

The Atlanta Astronomy Club

Charlie Elliot Chapter

This Month's Sky

This Month's Sky – April / May 2012

- The Sky Tonight
- Our Solar System This Week
- This Month's Astro Events
- Target List
- Collimation Basics

The Sky Tonight

- Sunset at 8:11 PM
- Moon sets at 8:48 PM
- Jupiter sets at 9:24 PM
- Venus sets at 11:48 PM

The Sky Tonight

Tomorrow morning:

- Pluto rises at 1:03 AM
- Neptune rises at 4:18 AM
- Mars sets at 4:35 AM
- Uranus rises at 5:48 AM
- Mercury rises at 5:54 AM
- Saturn sets at 6:54 AM
- Sunrise at 6:55 AM

Our Solar System this week

- Mercury - Lost in the glare of sunrise
- Venus - Visible high in the Northwest after sunset
- Mars - High in the South after sunset and 5° to the left of the bright star Regulus
- Jupiter - Low near the Northwest horizon after sunset below the planet Venus
- Saturn - Rises in the Southeast around sunset and visible high in the South after midnight
- Uranus - Lost in the glare of sunrise
- Neptune - Low in the East/Southeast before dawn
- Pluto - Visible in the South before dawn in the constellation Sagittarius

This Month's Astro Events

- April 21 - New moon
- April 22 - Lyrid Meteor shower peaks early in the morning
- April 22 - Jupiter 2° below thin crescent moon at dusk
- April 24 - Venus at greatest eastern elongation
- April 24 - Moon passes 6° south of Venus 10:00pm
- April 30 - Venus at greatest brilliancy (magnitude -4.7)
- May 3 - Saturn and Spica left of waxing gibbous moon
- May 4 - Moon passes 6° south of Saturn and Spica
- May 5 - Eta Aquarid Meteor shower peaks before dawn
- May 5 - Full moon
- May 7 - Ejecta rays visible near southeast lunar limb
- May 19 - Next CE Chapter meeting at 5:00pm

