



Astronomy Club of Tulsa *Observer*



September 2008

Picture of the Month – Rod Gallagher



M22 (NGC 6656) Globular Cluster in Sagittarius

Taken by ACT's own Rod Gallagher at the Texas Star Party and printed here with his permission. M22 is one of the nearer (10,400 light years) globular clusters to our solar system and is outshone in brightness only by 47 Tucanae (NGC 104) and Omega Centauri (NGC 5139). This was probably the first globular cluster discovered, by Abraham Ihle in 1665. M22 is placed for early evening viewing just northeast of the teapot of Sagittarius due south at dusk in September.

Optics: Takahashi TOA-150 / Camera: SBIG ST-10XME / Exposure Data: RGB 90:60:120 mins @ -10C / Date - 6/4/2008

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Important ACT Upcoming Dates:

- ACT Meeting @ TCC - Fri. September 12, 2008
- Member Only Star Party - Fri. September 19, 2008
- Public Star Party - Fri. September 26, 2008 (p 8)

President's Message by Tamara Green

September is here, and that means our membership meetings will be up and going again. The first meeting after the summer hiatus will be on Friday, Sep 12, at 7:00 PM. It will be held at Tulsa Community College, Metro Campus, in the Phillips Building Auditorium. The program for the evening will be announced soon.

Don't forget our September star parties! The members-only party will be on Friday, Sep 19, with Saturday, Sep 20 as the back-up night, in the event of uncooperative weather.

For those of you who are not going to Okie-Tex, the public party will be on Friday, Sep 26, with Saturday, Sep 27 as the back-up night.

Okie-Tex time is almost here! The deadline for pre-registration is September 13, so get your registrations in! Okie-Tex 2008 runs from Sep 27 – Oct 5. This is a wonderful chance to see the darkest sky in all of Oklahoma, and some of the most breathtaking and magnificent scenery you will ever see! Plus, it is a whole week of observing with friends from near and far, and some really fine home cooking, courtesy of the Cimarron Heritage Society! And don't forget the Okie-Tex Giveaway, in which there are fabulous prizes to be won! This is a fun week for the whole family, and an unforgettable experience! I personally highly recommend that those of you who have not yet experienced Okie-Tex, to do so if you can, because you will be in for some kind of fun!!

For more information, see the Okie-Tex website: <http://www.okie-tex.com>

On another note, 2009 will be the International Year of Astronomy. Our club plans to do many things, including public events, to make this a really memorable year! Plans will be announced later, and volunteers to help out will be appreciated, as always.

We still will need volunteers to help out with maintaining our observatory grounds. Craig is still, as far as I know, under doctor's orders to not do any kind of overly strenuous activity due his heart attack. Those of you who are interested in mowing, weeding, other "yard work" and/or maintaining the building are welcome to contact me at astronomer.misstamara@yahoo.com or any other officer, or Craig at sirian@cox.net.

We hope to see you at the meeting this month, and at our star parties. I hope to see y'all at Okie-Tex!

Clear Skies, Tamara



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

Sat Sept 27 - Sunday Oct 5th

Time is running out to register for the Okie-Tex Star Party. Registration deadline is Saturday September 13th.

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

Each year nearly 300 astronomers from all over the Midwest and beyond gather in the tip of the Oklahoma panhandle to enjoy some of the darkest skies on the planet. 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.

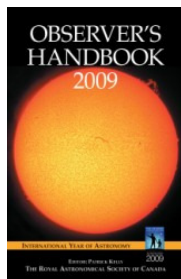
Time to sign up for 2009 Astronomy Calendars and Observer's handbooks.

Each year we give our club members and guest an opportunity to sign up for 2009 calendars for a substantial discount over the retail cost. **If you are interested in either of these items please send an email to John Land astroclubbiz@valornet.com with the Subject TITLE 2009 Calendars** or call at 695-3195

DO NOT SEND MONEY AT THIS TIME. We are just making a list to see how many to order.

Cost of the 2009 Astronomy Wall calendars will be \$ 8.00 (retail cost is \$ 12.95 plus tax)

Cost of the 2009 Canadian Observer's handbook is \$ 21 (Single copy cost is \$ 32.95)



