

## 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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The seminars are given in the ISDC "Pavillon" building  
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