

Astronomy Club of Tulsa
Observer

August 2008

Picture of the Month – Tamas Ladanyi – July 5, 2008



The Moon, Regulus, Mars & Saturn over Lake Balaton, Hungary

Taken by Tamas Ladanyi in Hungary and printed here with his permission. The scene is very much like the one enjoyed by the participants at the July 4th Star Party - just substitute cool lake water for warm prairie grass. If you like Tamas' work please visit his website listed below or email him a note of appreciation. Thanks, Tamas, and many greetings from all of us here in Tulsa, Oklahoma, USA!

Exposure Data: Canon 450D, Canon 24-70 zoom lens, f/2,8 objective set at 54 mm & f4, 4 sec exposure, iso 800

Tamas' Website: <http://ladanyi.csillagaszat.hu/>

Tamas' email: ladanyitamas@chello.hu

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Important ACT Upcoming Dates:

- Special meeting – Members Only Star Party 7/25/08***
- Public Star Party... Fri. August 1, 2008 (p 12)
- Public Star Party... Fri. August 29, 2008 (p 12)
- Next ACT Meeting September 12, 2008 @ TCC

President's Message by Tamara Green

August is going to be a busy month for us, with THREE star parties! Note that there are TWO New Moons this month.

Our (first) public star party will be on Friday, August 1. Because our July 4 star party/ice cream social was such a success, we will be doing it again on August 1! So if you wish to, bring some ice cream or other desserts to share and we will have another good time together like last month! In the event of clouds and/or rain, the back-up night will be Saturday, August 2.

Our members-only star party will be on Friday, August 22, with Saturday, August 23 as the back-up night.

Our second public star party will be on Friday, August 29th. Since this date is also club board member Owen Green's birthday, how about doing another ice cream/dessert social?? The back-up night will be Saturday, August 30.

We are also going to need lots of support from our membership and volunteers to help maintain our observatory. Our Facility Manager, Craig Davis, is recovering from a heart attack he suffered in early June, and is under doctor's orders to NOT do any kind of strenuous work for some time, and therefore cannot take care of the grounds right now.

We are planning on having at least one, if not two, work days per month to mow, weed-eat, and maintain the building at least until the end of the season. Any volunteers will be greatly appreciated. And most importantly, let's all keep Craig in our thoughts and prayers. We all hope he makes a full recovery.

Looking ahead to Fall, our first meeting back at TCC will be on Friday, September 12. It will be held in the Phillips Building Auditorium at Metro Campus at 7:00 PM. We plan to have a good presentation for all to enjoy. More details will be coming soon.

I know it's a bit early, but Okie-Tex is almost just around the corner! It is from September 27 to October 5 at Camp Billy Joe, near Kenton, OK. The deadline for pre-registratons is September 13, at least they have to be post-marked by that date. This is per the Okie-Tex link on the Oklahoma City Astronomy Club's website, www.okcastroclub.com. For more info, visit the OKC club's website and click on the link.

Also, the Tulsa Rocketry Club will be doing High Frontier on the weekend of Saturday, October 25 and Sunday, October 26. I believe on that Saturday night, we will be doing another public star party following the rocket launches. This is always a good time for us all, and a good way to do public outreach. The people of Pawhuska have always been very kind to us, and love having us out there. So if you can come out and bring a scope or two, the more the merrier! Some of us also go up there during the day to watch the launches, which are always fun!

In case you all don't already know, 2009 is the International Year of Astronomy! We need some ideas for what we as a club can do in terms of public outreach. We are kicking around some ideas for big public events, but any other ideas would be appreciated too! Let's make 2009 a really great and memorable year!

I hope to see you all at our upcoming events! - - - Clear Skies, Tamara

Secretaries Corner: What has the board been up to lately?

This summer many of us have been traveling to darker skies. When the board has gotten together some of us have stories about our events. Rod Gallagher and John Land went to the Texas Star Party. I hear that every night for the entire week was clear. We are all anxious to see some of Rod's CCD images from that weeklong event. Tim Davis and I ventured to a remote wilderness area at close to 10,000 ft in elevation in Colorado for the annual Rocky Mountain Star Stare. We took in some of the darkest skies I've ever seen.

We did find time as a board to have a meeting for some important business. The following is a summary of each of the points on our agenda. For the details on all the motions and seconded.... etc, you can send me an email (msteresa_astrotulsa@yahoo.com) with a request and I will be glad to forward the complete official meeting minutes.

Security issues at the observatory: Although our observatory building was not vandalized, the Frosty Tower building next door to the observatory was. Apparently the vandals pried open the doors and ransacked the place. Blake Bowers, the owner of the building, now has the doors welded shut. We all hope that now the vandals realize there is nothing of value to go after in the building and maybe they will leave it alone. We have installed security cameras at both entrances to our observatory. After discussion at our board meeting we will now install a heavy, 8x8 metal box around our chain at the bottom gate, install a lock at the inner door between the classroom and dome access, and put a drop bar on the back door.

Up dating the by-laws: Teresa Kincannon will continue to act as the by-laws committee chairperson. The board, committee volunteers, and interested persons will be contacted to set up a time and place for a meeting soon. We will continue to up date one article at a time and prepare each article to be presented before the membership as a whole.

Club wide observing projects coming soon to our Club Star Parties: Several of us are quite excited about working together on this. We want to make up a small 'do-able in one night' observing list with a few challenging objects. This could be announced in the news letter and brought to each of our monthly star parties. We could even create a certificate for those that accomplish the task. With this idea came the issues that we all needed to resolve: 1- appoint a new observing chairperson (David Stine's work load led to his resignation.) and 2- Form a committee to work with new members. (Tom McDonough resigns this position also due to work load.) We have several from the meeting interested in volunteering with this. Tony White, Ann Bruun, Dennis Karcher, and others were

mentioned although not present, they have played a role in helping us at observing: Tim Davis and KC Lobrecht. As a result of our discussion: Tony White is our new Observing Chairperson and we have two new co-chairpersons for the 'New members' coordinators': Owen Green and Rick Walker.

Switching public star parties next year: Beginning next year we will be having our 'Club Star Parties' on the weekend closest to the last quarter moon and our 'Members Only Star Parties' on the weekend of the new moon.

New lawn mower is needed at the observatory: The old lawn mower is dead or dying and needs repairs at our expense every time the lawn is mowed. Currently the mower will not start due to some electrical problem. Craig Davis and John Land will be working on pricing lawn mowers that could be suitable for our needs. They will bring a quote to our attention as soon as they have had a chance to shop around. Craig Davis is taking a break as observatory maintenance/ manager for the summer. He is recovering from a recent heart attack. We will be announcing scheduled work days for the observatory building and grounds. Please watch for these notices through your emails.

Smoking/tobacco issues at the observatory: It has come to our attention that the smoke in the observatory during star parties has been a problem. We will be placing a sign in the observatory that simply says: 'Thank you for not smoking in our observatory. This is a tobacco free building.'

More business: Our new telescope needs cleaning. We will be calling on Cory Suddarth to do the work since he is well known by most board members as an expert in telescope optics.

Next year is '2009 - The Year of Astronomy'; we hope to have several public events to celebrate this.

Dennis Karcher has accepted the appointed position of News Letter Editor. Tom's workload has prevented him from continuing. Thank you both, Tom & Dennis.

How about a Yahoo group? Tony White has opened a Yahoo group for our Astronomy club. Watch your emails for an invitation to join. Tony is trying to get the information to the entire membership.

That's all for this time, - - - teresa kincannon, Club Secretary

Summer Groups



Troop 20 from Boston Ave Methodist Church camped at the observatory on the weekend of July 11-13, 2008. They worked diligently on earning the Astronomy Merit badge - Teresa Kincannon.

