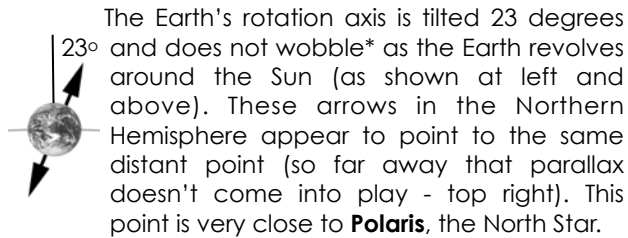


### \* Why Polaris Doesn't (Seem To) Move



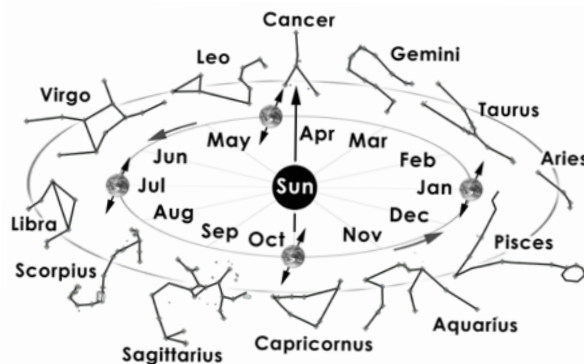
Like the Sun, the Night Sky appears to rise in the East and set in the West (which is a result of the Earth spinning from West to East).



\* Actually it does wobble. This phenomenon, called the "precession of the equinoxes," takes 26,000 years to complete a single cycle.

### \* The Zodiac And The Ecliptic

The **Zodiacal Constellations** mark the **ecliptic** - the path the Sun and planets appear to take over the course of the year. All planets lie somewhere in this band of constellations and are visible at certain times of the year. From Central New York, this band lies high in the Night Sky in Winter (highest at the Winter Solstice - Dec 21/22) and reaches its lowest point at the Summer Solstice (June 20/21).



### \* The Importance Of The Constellations

Constellations served as reminders of mythological & historical figures in all cultures in Antiquity. Greek and Roman names and legends persist today through our use of many of their star groupings. For modern amateur astronomers, constellations are the "coarse adjustment" by which we find our way around the Night Sky, using these star groupings as guides to planets, star clusters, nebulae, comets & galaxies.

### \* The Importance Of Dark Adaption

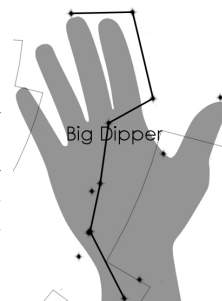
Rod (shades of gray) and cone (RGB color) cells in your retina detect light/color. After several minutes in the dark, your pupils (right top) fully dilate (right bottom), allowing you to see (primarily with your rods) faint stars in the Night Sky. **A camera flash or smart phone will set your dark adaption back MINUTES, SO AVOID BRIGHT LIGHTS!** If you must take a call, step away from others to spare them re-adapting. **RED FLASHLIGHTS** spare your night vision, as your eyes are mostly insensitive to red light.

### \* Sky's Too Confusing? Start In The City

Light Pollution is the bane of astronomers, but it does simplify the search for constellations by making your eyes less sensitive to light from dim and distant stars. Constellations are mostly drawn from the brightest stars in the Night Sky - the ones you're most likely to see from a brighter location. Once you can identify the bright stars, move to darker locations & see how the dimmer stars are placed within the constellations.

### \* Distances In The Sky – Hand's Up!

Measuring constellations and their separations is easy with a helping hand. It may cover a full constellation. Individual fingers may be the perfect length between two stars. With some "digital" calibration (as in, your fingers), a walk between constellations becomes a matter of letting your fingers gauge how far you need to look based on any sky charts you may be using.



### Originally Developed By:



Promoting Amateur Astronomy & Space Science In Central New York

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## A Guide For New Observers <sup>(v5)</sup>

- \* The Importance Of The Constellations
- \* The Importance Of Dark Adaption
- \* Sky Too Confusing? Start In The City
- \* Distances In The Sky - Hand's Up!
- \* Why Polaris Doesn't (Seem To) Move
- \* The Zodiac And The Ecliptic
- \* The Circumpolar & Seasonal Constellations

Star charts, planetspheres, smart phone apps! For all its tranquility, the Night Sky can seem like a complicated place for those first trying to find their way around its many stars and constellations. This brochure is meant to provide a brief overview of some of the most important aspects of learning the Night Sky, including some simple tricks for finding the notable **circumpolar constellations**.

Winter Constellations	Spring Constellations
Aries (Zodiacal) Taurus (Zodiacal) Gemini (Zodiacal)	Cancer (Zodiacal) Leo (Zodiacal) Virgo (Zodiacal)
<b>Feb 3, 2013 9:00 PM</b>	<b>May 3, 2013 9:00 PM</b>
1. Canes Venatici 2. Lacerta 3. Leo Minor 4. Lynx 5. Auriga 6. Perseus 7. Andromeda 8. Triangulum 9. Sextans 10. Canis Minor 11. Monoceros 12. Orion 13. Cetus 14. Canis Major 15. Lepus 16. Eridanus 17. Fornax 18. Puppis 19. Columba 20. Caelum	1. Lyra 2. Hercules 3. Auriga 4. Corona Borealis 5. Lynx 6. Serpens Caput 7. Bootes 8. Canes Venatici 9. Leo Minor 10. Coma Berenices 11. Canis Minor 12. Sextans 13. Corvus 14. Crater 15. Hydra 16. Antlia 17. Pyxis 18. Puppis

