



INSIDE THIS ISSUE:

THE OBSERVER

East Valley Astronomy Club

From the Desk of the President by David Douglass

As I write this, Christmas 2008 is still a few days away. But as you read it, it will be January in the new year of 2009, the International Year of Astronomy. A very special "Thank You" to Tom and Jennifer Polakis, who opened their home, and hosted the December meeting, also known as the annual Sol Invictus Holiday Potluck. Although I was unable to attend, due to illness, I have heard from others that everyone had a very enjoyable evening. Our new Vice-President, Wayne Thomas, has report-

ed that he is hard at work, lining up speakers for the 2009 schedule. At this writing, no speaker has been scheduled for January, but I am sure Wayne will have something special for us. If you have any suggestions of either speakers, or subject matter that you would like to see at one of our meetings, be sure and let Wayne know. I know that he would appreciate any and all ideas. January is also the beginning of our fiscal year. That means that dues are due. Many have already paid for 2009, but many oth-

ers have not. Check the membership form found here in The Observer, and you can determine your total amount due, for dues, and possibly magazine subscriptions. Our continuing Treasurer, Ray Heinle, will be very happy to receive any and all payments at the January 16th general membership meeting. If you cannot attend that meeting, check our website, <http://www.eastvalleyastronomy.org> for a total of four (4) different ways you can pay your dues, *Continued on page 12*

The Backyard Astronomer

It's January - Grab Your Binos by Bill Dellinges

January is a splendid time to peruse wide field goodies in the winter sky. Leave your telescope in the case, grab the 7x50's you got for Christmas and follow me. I used Swarovski 8x50 binoculars with a 7 degree field to view these sights because they require a much bigger field than any telescope can produce – and you'll be able to use both eyes! Also, many stargazers have access to the ubiquitous 7x50, or have a 7x35 or 8x42 birding/nature binocular lying around the house; even the latter two binoculars will work fine for our purposes.

Alpha Persei Association: One of the best kept secrets of the night sky. Note the area south of Perseus' brightest star, Mirfak. To the naked eye there seems to be a glow there. This is Melotte (Mel) 20, a large loose open star cluster of 106 stars. This is one of 245 clusters compiled by Philibert Melotte (1880 -1961) in his 1915 catalog. I counted about 50 stars with my binoculars.

Most form a large winding "S" ending with a four star trapezoid that likens the swarm, in my mind, to a miniature version of Draco. The cluster is 592 light years away. It's heresy to say, but I think Mel 20 gives the Pleiades a run for its money.

The Pleiades (The Seven Sisters): "Glitter, like a swarm of fireflies tangled in a silver braid" (Tennyson). Perhaps the most beautiful and distinctive object in the night sky. The group is an open star cluster of about 100 members, 387 light years distant, but close enough for the unaided eye to resolve it! The group has an estimated age of 50 million years. If this age is correct, these stars were born after the dinosaurs became extinct. The cluster is about 2 degrees across, so this is the one object on our tour that doesn't require the 7 degree field I decreed above. While any binocular view of the Pleiades is a wondrous sight, my favorite view of this *Continued on page 2*

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Upcoming Events:

- Public Star Party - January 9*
- Monthly General Meeting - January 16*
- Local Star Party - January 17*
- Jacobsen Elementary School Star Party - January 22*
- Deep Sky Star Party - January 24*

The Backyard Astronomer

Continued from page 1 gem is with tripod mounted 10x70's which renders an awesome, breathtaking sight - just the right combination of enough magnification (10x) and field (5.18 degrees) to frame it nicely.

I wish I had a dollar for every person who told me they thought this group of stars was the Little Dipper. Of course it's too small and in the wrong part of the sky to be that asterism - but it does look like a small dipper so the public's misidentification is understandable. Note the delicate chain of faint stars wandering south from Alcyone, the cluster's brightest member. The first star in the chain is the double star Struve 450; you'll need a telescope to split it. However, your binocular will easily split the double star ADS 2755 found dead center in the "bowl" of this Dipper imposter.

Kemble's Cascade: An interesting asterism in Camelopardalis introduced to the late Walter Scott Houston by Canadian amateur Lucian Kemble in 1980. By the way, it's a giraffe, not a camel. This faint constellation is a challenge to find even in dark skies. It was created in 1613 by Petrus Plancius - he must have been desperate. The asterism is a 2.5 degree string of about 25 stars, magnitude 7-10, in a long meandering chain terminating at the faint, tight open star cluster NGC 1502 which in binoculars looks like just another

star in the group. It's really quite unique and striking, though I found it looks more impressive in 10x70's - their 5.18 degree field can still contain the asterism. Good luck finding it! This time of year it's on the meridian in the north. Take a line drawn through Beta and Epsilon Cassiopeiae, extend it that distance again towards Capella. That will place you in the middle of nowhere which is where you want to be. Scan the area with binoculars and you should be able to sweep it up. A line from Algol through Mirfak in Perseus will also lead you there, just a little farther than the distance between those two stars. See Cascade photo: Deep Sky Wonders-Houston, p. 31; Hidden Treasures-O'Meara, p. 113; Diagram: Binocular Highlights-Seronik, p. 16.

Hyades: The "V" pattern of Taurus the Bull's face is actually the second closest open star cluster to us (120 light years) after the Ursa Major Group (80 light years). Aldebaran, the group's brightest star is a foreground object 68 lights away. The 8x50's 7 degree

field just gets the entire "V" in, and a glorious sight it is. I've always been intrigued by the clump of stars just northwest of Aldebaran. They form three pairs of stars, 120 degrees apart, as if set there to attract attention - a signpost in the sky? E.T., call home! I suspect the Hyades are overlooked by amateurs enamored with the Pleiades or tracking down the Crab Nebula. So put your binos on Taurus' face and soak up a vista your telescope can't provide.

Orion's Belt and Sword: The three stars in Orion's Belt certainly stand out, but have you ever bothered to put binoculars on them? If you do, you'll spy a cloud of about 60 stars surrounding Alnitak, Anilam, and Mintaka. This swarm of stars is Collinder (Cr) 70, cataloged by Swedish astronomer Per Collinder (1890-1974). Move your binoculars west along the Belt and turn north at Mintaka where the stars become somewhat brighter but sparser reaching almost to Bellatrix.

