

Constellation Studies - Fall Sky

Preparation before the observing session:

- Read "Notes on Observing" thoroughly.
- Find all the targets listed below using your star charts.
- **Note:** The observatory longitude is 97.1234° W and the latitude is 49.6452° N and its elevation is 233m.
- Observe any predicted events and record your observations during the observing session.

In the list of constellations below, the name of the constellation is underlined followed by the genitive case of the name in parenthesis followed by the three-letter abbreviation. Note that references to stars such as α UMa, spoken as alpha Ursae Majoris (note genitive case), literally means alpha of Ursa Major. The Greek letters are usually assigned in order of brightness in the constellation (α -- brightest). Note that the constellation, Ursa Major, is a major exception to this rule.

Ursa Major (Ursae Majoris) **UMa**: (The Great Bear, The Big Dipper, The Plow)

Through all ages, Ursa Major has been known under various names. It is linked with the nymph Kallisto, the daughter of Lycaon, a king of Arcadia in Greek mythology.

Moving along the asterism of the dipper from the lip identify the stars Dubhe (α UMa), Merak (β UMa), Phecda (γ UMa), Megrez (δ UMa), Alioth (ϵ UMa), Mizar (ζ UMa), and Alkaid (η UMa). Show the relative position and brightness of these stars on a half page drawing, identifying each with its Greek letter.

Locate and record Mizar's faint companion: Alcor.

Estimate and record the angular distance between a) the pointer stars, α UMa and β UMa, b) α UMa and Polaris, α UMi, and, c) the stars, Mizar and Alcor.

Ursa Minor (Ursae Minoris) **UMi**: (The Little Bear, The Little Dipper)

The origin of this group is uncertain and in some ages has been referred to as the Little Dog belonging to Kallisto.

On a (new) half-page diagram sketch the seven principal stars, indicating their brightness in the usual manner. Label β UMi and γ UMi (the "Guardians of the Pole"). Estimate the altitude of Polaris, α UMi, above the horizon.

Cassiopeia (Cassiopeiae) **Cas**: (The Queen, The Chair, or, The Throne)

Cassiopeia is one of the oldest and best known of our constellations. The Chair or Throne is quite familiar to most observers. It is also known as the celestial W when below the Pole and the celestial M when above it. In mythology, Cassiopeia was the wife of Cepheus, king of Ethiopia, and the mother of Andromeda.

Identify in the sky and sketch the 6 major stars making up "Cassiopeia's Chair". Locate β Cas and label it on your diagram.

Cepheus (Cephei) Cep: (The King, The Church Steeple)

According to Greek mythology, Cepheus was the King of Ethiopia, husband of Cassiopeia and father of the beautiful Andromeda.

Sketch and label the 5 major stars. Mark δ Cep on your diagram and label it "Cepheid Variable Star".

Perseus (Persei) Per: (Rescuer of Andromeda)

According to Sophocles: Perseus, the son of Zeus and Danae, slew the Gorgon, Medusa, and rescued Andromeda. Record and label on the diagram the star β Per, Algol, the Demon star.

Sketch the following 3 constellations on a single page:

Lyra (Lyrae) Lyr: (The Lyre)

Brightest star is Vega, α Lyr.

Cygnus (Cygni) Cyg: (The Swan, The Northern Cross)

Locate the main stars outlining this constellation. Mark Deneb, α Cyg, and, the binary star, Albireo, β Cyg, on your diagram. Can you see the Milky Way? If yes, indicate its position through Cygnus by shading.

Aquila (Aquilae) Aql: (The Eagle)

Brightest star is Altair, α Aql.

NOTE how the 3 stars: Vega, α Lyr; Deneb, α Cyg; and Altair, α Aql, form a conspicuous triangle. This is known as the Heavenly Triangle or the Summer Triangle.

Stellar Brightness

After you have completed the above observations, look at all the stars in the sky to find the brightest star that you can see. Then locate the faintest stars that you can see. Assign the number 1 to the brightest star and the number 5 to the faintest. Then the brightness of all stars can be assigned numbers between 1 and 5. Note that the brighter stars are assigned smaller numbers.

Beside the main stars in your sketches of the constellations named below, indicate the number, between 1 and 5, corresponding to the brightness of the star. You will have to compare brightness of stars: first with the brightest and faintest, then with stars in between. Before marking down any numbers, try several stars and see how you progress. The aim of this exercise is to note that you can subdivide the range in brightness of stars into 5 groups. Assign brightness numbers to the following constellations and stars:

1. Ursa Minor
2. Cassiopeia