

# RASC – Regina Centre

## Beginners Observing Certificate List



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# Introduction

## Why use this list

- You will learn 12 constellations and how to navigate the night sky
- You will learn how to observe the night sky along with the types of objects you can see
- The list guides your learning and provides a sense of accomplishment

## Design of this list

- The list consists of 12 objects each in a different constellation along with 3 solar system objects
- The objects are balanced across the four seasons and object types
- Over half of the objects are visible naked eye and only binoculars are required for the others
- Most of the objects are included on the various RASC National Certificates so this will give you a start on those lists

## Structure of the material

- There is an overview on how to read and use the finder charts including an explanation of any astronomy related terminology
- There is an overview chart for each season that shows how the constellations fit together

- There is a chart for each object that includes a map of naked eye stars, details on the object, hints on how to find it, and what you will see
- There is a logging form that you can use to track your progress and to demonstrate you have completed observing the list.

## How to apply for the certificate

- Send your completed logging form to the Centre Council at [reginfo@lists.rasc.ca](mailto:reginfo@lists.rasc.ca) or by bringing it to one of the monthly Centre Meetings
- The Council will review your observing log and certify you have completed the requirements for the observing certificate
- Your certificate will be presented at one of the monthly Centre Meeting or mailed to you if you are unable to attend

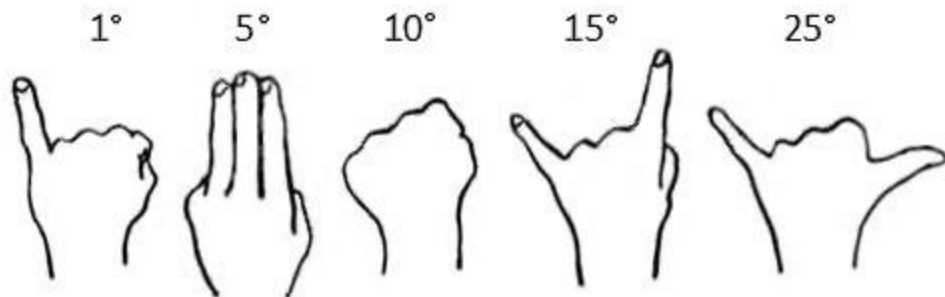
# Using the Object Charts

## Locating the object on the chart

- The coordinates for the object are at the top just above the finder chart
- The Right Ascension (RA) scale runs along the top and bottom of the chart and is measured in Hours and decimal Minutes
- The Declination (Dec) scale runs along the sides of the chart and is measured in Degrees
- The object will be located at the intersection of the RA and Dec coordinates

## Locating the object on the sky

- Start by using the Season charts to locate the constellations on the sky
- Next use the object chart to locate the object in the constellation using the “How to find” hints
- You can measure distances on the sky by extending your arm and using one eye to look at your fingers / hand



## Understanding the size of the object

- The size of the objects are all listed in Arc Minutes which is symbolized as a ' mark.
- One degree ( $1^\circ$ ) contains  $60'$
- A typical set of 7 to 8 power binoculars will show about  $6.5^\circ$  of sky or about  $400'$
- As a point of reference the full moon is  $30'$
- The sizes on the charts represent the full size of the object including the faintest regions
- Many objects appear smaller to the naked eye or in binoculars

## Understanding the brightness of the object

- The brightness of a star is called its Magnitude
- The higher the number the dimmer the star
- In the city you can see to Mag 3.0, in rural areas to Mag 4.5, and in a dark sky to Mag 6.0
- Binoculars will allow you to see to Mag 9.0
- The Magnitude of a deep sky object is the average brightness over its area
- Each chart has a scale with large dots showing the bright stars and small dots the dim stars



**RASC – Regina Centre – Beginners Observing List**

Name		email				Phone #	
	Object	Constellation	Type	Name	Date / Time	Instrument	Description
<b>Winter</b>	M46 / 47	Puppis	Open Cluster				
	M42	Orion	Emission Nebula	Orion Nebula			
	M45	Taurus	Open Cluster	Pleiades			
<b>Spring</b>	M81	Ursa Major	Galaxy	Bode's Galaxy			
	M5	Serpens Caput	Globular Cluster				
	M3	Canes Venatici	Globular Cluster				
	M44	Cancer	Open Cluster	Beehive Cluster			
<b>Summer</b>	Cr399	Vulpecula	Open Cluster	Coathanger			
	M8	Sagittarius	Emission Nebula	Lagoon Nebula			
	M13	Hercules	Globular Cluster	Hercules Cluster			
<b>Autumn</b>	NGC869 / 884	Perseus	Open Cluster	Double Cluster			
	M31	Andromeda	Galaxy	Andromeda Galaxy			
<b>Solar System</b>	Moon		Moon	Luna			
	Jupiter		Planet	Jupiter			
	Saturn		Planet	Saturn			

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# Winter Constellation Charts

