

# Supernova remnants of exiled massive stars



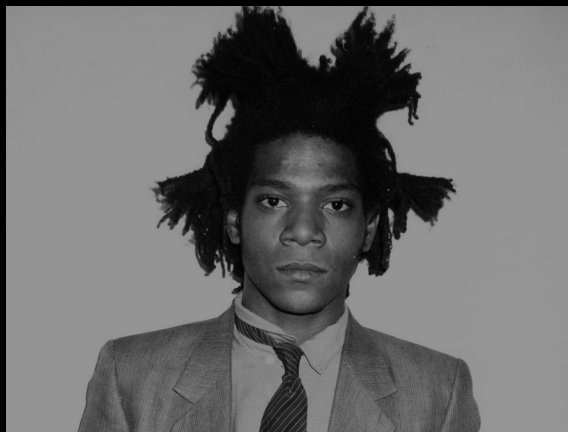
Meyer D. M.-A., Pohl M.  
Petrov M., Oskinova L.

University of Potsdam

# Massive stars live fast & die young



Runaway star



Supergiant



Supernova

Rare

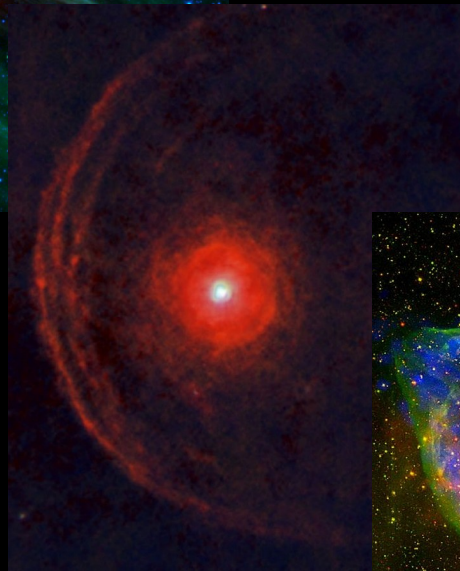
Blow strong winds

Die as supernova

Leave a huge imprint

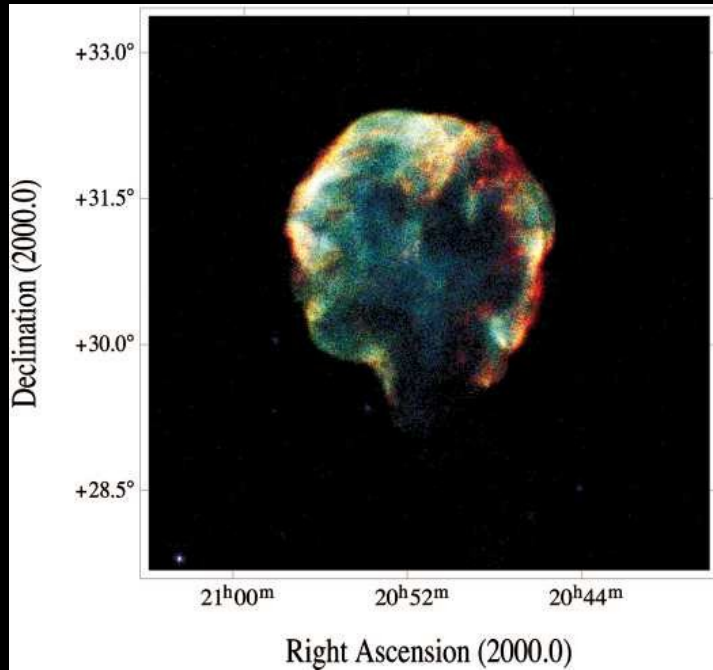
# Massive stars (circum)stellar evolution

Protostar → Main-sequence → Supergiant → (exotic)  
→ Supernova + Neutron star or Black hole

