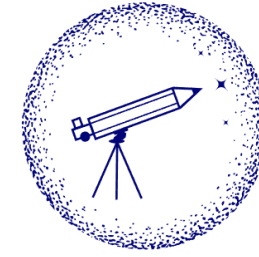


Pulsar wind nebulae meeting the circumstellar medium of their progenitors

Meyer D. M.-A., Meliani Z., Torres D. F.

Massive star circumstellar evolution

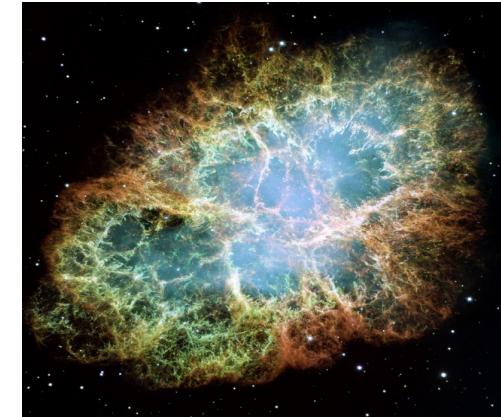


**MULTIMESSENGER
ASTROPHYSICS**

COSMIC RAYS - COMPACT OBJECTS - RELATIVISTIC ENVIRONMENTS

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Main-sequence → Supergiant → Supernova → Pulsar



Stellar wind

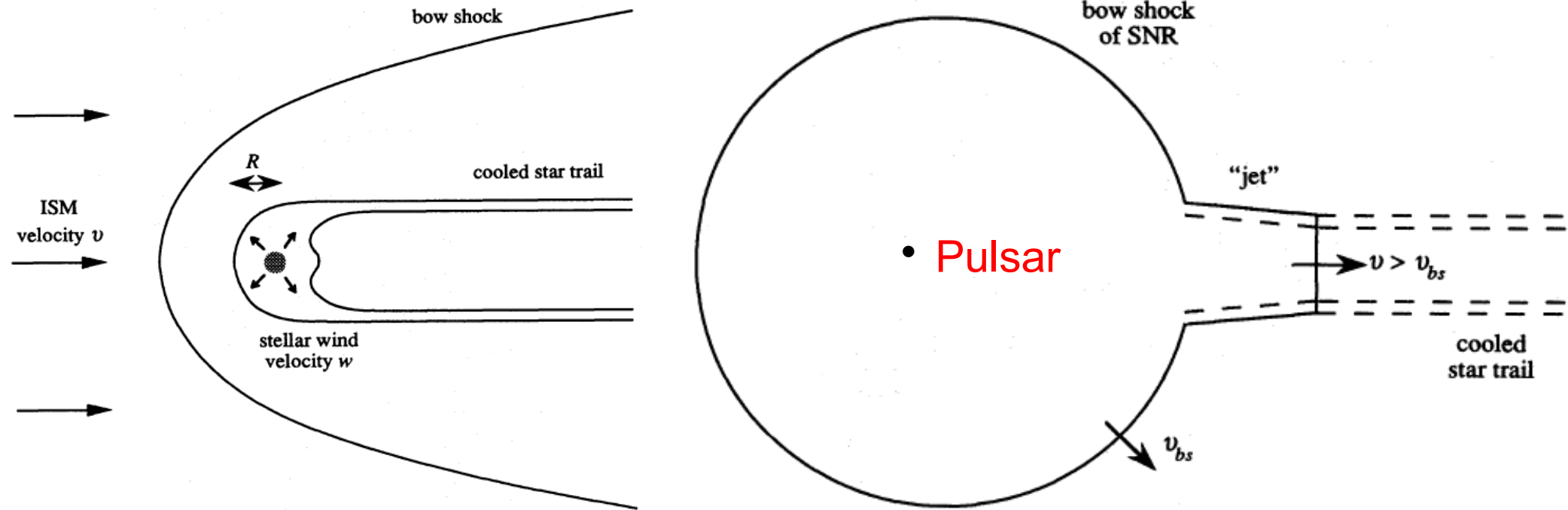
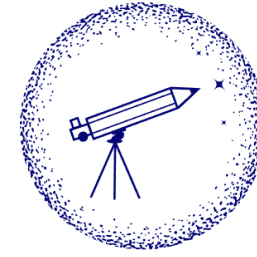
→ Ejecta → Leptions



So far neglected in pulsar wind litterature

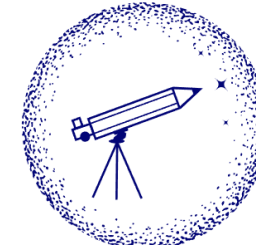
- Credits : NASA (Spitzer, Herschel, HST), ESO.