Chart 1 – Puppis  
M46 / M47 – Open Clusters

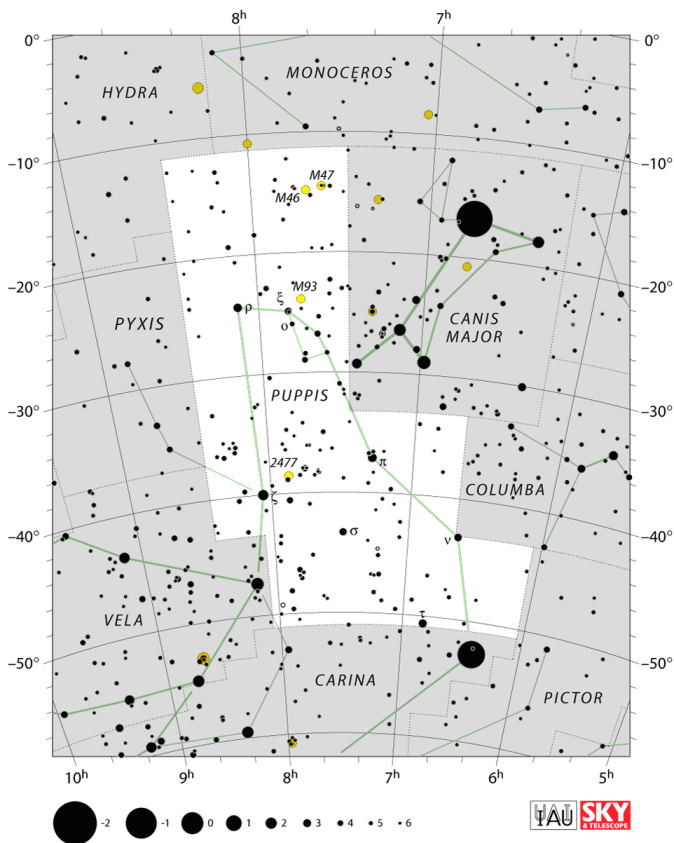


Chart 2 – Orion  
M42 – Orion Nebula

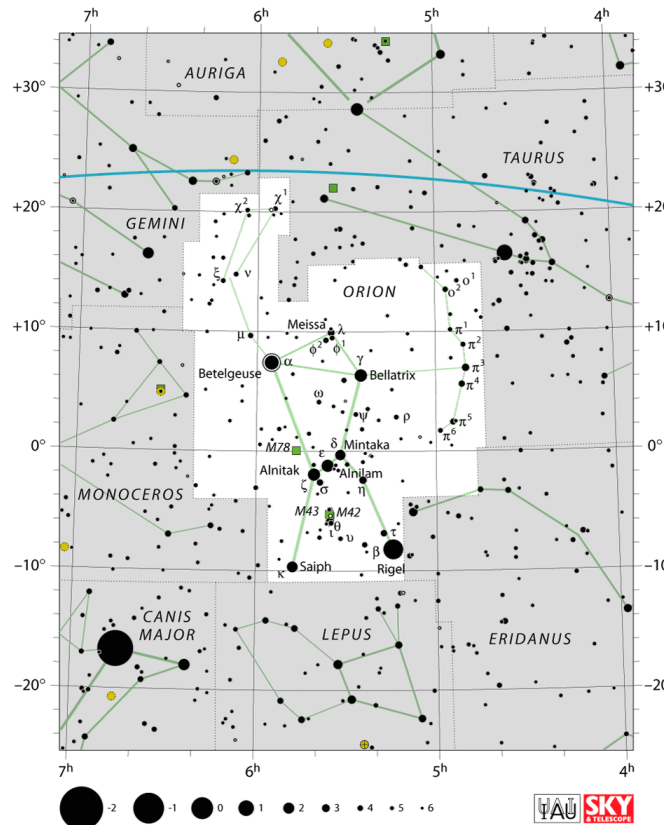
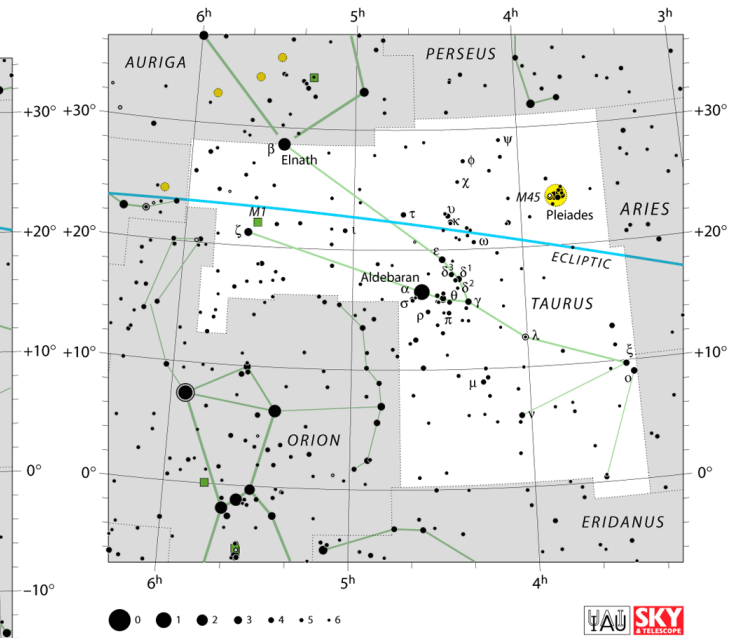


