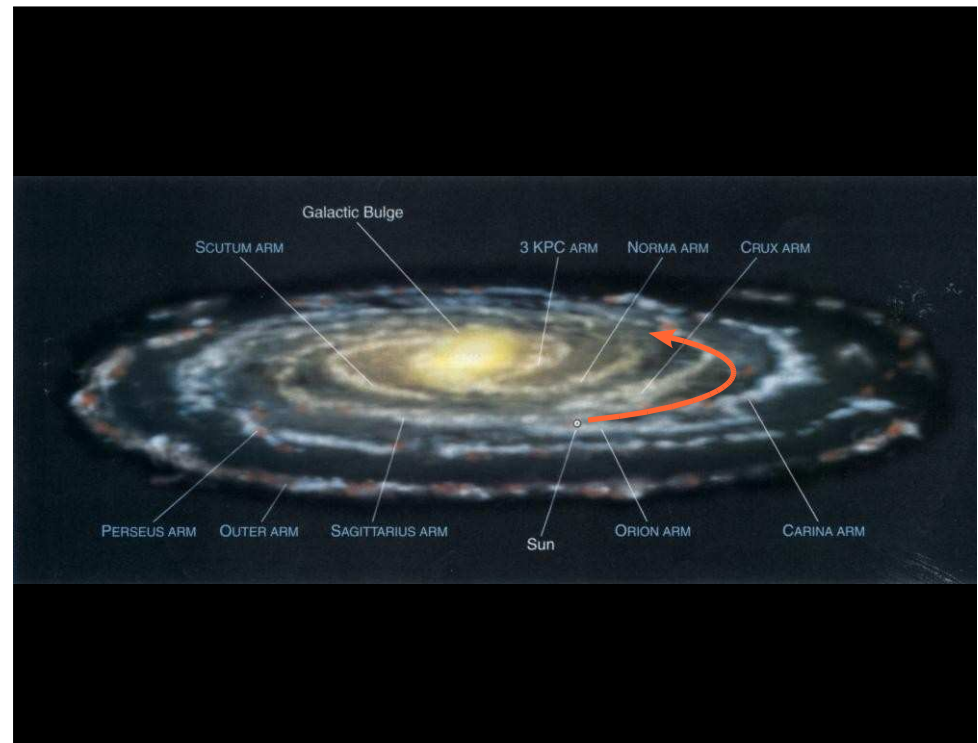
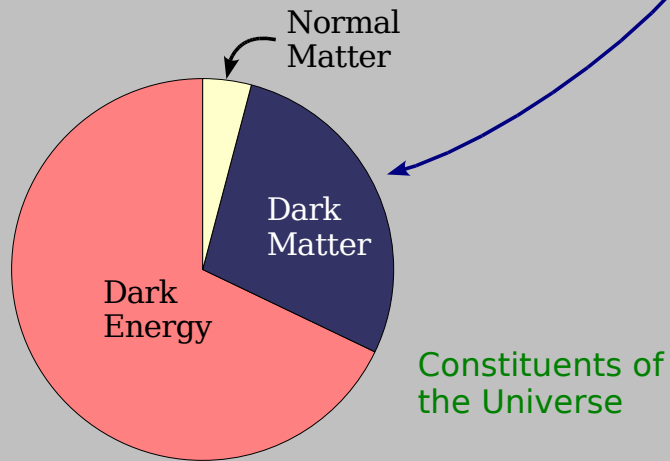
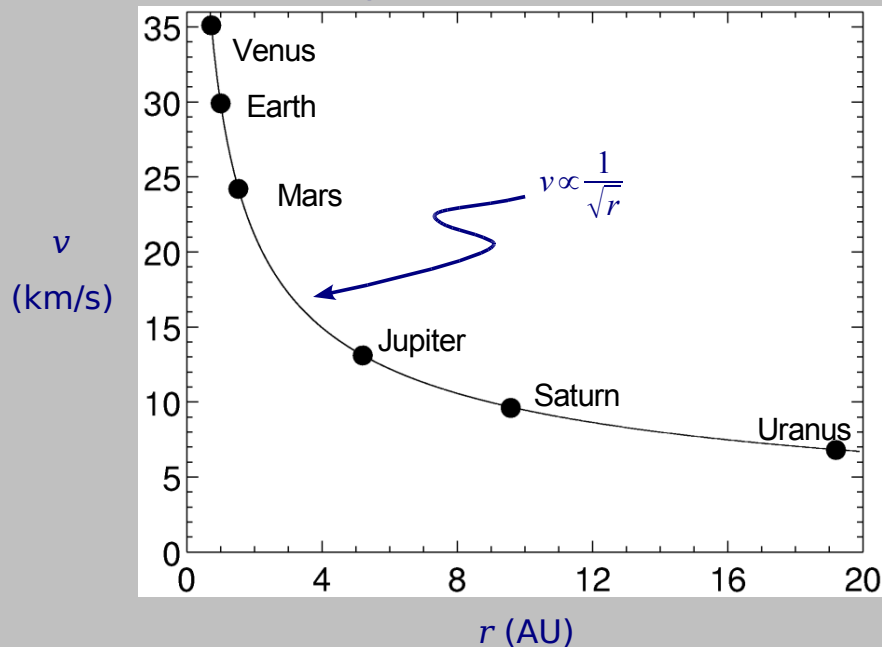


