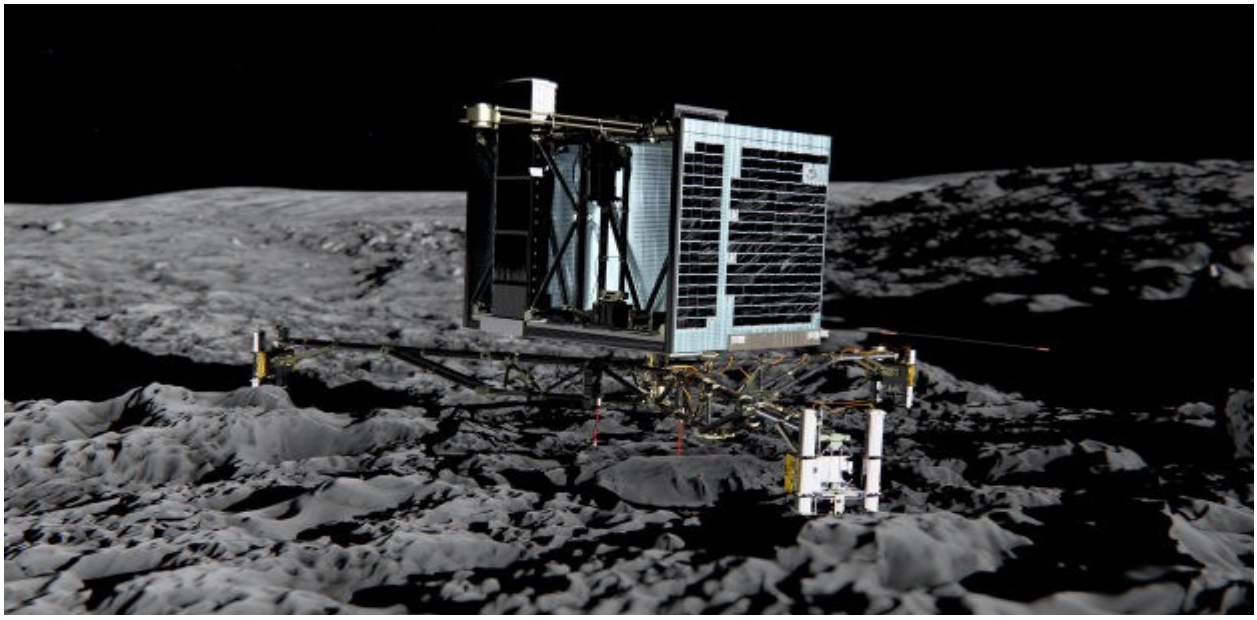
Night Visions

Newsletter of the Baton Rouge Astronomical Society

December, 2014

Next Meeting: December 8th at 7PM at the HRPO



Artist rendition of the Philae lander from the ESA's Rosetta mission. Click on the picture to go see the latest info.

What's In This Issue?

Mercury: Snow Globe Dynamo?

We already knew Mercury was bizarre.

A planet of extremes, during its day facing the sun, its surface temperature tops 800°F—hot enough to melt lead—but during the night, the temperature plunges to -270°F, way colder than dry ice. Frozen water may exist at its poles. And its day (from sunrise to sunrise) is twice as long as its year.

Now add more weirdness measured by NASA's recent MESSENGER spacecraft: Mercury's magnetic field in its northern hemisphere is triple its strength in the southern hemisphere.

Numerical models run by postdoctoral researcher Hao Cao, working in the lab of Christopher T. Russell at UC Los Angeles, offer an explanation: inside Mercury's molten iron core it is "snowing," and the resultant convection is so powerful it causes the planet's magnetic dynamo to break symmetry and concentrate in one hemisphere.

"Snowing" inside Mercury

With a diameter only 40 percent greater than the Moon's, Mercury is the smallest planet in the solar system (now that Pluto was demoted). But its gravitational field is more than double the Moon's. Why? Mercury has an absolutely gigantic iron core, accounting for 85 percent of the planet's radius—about the size of the entire Moon. Only the planet's outermost 15 percent is a silicate mantle.

Most of that iron is molten. Just the innermost core is solid: its size is unknown, but more on this in a bit. The molten iron is mixed with lighter elements, of which silicon and sulfur are most abundant. In 2008, other scientists showed that when iron is mixed with a lighter element under intense pressures likely reached partway inside Mercury's molten core, there is a zone where solid iron will spontaneously precipitate in fine flakes like iron filings, drifting down like snow toward the solid core. At the same time, buoyant lighter elements will also separate from the iron as a liquid and will float upwards as fine droplets toward the mantle.

Inside Mercury there may be two distinct "snow zones." In both cases, as solid iron falls and the lighter elements rise, their convective action stirs this gigantic molten iron core, bending and stretching magnetic field lines, driving an energetic planetary dynamo.

