X-rays from Massive Stars

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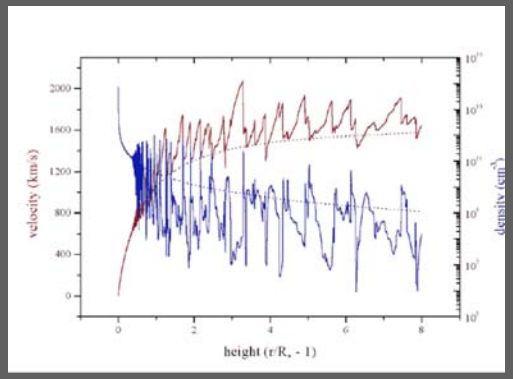
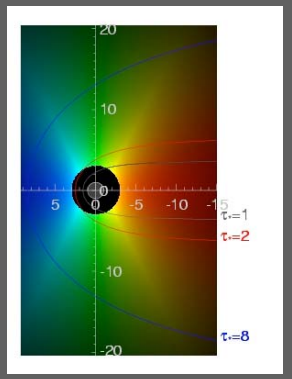
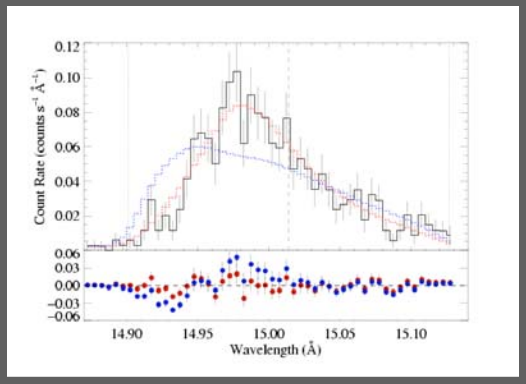
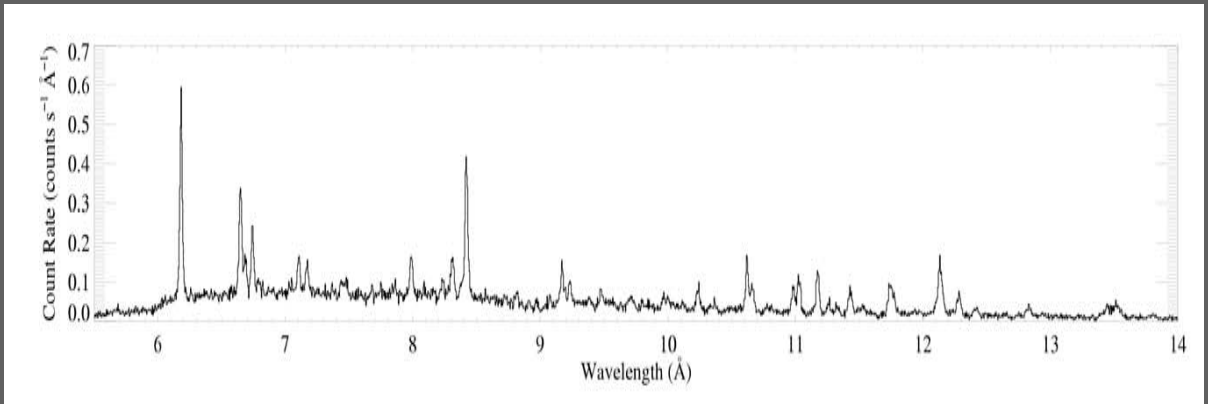