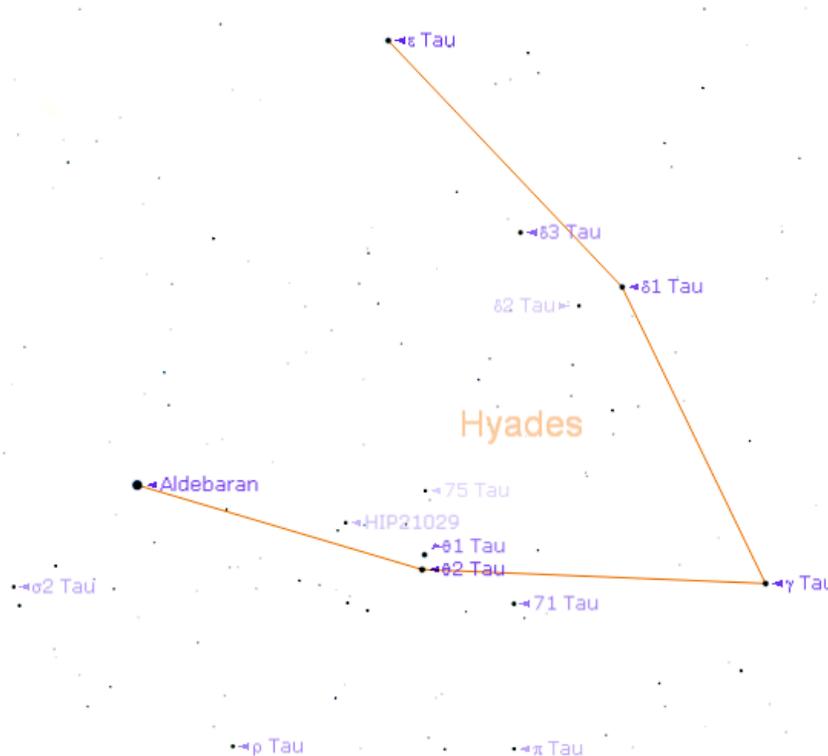
Any binocular will comfortably accommodate the entire Sword of Orion. I think this is one of the best binocular sights in the night sky. The Sword is transformed from a small group of three faint stars barely visible to the naked eye to a panorama of (north to south) two open star clusters (NGC 1981 and 1977), the Orion Nebula (M42), the bright star Iota Orionis (a telescopic triple), and

binocular double Struve 747. The latter, in my opinion, is the most beautiful and brightest binocular double in the sky. Their blue-white components are magnitude 4.8 and 5.7 and separated by 36".

The 8x50's seven degree field could actually get the Belt and the Sword in the same field. Could they resolve the Trapezium? No. The 10x70's? No. The 15x70's? Partially. Fifteen power was enough to split it into two stars with a hint of a third. If you're

wondering what it does take to split the Trapezium into four stars, 20x100's will barely accomplish the trick (three stars are easy, the fourth difficult). My Televue 85mm refractor at 29x will cleanly split this group into four pinpoint little gems.

I highly recommend your binoculars be tripod mounted during sky sweeps. This will immensely improve your viewing pleasure, as will a stool to sit on during observing. Dress warmly and get out there, the winter sky is like a candy store for binocular users.



Accretion Disks and Black Holes (Part Two)

by Henry De Jonge IV

In this second and final installment we will look in more detail at BH accretion disks, what they may tell us about the BH and its surroundings, and briefly look at some of the observational evidence we have.

Light exerts radiation pressure, this is why the idea of solar sails is so promising for future space flight. The Eddington limit, (or Eddington luminosity) is the maximum of the ratio of luminosity, (or radiation pressure) to the mass of an object, before the amount of radiation pressure overcomes the gravitational force. It is basically the maximum luminosity for a given mass. At a great enough luminosity the outward pressure of radiation from the in falling matter would be larger than the inward gravitational attraction and the accretion would stop. Thus a specific BH has a limit as to how much matter it can be actively accreting at a given moment. The photons emitted from the in falling matter irradiate the accretion disk and can have a large influence on the global stability of the disk, the timing and degree of further radiation outbursts, and in shaping or warping of the disk itself. For example, near the horizon of the BH radiation pressure from the in falling matter may also cause the accretion disk to puff up and form a doughnut shape, complicating matters even more.

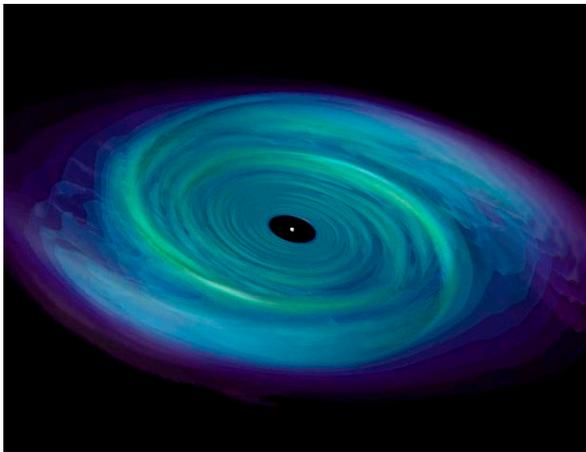


Figure 4: An accretion disk simulation (clo APOD 3-12-05).

A very critical concept in BH accretion disk models is magneto rotational instability. In the case where the accretion disk contains electrical charge, plasma) then it will also become magnetized and this can produce disk instability which in turn causes turbulent flow. The magnetic field lines will “go with the flow” of the accretion disk while being stretched and broken. This magnetic instability and tension-release cycle is thought to cause the transference of angular momentum from the inner ring to the outer portions, causing the inner matter to be drawn in to the central BH. This effect is called magneto rotational instability or MRI and is essential to understanding accretion dynamics. It was formulated in 1991 and is thought to be a major component in the angular momentum transport in accretion disks. The vast quantities of detectable radiation, (especially x-rays which can be seen by satellites) produced via the MRI effect may have patterns associated with

it that can be used to classify accretion disks, the BHs, and the space-time structure about BHs.. Needless to say the MRI effect can produce extremely variable outputs, (due to turbulence) of energy for BHs.

Quasi-periodic oscillations of the x-ray output or QPOs are thought to occur around BHs as evidence of these fluctuations caused by in falling matter and may occur at specific frequencies for specific types of BHs and certain accretion disk types. They generally range in frequency from 0.1Hz to about 10 Hz.

The MRI effect is also thought to sometimes cause winds and jets from the accretion disk, although these effects most likely have other factors as well. Perhaps the radiation pressure from the in falling matter also influences these out flows. The jets from SMBH accretion disks can extend for several million light years outward and be highly collimated. The exact mechanisms for jet formation are not yet well understood.

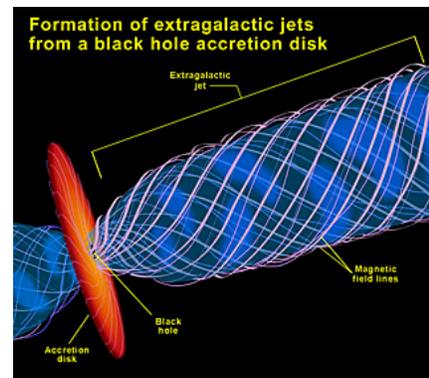


Figure 5: A schematic of the M87 jet

If the accretion disk remains cool, (until it reaches the center) it will remain relatively thin. Cool gas has less pressure than hot gas, which would form a thicker disk all around. Also if the disk has a tremendous amount of matter it will be harder for it to cool down and thus remain thicker than a disk with less mass. Most BHs have hotter disks than many other objects and thus have thicker accretion disks.

