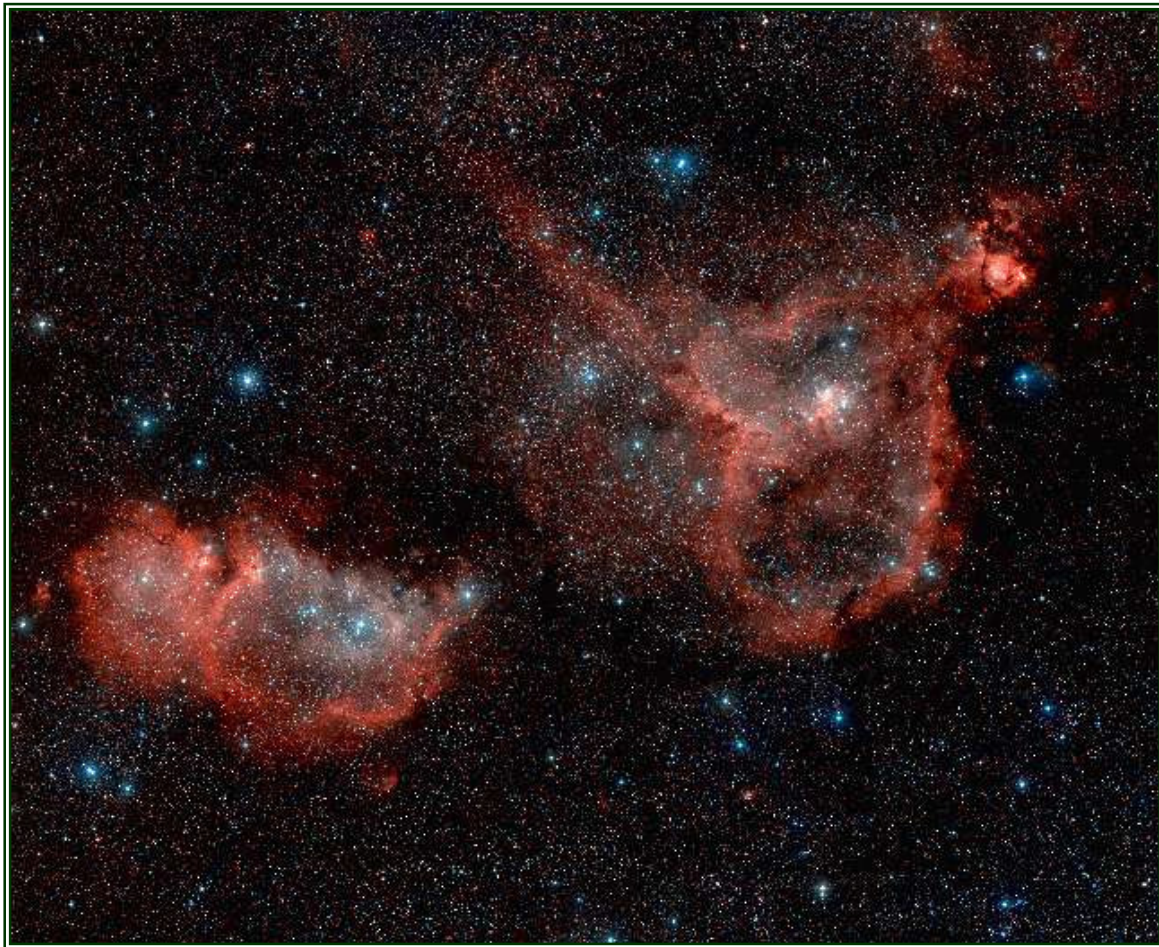




# Astronomy Club of Tulsa Observer



**February 2010**



## IC1805 and IC1848 - The Heart and Soul Nebulae

In honor of Valentine's Day, from the Digital Sky Survey... the Heart (right) and Soul (left) Nebulae in the constellation Cassiopeia approximately 6,000 light years from our solar system toward the outer rim of our Milky Way Galaxy. *Credit & Copyright – DSS image. © CalTech/Palomar (Image size: 5.3'x4.3')*

<b>Inside This Issue:</b>	Upcoming Events - - - - - p8	<b>Important ACT Upcoming Dates:</b>	
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March Messier Madness - - p4	A letter from the Editor - - p10	Member Only Night	Fri, Feb. 12, 2010
Globe at Night - - - - - p5	Land's Tidbits - - - - - p11	ACT Meeting at TCC	Fri, Feb, 26, 2010 (p 2)
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## February Meeting

**Dr. Eddie Baron from the Homer L. Dodge Department of Physics and Astronomy at the University of Oklahoma will be our featured speaker for February's ACT meeting. Dr. Baron received his B.A. in 1980 from Pennsylvania and his Ph.D. in 1985 at SUNY Stony Brook.**