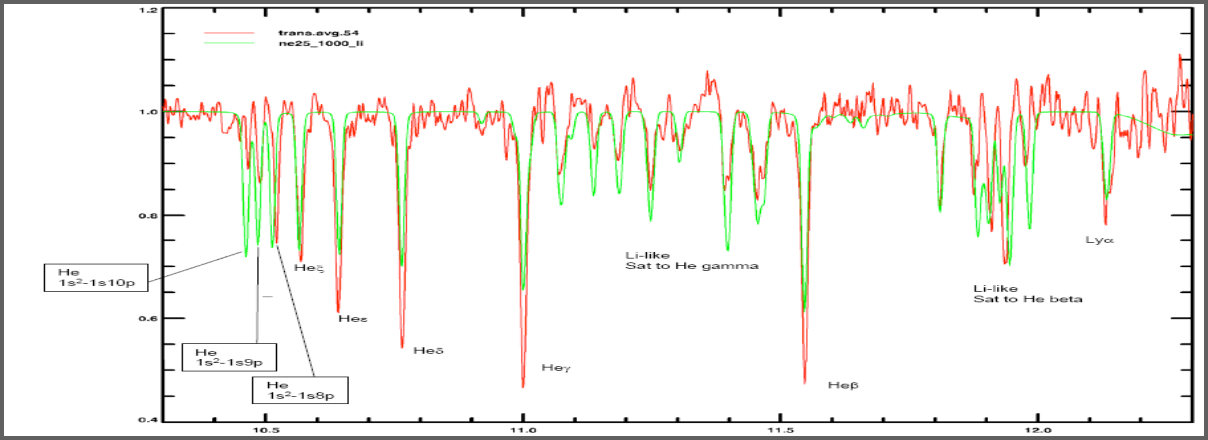


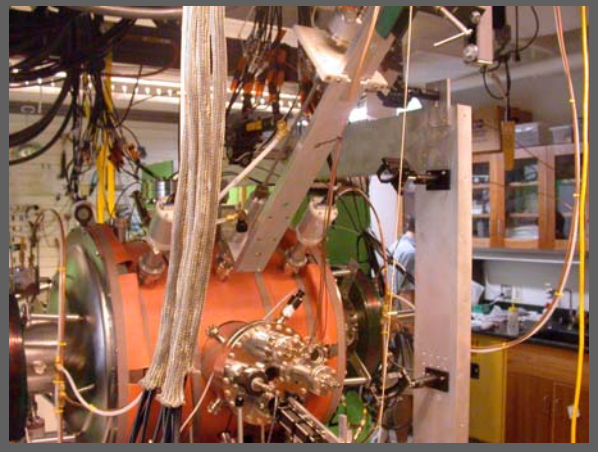


X-ray spectroscopy of hot plasmas

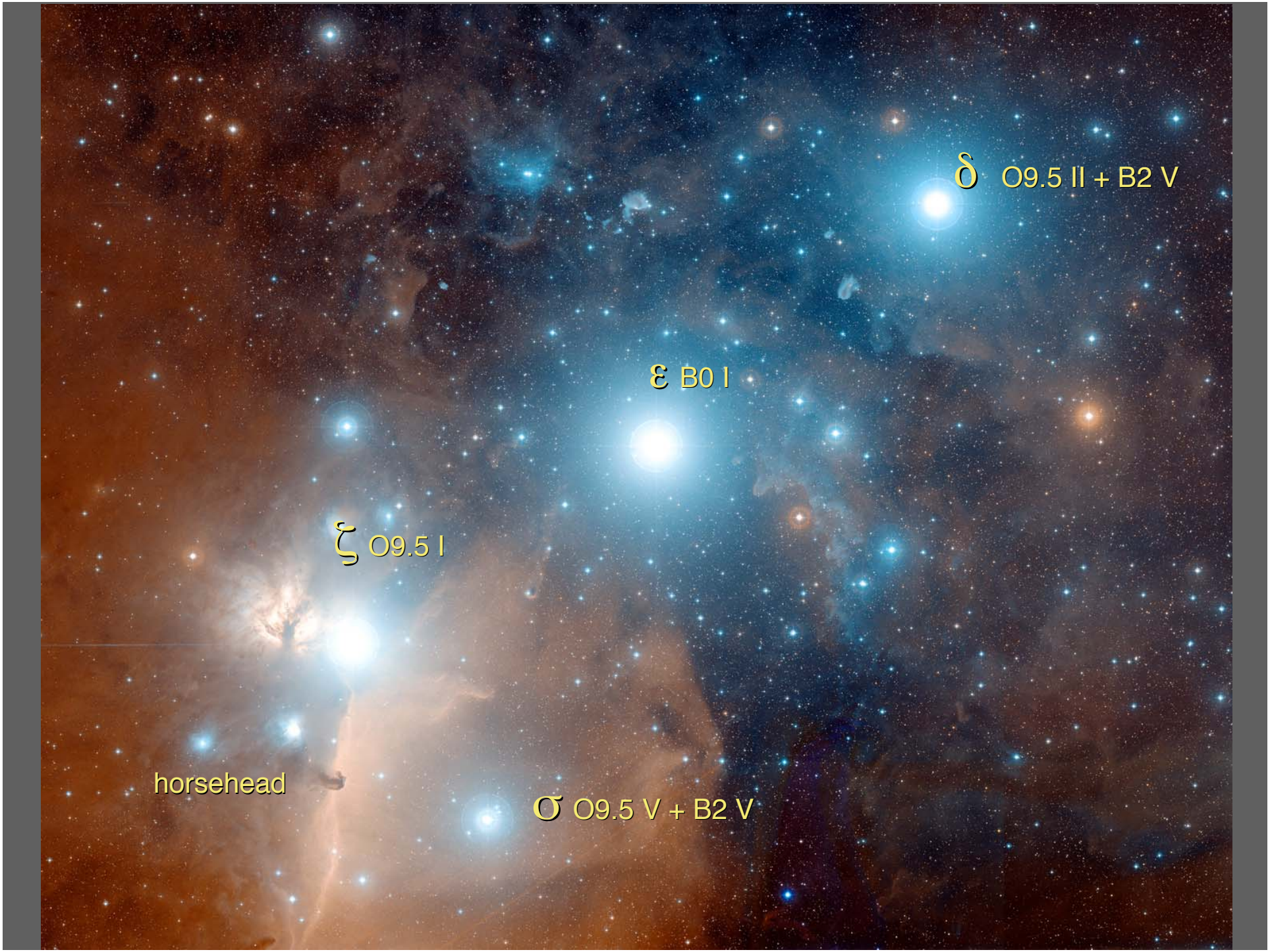
temperature, density, kinematics in **stars**