STARLIGHT BAND UNDER STAR LIGHT

Story by Peg Walker / Organization & Pictures by Teresa Kincannon

Tuesday, July 15th the Starlight Band performed a concert on the grassy lawns at River Park West for hundreds of fans. This performance was partnered with the Tulsa Astronomy Club who provided the visual entertainment while the band featured songs about “stars”. (*The coordinator for the starlight program, Wendy Reed, contacted Teresa Kincannon just one week ahead of the performance and by the time a few logistic details were worked out, only 3 days remained until the performance - so many thanks to Teresa for all the hard work on such short notice...*) The club members arrived about 7:00 pm and started setting up their scopes. John Land set up a table with informational flyers in hand. By 8:00 pm there were five 10-inch, two 12-inch, two 8-inch, two 6-inch and one 3.5-inch scopes along with two sets of binoculars all locked and loaded for the event. The club members were excited to have a great showing of support for the hobby that we hold so near and dear to our hearts.



Tamara and Teresa were greeted by the coordinator who gave her the agenda for the night. The announcer said he would introduce us to the crowd and encourage the audience to go check out the sky during the intermission. Curious concertgoers would look as they passed by with chairs in hand on their way to the staging area.

The concert started with the *Star Spangled Banner* that had all in attendance on their feet with hands over their hearts. The musicians played on as the TAC waited for the sun to set. A guest named Brett showed up because he saw this event on the website and wanted to see what it was all about. Brett had mentioned he just bought a 10 inch scope two months ago and needed to get hooked up with the club. Rick and Peggy Walker introduced him to the club members who each spent some time talking with him. He did regret he did not bring his scope with him. He said he would be joining us for our August viewing at the observatory so everyone make sure you track him down and say “hi”.

The band played on, *Jesus Christ Superstar*, *Phantom of the Opera*, *Twinkle Twinkle Little Star*, *When you Wish Upon a Star*, the *Star Wars Theme* as well as a few other favorites and a few original pieces. Finally, the sun was set and all scopes were positioned on the moon. Slowly but surely the music fans came by looking in the first scope and forming a large line. They were encouraged to move on down to view from the many other scopes available. That’s all it took. The scopes all were averaging lines at any given time. The crowd consisted of children through grand parents all interested in the night sky.

Then Jupiter rose and all the focus was on him. The crowd mentioned how they could see some of his moons and the stripes and the oval storm on the planet. Many people got back in line at their favorite scope and asked many questions. Several guests commented on how they bought a scope and have no idea what to do with it. They were handed flyers and encouraged to bring them to the August meeting where they would be helped in setting up their scopes and get some mentoring.

Several scopes focused on Saturn and Mars which gave the crowd quite a planetary show. They kept thanking the members for being there and how they appreciated it. The band finished their concert and the scopes kept on being busy. The last of the attendees left at about 10:30 which started the breakdown of the scopes. John Land said that he felt two to three hundred people came through our area and Theresa added that the scopes averaged 4 to 5 people in line. Overall, the club was well represented and very congenial to the crowd. Several said they would be at the August star party.

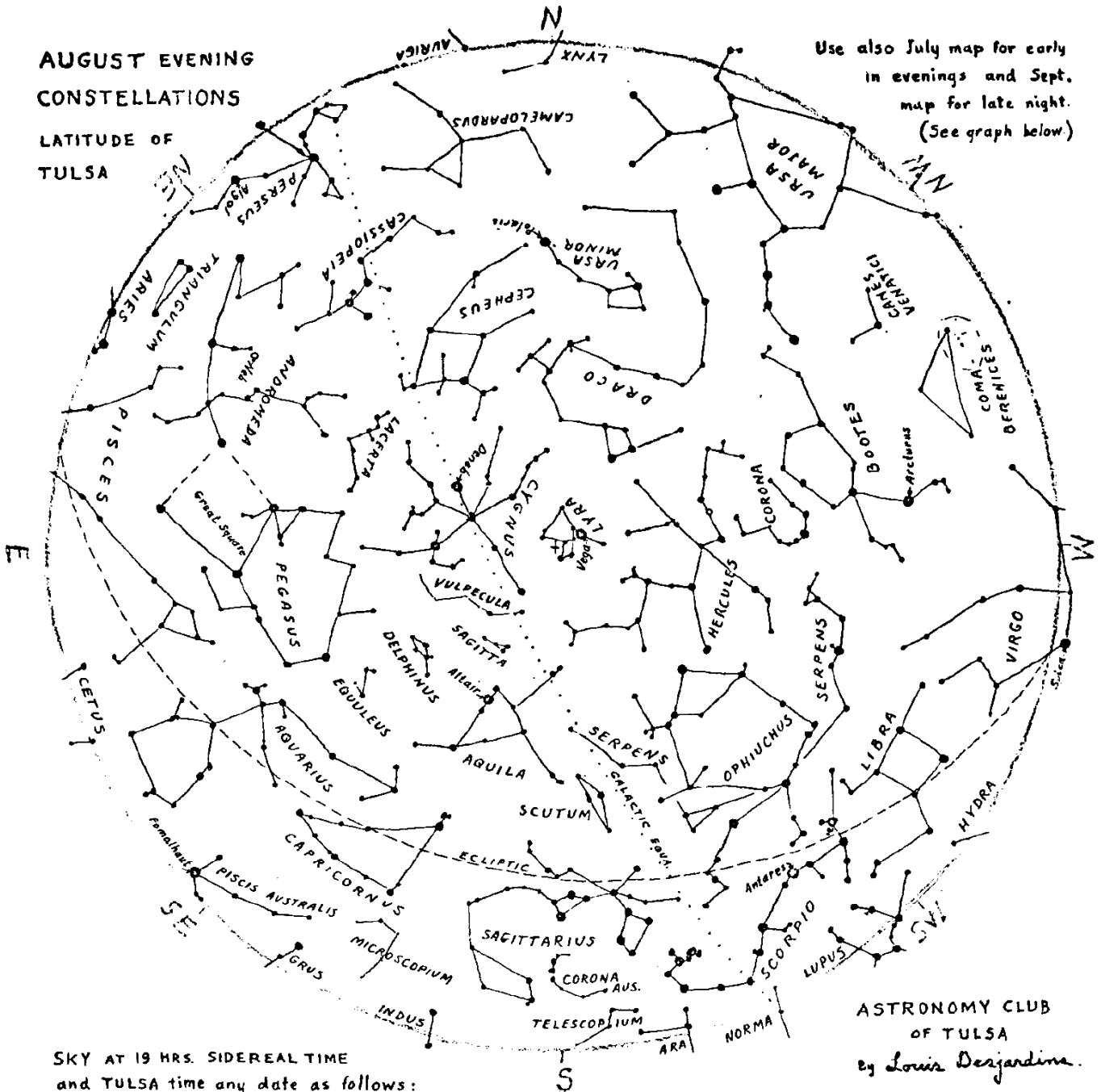
Wendy Reed came by to tell Teresa that she should send a big Thank you to all those who participated from our Club. She expressed that the crowd was awed by the views that they would see and had continuous comments over in the band area each time someone returned from the scopes.