Chart 3 – Taurus  
M45 – Pleiades Cluster

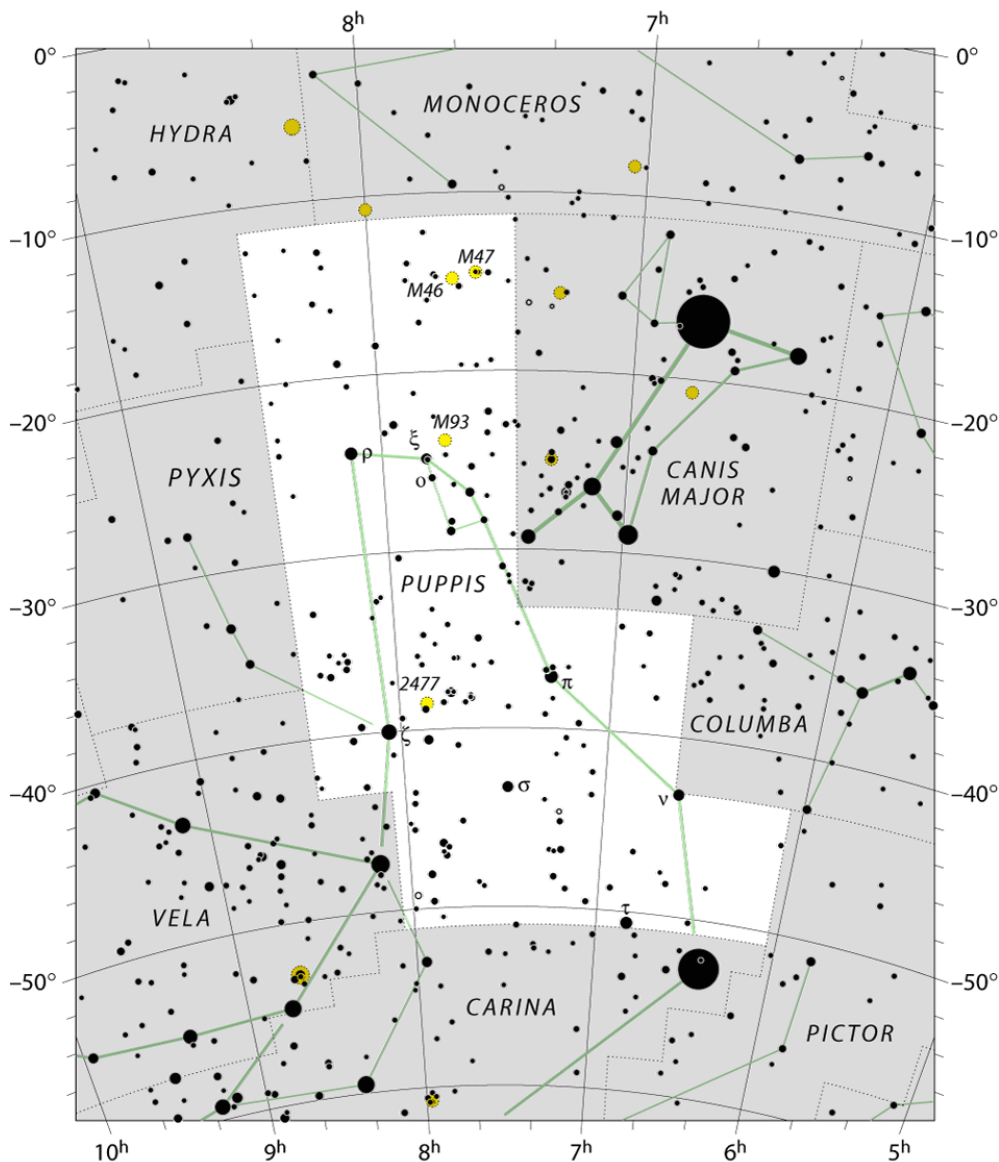


The charts are laid out based on their relative sky position. Note the scales and constellation overlaps.