Today : evidence for Dark matter

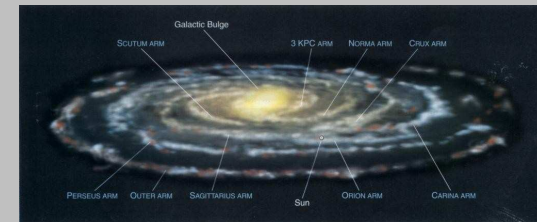
Tutorial : Gravity and Orbits



Keplerian Orbits



How should the velocity/distance from center relationship for stuff in the Galaxy to compare to Keplerian orbits?



- A** Velocities should fall off *slower* with distance than in the Keplerian case, because as you get farther out, there is more mass closer to the center holding stars in orbit.
- B** Visibly, the stars are all still more concentrated towards the center of the Galaxy, so we should still have Keplerian orbits.
- C** Velocities should fall off *faster* with distance than in the Keplerian case, because there is matter both closer to the center and farther away, thus pulling both inwards and outwards.
- D** Velocities should rise with distance due to centrifugal force from the spiral arms.

Galaxy Rotation Curve – Expected and Observed

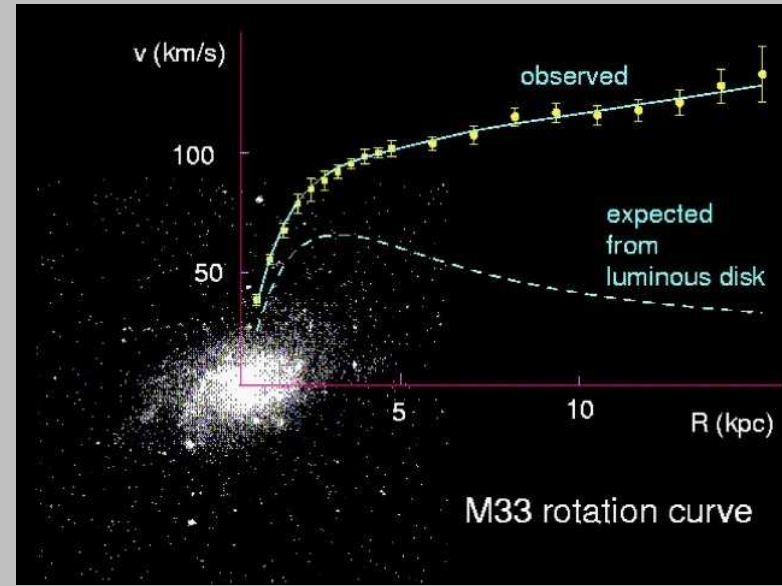
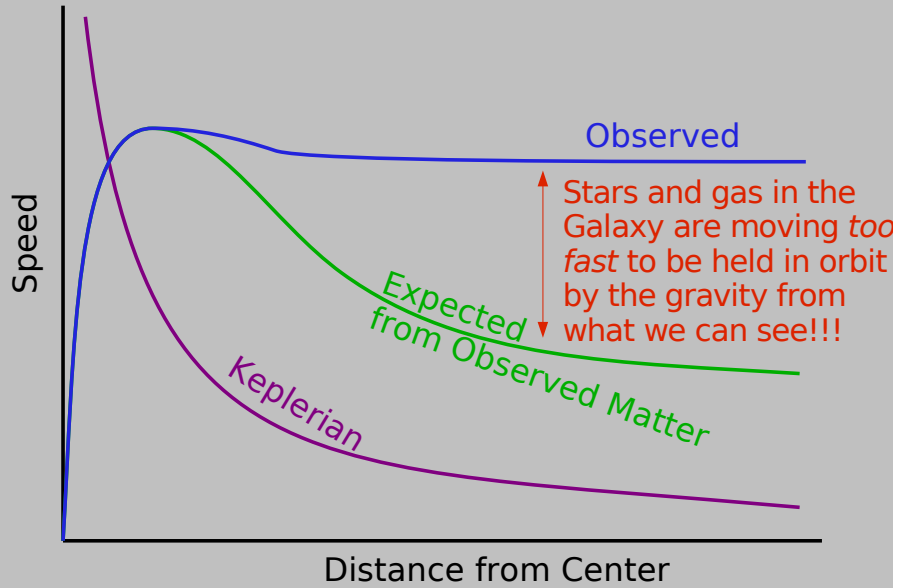
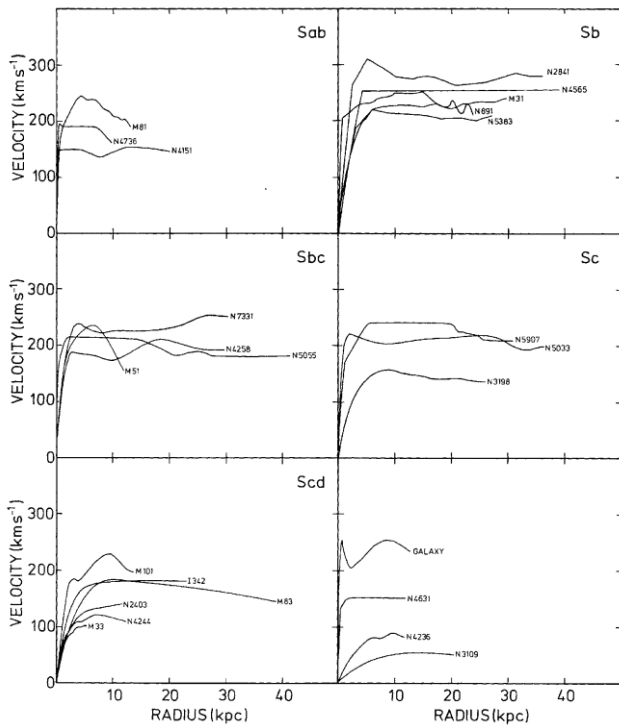
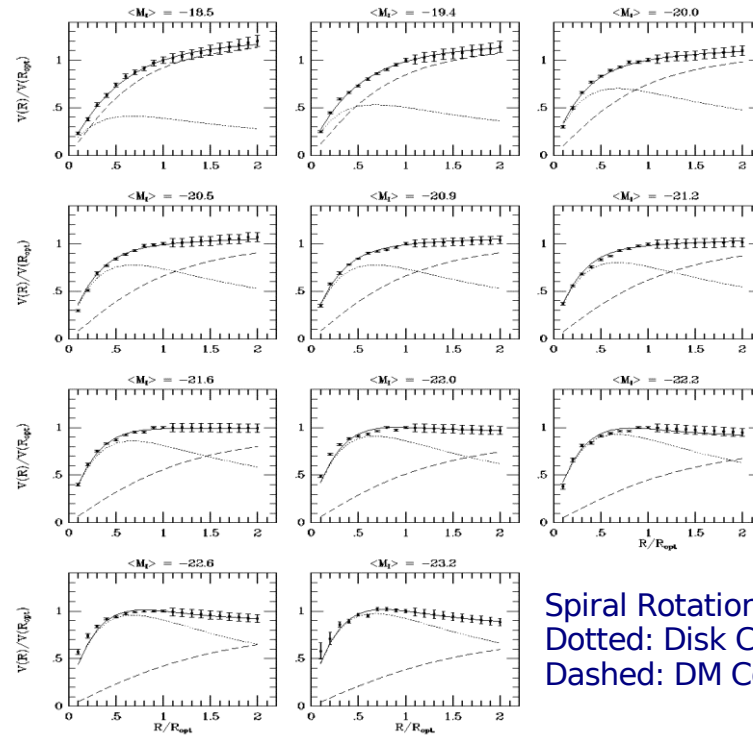


Image : Roy, physics/0007025



Rotation curves of several spiral galaxies.

Faber & Gallagher, 1979, after Bosma, A., 1978, PhD Thesis



Salucci & Persic, 1997, astro-ph/9703027

Spiral Rotation Curves
Dotted: Disk Contrib.
Dashed: DM Contrib.