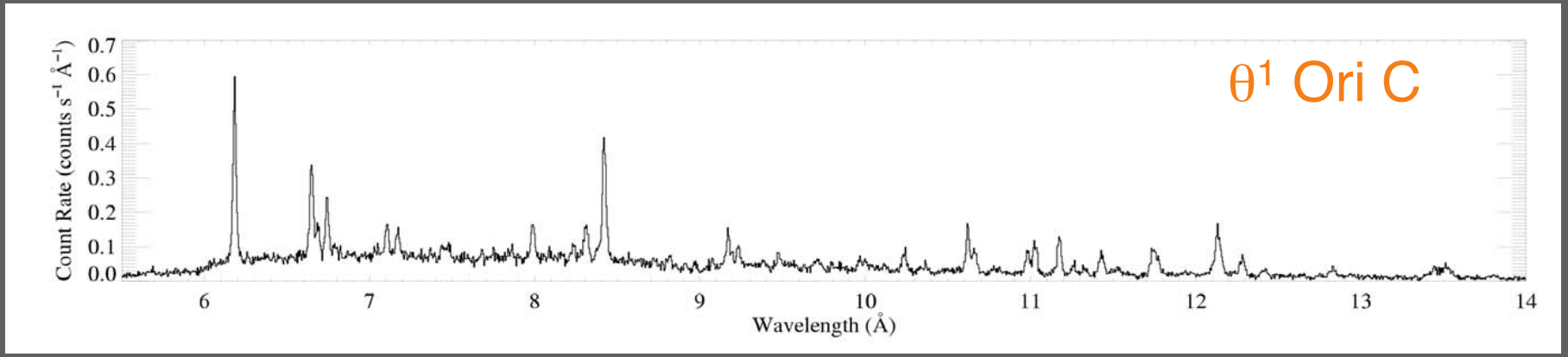




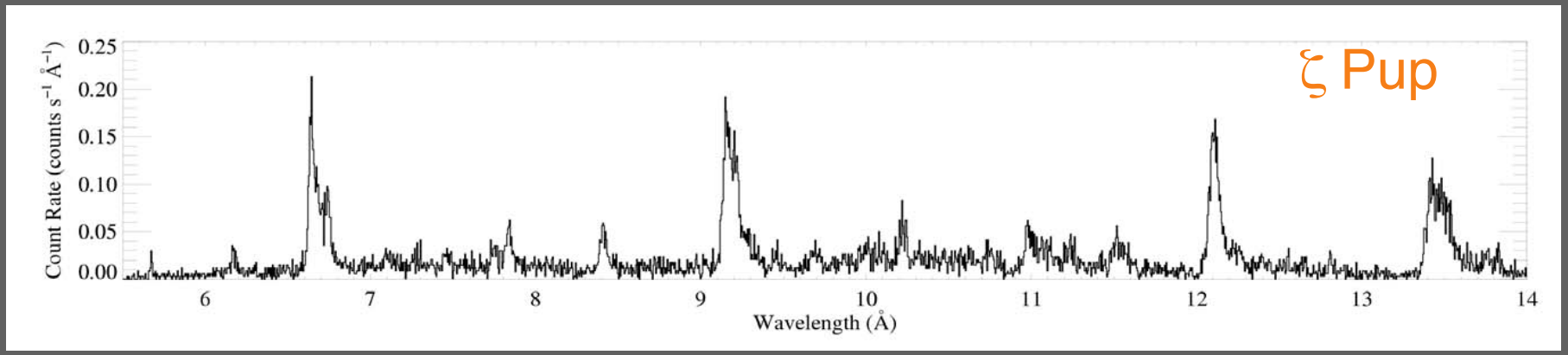
charge state distribution in the **laboratory**


δ O9.5 II + B2 V
ε B0 I
ζ O9.5 I
horsehead
σ O9.5 V + B2 V

Chandra grating spectra ($R \sim 1000 \sim 300$ km s^{-1})

