

## ASTROPHYSICS SEMINAR

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# Clustering between high-mass X-ray binaries and OB associations in the Milky Way

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**Abstract.** We present the first ever measurement of the spatial cross-correlation function of high-mass X-ray binaries (HMXBs) and active OB associations in the Milky Way. This result relied on a sample containing 79 hard X-ray detected HMXBs and 458 OB associations. Clustering between the two populations is detected with a significance above  $7\text{-}\sigma$  for distances  $< 1$  kpc from any given HMXB. Thus, HMXBs closely trace the underlying distribution of the massive star-forming regions that are expected to produce the progenitor stars of HMXBs. The average minimum separation of  $0.4(2)$  kpc between OB associations and HMXBs is consistent with the view that the latter have large runaway velocities (100 km/s). This suggests that the offset is mostly due to natal kicks acquired by the binary during the supernova phase (with a few exceptions). The characteristic scale of the correlation function indicates an average kinematical age (i.e., the time between the supernova and X-ray phase) of 4 Myr for the HMXB population. Despite being derived from the "grand design" of our Galaxy, these signatures of HMXB evolution are consistent with theoretical expectations and observations of individual objects.

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### Additional Information

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