December 2008

The Observer

East Valley Astronomy Club

Volume 22 Issue 12

From the Desk of the President
by Claude Haynes

Thanksgiving – November tradition, but a heartfelt sentiment at the end of my two years as EVAC president. I am thankful for a strong and vibrant club, which is committed to sharing the love of astronomy with each other and the general public. I am grateful to Peter for prodding me to finish my articles, to Marty for taking on the task of moving our website to a lower cost provider, to Martin and Joan who spend hours each weekend at the observatory, to Randy for tirelessly organizing community outreach, to Wayne for great ideas and taking notes, to Bill and Ray for balancing the books and paperwork, to Howard for interesting and informative speakers, to David for schlepping our stuff around, and for the wise counsel of Henry, Dave, Ron, Ray, Joan and Martin. I have had a wonderful term, and am sincerely grateful to all who have helped. I look forward to the leadership of David and the new officers to ably continue the mission of EVAC.

Join us at Tom and Jennifer Polakis' home on December 19 for our Sol Invictus Holiday Potluck which replaces our usual December meeting. EVAC will provide a meat and cheese tray and sodas. Please bring a dish to share as we celebrate the solstice – with the feast of the Unconquered Sun, and the Invincible EVAC. Details are on the website.

Peace
Claude Haynes

Inside this Issue:

The Backyard Astronomer
Autumn Skies *by Bill Dellinges*

Looking up at the night sky in early December while facing south, one has to wonder where all the stars went. The pickings are mighty slim compared to what the summer offered and what the winter will bring. The reason for this stellar famine is that during autumn nights we are looking in the direction of our Galaxy's south pole. That is, our view is out through the "bottom" of our great galactic disk. In this direction we peer through a mere few thousand light years of stars as opposed to tens of thousands of light years in the disk.

The prominent constellation of autumn is Pegasus, the Flying Horse. The steed was born from a mixture of sea foam and blood from the slain Medusa. The horse's rider, Bellerophon, was blasted out of the saddle by Zeus when attempting to reach the realm of the God's home atop Mount Olympus. Pegasus was allowed to stay and now graces the heavens. The main part of the constellation is the distinctive Great Square, representing the horse's torso. It is quite large and composed of one second magnitude star in its northeast corner, Alpheratz, and three third magnitude stars, Scheat, Markab, and Algenib. The Square is about the only thing in this part of the sky that resembles a possible constellation. Its interior is devoid of stars; there are however, three 4.5 magnitude stars in the big box. Can you see them?

Pegasus is upside down as seen by northern observers. A string

Continued on page 2

Upcoming Events:

Burke Basic School Star Party – December 1

Kino Junior High School Star Party – December 2

Salt River Tribal Library Star Party – December 3

Las Sendas School Star Party – December 4

Burke Basic School Star Party – December 5

Public Star Party – December 12

Holiday Party – December 19

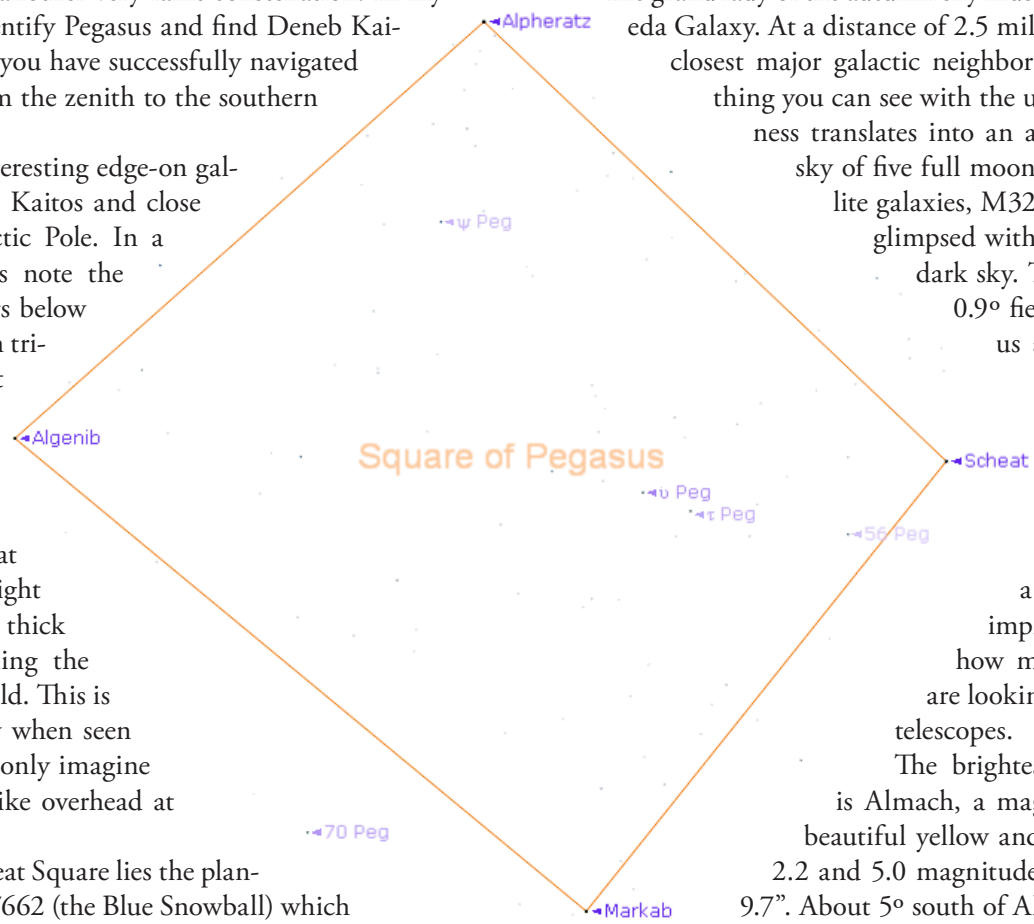
Local Star Party – December 20

Deep Sky Star Party – December 27

The Backyard Astronomer

Continued from page 1 of stars from the southwest star, Markab, form the horse's neck (Theta) and snout (Enif). Enif is an easy double star to split. The AB stars, magnitude 2.4 and 11.2, are separated by 81.8" (arc seconds). This double is sometimes referred to as the Pendulum double because of a unique characteristic. If you alternatively move the pair quickly east – west in your eyepiece field, the brighter bottom A component will appear to rock back and forth relative to the stationary B star above it – like a pendulum!

You can use the Great Square to find the only other two bright stars in this part of the sky. Follow a line through the two eastern Square stars south 35º to Deneb Kaitos (a.k.a. Diphda, mag. 2.0). This is the "tail of the whale," the brightest star in Cetus the Whale. The rest of this faint constellation goes off to the east. A line through the western two stars of the Square continued down 45º brings you to Fomalhaut (mag. 1.2), the "fish's mouth," in Piscis Austrinus, another very faint constellation. In my book, if you can identify Pegasus and find Deneb Kaitos and Fomalhaut, you have successfully navigated the autumn sky from the zenith to the southern horizon.



NGC 253 is an interesting edge-on galaxy south of Deneb Kaitos and close to the South Galactic Pole. In a finder or binoculars note the two triangles of stars below this star. The bottom triangle's western most stars point down at the galaxy. You should see a dim blur there. In an 11" SCT at 165x in moderate light pollution, I saw a thick elongated fog running the length of the 0.5º field. This is a spectacular galaxy when seen in a dark sky. I can only imagine what it must look like overhead at latitude -25º.

High above the Great Square lies the planetary nebula NGC 7662 (the Blue Snowball) which is actually in the confines of Andromeda. It will be a challenge to star hop to this object. This is where a GOTO is handy! The 11" at 200x reveals this 1' (arc minute) planetary to be somewhat small, green in color (to me) with a hint of something dark just off center to the upper right. Sure enough, a picture of 7662 in Burnham's on page 158 shows what looks like a hole in it though not as clean as in M57, the Ring Nebula.

M15, a fairly impressive globular star cluster in Pegasus, is easily found by drawing a line through Theta and Epsilon Pegasi (Enif) and extending that line northwest about half the distance between these two stars. The cluster is smaller than M13 but has a brighter core. At 200x in the 11" the cluster was impressive.

I have a confession to make. Technically, there is no "Great Square of Pegasus."

The star making up the north-east corner of Pegasus (Alpheratz) used to share residence with Andromeda but now actually belongs to the latter only. This was a result of the I.A.U. creating official constellation borders in 1928. But personally, I still see a "square" there and teach it that way.

Looking for a challenging double star? Al Rischa ("the cord") is the "brightest" star in Pisces, the eastern most group of the three faint "watery" constellations: Pisces, Aquarius and Capricornus. Not only is this double difficult to split, it's a challenge just to find Pisces! Al Rischa stats: AB Mag. 4.1, 4.9; Sep. 1.9"; P.A. 272º; Spec. A2, A2. The 11" at 233x could not get a clean split. However, my observing notes show that in 2004, my 5" APO refractor split them cleanly at 260x. You gotta love those refractors.

The grand lady of the autumn sky must be M31, the Andromeda Galaxy. At a distance of 2.5 million light years, it's our closest major galactic neighbor and the most distant thing you can see with the unaided eye. This closeness translates into an apparent length on the sky of five full moons or 2.5º. Its two satellite galaxies, M32 and NGC 205 can be glimpsed with 10x70 binoculars in a dark sky. The 11" at 90x with its 0.9º field can fit M31's nucleus and M32 in the same field. I must slew some to sweep up NGC 205 on M31's opposite side. Centered in the 11", M31 looks like a huge bright cloud, an impressive sight. I wonder how many of its inhabitants are looking back at us with their telescopes.

The brightest star in Andromeda is Almach, a magnitude 2.3 star. It's a beautiful yellow and blue double star. The 2.2 and 5.0 magnitude stars are separated by 9.7". About 5º south of Almach are two interesting objects, NGC 752 and 56 Andromedae. NGC 752 is a large sparse open cluster best seen in binoculars allowing the adjacent wide double star to its west, 56 Andromedae (3.6') to be included in the view. Note the neat curved star chain running northwest away from the cluster. The 11" at 51x can only get the western half the cluster and the double in its 1.0º field.