# M46 / M47 – Open Clusters

## Chart 1 – Puppis

RA 07h 41.8m Dec -14° 49m / RA 07h 36.6m Dec -14° 29m



Size 27' / 30'  
Mag 6.1 / 4.4  
Difficulty Medium

### Equipment

- Requires binoculars

### How to find

- Locate Orion using chart 2
- The three “belt” stars point towards a bright star (Sirius) to the lower left in Canis Major
- From Sirius, move your binoculars two fields to the east (left) to M46 / M47

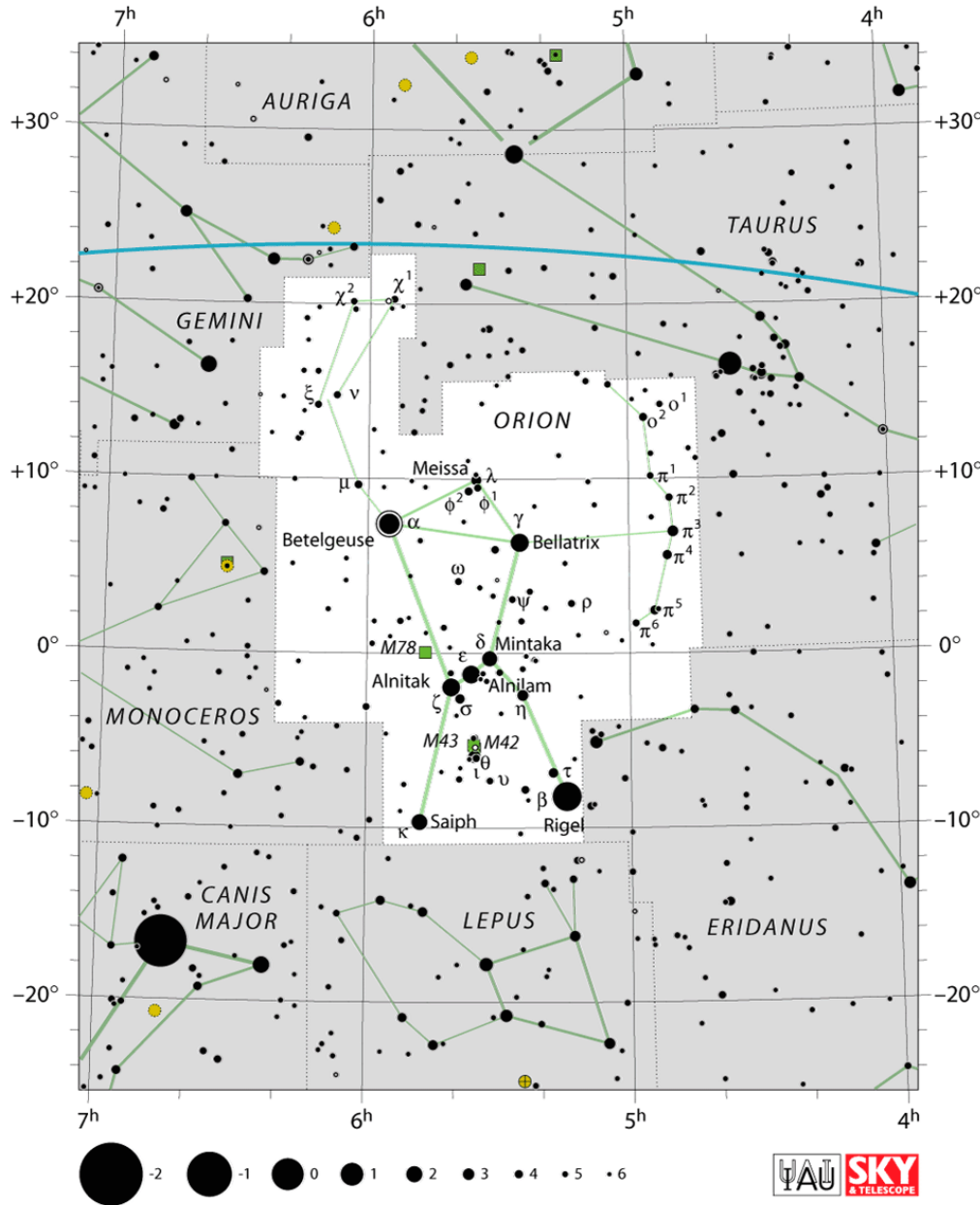
### What to look for

- M46 will look like a small, round, hazy patch
- M47 will contain half a dozen brighter stars plus many faint stars

# M42 – Orion Nebula

## Chart 2 – Orion

RA 05h 35.3m Dec -05° 23m



Size 85' x 60'

Mag 4.0

Difficulty Easy

### Equipment

- Naked eye visible (city)

### How to find

- In the centre of Orion there are three bright stars in a row known as the Belt of Orion
- Two thirds of a binocular field (4.2°) below the belt is M42 known as Orion's Sword