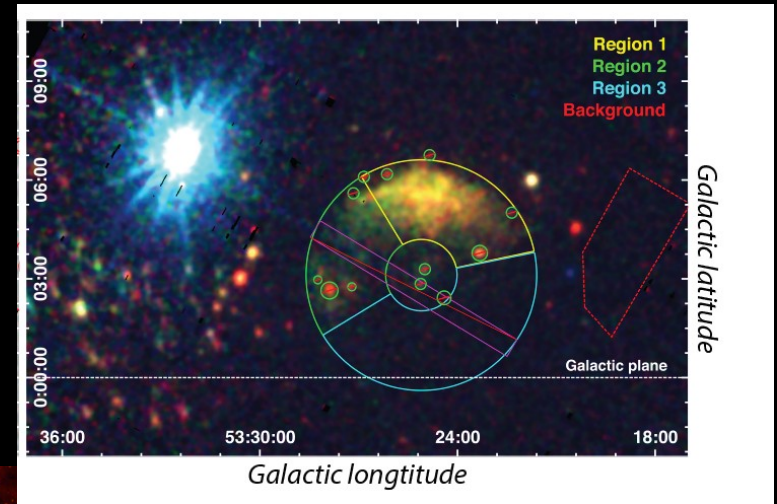




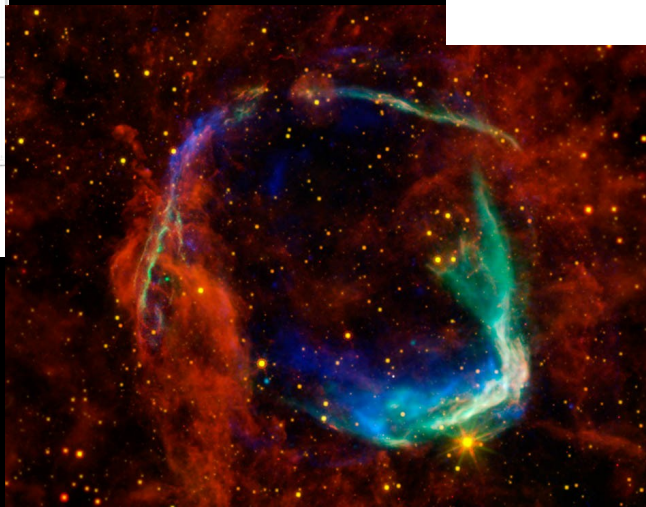
# Many supernova remnants are asymmetric...



Cygnus Loop  
(Aschenbach et al. 1999)