**Subject of Dr. Baron's talk will be:**

***"Measuring the Universe with Supernovae"***

**When: Friday, February 26, 2010 7:00 PM**

**Where: TCC Metro Campus – Philips Auditorium**

**Located in Building 2 at the corner of 9<sup>th</sup> and Cincinnati. Park on NORTH side in Lot 5 on 9<sup>th</sup> and Boston Ave. From the BA Expressway – take the Detroit Exit and go north to 9<sup>th</sup> St and then turn left. The meeting room is on the NE corner of the buildings.**



Dr. Eddie Baron's specialty is in the physics of supernova explosions, stellar evolution, and nucleosynthesis. He uses supernovae as galactic and cosmological probes. Dr. Baron's main field of technical expertise is in numerical astrophysics, developing parallel algorithms and high performance scientific computing. His research focuses on carrying out detailed theoretical models of the transport of radiation in the fast-moving supernova atmosphere. The tools of this research are detailed numerical calculations of both hydrodynamic and radiation transport, primarily Dr. Baron is working towards understanding the detailed systematics of how a supernova works, what types of stars lead to what types of supernovae? What is the source of the

variation in the energies of the explosion? What are the characteristics of the object that is left behind? Supernovae are fascinating systems to study, since all fields of physics are important to their understanding, and one is forever learning new things. Recently Dr. Baron has begun work with his colleagues to calculate radiative transport in 3 spatial dimensions, a daunting computational task, that is proceeding apace. This work will allow them to analyze 3-D models of many objects: supernovae the sun, variable stars, and even global climate models of extrasolar planets and the earth. The common thread is that almost all observed astrophysics depends on understanding the objects that are producing the observed spectrum and that can only be done by detailed modeling or quantitative spectroscopy. Dr. Baron's research is supported in part by the NSF, NASA, U.S. DOE, the IBM Corporation, and Apple Inc.

Meeting Date	Scheduled Speaker
Friday, February 26, 2010	Dr. Eddie Baron – OU
Friday, March 26, 2010	Neta Apple – Former ACT Member
<b>April 2010 – Exact Date TBD</b>	<b>John Dobson – Sidewalk Astronomer (Don't Miss This!!)</b>
Friday, May 28, 2010	To Be Determined
Friday, June 04, 2010	* <i>Summer Series</i> - Speaker TBD
Friday, July 02, 2010	* <i>Summer Series</i> - John Land
Friday, August 13, 2010	* <i>Summer Series</i> - Speaker TBD
Friday, September 24, 2010	Dr. Peter Shull – OSU
Friday, October 22, 2010	Tom McDonough – Club Elections
Friday, November 19, 2010	<i>2011 Club President</i> – Dinner Meeting
Friday, December 17, 2010	Dr. Aaron Coyner – Goddard Space Center

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## President's Message – February 2010

With all the weather we've been having it seems like astronomy has been impossible lately. Since our observatory is out of commission due to weather and dome problems, this is a great time to discover urban astronomy. Mars looks fantastic right now and is definitely worth setting your scope up in the driveway. While you have it out, there are many bright open clusters in the winter sky that look good from the city. And since you have your scope out and are observing, might as well work towards completing the Astronomical League's Urban Observing Club <http://www.astroleague.org/al/obsclubs/urban/urban.html>.

We now have a Facebook page which is being administered by Chris Proctor. This will be another avenue to spread the word about our club.

We are in the process of finalizing plans for our Adams Ranch Summer Star Party. It will be a joint event with observers from Kansas. Stay tuned for details.

Please welcome Allen Martin our new newsletter editor. We also have four positions open on the board and are looking to fill the Program Director and Webmaster positions. If anyone is interested in serving, please let any club officer know.

Keep Looking Up!

Tom McDonough / President, ACT



## March Messier Madness

By Ann Bruun

It's that time of year again, Messier Marathon time. For those of you who are new to astronomy the March Messier Marathon is a magical time when it is possible to see all 110 Messier objects in one night. There happens to be a small segment of the sky that does not have any Messier objects. When the sun is in that area, theoretically, you can see all the Messiers in one night. Truth be told, all 110 aren't usually available for us, a few will just be too close to sunset or sunrise to see, but we can get close.

So the marathon is a competition, sort of – who can find the most Messiers. What it really is though is a chance for us all to get together, try to stay up all night and go crazy observing Messiers. It's like an endurance race for amateur astronomers.

If you are new to observing don't be intimidated, it is a fun and wonderful adventure. Watching the sky turn throughout the night and looking for targets is great experience. The Messier marathon is not the time to do serious observing. You basically jump from object to object as fast as you can.