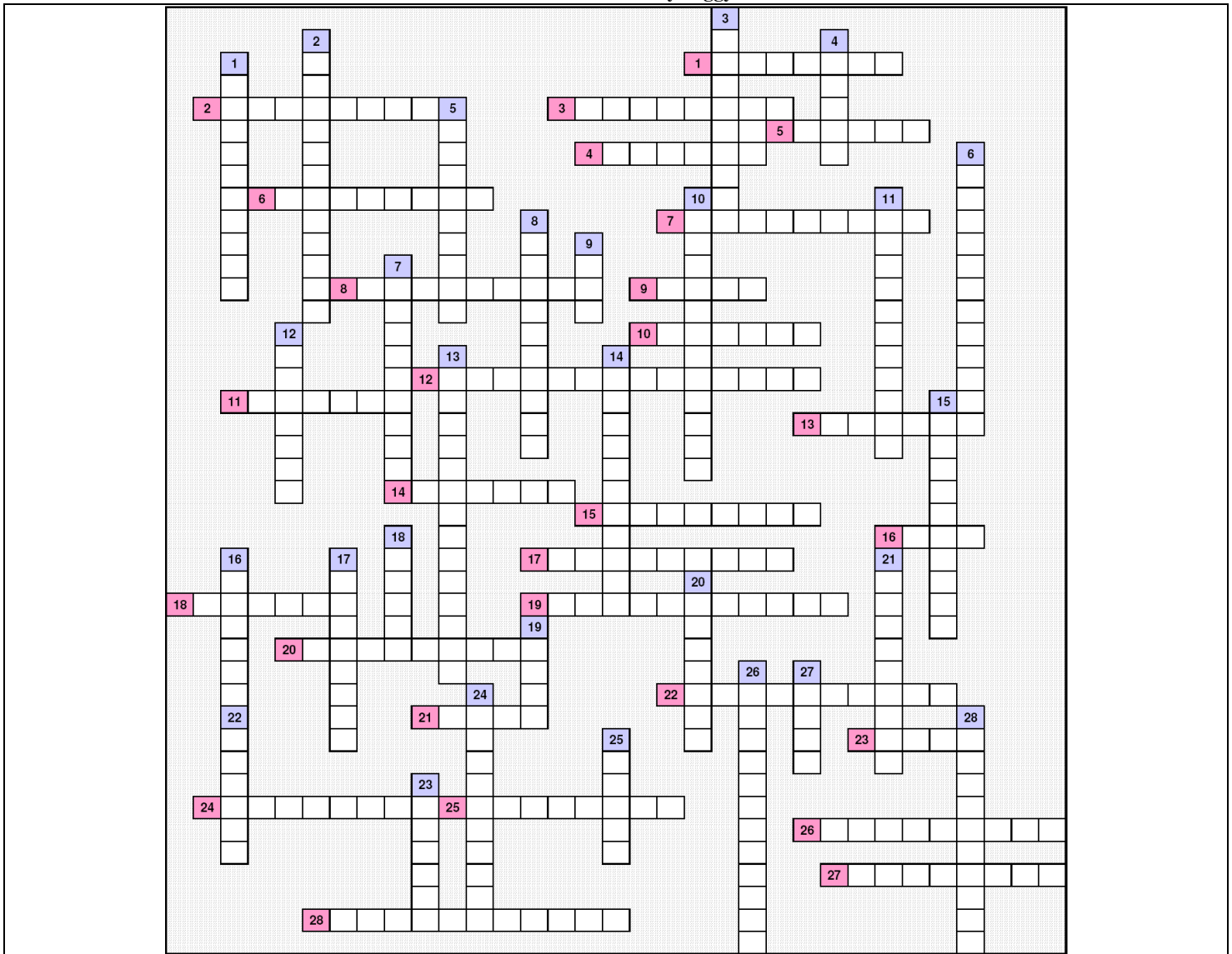
Now 101 editions young! Published continuously since 1907 the **RASC Observer's Handbook** is a unique annual compendium of astronomical information and highlights for the coming year. Rigorously researched and developed for advanced amateurs and professionals, the Handbook is a must-have resource. <http://www.rasc.ca/publications/index.shtml>

2009 Deep Space Mysteries Wall Calendars from Astronomy magazine are here. Twelve stunning Astronomy photos plus all the major astronomy events for the year. As club members you can get yours for \$ 8.00 each a 38% discount over the cover price. Note: Price is based on you picking up your copy at a club meeting. Additional cost required if mailing them to you.



Contact [John Land](mailto:astroclubbiz@valornet.com) to reserve yours - Do not send money yet.

