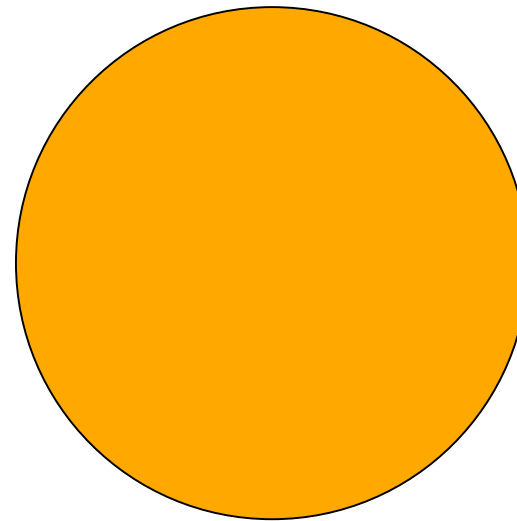
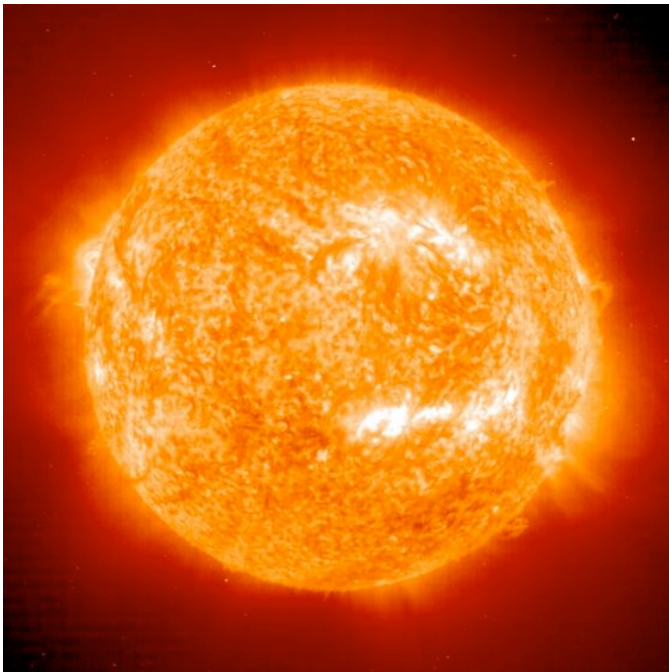


# Discussion and questions

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## Stellar evolution and atmospheres

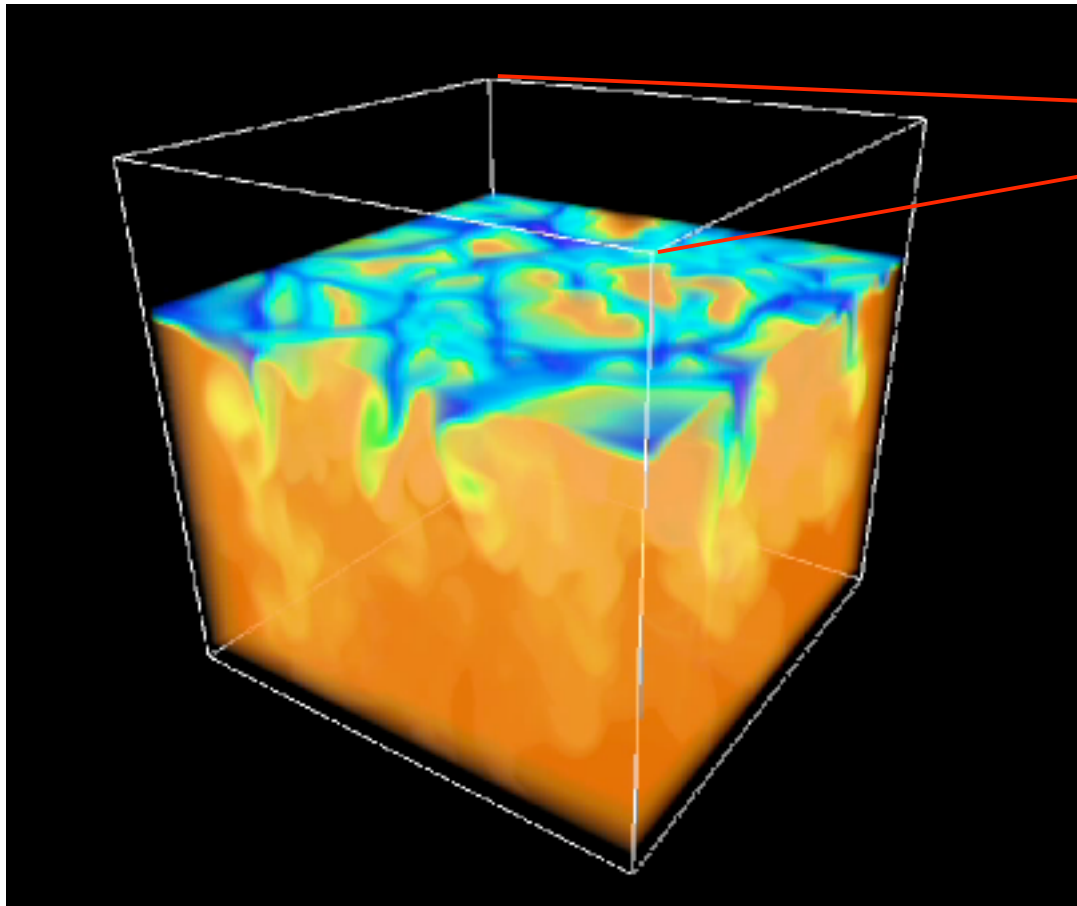
Good approximation?