Be sure to bring all your warm clothes, it gets cold in the wee hours of the morning. Also bring snacks to help you stay awake, peppermint is good, coffee, jerky anything that will pep you up. The hardest part for me is staying awake.

The marathon this year will be held at TUVa on March 13<sup>th</sup>. TUVa is the observing club located at Ron and Maura Wood's house near Council Hill, Oklahoma. They have offered to host the marathon for many years and I can't imagine it anywhere else. The observing field is pastureland so setting up on a tarp is a good idea. They also have a



nice clubhouse where you can get inside for breaks or, as we did during the fall Messier last year, to dry the dew off your eyepieces and finder scopes.

You never know what is going to happen during the marathon, they are all different. The fun part is sharing the experience with others and building friendships. We usually head down to TUVa in the afternoon. Everybody contributes and we have a potluck dinner before setting up our equipment for the evening.

Tom McDonough is very good at putting together a list of the order the Messiers will become available in our sky. He also adds finder charts to help locate the objects. The links below will take you to his list and charts for this year. There is also a link to additional information and sources. If this March Messier madness sounds like something you would be interested in mark your calendars and get ready. Watch for details on the website and Yahoo Group.



<http://astrotulsa.com/pub/Messier/MessierMarathon2010.pdf>

<http://astrotulsa.com/pub/Messier/MessierMarathonLinks.pdf>



## Globe at Night 2010

March 3 to March 16

<http://www.globeatnight.org/>

by John Land

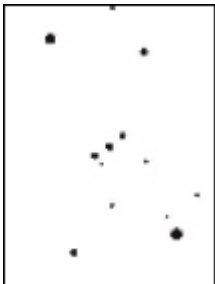
### HOW DARK IS YOUR SKY? How many Stars can you see?

Did you ever wonder what your limiting magnitude is from your observing site?

How many more stars can you see from a rural dark site compared to your home site?

This project gives you easy tools to measure the sky from your viewing site and be a part of a worldwide effort to measure light pollution.

**GLOBE at Night** is an annual 2-week campaign in March. People all over the world record the brightness of their night sky by matching its appearance toward the constellation Orion with star maps of progressively fainter stars. They submit their measurements on-line and a few weeks later, organizers release a map of light-pollution levels worldwide. Over the last four GLOBE at Night campaigns, volunteers from over 100 nations have contributed 35,000 measurements. They also have a fall event measuring the sky using the Summer Triangle.



All you have to do is count the number of stars you can see in the area of Orion and then compare that to a set of charts to measure your seeing magnitude. **Be sure to allow at least ten minutes in the dark for your eyes to achieve maximum dark adaptation.** Also try to find a place in your yard that does not have direct light shining into your eyes or shield your eyes with a dark card. **Use only dim Red Light for reading charts at night.** Some left over red cellophane from Valentine's candy taped over a flashlight works well.

There is a handy download **Family Activity Pack** on the website. They also have a couple of websites to find your exact Latitude and Longitude.

I had more luck with the <http://www.itouchmap.com/latlong.html> even though dragging the cursor around to find my exact location was a bit of a challenge. Once you get close to your address, use the Satellite option to see a photographic image to locate your house. Scroll down to the bottom of the page to see the location data. I was even able to locate my exact observing site in my back yard.

Just a little FYI. The center pad at the observatory grounds is located at:

	Degrees	Minutes	Seconds
Latitude:	<input type="text" value="35"/>	<input type="text" value="49"/>	<input type="text" value="52.0098"/>
Longitude:	<input type="text" value="-96"/>	<input type="text" value="8"/>	<input type="text" value="49.3938"/>

## In the Steps of Galileo

by John Land

In 2009 astronomy clubs worldwide celebrated the International Year of Astronomy. Thanks to many innovative ideas from Peggy and Rick Walker and lots of participation by our members the Astronomy Club of Tulsa had many opportunities to introduce the public to the wonders of the universe. Although Galileo began his astronomical observations in the fall of 1609, the year 1610 was really his year of discovery. Using an improved telescope, Galileo turned his telescope toward Jupiter and discovered that Jupiter had four moons. Using a telescope of about 30 power and a field of view smaller than the width of the moon, he was able, in a short time, to sort out their motions. Throughout 1610, he observed and drew the planet Venus. As he accumulated observations, he was astonished to see that Venus went through a cycle of phases like the moon. These two observations were eventually recognized as the fundamental scientific evidence that the planets orbited the Sun and not the Earth.



The Galileo Observing Certificate.