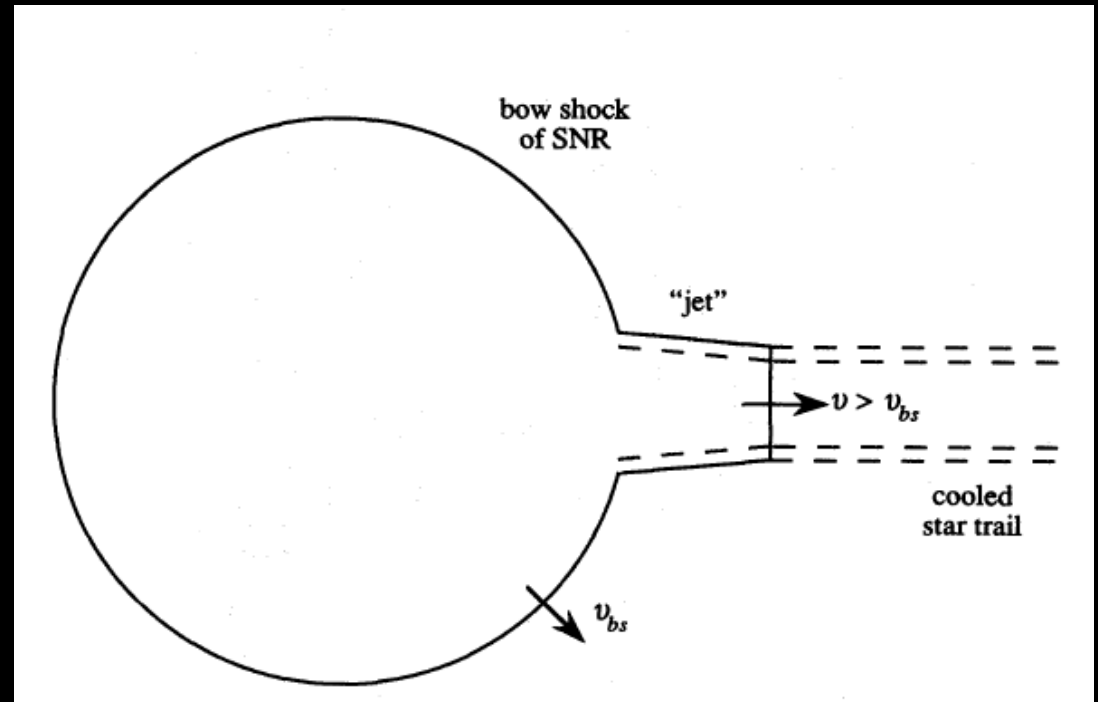
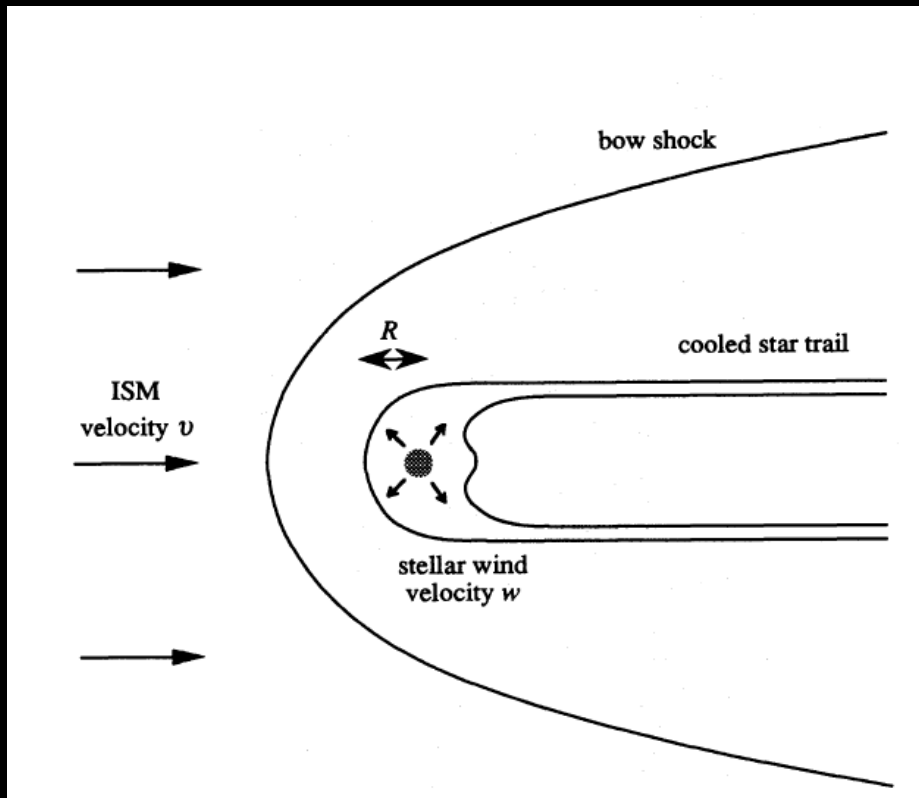


G53.41+0.03  
(Domcek et al. 2021)

