How do collisionless shocks interact? Can lab studies help us to understand?

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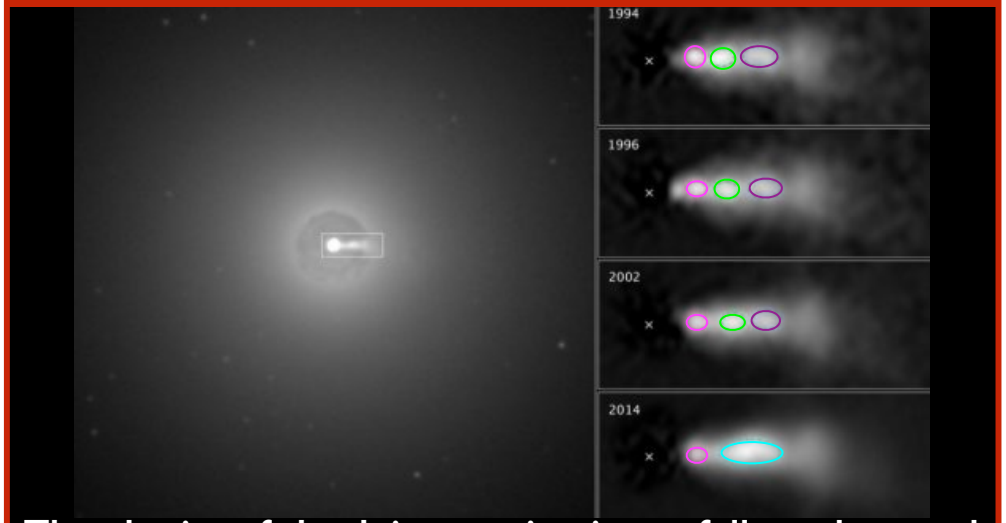
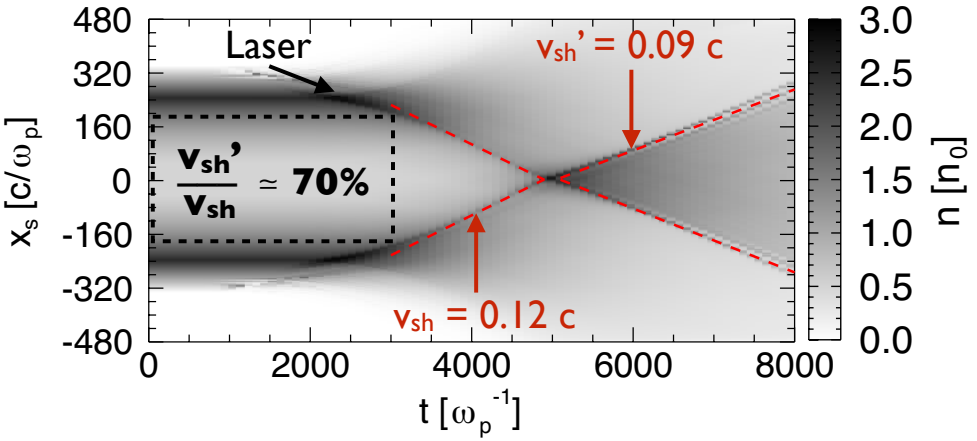
Shock collision has been observed*



The physics of shock interaction is not fully understood

Shock collision is inelastic

Transversely averaged density temporal evolution



Can we launch shocks in the lab?

2D PIC simulation setup

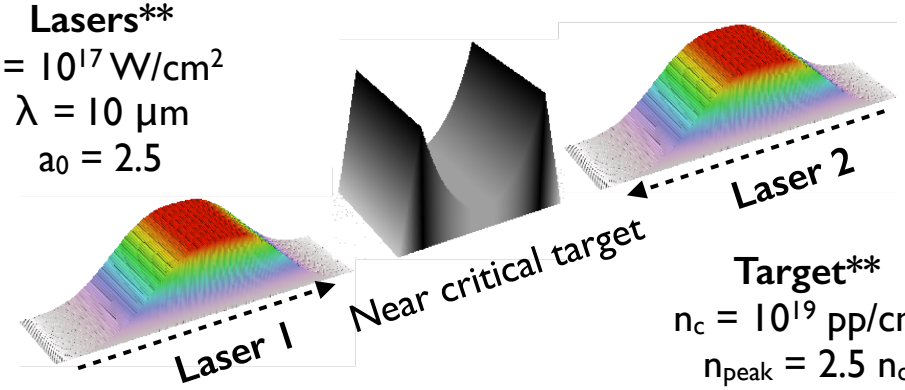
Osiris 3.0

Lasers**

$I = 10^{17}$ W/cm^2

λ = 10 μm

a_0 = 2.5



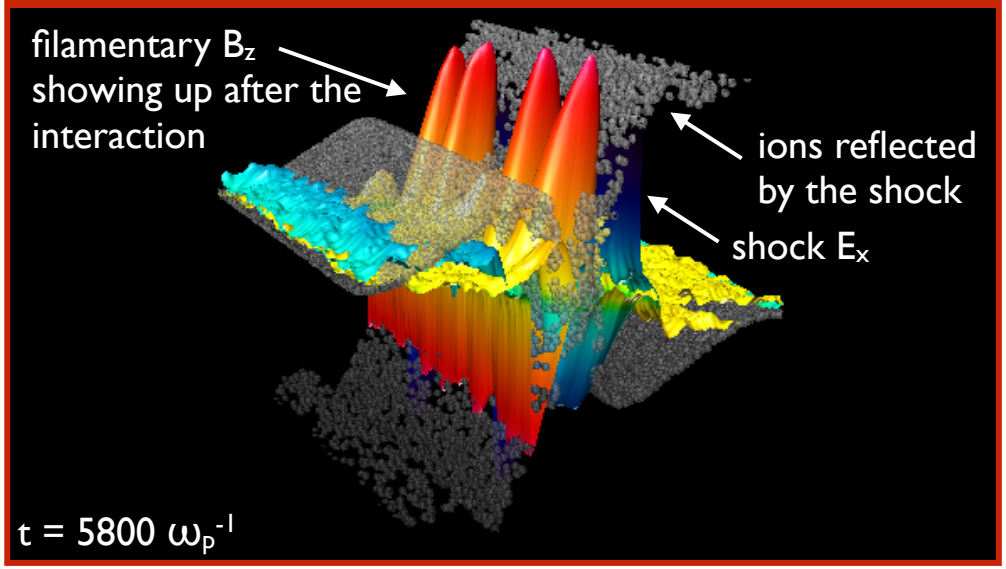
Target**

$n_c = 10^{19}$ pp/cm^3

$n_{peak} = 2.5\ n_c$

$m_i/m_e = 1836$

Strong transverse magnetic field is generated



* E.T. Meyer *et al.*, Nature 521, 495, (2015). **D. Haberberger *et al.*, Nat. Phys., 8, 95 (2012).