# Unfolding of the vortical amplification of the magnetic field at inward shocks of Supernova remnant Cassiopeia A

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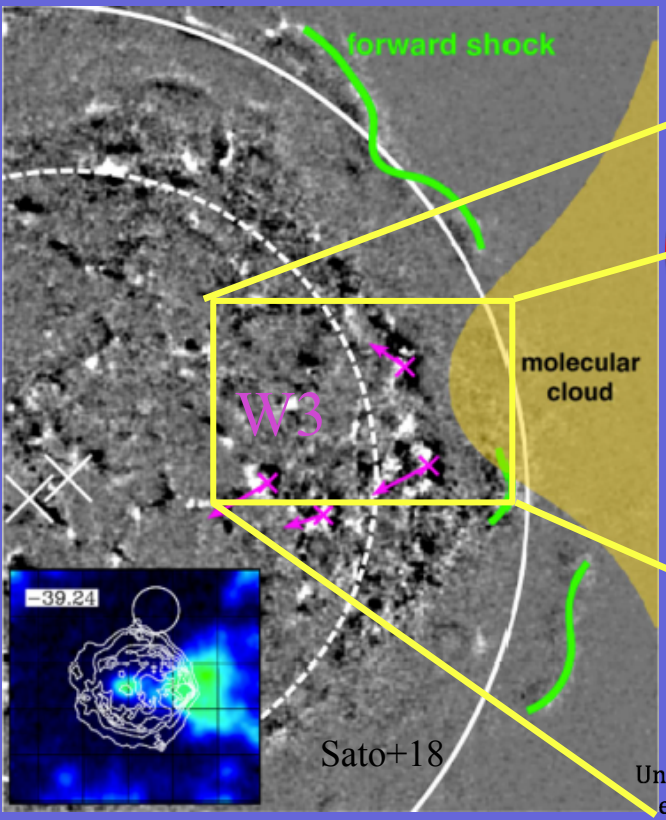
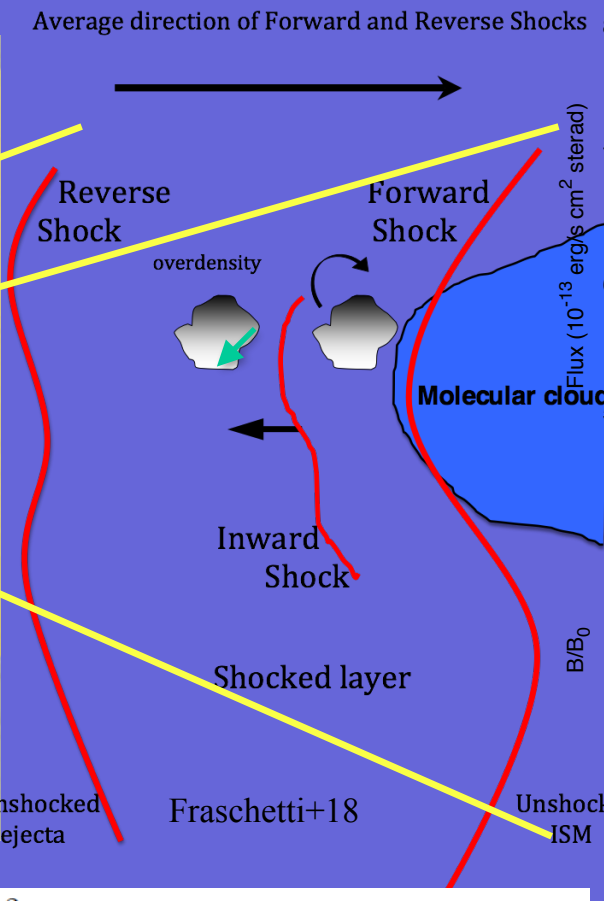
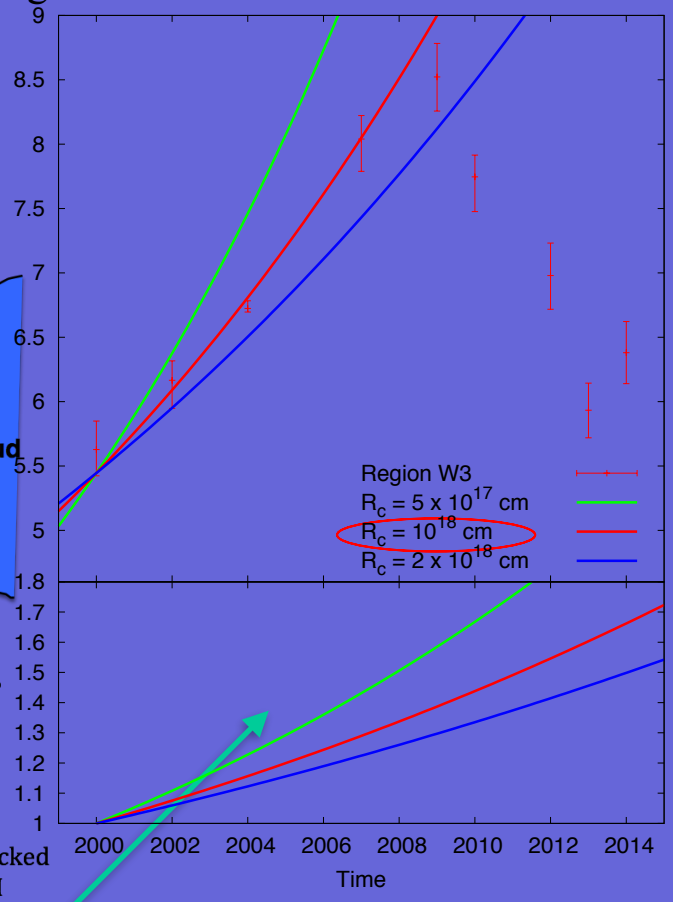
- Multi-epoch Chandra observations of supernova remnant Cassiopeia A (Sato +18)
- First quantitative explaination (Fraschetti+18)
- Observations consistent with magnetic field amplification by vortical generation downstream of the (inward) shock as predicted by Fraschetti13




$$\frac{\text{Turbulent energy}}{\text{Seed field}}(t) = \left(\frac{B}{B_0}\right)^2(t) = \frac{e^{2t/\tau}}{1-\alpha\tau(1-e^{2t/\tau})v_A^2/2}$$

FF13

τ ~ 29 years (growth time scale)
Magnetic field back reaction to fluid vorticity included