

# Night Visions

January 2017 Issue

*Newsletter of the Baton Rouge Astronomical Society*

**Next Meeting: Monday, January 9<sup>th</sup> at 7PM at HRPO**  
(2<sup>nd</sup> Mondays, Highland Road Park Observatory)

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## President's Message

A new year is here, and we look forward to all that can happen, and we look back on all that has happened. In 2016, BRAS gained some new members, and on December 27<sup>th</sup> we lost one of our founding members - Wally Pursell. Wally was active in BRAS to the last, a friend to everyone, and will be sorely missed. Due to the suddenness of this event and the rush of the holidays, we will include a memorial page to Wally in our February newsletter. Please send Michele your photos to newsletter@brastro.org. Meanwhile, please feel free to visit Wally's online Legacy Page to read the farewell comments and add your own at:

### Wallace Pursell's Legacy Page

<http://www.legacy.com/guestbooks/theadvocate/wallace-pursell-condolences/183224987>

Everyone is invited to the BRAS business meeting on Jan. 4<sup>th</sup> at HRPO – starting at 6:00 PM. At the next regular membership meeting on Jan. 9<sup>th</sup>. Dr. Brad Schaefer will be giving the program:

### *What Will You Do When the Next Carrington Event Strikes Earth?*

2017 BRAS dues are due! See Trey at the meeting, or send the dues in with the membership form (available on line or at HRPO).

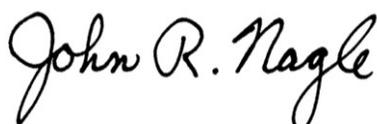
I want to thank the membership for re-electing me for a second term as President for 2017.. I am looking forward to working with you all this New Year, and to all the opportunities it will provide us via outreach to enable people to enjoy the wonders and joy of the night sky and astronomy.

BRAS will hold its first "Sidewalk Astronomy" in almost 2 years at Perkins Rowe on Jan. 3<sup>rd</sup>, near the fountain, and if weather is bad, it will be held on Jan. 5<sup>th</sup>. HRPO's "Learn to Use Your Telescope" will be held on Jan. 7<sup>th</sup> for new owners of telescopes – we have enough volunteers for this.

Do not forget that the Rockefeller Wildlife Preserve weekend is coming up – see Don Weinell about attending. The Hodges Gardens Star Party (BRAS's star party) is coming up also – see Don about this also – we need BRAS members to participate!

In April, the annual IAD (International Astronomy Day) is happening. If you want to volunteer, see Chris Kersey. There will be many opportunities to volunteer and help out this year – help BRAS spread the love of the night sky and astronomy – volunteer when you can.

Clear Skies,



John R. Nagle  
President of BRAS  
Observing Chairperson

### 2017 Officers:

President: John Nagle  
Vice-President: Craig Brenden  
Secretary: Ben Toman  
Treasurer: Trey Anding

### BRAS Liaison for BREC:

Chris Kersey

### BRAS Liaison for LSU:

Greg Guzik

### Committees/Coordinators:

#### Outreach:

Ben Toman

#### Observing:

John Nagle

#### Light Pollution:

Thomas Halligan

#### Webmaster:

Frederick Barnett

#### Newsletter Editor:

Michele Fry



## Secretary's Summary of December Meeting

(after our festive Christmas Dinner)

John Nagle, presiding  
Ros filling in as Secretary for Ben

- John started off by inviting all interested members to the monthly business meetings. As a rule these occur on the Wednesday after the first Monday in the month at 6:30 pm at the Observatory.
- We discussed donating a telescope as a prize for International Astronomy Day in the spring.
- We also discussed proposals for \$1,000 and \$5,000 grants for outreach for the solar eclipse in August; the deadline for submission is January 27, 2017.
- Don mentioned that the Rockefeller Star Gaze is coming up the last weekend in January (1/27, 1/28). He will have more information at the next meeting
- Don will have more info on the Hodges Gardens Star Party taking place toward the end of March (3/22-3/26). He encouraged anyone who was going to Hodges to go ahead and make reservations now as cabins usually go pretty quickly.
- Sidewalk astronomy at Perkins Rowe was a bust recently because of the weather. There may be another event coming up on a Tuesday or Thursday one of the first weeks in January.
- The Observatory is looking to the membership for volunteers to help out with "Learn to Use Your Telescope" and "Learn to Use Your Binoculars" classes in January.
- Wally encouraged all the members to make themselves familiar with the BRAS Charter which is hanging by the door to the BRAS closet at the Observatory. He and John have been working on revising and updating the by-laws for BRAS. All members will get something in the mail soon on this.
- Officers were not term limited at this meeting; therefore most of those serving returned to their positions. We did need to fill a vacancy at vice-president; Craig was tapped to fill this.
- Trey announced that he was still collecting dues for the new year.
- The potluck dinner was followed by a Christmas game organized by Michele Fry. This was followed by a raffle for binoculars, a couple of books, red goggles, and several pictures.
- It was noted that Ephraim Craddock won second place in the 2016 Horkheimer/O'Meara Journalism Award. His essay "Examining the Mystery of Tabby's Star" is in the current December issue of the Reflector, and Michele posted a photo and links to the article in our December newsletter.
- Chris thanked the club for its support of the Observatory. He also mentioned the donation drive for this year is going on until the end of the month.



**Roslyn Readinger**  
**BRAS Substitute Secretary for Ben Toman**





## BRAS Outreach Report

Hi Everyone,

It's time to start the New Year off by trying to jump start some interest in astronomy. We have some upcoming events that could use your help.

### **Tuesday, January 3rd**

Sidewalk Astronomy  
Perkins Rowe Shopping Center  
6:30pm-9:00pm  
(Telescope viewing)

### **Saturday, March 11th**

Rockin' at the Swamp  
Bluebonnet Swamp and Nature Center  
9am-4pm  
6-8 volunteers needed  
(Solar observing, demos, info)

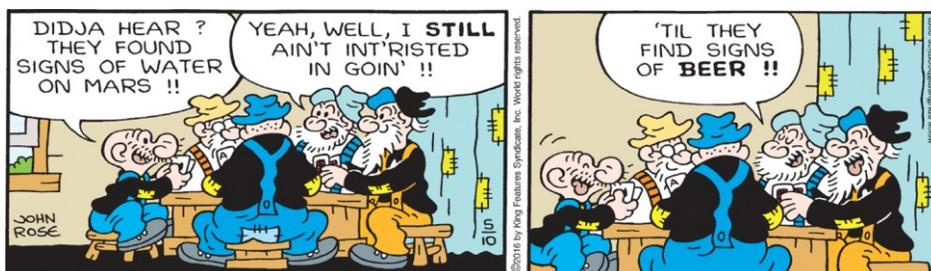
We also have some more events coming in April and May so be on the lookout for those requests as we get further along into the year.