Runaway massive star die in their own bow shock



Cox et al. (1991)

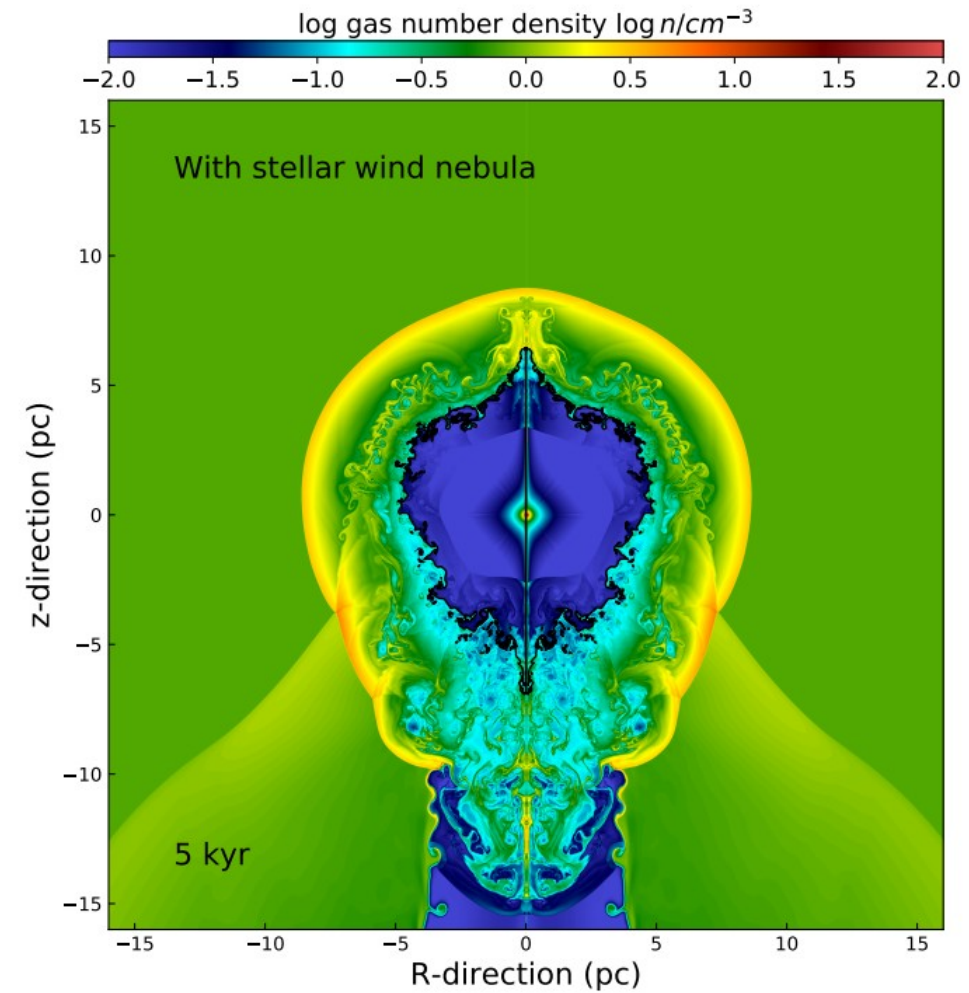