Planetary dynamos are thought to be helical (spiral) flows of a magnetized fluid along columns parallel to the planet's axis of rotation; molten iron in the case of the rocky inner planets. A given column can spiral any of four combinations of directions: either clockwise or counterclockwise while flowing toward the poles or toward the equator. The question is what happens at the planet's equator.

Spin flip

Inside Earth, in any single column both the northward and southward flows on both sides of the equator are spiraling in the same direction (say, clockwise and toward the

equator). In a neighboring column, the flows all spiral in the opposite direction (say, counter-clockwise and toward the poles). That flow configuration is called an "even" mode.

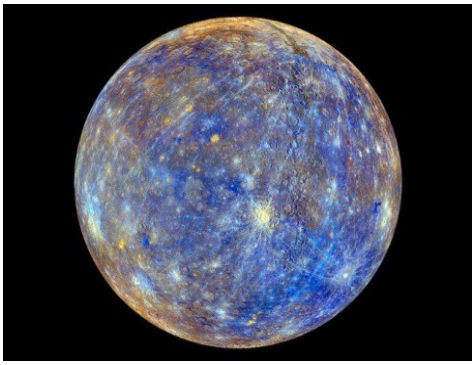
If convective stirring is much stronger than Earth's, fluid mechanics predicts that a planet's molten iron core can also host an "odd" mode where the section of each column south of the equator spins in the opposite direction from the section north of the equator —that is, they reverse vorticity at the equator.

But the numerical simulations reveal that with really, really strong convective stirring —as would happen if a planet's entire molten core is pervaded with convective iron snow—something dramatic happens: the odd and even modes overlap, spontaneously breaking symmetry and enhancing helicity in one hemisphere at the expense of the other.

"Unlike the Earth's dynamo…, Mercury's dynamo is likely powered by uniformly distributed buoyancy sources within the liquid core," the authors conclude.

The model also predicts a size for Mercury's inner core: small. In the simulations, a Mercury-like asymmetric magnetic field developed only when the solid inner core was less than half the radius of the molten outer core-mantle boundary. *–Trudy E. Bell, M.A.*

Further reading: The paper by Cao and coauthors is "A dynamo explanation for Mercury's anomalous magnetic field" in *Geophysical Research Letters* 41(2014):4127–4134. A review article is "Model dynamo may solve Mercury mystery," by Ashley G. Smart, in *Physics Today* (August 2014) pp. 14–16. See also UCLA press release "Mercury's magnetic field tells scientists how its interior is different from Earth's" at http://newsroom.ucla.edu/releases/mercury-s-magnetic-field-tells-scientists-how-its-interior-is-different-from-earth-s.



Mercury seen close-up from MESSENGER, with colors enhanced to emphasize the chemical, mineralogical, and physical differences among its surface rocks. Credit: NASA

Secretary's Summary of November Meeting

- It was announced that today was Ben Toman's birthday. Cake will be served to all during the meeting.
- Craig brought two 30-minute DVD's; the club will vote on which one to watch this evening. The first one is an IMAX film entitled "Cosmic Voyage" with Morgan Freeman narrating; the second one is entitled "Cosmic Collisions" with Robert Redford narrating. The club voted for Cosmic Collisions.
- Chris mentioned that the Orion capsule is going for its test run on December 4th. The marketing department at NASA sent the observatory a baseball cap and an XL T-shirt as we are one of the main venues for televising the launch. Merrill has a neighbor that has worked on this project; he will check with him to see if he wants to come and give a lecture sometime in the future. The cap and shirt will be raffle prizes at the end of the evening.
- Someone was asking about the Leonid meteor shower next week. The fireball from Halloween night was noted. Chris Deselles talked about doing sidewalk astronomy Halloween night.
- The AL Lunar Observing Award was presented to Chad Thibodeaux. Ben talked about the BRAS Lunar Certificate also. There are two AL outreach certificates and one more Messier certificate coming in the future.
- Trey is taking dues for next year. The Astronomy calendars are in; you can pick yours up if you have ordered one or you can purchase one from him for $10. He also mentioned that you now have the ability to renew your Astronomy subscription online; see him for details.
- While they were lighting up the birthday cake for Ben, it was announced that they were raffling off several books and that you could pick up two paperbacks for you winning raffle ticket. Everyone sang "Happy Birthday" to Ben, cake was served, and then we watched the "Cosmic Collisions" DVD.
- The December meeting on the 8th is our annual Christmas potluck. There will be a raffle then at $5 a ticket for the Celestron 9.5 x 44 binoculars. These have a 6-degree field of view similar to Zeiss binoculars. These are roughly valued at $300 and are a donation from the late Art Newman.
- The Rosetta mission having to do with rendezvousing with a comet was mentioned. They are taking lots of photographs. They moved the landing time up to the 12th. They are starting to broadcast this from the ESA. They will use harpoons to anchor the probe to the comet when it lands. There is more information at the ESA website.
- A raffle was held and then all the BRAS-owned scopes and equipment was pulled out of the closet for evaluation.