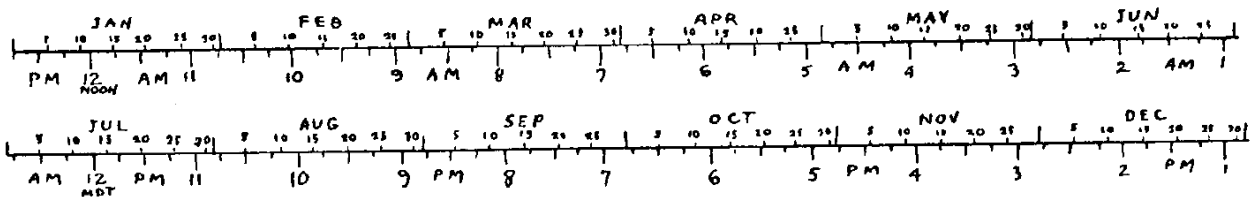
**AUGUST EVENING
CONSTELLATIONS**

LATITUDE OF
TULSA

Use also July map for early
in evenings and Sept.
map for late night.
(See graph below)



SKY AT 19 HRS. SIDEREAL TIME
and TULSA time any date as follows:



New Moon – 8/1/08 – 10:13UT
First Quarter – 8/8/08 – 20:20UT
Perseid Meteor Shower Peak – 8/12/08
Neptune at Opposition – 8/15/08

Full Moon – 8/16/08 – 21:16UT
Last Quarter – 8/23/08 – 23:50UT
New Moon – 8/30/08 – 19:58UT

John Bortle's Dark-Sky Scale – K.C. Lobrecht

The Bortle Dark-Sky Scale is a nine-level numeric measure of the night sky brightness of a particular location. It quantifies the observability of astronomical objects and the interference caused by light pollution and skyglow. John E. Bortle created the scale and published it in the February 2001 edition of *Sky & Telescope* magazine to help amateur astronomers compare the darkness of observing sites. The scale ranges from class 1, the darkest skies available on Earth, through class 9, inner city skies. The colors are from *The World Atlas of Artificial Night Sky Brightness*, and they're provided as a convenience to the reader. The correlation between the colors and Bortle Classes is approximate at best. The included graphic below pinpoints the "dark-sky" condition of our RMCC Observatory, Mounds, OK as a Bortle Class 4 site (rural/suburban transition).

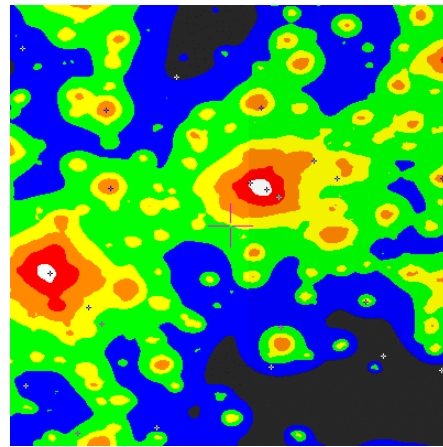
Class 1: Excellent dark-sky site. The zodiacal light, gegenschein, and zodiacal band are all visible - the zodiacal light to a striking degree, and the zodiacal band spanning the entire sky. Even with direct vision the galaxy M33 is an obvious naked-eye object. The Scorpius and Sagittarius region of the Milky Way casts obvious diffuse shadows on the ground. To the unaided eye the limiting magnitude is 7.6 to 8.0 (with effort); the presence of Jupiter or Venus in the sky seems to degrade dark adaptation. Airglow, (a very faint, naturally

occurring glow most evident within about 15° of the horizon) is readily apparent. With a 12½" scope stars to magnitude 17.5 can be detected with effort, while a 20" instrument used with moderate magnification will reach 19th magnitude. If you are observing on a grass-covered field bordered by trees, your telescope, companions, and vehicle are almost totally invisible. This is an observer's Nirvana!

Class 2: Typical truly dark site. Airglow may be weakly apparent along the horizon. M33 is rather easily seen with direct vision. The summer Milky Way is highly structured to the naked eye, and its brightest parts look like veined marble when viewed with ordinary binoculars. The zodiacal light is still bright enough to cast weak shadows just before dawn and after dusk, and its color can be seen as distinctly yellowish when compared to the blue-white of the Milky Way. Any clouds in the sky are visible only as dark holes or voids in the starry background. You can see your telescope and surroundings only vaguely, except where they project against the sky. Many of the Messier globular clusters are distinct naked-eye objects. The limiting naked-eye magnitude is as faint as 7.1 to 7.5, while a 12½" telescope reaches to magnitude 16 or 17.

Class 3: Rural Sky. Some indication of light pollution is evident along the horizon. Clouds may appear faintly illuminated in the brightest parts of the sky near the horizon but are dark overhead. The Milky Way still appears complex, and globular clusters such as M4, M5, M15 and M22 are all distinct naked-eye objects. M33 is easy to see with averted vision. The zodiacal light is striking in spring and autumn (when it extends 60° above the horizon after dusk and before dawn) and its color is at least weakly indicated. Your telescope is vaguely apparent at a distance of 20 or 30 feet. The naked eye limiting magnitude is 6.6 to 7.0, and a 12½" reflector will reach to 16th magnitude.

Class 4: Rural / suburban transition. Fairly obvious light pollution domes are obvious over population centers in several directions. The zodiacal light is clearly evident, but doesn't extend even halfway to the zenith at the beginning or end of twilight. The Milky Way well above the horizon is still impressive but lacks all but the most obvious structure. M33 is a difficult averted-vision object and is detectable only at an altitude of higher than 50°. Clouds in the direction of light pollution sources are illuminated but only slightly



so, and are still dark overhead. You can make out your telescope rather clearly at a distance. The maximum naked-eye limiting magnitude is 6.1 to 6.5, and a 12½" reflector used with moderate magnification will reveal stars of magnitude 15.5.

Class 5: Suburban sky. Only hints of the zodiacal light are

seen on the best spring and autumn nights. The Milky Way is very weak or invisible near the horizon and looks rather washed out overhead. Light sources are evident in most, if not all, directions. Over most or all of the sky, clouds are quite noticeably brighter than the sky itself. The naked eye limit is around 5.6 to 6.0, and a 12½" reflector will reach about magnitude 14.5 to 15.

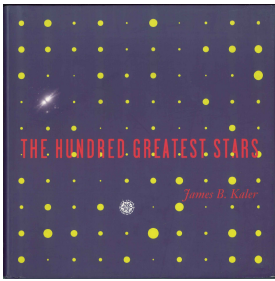
Class 6: Bright suburban sky. No trace of the zodiacal light can be seen, even on the best nights. Any indications of the Milky Way are apparent only toward the zenith. The sky within 35° of the horizon glows grayish white. Clouds anywhere in the sky appear fairly bright. You have no trouble seeing eyepieces and telescope accessories on an observing table. M33 is impossible to see without binoculars, and M31 is only modestly apparent to the unaided eye. The naked eye limit is about 5.5, and a 12½" telescope used at moderate powers will show stars at magnitude 14.0 to 14.5.

Class 7: Suburban / urban transition. The entire sky background has a vague, grayish white hue. Strong light sources are evident in all directions. The Milky Way is totally invisible or nearly so. M44 or M31 may be glimpsed with the unaided eye but are very indistinct. Clouds are brilliantly lit. Even in moderate-size telescopes the brightest Messier objects are pale ghosts of their true selves. The naked eye limiting magnitude is 5.0 if you really try, and a 12½" reflector will barely reach 14th magnitude.

Class 8: City sky. The sky glows whitish gray or orangish, and you can read newspaper headlines without difficulty. M44 and M31 may be barely glimpsed by an experienced observer on good nights, and only the bright Messier objects are detectable with a modest-size telescope. Some of the stars making up the familiar constellation patterns are difficult to see or are absent entirely. The naked eye can pick out stars down to magnitude 4.5 at best, if you know just where to look, and the stellar limit for a 12½" reflector is little better than magnitude 13.

Class 9: Inner-city sky. The entire sky is brightly lit, even at the zenith. Many stars making up familiar constellation figures are invisible, and dim constellations like Cancer and Pisces are not seen at all. Aside from perhaps the Pleiades, no Messier objects are visible to the unaided eye. The only celestial objects that really provide pleasing telescopic views are the Moon, the planets, and a few of the brightest star clusters (if you can find them). The naked eye limiting magnitude is 4.0 or less.

