

Distance scale. Galaxies course

We have not discussed in detail the following distance estimators

1. Baade-Wesselink
2. Gravitational lensing
3. Star S2 in the Galactic center (and distance to the Galactic center)
4. Luminosity function of planetary nebulae
5. Supernovae Ia (and determination of the cosmological constant)
6. Tully-Fisher
7. Surface brightness fluctuations

Guide and general instructions

The goal of this lab is to become familiar in more depth with at least one method used in astronomy to determine distances. You will need to write a short report (roughly two pages) and give an informal presentation between 5 to 10 minutes describing your findings.

The following set of questions will hopefully help you in your research:

1. What are the physical principles behind the method?
2. Is it an absolute or a relative distance indicator? If relative, on which other methods does it rely upon?
3. What are the largest assumptions made, do you think these may lead to systematic effects?
4. What do you need to know to apply this method to determine a distance?
5. Out to what distances can it be applied? What are the typical distance uncertainties?
6. Has it been used recently? To determine the distance to which objects?