

Cosmology & Galaxy Formation (+Stars & Black Holes)

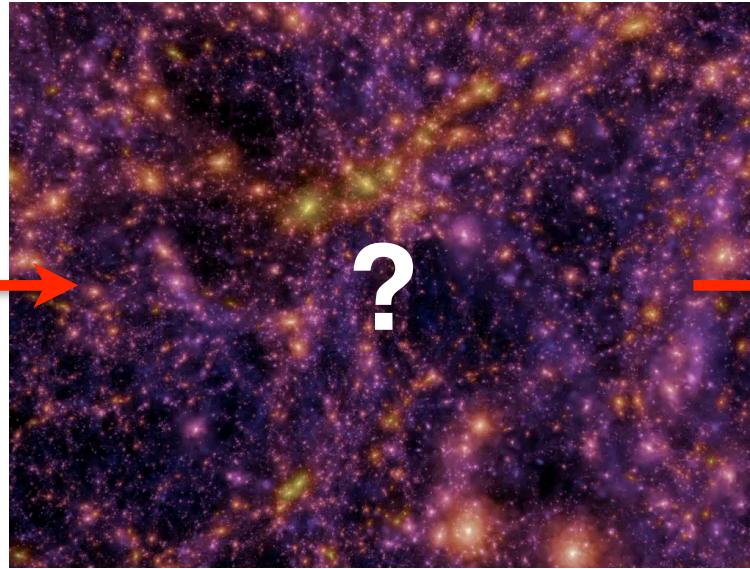
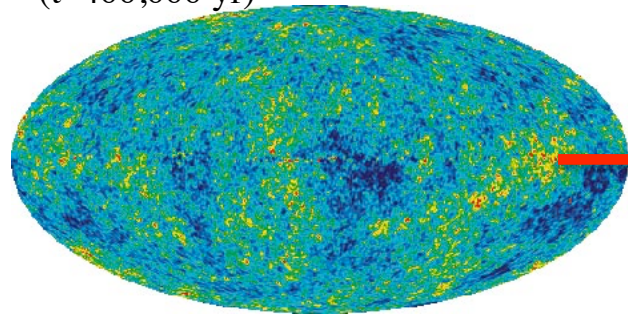
- How do we go from Big Bang to Milky Way?



Phil Hopkins

(numerical simulations to link the two...)

$z \sim 1090$
($t \sim 400,000$ yr)



Today



- Formation of structure in the Universe
- Probes of dark matter & dark energy
- Galaxy formation: why do our models fail so badly?
- Stars (Supernovae) + Black Holes (Quasars): they matter!



Suoqing Ji



Nadine Soliman



Gina
Panapoulou



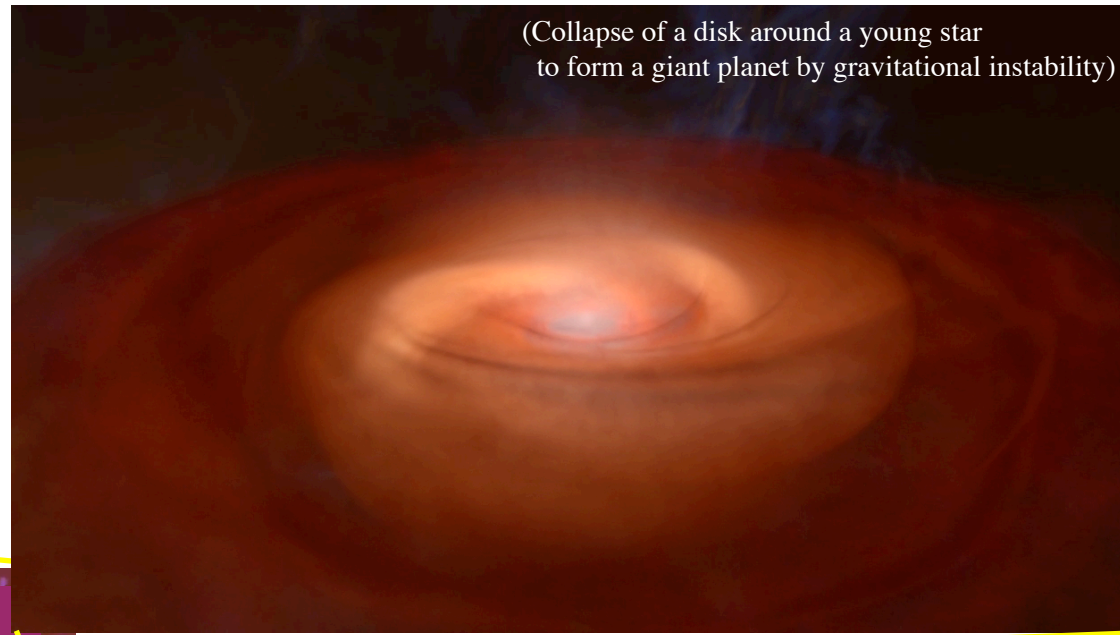
Jacob Shen



Sam Ponnada

From Galaxies to Planets

- Scales $\sim 10^{12}$ - 10^{28} cm



- How do stars form? Why isn't everything a star?
- How do planets form? Why are there planets unlike anything in our solar system?
- How do the "seeds" of super-massive black holes form? How do they grow/merge?
- Chaos, turbulence, radiation, magnetic fields, gravity, fluid dynamics, together at last!

