Dark Matter in NGC3762—3 Nov

- No class on Wed, Nov 26th
- To find mass of NGC3762 and the location of the mass.
- Where is the mass?
  - Answer: Mass is not where the stars are.
- Galaxies are made mostly of what we cannot see.

Most mass here, not where stars are.

Review

- Astronomers use the same physics (Kepler’s 3rd law) to measure the mass of and the galaxy NGC 3672.
- Under influence of the gravity of the sun (galaxy), a planet (cloud of gas) moves a given distance. If the time is short, the mass is
  A. greater.
  B. smaller.
- Rather than the form of Kepler’s 3rd law \( M = R^3/T^2 \), astronomers use \( M = Rv^2 \) and the Doppler effect for measuring the mass of a galaxy, because
  A. galaxies are much farther away.
  B. the period is too long to measure directly.
  C. the periods are different for different clouds of gas.

1. What in the spectrum along the major axis shows different parts of the galaxy are moving at different speeds? My answer is
   A. right.
   B. wrong.
2. Why is the same motion not seen in the spectrum along the minor axis? My answer is
   A. right.
   B. wrong.
3. How fast is the galaxy moving from us?
   A. 2040 km/s
   B. 1850 km/s
   C. 1650 km/s
4. Why is the galaxy moving from us?
   A. It is rotating
   B. Big bang
   C. Supernova
5. If the mass of the galaxy were greater, would this speed be different?
   A. Yes
   B. No
6. What is the rotation speed of gas that is 16 kpc from the center?
   A. 2040 km/s
   B. 1850 km/s
   C. 190 km/s
7. If the mass of the galaxy were greater, would this speed be different?
   A. Yes
   B. No