[http://astroleague.org/al/obsclub/galileo\\_club/galileo\\_club.html](http://astroleague.org/al/obsclub/galileo_club/galileo_club.html)

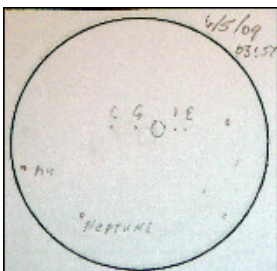
Additional resources posted in files of the Astronomy Club Yahoo Group.

The Astronomical League offers a challenging observing program to repeat the observations of Galileo using a telescope or binoculars of 20 power or less. That may seem a simple task given today's superior instruments and easy access to astronomical information. But in beginning this project, you will soon learn that it takes some careful planning and dedication to complete all the segments of the project. At the end, you will have a greater respect for the genius of Galileo not only observing but interpreting what he saw. I decided I would test my skills against the great Italian observer and take up the Challenge to complete the Galileo certificate by the end of IYA 2009.



For most of my observations, I used a modified camera telephoto lenses. Its 63 mm Aperture and focal length of 400 mm gave exactly 20 power using a 20mm Erfle eyepiece. Its 3 degree field of view was about 10 times wider than what Galileo had to work with. The aperture ratio was adjustable from f 6.3 to f 22. This came in very handy when trying to observe bright Venus and the moons of Jupiter.

The Galileo certificate has eleven required activities and two optional activities. Some are simple and can be done in a single night while others require a series of observations over an extended period of time. The single observations are drawing the **Moon**, a region of **Orion**, the **Pleiades** and the **M44 region** of Cancer. The latter three of these are winter sky objects. Planet observations include a drawing of **Saturn**. This is a real challenge at 20X especially since the rings are nearly edge on now. A drawing of **Neptune** and its surrounding star field was easier because in 2009, Jupiter and Neptune had a triple conjunction and were visible in the same field of view for about 3 weeks. **Note:** Jupiter and Uranus have a triple conjunction this year. They will pass within 1/2 degree of each other in June, again in Sept when they both reach opposition on Sept 21<sup>st</sup> and again in January of 2011



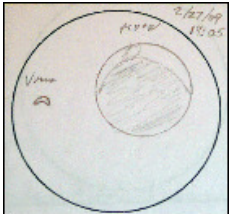
Observations of the **motions of Jupiter's moon** requires at least a month and some luck having a series of clear skies. Jupiter is in conjunction with the Sun now and won't be observable again until early May in the predawn skies. You'll need 15 to 20 observations to complete the series. Then you have to use your observations to estimate the orbits of Jupiter's four moons. I did my series of observations starting off around 5:00 AM in May and finishing in June with observations near midnight. Observing the moons at **20x** is a challenge if the moon was close to the planet. At the end of the project, I set up a spreadsheet to record the date and times of the observations and calculate the elapsed time between each. I then made a diagram of the moon's positions relative to Jupiter to calculate their orbits. Even knowing which dot was which moon, it was still a

challenge. Galileo did his calculations without all our modern aides.



Sky and Telescope has a neat Java script that will let you identify the positions of Jupiter's moons for any date and time. <http://www.skyandtelescope.com/observing/objects/javascript/jupiter#>

**Observe, sketch and TIME at least two eclipses of Jupiter's moon**, one near quadrature when Jupiter is about 90 degrees to the sun and another near opposition. In 2010 Jupiter reaches Western quadrature June 23rd, opposition Sept 21st and Eastern quadrature Dec 16th. Eclipses occur when the moons either enter Jupiter's shadow and disappear or emerge from the shadow and reappear. Sky and Telescope had a listing of Phenomena of Jupiter's moons for 2009 but I haven't seen one yet for 2010. The disappearances occur before opposition and are easier to observe since the moons abruptly disappear as you are watching them. Io goes out almost instantly while the others fade out over a few seconds. When I first moved to Broken Arrow in 1978, Sky and Telescope was encouraging amateur astronomers to do careful timings of these moon eclipses using short wave radios, tape recorders and stop watches. I and scores of other observers sent in timings that were compiled and passed on to NASA. They used our observations to refine the orbits of Jupiter's moons for the Voyager I and II spacecraft to observe these moons when they arrived at Jupiter.



Another extended series involves **observing phases of Venus at least once a month** for half its orbit as it goes from a tiny indistinct disk to an easily seen crescent. I was fortunate in 2009 to observe a daytime lunar occultation of Venus, also observations on both sides of Inferior conjunction the evening of Mar 24th and eleven hours later on the opposite side of the sun on the morning of Mar 25<sup>th</sup>. My series of observations extended from Feb 23<sup>rd</sup> to Nov 22<sup>nd</sup>. In 2010 the Venus observing season begins in the evenings about March 1<sup>st</sup> and extends to inferior conjunction in late October.