ACT Crossword Puzzle #1 by Peggy & Rick Walker

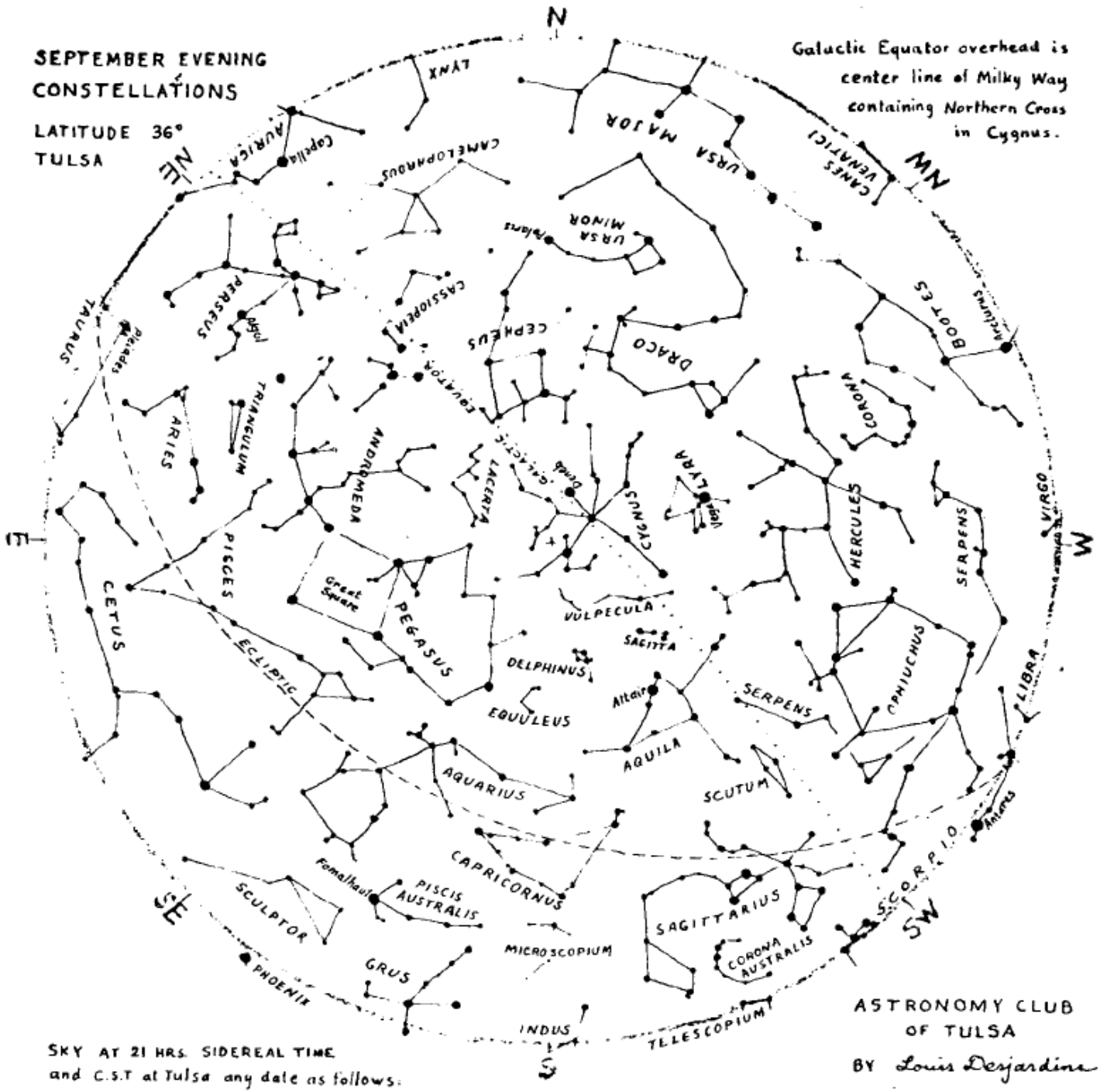


ACROSS:

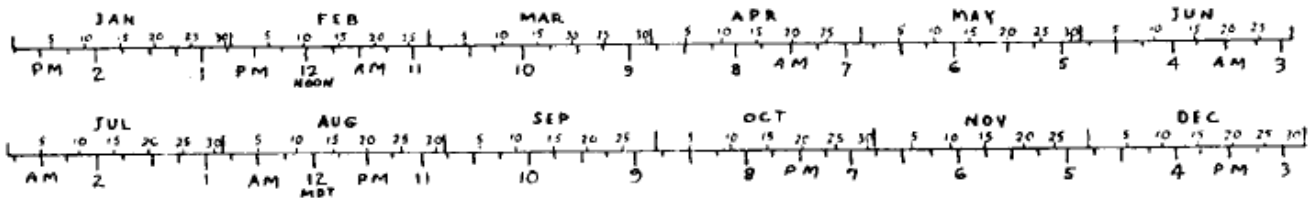
- 1 Has an equatorial diameter of 30,777 miles and a rotational period of 19.2 hours
- 2 The totality, infinite and finite
- 3 Ocular
- 4 Radiation, radio source, emitting radio waves
- 5 The language of the stars
- 6 most common seeing measurement, full width at half maximum
- 7 Celestial coordinates used to measure longitude of a celestial sphere
- 8 Itemized lists
- 9 The 6th brightest star in a constellation
- 10 N35 degrees 12.114, W11 degrees 39.70872
- 11 Increase of a celestial body
- 12 Was proposed by the Dutch astronomer Petrus Plancius in 1613.
- 13 A star couple's dance
- 14 A term originally applied to any extended object in the sky
- 15 From the Greek meaning, "I cease to exist"
- 16 A listing
- 17 Unaided visual sighting
- 18 "Goodness, Gracious. Great Balls of Fire!"
- 19 Where one observes astronomical phenomenon
- 20 A simple, economical mount
- 21 Discovered in 2005 by Mike Brown
- 22 Location of a visual perception along a continuum from black to white
- 23 Edge of the apparent disc of a celestial body
- 24 The Big Dipper, The Little Dipper, The Coat Hanger are described as
- 25 Nearly spherical
- 26 The study of the universe
- 27 A star with a magnetic personality
- 28 Beer, Piazzi, Bessel, Henderson, Draper, Lassell, and Huggins

DOWN:

- 1 Outer remnants of solar system, part of Oort Cloud
- 2 Daughters of Atlas and Pleione
- 3 A moon of our 6th planet
- 4 The inner, darkest part of a shadow
- 5 A shape of galaxies
- 6 Permitting the free passage of electromagnetic radiation
- 7 A unit of angular measure
- 8 Our galaxy is about 80,000 of these in diameter
- 9 Wavelength that is visible light that is 660 nanometers
- 10 Remnants left over from the formation of the solar system
- 11 Largest inactive volcano in our solar system
- 12 The crossing of the sun over the celestial equator
- 13 Patterns in the sky
- 14 Protrusion of ionized gas from the surface of our closest star
- 15 The apparent backward movement of planets
- 16 Dirty snowballs
- 17 Moon soil
- 18 6,585,32 days
- 19 Cyclical repeated infusion of hydrogen gas resulting in an explosion
- 20 Wavelengths that can be seen by the naked eye
- 21 Companion satellite to "Across #21"
- 22 Saturn is the most _____ of our solar system
- 23 Enters the Earth's atmosphere
- 24 Angle between a celestial object and the sun as seen from earth
- 25 Map
- 26 Occurring among or between stars
- 27 Aura
- 28 The only star besides our sun, for which we have surface images



SKY AT 21 HRS. SIDEREAL TIME
and C.S.T. at Tulsa any date as follows:



First Quarter – 9/7/08 – 14:04UT
Full Moon – 9/15/08 – 09:13UT
Last Quarter – 9/22/08 – 05:04UT
New Moon – 9/29/08 – 08:12UT

Saturn Conjunction w/ Sun – 9/4/08
Mercury *Greatest East Elongation* (27°) – 9/11/08
Uranus at Opposition – 9/13/08

Moonwatch & the Tulsa Connection

John Land recently showed us an old satellite spotting scope at an ACT meeting at TCC which led me to do some digging up of history. Much of the following is from Wikipedia and old SAO bulletins from Sky & Telescope.