Surprisingly it is possible that the flow around a BH in an accretion disk can also occur without any observable radiation signature. This is a highly stable state but mathematically permissible. In this case all the observable photons would have been “sucked in” the BH. This may explain why many SMBHs are suspected in galaxies yet there exists no detectable radiation. Another reason for “quiet” SMBHs is that perhaps these SMBHs are not drawing in any matter to form an accretion disk at all and are just waiting patiently for some unsuspecting matter to come close enough to be gravitationally bound.

If the BH has a halo of matter surrounding it as well as an accretion disk then things can become quite complicated. The mass in the halo, (which can actually include stars in a SMBH halo) is thought to be drawn into the BH by sub Keplerian flow, that is faster than a Keplerian flow rate but not too

Continued on page 4

Accretion Disks and Black Holes (Part Two)

Continued from page 3

fast to be flung out away from the BH, (super Keplerian flow). This sub Keplerian inflow of matter into a BH may also be a dominant flow in SMBHs. This interface of the halo and the disk is an area of ongoing research.

Most of the energy emitted by accreting BHs is in the x-ray region and this higher energy is caused mainly by the inverse Compton process, (where a photon gains energy from an electron) from a very hot, (about 100M to 1B degrees Kelvin) plasma as the matter falls into the BH. There seem to be two main spectral states, (when they are emitting radiation) for accreting BHs. X-ray emissions of

liptical galaxy, (about 1970 Mpc distant or $z = 0.37$) that is thought to be a tidal disruption flare from a SMBH caused by the close passing by of a star that the SMBH tore apart and absorbed. The x-ray spectrum was followed up for 2 years following the initial detection and the data agreed very well with theoretical predictions for such an encounter. It is predicted that about every 10,000 to 100,000 years the orbit of a star will bring it close enough to a central SMBH in a galaxy to be absorbed in such a manner.

The HST has shown us plain evidence of accretion disks, dusty doughnut shapes, and jets in AGN. Radio astronomy has detected Keplerian rotation in some AGN, (for example NGC 4528) as well.

Accretion disks around BHs are usually depicted as destructive mechanisms when actually they can also be quite constructive. It was recently discussed that the SMBH accretion disk in the center of our galaxy actually produced some of the stars seen rapidly revolving about the SMBH. They formed on the periphery of the accretion disk via local gravitational collapse and were not all absorbed by the SMBH. This occurred when a huge cloud, (most likely thousands or hundreds of thousands of solar masses) of gas and dust were being absorbed by the SMBH and the strong gravity of this SMBH stimulated the cloud to form stars in its outer portions, through local gravitational collapse.

A complete theory of accretion disk with BH model(s) that helps us predict observed spectral features, BH characteristics, and space time features of BHs, in conjunction with the various accretion disk inflows and structures, is the eventual goal. We have seen that the geometry of the disk and disk-halo are closely tied to the observed emission spectral output, (in all wavelengths) of the BH and with any jets present. A single accretion disk can undergo oscillations or changes in

its geometry, (physical changes or states) which can cause changes in the spectral output, (as from thermal to non-thermal for example). These phases or changes can be regular or irregular. It appears that it is not just the amount of mass that flows into the BH but also "how" it flows into the BH that is critical to this understanding. However a complete model of these connections is still work in progress.

Future observations from many satellites in all wavelengths, (though especially x-rays) will enable astronomers to gain a deeper understanding of the complex nature of accretion disks, BHs, their beauty, and unique relationships.

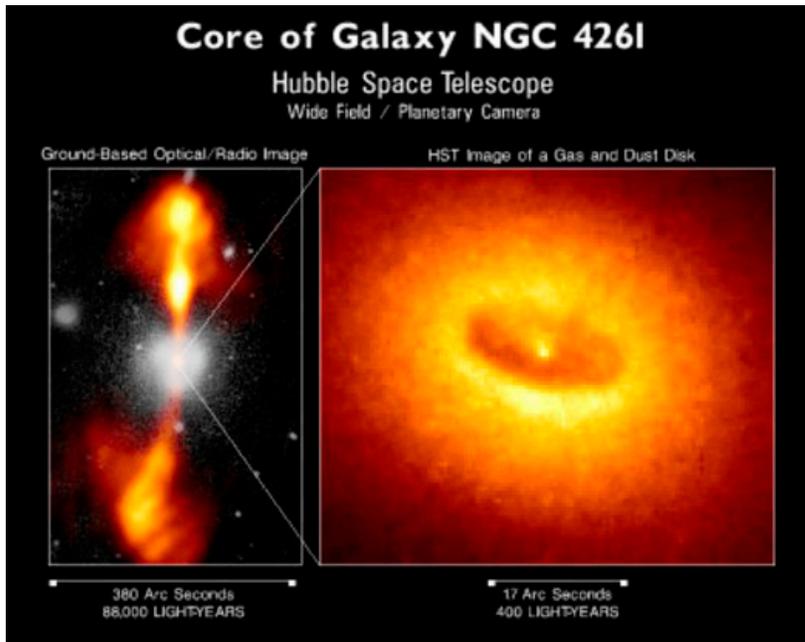


Figure 6: Hubble image of SMBH accretion disk in NGC4261, note the huge disk radius.

a few KeV seem to indicate a thin but dense accretion disk that cause x-rays by thermal effects, (friction). This type of disk flows in tight spirals into the BH and are usually quite luminous. They are sometimes called Shakura-Sunyaev disks after a famous paper in 1974 describing this disk type, by these two astrophysicists. At higher x-ray energies in the MeV range the spectral output is not mainly thermal, (usually inverse Compton processes) and may reflect a more complicated accretion disk geometry. The exact connection to any jets and the accretion disk, (including the halo) is again not well understood.

In 2006 the GALEX satellite detected a UV flare-up from an el-

All truths are easy to understand once they are discovered; the point is to discover them.

Galileo Galilei
Italian astronomer & physicist (1564 - 1642)

January Guest Speaker

As we went to publication on this month's newsletter, no guest speaker had yet been scheduled. Watch the EVAC email list for

an announcement soon! Looking forward to a great meeting on the 16th.

Saturn's Crazy Christmas Tilt by Dr. Tony Phillips

You look through the telescope. Blink. Shake your head and look again. The planet you expected to see in the eyepiece is not the one that's actually there. Too much eggnog?

No, it's just Saturn's crazy Christmas tilt.

All year long, the rings of Saturn have been tilting toward Earth and now they are almost perfectly edge-on. The opening angle is a paper-thin 0.8° . Viewed from the side, the normally wide and bright rings have become a shadowy line bisecting Saturn's two hemispheres--a scene of rare beauty.

Amateur astronomer Efrain Morales Rivera of Aguadilla, Puerto Rico, has been monitoring Saturn and he created the composite image to the right showing how the geometry has changed.