Book Review: *The Hundred Greatest Stars* by James B. Kaler



Publisher: Springer-Verlag New York, LLC
Pub. Date: June 2002
ISBN-13: 9780387954363
Edition Number: 1
Hardcover - 240pp
List Price: \$ 32.50
(Amazon: \$4.99 - \$32.00)

This is an extremely well written and understandable book that expresses in plain English language what makes 100 stars special. From the biggest, brightest, youngest and closest to the dimmest, smallest, oldest and furthest stars, Jim Kaler explains in layman's terminology exactly what makes his pick of the hundred greatest stars so interesting. This book is highly recommended for all amateur astronomers whether reading for enjoyment or as a reference copy on your bookshelf. Practically a college level astrophysics course in stellar evolution written in language that everyone can understand without the math getting in the way... and just a plain old interesting story to boot. Also, don't forget to check out Kaler's website at the University of Illinois:

["http://www.astro.uiuc.edu/~kaler/sow/sowlist.html"](http://www.astro.uiuc.edu/~kaler/sow/sowlist.html)

Dennis Karcher – July 2008

Comments from the Publisher

When we look into the night sky, thousands of stars twinkle back at us. We see cool red stars, hot blue stars, big stars and small stars. We find young stars and old stars, single stars and doubles. Some are astonishingly bright, while others hardly shine at all. Consider some examples from this book:

- Rapid rotators like the Black Widow, which spins 640 times per second, and speedsters like Barnard's Star, which clips along at 90 kilometers per second.
- Dazzling stars like Canopus, which shines 14,800 times more brightly than the Sun, and black holes like Cygnus X-1, with gravity so strong that no light at all escapes it.
- White dwarfs like EG 129, which has a magnetic field over a billion times stronger than Earth's.
- Young stars like T Tauri, just forming and accreting mass, and older stars like Eta Carinae that have exploded and are ejecting mass back into the Universe.
- Tiny neutron stars like Geminga, just 30 kilometers across, and enormous stars like V V Cephei, which is nearly as large as the entire orbit of Saturn.

The variety is astounding, even a bit overwhelming. How can the nascent stargazer begin to understand all the cosmos has to offer? In *The Hundred Greatest Stars*, James B. Kaler paints intimate portraits of the 100 stars he likes best. With an infectious enthusiasm, Kaler tells us about his favorites and, in the process, shows us how each star fits into the development and evolution of the cosmos.

About the Author

James B. Kaler is Professor of Astronomy at the University of Illinois at Urbana-Champaign. He has held both Fulbright and Guggenheim Fellowships, and has been awarded medals for his work from the University of Liège, Belgium, and the University of Mexico. Kaler is the author of dozens of articles and ten books, including *The Little Book of Stars* (Copernicus Books) and *Extreme Stars: At the Edge of Creation* (Cambridge University Press). He also directs and maintains several educational websites, including the highly regarded and award-winning "Stars of the Week" site at the University of Illinois.

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**Celestron NexStar 8 SE** for sale. About a year old with case & several eyepieces. Asking \$1000. Don't want to ship and would prefer a local deal if possible.

John Podpechan  
 Claremore, OK.  
 email: K5JJ@Cox.net

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Predicted MAXIMA of long period variables - August 2008
 North of -55° Declination ~ Tulsa, OK Viewing Limit
 (Predicted Maxima > 8.0 - Easy Binocular Range)

Designation	Name	Code	Range	Est Max Date
0351-24	T Eri	%	<8.0-12.8>	Aug 27
0811+12	R Cnc		<6.8-11.2>	Aug 29
1144-41	X Cen	%	<8.0-13.4>	Aug 22
1606+25	RU Her		<8.0-13.7>	Aug 23
*1657+22	SY Her		7.8-13.2	Aug 11?
1805+31	T Her		<8.0-12.8>	Aug 1
2011-39	RT Sgr	%	<7.0-13.3>	Aug 31

Codes:
 # - needs more observations
 & - needs more observations urgently
 @ - needs more observations very urgently
 % - has good CCDV or multicolor photometry, but more visual observations are needed (usually more visual observations are needed very urgently)

Source: AAVSO Bulletin 71

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**Call for Newsletter Input & Articles**

OK, folks... It's your newsletter, so what would you like to see (or not see) in upcoming issues? Any ideas, articles, pictures, road-trip reports, visits to other clubs, complaints, changes or anything that would improve our newsletter would be most welcome and appreciated.

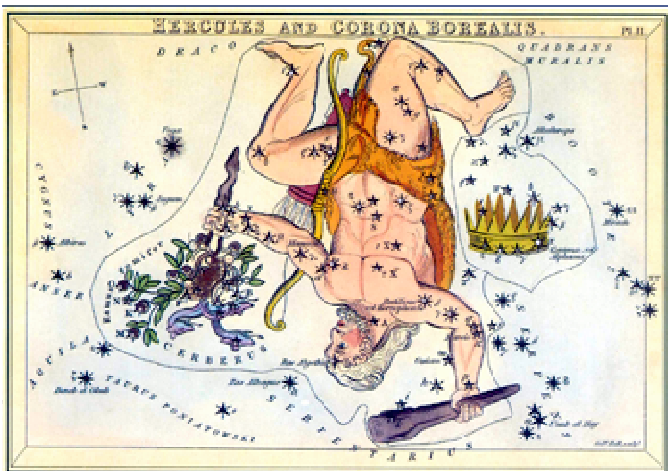
The newsletter will evolve over the next few months as I switch from Microsoft Word for Windows to Publisher, so please tolerate the construction changes and take the opportunity to input suggestions and articles. Thanks – and let me know what's on your mind for improving the Observer!!

Dennis Karcher / [djkarcher@cox.net](mailto:djkarcher@cox.net) / 918-619-7097 cell

## THE MARVELOUS MEN OF SUMMER by Peggy Walker

*In the summer sky, women can stare at several men to their hearts content without getting into trouble. We have a King-husband and father, a superhero, a woman rescuer, a healer/serpent handler, a down-to-earth man and one right out of Mid-Summer's Night Dream.*

**Cepheus** (see' fee us) is the King Ethiopia and sits on his throne next to his vain wife of many years, Cassiopeia. His wife and daughter Andromeda, were so vain, that the sea creatures were tired of their bantering so Poseidon, god of the sea needed appeasement. Cephus allowed his daughter Andromeda to be offered as a sacrifice to Cetus the sea monster. As the monster started to devour her, Perseus mounted on his winged horse Pegasus and saved the damsel in distress. He is 588 square degrees and has 57 visible stars many pulsating variable stars, with the brightest star being Alderamin with 2.5 magnitude. He is a north circumpolar constellation with NGC 40 a planetary nebula, NGC 6939 an open cluster and NGC open cluster with about 20 bright stars. His position has the broadest part of the constellation as the king's shoulders and it comes to a point down at his feet as sits on the throne. Cassiopeia sits across from him with her shoulder being the top part of this open "W" formation.



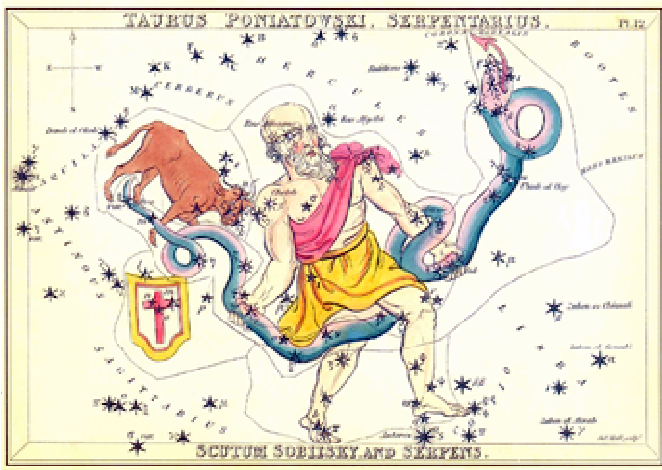
The next man happens to be **Hercules** the hunk of the sky who is the son of Alcmene and Jupiter. As a child Juno, Jupiter's wife sent two terrible snakes to murder Hercules in his crib, but the infant strangled them to death. Later, Hercules had to perform the twelve labors, battling many of the other constellations in the sky. He is recognizable by his keystone upper body and the presence of M 13 the Hercules Cluster with magnitude of 5.9 and M92 a globular cluster with magnitude of 7.5 in his upper torso. He also houses several double stars of contrasting color like Ras Algethi – alpha Hercules, has a red super giant next to the smaller blue companion star. Hercules has an area of 1,225 square degrees with 85 visible

stars. Hercules has NGC 6210 a planetary nebula, a split double red and gold pair stars and the Tau-Herculids meteor showers. He is positioned in the sky at the head of Draco with his sword overhead ready to attack.