● Polaris

DRACO

HERCULES

Radiant

Vega ●

LYRA

OPHIUCHUS

CEPHEUS

Deneb ●

CYGNUS

Altair ●

AQUILA

SAGITTARIUS

Enif ●

10°

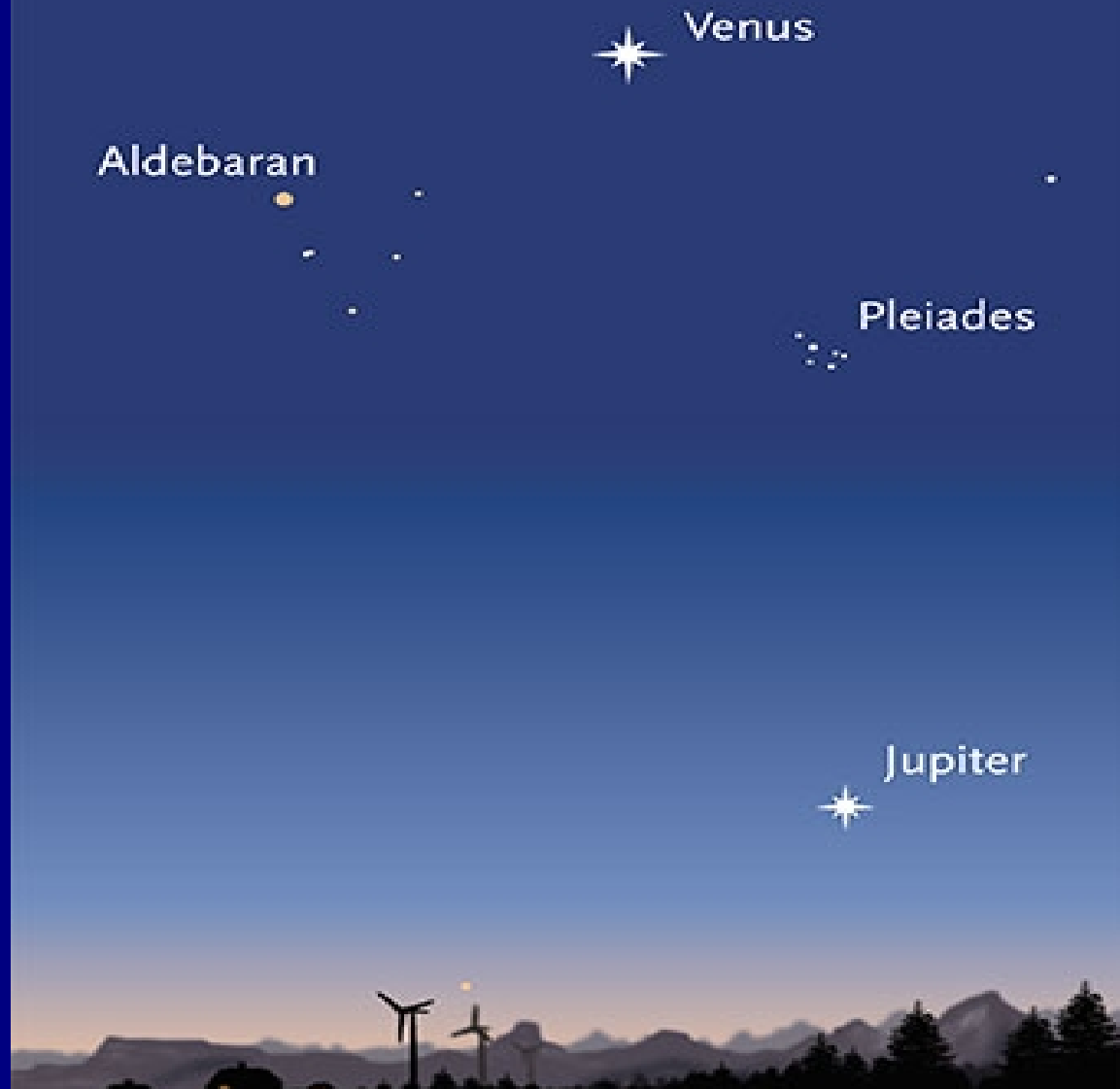
April 22, 3 A.M.
Looking east





Dusk, April 14

1 hour after sunset



Looking West

© 2012 Sky & Telescope

Dusk, April 22 – 25

45 minutes after sunset

Moon
April 25

ζ Tau

β Tau

Venus

Moon
April 24