Astronomers call the phenomenon a "ring plane crossing." As Saturn goes around the sun, it periodically (once every 14 to 15 years) turns its rings edge-on to Earth. Because the rings are so thin, they can actually disappear when viewed through a backyard telescope. At the precise moment of crossing, Saturn undergoes a startling metamorphosis. The ringed planet becomes a lonely ball

of gas, almost unrecognizable. This is further illustrated in the Hubble photo on page 15 of this issue.

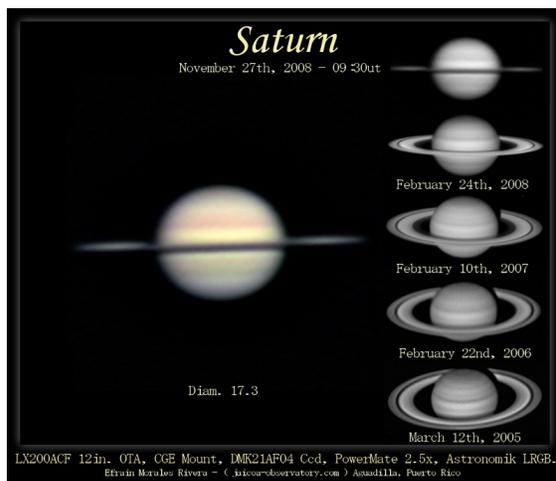
(Historical note: Shortly after Galileo discovered Saturn's rings in 1610, they disappeared in precisely this fashion. Galileo didn't understand the nature of the rings and the vanishing act confused him mightily. Nevertheless, his physical intuition prevailed. "They'll be back," he predicted, and without ever knowing why, he was correct.)

The best time to look is now.

The 0.8° opening angle of Christmas 2008 is the minimum for some time to come. In January 2009 the rings begin to open up again, a temporary reversal caused by the orbital motions of Earth and Saturn. By the time narrowing resumes in summer 2009, Saturn will be approaching the sun; looking through a telescope then could actually be dangerous. The next ring plane crossing that's easy to watch won't come until 2038.

So if you woke up before sunrise on Dec. 25th and pointed your telescope at the golden "star" in Leo, you witnessed Saturn's crazy Christmas tilt.

Article courtesy of Science@NASA. Image courtesy of Efrain Morales Aguadilla.



☾ FIRST QUARTER MOON ON JANUARY 4 AT 04:56

● FULL MOON ON JANUARY 10 AT 20:27

☾ LAST QUARTER MOON ON JANUARY 17 AT 19:47

○ NEW MOON ON JANUARY 26 AT 00:55

Orion 8" F10 SCT & SkyView Pro Equatorial Mount

Standards include: XLT coatings, 24mm Plossl and manual for mount.

Extras include: Pro GoTo Upgrade Kit, v 3.20, firmware upgraded, cable and documentation manual for GoTo upgrade kit, polar axis finder and 12v battery. List price \$1999.00

This equipment is 18 months old. Used sparingly because 14.5" Dob gets preference. Reason for sale is to finance an upgrade.

Sale price \$1600.00

If you are interested in seeing this telescope contact AJ Crayon at 602-938-3277 or e-mail at acrayon@cox.net



Also, if you are thinking of a telescope for Christmas this is an ideal time to start looking and this is an ideal telescope to give.

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TeleVue Panoramic Alt-Az Mount

TelePod head is mated with a Panoramic tripod with Ash legs and central tray. This sells new for about \$600. I'll sell this one for \$225. Also have a Stellarvue 2" enhanced diagonal (with 1/4" adapter) for \$100.



*Peter Argenziano
news@evaonline.org*

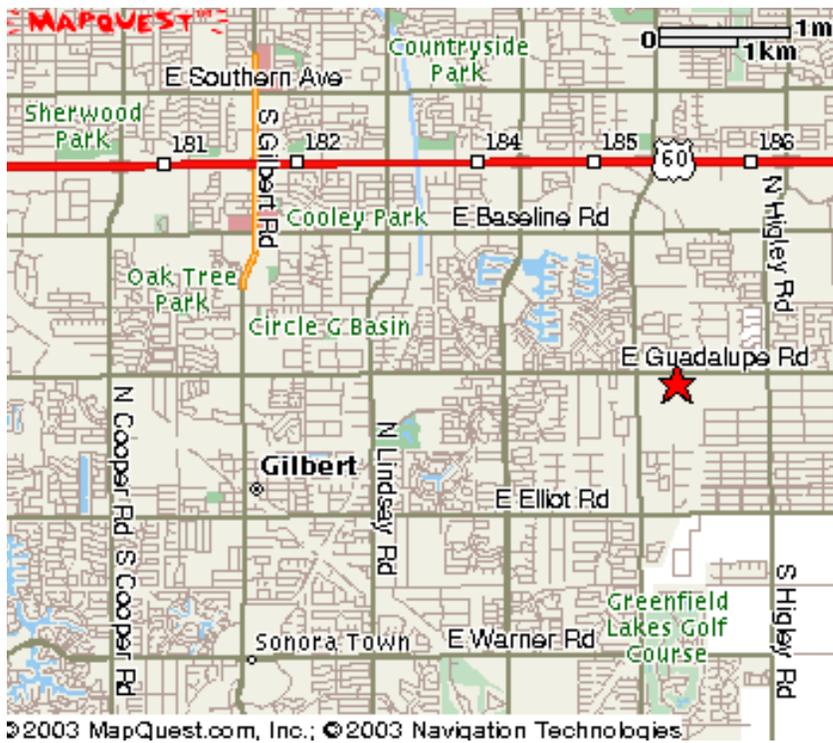
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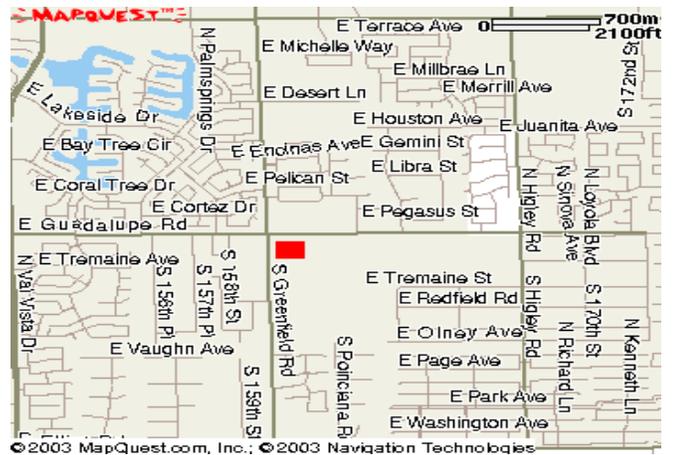


The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

Our meetings are held on the third Friday of each month at the Southeast Regional Library in Gilbert. The library is located at 775 N. Greenfield Road; on the southeast corner of Greenfield and Guadalupe Roads.

Meetings begin at 7:30 pm.

Visitors are always welcome!



Upcoming Meetings

- January 16
- February 20
- March 20
- April 17
- May 15
- June 19

Southeast Regional Library
775 N. Greenfield Road
Gilbert, Az. 85234

All are welcome to attend the pre-meeting dinner at 5:30 pm. We meet at Old Country Buffet, located at 1855 S. Stapley Drive in Mesa. The restaurant is in the plaza on the northeast corner of Stapley and Baseline Roads, just south of US60.

