2000, A&A, 353, 186) with similar proper motions ($\mu_{\alpha*}$, μ_δ = +8, –33 mas yr^{-1}) and RVs (+18 km s^{-1}), co-moving with the nearby (d $\simeq$ 90 pc) massive binary 32 Ori (B5V+B7V). The $\sim$25-Myr-old group is defined by 32 Ori, RX J0520.0+0612, RX J0520.5+0616, RX J0523.7+0652, and a half dozen other young systems. The space motion of the new group is U, V, W = (–12, –19, –9 km s^{-1}), which is somewhat similar to that for the ill-defined Cas-Tau association in the same region, however Cas-Tau is claimed to be older ($\sim$50 Myr) and more distant ($\sim$125-300 pc; de Zeeuw *et al.* 1999, AJ, 117, 354). The group is clearly in the foreground of, and completely unrelated to, the Ori OB1 complex ($d \sim 400$ pc).

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