Winds from Massive Stars

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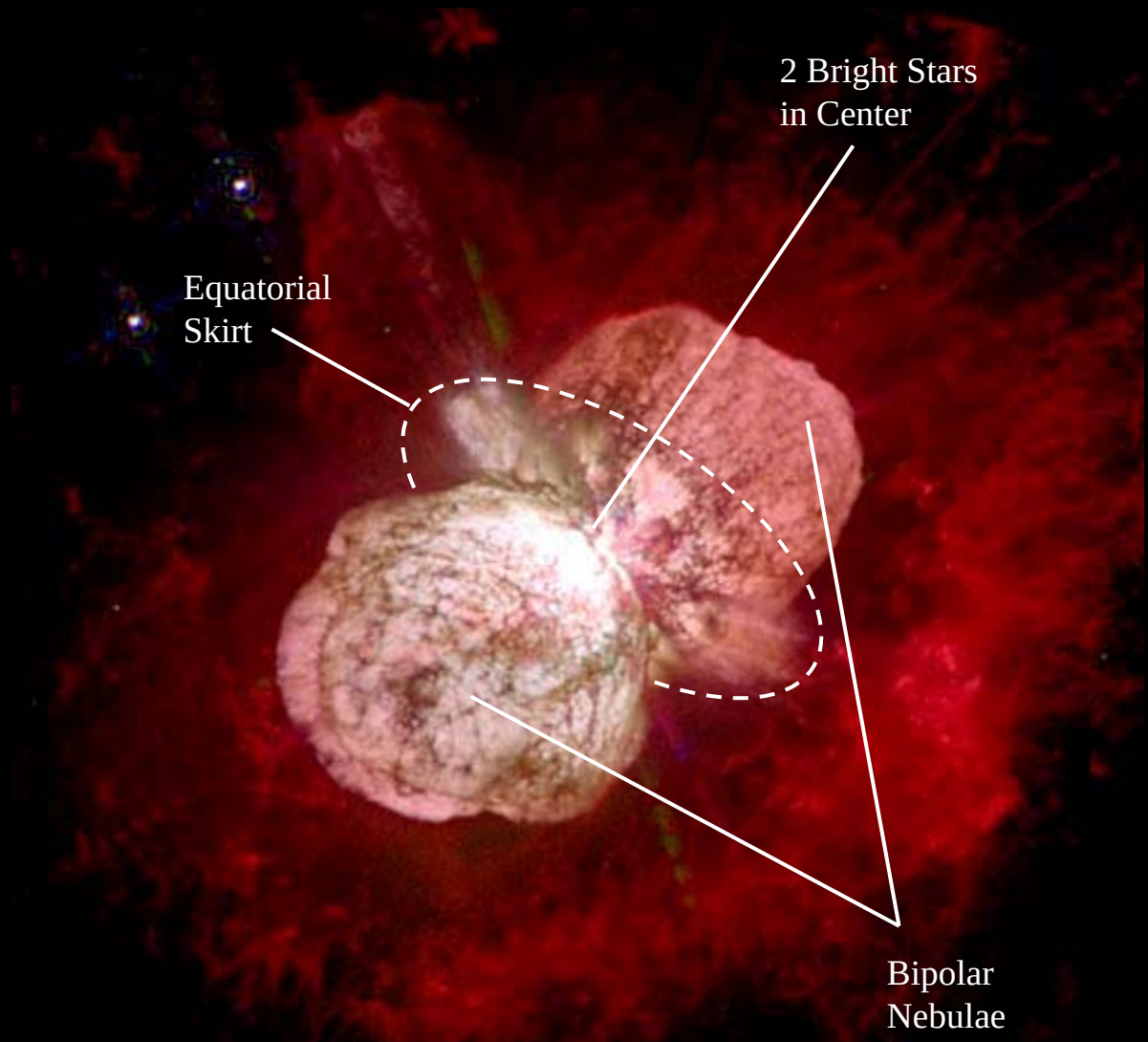