Hopefully, you made a New Year's resolution to do more outreach events with the club! Take it from me, these events are a great way to help out the club, educate the community and even increase your own knowledge. I think I learn something new each time I volunteer for an event.

Please let me know as soon as possible if you can help out with one of these events so I can start to get a schedule going.

Clear Skies,

Ben Toman  
Outreach Coordinator





## BRAS Light Pollution Committee Report

**2<sup>nd</sup> Mondays, from 6:15 pm to 7:00pm, before the BRAS public meeting.**

One does not need to be a BRAS member to attend.

No meeting in December. Several items will be on the agenda during January's meeting, including how to achieve in 2017 the goal of 200 GaN measurements that was *not* reached last year.

We are still looking for a secretary to take notes at the meetings.



This meeting will...

- introduce the general public to the LPC
- explain the LPC's benefit to amateur astronomers, nature lovers, homeowners and taxpayers
- summarize the accomplishments of BRAS in this endeavor

A handwritten signature in black ink that reads "Thomas J. Halligan". The signature is fluid and cursive.

Thomas Halligan  
Light Pollution Chairperson

***Space is right overhead—double stars, nebulae, the Milky Way Galaxy and other galaxies. We can see it if we let it through.***



# Question:

# What's between a

# Nova and a Supernova?

*(answer on another page)*



## Recent Entries in the BRAS Forum

***Below are selected additions to the BRAS Forum. There are also nine active polls. The Forum has reached 4300 posts.***

The World Loses [John Glenn](#)  
New [Light Pollution Filter](#)  
At Least Five December Days with [Geomagnetic Activity](#)  
Rain Trounces View of [Geminids](#)  
[Asteroid 2016 YJ](#) Makes Close Pass by Earth



## Our 2016 Christmas Dinner



**Answers**  
**A pretty good Nova!**





## **BRAS's 20/20 Vision Campaign**

### **GLOBE at Night: January Dates TBA**

#### **OBSERVATIONS NEEDED FOR Shera's SCHOOL PROJECT**

BRAS is in the process of assisting yet another student at St. Joseph's Academy acquire raw data. This young lady (named Shreya) will need data concerning how light pollution effects the view of certain variable stars while they are at their minima.

Below is our suggested list of variable stars for Shreya. Dates are the times during which the star is at least thirty degrees above the horizon at 9pm Standard Time and 10pm Daylight Time. All periods (time from maximum to maximum) are fewer than ninety days. All chosen stars have a difference of at least 1.0 between maximum and minimum magnitude.

#### ***RX Leporis***

Magnitude Range: 5.4 to 7.4    Period: 75 days    Class: K  
Dates: 11 December to 9 March

#### ***T Monocerotis***

Magnitude Range: 5.6 to 6.6    Period: 27 days    Class: G  
Dates: 14 December to 12 April

#### ***S Leporis***

Magnitude Range: 6.0 to 7.6    Period: 89 days    Class: K  
Dates: 12 January to 4 March

#### ***ST Ursae Majoris***

Magnitude Range: 6.0 to 7.6    Period: 81 days    Class: M  
Dates: 12 February to 15 July

#### ***g Herculis***

Magnitude Range: 4.4 to 6.0    Period: 80 days    Class: M  
Dates: 29 April to 28 September

#### ***R Lyrae***

Magnitude Range: 3.9 to 5.0    Period: 46 days    Class: M  
Dates: 5 June to 6 November

#### ***Sheliak***

Magnitude Range: 3.3 to 4.4    Period: 12.9 days    Class: B  
Dates: 8 June to 31 October

#### ***X Cygni***

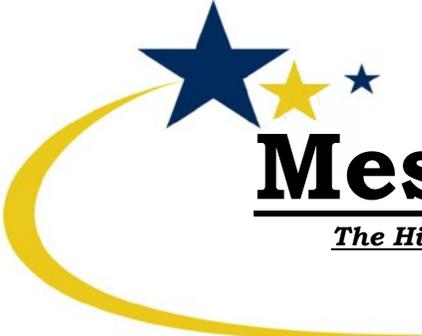
Magnitude Range: 5.9 to 6.9    Period: 16.4 days    Class: F  
Dates: 5 July to 29 November

#### ***Algol***

Magnitude Range: 2.1 to 3.4    Period: 2.87 days    Class: B  
Dates: 9 October to 9 March

**Observations should only be made when the Moon is below the horizon. Each observation should include the location's GLOBE at Night measurement or SQM measurement. Use all of these parameters to report your results to [observatory@brec.org](mailto:observatory@brec.org).**





# Messages from HRPO

The Highland Road Park Observatory will be closed on 24 June.



## FRIDAY NIGHT LECTURE SERIES

*all start at 7:30pm*

**6 January: “2016—The Space Year in Review”** The [death of a legend...an arrival at Jupiter](#)...the detection of [further proof of relativity](#). Which was your favorite story of 2016? Which was the most profound?

**13 January: “Star Clusters”** [Clusters of stars](#), whether “open” or “globular”, each have their own unique personality and appeal. LSU physics undergraduate Rory Bentley returns with an overview of the most famous clusters of our skies.

**20 January: “Wonders of the Winter Sky”** BREC Education Curator Amy Brouillette will take the audience on a fascinating tour of Baton Rouge’s winter season. She’ll highlight the celestial gems that will sparkle throughout the [next three months](#)—gems visitors will be able to see live if they continue to visit HRPO!

**27 January: “Apollo 1 Fiftieth Anniversary”** BREC Center Supervisor Tom Northrop recounts the [first loss of American astronaut life](#), when a practice run-through of procedures led to the deaths of Gus Grissom, Ed White and Roger Chaffee.