**Perseus** (purr' see us) is the son of Zeus and Danae. He and his mom survived a drowning attempt on their life plotted by his mom's jealous husband. They were helped by the winged sandals from Hermes and Athena's polished shield. Perseus beheaded Medusa the monster and is shown carrying that in his position in the sky. He also rescued Andromeda from the sea monster Cetus. This constellation has Mirfak the alpha star sits in the center of an open star cluster. The beta star, Algol (which means demon star) is the first eclipsing binary to be discovered and has a winking appearance which is told to be the eye in the head of Medusa that Persus holds in his hand. He is noted for his meteor showers the Perseid that peak around August 12<sup>th</sup> each year. He has the area of 948 square degrees with 65 visible stars. He has M 76 planetary nebula called the Little Dumbel with a magnitude of 12.0 magnitude. There are two nebulas The Heart Nebula and the Soul Nebula IC 1805, and shares a double cluster in between him and Cassiopeia with NGC 884 and NGC 869 that is pretty bright. Perseus was the site of Comet Holmes' visit last October as he passed through. His position in the sky is at the feet of Andromeda with his winged horse above Andromeda's head.

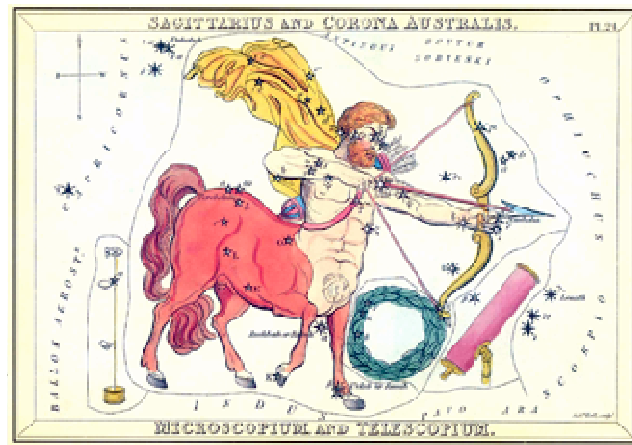
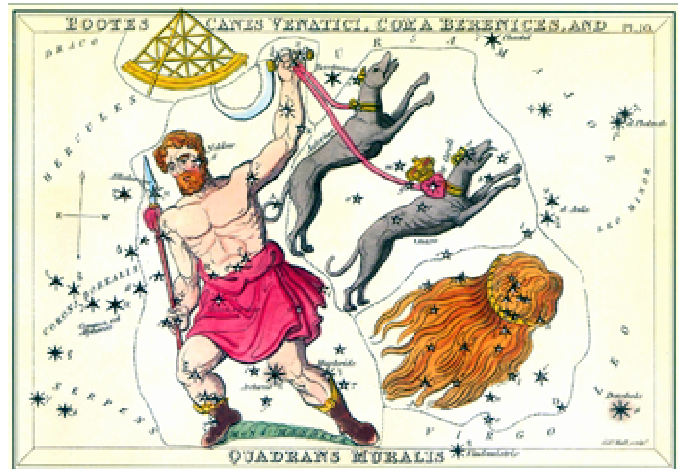






head of Hercules (who is positioned upside-down in the sky) with the top star being his head and the two wider ones as his shoulders as he holds a large snake.

**Boötes** (bow owe' teez) is a huntsman who drives the bear Ursa Major with his hunting dogs Canes Venatici. He has a lot of controversy over his story. Boötes is thought to have been put in the sky by Jupiter and Ceres the god of agriculture because he created the plough. The other story is that he was a grape grower and the god of wine Bacchus partied a lot and all their friends got drunk and disoriented. In their haziness they thought Boötes was trying to poison them so they killed him and his dogs too. The mother bear's tail in the big dipper points straight to his alpha star, Arcturus the brightest star in the Northern hemisphere and the first star recorded. He has Izar or Pulcherrina (most beautiful) a double star with orange and blue components. Boötes' area is 907 square degrees with 53 visible stars. He does not have any Messier objects but one could find some fine NGC's: NGC 5248 *galaxy*, NGC 5466 *globular cluster*, NGC 5676 *galaxy*, and NGC 5689 *galaxy*. (Editor's note: these are all Herschel-400 objects...) Epsilon Boötes is a gold and blue pair and Xi Boötes is a yellow and red/orange pair. Boötes is positioned at the tail of Ursa Major and looks like a kite. The top star as his head and the two lower down are his shoulders. The constellation narrows to one star down in his leg.



magnitude 4.9, and M 17 diffuse nebula – Omega or Horseshoe with magnitude 7.0 also is a site of star formation. Sagittarius also has a few NGC items like NGC 6522 a faint globular cluster, NGC 6528 another faint globular cluster, NGC 6520 small open cluster and B86 dark nebula. Sagittarius is positioned at the curled tail of Scorpius with the “teapot” formation his arms holding a bow and arrow ready to release Sagitta his arrow.

**Sagittarius** is a centaur archer with a war-like attitude. His goal is to shoot an arrow into Scorpius since he attacked Orion the hunter. The Milky Way can be seen through this constellation and is the brightest part of the Milky Way and the center of the galaxy lie in his direction. Sagittarius is packed full of objects like nebulas, open and globular clusters. He has an area of 867 square degrees and 65 visible stars. He offers many Messier objects; M 75 globular cluster with magnitude 9.5, M 55 globular cluster with magnitude 7.0, M 54 globular cluster with magnitude 8.5, M 70 globular cluster with magnitude 9.0, M 69 globular cluster with magnitude 9.0, M 28 globular cluster with magnitude 8.5, M 22 globular cluster with magnitude 8.5, M 8 diffuse nebula – Lagoon Nebula with magnitude 5.0, M 20 diffuse nebula – Trifid Nebula with magnitude 5.0, M 21 open cluster with magnitude 7.0, M 23 open cluster with magnitude 6.0, M 24 star cloud – Milky Way Patch with magnitude 11.5, M 18 open cluster with magnitude 8.0, M 25 open cluster with

(Illustrations from “Urania’s Mirror” – London 1825)

## ROAD TRIP REPORT - THE HEART OF AMERICA STAR PARTY---BUTLER, MISSOURI ...AS SEEN THROUGH THE EYES OF BOB BOSTON.

On Thursday, June 26, Marcia and I left our home in Owasso and drove three hours to Butler Missouri. Butler is just off Highway 71 about 75 miles south of Kansas City. From Butler we drove another 15 miles over hard-surfaced county roads until we began seeing signs announcing the approach of the Heart of America Star Party, (HOASP). We passed farms with pastures containing several donkeys, ducks and geese, large herds of Holstein Dairy Cattle and beautifully landscaped yards. On your way there next year drive those last 15 miles at about 30 miles per hour. Don't miss all the beautiful sights. One family farm had two huge rock gardens that were worthy of Home and Gardens Magazine. The final turn took us into a freshly mowed hay meadow, over the crest of a small hill, and there in front of us were about 60 recreational vehicles and probably 30 tents of every type imaginable.