These are only a few of the gems to be found in the great autumn void. Hmmm, maybe it's not such a void after all!

Accretion Disks and Black Holes

by Henry De Jonge IV

In the first part of this article we will look at accretion disks in general and their overall relationship to black holes. In the second part we will examine accretion disk theory and the relationship of accretion disks to black holes in more detail.

Accretion disks play a very important role in astronomy. They are tied to the outer planets in our own solar system, protoplanetary systems, stellar births, binary star systems, supernova, galaxy evolution, and black holes, including super massive BHs, (black holes) and AGN, (active galactic nuclei). Each of these phenomena have specific properties of their accretion disks that are unique, although many similarities exist among the theory of accretion disks in general. We will discuss the accretion disks pertaining to BHs. What is an accretion disk? Accretion is defined as the collecting of additional material, as in gas and dust being gravitationally collected and attracted to a common point. As we shall see this gravitational collecting of matter usually forms a disk shape. One unique and very interesting feature to all BH accretion disks when compared to all other types, is that there is no surface onto which the accreting matter can fall onto.

Many BHs exist as x-ray binary systems or SMBHs in the center of galaxies, (the engine that makes an AGN). The accretion disks in these systems are the source of energy that we usually observe. When connected to black holes, accretion disks can be powerful sources of energy in their own right. They get this energy by the extraction of gravitational potential energy from the accretion disk onto a large gravitating body and this can be a very strong source of energy. It is a natural mechanism for producing high energy radiation. The energy released by an accretion disk is directly proportional to the mass of the central body and disk, and inversely proportional to the radius of the central gravitating body. Thus a very compact body can produce a large amount of energy with greater efficiency.

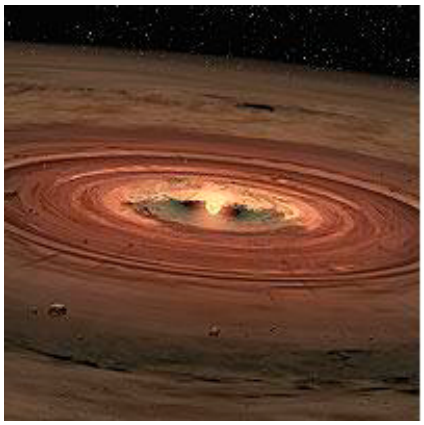


Figure 1: A drawing of a proto planetary accretion disk.

Accretion of matter onto a BH usually produces copious x-ray emissions. By studying these emissions we can probe the gravitational field of the BH and the accretion disk geometry. It is thought that accretion disks around SMBHs (super massive black holes) have influenced the local stellar environment as well as the way the host galaxies form and evolve. Some ways this could occur are, thru powerful winds created buy the accretion disk-BH combination, any jet formation, the local production of stars from accumulated matter that is gravitationally bound further out in the disks, and the radiation output of the accreted matter that can "push" material away from the surrounding area.

How does an accretion disk form in the first place? Assuming we have a large collection of mass gravitationally bound by a compact object, the rotation of a disk counters the pull of gravity towards the center of the BH, much like holding on to a fast moving merry go round. If you let go you will fly off. This rotation prevents the disk from totally collapsing. Accretion disks have angular momentum as do all rotating bodies. This angular momentum is proportional to the rate of rotation and the matter distribution of the disk. Just like the spinning ice skater the mass in the disk farther away from the center has more angular momentum than the mass closer to the center. Since the energy in angular momentum is conserved, (like all energy) the mass closer to the center spins more rapidly than the mass farther out. This conservation of angular momentum helps us understand why accretion disks are so common throughout the universe. Since almost all matter in the universe rotates, it has some angular momentum. If it begins to gravitationally contract towards a center point, it rotates faster. This causes any material along the axis of rotation, (like a cloud of mass about a central compact object) to fall vertically inward towards the equatorial region, (which is perpendicular to the axis of rotation) faster than the material along this equatorial region, and thus over time a rotating disk shape is formed. Typically matter does not fall directly into another mass or center point but instead flows in gradually through this disk mechanism.

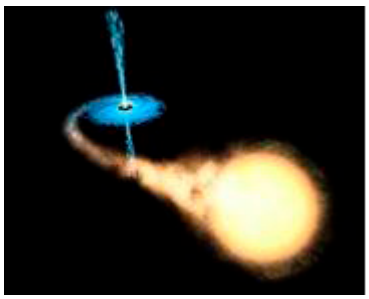


Figure 2: Drawing of a black hole with binary star and accretion disk

Since the matter closer to the central BH rotates faster then the matter further out this can cause a shear effect in the disk as some bits of matter may "slide" past other bits of matter causing friction to occur. This friction causes the inner rotating matter to slow down and speed up the rotating matter further out, in effect transporting the angular momentum to the outer portions of the disk. This then causes the inner matter to be overcome by the gravitational attraction and actually accelerate inward and spiral towards the central BH. This basic driving mechanism of transporting angular momentum outwards in an accretion disk and allowing matter to spiral inwards in a disk is called "viscosity" and is a common element of disk theory.