Aldebaran

Moon
April 23

Hyades

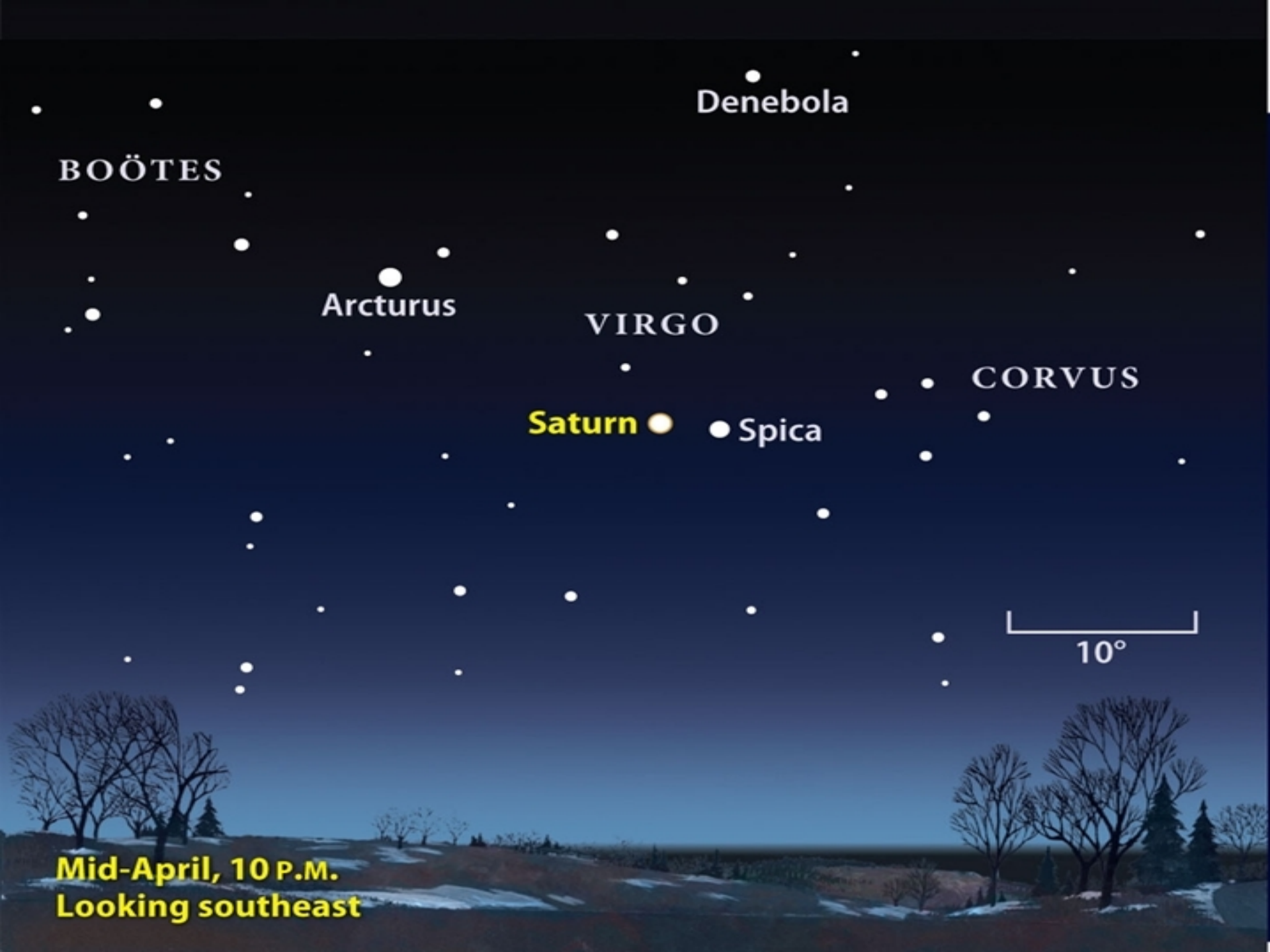
Pleiades

Moon
April 22

Jupiter

Looking West

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Denebola

BOÖTES

Arcturus

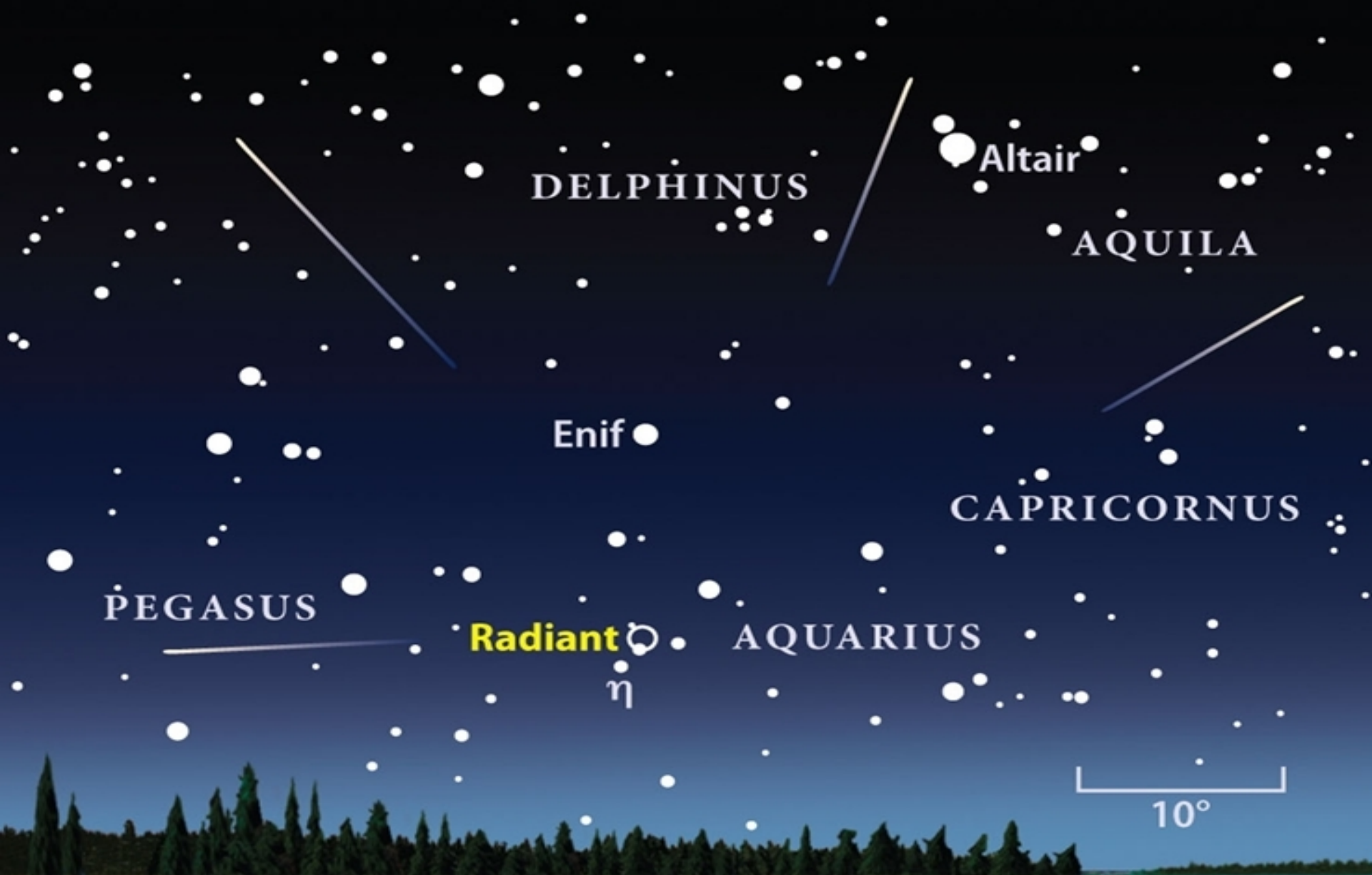
VIRGO

CORVUS

Saturn ● Spica

10°

Mid-April, 10 P.M.
Looking southeast



DELPHINUS

Altair

AQUILA

Enif

CAPRICORNUS

PEGASUS