## SCIENCE ACADEMY

*Saturdays from 10am to 12pm*

*For ages eight to twelve. \$5/\$6 per child.*

**7 January:** “Expedition 1”

**14 January:** “Calendars and Time Keepers”

**21 January:** “Winter Day”

**28 January:** “Venus”

## ONE-TIME CALLS FOR VOLUNTEERS

**\*Saturday 7 January, 5pm to 7pm.** *Three or four volunteers.* **Learn Your Telescope.** Showing patrons how to set up and use their personal telescopes. Moderate difficulty.

**\*Saturday 28 January, 7pm to 10pm.** *Two or three volunteers.* **Evening Sky Viewing Plus.** Telescope operation, physical science demonstrations, front desk duty. Easy to moderate difficulty.

## ONGOING CALL FOR VOLUNTEERS

HRPO periodically needs BRAS volunteers for crafting (gluing, cutting, painting, etc.); training is offered for these easy to moderate tasks. We also have plenty of “grunt work”. Also, we would more than welcome any who can help for at least one or two hours anytime during Winter Rocket Camp. We are asking any BRAS volunteers with time to assist. Thank you.





# Observing Notes:

by John Nagle

## Eridanus – The River

Position: RA 3.25, Dec. -29°

### *Named Stars*

**Achernar (Alpha Eri)**, “*Ākhir an-nahr*”, “*end of the river*”, mag. 0.45, 01 37 42.73 -57 14 12.0, is a blue-white main sequence dwarf star (9<sup>th</sup> brightest in the night sky – the bluest and hottest among the 10 brightest stars in the sky) with a companion in close orbit. The two stars are separated by about 12.3 au and orbit each other with a period of 14-15 years. **Achernar** is a very fast rotator, and, as a consequence, it is the least spherical star studied in the **Milky Way** galaxy. It has the shape of an oblate spheroid, and its diameter at the equator is 56% greater than its polar diameter. The star has a circumstellar disk of gas, also a consequence of fast rotating.

**Cursa (Beta Eri)**, “*Al Karsiyy al Jauzah*”, “*the foot stool of the giant*”, mag. 2.78, 05 07 51.03 -05 05 10.5, is a blue-white giant star that is also a fast rotator, with a projected rotational velocity of 196 km/sec. **Cursa** has a visual companion at mag. 10.90, located 120 arc seconds away at 3° northwest of **Rigel in Orion**. The “foot stool of the giant” refers to a star association that includes **Lambda Eri**, **Psi Eri**, and **Tau Orionis**.

**Zaurak (Gamma Eri)**, **34 Eridani**, “*boat*”, mag. 2.97, 03 58 01.73 -13 30 29.7, is a yellow star. The small visual companion at 53” separation has no real connection.

**Rana (Delta Eri)**, “*the frog*” in Latin, mag. 2.97, 03 58 01.73 -09 45 54.7, is a sub-giant star.

**Sadira (Epsilon Eri)**, “*Al Sadirah*”, mag. 3.72, 03 32 56.42 -09 27 29.9, is an orange main sequence star to **Earth**; has two asteroid belts, a dust disk, and one giant planet with an orbital period of 7 years and one unconfirmed planet. One of the nearest naked eye stars.

**Zibal (Zeta Eri)**, mag. 4.80, 03 15 50.03 -08 49 11.4.

**Azha (Eta Eri)**, “*hatching place*”, mag. 3.89, 02 56 25.60 -08 53 51.4

**Acamar (Theta Eri)**, “*Ākhir an-nahr*”, “*the end of the river*”, is a binary star. **Theta<sup>1</sup> Eri**, mag. 2.88, 02 58 15.72 -40 18 17.0, is a blue-white star; **Theta<sup>2</sup> Eri**, mag. 4.35, 02 58 16.30 -40 18 16.0, is also a blue-white star. The two stars are separated by 8.3 arc seconds, and the orbital period seems to be several thousand years. **Theta<sup>1</sup> Eri** appears to be a spectroscopic binary, with an unknown period.

**Acamar (Theta Eri)** used to represent the end of the celestial river, **Eridanus**, now it is the brighter star **Achernar (Alpha Eri)** that holds that distinction. Since **Alpha Eri** is not visible from **Greece**, **Acamar (Theta Eri)** was chosen to mark the river’s end by **Hipparchus** and **Ptolemy**.

**Beid (Omicron<sup>1</sup> Eri)**, mag. 4.04, 04 11 51.95 -06 50 16.0, is a double star.

**Keid (Omicron<sup>2</sup> Eri)**, **40 Eri**, “*gaya*”, “*egg shells*”, mag. 4.43, 04 15 17.64 -07 38 40.4, is a triple star system. The primary is a main sequence yellow dwarf star at mag. 4.48, with a white dwarf star at mag. 9.7 as a companion, and the third member is a red dwarf star at mag. 10.8. The A-B separation (a wide pair separation) is 82.8 “and an orbital period of 8000 – 9000 years. B-C forms a close visual binary with an orbit of 252 years and a separation of 9.3”. **Omicron<sup>2</sup> Eri** is the 8<sup>th</sup> nearest star to **Earth**. The red dwarf star, **40 Eri C**, is a flare star and also has a designation of **DY Eri**. **40 Eri A** is the **Gene Roddenberry** accepted home of **Star Trek’s** planet **Vulcan**.

**Angetenar (Tau<sup>2</sup> Eri)**, “curve of the river”, mag. 4.76, 02 51 02.35 -21 00 14.3, is the only named star of the 9 stars designated as **Tau<sup>1</sup> Eri** thru **Tau<sup>9</sup> Eri**.

**Theemin (Upsilon<sup>1</sup> Eri)**, mag. 4.49, 04 33 30.65 -29 45 57.0, is a triple star system.

**Beemin (Upsilon<sup>2</sup> Eri)**, mag. 3.81, 04 35 33.07 -30 33 44.3, is the 2<sup>nd</sup> of three stars – the 3<sup>rd</sup> star, **Upsilon<sup>3</sup> Eri**, mag. 3.97, 04 24 02.17 -34 01 01.2, is not named.

**Rabah al Nahr (Omega Eri)**, mag. 4.36, 04 52 53.68 -05 27 09.9.

**Sceptum (53 Eri)**, mag. 3.86, 04 38 10.87 -14 18 12.9.



## Deep Sky

There are no Messier objects in Eridanus.