We hadn't even come to a stop when we saw Rick, Neta, Alex and Ian Apple waving us to pull in next to their camp sight. For those who don't know the Apples, they are a family who were members of the Astronomy Club of Tulsa for longer than I know. Rick took a job near Kansas City several years ago necessitating the family's move there. Neta is working on her Masters Degree in Astronomy. She and the boys are also taking piano lessons, training horses, sharing the chores, observing the sky from their home and all of them are demonstrating to everyone else in the community what "Family Values" truly mean! Everyone who has contact with the Apples learns something about astronomy, family relations or life in general. They are a beautiful family and everyone who knows them loves them. Neta has taught me, by e-mail, almost everything I know about solar observing. They were a wonderful sight to see. It had been a long time since we last saw them at the Okie-Tex Star Party. Each of the boys had grown several inches and Rick and Neta looked the same as always.

It didn't take long for us to start setting up tents but we were slow to pull out the telescopes. Clouds were looming all across the western horizon. As time passed they became denser and darker. The weather forecast had called for beautiful skies. We walked down to the kitchen and dining area, checked out the "Meteor Shower", complete with hot and cold running water with men's and women's sections. The out-house was well made and will never blow over. But, it is an outhouse.

After registering for the party we milled about and began to meet others attending the event. Nearby I spotted several gadgets and gizmos standing in front of an RV. I homed in on a small tripod with a fragile-looking alt-az mount. "Perfect for my Solar Max 40" I told Marcia. And at just \$65.00 I couldn't pass it up. This was the last of a kind, made by Robert Nederman who also publishes a fine star atlas, "THE OBSERVERS GUIDE to the UNIVERSE". He stopped publishing the atlas several years ago but he's coming out with it again after popular demand. I'll bring mine to the next meeting or star-party I get to attend. Every page is heavily laminated. It comes with a "Telrad" transparency so you can measure the distance from object to object. It's especially nice if your scope has a Telrad finder on it, as mine does.

Thursday night the clouds came in early and the storms soon followed. This was not the Great Okie-Tex Hurricane but it was a close second. Our tent withstood the beating wind and driving rain but a little of the rain managed to penetrate our tent. Weather reports Friday morning promised more of the same, then more for Friday night. We packed up everything but our tent and headed into Butler. We found a nice room at the Days Inn, Marcia went for a swim and we relaxed away the rest of the day and evening.

We went back to the Star Party location for the Friday night door prize drawings. We've learned by experience to never pass up an opportunity for a free gift. And, we weren't to be disappointed. David Fox had done a magnificent job lining up many nice door prizes that included many star charts, NASA Patches, planispheres, eyepieces, even an Edmund Scientific Astroscan. Marcia won one of the very nice planispheres and I won the beautiful Herald-Bobroff AstroAtlas. Learning to use this "printed machine of





knowledge" will be a challenge. Ian Apple won the Astroscan. I think that between the two Apple boys they have brought home 4 or 5 telescopes.

Saturday morning, when we returned to the Star Party location, we found our tent crushed by a ton of water. Nothing was broken but it had to be taken down and dried out. Everyone was telling stories of being in the "Vortex" of a lightning storm that night. Witnesses said that they were surrounded by a "Circular Wall of Continuous Lightening" for several minutes. "There were no lightning strikes" they said "just continuous electrical light from the charged atmosphere". Some told stories of the nearby high voltage power lines singing many tones of music to them for much of the night because of the electricity in the air.

By Saturday morning all Marcia and I were willing to believe was that more storms were on the way. I wanted Marcia to have some fun before we returned to Oklahoma so we headed for the Ameristar in Kansas City. This has been our "favorite get-a-way" for the past several years. After about four hours of "more fun than we could stand" we looked outside and saw sunny blue skies. These were the kind of skies that had been washed clean by the previous night's rain. They were the kind of skies that seemed to have some "staying power".

Off we were again, to Butler, Missouri and our *now* many friends at the HOASP. The skies were crystal clear by the time we got back to the big, beautiful hay meadow full of RV's and tents. The forecast was for nothing but clear skies. This time the meteorologists weren't lying (rather, mistaken). We unloaded our telescopes and got ready for an evening of observing.

After dinner had been served everyone gathered for the last of the door prizes to be given away. Robert Nederman played MC for this event as he had Friday night. As a comedian Mr. Nederman needs to keep selling astronomy equipment. But, he made it fun for all. Again, many nice door prizes were given out. The organizers made sure that every child present won a nice gift. Finally, all but one gift had been given to a new owner. One item remained. Every ticket was returned to the drawing pot. About 120 registered guests had their ticket in the pot. One chance out of 120 remained for one lucky person. "50253" Mr. Nederman called out. Marcia let out with one of those screams that sends shivers up your spine and makes you duck. I looked at her wondering what in the world had happened. "It's yours", she screamed looking straight at me. It was mine! I couldn't believe it. I was the proud owner of a brand new Nagler Tele Vue 9mm, 6-element eyepiece. I couldn't have asked for anything closer to perfect! The irony of this is that just last year, at the Okie-Tex Star Party, Marcia had walked away with the Grand Prize. It was a Celestron 100mmED Refractor. Everyone who has looked through it has proclaimed it to be one of the most perfect telescopes they had ever used. Now it was going to get to carry my 9mm Tele Vue tonight. Rick and Neta looked through the scope, all dressed up the my new 9mm Tele Vue, and confirmed it to be one very fine observing instrument.

On Saturday night you could see every type of telescope on the market displayed and being used by its owner to pierce the distance of hundreds of thousands, if not millions of light years of space to see what lies out there for us to see. Jeremiah had a hand made reflector that, in total, stood about 20' tall. It was the strangest contraption I've ever seen but through it's eyepiece Saturn looked a hands' width away from my face with four moons lined up to begin passing over the planet. He also had a hand-made binocular viewer designed out of cheap 1X3 white pine and an old French Tank mirror. You'll hear more about this later. Then there were all the usual mass manufactured scopes that we tend to gravitate toward. Each was designed by someone or some company to bring self-satisfaction to their owner. And you can be certain that every telescope there was the love of their owner's life.

Joe Wright, President of the Astronomical Society of Kansas City made it his responsibility to shake hands with every person who came into that beautiful hay meadow near Butler, Missouri. Joe wanted to hear what everyone had to say about the Star Party so he could learn what to do better next time. David Fox made sure there were plenty of high quality door prizes to give everyone a fair chance to win. (Thank God I won the big one). Robert Nederman made the prize give-a-ways fun with his humor and teasing. (Look for that fine Star Atlas he published from your astronomy equipment supplier. It's a beauty!)

Paul Thompson and Dan Johnson were the organizers of the event. They did a yeoman's job and I recommend them for the task next year. David Young did an especially great job making this a very fun event for the children. He organized a treasure hunt complete with real money. (Some is still out there in that Hay Meadow). He also made very large water guns and potato guns for the children. The children even got to use them a little.

Randy Thompson, Joe, and David made sure the Meteor Showers were kept working and that there was plenty of water and propane to keep the water warm. Mike Sterling also helped the kids have fun by bringing a bicycle and several very large kites. Linda Pittman organized and





supervised the evening bingo games. They were a big hit. Several people had to have had a hand in keeping the toilets clean but only Mike Sterling was witnessed performing this thankless task. Thank you Mike!!!

Guest Speakers for the event included Charlie Warren and Dr. Pamela Gay. Charlie is the Managing Editor of Amateur Astronomy Magazine. He is an avid astrophotographer currently working on emission and reflection nebula with narrowband filters. He has over a thousand hours of imaging involving more than 200 deep space objects. Dr. Gay teaches at Southern Illinois University in Edwardsville. She spoke about the importance of partnerships between the amateur and professional astronomy communities. She is also one of Neta's Professors. (Pamela, Neta deserves an A+, okay).

If I've failed to mention anyone from HOASP and the work they did to make this such a wonderful success, I apologize and invoke "plumb ignorant" as my only excuse! Everyone in that beautiful hay meadow did a magnificent job and I'll appreciate you forever for all the fun Marcia and I had.