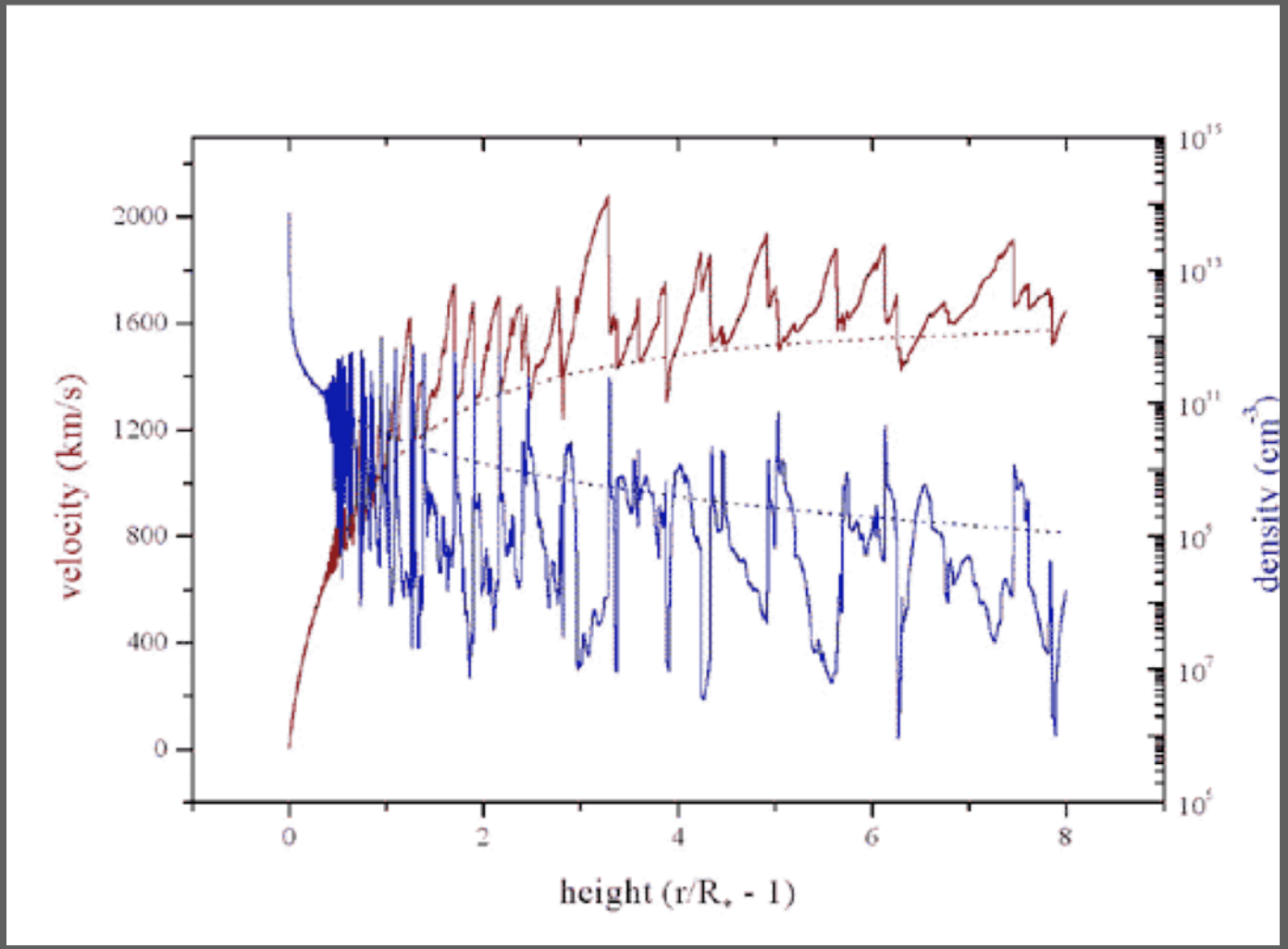


θ^1 Ori C: hotter plasma, narrower emission lines



ζ Pup (O4 I): cooler plasma, broad emission lines

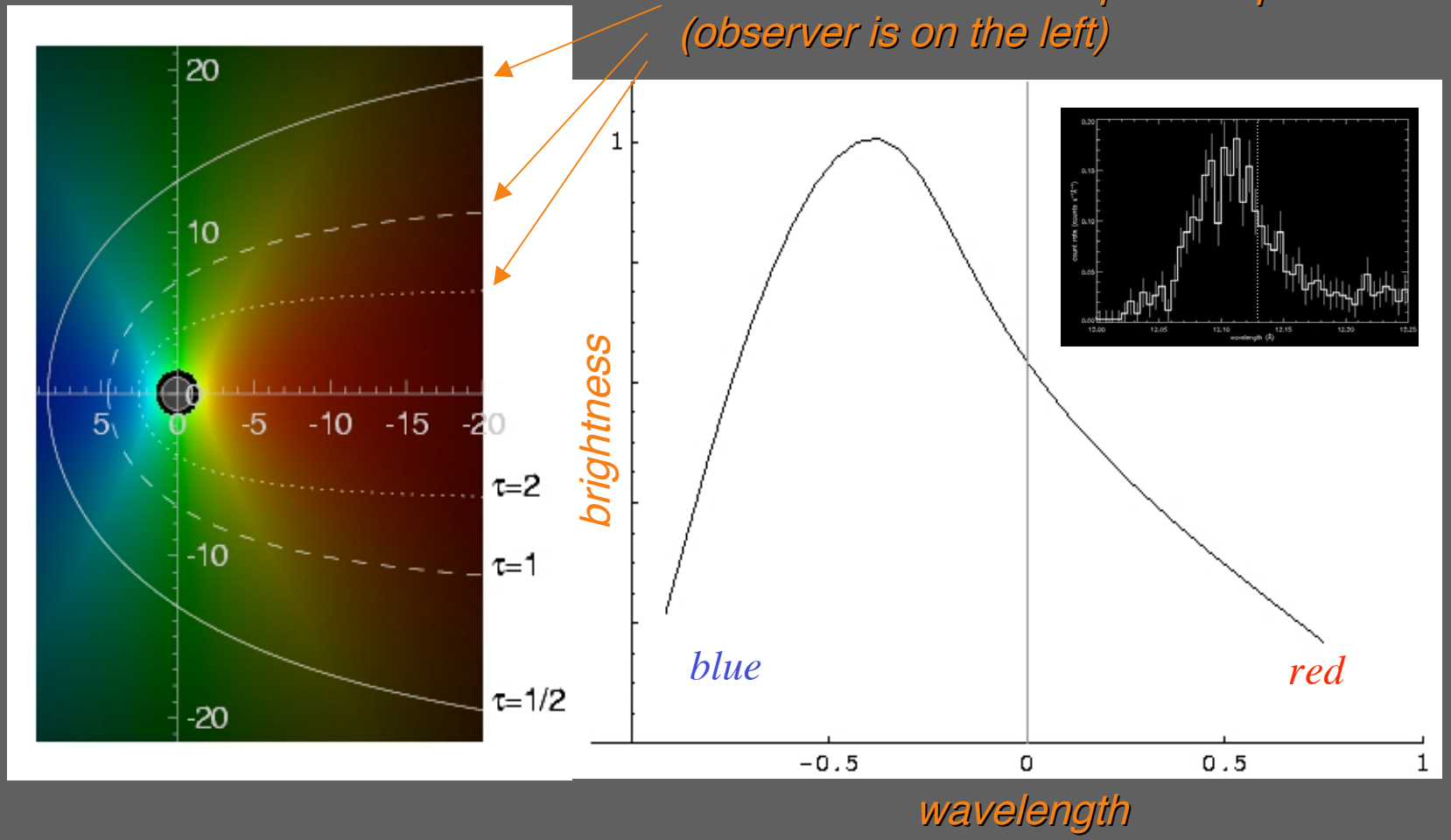
1-D rad-hydro simulation of an O star wind