Operation Moonwatch was an amateur science program formally initiated by the Smithsonian Astrophysical Observatory (SAO) in 1956. The SAO organized Moonwatch as part of the International Geophysical Year (IGY), which was probably the largest single scientific undertaking in history. Its initial goal was to enlist the aid of amateur astronomers and other citizens who would help professional scientists spot the first artificial satellites. However, until professionally manned optical tracking stations came on-line in 1958, this network of amateur scientists and other interested citizens played a critical role in providing crucial information regarding the world's first satellites.



The convenience of table-top observing is illustrated by this picture of Miss Marjorie Holt using an experimental MOONWATCH telescope constructed in the shops of the Smithsonian Institution. The mounting is made entirely of aluminum. The telescope's bed-plate has a rigid extension inclined at 45 degrees to carry the front-surface mirror.

Moonwatch's origins can be traced to two sources. In the United States, there was a thriving culture of amateur scientists including thousands of citizens who did astronomy for an avocation. During the Cold War, the United States also encouraged thousands of citizens to take part in the Ground Observer Corps, a nationwide program to spot Soviet bombers. Moonwatch brought together these two activities and attitudes, melding curiosity and vigilance into a thriving activity for citizens. Moonwatch, in other words, was an expression of 1950s popular culture and fixed properly within the context of the Cold War.

Moonwatch was the brainchild of Harvard astronomer Fred L. Whipple. In 1955, as the recently appointed director of the Smithsonian Astrophysical Observatory in Cambridge, MA, Whipple proposed that amateurs could play a vital role in efforts to track the first satellites. He overcame the objections of colleagues who doubted ordinary citizens could do the job or who wanted the task for their own institutions. Eventually, Whipple carved out a place for amateurs in the IGY.

In the late 1950s, thousands of teenagers, housewives, amateur astronomers, schoolteachers, and other citizens served on Moonwatch teams around the globe. Initially conceived as a way for citizens to participate in science and as a supplement to professionally-manned optical and radio tracking stations, Moonwatchers around the world found themselves an essential component of the professional scientists' research program. Using specially designed telescopes, hand-built or purchased from vendors like Radio Shack, scores of Moonwatchers nightly monitored the skies. Their prompt response was aided by the extensive training they had done with by spotting

pebbles tossed in the air, registering the flight of moths, and participating in national alerts organized by the Civil Air Patrol.

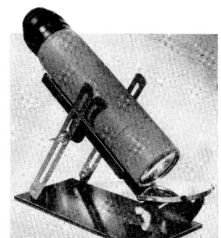
Once professional scientists had accepted the idea that ordinary citizens could spot satellites and contribute to legitimate scientific research, Whipple and his colleagues organized amateurs around the world. Citizens formed Operation Moonwatch teams in towns and cities all around the globe, how they built equipment, and courted sponsors. Team leaders carefully trained their groups with exercises like spotting pebbles tossed over the crossbar of their mast, registering the flight of moths, and participating in national Moonwatch alerts carried out with the cooperation of Civil Air Patrol. In many cases, Moonwatch was not just a fad but an expression of real interest in science. By October 1957, Operation Moonwatch had some 200 teams ready to go into action, including observers in Hawaii and Australia.

Whipple envisioned a global network of specially designed instruments that could track and photograph satellites. This network, aided by a corps of volunteer satellite spotters and a computation bureau in Cambridge, would establish ephemerides – predictions of where a satellite will be at particular times. The instruments at these stations were eventually designed by Dr. James G. Baker and Joseph Nunn and hence known as Baker-Nunn cameras. Based on a series of super-Schmidt wide-angle telescopes and strategically placed around the globe at 12 locations, the innovative cameras could track rapidly moving targets while simultaneously viewing large swaths of the sky.

From the start, Whipple planned that teams of dedicated amateurs would complement the professionally manned Baker-Nunn stations. Amateur satellite spotters would inform the Baker-Nunn stations as to where to look, an important task given that scientists working on the Vanguard program likened finding a satellite in the sky to finding a golf ball tossed out of a jet plane. Amateur teams would relay the information back to the SAO in Cambridge where professional scientists would use it to generate accurate satellite orbits. At this point, professionals at the Baker-Nunn stations would take over the full-time task of photographing them.

Sputnik 1's sudden launch was followed less than a month later with the Soviets orbiting Sputnik 2 and the dog Laika. Moonwatch teams networked around the world that provided tracking information needed by scientists in Western nations. For the opening months of the Space Age, members of Moonwatch were the only organized worldwide networks that were prepared to spot and help track satellites. The information they provided was complemented by the radio-tracking program called Minitrack the United States Navy operated as well as some information from amateur radio buffs.

In many cases, Moonwatch teams also had the responsibility of communicating news of Sputnik and the first American satellites to the public. The public responded, in turn, with infectious enthusiasm as local radio stations aired times to spot satellites and local and national newspapers ran hundreds of articles that described the nighttime activities of Moonwatchers.



EDSCORP SATELLITE TELESCOPE

THE STORY: From the beginning of the visual satellite program, Edmund Scientific Co. was consulted by the Coordinator of Visual Satellite Observations of the Smithsonian Astrophysical Observatory in order to find existing optical instruments or to help in the development of new ones to meet the unique requirements of MOONWATCH. Every effort was to be made to get an instrument with the greatest possible field, which would still have the ability to observe faint objects with only slight magnification. All this was to be provided at a minimum cost. More than thirty different optical arrangements were examined and evaluated by expert advisors to the MOONWATCH program. The optics which we have used have been described in the *Bulletin for Visual Observers of Satellites* as providing the best combination for the purpose.

OPTICS: The Satellite Scope has two important optical characteristics: A wide (21-mm.) diameter, low-reflection-coated objective lens. A six-element extremely wide field, coated Erle eye-piece that, in combination with the objective, gives 3.5 power with a big 12° field and over 7-mm. exit pupil.