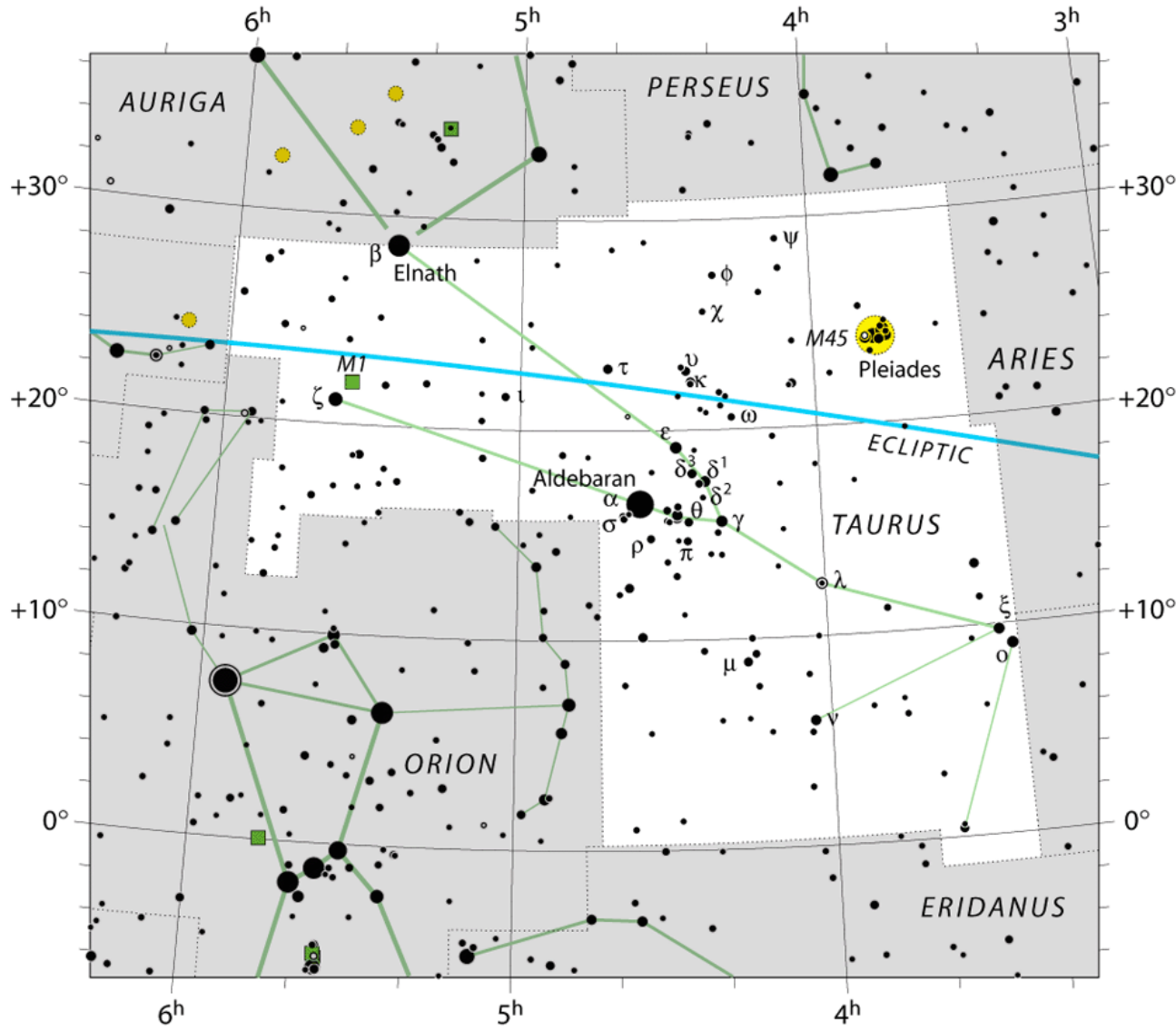
### What to look for

- Naked eye M42 will look like a bright elongated hazy patch
- Binoculars will reveal a very bright, round, nebulous patch of light
- Careful observation may reveal a break and a smaller separate patch of light above which is M43 – De Mairan's Nebula

# M45 – Pleiades Cluster

## Chart 3 – Taurus

RA 03h 47.0m Dec +24° 07m



Size 110'  
Mag 1.6  
Difficulty Easy

### Equipment

- Naked eye visible (city)

### How to find

- Locate Orion and Taurus
- Draw an imaginary line from the top right star in Orion's body thru Aldebaran and an equal distance to M45

### What to look for

- Naked eye M45 will look like 5 or 6 bright stars arranged in a small dipper shape
- Binoculars reveal a large number of bright and faint stars

# Spring Constellation Charts

The charts are laid out based on their relative sky position. Note the scales and constellation overlaps.

Chart 5 should be ~ 15° lower.