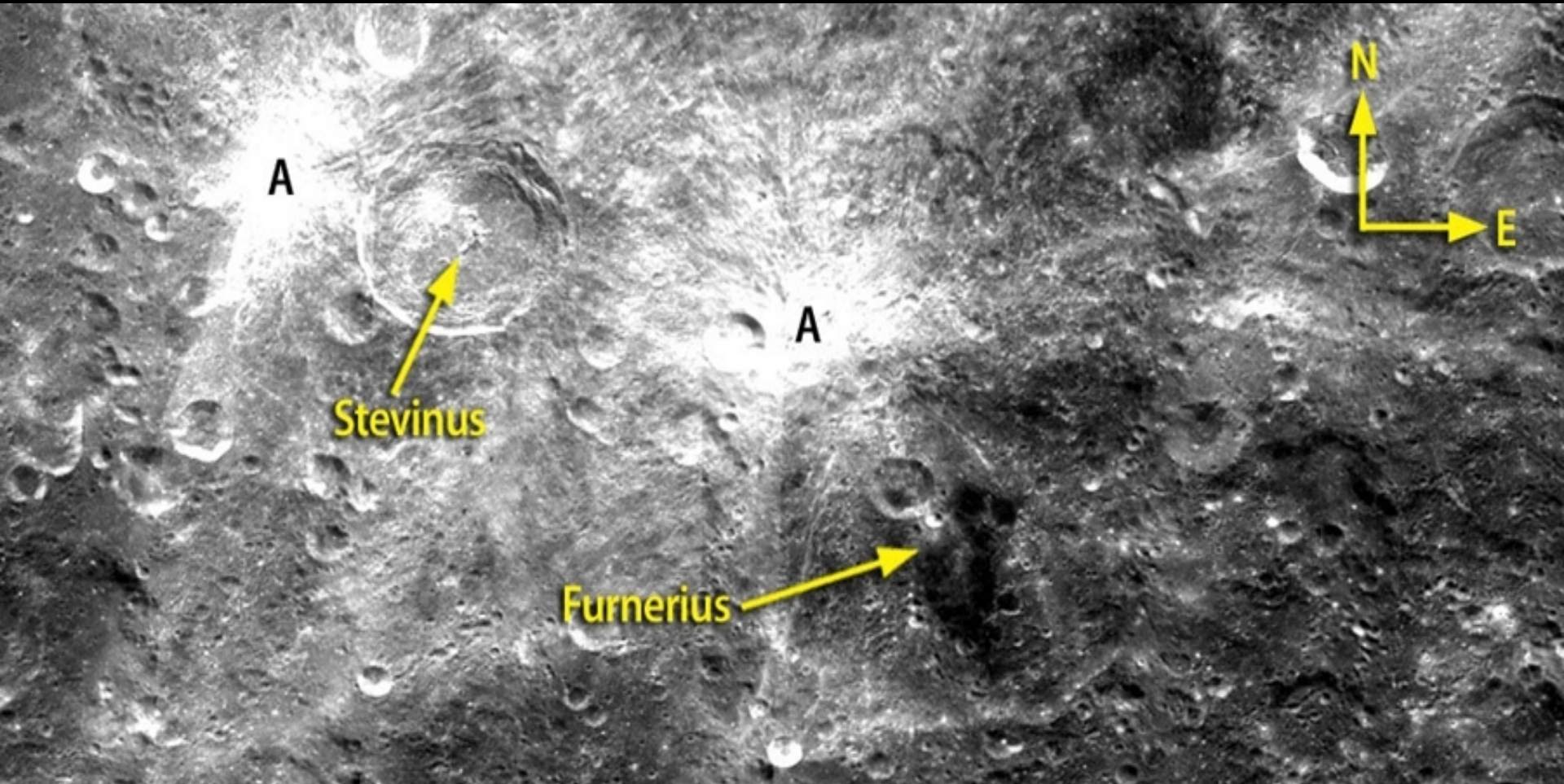
Radiant

AQUARIUS

η

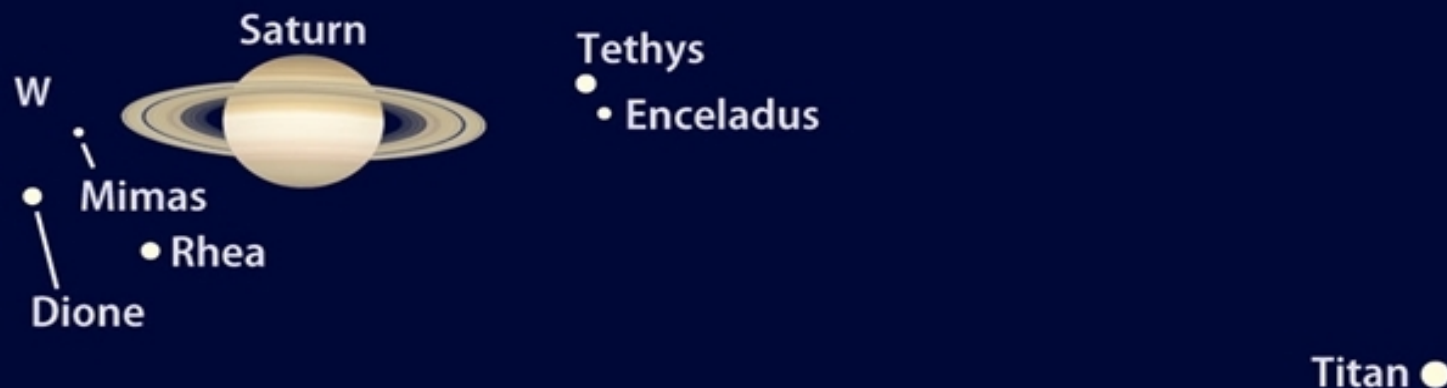
10°

May 5, 4 A.M.
Looking east-southeast



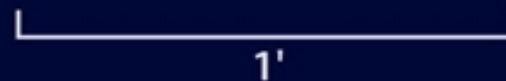
S

Saturn on May 14, 11:30 P.M. EDT



• **GSC 4972:631**

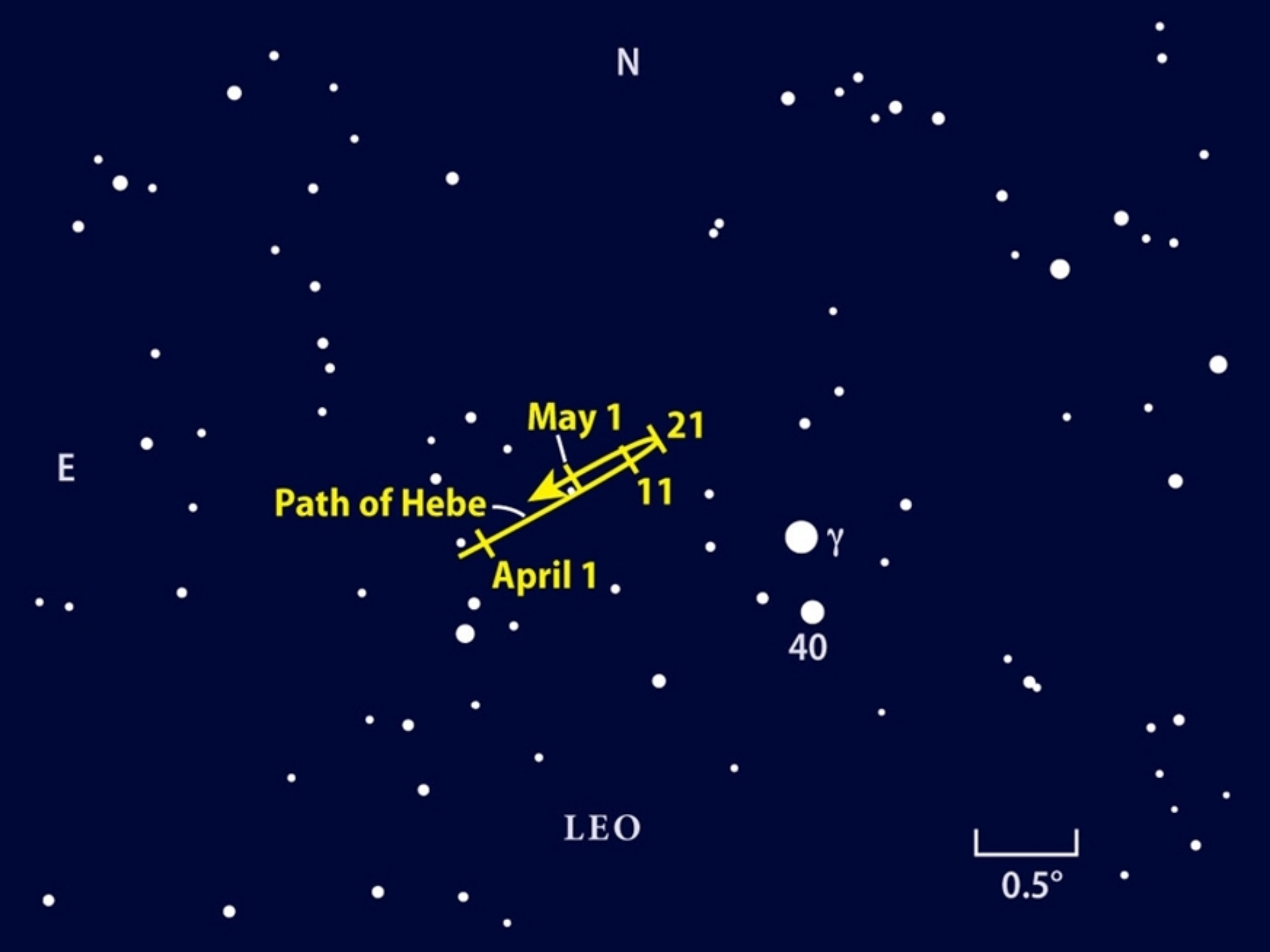
• **Iapetus**



Astro Events

Events visible during the next month.....

- Apr 2012 - Asteroid 6 Hebe glides through Leo
- Apr 2012 - Comet Garradd passes between Ursa Major and the North Pole (Polaris)
- May 2012 - Comet Garradd crosses the constellation Lynx and into Cancer the crab
- May 2012 - Asteroid 5 Astraea glides through the constellation Leo into Virgo the maiden
- May 2012 - Dwarf planet Pluto moves slowly through northern Sagittarius





N

April 1

URSA MAJOR.