**Observe one large spot that completes one complete rotation of the sun.** This proved to be the most elusive of the objectives of the project. 2008 had 266 days without sunspots and 2009 looked like it was well on its way to smashing that record. A late pick up of activity in mid-December prevented a new record and left us with 260 blank days. Only 1913 exceeded the pair with 311 blank days. I did get in about a dozen observations, but none of the groups lasted very long. In late Nov 2009, the certificate team decided to give a waiver for observers completing their projects in 2009. 2010 has seen a marked increase in solar activity with only 2 blank days. Two groups have made a full rotation of the sun. Most sunspots last only a week or two. Only the strongest stay organized enough to make the month long trip around the sun. Observers need to be aware that they often change the number of a sunspot group even if it does make a full rotation of the sun. The best place to keep up with the sun's daily activity is at [www.SpaceWeather.com](http://www.SpaceWeather.com) I plan to write more about Safe Solar Observing and making your own solar filter in a future article.

### **Make at least three observations of a comet and plot its progress among the stars.**

January 2009 opened with the predawn appearance of the bright binocular Comet, Lulin, that moved along a retrograde orbit from Libra into Leo. <http://antwrp.gsfc.nasa.gov/apod/ap090207.html> I'm not sure I even knew about the Galileo certificate when I started observing the comet. But I soon discovered that my observations fit right into the requirement of the certificate to make a set of observations of a comet showing its motions among the stars. You'll need some good luck to complete this segment of the requirements. Comet Temple (10 P) is expected to appear at about 8<sup>th</sup> magnitude near Jupiter in July 2010. This particular requirement is a bit flawed in that Galileo never observed a comet through his telescope even though he had three excellent opportunities to do so in the fall of 1618. To make matters worse he even wrote a series of articles asserting that comets were mere atmospheric phenomena and mocking Tycho Brahe and the Jesuit astronomer, Father Grassi, who both asserted that comets were far above the Earth's atmosphere. It was Johannes Kepler who asserted that comets traveled in straight lines among the stars. None-the-less, there were contemporaries of Galileo who did observe comets with telescopes similar to his.

### **The two optional activities are to observe the Aurora Borealis and a Super Nova in the Milky Way.**

The first though rare - do occur in Oklahoma near times of maximum solar activity. Some of our club members saw them in Aug 2009 at the Nebraska Star party and others have seen them at Okie-Tex.

I've seen them a few times from my home area in east Broken Arrow. There hasn't been a super nova in the Milky Way since 1604, before the invention of the telescope, but Galileo did observe it with the naked eye as did many others.

I enjoyed working on the project. Most of the observations could be done from my front yard. My wife has learned living with an astronomer may mean ignoring him setting an alarm night after night to get up at 4 or 5 AM to get in an observation. I now have a much greater respect for the pioneers of astronomy and the things that they accomplished. Fellow Tulsa Club member Brad Young also completed the Galileo certificate in 2009. His certificate is certificate number 6 and mine was number 13. We'd both be glad to answer any question you have on the project.

## Upcoming 2010 Events

- Messier Marathon**                      March 13        *See ACT's Yahoo group for latest info*
- Texas Star Party**                      May 9 to 16    <http://www.texasstarparty.org>
- Grand Canyon Star Party**        June 5 to 12    <http://www.tucsonastronomy.org/gcsp.html>



*MidStates Regional convention*  
**June 4- 5, 2010 Lincoln, Nebraska**  
<http://msral.org/>



*National Astronomical League Convention*  
**June 25–26, 2010 Tucson, AZ**  
 Side trips include tours of Kitt Peak  
 national observatory  
<http://alcon2010.astroleague.org/>

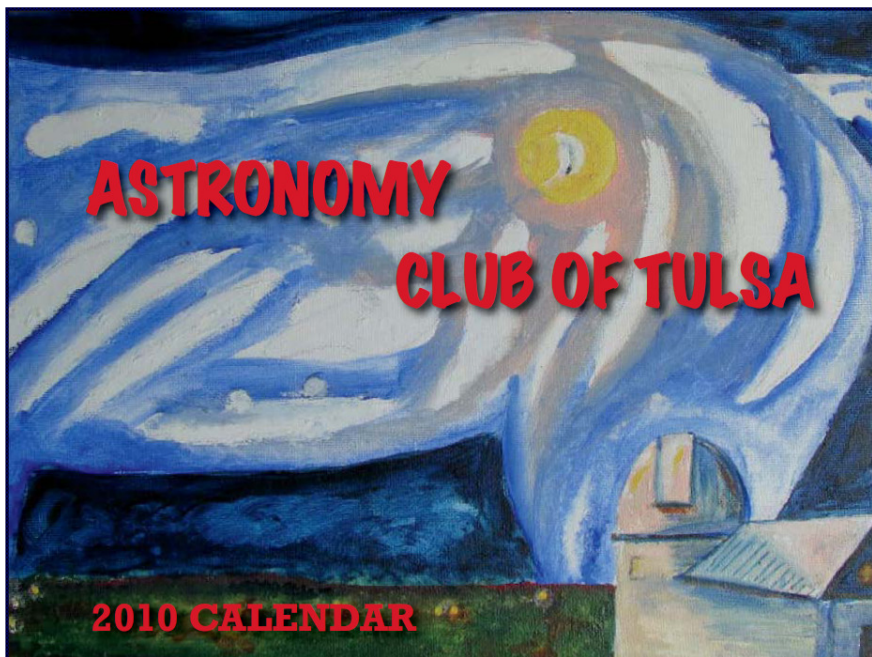
- Nebraska Star Party**                      Aug 8 to 13    <http://www.nebraskastarparty.org/>
- Heart of America Star Party**        Sept 2 to 9    <http://www.hoasp.org/>  
 In west central Missouri
- Okie-Tex Star Party**                      Oct 2 to 10    <http://www.okie-tex.org/>