As the material spirals into the central BH it gains orbital speed, (thought to be close to the speed of light in some SMBHs) and begins to generate heat by the increased friction. By the time it reaches the horizon of the BH it is moving as a supersonic flow. This causes the familiar and powerful energy release in visible, UV, and x-ray, radiation we see around BHs. In fact this energy is what first attracted astronomers to the idea of BHs even existing, for the BH does not emit light, (nothing can escape from inside the Schwarzschild radius) but the accretion disk does. This process of emitting energy from an accretion disk around a central BH is extremely efficient. It can convert about 10% of

Continued on page 4

Accretion Disks and Black Holes

Continued from page 3

the rest mass of the accretion disk matter into pure energy, far more efficient than a thermonuclear explosion or stellar fusion, (remember E=mc2). It is what gives quasars, (AGN) their super high energy output and matches the theoretical predications of general relativity quite well.

If all the mass of the controlling body lie at the center of the disk then it will behave overall like the orbit of the planets about the sun, which is in a Keplerian manner, (where the rotational velocity and period change as the distance from the center). That is, it will obey the same orbital laws as the planets. If the center mass is not the main controlling mass, (like around a SMBH with a dark matter halo) then the accretion disk will not behave in a Keplerian manner. Keplerian accretion disks are usually moving slower and are accreting at a slower rate than non Keplerian disks.

The full physics and exact mechanism by which these accretion disks supply the high energy outputs such as with SMBHs is still not completely understood. It involves turbulent flow mechanics, (chaos theory), magneto hydrodynamics, and disk instability. Astrophysicists have been able to construct models whose effects and outputs can be compared to what is seen and this has had much success.

In the next installment we will examine more closely accretion disks, models, and what they may tell us about their BH partner.

November 18, 2008

KERR ELEMENTARY READING UNDER THE STARS

Randy Peterson

Don Wrigley

Claude Haynes

David Douglass

Gary Davidson

Bernard Miller and son Ben

EVAC Holiday Party

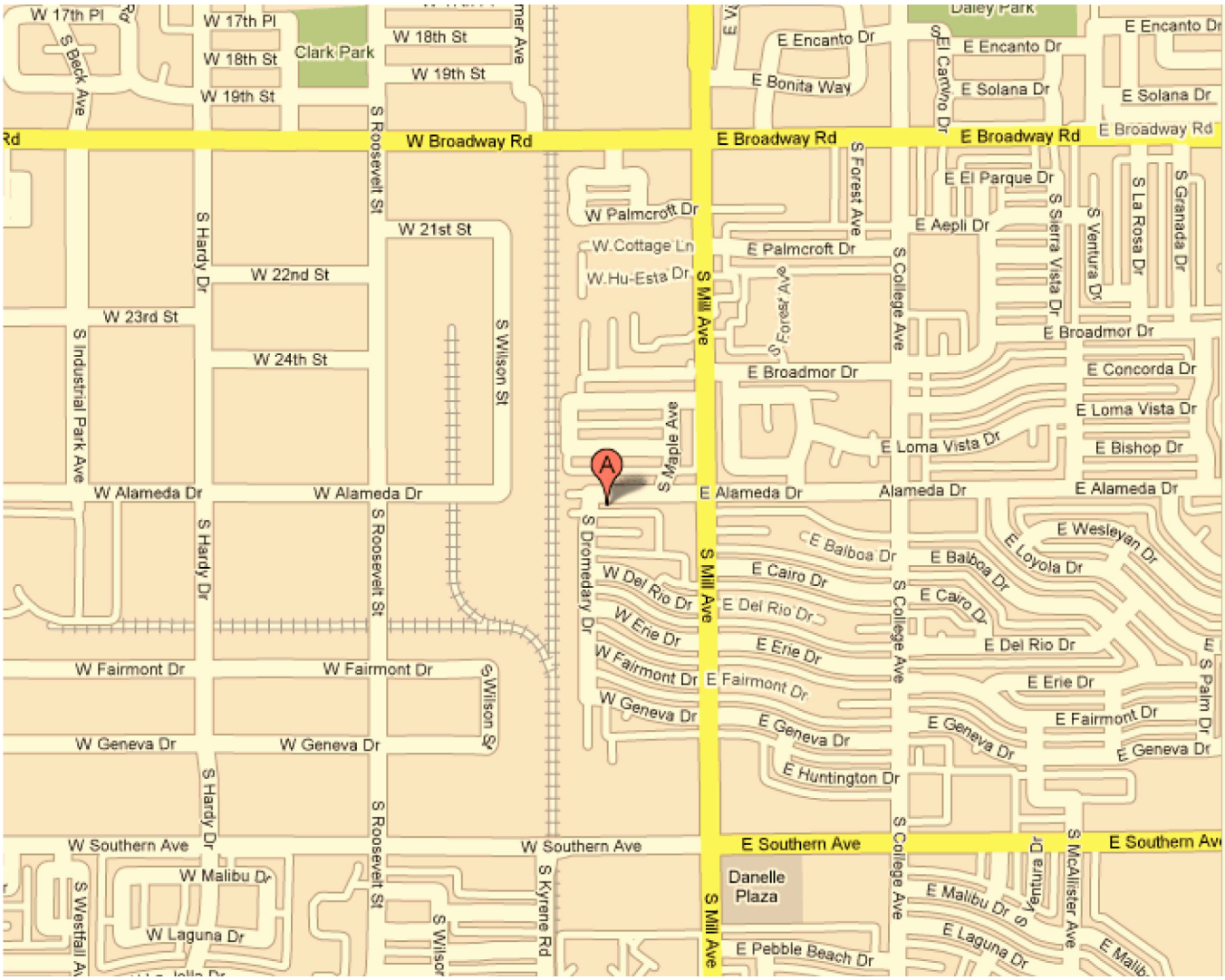
This year's Sol Invictus Holiday Potluck will be held at the home of Jennifer and Tom Polakis.