-**Roslyn Readinger**
BRAS Secretary

HRPO

FRIDAY NIGHT LECTURE SERIES
all start at 7:30pm
5 December: "Buying Your First Telescope"
12 December: "The Star of Bethlehem"
19 December: {no lecture}
26 December: {HRPO closed}

SCIENCE ACADEMY
Saturdays from 10am to 12pm
For ages eight to twelve. $5/$6 per child.
6 December: "Venus"
13 December: "Expedition 5"
20 December: "Distance in Space"
27 December: "Temperature in Space"

CALL FOR VOLUNTEERS

*Thursday, 4 December. *Two volunteers for three hours each.* **Orion First Test Flight.** Small telescope. Easy.
*Saturday, 13 December from 9pm to 1am. *Two volunteers.* **Geminid Meteor Shower**. Small telescope. Easy.
*Friday, 19 December from 6pm to 10pm. *Three volunteers.* **International Year of Light Preview Party.** Various simple tasks; easy.
*Saturday, 27 December from 12pm to 2pm. *One volunteer in addition to regular BRAS complement.* **Solar Viewing**. Marshmallow roast, demonstration tables; small telescope; setup and takedown. Easy; training provided.
*Saturday, 3 January from 3pm to 7pm. *Four or five volunteers.* **Learn Your Binocular**. Instructing registrants in the use of their personal binoculars. Previous binocular knowledge required.
*Saturday, 24 January from 3pm to 7pm. *Eight or nine volunteers.* **Learn Your Telescope**. Instructing registrants in the use of their personal telescopes. Previous telescope knowledge required.
*Saturday, 31 January from 3pm to 7pm. *Four or five volunteers.* **Learn Your Binocular**. Instructing registrants in the use of their personal binoculars. Previous binocular knowledge required.

GLOBE At Night

11 December to 20 December

Everyone's favorite winter light pollution exercise is back...except it's no longer just for winter. During 2014 the GLOBE at Night staff will collect observations during *all twelve* New Moon periods!

This is an excellent time to start compiling a good historical record of sky glow in Baton Rouge. Each BRAS member should take at least one measurement per season during 2014. The GLOBE at Night website makes it as easy as possible, with step-by-step instructions and an downloadable instruction manual.

During December participants use the constellation Perseus.

The heading on this page hyperlinks to the BRAS Forum thread devoted to GLOBE at Night. Visit there regularly for updates and answered questions.

Recent Entries in the Forum

Below are selected recent additions to the BRAS Forum. There are also nine active polls.

Preliminary Reports Claim Part of Amelia Earhart's Plane Found
Baton Rouge Gallery's Astrosketching Course a Success
Great Red Spot Viewing Times Posted for December
Over 4700 Louisianians Acquire Orion "Boarding Passes"
One-Year-Old MAVEN's Instruments Fine after Studying Siding-Spring
NASA to Broadcast Yet Another *Beautiful Earth* Event
Americans Celebrate Forty-Fifth Anniversary of Apollo 12
LADEE's First Anniversary Passes
Four BRAS Members Spot Lunar Halo
American Society Reverts Back to Standard Time
New Ten-Year Bolide World Map Released
HRPO Opens for Philae Lander Touching Down on Comet 67/P

Culmination times posted for the following objects…
NGC 6188
M99
M32
Triangulum Galaxy
NGC 2683

Orion Exploration Test Flight 1

Thursday, 4 December
[HRPO open from 5am to 11am.]

American crew vehicles return to space! After over forty years (since the venerable Apollo mission) and a generation wondering about our past and future travels, a United States crew vehicle will venture beyond low-Earth orbit! This unmanned test flight is the beginning of a new era in space exploration! HRPO personnel will screen the live broadcast—from launch to splashdown and recovery by the United States Navy in the Pacific Ocean. Seems like old times! During the HRPO event there will be refreshments, games and viewing of Jupiter and the Sun.

It is asked that all BRAS members promote this Test Flight as much as possible, whether travel is possible to HRPO or not. The Test Flight will be broadcast on satellite television, cable television and NASA's website.

"See? I told you it wasn't a new planet!"

The International Year of Light
Preview Party

Friday, 19 December, 6pm to 10pm
[Free and for all ages.]

In December of last year, the United Nations General Assembly proclaimed 2015 the *International Year of Light and Light-based Technologies*. This proclamation is an initiative of scientific organizations and UNESCO (the United Nations Educational, Scientific and Cultural Organization).

IYL2015 is meant to focus on the science of light and light-based applications. HRPO is happy to announce that this proclamation takes into account the dangers and wastes of light pollution. The International Astronomical Union is building a page devoted to IYL2015.