**NGC 1291, Bennett 12 – sometimes called NGC 1269, “Golden Eye Galaxy”**, mag. 8.5, 03 17.3 -41 06, 10.5' x 9.1' in size, is a very bright, pretty large, and round galaxy; very bright nucleus. Located 3.7° east-southeast of **Theta Eri**. **NGC 1291** is a ring galaxy that has an unusual structure of its outer ring and inner bar.

**NGC 1535, Bennett 22, Best 52, PK206-40.1, “Cleopatra’s Eye”**, mag. 9.6 (photo), 04 14.3 -12 44, 21" in size, is a very bright, small, round planetary nebula; traces of a ring structure; central star at mag. 12.2. Shows as a blue-white colored disk in small telescopes. The nebula actually consists of two rings, a bright inner ring and a faint outer ring – not visible in an 8 inch telescope. Located 4° east-northeast of **Gamma Eri**.

**NGC 1395**, mag. 9.7, 03 38.5 -23 02, 5.0' x 4.6' in size, is a bright, very small, and elongated galaxy; has a very bright center.

**NGC 1404**, mag. 9.7, 03 38.9 -35 36, 4.0' x 3.3' in size, is a very bright, pretty large, and roundish galaxy; bright nucleus. Member of the **Fornax Galaxy Cluster**. A bright star is superimposed; faint galaxies nearby.

**NGC 1407**, mag. 9.7, 03 40.2 -18 35, 5.0' x 4.6' in size, is a very bright, large, and round galaxy; small, bright, diffuse nucleus. Paired with **NGC 1400**, mag. 11.0. Brightest member of a group of galaxies.

**NGC 1232, Bennett 10A, Best 31**, mag. 9.9, 03 09.8 -20 35, 7.8' x 6.9' in size, is a pretty bright, quite large, and round galaxy; thin arms; very small, bright, diffuse nucleus. **NGC 1232A** is a satellite galaxy. Part of the **Eridanus Cluster of Galaxies**. Located 2.5° west-northwest of **16 Eri (Tau<sup>4</sup> Eri)**, just north of the **Fornax** constellation.

**NGC 1532**, mag. 9.9, 04 12.1 -32 52, 11.0' x 3.4' in size, is a bright, very large, and very elongated galaxy; patchy arms; dust lane. Paired with **NGC 1531** (mag. 12.1) – a dwarf companion galaxy.

**IC 2118 (NGC 1909), “Witch Head Nebula”**, 05 06.9 -07 13, 3.0° x 1.0° in size, is a very large, extremely faint reflection nebula, thought to be a remnant of an ancient supernova or possibly a gas cloud illuminated by the bright star **Rigel** in the neighboring constellation **Orion**. **IC 2118** is located 1.5° south of **Beta Eri** and 2° northwest of **Beta Ori**. **IC 2118** has the apparent magnitude of 13.0.

**Eridanus Supervoid (CMB Cold Spot/WMAP Cold Spot)**, is the largest supervoid ever discovered (A supervoid is an area of space that contains no galaxies). It is about one billion light years in diameter. The **Eridanus Supervoid** was discovered by linking a cold spot in the **Cosmic Microwave Background (CMB)** to an absence of radio galaxies. **CMB** refers to the thermal radiation that fills the entire observable universe almost uniformly. Current theories of the origins of the universe cannot explain the supervoid, but it has been speculated that the supervoid may be the result of quantum entanglement between our universe and another universe.

**Eridanus Group of Galaxies (Eridanus Cloud)**, is a group of galaxies (about 200) roughly 75 million light years distant in **Eridanus**. The group consists of about 200 galaxies, and about 70% of them are categorized as spiral and irregular galaxies, the other 30% are lenticular and elliptical galaxies. The brightest galaxy in the **Eridanus Cloud** is **NGC 1407**. The galaxy group has several sub-groups. The **Eridanus Group** (the term here applies to a subgroup) has 31 member galaxies, nine of which are listed NGC objects, and two are IC objects. The brightest member is the elliptical galaxy **NGC 1395**.

The other two subgroups are centered on the galaxies **NGC 1407** (a giant elliptical galaxy) and **NGC 1332** (a spiral galaxy).

**There are 310 objects beyond mag. 10, including NGC, IC, HCG (Hickson Compact Group), ARP, PGC, and UGC objects.**

### ***Other Stars:***

**82 Eri (HD 20794)**, mag. 4.26, 03 19 53.22 -43 04 17.6, is a main sequence star that is less massive than the **Sun** as well as older. It is estimated to be between 6 to 12 billion years old. It is a high velocity star. Three planets were discovered orbiting the star on Aug. 17, 2011, and are classified as super **Earths**.

**32 Eri** is a double star. **32 Eri A**, mag. 4.46, 03 54 17.49 -02 57 17.0; **32 Eri B**, mag 4.79, 03 54 17.50 -02 57 17.0. The primary is a yellow star and the secondary is a blue-green star, with a separation of 6.9". **32 Eri** is near the northern boundary of **Eridanus**, 10° west of **Nu Eri** (or about 10° north of **Gamma Eri**).

**51 Eri**, mag. 5.22, 04 37 36.11 -02 28 24.2, has one planet; indications that a young **Jupiter**-like planet has been directly imaged in wide orbit via the **Gemini Planet Imager**.

**HD 10647**, mag. 5.52, 01 42 29.15 -53 44 26.1, has one planet and a debris disk.

**HD 30562**, mag. 5.77, 04 48 36.20 -05 40 24.4, has one planet.

**Gliese 86**, mag. 6.17, 02 10 25.93 -50 49 25.4, has a white dwarf star companion and one planet.

**HD 19467**, mag. 7.0, 04 26 26.32 -10 33 03.0, has one planet.

**HD 28185**, mag. 7.81, 04 26 26.32 -10 33 03.0, has one planet; note the same coordinates as **HD 19467**

**HIP-8541**, mag. 7.9, 01 50 06.0 -54 27 54, has one planet.

**HD 18742**, mag. 7.97, 03 00 11 -20 48 09, has one planet.

**HD 30856**, mag. 8.07, 04 50 18 -24 22 08, has one planet.

**HD 13808**, mag. 8.38, 02 12 43 -53 44 38, has two planets.

**WASP-99**, mag. 9.5, 02 39 35.0 -50 00 29, has a transiting planet.

**HIP-12961**, mag. 9.7, 02 46 42.89 -23 05 11.8, has one planet.

**EF Eri**, mag. 13.7, 03 14 13.03 -22 35 41.14, has an uncategorized sub-stellar object in orbit, called **EF Eridani B**.