Old Country Buffet
1855 S. Stapley Drive
Mesa, Az. 85204

Likewise, all are invited to meet for coffee and more astro talk after the meeting at Denny's on Cooper (Stapley), between Baseline and Guadalupe Roads.

Denny's
1368 N. Cooper
Gilbert, Az. 85233



JANUARY 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

January 9 - Public Star Party

January 16 - General Meeting at Southeast Regional Library in Gilbert

January 17 - Local Star Party at Boyce Thompson Arboretum

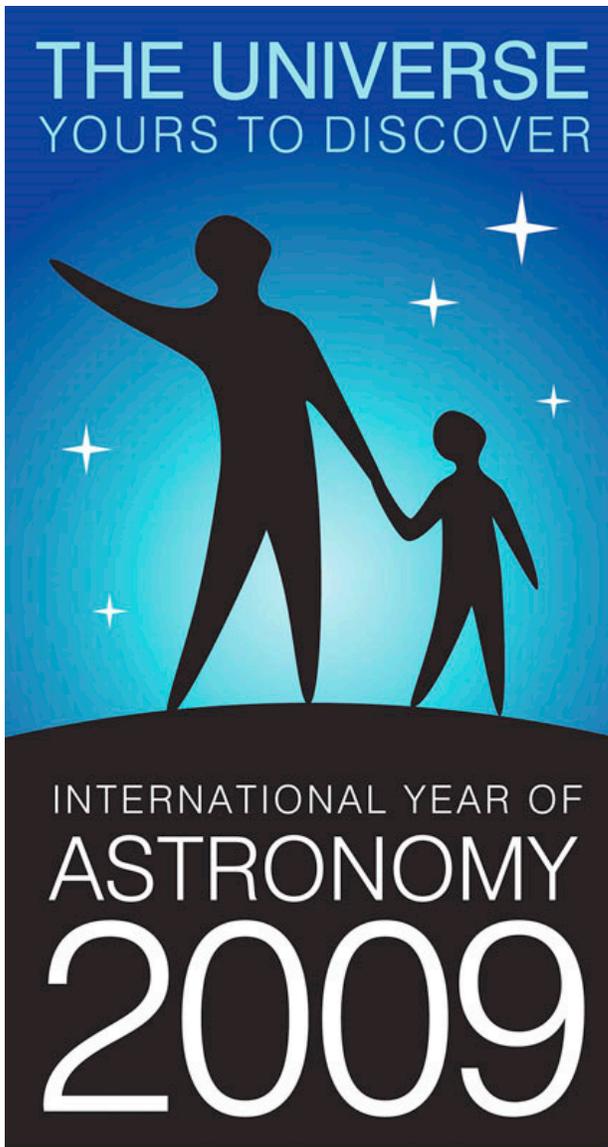
January 22 - Jacobsen Elementary School

Star Party

January 24 - Deep Sky Star Party at Vekol Road

Thompson Arboretum

January 27 - Deep Sky Star Party at Vekol



The International Year of Astronomy 2009 (IYA2009) has been launched by the International Astronomical Union (IAU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) under the theme, “The Universe, yours to discover”. Thousands of IYA2009 events are described on the national websites, as well as on astronomy2009.org, and a few of the global projects are listed here.

The official IYA2009 Opening Ceremony will take place in Paris on 15 and 16 January 2009, and the press is invited to attend. It will feature keynote speakers, including Nobel Laureates, and live video feeds to scientists working in remote locations. Many nations are holding their own Opening Ceremonies in January and February, showing their dedication to the Year.

One of IYA2009’s aims is to raise awareness of light pollution, and how the beauty of the night sky is progressively being drowned out, particularly over urban areas. The project Dark Skies Awareness is tackling these issues head-on in a practical, inclusive manner. One way in which it is doing this is by holding star-counting events, where the public are encouraged to see how many stars in a particular area of the sky are actually visible from their location. When compared with data from truly dark sites, the results are often very surprising! The “How Many Stars” event will run from January 2009.

A list of event highlights is available on the official IYA2009 website, www.astronomy2009.org/highlights.

IYA2009 seeks to involve the public at large in its activities, and to this end amateur astronomers have been called upon to help organise and run events. Known for their enthusiasm, this army of helpers is growing every day, preparing to promote astronomy in a stunning variety of ways. In fact, so many thousands of people across the globe are already involved, they have formed the world’s largest ever astronomy network.

With such a range of activities planned, now is the ideal time to learn more about the cosmos and our place within it. The International Year of Astronomy 2009 promises to make the Universe yours to discover, beginning on 1 January 2009.

East Valley Astronomy Club -- 2009 Membership Form

Please complete this form and return it to the club Treasurer at the next meeting or mail it to EVAC, PO Box 2202, Mesa, Az, 85214-2202. Please include a check or money order made payable to EVAC for the appropriate amount.

IMPORTANT: All memberships expire on December 31 of each year.

Select one of the following:

New Member
 Renewal
 Change of Address

New Member Dues (dues are prorated, select according to the month you are joining the club):

<input type="checkbox"/> \$30.00 Individual January through March	<input type="checkbox"/> \$22.50 Individual April through June
<input type="checkbox"/> \$35.00 Family January through March	<input type="checkbox"/> \$26.25 Family April through June
<input type="checkbox"/> \$15.00 Individual July through September	<input type="checkbox"/> \$37.50 Individual October through December
<input type="checkbox"/> \$17.50 Family July through September	<input type="checkbox"/> \$43.75 Family October through December

Includes dues for the following year

Renewal (current members only):

\$30.00 Individual
 \$35.00 Family

Magazine Subscriptions (include renewal notices):

\$34.00 Astronomy
 \$33.00 Sky & Telescope

Name Badges:

\$10.00 Each (including postage) Quantity: _____

Name to imprint: _____

Total amount enclosed:

Please make check or money order payable to EVAC

Payment was remitted separately using PayPal
 Payment was remitted separately using my financial institution's online bill payment feature

Name: <input style="width: 300px; height: 25px;" type="text"/>	Phone: <input style="width: 300px; height: 25px;" type="text"/>
Address: <input style="width: 300px; height: 25px;" type="text"/>	Email: <input style="width: 300px; height: 25px;" type="text"/>
City, State, Zip: <input style="width: 250px; height: 25px;" type="text"/>	<input type="checkbox"/> Publish email address on website URL: <input style="width: 300px; height: 25px;" type="text"/>

How would you like to receive your monthly newsletter? (choose one option):

Electronic delivery (PDF) *Included with membership*
 US Mail **Please add \$10 to the total payment**

Areas of Interest (check all that apply):

<input type="checkbox"/> General Observing	<input type="checkbox"/> Cosmology
<input type="checkbox"/> Lunar Observing	<input type="checkbox"/> Telescope Making
<input type="checkbox"/> Planetary Observing	<input type="checkbox"/> Astrophotography
<input type="checkbox"/> Deep Sky Observing	<input type="checkbox"/> Other

Please describe your astronomy equipment:

Would you be interested in attending a beginner's workshop? Yes No

How did you discover East Valley Astronomy Club?