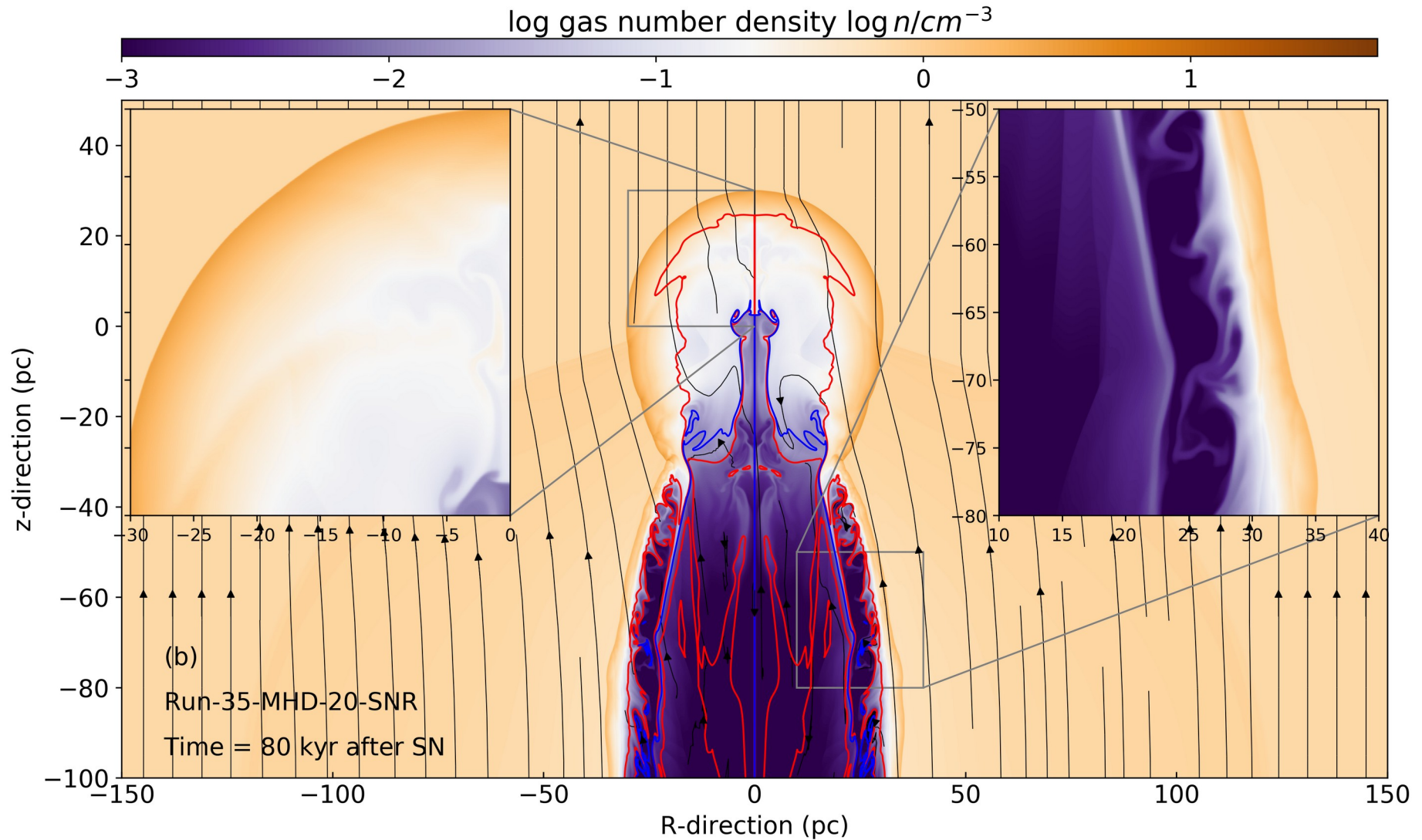


RCW86 (ESO)

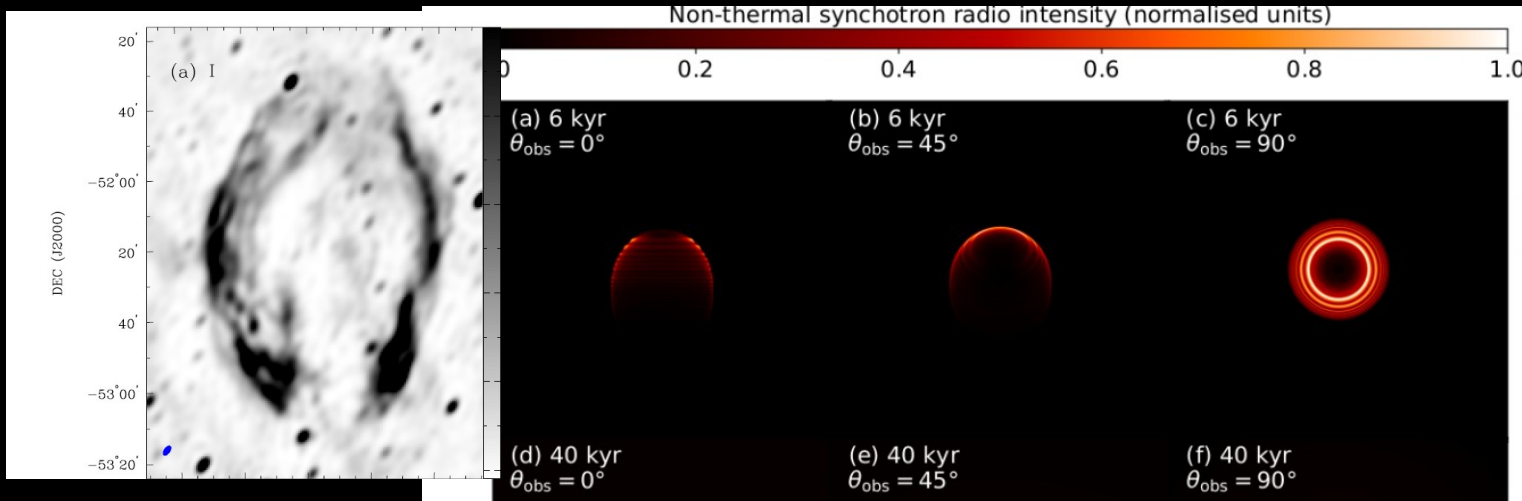
# Idea : 30 % of massive stars are runaway