That Saturday night, June 28, 2008 was the finest night of astronomical observing I have ever enjoyed. The Andromeda Galaxy filled my ETHOS 13mm eyepiece from edge to edge. Through that new 9mm Tele Vue I saw thousands of diamonds in M13. In Sagittarius, I saw more clusters than are in the AstroAtlas. In one part of the sky I could see three galaxies in the same field of view. We observed countless satellites fly over, naked eye and accidentally through eyepieces. Several stray meteors also lit up the sky. It was one magnificent night under the stars (Thank you, God).

Marcia and I went to this beautiful hay meadow near Butler, Missouri knowing only the Apple family. We came away with many new friends. We hope we'll get to see them all again at next year's great Third Annual Heart of America Star Party. For anyone who's curious about it, I can only say this was a very fine star party.

Bob Boston – July 2008

### **Omega Centauri's Black Heart – NASA/ESA Press Release**

*(Photo by Rod Gallagher, with permission)*

Omega Centauri has been known as an unusual globular cluster for a long time. A new result obtained by the NASA/ESA Hubble Space Telescope and the Gemini Observatory reveals that the explanation behind Omega Centauri's peculiarities may be a black hole hidden in its center. One implication of the discovery is that it is very likely that Omega Centauri is not a globular cluster at all, but a dwarf galaxy stripped of its outer stars, as some scientists have suspected for a few years.



A new discovery has resolved some of the mystery surrounding Omega Centauri, the largest and brightest globular cluster in the sky. Images obtained with the Advanced Camera for Surveys onboard the NASA/ESA Hubble Space Telescope and data obtained by the GMOS spectrograph on the Gemini South telescope in Chile show that Omega Centauri appears to harbor an elusive intermediate-mass black hole in its center. "This result shows that there is a continuous range of masses for black holes, from supermassive, to intermediate-mass, to small stellar mass types", explained astronomer Eva Noyola of the Max-Planck Institute for Extraterrestrial Physics in Garching, Germany, and leader of the team that made the discovery.

Omega Centauri is visible from Earth with the naked eye and is one of the favorite celestial objects for stargazers from the southern hemisphere. Although the cluster is 17 000 light-years away, located just above the plane of the Milky Way, it appears almost as large as the full Moon when the cluster is seen from a dark rural area. Exactly how Omega Centauri should be classified has always been a contentious topic. It was first listed in Ptolemy's catalogue nearly two thousand years ago as a single star. Edmond Halley reported it as a nebula in 1677. In the 1830s the English astronomer John Herschel was the first to

recognize it as a globular cluster. Now, more than a century later, this new result suggests Omega Centauri is not a globular cluster at all, but a dwarf galaxy stripped of its outer stars.

Globular clusters consist of up to one million old stars tightly bound by gravity and are found in the outskirts of many galaxies including our own. Omega Centauri has several characteristics that distinguish it from other globular clusters: it rotates faster than a run-of-the-mill globular cluster, its shape is highly flattened and it consists of several generations of stars – more typical globulars usually consist of just one generation of old stars.

Moreover, Omega Centauri is about 10 times as massive as other big globular clusters, almost as massive as a small galaxy. These peculiarities have led astronomers to suggest that Omega Centauri may not be a globular cluster at all, but a dwarf galaxy stripped of its outer

stars by an earlier encounter with the Milky Way. “Finding a black hole at the heart of Omega Centauri could have profound implications for our understanding of its past interaction with the Milky Way”, said Noyola.

Eva Noyola and her colleagues measured the motions and brightnesses of the stars at the center of Omega Centauri. The measured velocities of the stars in the center are related to the total mass of the cluster and were far higher than expected from the mass deduced from the number and type of stars seen. So, there had to be something extraordinarily massive (and invisible) at the center of the cluster responsible for the fast-swirling dance of stars — almost certainly a black hole with a mass of 40 000 solar masses. “Before this observation, we had only one example of an intermediate-mass black hole — in the globular cluster G1, in the nearby Andromeda Galaxy”, said astronomer Karl Gebhardt of the University of Texas at Austin, USA, and a member of the team that made the discovery.

Although the presence of an intermediate-mass black hole is the most likely reason for the stellar speedway near the cluster’s center, astronomers have analyzed a couple of other possible causes: a collection of unseen burnt-out stars such as white dwarfs or neutron stars adding extra mass, or a group of stars with elongated orbits that would make the stars closest to the center appear to speed up.

According to Noyola these alternative scenarios are unlikely: “The normal evolution of a star cluster like Omega Centauri should not end up with stars behaving in those ways. Even if we assume that either scenario did happen somehow, both configurations are expected to be very short-lived. A clump of burnt-out stars, for example, is expected to move farther away from the cluster center quickly. For stars with elongated orbits, these orbits are expected to become circular very quickly.”

According to scientists, these intermediate-mass black holes could turn out to be “baby” supermassive black holes. “We may be on the verge of uncovering one possible mechanism for the formation of supermassive black holes. Intermediate-mass black holes like this could be the seeds of full-sized supermassive black holes.” Astronomers have debated the existence of intermediate-mass black holes because they have not found strong evidence for them and there is no widely accepted mechanism for how they could form. They have ample evidence that small black holes of a few solar masses are produced when giant stars die. There is similar evidence that supermassive black holes weighing the equivalent of millions to billions of solar masses sit at the heart of many galaxies, including our own Milky Way.

Intermediate-mass black holes may be rare and exist only in former dwarf galaxies that have been stripped of their outer stars, but they could also be more common than expected, existing at the centers of globular clusters as well. A previous Hubble survey of supermassive black holes and their host galaxies showed a correlation between the mass of a black hole and that of its host. Astronomers estimate that the mass of the dwarf galaxy that may have been the precursor of Omega Centauri was roughly 10 million solar masses. If lower mass galaxies obey the same rule as more massive galaxies that host supermassive black holes, then the mass of Omega Centauri does match that of its black hole.

NASA/ESA – April 2008



In addition to our local club star parties, many of our members have enjoyed attending Summer Astronomy conventions around the country. We’ve had members at the Texas Star Party, Heart of America Star Party, Rocky Mountain Star Party and Grand Canyon Star Party. Images above from the Texas Star Party.



<http://www.okie-tex.com/>

Sat Sept 27 - Sun Oct 5th

The Okie-Tex Star Party in our area is just around the corner. This year’s event features

TWO weekends under the deep dark skies of the Oklahoma Panhandle. Registration is only \$ 40 per person. Meals can be purchased as a package plus there is a late night grill. Limited space is available in bunkhouses plus there is plenty of room for Tents and RV’s. Several of our club members make the trip faithfully every year, so ask around about tips for enjoying Okie-Tex. Registration and lots of information are at their website.

# EXTRA-EXTRA!!

## August *Black* Moon Special: Two Public Star Parties This Month

**August 1, 2008 - 8:00PM AND August 29, 2008 - 8:00PM**  
**RMCC Observatory, Mounds OK**

**Definition: Black Moon** (from Wikipedia) - In astronomy, the term black moon is neither well known nor frequently used. As a consequence it has no accepted definition, but seems to have occasionally been applied to at least four different situations:

- 1) The absence of a new moon or dark moon in a calendar month;
- 2) The absence of a full moon in a calendar month;
- 3) Either the third or the fourth new moon or dark moon in a season that has four of them (a season normally has only three). This is in analogy to the term blue moon which is the third full moon in a season that has four;
- 4) The second occurrence of a dark moon or new moon in a calendar month; this in analogy to another use of the term blue moon which sometimes is applied to the second full moon in a calendar month. (...*also sometimes called a "Fairie Moon"*.)

A black moon by the first meaning can only occur in February, with the next taking place (according to UTC) in 2014. In that year January and March will each have a black moon according to the fourth meaning.

A black moon by the second meaning can only occur in February, with the next taking place in 2018. In that year January and March will each have a second full moon (sometimes called a blue moon).