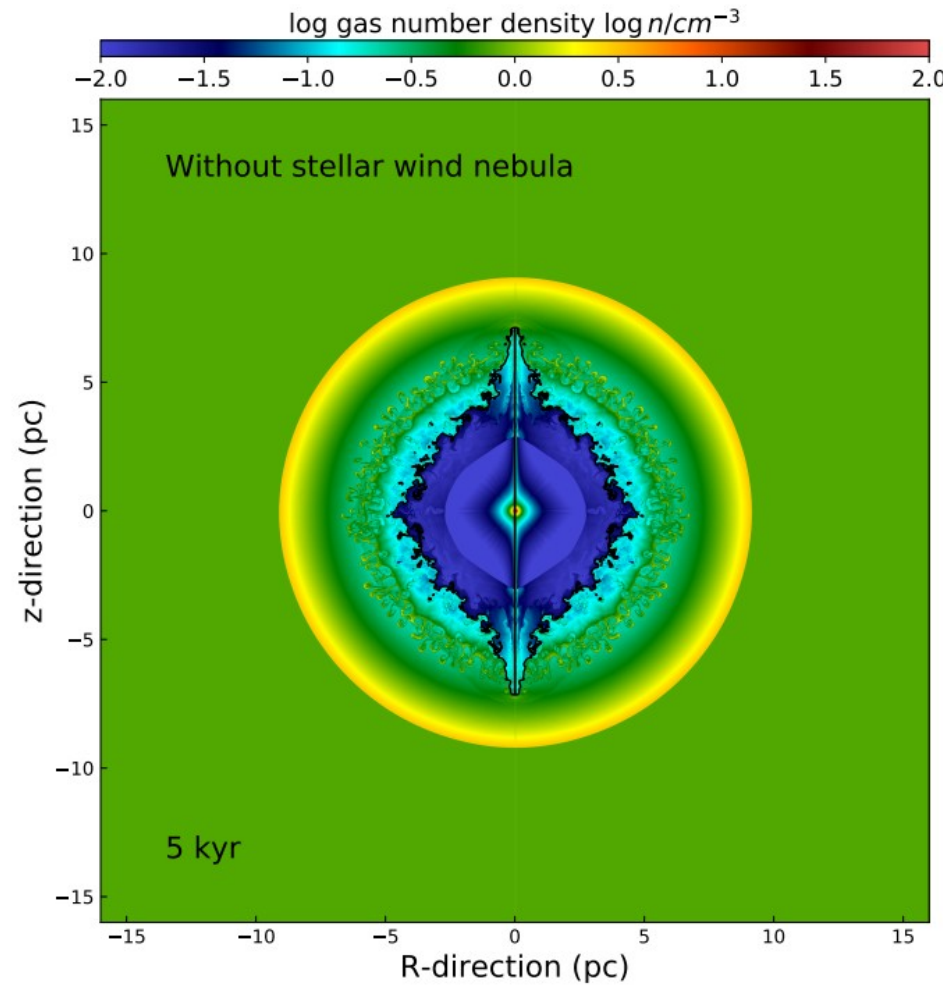
Asymmetric remnant with pulsar wind nebulae