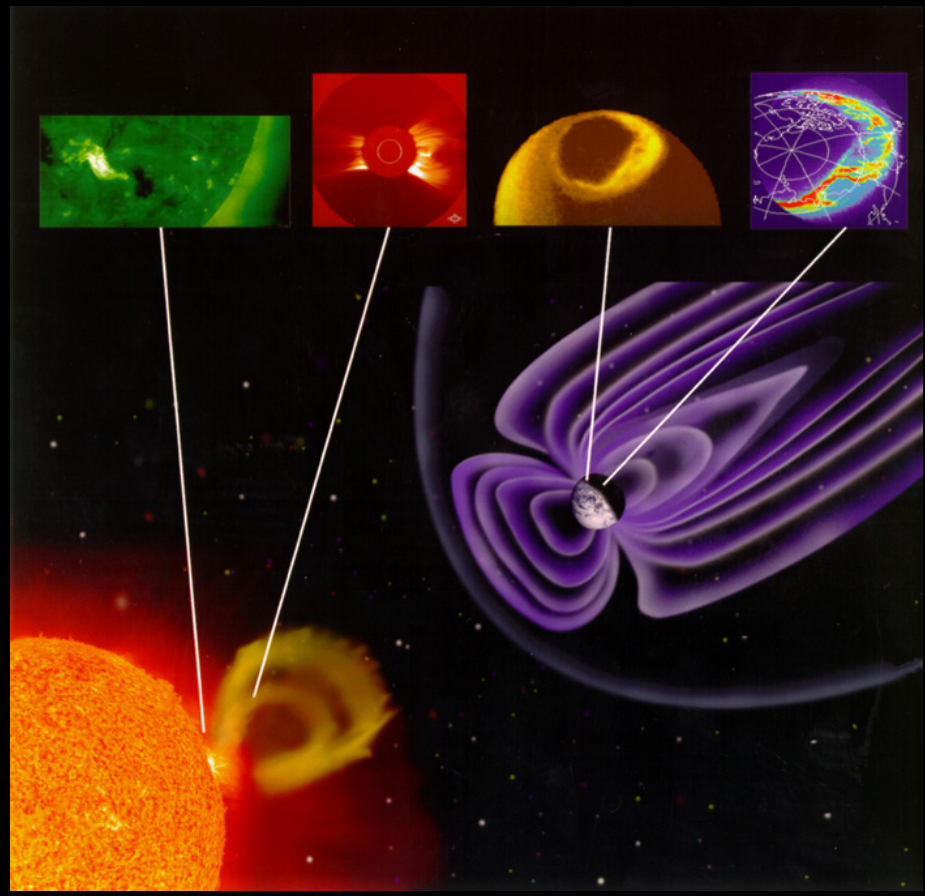
I study the winds of a star named Eta Carinae.