6

θ
NGC 2841

11

Path of Comet C/2009 P1

κ

16

E

λ

21

LYNX

26

May 1

2°





N
LEO

May 1

6

ι

11

16

21

26

31

ω

Path of Astraea

VIRGO

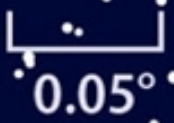
E

0.5°

N



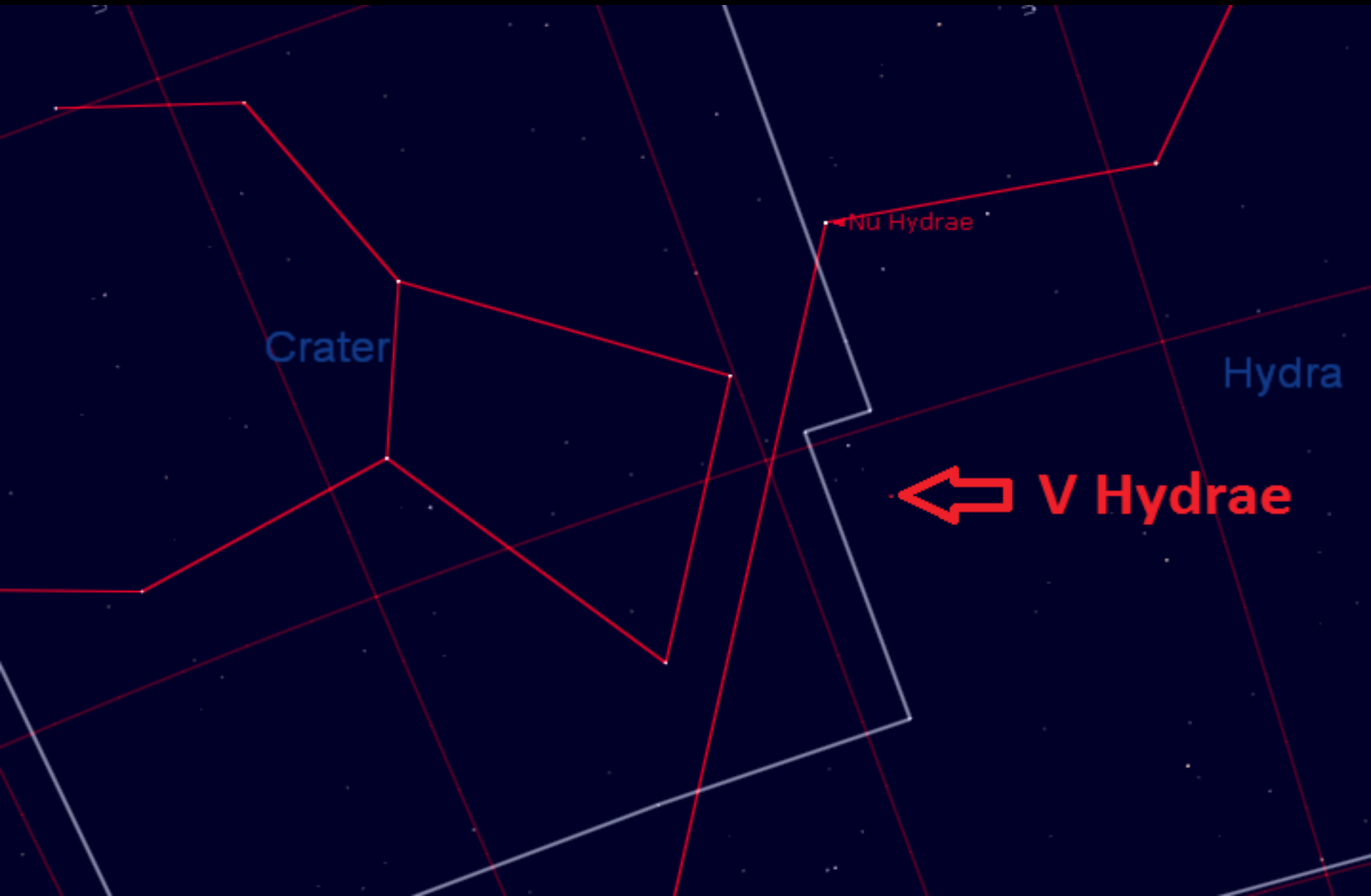
SAGITTARIUS



Target List – Small Telescopes & Binoculars

Object	Type	Mag	Size/Sep	Constellation
Algeiba	Double Star	2.6	4.5"	Leo
Cor Caroli	Double Star	2.9	19.4"	Canes Venatici
24 Comae B	Double Star	5.0	20.2"	Coma Berenices
M51	Galaxy	8.9	10.8' x 6.6'	Canes Venatici
M81	Galaxy	7.8	25' x 11'	Ursa Major
M82	Galaxy	9.2	10' x 5'	Ursa Major
NGC3521	Galaxy	8.9	9.5'	Leo
M37	Open Cluster	6.0	24'	Auriga
M44	Open Cluster	4.0	95'	Cancer
M67	Open Cluster	7.5	30'	Cancer
M97	Planetary Neb	9.9	3.2'	Ursa Major
NGC2392	Planetary Neb	9.2	.78'	Gemini
V Hydrae	Carbon Star	9.3	N/A	Hydra

V Hydrae – RA 10hr 51.6m Decl -21° 15'



Collimation Basics



What is Collimation ? Why bother ?

- Collimation is the alignment of each optical element in your telescope.
- Every telescope has a theoretical performance which which assumes perfect alignment of all optical elements.
- Image processing will not restore loss of contrast due to poor collimation
- Reflectors and Compound telescopes are extremely sensitive to misalignment
- Schmidt Cassegrain telescopes require only the alignment of the secondary mirror but a Newtonian reflector may also require alignment of the primary mirror after the secondary mirror has been adjusted²⁴

Collimation of the Secondary Mirror

- Make sure the atmosphere is steady and your optics are properly cooled down. You will need a good eyepiece, a barlow lens, and a set of allen wrenches.
- Observe a bright star at the approximate magnification of your objective size in millimeters
- 3 screws allow modification of the secondary mirror but the central screw which holds the secondary should not be touched
- The 3 screws should be adjusted in moderation with no screw being overtightened or completely unscrewed. When 1 screw is slightly loosened the other 2 screws must be tightened.
- Each time an adjustment is made the star must be centered in the field of view.
- The rotations on the screws must be small and your final adjustment may be only the flexure of the tool
- A good align will show a perfect symmetrical diffract pattern