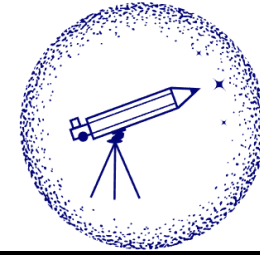
**MULTIMESSENGER
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COSMIC RAYS - COMPACT OBJECTS - RELATIVISTIC ENVIRONMENTS

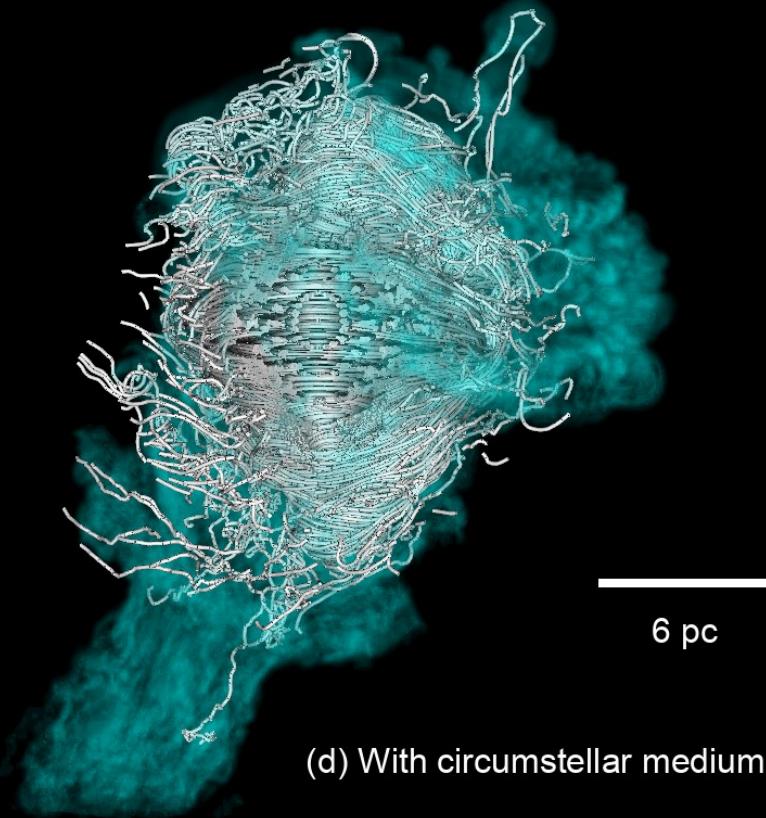
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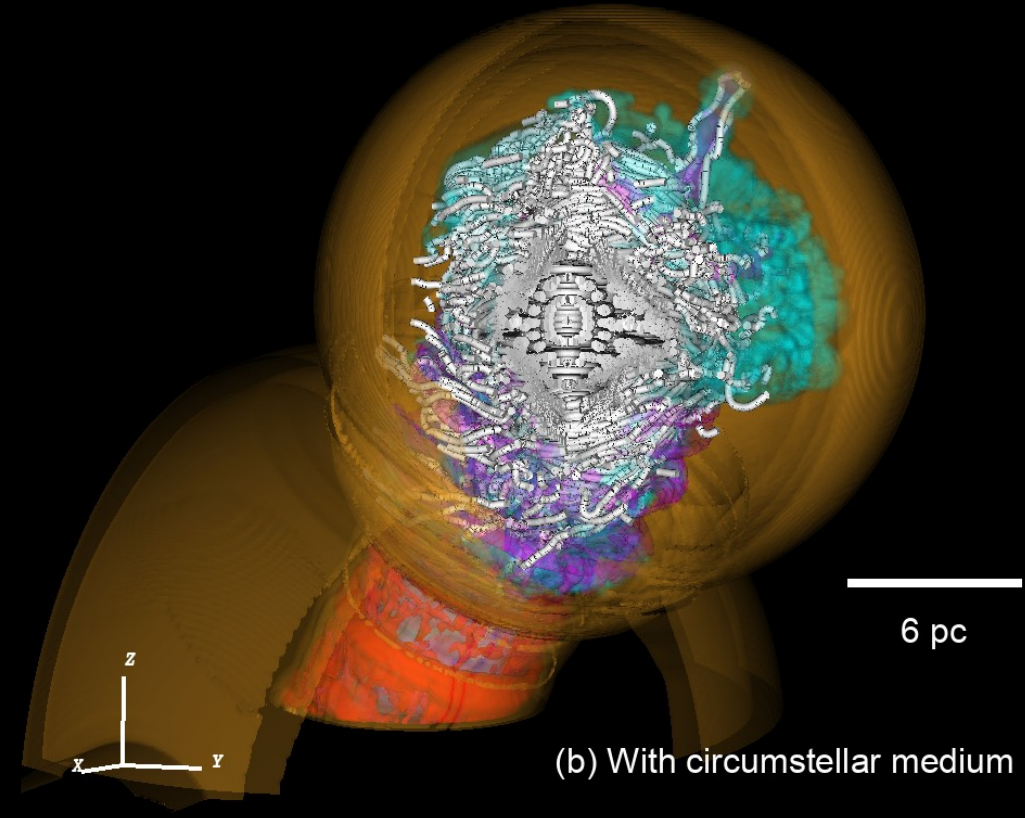
Next: 3D MHD models with pulsar motion inside of the remnant



20 Mo progenitor moving with 40 km/s
Pulsar moving with 300 km/s along Ox



20 Mo progenitor moving with 40 km/s
Pulsar moving with 300 km/s along Ox



Take home message



The circumstellar medium of massive (runaway) star is a governing parameter in the morphology, distribution and mixing of materials in plerion.

eprint arXiv:2409.15829