At long last, during HRPO's Preview Party for IYL2015, the goals and guidelines will be revealed for the…

20/20 Vision Campaign

The 2013 baseline reading at HRPO's back viewing pad was 18.7. Accordingly, to reach 20.0 by HRPO's twentieth anniversary in 2017, these intermediate goals should be met:

18.80	19 Dec 2014
18.90	16 Mar 2015
19.00	13 Jun 2015
19.10	10 Sep 2015
19.20	7 Dec 2015
19.30	4 Mar 2016
19.40	1 Jun 2016
19.50	29 Aug 2016
19.60	26 Nov 2016
19.70	23 Feb 2017
19.80	20 May 2017
19.90	17 Aug 2017
20.00	**14 Nov 2017**

All the measurements dates are, of course, Moon-free at 10pm local time.

Both the Party and the Campaign will be plugged during the Orion Launch, both remaining lectures of the year, and the Geminid meteor peak.

Aries – The Ram: Observing Notes by John Nagle

Position: RA 03 00, Dec. +20 00

Named Stars:
Hamal (Alpha Ari), "ras al-hamal", "The Head of the Ram", mag. 2.01, 02 07 10.29 +23 27 46.0, is an orange giant star and was located at the vernal equinox – the point that marks the beginning of spring – between the years 2000 BC to 100 BC. Alpha Arietis has one planet in orbit around it.
Sheratan (Beta Ari), "aš-šarātān", "The Two Signs", mag. 2.64, 01 54 38.35 +20 48 29.9, is a blue-white star and a spectroscopic binary. The companion is a suspected "G" class star. "The Two Signs" refers to both Beta Ari and Gamma Ari, in their position as the heralds of the vernal equinox. The two stars were known as "garna al-hamal", horns of the ram". The orbital period is 106.997 days and has a high eccentricity of 0.89. The mean separation appear to be in the range of 15 to 20 million miles.
Mesarthim (Gamma Ari), is a triple star system consisting of a binary system with a third component, a mag. 9.6 binary star (mag. 13 for 2nd star) with a separation of 1.7". The main binary stars are Gamma Ari 1, mag. 4.70, 01 53 31.77 +19 17 38.7, and is a variable star having strong silicon emission lines; Gamma Ari 2, mag. 4.62, 01 53 31.80 +19 17 45.0. Both stars are white main sequence stars and have a separation of 7.7 arc seconds. Gamma Ari 1 and 2 are one of the first double stars to be discovered.
Botein (Delta Ari), "butain", "Belly", mag. 4.35, 03 11 37.67 +19 43 36.1, is an orange giant star.
Bharani (41 Ari, C Ari),"Nair al Butain", mag. 3.61, 02 49 58.99 +27 15 38.8.

Deep Sky:
There are no Messier objects in Aries, and all deep sky objects are fainter than mag. 10 (11 NGC objects, 1 UGC object, 9 Arp Peculiar Galaxies, and 1 vdB object). See me for the particulars.

Other Stars:
Epsilon Ari A, mag. 5.2, 02 59 12.70 +21 20 25.0, is a binary star composed of two white main sequence dwarf stars with 1.5 arc seconds separation. **Epsilon Ari B**, mag. 5.5, 02 59 12.73 +21 20 25.6.
Lambda Ari, mag. 4.79, 01 57 55.78 +23 35 45.9, is a binary star with a white hued dwarf primary and a yellow hued secondary at mag. 7.3. The two stars are separated by 36 arc seconds and are located 0.5° east of the star 7 Arietis.
Pi Ari, mag. 5.26, 02 49 17.56 +17 27 51.6, is a spectroscopic binary star with a blue-white dwarf star for the primary and a white star for the secondary at mag. 8.5, and a separation of 3.2 arc seconds. The primary itself is a wide double star with a separation of 25.2 arc seconds; the tertiary has a mag. of 10.8.
56 Ari (SX Ari), mag. 5.78, 03 12 14.24 +27 15 25.2, is the proto-type SX Ari variable star – a rotating variable star of the helium variable star class. These variable stars have very prominate emission lines of Helium I and Silicon III. There are between 39 and 49 SX Arietis variable stars currently known – 10 are noted as being "uncertain" in the GCVS (General Catalog of Variable Stars).
53 Ari, mag. 6.3, 03 07 25.69 +17 52 47.9, is a "Run-away" star (only 3 are known). It was likely ejected from the Orion Nebula about 5 million years ago, with its space velocity approximately 35 miles/sec, with an annual proper motion of 0.025 arc minutes.
HD 20367, mag. 6.40, 03 17 40.12 +31 07 37.9, has one planet with an orbital period of 500 days.
HD 12661, mag. 7.41, 02 04 34.29 +25 24 51.5, has two planets in orbit.
HIP 14810, mag. 8.52, 03 11 14.23 +21 05 50.5, has three planets in orbit.
BD +20° 307, mag. 9.01, 01 54 50.79 +21 18 22.5, has a circumstellar disk
WASP-11/ HAT-P-10, mag.11.89, 03 09 28.55 +30 40 24.9, has a transiting planet.
HAT-P-25, mag. 13.19, 03 13 45 +25 11 51, has a transiting planet.
Teegarden's Star, mag. 15.40, 02 53 00.89 +16 52 52.7, is a brown dwarf star, and is the 24th closest star to

Earth.
PSR B0301+19, 03 04 33.12 +19 32 51.4, is a pulsar star.