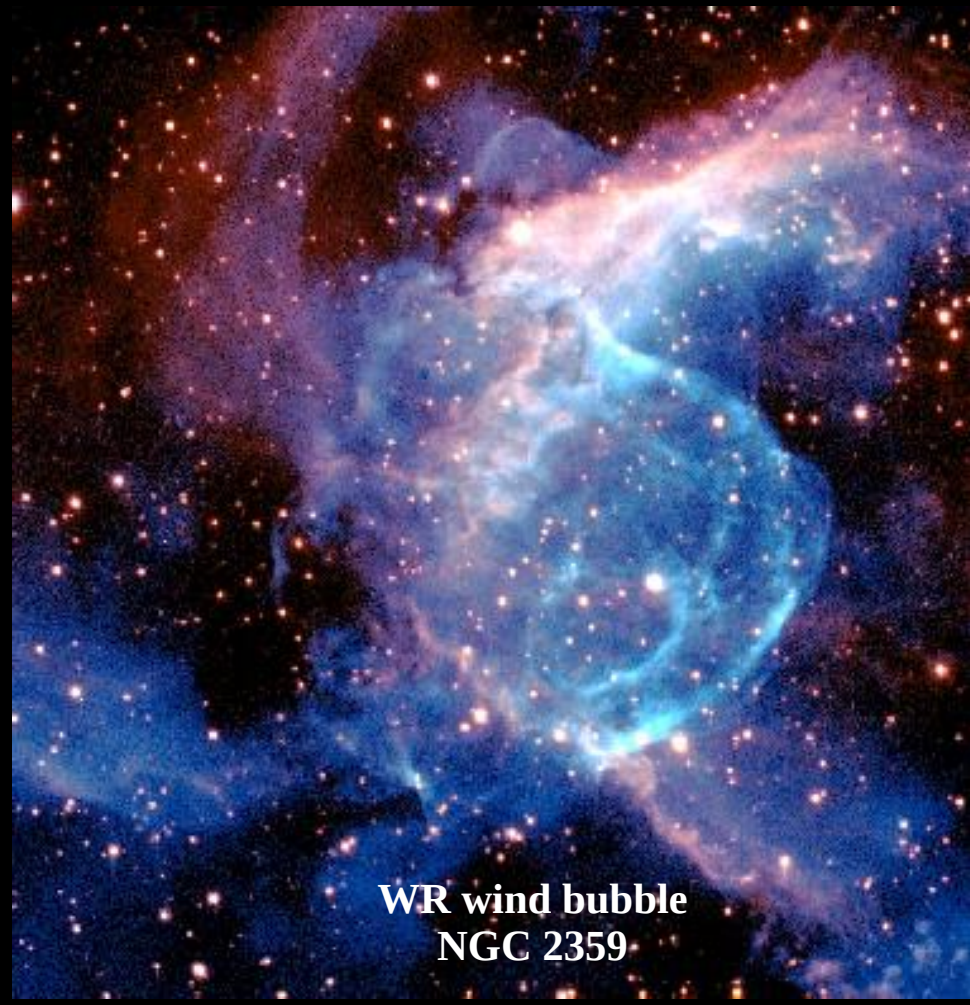
So Why Should We Care?

