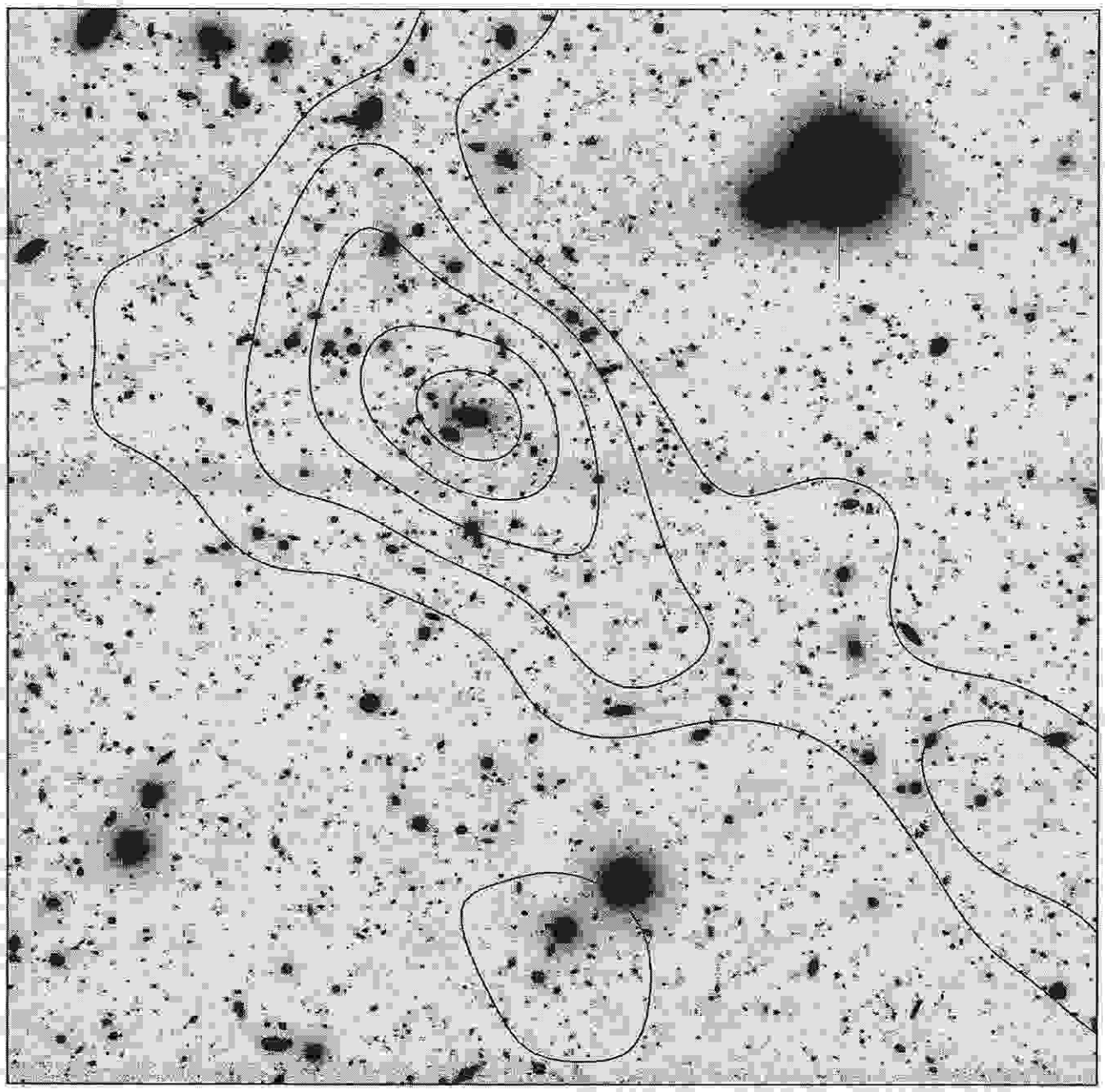
Desert Skies

Tucson Amateur Astronomy Association

Volume L, Number 9 **September, 2004**



Galactic Mass and Gravitational Lensing

Cover Photo: A cluster of galaxies fills this image. Taken with the Very Large Telescope in Chile, this image is 7' on a side or 2 mega-parsecs at the cluster's distance. The contour lines depict the mass distribution of the cluster. The center contour encircles the core of the cluster. Image supplied by our speaker, Dr Clowe.

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Membership in the TAAA

Annual Dues

Individual membership	$ 25.00
Family	$ 30.00
Senior (over 60) membership	$ 23.00
Senior Family (at least one over 60)	$ 28.00
Student membership (over 18 years old)	$ 17.00

Family Membership includes two adults plus minor children. Persons under 18 may join at a special Reduced Family Membership rate ($17/yr) upon parental or guardian acknowledgement of participation in TAAA activities. Call the Treasurer to request the required form.

Options (add to above membership rates)

Tucson soc. of the Astronomical League (TAL)	$ 5.00
Sky & Telescope Magazine 1 year rate	$ 32.95
Astronomy Magazine1 year rate	$ 29.00
2 year rate	$ 55.00
Postage for New Member Pack	$ 3.85

Donations are accepted for the following funds: SA-IDA/Light Pollution, TIMPA, Education, 30" Telescope & Land, and General/Undesignated.