PO Box 2202
Mesa, AZ 85214-2202
www.eastvalleyastronomy.org

All members are required to have a liability release form (waiver) on file. Please complete one and forward to the Treasurer with your membership application or renewal.

Liability Release Form

In consideration of attending any publicized Star Party hosted by the East Valley Astronomy Club (hereinafter referred to as "EVAC") I hereby affirm that I and my family agree to hold EVAC harmless from any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), which may directly or indirectly be connected to EVAC and/or my presence on the premises of any EVAC Star Party and related areas.

I further agree to indemnify any party indicated above should such party suffer any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), caused directly or indirectly by my negligent or intentional acts, or failure to act, or if such acts or failures to act are directly or indirectly caused by any person in my family or associates while participating in an EVAC Star Party.

My signature upon this form also indicates agreement and acceptance on behalf of all minor children (under 18 years of age) under my care in attendance.

EVAC only recognizes those who are members or invitees and who also have a signed Liability Release Form on file as participants at an EVAC Star Party.

Please print name here

Date



Please sign name here

**PO Box 2202
Mesa, AZ 85214-2202
www.eastvalleyastronomy.org**

Superstar Hide and Seek

by Dr. Tony Phillips

It sounds like an impossible task: Take a star a hundred times larger in diameter and millions of times more luminous than the Sun and hide it in our own galaxy where the most powerful optical telescopes on Earth cannot find it.

But it is not impossible. In fact, there could be dozens to hundreds of such stars hiding in the Milky Way right now. Furiously burning their inner stores of hydrogen, these hidden superstars are like ticking bombs poised to 'go supernova' at any moment, possibly unleashing powerful gamma-ray bursts. No wonder astronomers are hunting for them.

Earlier this year, they found one.

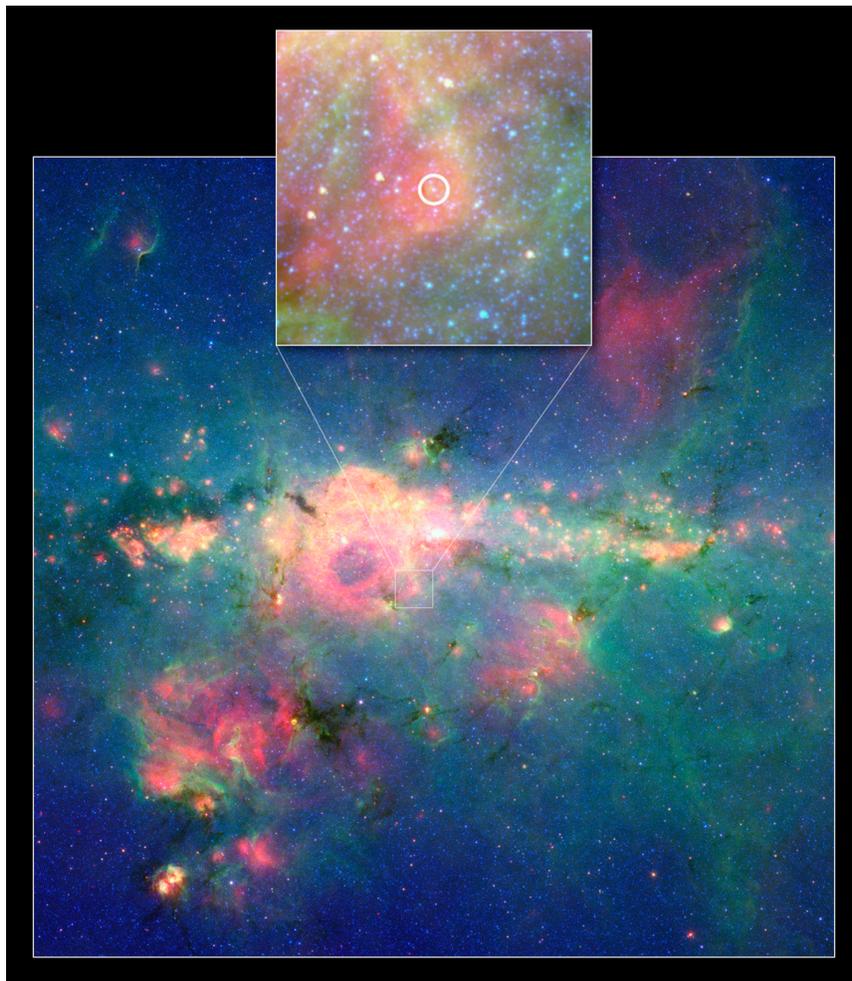
"It's called the Peony nebula star," says Lidia Oskinova of Potsdam University in Germany. "It shines like 3.2 million suns and weighs in at about 90 solar masses."

The star lies behind a dense veil of dust near the center of the Milky Way galaxy. Starlight traveling through the dust is attenuated so much that the Peony star, at first glance, looks rather dim and ordinary. Oskinova's team set the record straight using NASA's Spitzer Space Telescope. Clouds of dust can hide a star from visible-light telescopes, but Spitzer is an infrared telescope able to penetrate the dusty gloom.

"Using data from Spitzer, along with infrared observations from the ESO's New Technology Telescope in Chile, we calculated the Peony star's true luminosity," she explains. "In the Milky Way galaxy, it is second only to another known superstar, Eta Carina, which shines like 4.7 million suns."

Oskinova believes this is just the tip of the iceberg. Theoretical

models of star formation suggest that one Peony-type star is born in our galaxy every 10,000 years. Given that the lifetime of such a star is about one million years, there should be 100 of them in the Milky Way at any given moment.



The "Peony Nebula" star is the second-brightest found in the Milky Way Galaxy, after Eta Carina. The Peony star blazes with the light of 3.2 million suns.

Could that be a hundred deadly gamma-ray bursts waiting to happen? Oskinova is not worried.

"There's no threat to Earth," she believes. "Gamma-ray bursts produce tightly focused jets of radiation and we would be extremely unlucky to be in the way of one. Furthermore, there don't appear to be any supermassive stars within a thousand light years of our planet."

Nevertheless, the hunt continues. Mapping and studying supermassive stars will help researchers understand the inner workings of extreme star formation and, moreover, identify stars on the brink of supernova. One day, astronomers monitoring a Peony-type star could witness with their own eyes one of the biggest explosions since the Big Bang itself.

Now that might be hard to hide.

Find out the latest news on discoveries using the Spitzer at www.spitzer.caltech.edu. Kids (of all ages) can read about "Lucy's Planet Hunt" using the Spitzer Space Telescope at spaceplace.nasa.gov/en/kids/spitzer/lucy.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

If It's Clear...

by *Fulton Wright, Jr.*

Prescott Astronomy Club

JANUARY 2009

Shamelessly stolen information from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find info. When gauging distances, remember that the Moon is 1/2 a degree or 30 arc minutes in diameter. All times are Mountain Standard Time.