MEADE

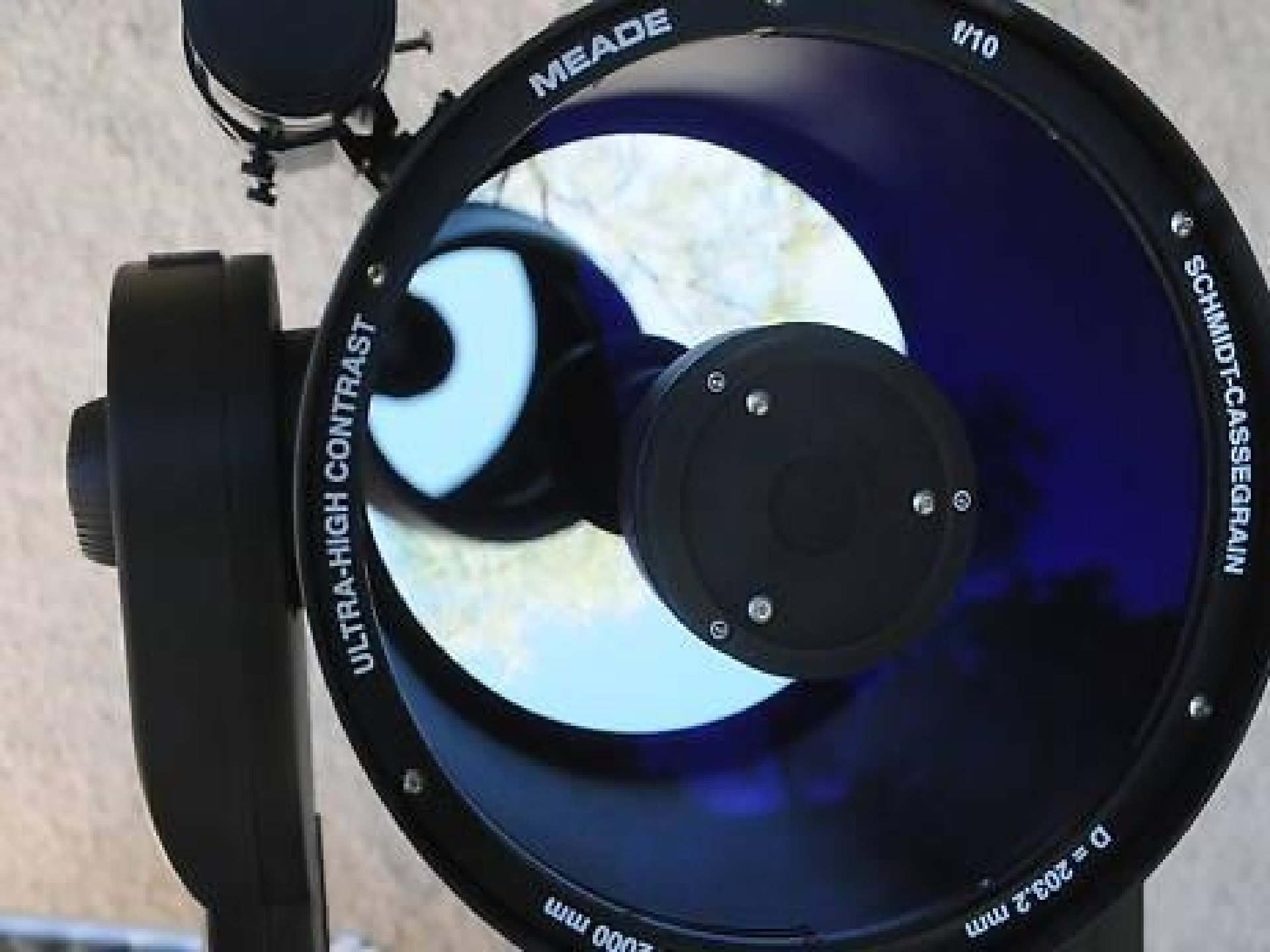
f/10

SCHMIDT-CASSEGRAIN

ULTRA-HIGH CONTRAST

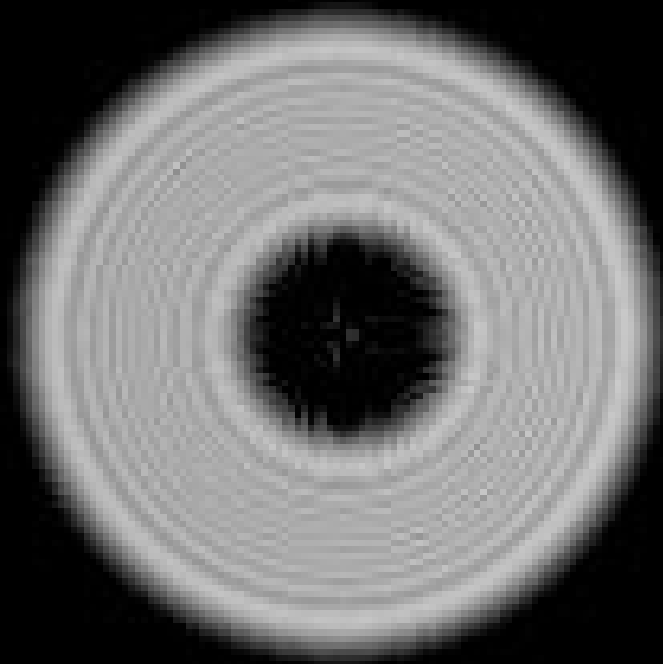
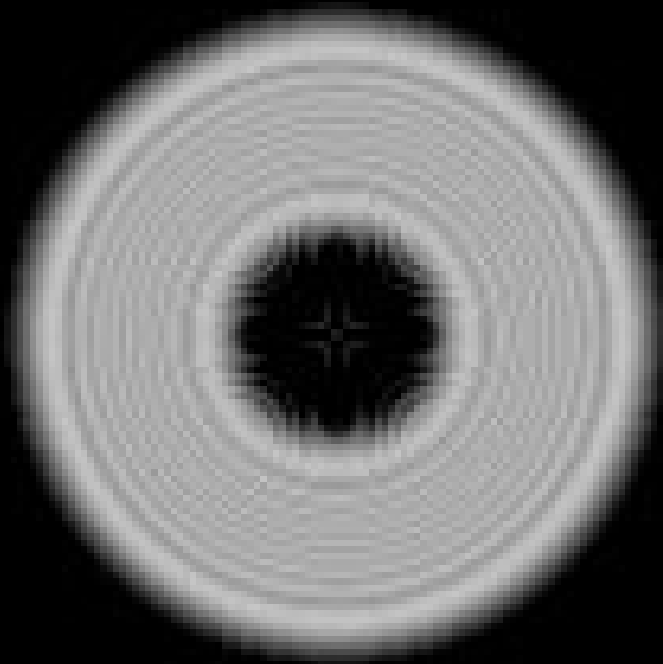
D = 203.2 mm

2000 mm



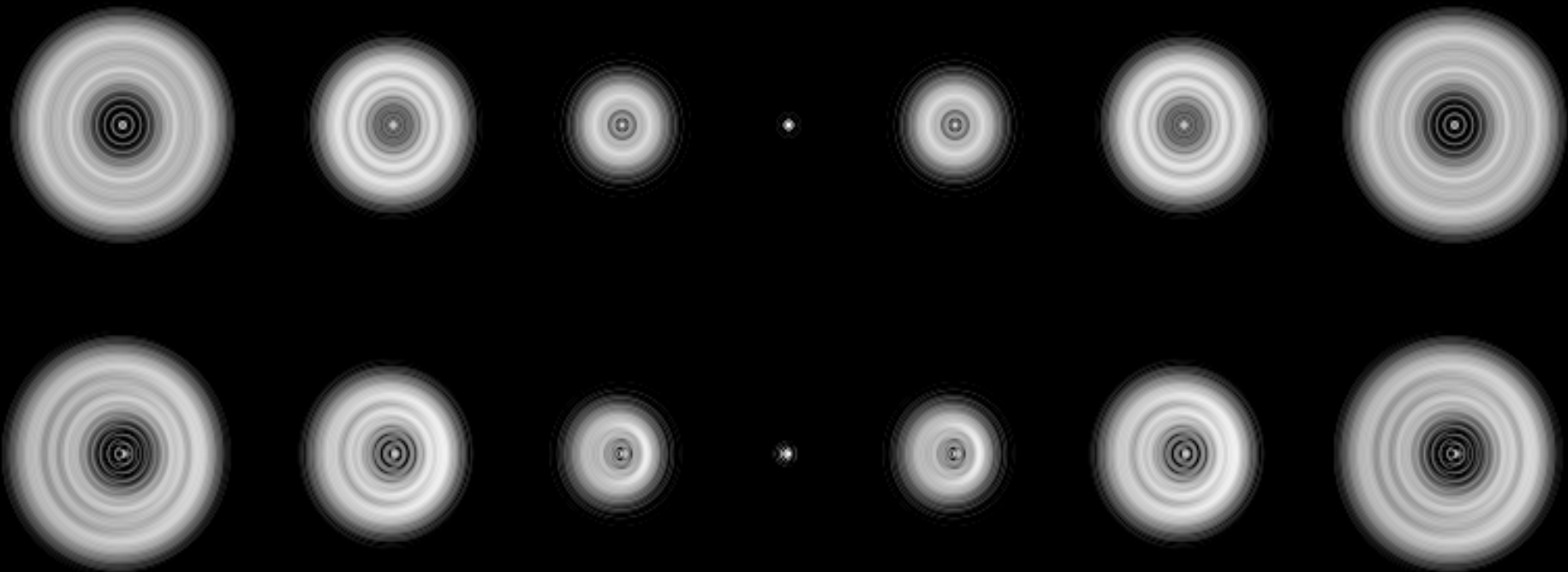
Collimation of the Primary Mirror – Step 1