- Earth-Sun interactions
  - The solar wind interacts with the Earth, providing a way for the Sun to induce activity like aurora, and perhaps even influence Earth's climate and weather.



Wind Blown Bubbles and Element Formation

- All elements heavier than lithium are formed in stars.
- The winds of hot stars are a way to feed large sources of energy and mass into the interstellar medium.
- So, everything we are made of comes from stars, their winds, and their deaths.



WR wind bubble NGC 2359

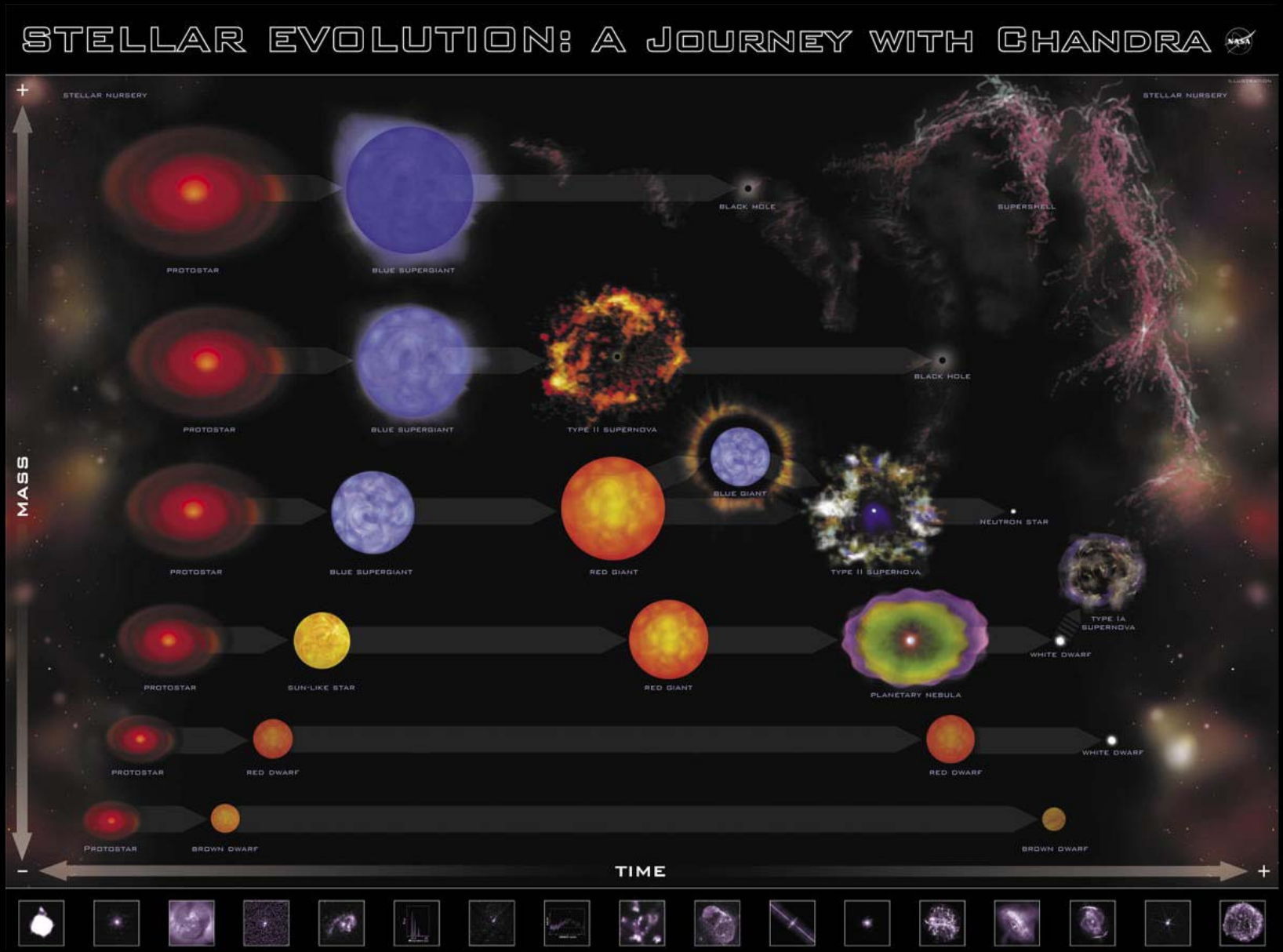
Winds and Starbursts

The compression around such wind bubbles plays a role in triggering further star formation.

Core of Galaxy NGC 4314 HUBBLESITE.org

Some galaxies even appear to be undergoing "starbursts", dominated by young, massive stars.