Chart 4 – Ursa Major  
M81 – Bode's Galaxy

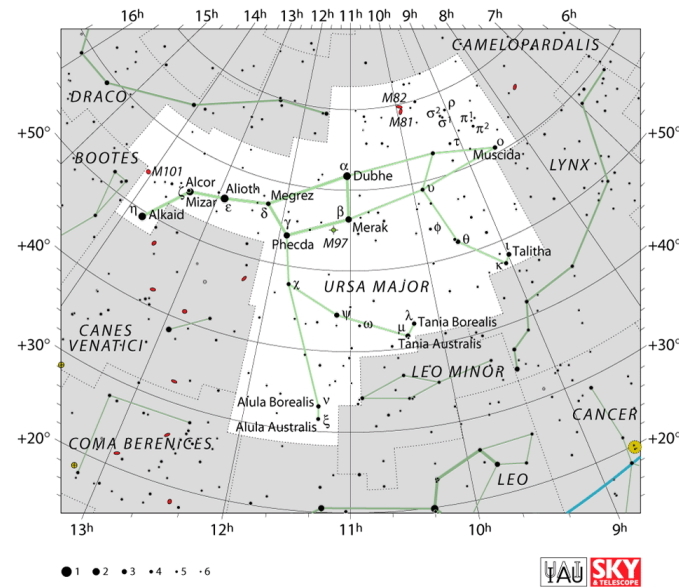


Chart 5 – Serpens Caput  
M5 – Globular Cluster

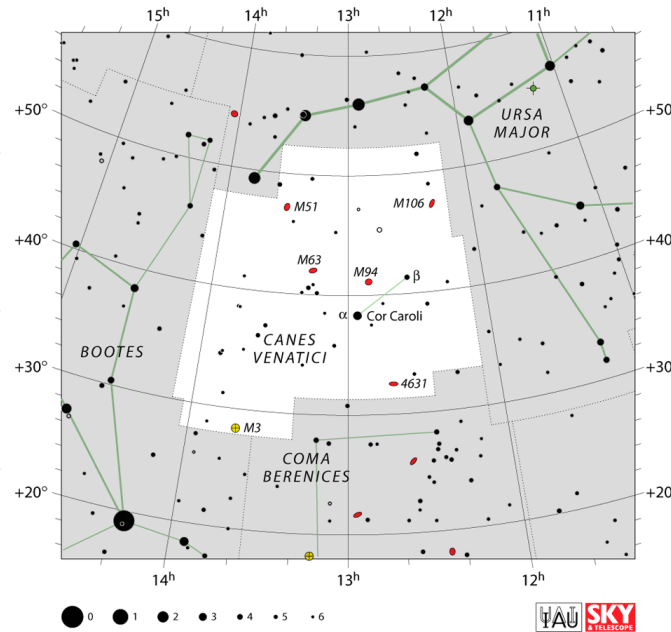
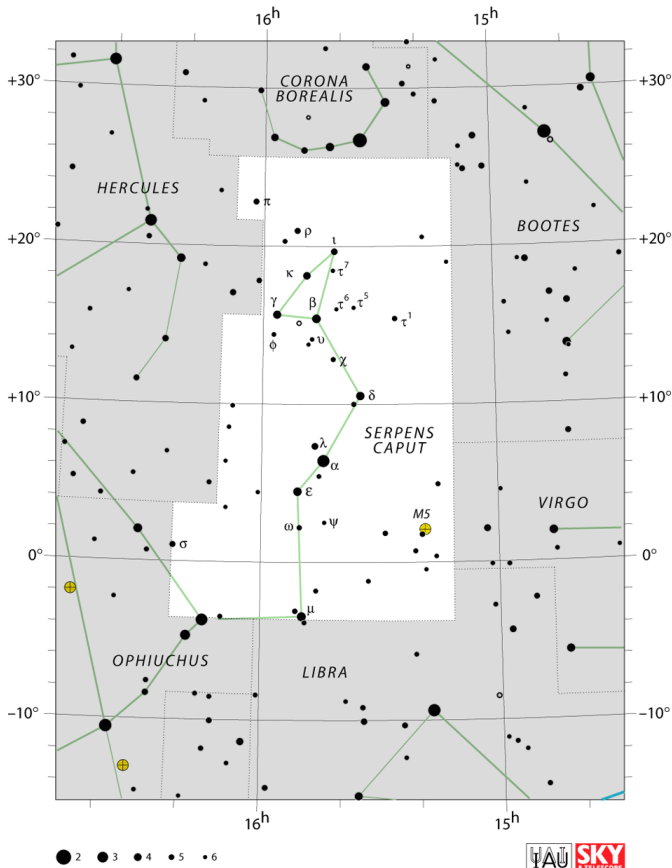
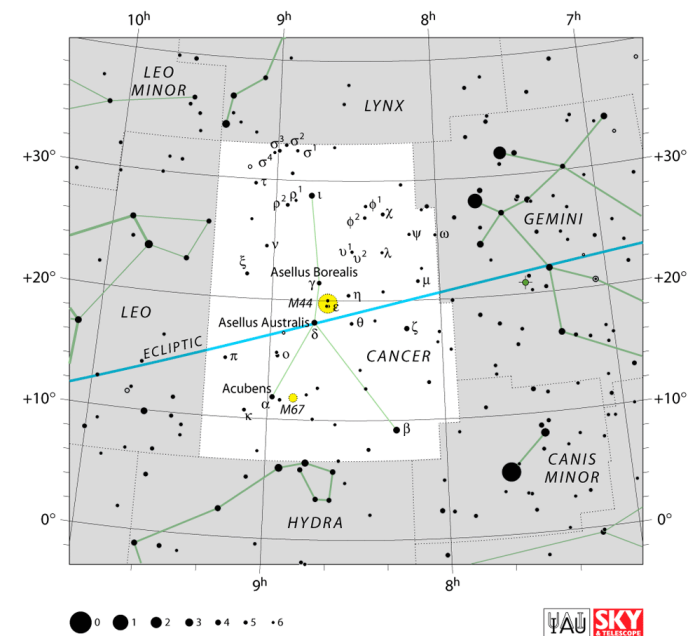