with Stan Owocki (U. Del.)

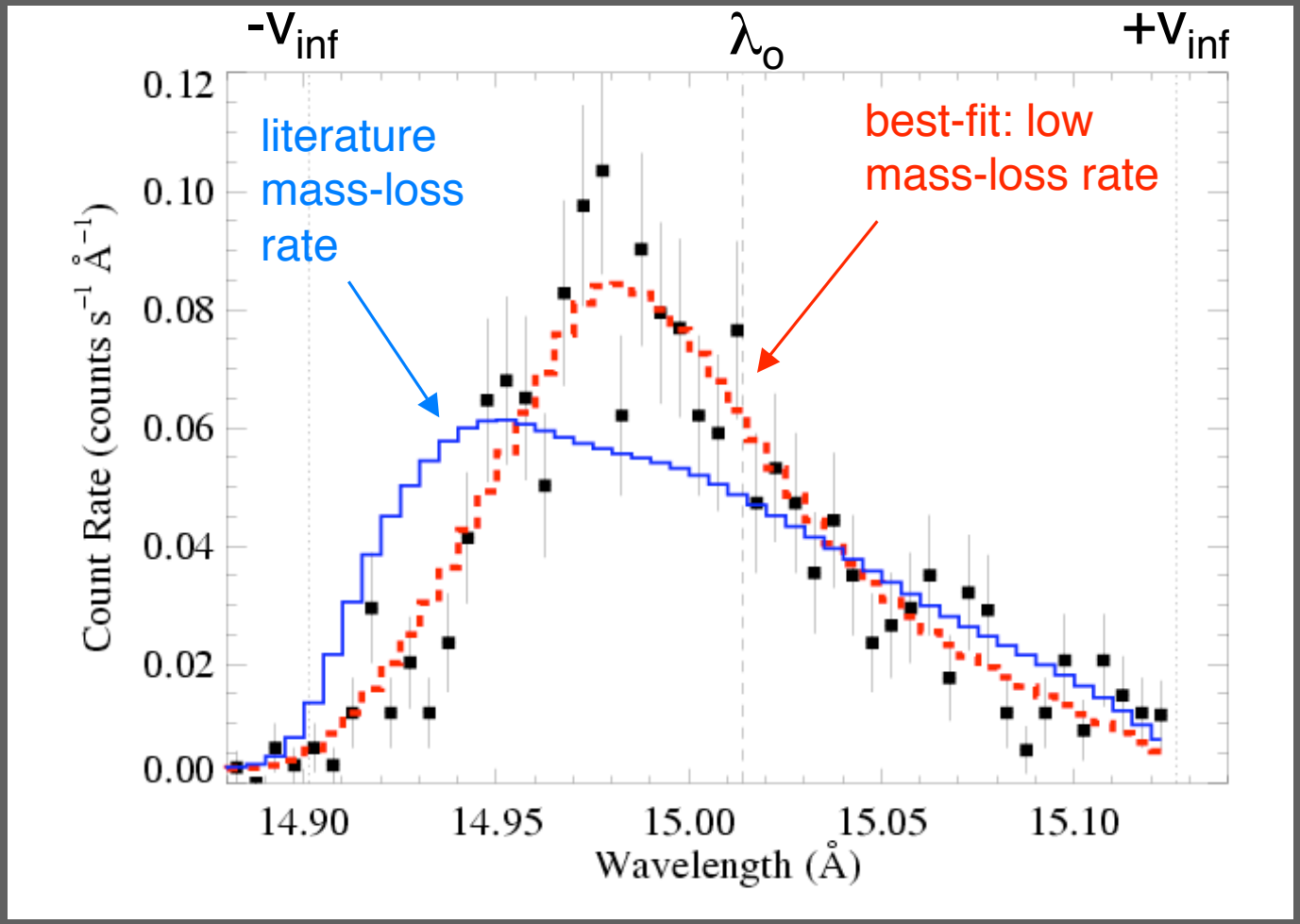
Radiation line driving is inherently unstable:
shock-heating and X-ray emission