There are over 50 Double and Multiple Stars, over 30 Variable Stars, and over 20 Star Clusters, Nebulae, and Galaxies in Aries.

Meteor Showers: Aries is home to several meteor showers. The Daytime Arietid Meteor Shower is one of the strongest showers that occur during the day, lasting from May 22nd to June 7th. It is an annual shower associated with the Marsden group of comets that peaks on June 7th with a maximum zenithal hourly rate of 54 meteors. Its parent body may be the asteroid Icarus. The meteors are sometimes visible before dawn, because the radiant is 32° away from the Sun. They usually appear at a rate of 1 to 2 per hour as "earthgrazers", meteors that last several seconds and often begin at the horizon. Because most of the Daytime Arietids are not visible to the naked eye, they are observed in the Radio Spectrum. This is possible because of the ionized gas that they leave in their wake. There are other meteor showers that radiate from Aries during the day; these include the Daytime Epsilon Arietids, and the Northern and Southern Daytime Arietids.

The Delta Arietids are another meteor shower radiating from Aries. Peaking on Dec. 9th with a low peak rate, the shower lasts from Dec. 8th to Jan. 14th, with the highest rates visible from Dec. 8th to Dec. 14th. The average Delta Arietid meteor is very slow, bright fireballs. This meteor shower has northern and southern components, both of which are likely associated with 1990 HA, a near Earth asteroid.

The Autumn Arietids also radiate from Aries. The shower lasts from Sept. 7th to Oct. 27th and peaks on Oct. 9th, with a low peak rate. The Epsilon Arietids appear from Oct. 12th to the 23rd. Meteor showers radiating from Aries include the Oct. Delta Arietids, the Day Time Epsilon Arietids, Daytime May Arietids, Sigma Arietids, Nu Arietids, and Beta Arietids. The Sigma Arietids, a class IV meteor shower, are visible from Oct. 12th to 19th, with a maximum zenithal hourly rate of less than 2 meteors/hr on Oct. 19th.

December Sky Happenings:

Dec. 1st - The Moon passes 1.2° north of Uranus at 6:00 PM CST.

Dec. 2nd -Asteroid Thala is at opposition at 9:00 PM CST.

Dec. 5th – Evening- Observers in the Americas can see Aldebaran (Alpha Taurii) very close to the almost Full Moon (about 0.5° below the Moon).

Dec. 6th – Full Moon occurs at 6:27 AM CST.

Dec. 8th – Mercury is in superior conjunction at 4:00 AM CST.

Dec. 9th – Jupiter is stationary at 1:00 AM CST in Leo.
Asteroid Ceres is in conjunction with the Sun at 6:00 PM CST.

Dec. 11th – The waning Moon, Jupiter, and Regulus (Alpha Leoni) form a 5° wide triangle, rising near midnight.
The Moon passes 5° south of Jupiter at 10:00 PM CST.

Dec. 12th – Mars is at perihelion (128.4 million miles from the Sun) at 2:00 AM CST.
The Moon is at apogee (251,395 miles from Earth) at 5:03 PM CST.

Dec. 13th/14th – The Geminid Meteor Shower peaks tonight. The best viewing will probably occur shortly before the Last Quarter Moon rises at 10:00 PM CST.

Dec. 14th – The Last Quarter Moon occurs at 6:51 PM CST.
Asteroid Juno is stationary at 3:00 PM CST.

Dec. 19th – The Moon passes 1.5° north of Saturn at 3:00 PM CST.

Dec. 21st – Winter Solstice occurs at 5:03 PM CST – **Winter starts!** New Moon occurs at 7:36 PM CST.

Dec. 22nd – Dusk- An extremely thin crescent Moon floats to the right of Venus, very low in the west-southwest

shortly after sunset.

Uranus is stationary at 12:00 midnight CST.

Dec. 24th – The Moon is at perigee (226,675 miles from Earth) at 10:42 AM CST.

Evening – Mars shines to the left of the waxing crescent Moon.

Dec. 25th – The Moon passes 6° north of Mars at 2:00 AM CST

Dec. 26th – The Moon passes 4° north of Neptune at 9:00 AM CST.