MOUNT: The mount came in for special attention because of unique requirements of group observing. The center of rotation of the instrument is just below the point where the optical axis is deflected by the front-surface mirror. The mirror is set at 45° to the axis of the telescope barrel and reflects light at exactly 90°. Side brackets and wing nuts permit fast, easy elevation and rigid locking. Rubber eyepieces and the angle of the telescope permit the greatest comfort in long-time viewing. The wide field and our special mount permit the utmost coverage of the possible passage of the satellite without omission of an area of the sky by a string of observers.

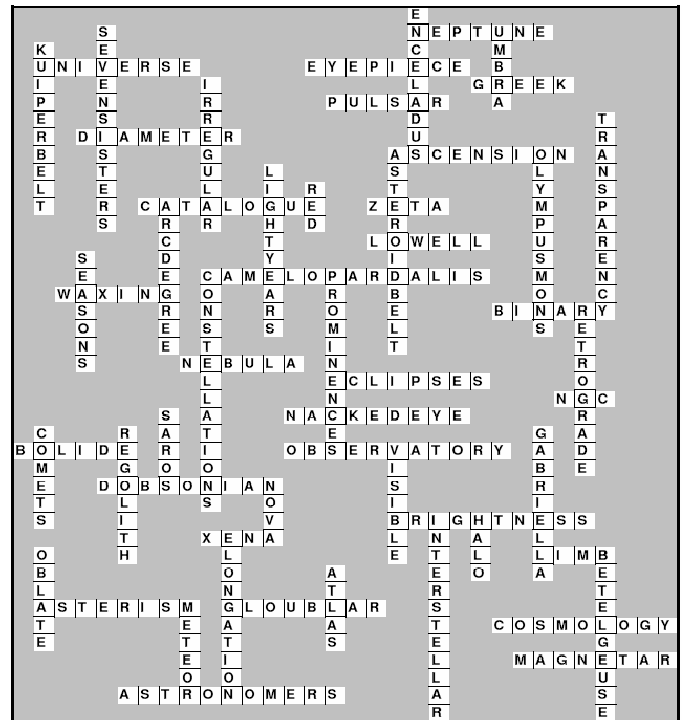
OTHER USES FOR THE SATELLITE SCOPE
1. Makes a perfect wide-field finder. A special groove on the barrel helps in locating it in the finder mount. Fits our wide-field finder mount. Stock No. 70,078-Y—\$9.95. 2. Use the Erle eye-piece on your regular astronomical telescope. You will need our adapter, Stock No. 30,171-Y—\$3.95, which gives you 11°. This eyepiece cost the government \$56,001. 3. Makes a wonderful comet seeker; see complete materials. 4. Makes a fine rich-field telescope; see wide areas of sky with deep penetration.
Especially Made for Members of MOONWATCH
Stock # 70,074-Y\$49.50 ppd.

Moonwatch caught the attention of those citizens interested in science or the Space Race during the late 1950s and much of the general public as well. Newspapers and popular magazines featured stories about Moonwatch regularly; dozens of articles appeared in the Los Angeles Times, The New Yorker, and The New York Times alone. In the U.S. local businesses sponsored teams with monikers like Spacehounds and The Order of Lunartiks. Moonwatch teams in Peru, Japan, Australia, and even the Arctic regularly sent their observations to the Smithsonian. Moonwatch complemented the professional system of satellite tracking stations that Fred Whipple organized around the globe. These two networks – one composed of amateurs and the other of seasoned professionals – helped further Whipple’s personal goals of expanding his own astronomical empire. Whipple mediated and organized the participation of amateurs to further his own institutional goals. Operation Moonwatch was the most successful amateur activity of the IGY and it became the public face of a satellite-tracking network that expanded the Smithsonian’s global reach. Whipple used satellite tracking as a gateway for his observatory to participate in new research opportunities that appeared in the early years of space exploration. In February 1958, President Dwight D. Eisenhower publicly thanked the SAO, Fred Whipple, and the global corps of satellite spotters that comprised Moonwatch for their efforts in tracking the first Soviet and American satellites.

Even after the IGY ended, the Smithsonian maintained Operation Moonwatch. Hundreds of dedicated amateur scientists continued to help NASA and other agencies track satellites. Their observations often rivaled those of professional tracking stations, blurring the boundary between professional and amateur. Moonwatch continued long after the IGY ended in 1958. In fact, the Smithsonian operated Moonwatch until 1975 making it one of the longest running amateur science activities ever. As the fad of satellite spotting passed, the Smithsonian refashioned Operation Moonwatch to perform new functions. It encouraged teams of dedicated amateurs to contribute increasingly precise data for satellite tracking. Moonwatchers adapted to the needs of the Smithsonian through the activities of “hard core” groups in places like Walnut Creek, California. Throughout the 1960s, the Smithsonian gave them ever more challenging assignments such as locating extremely faint satellites and tracking satellites as they re-entered the earth’s atmosphere. At times, the precise observations and calculations of dedicated Moonwatchers surpassed the work of professionals. One of the most notable activities of Moonwatchers after the IGY was the observance of Sputnik 4 when it reentered the atmosphere in September 1962. Moonwatchers and other amateur scientists near Milwaukee, WI observed the flaming re-entry and their observations eventually led to the recovery and analysis of several fragments from the Soviet satellite.