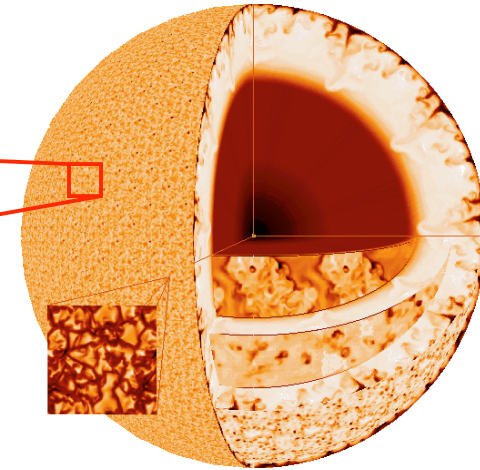
*“You would also look pretty simple at a distance of 10pc”*

-- R.O. Redman to F. Hoyle

# Atmosphere modeling



Entropy evolution in solar atmosphere



- 3-dimensional
- Time-dependent
- Hydrodynamical
- Radiative transfer
- Realistic EOS + opacities

# Atmospheric challenges

- Extend parameter space of 3D
- Radiative transfer
- Magnetic fields



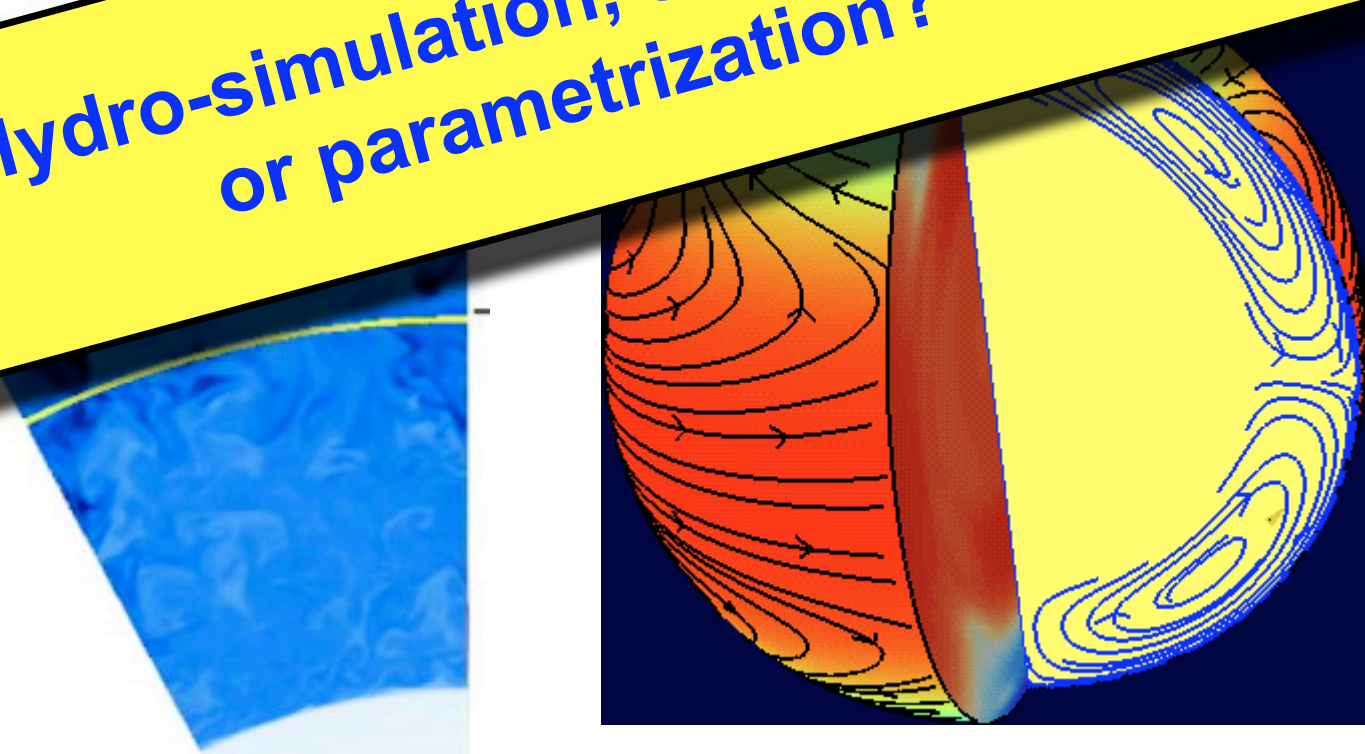
Rempel et al. (2009)

# Evolution: convection + mixing

- MLT calibration
- Convective overshoot
- Rotational-induced mixing
- Thermohaline mixing/entrainment
- Diffusion, interfacial mixing

Hydro-simulation, extrapolation  
or parametrization?