The week starting Wednesday, January 1, at about 6:15 PM, you have a chance to see Mercury very low in the southwest. If you miss it this time, you will have a better chance in April.

On Saturday morning, January 3, from 5:00 to 6:00 AM, you might see some meteors. The Quadrantids are a brief but active shower coming out of a radiant in northern Booties. It's going to be cold out there, dress warmly.

On Saturday evening, January 3, the Moon is at 1st quarter and sets at 12:34 AM (Sunday).

On Thursday, January 8, after sunset, you can see some lava domes on the Moon. With a small (3 inch) or medium (6 inch) telescope look for Mons Rumker in the mare near the north end of the terminator. (Go to <http://www.inconstantmoon.com/atlas.htm> and click on high resolution chart B2 for a map of where to look. There is also some information in Astronomy magazine, January 2009, p. 53.) You should see a group of lava domes which almost look like a ruined crater or circle of small mountains as seen from a low angle.

On Saturday, January 10, at 5:20 PM (18 minutes before sunset) the full Moon rises spoiling any deep sky observing for the whole night.

On Wednesday, January 14, about 7:00 PM you can see Venus at greatest eastern elongation. With a small (3 inch) telescope, look for the brightest "star" about 30 degrees above the southwest horizon. The planet will be at half phase. As it heads for a place between us and the Sun at the end of March, it's apparent size will grow, but it's phase will shrink to a thin crescent (and, toward the end, it will get lower and harder to observe).

On the night of Thursday, January 15, about midnight (the start of the 16th) you can see Saturn's 3 brightest moons on one side of the planet. With a medium (6 inch) telescope look 25 degrees above the east horizon for Saturn. To the celestial east (down and to the left in the sky) you can see (in order of distance from the

planet) Titan (mag 8.3), Dione (mag 10.4), and (somewhat more distant) Rhea (mag 9.7).

On Sunday, January 18, at 5:00 AM, you can see 3 of Saturn's moons very close together. With a large (12 inch) telescope look 60 degrees above the southwest horizon for Saturn. To the celestial east (left in the sky), near the rings, you can see Tethys (mag 10.2), Enceladus (mag 11.7), and Mimas (mag 12.9) in a 2 arcsecond triangle. This will not be an easy observation because they are dim and close. You should be able to detect motion of the satellites in a minute or two. Enceladus passes 0.3 arcseconds from Tethys at 5:05 AM. Mimas passes 0.2 arcseconds from Tethys at 5:35 AM.

On Sunday, January 18, at 1:14 AM the third quarter moon rises, allowing most of Saturday night for deep sky observing.

On Wednesday, January 21, at 4:17 AM, the very thin crescent Moon and Antares rise very near each other. After about 6:05 AM twilight begins to interfere. By this time the two are 15 degrees above the southeast horizon.

On Thursday, January 22, about 7:00 PM you can see Venus (mag -4.5) near Uranus (mag 6). They will be 1 1/4 degrees apart. They are also close the day before and after. Because of the difference in brightness, you will probably want to look with binoculars. Sky and Telescope, January 2009, p. 62 has a diagram which might be useful.

On Sunday, January 25, it is new moon, and you can observe faint fuzzies all night.

On Sunday, January 25, between 8:30 PM and 11:00 PM, you can see a comet near a galaxy. 85P/Boethin and M74 are within 1/2 a degree of each other. The comet might be about 1 magnitude brighter and less symmetrical, but both are low surface brightness. Use the biggest telescope you have with a 1/2 degree field. They will also be close tomorrow night.

On Friday, January 30, between 11:00 PM and midnight, you can see 5 of Saturn's moons near each other. With a medium (6 inch) or bigger telescope look 25 degrees above the east horizon for mag 1 Saturn. To the celestial west (up and to the right in the sky) you will see (in order of brightness) Titan (mag 8.2), Tethys (mag 10.1), Dione (mag 10.3), Enceladus (mag 11.6), and Mimas (mag 12.8). (Rhea (mag 9.6) is on the other side of the planet.) Over the next hour or so you can see the 5 moons change position relative to each other.

From the Desk of the President

Continued from page 1

including "PayPal", and online "Bank Payment".

Our continuing Events Coordinator, Randy Peterson, has been busy again. Our public outreach program has a school event scheduled on January 22nd at Jacobson Elementary School in Chandler. There are already two additional events scheduled in February. Randy appreciates the efforts of all the member volunteers who commit to these events by supplying their telescopes for public viewing. There is also the public star party on January 9th at the

Riparian Preserve.

A special "Thank You" to our out-going President, Claude Haynes. He has worked very hard to insure a strong and viable club, and has left some "big shoes" to fill. Lucky for me (and all of us), Claude will be continuing to serve the East Valley Astronomy Club, as an elected Board Member.

I look forward to seeing all of you on January 16th for the next regular general membership meeting. Until then, I wish clear skies to all. As Claude has taught me, "Keep Looking Up".



CHAPARRAL ELEMENTARY

Gilbert, AZ - Dec. 4, 2008

The moon was a popular object and sometimes the only one to be seen in the cloudy sky.

Venus and Jupiter were visible at times. EVAC members helping Events Coordinator

Randy Peterson at this event were:

Bill Houston, Brooks Scofield, Ray Heinle, Bill Van Orden, David Hatch, Claude Haynes, Frank Pino, Bill Dellinges and David Douglass