Empirical X-ray Line Profile Model for Data Fitting



continuum absorption in the bulk wind preferentially absorbs red shifted photons from the far side of the wind

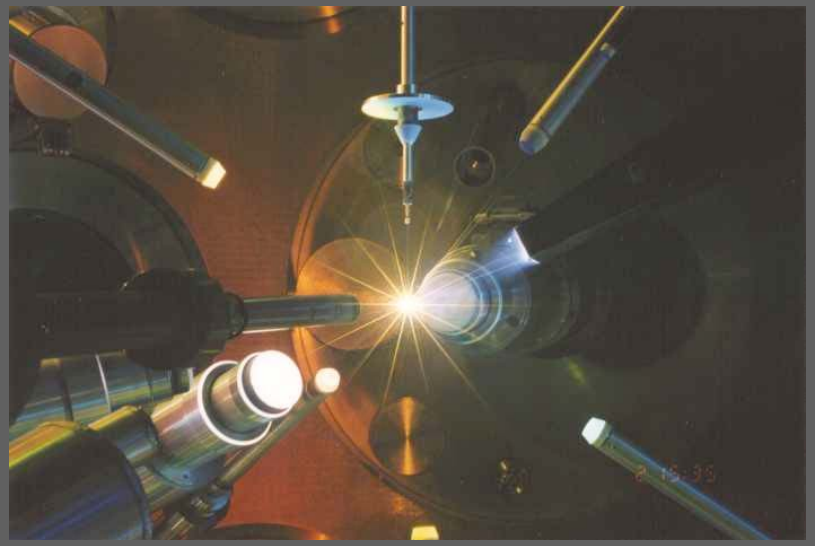
Chandra grating spectrum of ζ Pup: Fe XVII line at 15.014 Å

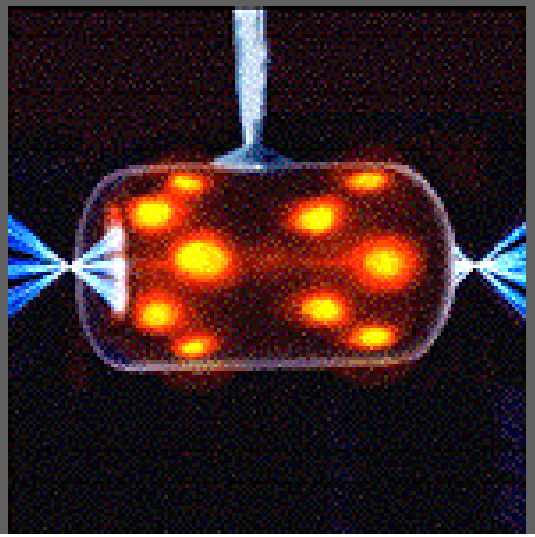


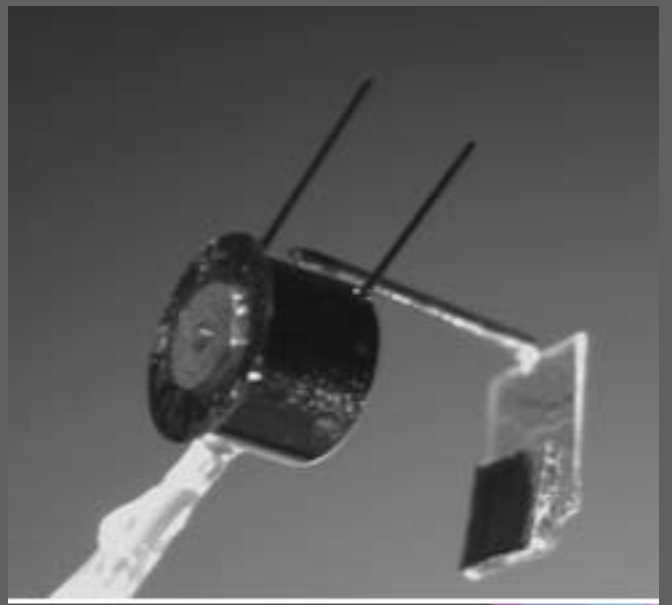
Mass-loss rate is reduced by factor of 4

