

AST 250 – Spring 2019
Homework Due: Monday January 14

1. Astronomy uses unique measures of distance (parallax) and angular separation (arcseconds).

- (a) Calculate how many arcseconds are in 1 radian and write this number to 6 significant digits.
- (b) Use the small angle approximation for the parallactic angle to calculate how many AU are in 1 parsec (to 6 significant digits). Compare to your answer in (a). Does this answer make sense?
- (c) The bright stars Capella (α Aurigae, 13.16 pc) is actually a binary star system composed of two roughly equal mass stars separated on the sky by 56.4 mas (see Figure). What is their projected separation in AU? Which planet in our Solar System is closest to that distance from the Sun?
- (d) The Very Long Baseline Array measured a parallax of $49 \mu\text{as}$ for a radio source on the other side of the Milky Way in 2017. What is the distance to this source in kpc and ly?

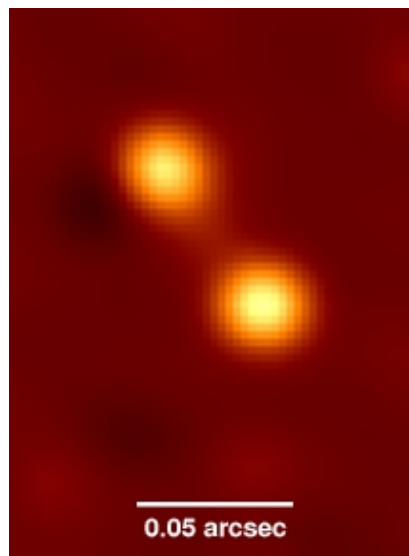


Figure: Image of Capella from the COAST optical interferometer.