Address: 121 W. Alameda Drive in Tempe 480-967-1658

Alameda is located midway between Broadway (to the north) and Southern (to the south), and is marked by a traffic light. The intersection of note, relative to locating this festive gathering, is Mill Avenue and Alameda Drive. Casa de Polakis is located west of this intersection, on the south de of the street. Please refer to the map for navigational assistance.

Date: Friday, December 19 with festivities getting under way around 7:30 pm

The club will furnish a meat and cheese tray and soft drinks. Please bring along a side dish, finger food, dessert or favorite beverage to share! Ho ho ho... food, fun, and holiday cheer!



First Quarter Moon on December 5 at 14:26

Full Moon on December 12 at 09:38

Last Quarter Moon on December 19 at 03:30

New Moon on December 27 at 05:23

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

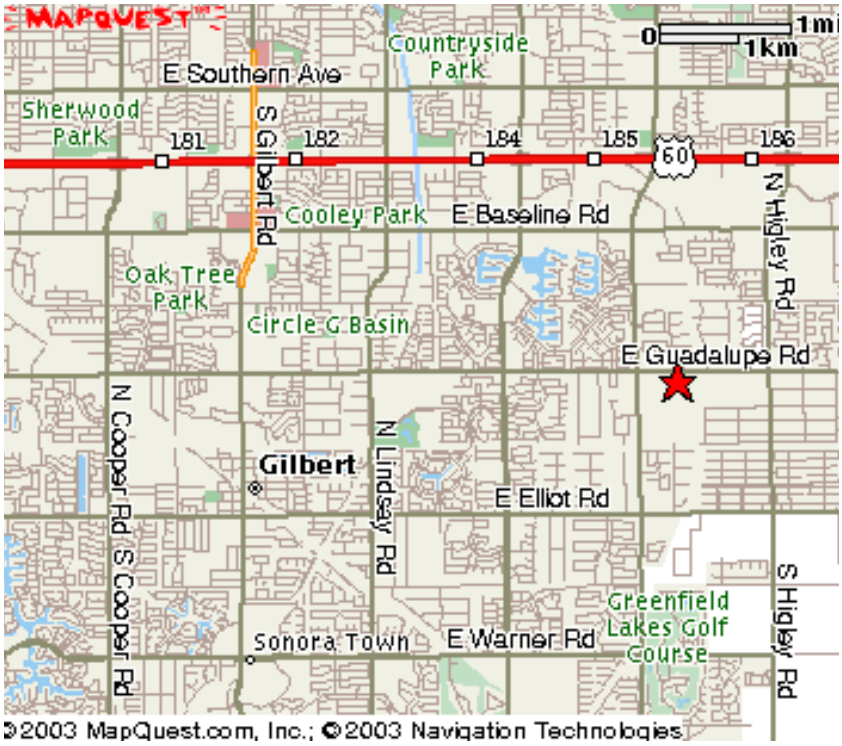
Also, if you are thinking of a telescope for Christmas this is an ideal time to start looking and this is an ideal telescope to give.

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 1¼" adapter) for $100.