Moonwatch affected the lives of participants long after they stopped looking for satellites. When the Smithsonian discontinued the program in 1975, one long-time Moonwatcher compared his participation to “winning the Medal of Honor.” Quite a few people started their science careers through Moonwatch. For example, James A. Westphal, a Moonwatch team leader from Tulsa, Oklahoma and very active in the Astronomy Club of Tulsa, eventually became a scientist at Caltech and helped design instruments for the Hubble Space Telescope. (Editor’s Note: *In researching this article, I was disappointed to learn that James Westphal had recently passed away in 2004, but there is a very fascinating oral history interview from 1998 in the Cal Tech archives is easily available on the internet at: <http://oralhistories.library.caltech.edu/107/> if anyone wishes to check it out...*) The Moonwatch program boosted science programs at many small schools throughout the country and helped revitalize the amateur science community in the United States. Scientists’ ability to say, with precision, where satellites are formed the basis for today’s Global Positioning System and was also valuable to the military during the Cold War.

Solution to Crossword Puzzle



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Image by Quentin Déhais, Normandy, France
Date: 07/24/2008. C8 (203/2032) + Reducer f/6.3 + Canon EOS 400D

Most of us think of the moon as incredibly bright and indeed it is compared to the dim deep sky objects that we all hunt in the absence of our nearest neighbor. The moon only reflects about 10% of the sunlight that hits it, but even that small amount is enough to dazzle the eye in a dark sky. In a clear sky with a sunlit aircraft for comparison, however, the true nature of just how dark the moon actually is becomes very apparent. Our eyes are amazing optical devices and the power of our brain to process the data over such a wide range of brightness is extraordinary as anyone who has tried their hand at photographing the moon can readily confirm. BTW – Quentin is 15 years old and would love to get email feedback on his work.

Quentin’s email = space11@hotmail.fr

**Book Review: *Turn Left at Orion*
by Guy Consolmagno & Dan M. Davis**



*Publisher: Cambridge University Press
Pub. Date: 2006
ISBN - 0 521 78190 6
3rd Edition / 6th Printing
Hardcover - 224pp
List Price: \$ 26.99
(Amazon: \$11.98 - \$51.42)*

Written by two professional astronomers for the new or just beginning astronomer. This book is equally well written for young folks or older amateurs that are just beginning to learn their way around the heavens. I originally bought the book for my granddaughter at a used bookstore while on the road (for when she gets a little older...) but wound up reading it cover to cover and learning a few new bits of lore and found a few new targets that were off the beaten paths. One of the best things about this volume is it doesn't denigrate the small store bought scopes with snide remarks like "useless" or "get a real instrument" but encourages the beginning star gazer to get outdoors and use whatever they have to explore the heavens and points out sights that are at home in both small and large instruments. Highly recommended whatever your experience level – for beginners a fantastic resource; for old timers a fresh look through young eyes at splendors we have begun to take for granted. Also has a very nice section on moon observing – a forgotten target for those of us who view the moon only as a "bright light" to be avoided while looking for real targets.

D.J. Karcher / August 2008

Comments from the Publisher

A guidebook for beginning amateur astronomers, *Turn Left at Orion* provides all the information you need to observe the Moon, the planets and a whole host of celestial objects. Large format diagrams show these objects exactly as they appear in a small telescope and for each object there is information on the current state of our astronomical knowledge.

Revised and updated, this new edition contains a chapter describing spectacular deep sky objects visible from the southern hemisphere, and tips on observing the upcoming transits of Venus. It also includes a discussion of Dobsonian telescopes, with hints on using personal computers and the internet as aids for planning an observing session. Unlike many guides to the night sky, this book is specifically written for observers using small telescopes. Clear and easy-to-use, this fascinating book will appeal to sky watchers of all ages and backgrounds. No previous knowledge of astronomy is needed.

About the Authors

Guy Consolmagno is a Jesuit brother at the Specola Vaticana (Vatican Observatory) dividing his time between Tucson,

Arizona and Castel Gandolfo, Italy. He studied the origin and evolution of moons and asteroids in our solar system. His telescope is a 3.5" catadioptric.

Dan M. Davis is a professor of geophysics in the Department of Earth and Space Sciences at the State University of New York at Stony Brook. His research concerns the formation of mountain belts on Earth. Most of his observations for this book were made with a 2.5" refractor.

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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 - September 2008
North of -55° Declination ~ Tulsa, OK Viewing Limit
(Predicted Maxima > 8.0 - Easy Binocular Range)

Designation	Name	Code	Range	Est Max Date
1517+31	S CrB		<7.3-12.9>	Sep 24
1546+15	R Ser		<6.9-13.4>	Sep 27

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 (a much more difficult transition that I had anticipated...), 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

## **Astronomy Club Star Party – Friday September 26th**

**Alternate date will be Saturday September 27th if sky is cloudy on Friday.**

Gates open at 6:30 PM    Sunset is 7:14 PM / End civil twilight is 7:40 PM

New Moon on 29 September 2008 at 3:12 a.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 are 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.*

### **Information Exchange**

The Astronomy Club of Tulsa has started a new Yahoo Group for the club. For those of you who are unfamiliar with Yahoo groups, it is a forum that allows for messages, photos and files that can be shared among the group's members. As stated in the group's description, "This group is for the members of the Astronomy Club of Tulsa to ask questions, share ideas, get information, plan observing sessions, or just communicate in general. Informal club business communications may also be announced here." This group can be found on the web at <http://tech.groups.yahoo.com/group/AstroTulsa/>. It is open to all club members so be sure to check it out! Tony White, our new Observing Chairman is the group's moderator.