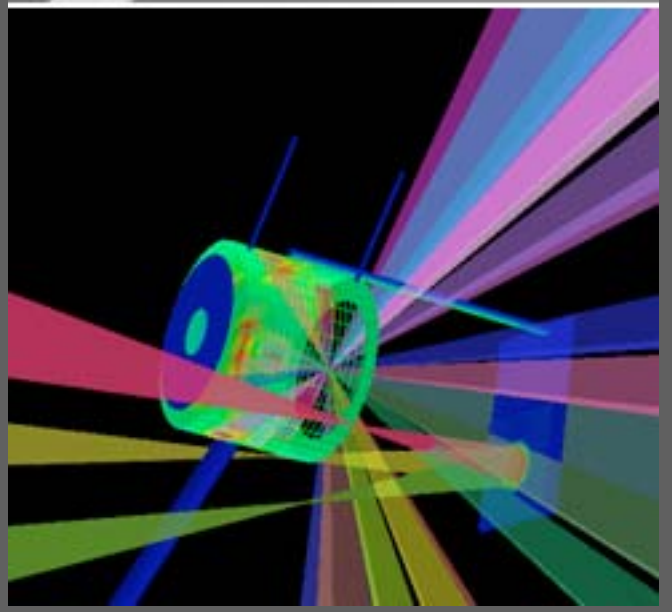
Laser fusion (ICF)
exps and modeling

OMEGA Laser @ U. Rochester





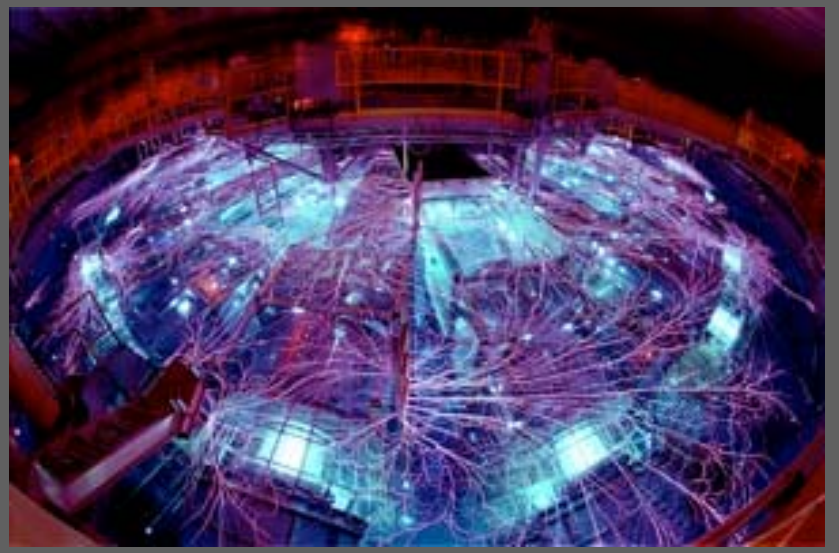


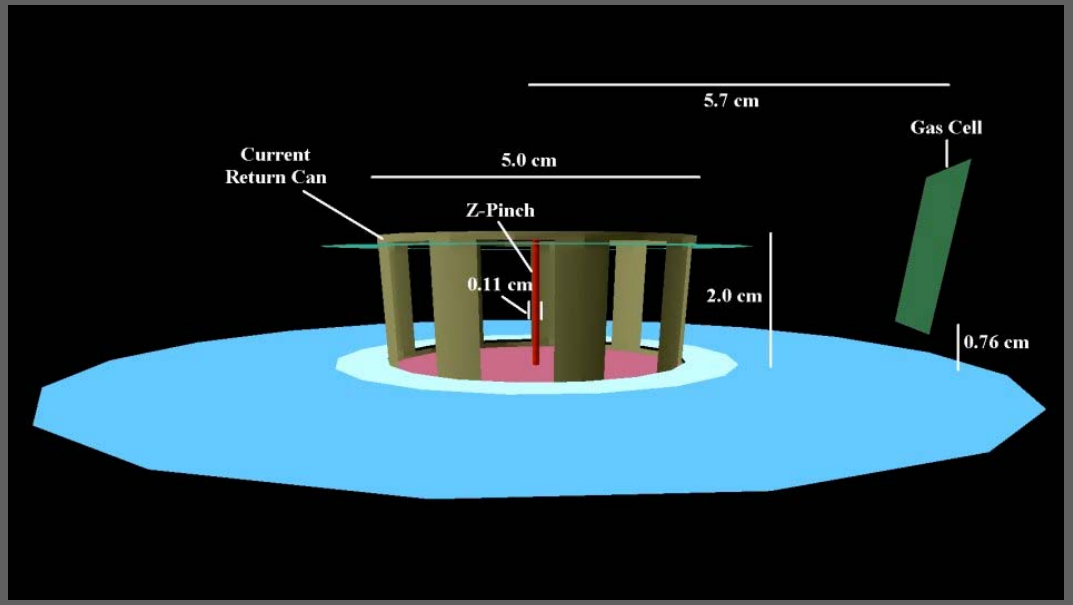


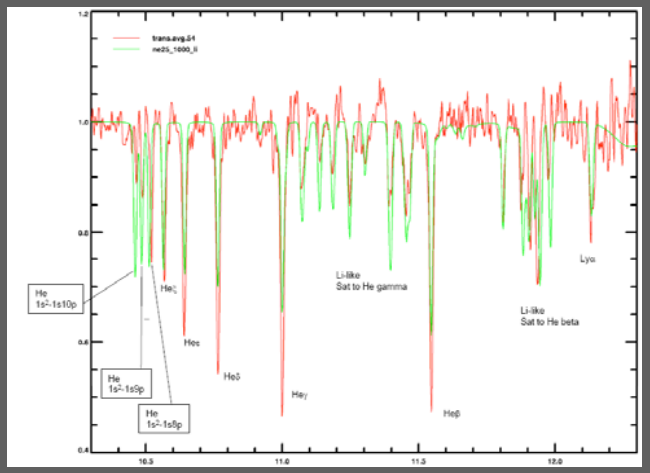
Laboratory Astrophysics:

Sandia Nat'l Lab: Z-Machine

Benchmarking photoionized plasma spectra