Dec. 28th – First Quarter Moon occurs at 12:31 PM CST.

The Moon passes 1.0° north of Uranus at 11:00 PM CST.

Mercury – Mercury goes through superior conjunction with the Sun on Dec. 8th, but it will come back into view three weeks later. On Dec. 31st, at mag. -0.8, Mercury appears half as high as Venus and to the lower right. The pair will close to within 1° of each other in early January.

Venus – During the course of Dec., the interval between sunset and Venus-set increases from about 45 to 75 minutes, with the planet's altitude increasing from 5° to 11°. On Dec. 15th, Venus appears 3° high in the southwest a half-hour after sunset, at mag. -3.9, and the apparent size grows from about 9.9" to 10.3" during Dec. The thin waxing Moon passes 5° above Venus on Dec, 22nd.

Mars –Mars lies some 20° above the southwest horizon an hour after sunset throughout December. Mars crosses the border from Sagittarius into Capricorn on Dec. 4th, and remains there through December. Mars, at mag. 1.0, moves to just 3° west of Delta Capricorni (mag. 2.8) with a disk of less than 5° across.

Jupiter – Jupiter rises around 10:00 PM local time in early Dec. and two hours earlier by month's end, shining at mag. -2.3. Jupiter's eastward motion early in the month carries it to within 7° of 1st magnitude Regulus by Dec. 9th. On Dec. 9th, Jupiter begins retrograde motion to the west, taking it to a point 8° from Leo's brightest star by the 31st. During Dec., Jupiter's disk enlarges from 40" to 43" apparent diameter. On Dec, 5th/6th, Callisto occults Europa nearly 3' west of Jupiter, starting at 11:00 AM CST, and lasts 56 minutes. On Dec. 23rd, Europa occults Io near the Jovian disk's center at around 4:15 AM CST. Europa's shadow first appears on the planet's cloud tops at 12:44 AM CST, followed by Io's shadow at 2:05 AM CST. Europa itself starts transiting the planets disk at 2:42 AM, with Io trailing just 20 minutes behind. Io closes the gap between the two moons over the next 75 minutes, when they appear to merge above Jupiter's equatorial zone.4

Saturn – Saturn comes up (in Libra) only about an hour before the Sun as Dec. opens, but more than 3 hours by month's end. Saturn hangs low in the southeast as the sky begins to brighten. As the month progresses, the stars that mark the head of Scorpius and then, lower in the southeast, 1st magnitude Antares (Alpha Scorpii), appear below Saturn. By month's end, Saturn is nearing Beta Scorpii. Saturn is at mag. +0.5, and on the 31st, Saturn's disk appears 16" across while the rings span 35" and tilt 25° to our line of sight.

Uranus – Uranus is in Pisces the Fish, high in the southeast at nightfall and does not set until after midnight local time. Uranus is located 3.3° south of Delta Piscium all month. Uranus glows at mag. 5.8, and has a blue-green disk at 3.6" diameter.

Neptune – As Dec. opens, Neptune stands about 40° above the southern horizon as darkness falls, glowing at mag. 7.9 among the background stars of Aquarius the Water Bearer. You can find Neptune by finding Zeta Aqr (mag. 3.7) at the center of the asterism that forms the water jar. Then, at 10° due south, is Sigma Aqr (mag. 4.8). Neptune lies less than 1° west of Sigma Aqr all month. Neptune has a blue-grey disk which spans 2.3".

Pluto – Pluto is 3° north of Venus on Dec. 20th and a little more than 4° north of Mercury on Dec. 25th, but it is far too dim to view in the bright sky, even through telescopes.

Moon – Observers in the Americas can see Aldebaran (Alpha Taurii) very near the almost full Moon on the evening of Dec. 5th. The waning gibbous Moon forms a largish right triangle with Regulus and Jupiter on the morning of Dec. 12th. The waning lunar crescent is not far from Saturn's upper right at dawn on Dec. 19th.

Asteroids – Asteroid 23 Thalia (9th magnitude) climbs the eastern sky with the Hyades and Pleides star clusters on December evenings. Thalia will be less than 1° north of 72 Aqr and about 1° north of Nu Aqr on Dec. 8th and 9th. On Dec. 13th and 14th, Thalia will be 1 ½ ° to 2° south of Chi Aqr, and on Dec. 31st, will be about 1° north-northwest of 36 Aqr. Asteroid Hebe is moving through its retrograde loop north of Eridanus, shining at mag. 8.8. On Dec. 3rd, Hebe is about 1 ½ ° to the north-northwest of Epsilon Eri (4th magnitude), and on Dec. 23rd is about 1° to 1 ½ ° east of 17 Eri. Hebe is a big asteroid at 120 miles across, has an eight hour rotational period, and may be a double.

