



# The Astronomical League

A Federation of Astronomical Societies

## Astro Note C3 – Transparency Conditions

**Introduction** – Transparency is a measure of the clarity of the atmosphere (the transparency). Light from distant astronomical objects must pass through the atmosphere to get to your equipment and ultimately to your eyes. One advantage of placing telescopes in space is that they do not have to deal with atmospheric conditions like transparency.

The transparency of the atmosphere is affected by dust, smoke, and humidity. These particles tend to reflect light pollution back towards the observer and result in increased background sky brightness. This simple technique is based on the faintest star that is visible directly overhead, but since these stars change during the year we can use Ursa Minor (the Little Dipper) as our target field.

It is important to record seeing in your log sheets so that you can compare the views from different nights under different conditions. There are formal and very quantitative means to measure transparency, however there are also simple ways that an amateur astronomer can do while in the field and without special equipment. This is a scale that can be used and is acceptable for all Astronomical League Observing Programs.

**The Scale: Transparency** – How clear (transparent) is the sky?

Using Ursa Minor (the Little Dipper), transparency can be measured using this scale:

- 1 - If you can't see Polaris.
- 2 - If you can only see Polaris.
- 3 - If you can see the two stars on the end of the bowl of the Little Dipper (Kochab and Pherkad).
- 4 - If you can see any of the stars in the handle of the Little Dipper.
- 5 - If you can see 6 of the 7 stars in the Little Dipper.
- 6 - If you can see all 7 stars in the Little Dipper.
- 7 - If you can see stars near the Little Dipper that are not part of the stick figure. (I envy your young eyes...)

Although atmospheric extinction will vary from season to season, and from latitude to latitude, using Ursa Minor is a simple and reasonable solution if you observe from the northern hemisphere.