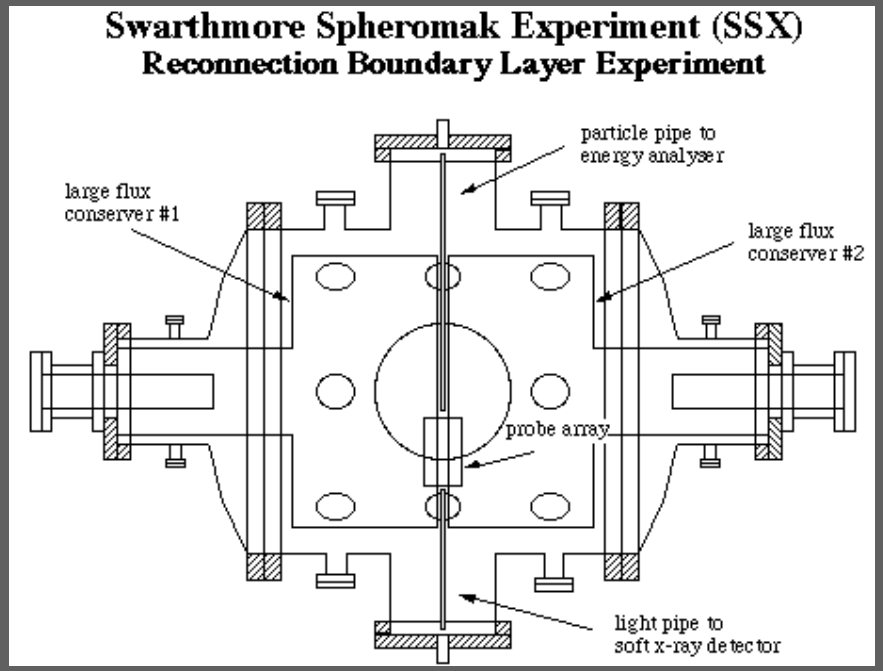


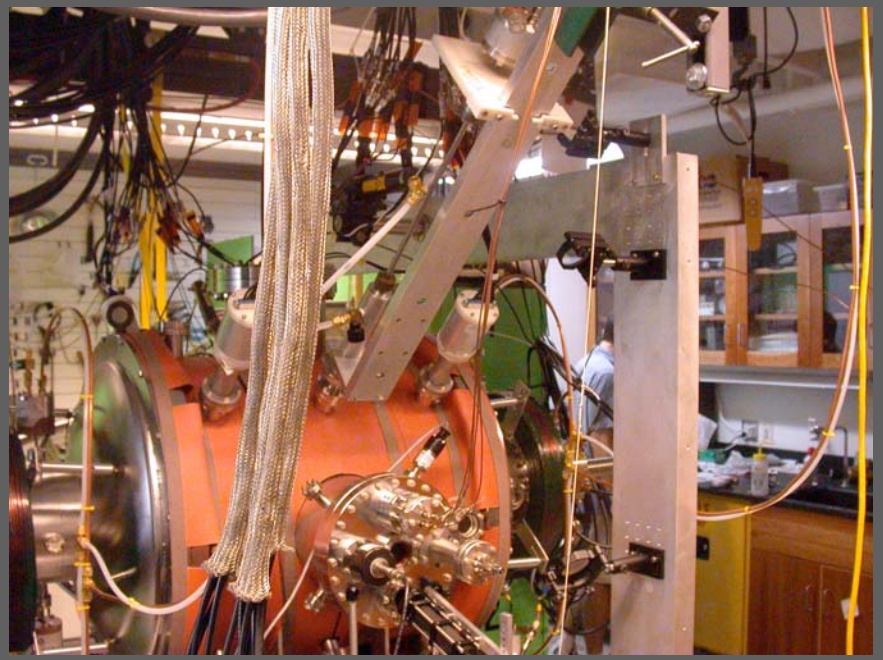


Laboratory Astrophysics:

Swarthmore Spheromak Exp (SSX)

Characterizing magnetic reconnection heating





Swarthmore's on the R3. Maybe you'd like to visit and talk about x-rays, plasma, and hot star winds this summer?