Chart 6 – Canes Venatici  
M3 – Globular Cluster

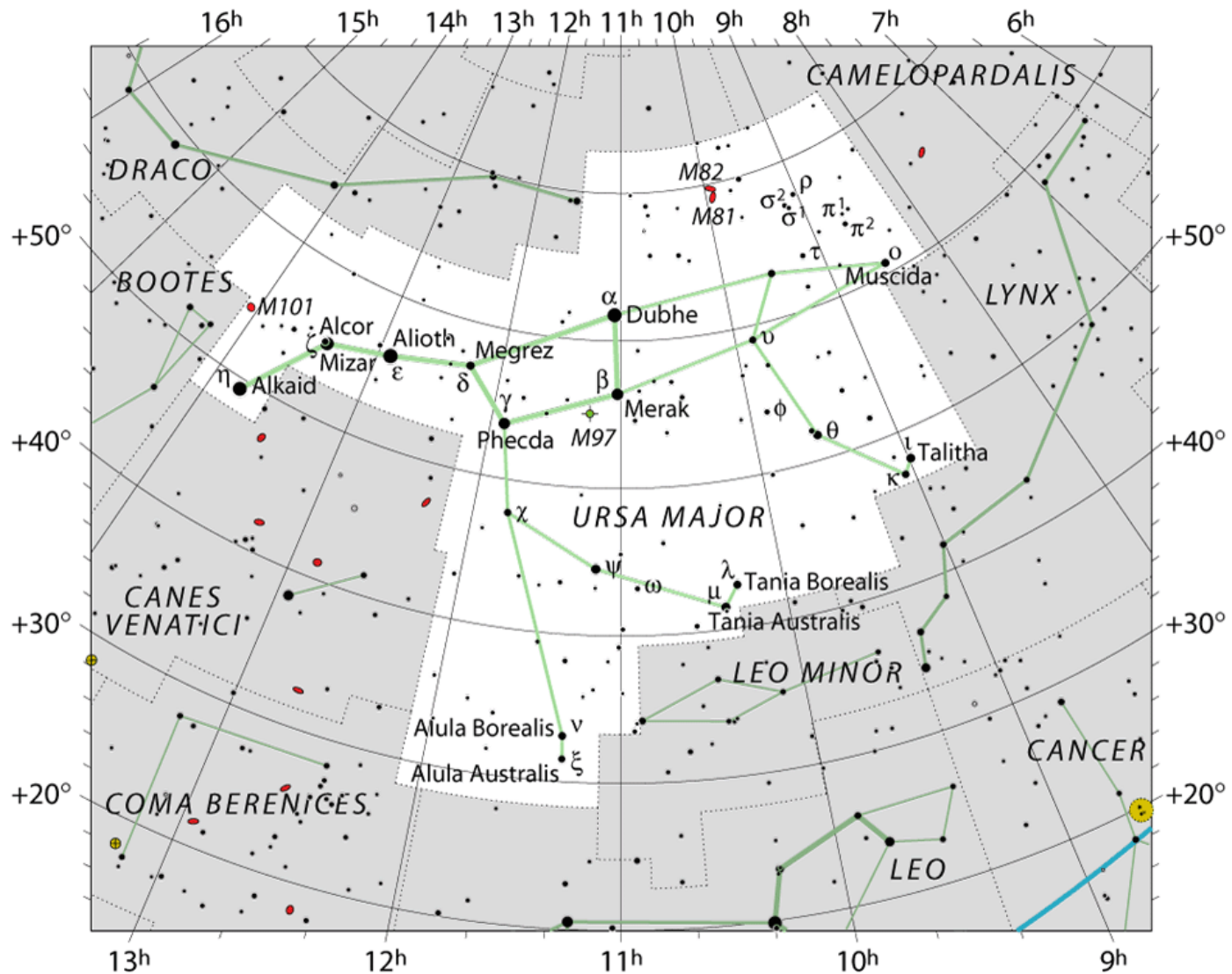
Chart 7 – Cancer  
M44 – Beehive Cluster