**There are 11 WASP and 1 HATS stars beyond mag. 10 that have planets.**

### ***Sky Happenings: January, 2017***

*(what follows pertains ONLY to the current month. Material above is good year after year.)*



- Jan. 1<sup>st</sup> -** **Mars** passes 0.02° south of **Neptune** at 1 AM CST,  
Evening: a waxing crescent **Moon** is about 5° to lower right of bright **Venus** in the southwest, and **Mars** shines 12° to upper left of **Venus**.
- Jan. 2<sup>nd</sup> -** The **Moon** passes 1.9° north of **Venus** at 3 AM CST,  
Evening: The **Moon** hangs 3-4° to lower right of **Mars** and 5-6° to upper left of **Venus**,  
The **Moon** passes 0.4° north of **Neptune** at 10 PM CST.
- Jan. 3<sup>rd</sup> -** The **Moon** passes 0.2° north of **Mars** at 1 AM CST,  
The **Quadrantid** meteor shower peaks under a moon free sky.
- Jan. 4<sup>th</sup> -** The **Earth** is at perihelion (91.4 million miles from the **Sun**) at 8 AM CST.
- Jan. 5<sup>th</sup> -** **First Quarter Moon** occurs at 1:47 PM CST,  
The **Moon** passes 3° south of **Uranus** at 8 PM CST.
- Jan. 7<sup>th</sup> -** **Pluto** is in conjunction with the **Sun** at 1 AM CST.
- Jan. 8<sup>th</sup> -** **Mercury** is stationary at 4 AM CST,  
Dawn: For the next 3 mornings, **Mercury** and **Saturn** are 7° apart low in the southwest.  
Evening: The waxing gibbous **Moon** shines upper right of **Aldebaran** on the 8<sup>th</sup>, and the

- Jan. 8/9** lower left on the 9<sup>th</sup> for **North America**, with the **Moon** occulting **Aldebaran** for much of **Asia**.
- Jan. 9<sup>th</sup>** - The **Moon** passes 0.4° north of **Aldebaran** at 9 AM CST.
- Jan. 10<sup>th</sup>** - The **Moon** is at perigee (225,706 miles from **Earth**) at 12:01 AM CST.
- Jan. 12<sup>th</sup>** - **Full Moon** occurs at 5:34 AM CST,  
**Venus** is at greatest eastern elongation (47°) from the **Sun** at 7 AM CST,  
**Venus** passes 0.4 ° north of **Neptune** at 8 PM CST.
- Jan. 14<sup>th</sup>** - The **Moon** passes 0.8° south of **Regulus** at 11 PM CST.
- Jan. 17<sup>th</sup>** - Asteroid **Vesta** is at opposition at 7 PM CST.
- Jan. 18<sup>th</sup>** - The **Moon** passes 3° north of **Jupiter** at 11PM CST.
- Jan. 19<sup>th</sup>** - **Mercury** is at greatest western elongation (24°) at 4 AM CST,  
 Morning: The last-quarter **Moon**, **Jupiter**, and **Spica** form a compact triangle high in the south before dawn,  
**Last Quarter Moon** occurs at 4:13 PM CST.
- Jan. 20<sup>th</sup>** - **Jupiter** passes 4° north of **Spica** at 3 PM CST.
- Jan. 21<sup>st</sup>** - The **Moon** is at apogee (251,602 miles from **Earth**) at 6:14 PM CST.
- Jan. 24<sup>th</sup>** - The **Moon** passes 4° north of **Saturn** at 4 AM CST.
- Jan. 25<sup>th</sup>** - Dawn: **Mercury** sparks 5-6' below or lower left of the very thin crescent **Moon** low in the southeast,  
 The **Moon** passes 4° north of **Mercury** at 7 PM CST.
- Jan. 27<sup>th</sup>** - **New Moon** occurs at 6:07 PM CST.
- Jan. 30<sup>th</sup>** - The **Moon** passes 0.2° north of **Neptune** at 5 AM CST.
- Jan. 31<sup>st</sup>** - The **Moon** passes 4° south of **Venus** at 9 AM CST,  
 Dusk: The waxing crescent **Moon**, **Mars**, and **Venus** form a triangle in the west-southwest in twilight,  
 The **Moon** passes 2° south of **Mars** at 7 PM CST.



## ***Planets:***

**Mercury** – **Mercury** becomes visible to **Saturn**'s lower left after Jan. 5<sup>th</sup> or so. By Jan. 9<sup>th</sup>, **Mercury** has brightened past the mag. +0.5 radiance of **Saturn** and has closed to 7° from it. On the 9<sup>th</sup>, 45 minutes before sunrise, **Saturn** stands about 10° above the horizon with **Mercury** about 3° lower. **Mercury** then begins edging away from **Saturn**. **Mercury** peaks when it reaches greatest western elongation on Jan. 19<sup>th</sup>. It then lies 24° west of the **Sun** and stands 10° above the southeastern horizon a half-hour before sunrise. **Mercury** is separated from **Saturn** by 12°. On Jan. 14<sup>th</sup>, **Mercury** shows a disk spanning 7.4", and is exactly ½ lit. By Jan. 31<sup>st</sup>, **Mercury**'s diameter has dwindled to 5.7" while the phase waxes to 80% lit.