## Observing Lists

How many people show up at the observatory, set up their equipment and then say, "Now what am I going to observe tonight?" Then after a quick review of what's up, they begin to observe the same old things again. Let's look at Jupiter, M13, M51, M57, M31,... and now what? Not that you will ever tire of some of the most spectacular objects but there are many other beautiful objects that often get overlooked. Well here's the opportunity that you have been looking for. In the first of hopefully many such projects, Tony has asked me to put together a list of objects to observe at our next star party (September 26). Here's the list for:

### September 2008.

|    | <b>Caldwell</b> | <b>Deep Sky<br/>Binocular</b> | <b>Double Star</b> | <b>Messier</b> | <b>Herschel</b> |
|----|-----------------|-------------------------------|--------------------|----------------|-----------------|
| 1  | IC 5146         | NGC7063                       | Beta Cephei        | M52            | NGC7000 *       |
| 2  | NGC7000 *       | NGC7160 *                     | Struve 2816        | M15            | NGC7006 *       |
| 3  | NGC7006 *       | NGC7209                       | Epsilon Pegasi     | M2             | NGC7008         |
| 4  | NGC7009 *       | NGC7235                       | Xi Cephei          | M30            | NGC7009 *       |
| 5  | NGC7023         | NGC7243 *                     | Zeta Aquarii       | M39            | NGC7044         |
| 6  | NGC7243 *       |                               | Delta Cephei       | M72            | NGC7062         |
| 7  | NGC7293         |                               | 8 Lacerta          | M73            | NGC7086         |
| 8  | NGC7331 *       |                               |                    |                | NGC7128         |
| 9  | NGC7479 *       |                               |                    |                | NGC7142         |
| 10 | NGC7635         |                               |                    |                | NGC7160 *       |
| 11 | NGC7662 *       |                               |                    |                | NGC7217         |
| 12 | Sh2-155         |                               |                    |                | NGC7243 *       |
| 13 |                 |                               |                    |                | NGC7296         |
| 14 |                 |                               |                    |                | NGC7331 *       |
| 15 |                 |                               |                    |                | NGC7380         |
| 16 |                 |                               |                    |                | NGC7448         |
| 17 |                 |                               |                    |                | NGC7479 *       |
| 18 |                 |                               |                    |                | NGC7510         |
| 19 |                 |                               |                    |                | NGC7606         |
| 20 |                 |                               |                    |                | NGC7662 *       |
| 21 |                 |                               |                    |                | NGC7686         |
| 22 |                 |                               |                    |                | NGC7723         |
| 23 |                 |                               |                    |                | NGC7727         |
| 24 |                 |                               |                    |                | NGC7789         |
| 25 |                 |                               |                    |                | NGC7790         |

\* - Multiple entries

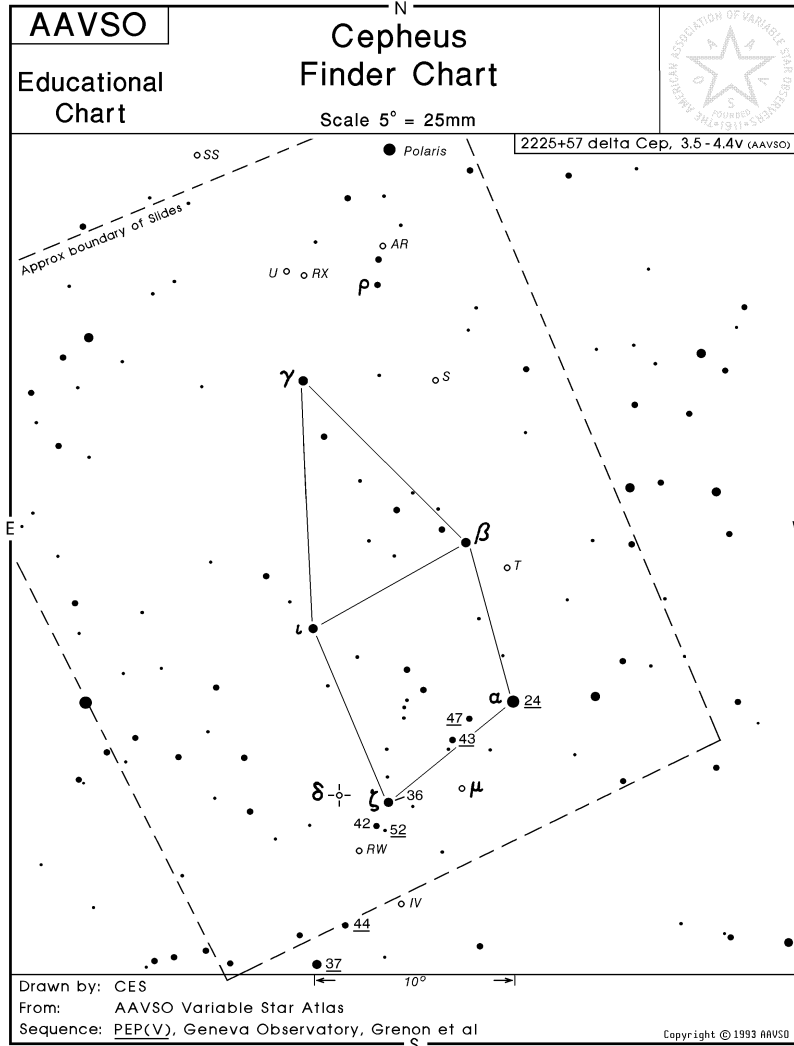
Details of this list are located in a folder in the AstroTulsa Yahoo group's files section, "ACT Observing Lists." The list for September contains 47 objects which are too many to "observe" in one evening but we plan to recognize anyone who observes 20 or more of these objects. The reason that there are so many objects is to give the observer a variety of objects that could also be used for Astronomical League (AL) Observing Clubs. For more information on the Astronomical League and the observing clubs, check it out on the web at: <http://www.astroleague.org/observing.html>. All of the objects cross the meridian between 9PM and 1AM. For this month, the list contains 7 double stars (AL Double Star Club), 7 Messier objects (AL Binocular Messier & AL Messier Clubs), 5 deep sky objects (AL Deep Sky Binocular Club), 12 Caldwell objects (AL Caldwell Club) and 25 Herschel objects (AL Herschel-1 Club). Several of the Herschel objects are also on the AL Deep Sky Binocular list, so observing any of these with binoculars is the same as two observations. Several of the Herschel objects are also on the Caldwell list, so observing any of these is also the same as two observations. One of the objects (NGC7243) is actually on three lists: Caldwell, Herschel 1 and the Deep Sky Binocular lists. How about that! One observation can be used to log entries in three AL observing clubs.