Comets – Comet PANSTARRS (C/2012K1) has a nice conjunction with the edge-on barred spiral galaxy NGC 55 in Sculpter from Dec. 17th to 19th, and has a conjunction with Theta Sculpti on Dec. 27th.

Meteor Showers – The Geminid Meteor Shower peaks during the morning hours of Dec. 14th, while the Ursids Meteor Shower peaks on Dec. 22nd.

When to View the Planets:

Evening	Midnight	Morning
Mercury (southwest)	Jupiter (east)	Jupiter (southwest)
Venus (southwest)	Uranus (west)	Saturn (southeast)
Mars (southwest)		
Uranus (southeast)		
Neptune (south)		

Dark Sky Viewing: Primary on Dec.20th, Secondary on Dec. 27th

Aries – The Ram

Modern day Aries was known as “the agrarian worker” or “The Hired Hand”. Although likely compiled in the 12th or 11gth century BCE, the MUL.APIN reflects a tradition which marks the Pleiades as the Vernal Equinox, which was the case with some precision at the beginning of the Middle Bronze Age. The earliest identifiable reference to Aries as a distinct constellation comes from boundary stones that date from 1350 to 1000 BCE. On several boundary stones, a zodiacal ram figure is distinct from the other characters present. The shift in the identification from the constellation as the “Agrarian Worker” to the “Ram” likely occurred in later Babylonian tradition because of its growing association with Dumuzi, “The Shepard”. By the time the MUL.APIN was created (by 1000 BCE), modern Aries was identified with both Dumuzi’s ram and a hired laborer. The exact timing of this shift is difficult to determine due to the lack of images of Aries or other ram figures.

Aries was not fully accepted as a constellation until classical times, and it is not surprising to find a ram in the sky, for rams were frequently sacrificed to the gods, and Zeus was at times identified with a ram. But the mythographers agree that Aries is a special ram, the one whose golden fleece was the object of the voyage of Jason and the Argonauts. The ram made its appearance on Earth just as King Athamas of Boeotia was about to sacrifice his son Phrixus to ward off impending famine.

King Athamas and his wife Nephele had an unhappy marriage, so Athamas turned instead to Ino, daughter of King Cadmus from the neighboring Thebes. Ino resented her step-children; Phrixus and Helle, and she arranged a plot to have them killed. She began by parching the wheat so that the crops would fail. When Athamas appealed for help to the Delphic Oracle, Ino bribed messengers to bring back a false reply – that Phrixus must be sacrificed to save the harvest.

Reluctantly, Athamas took his son to the top of Mount Laphystium, overlooking his palace at Orchomenus. He was about to sacrifice Phrixus to Zeus when Nephele intervened to save her son, sending down from the sky a winged ram with Golden Fleece.

Phrixus climbed onto the ram's back and was joined by his sister Helle, who feared for her own life. They flew off eastwards to Colchis, which lay on the eastern side of the Black Sea, under the Caucasus Mountains (the modern country of Soviet Georgia).

On the way, Helle's grip failed, and she fell into the channel between Europe and Asia, the Dardanelles, which the Greeks named the Hellespont in her memory. On reaching Colchis, Phrixus sacrificed the ram in gratitude to Zeus. He presented its golden fleece to the fearsome King Aeetes of Colchis who, in return, gave Phrixus the hand of his daughter Chalciope.