Oxygen Mass Fraction  
0.8  
0  
0.0



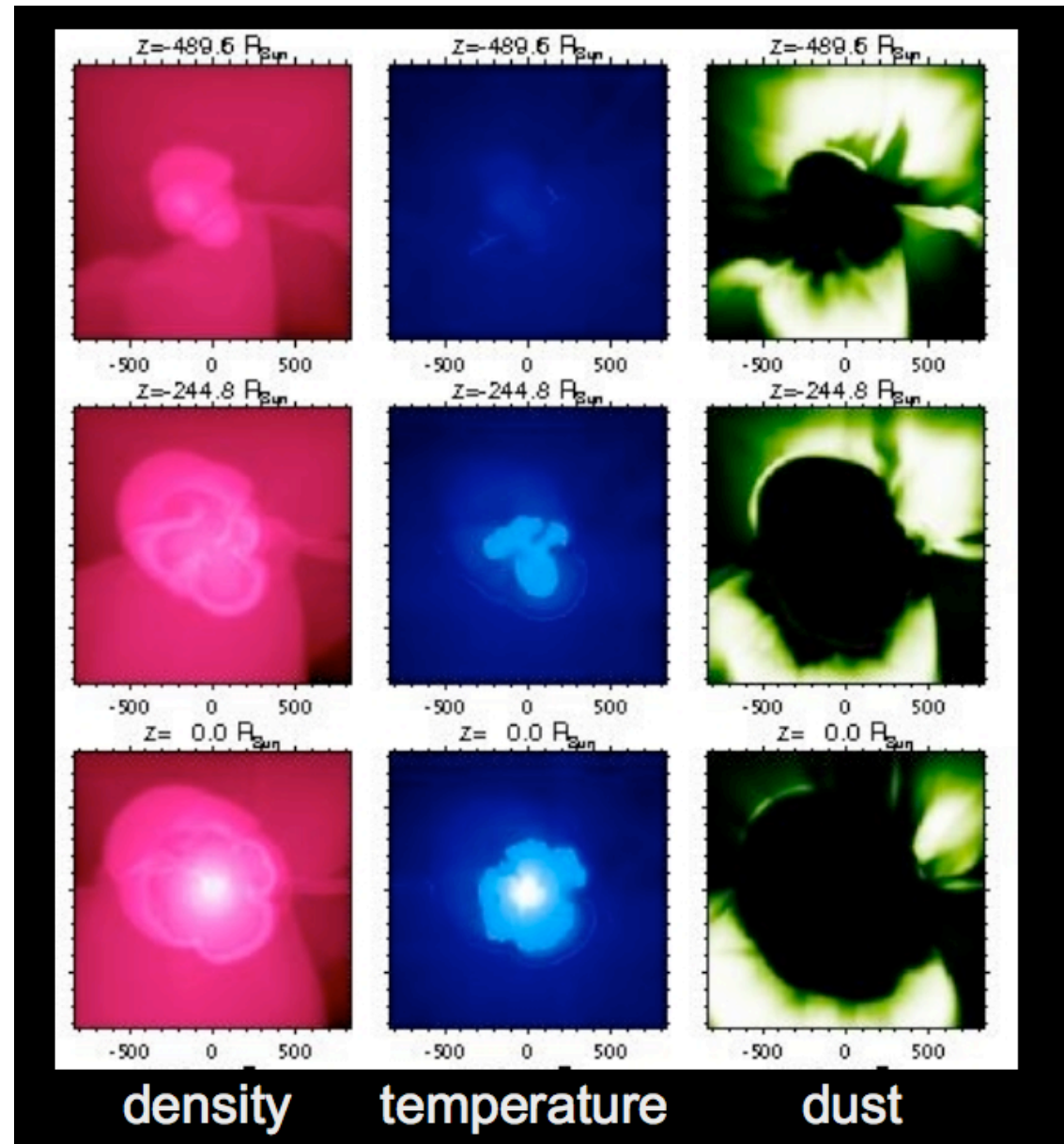
# Evolution: mass-loss

Dust-driven AGB winds

RGB stars?

Red supergiants?

Theoretical vs  
empirical mass-  
loss laws



# Evolution: pre-main sequence

Wuchterl (2004)