- The process of aligning the primary mirror is only necessary for a newtonian reflector
- Center a bright star (magnitude 0 to 1.0) in the field of view at the approximate magnification of your objective size in millimeters
- Strongly defocus the star so the image appears as a donut with the central hole being the the shadow of the secondary mirror.
- If the shadow is not centered adjust the primary mirror collimation screw in the direction of the shift until the shadow is centered.



Collimation of the Primary Mirror – Step 2

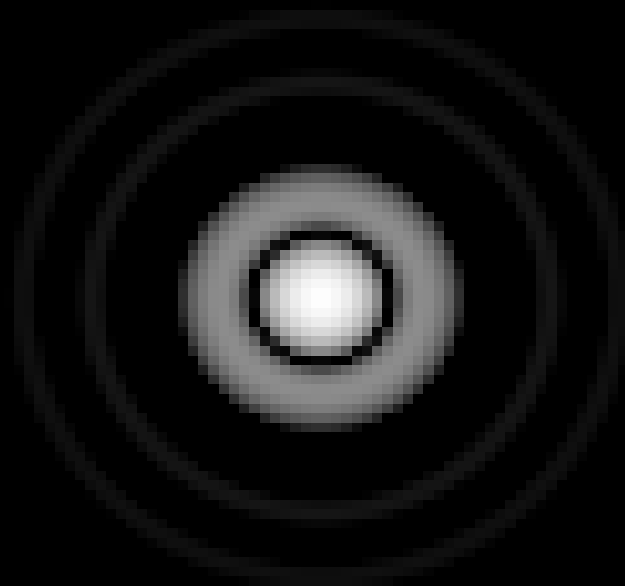
- Center a dimmer star (magnitude 2.0 to 3.0) in the field of view at the approximate magnification double or triple the magnification with a barlow lens.
- Slightly defocus the star back and forth so the image appears as a series of concentric rings with a bright point in the center.
- If the bright point is not centered then adjust the primary collimation screw in the direction of the shift until the bright point is perfectly centered within the innermost ring



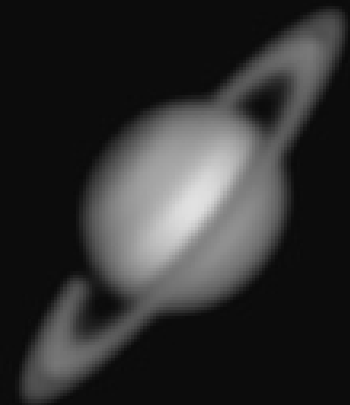
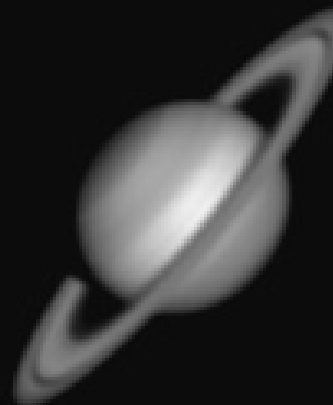
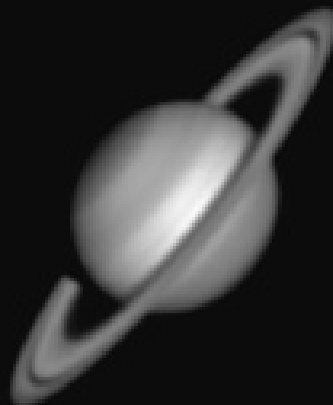
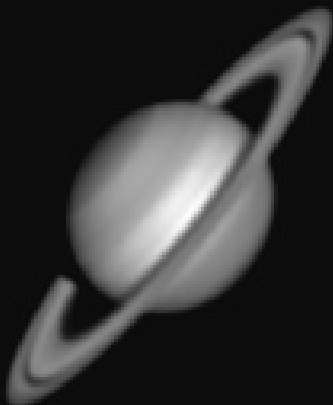
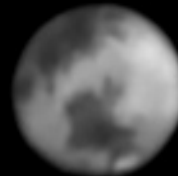
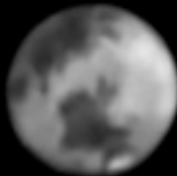
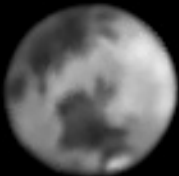
Collimation of the Primary Mirror – Step 3

- Carefully focus the star and the Airy pattern appears with a false disk surrounded by diffraction rings of decreasing brightness.
- If the collimation is good the first diffraction ring around the disk will be complete and uniform.
- If the first ring is not complete and uniform you must very slightly adjust the collimation screws less than $1/20^{\text{th}}$ of a turn as in the previous steps





The Effect of Collimation on Planetary images



Web Links

- Astronomy Magazine
 - www.astronomy.com
- Sky & Telescope Magazine
 - www.skyandtelescope.com
- The Old Farmer's Almanac
 - www.almanac.com
- Thierry Legault – The Collimation
 - legault.perso.sfr.fr/collim.html
- Astro Guyz
 - www.astroguyz.com

Clear Skies!