THE DEEP SKY OBJECT OF THE MONTH

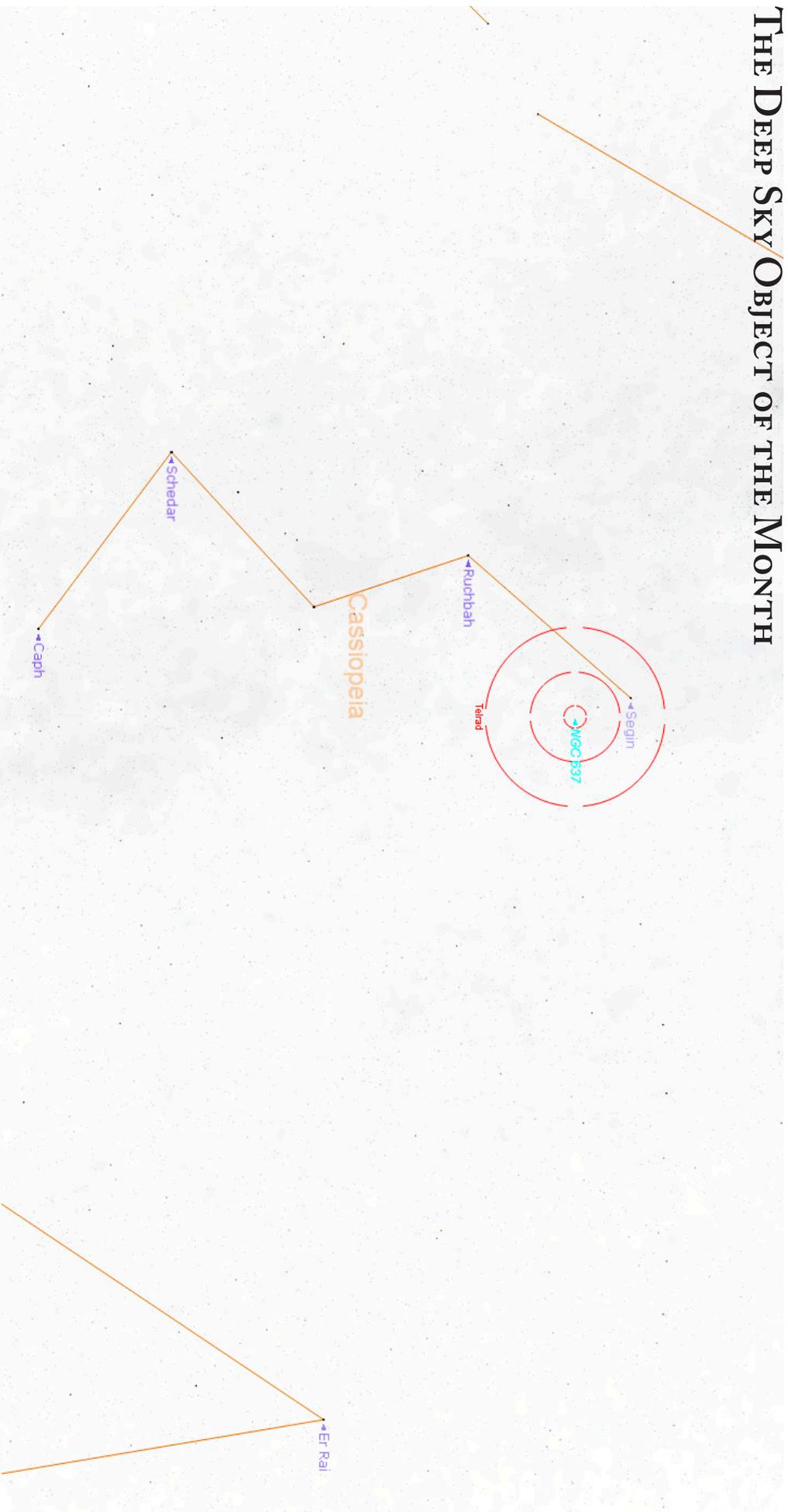
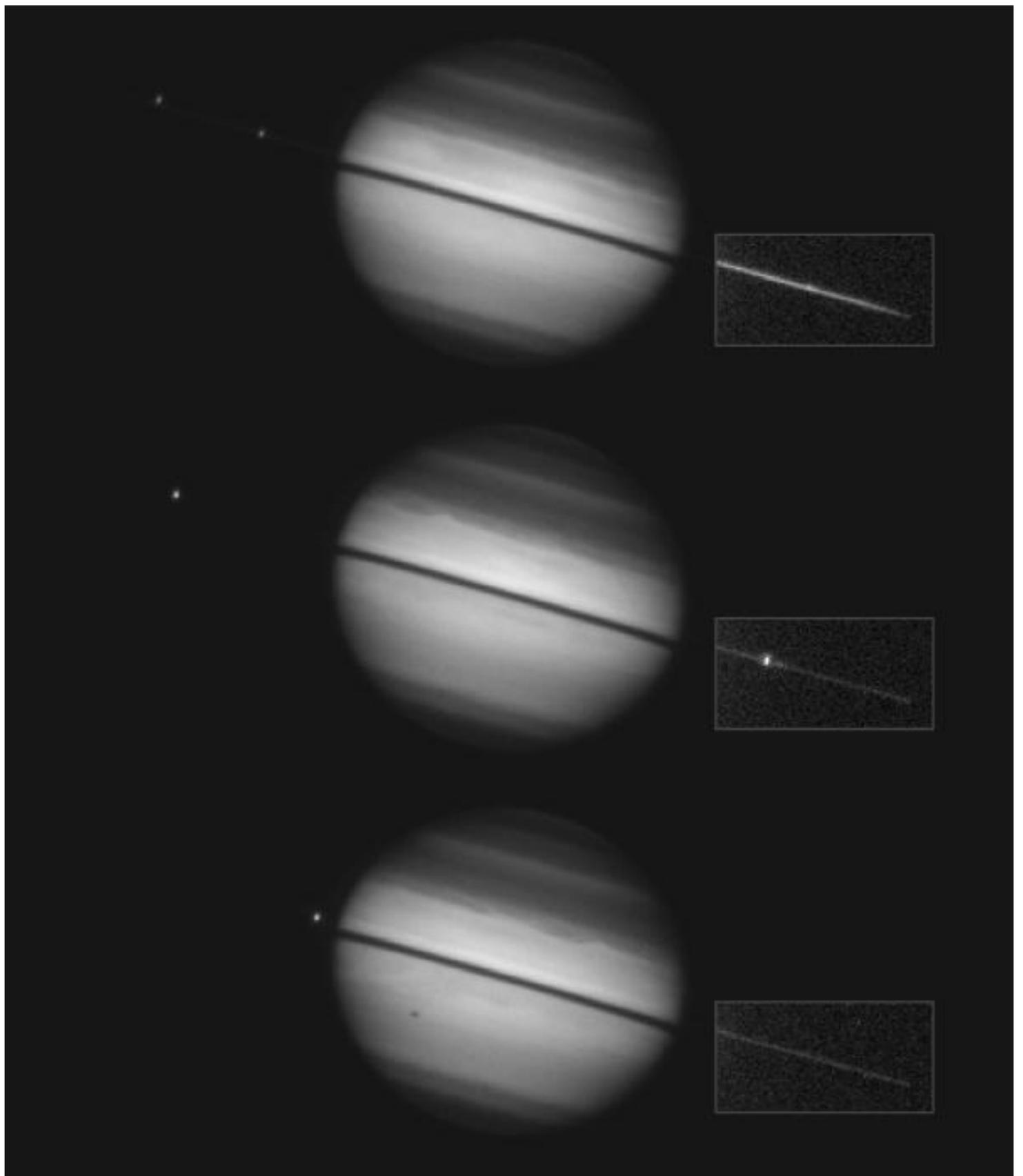


Chart generated with Starry Night Pro

NGC 637 (Collinder 17) Open Cluster in Cassiopeia

RA 01h 43m 04.0s DEC +64° 02' 24" Magnitude: 7.3 Apparent Size: 3.0'



Saturn Ring-Plane Crossing May 22, 1995

HST • WFPC2

PRC95-25b • ST ScI OPO • June 5, 1995 • A. Bosh (Lowell Obs.), NASA

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Please send your contributions, tips, suggestions and comments to the Editor at: news@evaonline.org
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Keep Looking Up!

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