# M81 – Bode's Galaxy

## Chart 4 – Ursa Major

RA 09h 55.6m Dec +69° 04m



Size 24' x 12'

Mag 6.9

Difficulty Hard

### Equipment

- Requires binoculars

### How to find

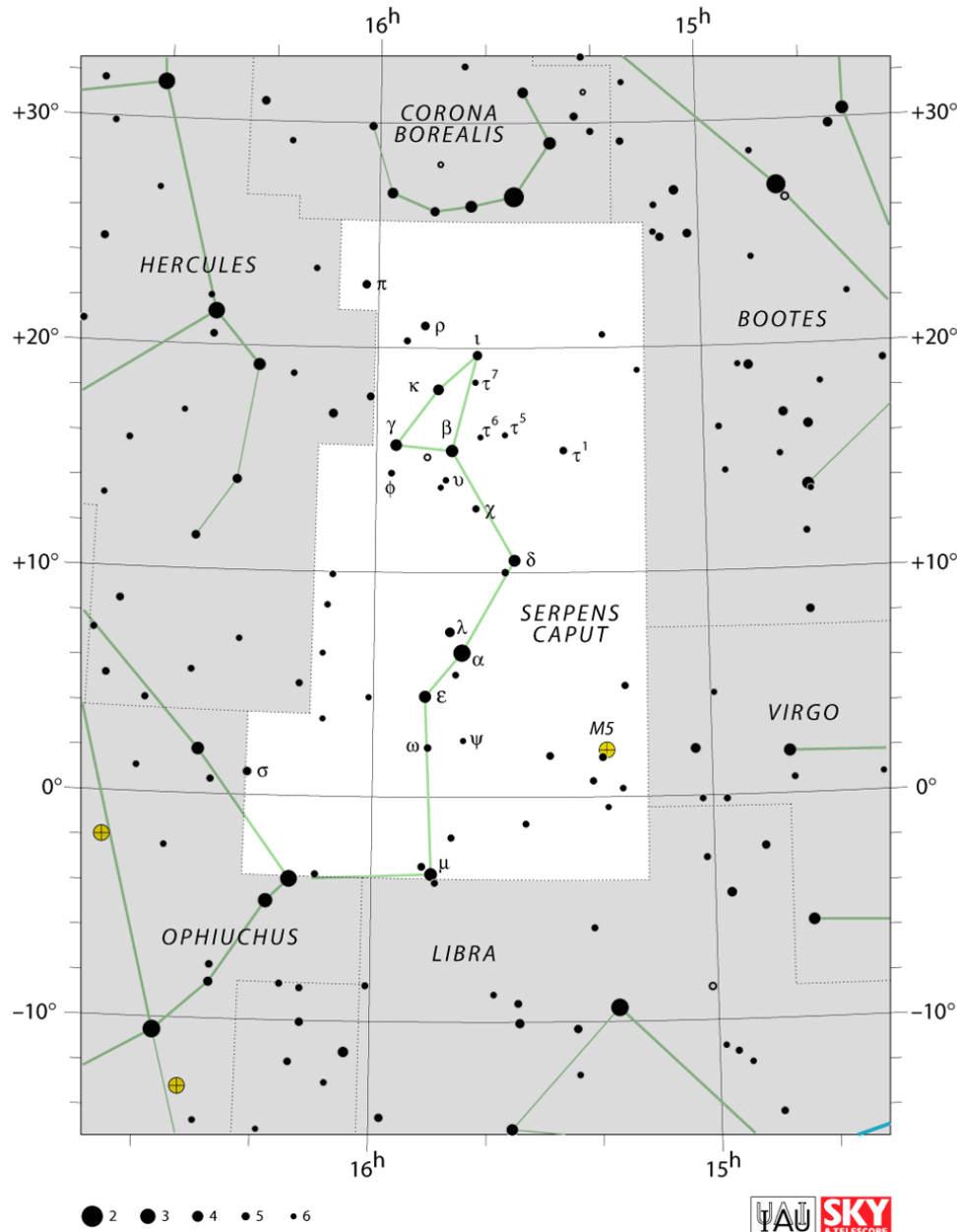
- Locate Ursa Major and the Big Dipper bowl stars Phecda and Dubhe
- Draw an imaginary line from Phecda thru Dubhe and an equal distance to M81

### What to look for

- M81 will look like a very small round smudge
- M82 may also be visible under excellent conditions

● 1 ● 2 ● 3 ● 4 ● 5 ● 6

**M5 – Globular Cluster**  
**Chart 5 – Serpens Caput**  
 RA 15h 18.6m Dec +02° 05m



Size 17.4'  
 Mag 5.7  
 Difficulty Medium

**Equipment**

- Requires binoculars

**How to find**

- First locate Serpens Caput
- Then imagine an equilateral triangle using alpha Serpens and mu Serpens
- M5 will form the third point to the west (right) of those two stars

**What to look for**

- M5 will look like a small, round, hazy patch of light