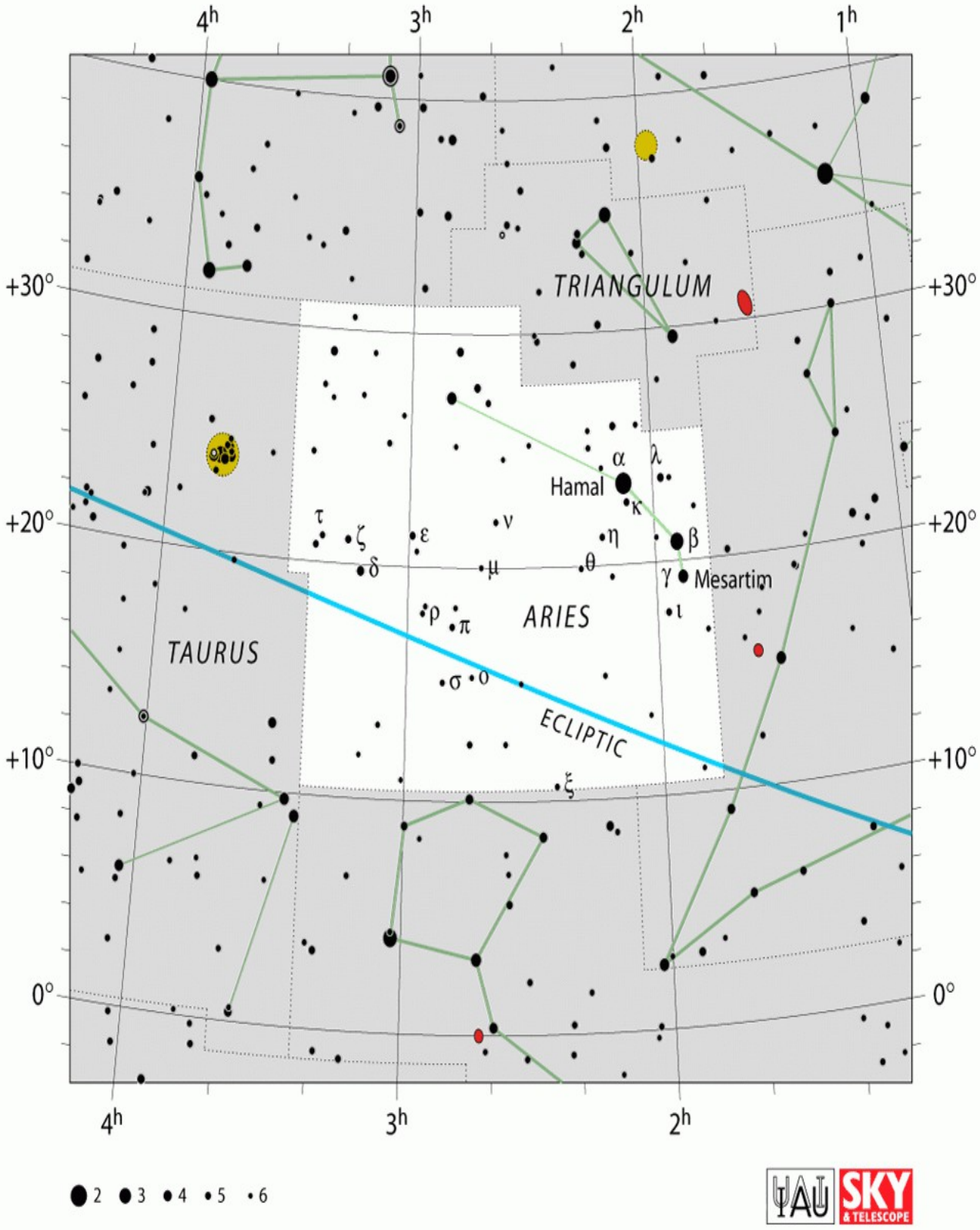
After Phrixus died, his ghost returned to Greece to haunt his cousin Pelias, who had seized the throne of Iolcus in Thessaly. The true successor to the throne was Jason. Pelias promised to give up the throne to Jason if he brought home the Golden Fleece from Colchis. This was the challenge that led to the epic voyage of Jason and the Argonauts.

When he reached Colchis, Jason first asked King Aeetes politely for the fleece, which hung on an oak tree in a sacred wood, guarded by a huge, unsleeping serpent. King Aeetes rejected Jason's request. Fortunately for the expedition, the king's daughter, Medea, fell in love with Jason and offered to help him steal the fleece. At night the two crept into the wood where the Golden Fleece was hung, shining like a cloud lit by the rising sun. Medea bewitched the serpent so that it slept while Jason snatched the fleece. According to Apollonius Rhodius, the fleece was as large as the hide of a young cow, and when Jason slung it over his shoulder it reached his feet. The ground shone from its glittering golden wool as Jason and Medea escaped with it. Once free of the pursuing forces of King Aeetes, Jason and Medea used the fleece to cover their wedding bed. The final resting place of the fleece was in the temple of Zeus at Orchomenus, Where Jason hung it on his return to Greece.

On old star maps the Ram is shown in a crouching position, but without wings, its head turned toward Taurus. In the sky it is not at all prominate. Its most notable feature is a bent line of three stars, which mark its head. Of these three stars, Alpha Ariets is called Hamal, from the Arabic for lamb; Beta Ariets is called Sheraton, from the Arabic meaning "Two" of something (possibly two signs or two horns, for it was originally applied to this star and to its neighbor, Gamma Ariets); and Gamma Ariets is Mesarthim, a curiously corrupted form of "al-sharaton", the title which it originally shared with Beta Ariets.

In Astronomy, Aries assumes a far greater importance than its brightness would suggest, for in Greek times it contained the cardinal point known as the vernal equinox. This is the point at which the Sun crosses the celestial equator from north to south. But the vernal equinox is not stationary, because of the slow wobble of the Earth's axis, known as precession.

The first point of Aries, the location of the vernal equinox (about 2000 years ago), is named for the constellation. Hipparchus defined it, in 130 BCE, as a point south of Gamma Arietis. Because of the precession of the equinoxes, the First Point of Aries has since moved into Pisces and will move into Aquarius by around 2600 CE (the true "Age of Aquarius"). The Sun now appears in Aries from late April through mid May, though the constellation is still associated with the beginning of Spring.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