Peter Argenziano
news@evaconline.org

www.eastvalleyastronomy.org/grco/obs.asp

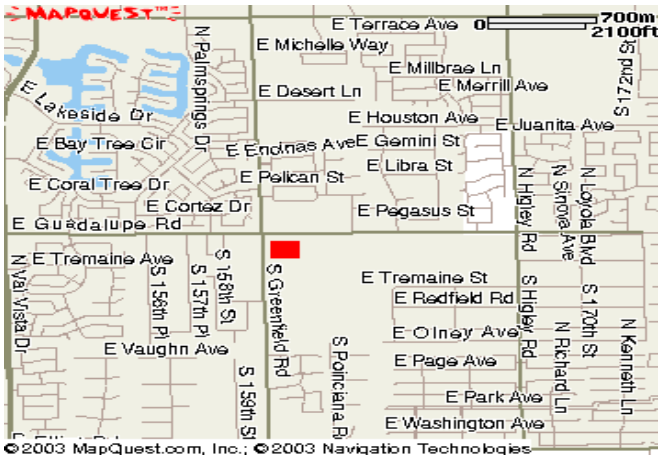


The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

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

Holiday Party December 19

January 16

February 20

March 20

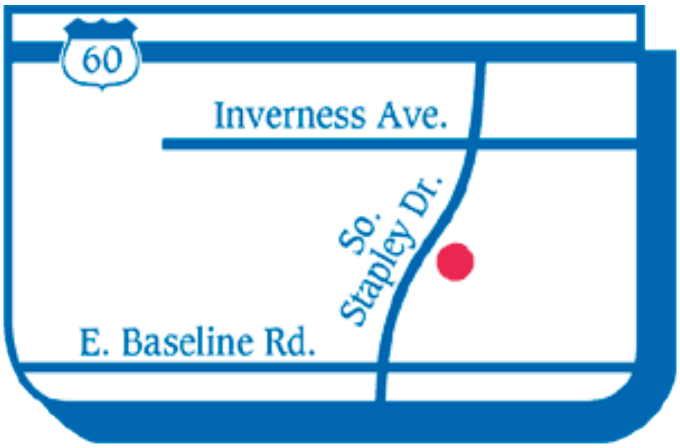
April 17

May 15

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

December 2008

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			

December 1 - Burke Basic School Star Party

December 2 - Kino Junior High School Star Party

December 3 - Salt River Tribal Library Star Party

December 4 - Las Sendas School Star Party

December 5 - Burke Basic School Star Party

December 12 - Public Star Party at Riparian Preserve

December 19 - Holiday Party at Casa Polakis in Tempe

December 20 - Local Star Party at Boyce Thompson Arboretum

December 27 - Deep Sky Star Party at Vekol

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):

☐ **$30.00 Individual** January through March

☐ **$35.00 Family** January through March

☐ **$15.00 Individual** July through September

☐ **$17.50 Family** July through September

☐ **$22.50 Individual** April through June

☐ **$26.25 Family** April through June

☐ **$37.50 Individual** October through December

☐ **$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: [ ] Phone: [ ]

Address: [ ] Email: [ ]

☐ Publish email address on website

City, State, Zip: [ ] URL: [ ]

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):

☐ General Observing ☐ Cosmology

☐ Lunar Observing ☐ Telescope Making

☐ Planetary Observing ☐ Astrophotography

☐ Deep Sky Observing ☐ 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

NASA's Space Place

The Chemical Weather Report

"Sunny tomorrow with highs in the mid-70s. There's going to be some carbon monoxide blowing in from forest fires, and all that sunshine is predicted to bring a surge in ground-level ozone by afternoon. Old and young people and anyone with lung conditions are advised to stay indoors between 3 and 5 p.m."

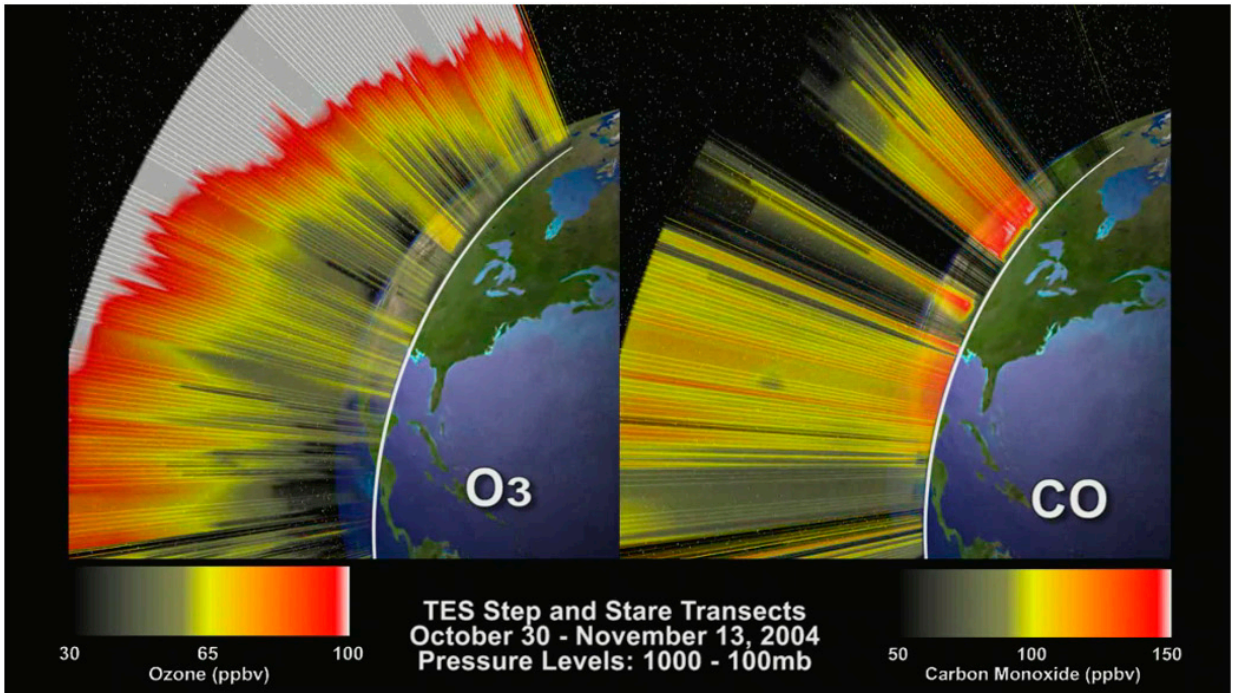
Whoever heard of a weather report like that?