**Venus** –On Jan. 1<sup>st</sup>, **Venus** is 5° upper left of the four-day old crescent **Moon** (13% lit) above the southwest horizon an hour after sunset. **Venus** shines at mag. -4.4, and resides in **Aquarius**, as does **Mars** and **Neptune**. **Mars** will be glowing at mag. 0.9 and lie 12° to the upper left of **Venus**, and mag. 7.9 **Neptune** will be just 0.5° to **Mars** lower right. On Jan. 2<sup>nd</sup>, the waxing crescent **Moon** hovers between **Venus** and **Mars**. **Venus** reaches greatest eastern elongation on Jan. 12<sup>th</sup>, when it lies 47° east of the **Sun**, appearing 30° above the southwest horizon an hour after sundown, and does not set until 9 PM local time. During Jan., **Venus** gains height from 30 to 40° above the horizon, and its magnitude improves from -4.4 to -4.7. **Venus**'s apparent diameter grows from 21" to 30", while its phase wanes from 58% to 40% sunlit. **Venus** starts the month in south-central **Aquarius** and crosses into western **Pisces** on the 23<sup>rd</sup>. A waxing crescent **Moon**, on Jan. 31<sup>st</sup>, forms a tight, photogenic triangle with **Venus** and **Mars**. By then **Venus** has brightened to mag. -4.7, while **Mars** has faded to mag. 1.1. On the evening of Jan. 1<sup>st</sup>, **Venus** appears 22" across and 56% lit. On the 14<sup>th</sup>, exactly 50% of the 25" diameter disk is illuminated. On Jan. 31<sup>st</sup>, **Venus** spans 31" and is 40% lit.

**Mars** – **Mars** experiences an ultra-close conjunction with 8<sup>th</sup> magnitude **Neptune** on the night of Dec. 31<sup>st</sup>/Jan. 1<sup>st</sup>. They will be 68" apart at 6:53 UT as viewed from **Hawaii** and the Pacific. The pairing is tight a few hours earlier from the continental **United States**: they are 0.2° apart as seen just after dark from the **East Coast**, and 0.1° from the **West Coast**, with **Neptune** more or less above **Mars**. At the conjunction, **Mars**'

disk is 5.7" wide while **Neptune's** is 2.2". The brightness of **Mars** diminishes from mag. +0.9 to +1.1 during Jan. On the night of Jan. 18/19<sup>th</sup>, **Mars** crosses into **Pisces**. **Mars** spans a mere 5.4" at mid-month. **Mars** will show little, if any, surface details. Its most noticeable aspect is a gibbous phase, which waxes from 90 to 92% illumination during Jan.

**Jupiter** – **Jupiter** rises in the middle of the night and dominates the morning sky during January. It rises around 1 AM local time on the 1<sup>st</sup>, and some two hours earlier on the 31<sup>st</sup>. **Jupiter** brightens from mag. -1.9 to -2.1 during Jan., and grows from 35" to 39" wide. **Jupiter** passes through the western quadrature (90° west of the **Sun**) on Jan. 12<sup>th</sup>. **Jupiter** appears among the background stars of **Virgo**, 4° north of 1<sup>st</sup> magnitude **Spica**. **Jupiter's** moons have a few events this month. On Jan. 6<sup>th</sup>, the shadow of **Io** transits **Jupiter** beginning at 4:24 AM CST. **Io** itself starts transiting at 5:37 AM CST. Both transits last a little longer than 2 hours. On Jan. 15<sup>th</sup>, **Io's** shadow starts transiting **Jupiter** at 12:45 AM CST, while **Io** follows 1 hour and 14 minutes later. As **Jupiter** rises on Jan. 11<sup>th</sup>, **Europa** appears in transit, and departs the planet's disk at 2:21 AM CST. On the 18<sup>th</sup>, **Europa's** shadow will start to transit **Jupiter's** disk at 12:12 AM CST, departing at 2:42 AM CST. Just one minute after **Europa** its self begins to transit on the planet's opposite limb. **Ganymede** will transit across the north polar region on Jan. 26<sup>th</sup> from 1:55 AM CST to 4:02 AM CST. **Callisto** will be south of **Jupiter** on the morning of Jan. 22<sup>nd</sup>.

**Saturn** – **Saturn** will rise 90 minutes before the **Sun** on Jan. 1<sup>st</sup>, and 3 hours before on Jan. 31<sup>st</sup>. **Saturn** shines at mag. 0.5 in the southeast sky as dawn approaches. **Saturn** lies against the backdrop of southern **Ophiuchus**. A waning crescent Moon passes 4° north of **Saturn** on the morning of the 24<sup>th</sup>. Best viewing is late in the month when **Saturn** climbs highest before the dawn. **Saturn** will then show a 16" diameter disk with a ring system that spans 35" and tilts 27° to our line of sight.

**Uranus** – **Uranus** is in **Pisces**, where it has been since 2013. **Uranus** will lie more than halfway to the zenith in the south-southwest as darkness falls and does not set until around midnight local time. **Uranus** shines at mag. 5.8. To find Uranus, start at mag. 5.2 **Zeta Piscium**. **Uranus** stands 0.6° east of **Zeta Psc** as January begins, and moves to a point 1° east by the end of the month. **Uranus** will display a 3.5" diameter disk and a striking blue-green color.

**Neptune** – On Jan. 1<sup>st</sup>, **Neptune** lies 0.5° west-southwest of **Mars** – to the immediate lower right of **Mars**, and will glow at mag. 7.9. The gap between **Mars** and **Neptune** grows by 0.7° each day. On Jan. 12<sup>th</sup>, **Venus** passes 0.4° due north of **Neptune**. **Neptune** is in **Aquarius**, and to find it, use mag. 3.7 **Lambda Aquarii**. On Jan. 1<sup>st</sup>, **Neptune** lies 2.1° southwest of **Lambda Aquarii**, and closes to within 1.3° by Jan. 31<sup>st</sup>. **Neptune** will show a disk measuring 2.2" across, and has a subtle blue-grey color.

**Pluto** – **Pluto** is in conjunction with the **Sun** on Jan. 7<sup>th</sup>, and is not visible this month.

**Earth** – **Earth** is at perihelion (closest to the **Sun**) at 14<sup>h</sup> UT on Jan. 4<sup>th</sup>, when it lies 0.98331 au (147,100,998 km) from the **Sun**.