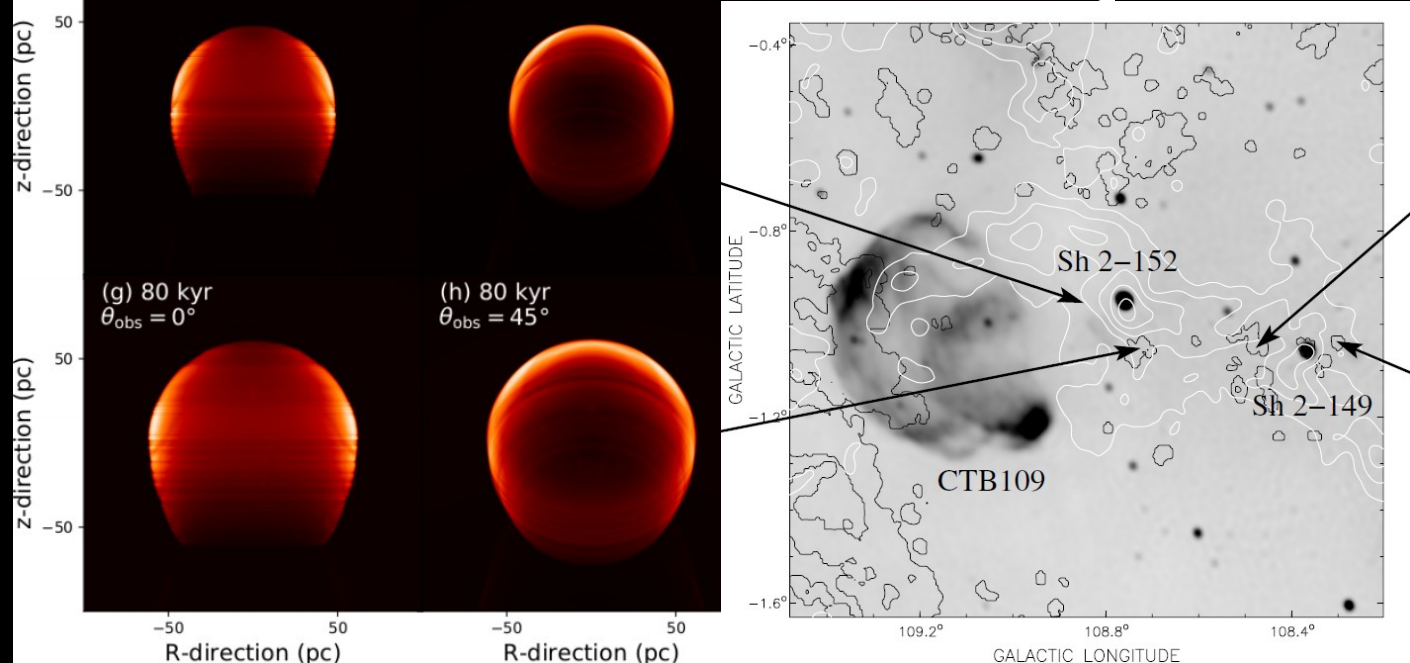
# Remnant of a 35 Mo massive star



# Radio synchrotron emission maps



G296.5+10.0,  
Harvey-Smith  
et al. (2010)



Meyer et al. MNRAS 502 (2021b)

CTB109, Kothes et al.  
(2012)

# Conclusion

Stellar evolution couples to stellar motion and determines the shape of supernova remnants from massive stars.

Remnants of moving Wolf-Rayet star produce shells and filamentary structures, well traced by synchrotron emission.

Meyer et al., MNRAS 502, (2021b)