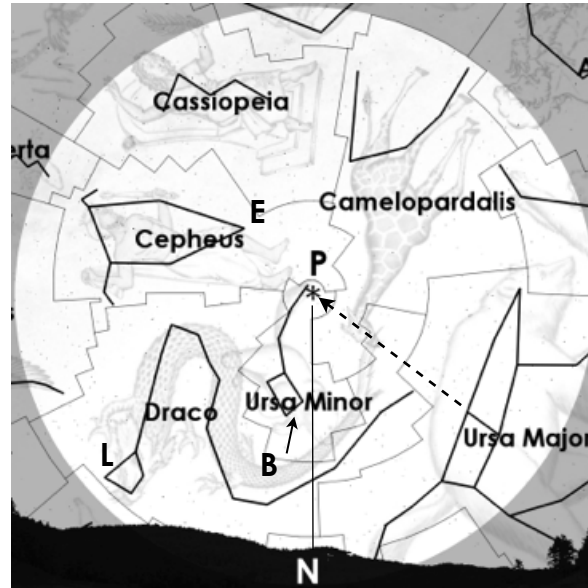
Summer Constellations	Fall Constellations
Libra (Zodiacal) Scorpius (Zodiacal) Sagittarius (Zodiacal)	Capricornus (Zodiacal) Aquarius (Zodiacal) Pisces (Zodiacal)
<b>Aug 3, 2013 9:00 PM</b>	<b>Nov 3, 2013 9:00 PM</b>
1. Andromeda 2. Lacerta 3. Canes Venatici 4. Pegasus 5. Cygnus 6. Coma Berenices 7. Equuleus 8. Delphinus 9. Velpecula 10. Sagitta 11. Lyra 12. Hercules 13. Corona Borealis 14. Bootes 15. Aquila 16. Serpens Caput 17. Serpens Cauda 18. Ophiucus	1. Lynx 2. Hercules 3. Auriga 4. Lyra 5. Perseus 6. Lacerta 7. Cygnus 8. Triangulum 9. Andromeda 10. Velpecula 11. Sagitta 12. Cetus 13. Pegasus 14. Delphinus 15. Aquila 16. Equuleus 17. Fornax 18. Sculptor 19. Pisces Austrinus

\* Constellations are listed as they appear in the Night Sky mostly from Northern-most to Southern-most.

## \* The Circumpolar Constellations

The Night Sky appears to spin from East to West around **Polaris**. If you draw a line from Polaris to the Northern

Horizon and spin that line to make a circle with Polaris at the center (thin line and white circle above), that



circle contains stars that are **ALWAYS VISIBLE** in the Night Sky from Central New York (or any location between 40 to 45 degrees North Latitude). These are **circumpolar stars**. The constellations made up of these stars are the **circumpolar constellations – Ursa Minor (Little Dipper), Ursa Major (Big Dipper), Draco, Cepheus, Camelopardalis, and Cassiopeia**. While their orientations due to Earth's rotation may change, they are **ALWAYS VISIBLE IN YOUR NIGHT SKY – SO LEARN THESE FIRST!**

## \* Seasonal Constellations

The non-circumpolar constellations change with the seasons and time of night. For those observing late, constellations for a given season are visible in the pre-dawn skies of the previous season - Winter constellations are visible before dawn in the Fall, etc. The tables at left list constellations most easily visible at 9 p.m. (and at least a few hours after) mid-season (some are visible for two seasons) from CNY. The later you observe, the more of the next season you'll see.

## \* Dippers, W's, Lozenges, And Barns

The circumpolar constellations are the best places to start for the new amateur astronomer because they are always visible from your latitude (even if you have to turn your head a bit to see them all). The tips below will help you find them easily.

**The Big Dipper (Ursa Major)** - The **Big Dipper** is one of the most familiar constellations (perhaps rivaled only by **Orion**). But the Big Dipper is NOT a constellation! It is an **asterism** (a non-constellation grouping of stars) composed of stars all within the larger constellation **Ursa Major** (the Great Bear). The bowl stars opposite the handle point directly to **Polaris**, the North Star (the dashed arrow in the image at left).

**Cassiopeia (The Great W or M)** - On the opposite side of the circumpolar circle (shown at left) from the **Big Dipper** is **Cassiopeia**, which may look like a W, M, or throne (for this queen) depending on its orientation (time of night or time of year). **Polaris**, the North Star, lies between **Cassiopeia** and the **Big Dipper**.

**The Little Dipper (Ursa Minor) And Polaris** - **Polaris** (the "P" in the image at left) is the second most important star in the sky (after our **Sun**) because of its long importance in maritime navigation and early astronomy. The **Little Dipper** is a mostly dim constellation, with **Polaris** and the two bowl stars farthest from the handle ("B" at left) most easily recognized. **Polaris** is made easy to find because it is in a part of the sky with few bright stars.

**Cepheus (The Barn)** - King **Cepheus** is a bit on the dim side, but the five stars responsible for the "barn" appearance are reasonably easy to find by using the bottom three stars of **Cassiopeia** as an order of alignment. Its roof star, **Er Rai** ("E" in the image), is the closest bright star to **Polaris**.

**Draco (And "The Lozenge")** - **Draco** is a long constellation that winds round **Ursa Minor** (The Little Dipper). Its most prominent feature is its head, composed of four bright stars known as "**The Lozenge**" ("L" in the image). Using **The Lozenge** asterism as a start and **Ursa Minor** as a guide, slowly loop your way across moderately bright stars to complete **Draco**.

**Camelopardalis (A Camel?!)** - **Camelopardalis** is the most difficult of the six circumpolar constellations to identify because it is composed of dim stars. One approach to mark its location is to make a nearly right angle between **Er Rai** in **Cepheus** and **Polaris** in **Ursa Minor** that points away from **The Lozenge**, then use **Cassiopeia** to mark the camel's edge.