As we continue with these lists, one should be able to complete several of the observing clubs in only one year. Of course the Herschel list will take longer.

Please take a look and give feedback to Tony or Rod. Also, please provide a copy of your observing log to Tony.

Thanks, Rod

## Mu Cephei (Herschel's Garnet Star) – (The Jewel under the King's Throne)



Simply stated, I'm a big fan of red stars (...not the communist variety, the "astro" type). These stellar gems are interesting both because of their fine appearance (a rich red color in small scopes) and the fact that these stars actually do something (all are variable stars). One of the best examples of this breed is Mu ( $\mu$ ) Cephei which culminates at midnight in September. Though sometimes known as "Erakis," it is more familiarly referred to as "Herschel's Garnet Star," the name honoring both the star's deep color and Sir William Herschel, who gave it its name. To use Herschel's own words, "A very considerable star, not marked by Flamsteed, will be found near the head of Cepheus. Its right ascension in time is about 2'19" preceding Flamsteed's 10th Cephei, and it is about 2°20'3" more south than the same star. It is of a very fine deep garnet colour, such as the periodical star  $\alpha$  Ceti was formerly, and a most beautiful object, especially if we look for some time at a white star before we turn our telescope to it, such as  $\alpha$  Cephei, which is near at hand."



The Garnet Star has a magnificence all out of proportion to its faint 4th magnitude. Part of the star's visual color comes from the absorption and reddening of its light by the Milky Way's interstellar dust. Were no dust present, the star would shine at mid-second magnitude (1.97). As a red class M2 supergiant with a low temperature of 3700 Kelvin, it is one of the largest visible stars in the entire Galaxy. Its distance is uncertain but around 2400 light years. Even at that distance, Mu Cephei is big enough that astronomers have been able to measure its angular diameter at 0.021 seconds of arc, giving it a radius of 7.7 AU. If it replaced the Sun, it would extend midway between the orbits of Jupiter and Saturn.

As is the case with all huge super-giants, the Garnet Star cannot quite find a place for itself, and is quite unstable, pulsating in brightness by a over a magnitude in a slow semi-regular manner with an uncertain period of over 2 years, the average magnitude varying over periods of decades. The star can shine as bright as 3<sup>rd</sup> magnitude (equaling  $\delta$  Cephei at its maximum) and dipping as faint as 5<sup>th</sup> magnitude. At this time in its evolution, it is rapidly losing mass through a strong stellar wind that has enshrouded it in a dusty shell that extends up to 15,000 AU from the star (and which also contributes to the reddening).

This late life weight loss (which has reduced the core to a svelte 25 solar mass size) cannot save the star (which began life containing perhaps 50 solar masses) from the ultimate fate. The Garnet has certainly stopped internal hydrogen fusion but its exact evolutionary status is uncertain. Most likely, it is now fusing helium in its core into carbon. Whatever the exact current conditions, the remaining mass of the star has most certainly doomed it - this great star is without a doubt destined to explode as a spectacular supernova, perhaps tomorrow or millions of years hence. Whenever the event occurs, northern hemisphere observers will have a ringside seat at the event.

D.J. Karcher / August 2008

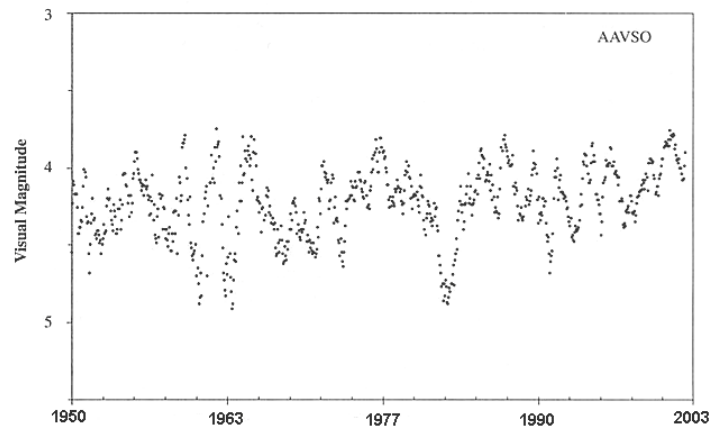


FIGURE 1 AAVSO light curve of 25-day means of observations of  $\mu$  Cephei from 1950 to mid-2003, created from 33 576 individual brightness measurements by 803 observers worldwide.

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## Lands Tidbits – by John Land (September 2008)

Welcome Recent New Members: Jonathan Filion, Mark Chouinard, Bret Salyer, Jerry Koenig & John C Martin

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        |
|----------------|------------------|--------------|
| President      | Tamara Green     | 918-851-1213 |
| Vice-President | Tom McDonough    | 918-665-1853 |
| Treasurer      | John Land        | 918-357-1759 |
| Secretary      | 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 |

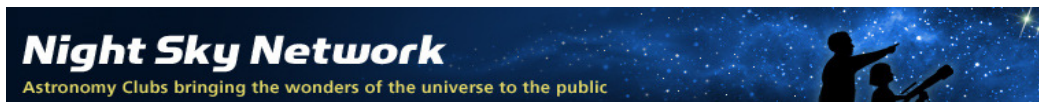
### APPOINTED STAFF

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

Deadline for October Article submissions: September 25, 2008  
Target Publication for October Observer = September 30, 2008  
eMail article submissions to: [djkarcher@cox.net](mailto:djkarcher@cox.net)