

AST 250 – Spring 2019

Homework Due: Friday January 18

4. The “pointer stars” of the Big Dipper align at roughly the same right ascension ($\alpha = 11^h$) and may therefore be used to find the north celestial pole. Calculate the Local Siderial Time (LST) when the Big Dipper pointer stars are (a) at their highest and (b) at their lowest elevation. (Note: this is a quick way to estimate the LST visually using a “24 hour clock”!). (c) Merak has $\delta = 56^\circ 23'$; above which latitudes are the pointer stars circumpolar (always above the horizon)?

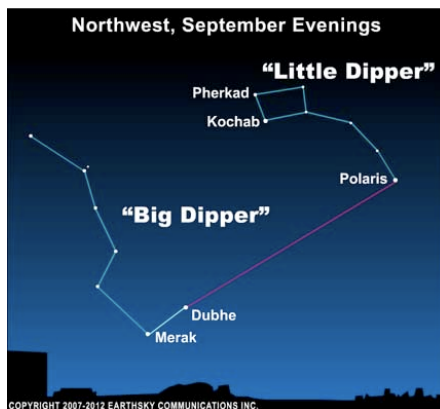


Figure 1: Merak and Dubhe point approximately toward the NCP.

5. The “airmass” of an object in the sky is the ratio of the path length through the atmosphere at the object’s elevation to path length at zenith. Submillimeter radio telescope rarely observe at elevations below 2 airmasses. For the SMT on Mount Graham at $\phi = 32^\circ 42' 6''$, what is the southernmost declination of objects that the SMT can observe? Assume the top of the atmosphere is “plane-parallel” to the ground (i.e. neglect curvature).