**Moon** – On Jan. 1<sup>st</sup>, the **Moon** is to the lower right of **Venus**, and the upper left on Jan. 2<sup>nd</sup>. The waxing gibbous **Moon** shines to the upper right of **Aldebaran** on the 8<sup>th</sup>, and lower right on the 9<sup>th</sup>. At dawn on Jan. 19<sup>th</sup>, the last quarter **Moon**, **Jupiter**, and **Spica** form a close triangle. The waning lunar crescent hangs about 3° to the upper left of **Saturn** at dawn on Jan. 24<sup>th</sup>, and about 6° above **Mercury** the next morning. The waxing lunar crescent is well below **Venus** on the evening of Jan. 30<sup>th</sup>, and then closes to create a tight triangle with **Venus** and **Mars** on the 31<sup>st</sup>. Favorable libations of the **Moon**: crater **Peary** on Jan. 10<sup>th</sup>; crater **Gauss** on Jan. 13<sup>th</sup>; crater **Drygalsky** on Jan. 23<sup>rd</sup>; and crater **Hausen** on Jan. 25<sup>th</sup>.



**Asteroids** – Asteroid 4 **Vesta** can be spotted through binoculars on almost any clear January nig... **Vesta** reaches opposition and peak visibility on Jan. 17<sup>th</sup>, when it glows at mag. 6.2, but it will remain within 0.4 magnitude of this pinnacle all month. **Vesta** rises around sunset and climbs halfway up the eastern sky by midevening. To find **Vesta**, start at mag. 1.6 **Castor** in northern **Gemini** and draw a line to mag. 1.2 **Pollux**. Continue that line south-southwest about twice the distance between the two stars until you get to 6<sup>th</sup> magnitude **Mu Cancri**. During the first half of Jan., the asteroid is the brightest point along the line, with **Vesta** being about 1° north of **Mu Cancri** on the 11<sup>th</sup>, about 1½° south of **Omega Cancri** on the 18<sup>th</sup>, and about 0.7° east-northeast of **Kappa Cancri** on the 31<sup>st</sup>. Avoid looking for it on the 11<sup>th</sup> to 13<sup>th</sup> when a bright **Moon** lies nearby.

**Comets** – Comet **45P/Honda-Mrkos-Pajdusakova** (7<sup>th</sup> magnitude) will light up the evening sky in early Jan. Set up and be ready to view by 6 PM local time, when the comet lies 10° high in the southwest. There is only an hour long window before it dips below the horizon. It will reappear shortly before sunrise at month’s end, climbing higher in Feb. and pass nearly overhead around midnight local time. The favorable geometry of this return means the comet could glow a full magnitude brighter than predicted. The comet is in **Capricornus**, and on Jan. 1<sup>st</sup> will be about 0.7° to the north-northeast of the star **20 Cap**, on the 5<sup>th</sup> it will be about 0.5° to the east-southeast of **Theta Cap**, and on the 11<sup>th</sup> it will be about 1.2° to the southwest of **29 Cap**.

**Meteor Showers** – The **Quadrantid** meteor shower will reach its peak before dawn on Jan. 3<sup>rd</sup>. The waxing crescent **Moon** will set before 10 PM local time the previous evening (Jan. 2<sup>nd</sup>), promising dark skies during the prime viewing hours after midnight. One could, with good weather, see up to 120 meteors per hour. The meteors appear to radiate from a point in northern **Bootes**. The radiant rises before midnight and climbs 60° high in the east-northeast by the time morning twilight begins, though meteors can appear anywhere in the sky.

**When to View the Planets:**

Evening Sky

- Venus (southwest)
- Mars (southwest)
- Uranus (south)
- Neptune (southwest)

Midnight

- Uranus (west)

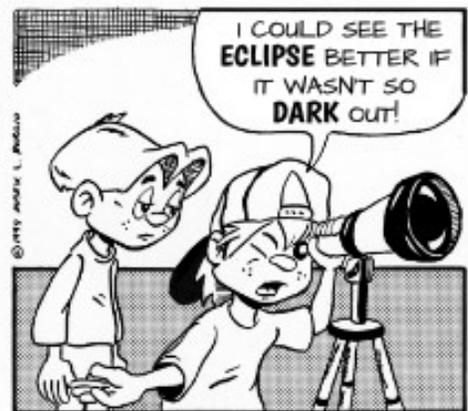
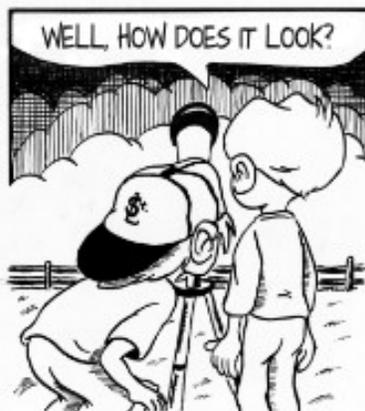
Morning Sky

- Mercury (southeast)
- Jupiter (south)
- Saturn (southeast)

**DARK SKY VIEWING · PRIMARY ON NEW YEAR EVE, SECONDARY ON JAN. 28TH**

**Acorn Park (The Early Years)**

by M. L. Burgio



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# Mythology

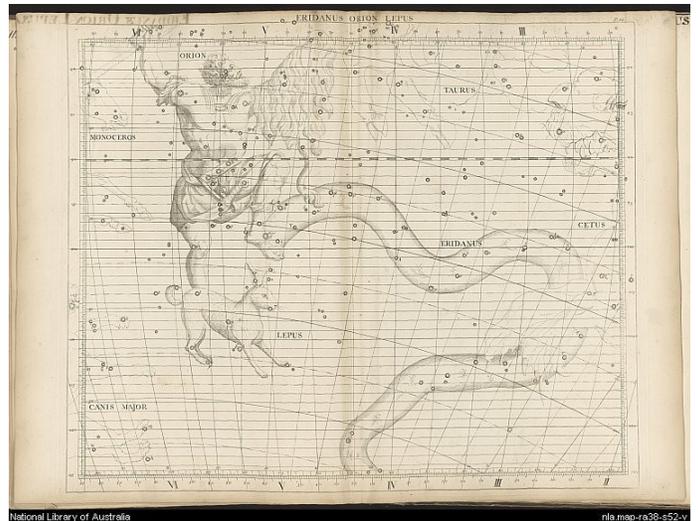
Early writers seem to have regarded the Eridanus as a mythical river, flowing into the great Ocean that surrounds the lands of the known world. Virgil called it ‘the King of Rivers’, Eratosthenes identified it as the Nile, ‘the only river that runs from south to north’. Hyginus agreed with this identification, pointing out that the star Canopus (marking the steering oar of the ship Argo) lay at the end of the celestial river, as the island Canopus lies at the mouth of the Nile. But Hesiod, in his *Theogony*, listed the Nile and Eridanus separately, showing that he regarded them as different rivers. Later Greek writers identified the Eridanus with the river Po in Italy.