**The next black moon in the fourth meaning of the term, which can occur in any month except February, is set to occur on August 30, 2008 (19:58 UTC). The last event occurred on December 31, 2005 (03:12 UTC).**

### **Astronomy Club Star Party – Friday August 1st**

**Alternate date will be Saturday August 2nd if sky is cloudy on Friday.**

Gates open at 7:30 PM Sunset is 8:28 PM / End civil twilight is 8:57 PM

New Moon on 1 August 2008 at 5:13 a.m. Central Daylight Time

### **Astronomy Club Star Party – Friday August 29th**

**Alternate date will be Saturday August 30th if sky is cloudy on Friday.**

Gates open at 7:00 PM Sunset is 7:55 PM / End civil twilight is 8:21 PM

New Moon on 30 August 2008 at 2:58 p.m. Central Daylight Time

Due to the uncertain weather reports, check your local weather reports for sky conditions. Our club has an excellent resource for predictions of cloud cover on the observe section of our website. <http://www.astrotulsa.com/Observe/observe.asp>

Since Night time temperatures can still dip to the mid 60's you should plan to bring a jacket.

- Insects have become active so bug repellent (i.e. – “OFF” or “Cutter”) will also be useful.
- Beginners Telescope Set Up on Center Pad: Several of our new members and guests have new telescopes they are trying to learn how to use. We would like to invite you to set up your equipment near the center concrete observing pad. Members let's all take time to meet these novice astronomers and help them get a good start with their equipment.
- Wireless Internet now available at the Observatory: For laptop users - Rod Gallagher has made arrangements for wireless Internet to be broadcast on the observing field. Details for log on are available at the observatory. This is available for members to use for astronomy, observing and weather information and should not be abused for other types of browsing and gaming.
- Things to bring to a star party:.. Of course a telescope or binoculars are great for observing but you don't have to have one to enjoy the evening. You don't have to own a telescope to enjoy an observing night. Our members are eager to share their views with others. There will be plenty of people willing to share the view if you just ask. Also bring a red colored or covered flashlight to see your way around. We have plenty of folding chairs and a clean restroom.
- Children are always welcome but must be supervised and must stay on observatory grounds. It's always wise to have an alternate activity such as a favorite book or tapes for younger children who may tire early. Closed toed shoes are preferred and a light jacket as needed.
- We would like to encourage our new members and guests to join us
- Plan to arrive before dark. We have plenty of chairs and a classroom area.
- We have a microwave and you can bring your own snacks. You need to bring your own drinking water!

***PARKING MAY BE AT A PREMIUM.*** Reserve Parking is available next door in old ATT lot for those without equipment or planning to leave early. PLEASE DO NOT PARK VEHICLES near the center-observing pad blocking the view and traffic access.

***SAFETY ISSUE:*** When large groups are present it is better to turn on your park lights or headlights on low beam rather than to try driving in or out without lights... especially if those groups include children. Just warn everyone when you are getting ready to leave.

***NEVER*** try driving down the hill without lights.

*A donation of \$1.00 per guest would be appreciated to help us maintain the observatory.*



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## Lands Tidbits – by John Land (August 1, 2008)

### Welcome Recent New Members: Jonathan Filion, Landon Holcomb and George & Janet Woods

Our membership rates for 2007 – 2008 will be as follows:

**Adults** - \$35 per year (includes Astronomical League Membership)

**Sr. Adult** - discount \$25 per year for those 65 or older (includes Astronomical League Membership)

**Students** - \$15 (without Astronomical League membership)

**Students** - \$20 (with Astronomical League membership)

The regular membership allows all members in the family to participate in club events but only ONE voting membership and one Astronomical League membership. If an additional member of the family would like to join with voting rights the additional cost is \$15, and/or additional Astronomical League memberships within a family are \$5 each.

**Magazine Subscriptions:** If your magazines are coming up for renewal, try to save the mailing label or renewal form you get in the mail. Do NOT mail renewals back to the magazine! To get the club discount you must go through the club group rate.

Astronomy is \$34 for 1 year or \$60 for 2 years. "www.astronomy.com"

Sky & Telescope is \$33 / year. "www.skyandtelescope.com"

Sky and Telescope also offers a 10% discount on their products.

Note: You may renew your Sky & Telescope subscription directly with out having to mail in the subscriptions to the club.

NEW SUBSCRIPTIONS must still be sent to the club treasurer. Forms are available on the website.

We now have an automated on line registration form on the website for new AND renewal memberships plus magazine subscriptions. You simply type in your information and hit send to submit the information.

"<http://www.astrotulsa.com/Club/join.asp>"

You can then print a copy of the form and mail in your check to:

**Astronomy Club of Tulsa**  
**25209 E 62nd St**  
**Broken Arrow, OK 74014**

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### *Address Corrections- Email changes – Questions:*

You may forward questions to the club by going to our club website (<http://www.astrotulsa.com/>) and fill out an online form or just click on John Land and send an email. Please leave a clear subject line and message with your name, phone number, your question – along with email.

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**CLUB OFFICERS**

| POSITION              | NAME             | PHONE        |
|-----------------------|------------------|--------------|
| <b>President</b>      | Tamara Green     | 918-851-1213 |
| <b>Vice-President</b> | Tom McDonough    | 918-665-1853 |
| <b>Treasurer</b>      | John Land        | 918-357-1759 |
| <b>Secretary</b>      | Teresa Kincannon | 918-637-1477 |

**BOARD MEMBERS AT LARGE**

| NAME          | PHONE        |
|---------------|--------------|
| Ann Bruun     | 918-834-0757 |
| Steve Chapman | 918-342-1643 |
| Rod Gallagher | 918-369-3827 |
| Owen Green    | 918-851-1213 |
| Jim Miller    | 918-627-4551 |
| Richie Shroff | 918-835-3565 |
| Bill Steen    | 918-251-3062 |
| Tony White    | 918-258-1221 |

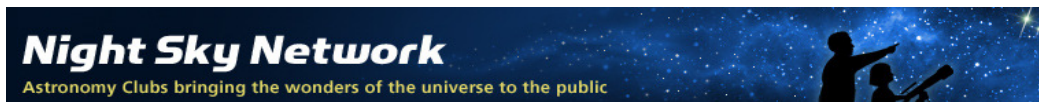
**APPOINTED STAFF**

| POSITION                             | NAME                      | PHONE                        |
|--------------------------------------|---------------------------|------------------------------|
| <b>RMCC Facility Manager</b>         | Craig Davis               | 918-252-1781                 |
| <b>Membership Chairman</b>           | John Land                 | 918-357-1759                 |
| <b>Observing Chairman</b>            | Tony White                | 918-258-1221                 |
| <b>New Members<br/>(co-Chairmen)</b> | Owen Green<br>Rick Walker | 918-851-1213<br>918-451-9235 |
| <b>Observatory Director</b>          | Teresa Kincannon          | 918-637-1477                 |
| <b>Webmaster</b>                     | Richard Alford            | 918-855-9986                 |
| <b>Newsletter Editor</b>             | Dennis Karcher            | 918-619-7097                 |
| <b>Night Sky Network</b>             | Teresa Kincannon          | 918-637-1477                 |

**MEMBERSHIP INFORMATION**

Astronomy Club of Tulsa membership (\$35/year) includes membership in the Astronomical League and subscription to ACT's "Observer" and AL's "Reflector". "Astronomy" (\$34/year) and "Sky and Telescope" (\$33/year) are also available through the club. For more information contact John Land at 918-357-1759. Permission is hereby granted to reprint from this publication provided credit is given to the original author and the Astronomy Club of Tulsa Observer is identified as the source.

The Astronomy Club of Tulsa is a member of the Astronomical League and the Night Sky Network



<http://www.astroleague.org>

<http://nightsky.jpl.nasa.gov>

ACT welcomes your questions, suggestions, comments, and submissions for publication.  
Please send all inquiries to [Newsletter@astrotulsa.com](mailto:Newsletter@astrotulsa.com)

Deadline for September Article submissions: August 25, 2008  
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eMail article submissions to: [djkarcher@cox.net](mailto:djkarcher@cox.net)