*If you know of an upcoming event not listed here that may be of interest to club members, Please email relevant information to [act\\_pm@astrotulsa.com](mailto:act_pm@astrotulsa.com)*



## 2010 ACT CALENDAR UPDATE

From Peg Walker



Those folks who still have calendars in their possession, please let me know how many you have and if I need to come and collect whatever funds you have thus far. Please e-mail me A.S.A.P. at [peg@astrotulsa.com](mailto:peg@astrotulsa.com).

The board has decided that as the year progressed, the calendar price would be reduced by \$2.00 each month. February sales are \$8.00, March will be \$6.00, but to go no lower than \$4 during and after April. This should help you sell what you have. I tried to sell them for \$8.00 to a member who refused to pay \$8.00 and gave me \$10.00 each anyway. One person gave me a \$12.00 to cover my

shipping to the Independence Community College in Kansas. Many of you wanted to wait for the price reduction and here it is.

Because of no January meeting or Sidewalk event, I still have one box with about 215 calendars left. On the 25<sup>th</sup>, I will be presenting my black hole presentation at Broken Arrow High School and will have them to sell to students and teachers. On the 26<sup>th</sup>, they will be available at the February meeting, then on the 27<sup>th</sup>, they will be available at *Sidewalk Astronomy* at Bass Pro Shops. If you want me to set any aside, now is the time since I have no idea how the sales will go.

Included in the ones I purchased for Christmas gifts to my family, the extras were sent to Donna Smith and John Dobson of *Sidewalk Astronomers* and Kenneth Frank of the *Astronomical Society of the Pacific/Night Sky Network*. I plan on sending one to Mike Simmons of *Astronomers Without Borders*. Those who got them have commented on what a great idea this was and how nice it looked.

Should this be done for next year? Let me know that as well. If there is no interest, I won't pursue it. If we do, I will need to get it started in the next few months so printing can be done and in hand before Okie-Tex in October. Next year we may not even have any left for us to sell in December!

Although this was a pretty time crunched and stressful situation, you have to admit it was a great idea and sparked interest and support on behalf of the membership. Plus, it has generated more revenue than *Astronomy Magazine* calendar sales ever have in the previous years. So far, we can account for \$710 profitable revenue and there are still quite a few members that have monies to be collected. Keep selling!

## A Letter From the Editor

-By Allen Martin



First, let me say what a privilege it is to be the new editor of the ACT's monthly newsletter "*The Observer*". I and my Fiancé Taylor have only been members of the ACT for a short time, but we both enjoy learning about our universe and sharing what we know with others. I have learned so much in the last few months from the amazing friends we have made within the club and had some pretty awesome experiences both at the observatory and at Woolaroc. We are both looking forward to this year and all the wonders we are yet to discover as we both pursue our AL achievements and complete as many clubs as the sky permits. I have recently plagued you all with bad weather due to the purchase of a new telescope and for that I am truly sorry. In the future, I will try to keep my purchases to a minimum.

All kidding aside, I welcome any help and criticisms you have to offer me with regards to editing your newsletter. My wish for "The Observer" is for it to not only keep our members informed and educated about astronomical events and ACT business, but to also reflect how amazing the people are who make the Astronomy Club of Tulsa what it is. Our membership is comprised of school teachers, engineers, doctors, IT professionals, construction experts and everything in between. All brought together by a hunger to see, learn and pass on everything we can about what's in the night sky. I have yet to meet a member who did not fully enjoy answering any question I asked and I don't believe I ever will. I have felt welcomed since my first public star party night and I want to help make new comers feel as warmly invited as I felt.