Get used to it. Weather reports of the future are going to tell you a lot more about the atmosphere than just how warm and rainy it is. In the same way that satellite observations of Earth revolutionized basic weather forecasting in the 1970s and 80s, satellite tracking of air pollution is about to revolutionize the forecasting of air quality. Such forecasts could help people plan around high levels of ground-level ozone—a dangerous lung irritant—just as they now plan around bad storms.

"The phrase that people have used is chemical weather forecasting," says Kevin Bowman of NASA's Jet Propulsion Laboratory. Bowman is a senior member of the technical staff for the Tropospheric Emission Spectrometer, one of four scientific sensors on NASA's Aura satellite.

Aura and other NASA satellites track pollution in the same way that astronomers know the chemical composition of stars and distant planetary atmospheres: using spectrometry. By breaking the light from a planet or star into its spectrum of colors, scientists can read off the atmosphere's gases by looking at the "fingerprint" of wavelengths absorbed or emitted by those chemicals. From Earth orbit, pollution-watching satellites use this trick to measure trace gases such as carbon monoxide, nitrogen oxide, and ozone.

However, as Bowman explains, "Polar sun-synchronous satellites such as Aura are limited at best to two overpasses per day." A recent report by the National Research Council recommends putting a pollution-watching satellite into geosynchronous orbit—a special very high-altitude orbit above the equator in which satellites make only one orbit per day, thus seeming to hover over the same spot on the equator below. There, this new satellite, called GEOCAPE (Geostationary Coastal and Air Pollution Events), would give scientists a continuous eye in the sky, allowing them to predict daily pollution levels just as meteorologists predict storms.



Example of visualization of data from the Tropospheric Emission Spectrometer. These frames are from an animation that steps through transects of the atmosphere profiling vertical ozone and carbon monoxide concentrations, combining all tracks of the Aura satellite during a given two week period.

"NASA is beginning to investigate what it would take to build an instrument like this," Bowman says. Such a chemical weather satellite could be in orbit as soon as 2013, according to the NRC report. Weather forecasts might never be the same.

Learn more about the Tropospheric Emission Spectrometer at tes.jpl.nasa.gov.

Kids can learn some elementary smog chemistry while making "Gummy Greenhouse Gases" out of gumdrops at spaceplace.nasa.gov/en/kids/tes/gumdrops.

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

December 2008

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.

On Monday, December 1, about 6:30 PM, you can see Venus, Jupiter, and the Moon near each other, low in the southwest.

On Friday, December 5, the Moon is at 1st quarter and sets at 12:40 AM (Saturday).

On Saturday, December 6, between 7:00 PM and midnight, you can begin the easy tracking of the motion of an asteroid. With binoculars or a small (3 inch) telescope look for Alpha Piscium (mag 3.8) and nearby (4) Vesta (mag 7.2). Two other stars, 112 Piscium (mag 5.9) and HD 12536 (mag 6.9) form a convenient triangle with Alpha for gauging Vesta's motion. Vesta moves a little through the triangle near HD 12536 from night to night till December 10. See Astronomy magazine, December 2008, p. 51 for a chart. While you are there with your telescope, crank up the power on Alpha to see the 1.8 arcsecond double star.

On Thursday, December 11, starting about 12:14 AM (just after midnight of the evening which began on December 10) you can see the Moon occult some bright stars in the Pleiades. They start coming out again about 1:16 AM. Since it is nearly full Moon, you will want to use a medium (6 inch) telescope and high power.

On Friday, December 12, at 5:22 PM (2 minutes after sunset) the full Moon rises spoiling any deep sky observing for the whole night. This moon has two interesting characteristics. First, it rises almost as far north of east as it ever does and passes only 8 degrees from overhead later in the night. Second, it is very near perigee which means it appears as large as it ever does. Also, since the earth is near perihelion, the Moon should be at it's brightest. So, if the Moon seems to be dominating the sky tonight, it's because it is.

On Friday, December 19, at 12:23 AM the third quarter moon rises, allowing most of Thursday night for deep sky observing.

On Friday, December 26, from 1:37 to 2:39 AM, there are shadows from 3 of Saturn's moons on Saturn. Unfortunately, I don't expect any of them to big enough to be seen in a telescope. Instead, notice how thin the rings look. They are tilted almost edge on to us.

On Saturday, December 27, it is new moon, and you can observe faint fuzzies all night.

On Saturday, December 27, about 7:00 PM, Venus and Neptune will be about 1 1/2 degrees apart. That means that the brightest (mag -4.3) and the dimmest (mag 8.0) planets will be in the same low-power telescopic field of view. Seeing both at once will be a challenge because of their 80,000-fold difference in brightness. See Sky & Telescope magazine, December 2008, p. 55 for a finder chart.

