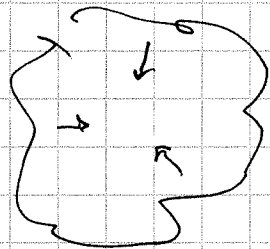


Mono lithic Galaxy Formation

- Tophat overdensity

Reformation
8

1. Collapse of giant primordial gas clouds

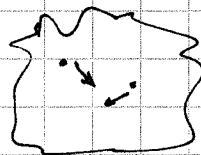


2. Stars start to form during collapse

- low metallicity
- eccentric orbits
- oldest stars present

} → Globular clusters + Galactic halo stellar

orbits retain memory of collapse



stars don't dissipate!

3. Gas settles into disk

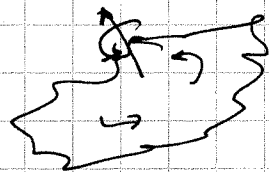
- gas dissipates
- settles into plane by net angular momentum specified initial
- collapses & contracts until rotationally supported

$$\lambda_i = 0.05 \rightarrow 20x \text{ collapse}$$

where $\lambda = \frac{J|E|^{1/2}}{GM^{5/2}}$

is the dimensionless angular momentum "spin parameter" from primordial tidal torques

- halo adiabatically compressed by gas infall



4. Stars form in disk

might evolve as closed box,

or gas accretion may continue at a low rate

(helps with G-dwarf problem)



Has to happen in this sequence:

only gas can dissipate to form a disk

Once formed, stars retain memory of their initial conditions

Hence getting all the stars to orbit in the same direction

in the same plane require the gas disk to settle first.