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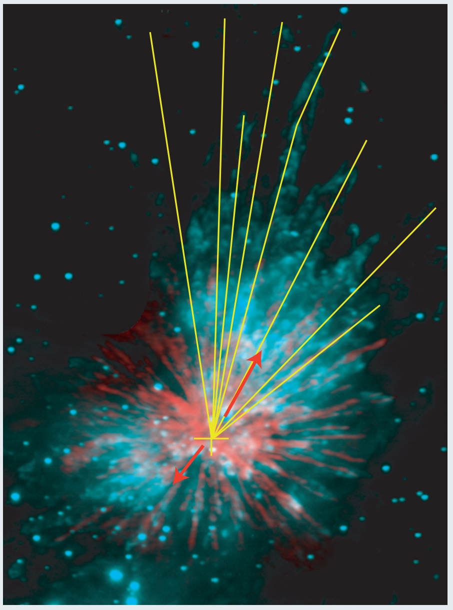
MASSIVE STARS

Close encounters of the first kind

Most massive stars form in dense clusters where gravitational interactions with neighbours are common and ejections from the cluster are possible. Such an ejective history is likely for two, and possibly three, stars behind the Orion Nebula, as described by John Bally and colleagues (*Astrophys. J.*, in the press; preprint at https://arxiv.org/abs/1701.01906; 2017). Two of the three massive stars, unofficially named BN (for Becklin–Neugebauer object, with a mass of 8–15 solar masses) and Source I (with a mass of 5–7 solar masses), are travelling in almost opposite directions, with their paths radiating away from a central position a few arcseconds in size. The third star, Source n, has lately been identified and is following a trajectory similar to that of Source I.

Recent ALMA observations of this region show over 100 high-velocity 'streamers' of CO gas (the red colour in the image) emanating from the central region between BN and Source I (marked with a cross). The arrows show the direction of travel of BN (heading towards the top-right) and Source I (heading towards the bottom-left). The emission from shocked molecular hydrogen is also shown in the image (in cyan). Some of the finger-like H_2 protrusions (highlighted with yellow lines) are tipped with Herbig–Haro objects.



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Bally *et al.* discuss the possible causes of this cosmic explosion. The preferred scenario involves a close (au scale) dynamic interaction between at least four massive protostars, some 500 years ago. This encounter scattered the stellar components, and also launched streams of gas in all directions. BN may have originally been in a compact binary system when it was flipped out by an interloper.

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