Mass-Loss Affects Stellar Evolution



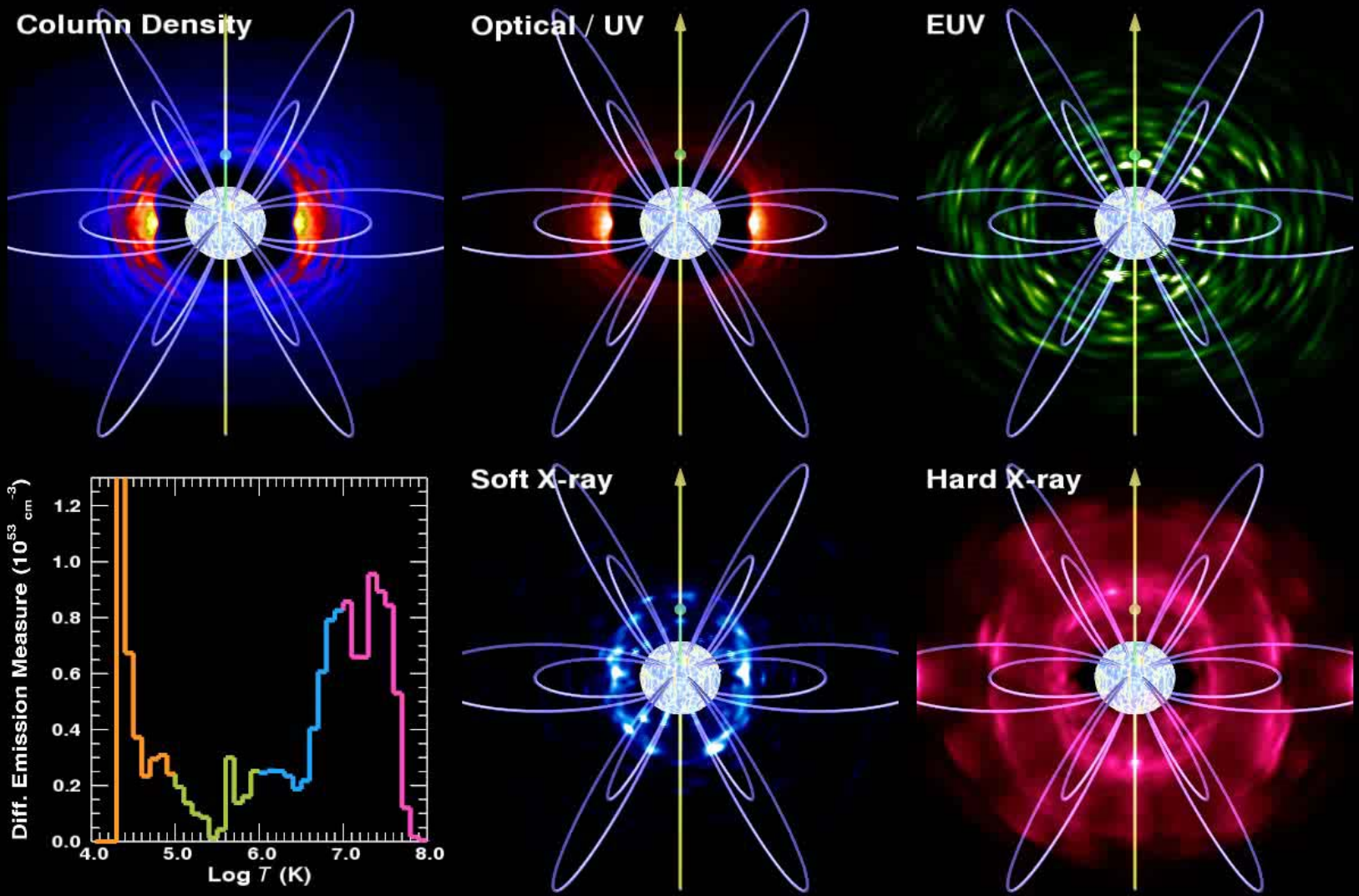
How It Works

- Light transports energy & information
- But it also has Momentum = Energy / Speed of Light
- Usually neglected since speed of light is VERY large
- Becomes significant in very bright objects
  – e.g. Lasers, Hot Stars

Question is: How big is this force vs. gravity?

For the Sun, Mass lost over lifetime ~ 0.01%
For hot stars ($M = 10 - 50\ M_\odot$) mass can be reduced by ½!

How Do We Study Massive Stars? We Do Computer Simulations



Summary

- **What I do – Study winds and material ejected from hot, massive stars; specifically Eta Carinae.**
- **Why I do it – It's fun and interesting, but also important in order to understand the universe we live in.**
- **Why its important – Stars are responsible for generating all of the heavy elements. Winds recycle this material back into space and can lead to nebula, new star formation, and affect a star's life and death.**
- **How I do it – I model the stars I'm interested in using computers and try to reproduce what we know from observations using these models.**

QUESTIONS?