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.

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1. Summary

Given the order of magnitude difference between the formation rate of embedded clusters ($\sim 4\,\mathrm{Myr^{-1}\,kpc^{-2}}$) and open clusters ($\sim 0.3\,\mathrm{Myr^{-1}\,kpc^{-2}}$; 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 ($\mu_{\alpha*}$, $\mu_{\delta}=-12$, -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 ($U, V, W = -12, -24, -4 \,\mathrm{km\,s^{-1}}$) 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 ($\mu_{\alpha*}$, $\mu_{\delta}=+8$, -33 mas yr⁻¹) and RVs (+18 km s⁻¹), co-moving with the nearby (d $\simeq 90\,\mathrm{pc}$) massive binary 32 Ori (B5V+B7V). The ~ 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 $U, V, W = (-12, -19, -9\,\mathrm{km\,s^{-1}})$, 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 ($\sim 50\,\mathrm{Myr}$) and more distant (~ 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 ($d \sim 400\,\mathrm{pc}$).

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