Even if you have not regularly submitted articles, pictures or other content for the newsletter in the past, I invite you now to start. I will ask; however, that all submissions be kept to astronomy related subject matter. I thank you all for this opportunity and in advance for your contributions. Please send newsletter contributions to [act\\_pm@astrotulsa.com](mailto:act_pm@astrotulsa.com).

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### **SPECIAL NOTICE**

#### **Observatory AND Grounds CLOSED until March 5<sup>TH</sup>.**

Due to the overall poor condition of the unpaved roads leading out to the observatory and the saturation of the viewing field, the board has decided that the **OBSERVATORY and GROUNDS will REMAIN CLOSED to both MEMBERSHIP and the PUBLIC until March 5<sup>th</sup>**. This is for your safety as well as the preservation of the observing grounds. Thank you for your cooperation and understanding regarding this matter.

Due to the uncertain weather reports, always check your local weather reports for sky conditions. Our club has excellent resources for predictions of cloud cover on the observe section of our website <http://www.astrotulsa.com/Observe/observe.asp>, or check the AstroTulsa Yahoo Page <http://tech.groups.yahoo.com/group/AstroTulsa/> for cancellations if weather is uncertain! Since night-time temperatures can dip to the mid 30's or colder you should plan to bring a jacket or heavier coat. **Note – The wind chill on the observatory hill can be brutally cold!!**

- **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 \$2.00 per guest would be appreciated to help us maintain the observatory*

## Land's Tidbits

– by John Land for Feb, 2010

### Welcome Recent New Members: David Hall, Thomas Montgomery and George Fernandez

Our membership rates for 2010 – 2011 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 League membership.**

**Students \$ 20 with 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.

**Additional 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](http://www.astronomy.com)

**Sky & Telescope is \$33 / yr** [www.skyandtelescope.com](http://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.**

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

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

**You may forward questions to the club** by going to our club website 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



Garrett Optical® stocks over 50 astronomy binoculars from six different manufacturers, and we're based right here in south Tulsa.

Visit our websites  
[www.GarrettOptical.com](http://www.GarrettOptical.com)  
[www.AstronomyBinoculars.com](http://www.AstronomyBinoculars.com)  
 for more information!



## Astronomy Club of Tulsa 2009 Budget Report

Astronomy Club of Tulsa		12/31/2009	
Expense Summary 2009		Treasurer - <i>John Land</i>	
<b>Regular Club Income</b>			
Renewal Memberships	80 renewals		\$ 2,630.00
2 Family 2 Student AL 18 Sr Adult 58 Full Adult			
New Memberships	53 New Members		\$ 1,615.00
5 student - 5 AL Student - 3 Sr Adult 40 Full Adult			
Bank Interest on Savings			\$ 15.86
Observatory Donations			\$ 351.10
Newsletter Donation			\$ 35.00
AstroTulsa Email accounts			\$ 55.00
Events & Sales			\$ (87.70)
<b>Total 2009 Income</b>			<b>\$ 4,614.26</b>
<b>2009 Major Expenses</b>			
Club Operation Expenses			\$ 1,147.95
Observatory Operating Costs			\$ 2,238.45
<b>Total 2009 Expenses</b>			<b>\$ 3,386.40</b>
Club Income minus Expenses			\$ 1,227.86
Net Club Income minus Expenses		\$ 1,227.86	
Net Capital Improvements		\$ 2,585.51	
Total Income & Capital Imp		\$ 3,813.37	
<b>Expenses</b>			<b>Paid out</b>
Astro League dues 08-09 - 135 AL memberships			\$ 635.00
Club Meeting costs -- Guest Speakers Etc.			\$ 130.00
PO Box Rent			\$ 96.00
News Letter & Postage			\$ 118.09
AstroTulsa Web Site			\$ 41.25
Misc Costs			\$ 127.61
Club Operation Expenses			\$ 1,147.95
<b>Observatory Operation Costs</b>			
Annual Fee	Liability Insurance	\$ 750.00	average cost
	Wireless network	\$ 300.00	\$ 25.00 /mo
	Electricity	\$ 509.42	\$ 42.45 /mo
	Water	\$ 182.30	\$ 15.19 /mo
Observatory Maintance & Repairs		\$ 496.73	for 2009 yr
Observatory Total cost		\$ 2,238.45	\$ 186.54 /mo
Minus Observatory Donations		\$ (351.10)	
Net Observatory Costs		\$ 1,887.35	\$ 157.28 /mo
<b>Capital Improvements to Observatory</b>			<b>Received</b>
Suddarth Optical 14" RCX cleaning			\$ 500.00
Cover for 14" RCX			\$ 217.41
Garrett Optical Bino Tripod			\$ 218.03
Sale of Japanese Naval Binoculars minus cost			\$ 3,600.00
79.05			
<b>Net Recieved vs Paid Out</b>		<b>\$ 2,585.51</b>	<b>\$ 3,600.00</b>
			<b>\$ 1,014.49</b>