On Tuesday, December 30, about 6:15 PM, you might glimpse Jupiter (mag -2) and (mag -1) near each other. With binoculars look very low in the southwest for the pair 1 1/2 degrees apart. They are also close tomorrow (also notice the Moon near Venus).

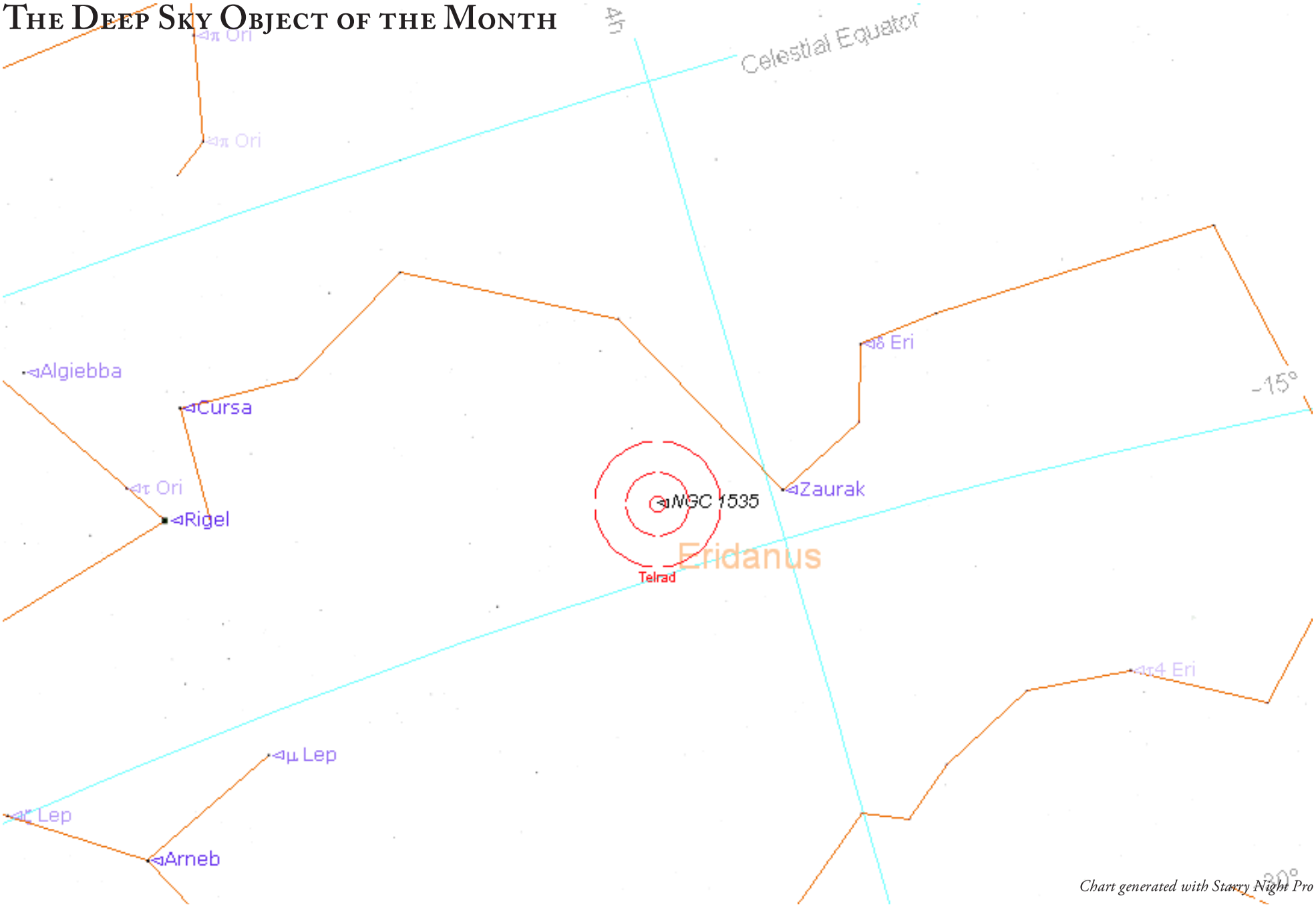
We live in a society exquisitely dependent on science and technology, in which hardly anyone knows anything about science and technology.

Carl Sagan
(1934 - 1996)

SMITH JR. HIGH

November 15, 2008

Randy Peterson
Donna Bader
Brooks Scofield
Dean Person
Bill Dellinges
Claude Haynes
Don Wrigley
David Douglass



NGC 1535 (Cleopatra's Eye) Planetary Nebula in Eridanus

RA 04h 14m 15.8s DEC -12° 44' 21" Magnitude: 9.6 Central Star: 12.2

EAST VALLEY ASTRONOMY CLUB

ADOPT A HIGHWAY

November 1, 2008
Highway 60 near Florence Junction

Randy Peterson Claude Haynes Ray Heinle Bill Dellinges Tom & Jennifer Polakis
Dave & Jan Douglass Russell Peterson Don Wrigley





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Keep Looking Up!

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