In mythology, the Eridanus features in the story of Phaethon, the son of the Sun-god Helios, who begged to be allowed to drive his father’s chariot across the sky. Reluctantly, Helios agreed to the request, but warned Phaethon of the dangers he was facing. ‘Follow the track across the heavens where you will see my wheel marks’, Helios advised.

As Dawn threw open her doors in the east, Phaethon enthusiastically mounted the Sun-god’s golden chariot studded with glittering jewels, little knowing what he was getting himself in for. The four horses immediately noticed the lightness of the chariot with its different rider and they bolted upwards into the sky, off the beaten track, with the chariot bobbing around like a poorly ballasted ship behind them. Even had Phaethon known where the true path lay, he lacked the skill and strength to control the reins.

The team galloped northwards, so that for the first time the stars of the Plough grew hot and Draco, the dragon, which until then had been sluggish with the cold, sweltered in the heat and snarled furiously. Looking down on Earth from the dizzying heights, the panic stricken Phaethon grew pale and his knees trembled in fear. Finally, he saw the constellation of the Scorpion with its huge claws outstretched and its poisonous tail raised to strike. Young Phaethon let the reins slip from his grasp and the horses galloped out of control.

Ovid graphically describes Phaethon’s crazy ride in Book II of his *Metamorphoses*. The chariot plunged so low that the Earth caught fire. Enveloped in hot smoke, Phaethon was swept along by the horses, not knowing where he was. It was then, the mythologists say, that Libya became a desert, the Ethiopians acquired their dark skins and the seas dried up. To bring the catastrophic events to an end, Zeus struck Phaethon down with a thunderbolt. With his hair streaming fire, the youth plunged like a shooting star into the

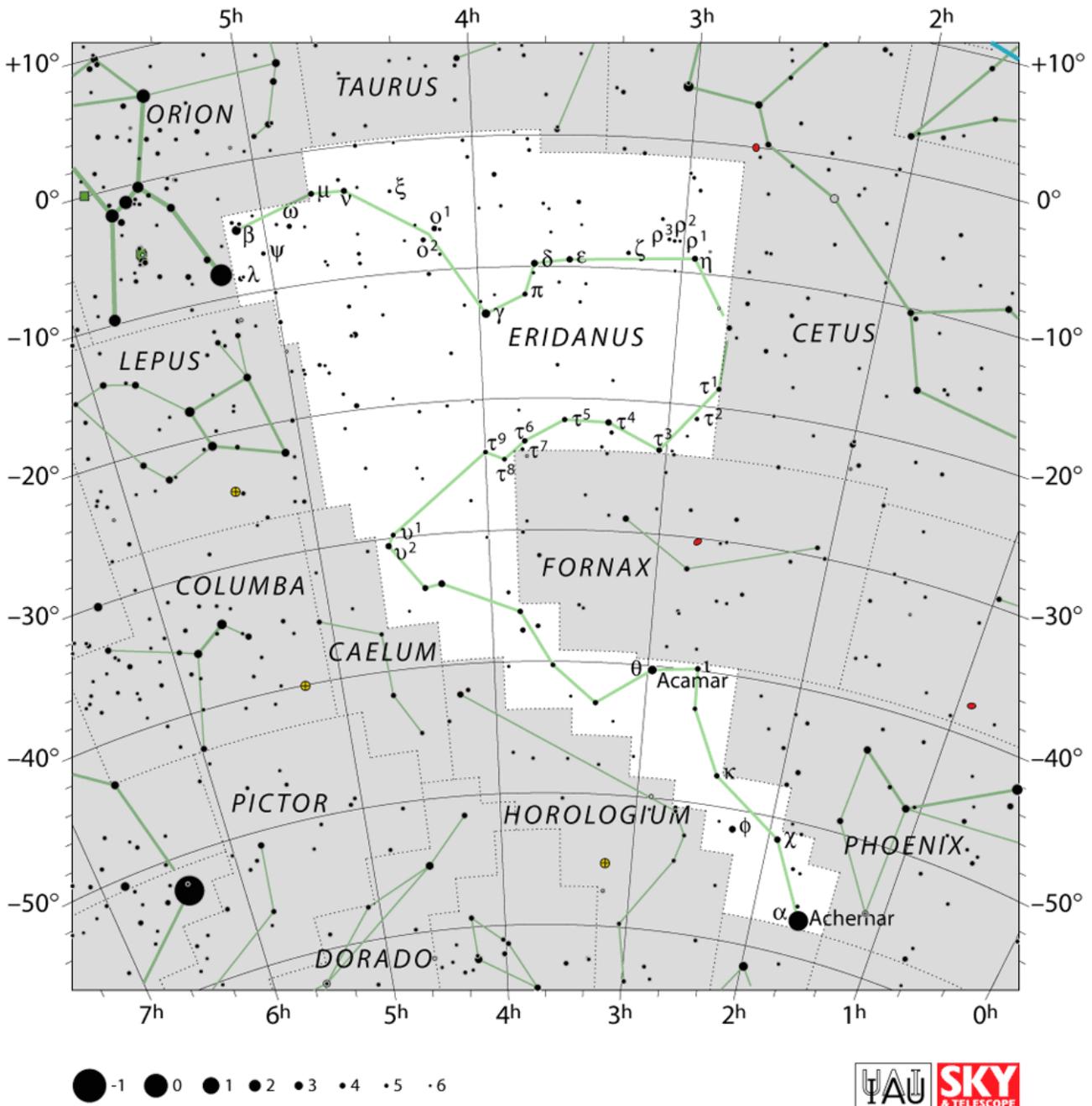


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Eridanus. Sometime later, when the Argonauts sailed up the river, they found his body still smoldering, sending up clouds of foul-smelling steam in which birds choked and died.

Eridanus is a long constellation, the 6<sup>th</sup> largest in the sky, meandering from the foot of Orion far into the southern hemisphere, ending near Tucana, the Tucan. The constellation's brightest star, first magnitude Alpha Eridani, is called Achernar, from the Arabic meaning 'the river's end'; it does indeed mark the southern end of Eridanus.



The End