Astronomy Club of Tulsa		12/31/2009	
Expense Summary 2009		Treasurer - <i>John Land</i>	
Page 2 Continued			
Events & Product Orders Paid in Advance by Club members -		Received	Paid out
Astronomy Magazine Subscriptions		\$ 946.00	\$ 980.00
Sky & Telescope		\$ 891.00	\$ 920.50
2009 Astronomy Wall Calendars		\$ 105.00	\$ -
2010 Astronomy Wall Calendars		\$ 372.00	\$ 323.75
2009 Canadian Observing Handbooks		\$ 19.00	\$ -
2010 Canadian Observing Handbooks		\$ 126.00	\$ 125.70
Adams Ranch event		\$ 695.00	\$ 660.62
BART restoration donations		\$ 800.00	\$ 800.00
Obs Key fees		\$ 40.00	\$ 40.00
Moon Maps		\$ 32.00	\$ -
Meteorite drawing		\$ 64.00	\$ -
2010 Astronomy Club Calendars - 139 of 500		\$ 1,390.00	\$ 1,300.31
International Year of Astronomy donations & expenses		\$ 336.00	\$ 778.52
Café Express Logo Wear		\$ 25.70	\$ -
<b>Net Recieved vs Paid Out</b>	\$ (87.70)	\$ 5,841.70	\$ 5,929.40
<b>Capitl Equipment Donations to Club</b>		<b>Est Value</b>	
100 mm Binoculars	\$ 1,000.00		
90mm Refractor	\$ 250.00		
Starry Night Software	\$ 250.00		
Binocular donation to YA	79.95		
<b>Annual Report of Accounts</b>		Dec 31-09	Dec 31-08
Checking		\$ 2,076.01	\$ 1,520.11
Savings		\$ 3,568.46	\$ 302.60
<b>Total Liquid Assets</b>		\$ 5,644.47	\$ 1,822.71
<b>Club Investment Accounts</b>		Dow Jones close Dec 31, 09 \$ 10,428.05	
	<b>Dec 31-2009</b>	<b>Dec 31-2008</b>	<b>Dec 31-2007</b>
Cash Balance	\$ 888.35	\$ 220.92	\$ 4.88
Franklin Income Fund	\$ 8,162.21 at \$ 2.09 / share	\$ 6,561.00	\$ 9,725.44
American Balanced Fund	\$ 2,226.33 at \$ 16.21 / share	\$ 1,892.58	\$ 2,573.52
Washington Mutual Inv Fund	\$ 2,012.47 at \$ 24.64 / share	\$ 1,748.66	\$ 2,652.02
<b>Total Club investments</b>	\$ 13,289.36	\$ 10,423.16	\$ 14,955.86
2009 reported dividends	\$ 667.43		
<b>Net Increase from 2008</b>	<b>\$ 2,866.20</b>	21.57 % increase	
<b>Investments gain</b>			
Franklin Income fund	\$ 1,601.21	19.62%	increase
American Balanced Fund	\$ 333.75	14.99%	increase
Washington Mutual Inv Fund	\$ 263.81	13.11%	increase

**CLUB OFFICERS**

POSITION	NAME	PHONE
<b>President</b>	Tom McDonough	918-851-2653
<b>Vice-President</b>	Ann Bruun	918-834-0757
<b>Treasurer</b>	John Land	918-357-1759
<b>Secretary</b>	Tamara Green	918-851-1213

**BOARD MEMBERS AT LARGE**

NAME	PHONE
Steve Chapman	918-342-1643
Catherine Kahbi	918-409-1867
Teresa Kincannon	918-637-1477
Denny Mishler	918-274-4772
Chris Proctor	918-810-6210

**APPOINTED STAFF**

POSITION	NAME	PHONE
<b>RMCC Facility Manager</b>	Chris Proctor	918-810-6210
<b>Membership Chairman</b>	John Land	918-357-1759
<b>Observing Chairman</b>	Ann Bruun	918-834-0757
<b>New Members</b>	Owen Green	918-851-1213
<b>Group Director</b>	Teresa Kincannon	918-637-1477
<b>Webmaster</b>	Tom McDonough	918-851-2653
<b>Newsletter Editor</b>	Allen Martin	918-407-9706
<b>Night Sky Network</b>	Peggy Walker	918-640-0832
<b>Program Director</b>	Vacant	

**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 proud member of the Astronomical League and the Night Sky Network



**Night Sky Network**

Astronomy Clubs bringing the wonders of the universe to the public



<http://www.astroleague.org>

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

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