Renewal Information

- Your membership expires as indicated on your mailing label.
- TAAA members may join the Tucson society of the Astronomical League (TAL) at the time they join or renew.
- Discounted Sky & Telescope or Astronomy magazine subscriptions are available to members and can be started or renewed at anytime. Rates are given above. Allow 3 months for processing. Subscriptions must be sent through the TAAA. *Do not send money directly to the magazines.* To change an individual subscription to the group rate, pay the subscription amount to the TAAA treasurer. Include your magazine renewal notice.
- Please include a note explaining what you are paying for. Credit cards are not accepted. Write one check or money order for dues plus any options or donations. Make it payable to TAAA and send to:

Tucson Amateur Astronomy Association
PO BOX 41254 Tucson, AZ 85717

Mailing Address or Email Changes - Send to address above or email the treasurer.

TAAA Mission Statement - The mission of the Tucson Amateur Astronomy Association is to provide opportunities for members and the public to share the joy and excitement of astronomy through observing, education and fun.

Desert Skies Publishing Guidelines - All articles, announcements, news, etc. must be submitted by the newsletter deadline. Materials received after that date will appear in the next issue. The editor retains all submissions unless prior arrangements are made. Partial page submissions should be submitted in Word compatible files via e-mail or on a floppy disk. Full-page articles, artwork, and photos can be submitted camera ready. All material copyright Tucson Amateur Astronomy Association or specific author. We will not publish slanderous or libelous material! Send submissions to:

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President's Message

My wife, Twila, and I were fortunate enough to have a week off to travel to some places we hadn't been before, and to some places where we met up with old friends. One of the latter places was in Fox Park, Wyoming which was the setting for the 14th annual Weekend Under the Stars (WUTS). This site is at 9400 feet elevation and has a naked eye limiting magnitude of 7.2! What a sky. There were 230 registered attendees and many more unregistered. Scopes ranged from minis to 30 inch aperture. The sky is such that the constellations blend in with the rest of the stars, making it a challenge to find objects normally star-hopped to. Minimal venders, like Astrosystems and Infinitees, were also avid amateur astronomers, so commercialism was held to a minimum. Comets, usually difficult to locate, were binocular visible, even at Magnitude 10 or fainter. And one could see shadows on the ground as a result of the glow of the Milky Way. If you get a chance to visit this site, about 50 miles southwest of Laramie and 11 mile from the Wyoming Infrared Telescope, please do. You only have a couple miles of dirt road to contend with after a beautiful drive into the Snowy Range. Be careful of dust devils, though. One got my van by picking up a tent canopy and whipping the aluminum standards around it. Otherwise, such a great place. Even in August, the temperature drops into the upper 20's and frost occurs near midnight, so dress appropriately.

On a different note, we need help on October 2 to clean up the TIMPA site in preparation of a big event the TIMPA group is holding on the weekend of October 22. There will be a signup sheet at the September meeting. Please help. Bring water, food if you need it, and gloves. Heavy duty equipment is supplied.

Speaking of TIMPA, if any individual would like to file a light pollution complaint, you have blessings from the TIMPA president, Mike Cummins, and the Head of Water Maintenance in Avra Valley and the Recharge Basin, Harold Maxwell, to do so. Maybe we can get the Rodeo lights fixed a bit.

Also, since we are trying to keep the TAAA meetings to a reasonable time, if you wish to make a presentation to the main group, please notify me by email or phone at least one week in advance of the meeting date. Late requests will be handled first come, first served after the break when the main speaker has finished. We are also trying to limit the Beginners' Lecture to 30 minutes with some time for questions and answers, and the main lecture to 45 minutes with Q and A time. If at all possible, a PowerPoint presentation is preferred. Meeting start times are going to be adhered to more rigidly. Have your CD ready before the meeting.

Meeting Information and Calendar of Events

TAAA MEETING DATE: Friday, Sept. 3 at the Steward Observatory Auditorium – Room N210

BEGINNERS LECTURE: 6:30 pm
Title: Important People in Astronomy
Speaker: Luke Scott

Many of us own Schmidt-Cassegrain or Newtonian scopes, use Barlow lenses and Plossl eyepieces, hunt down Messier objects, seek out Saturn's Cassini division, and observe Jupiter's Galilean moons. And most know the story of Galileo, Newton, and Messier, but what about Cassegrain, Barlow, Plossl, Cassini, and Schmidt? Luke Scott will present the history and contributions to astronomy of persons, both famous and obscure, which have lent their names to the equipment we use and the objects we observe.

GENERAL MEETING: 7:30 pm
Title: Galactic Cluster Lensing
Speaker: Dr. Douglas Clowe, Steward Observatory

Gravitational lensing* studies use the fact that light, or photons, passing a massive object will be bent by the object's gravitational pull. This gives astronomers a way to measure the mass of the deflecting object. This trajectory bending results in background objects being deflected away from the foreground object and stretched tangentially, which both alters the shape of the background object and increases the total observed flux of the object. Dr Clowe will briefly discuss the three most common types of lensing (strong, weak, and micro) and highlight some recent results. He will then show us how weak lensing can be used to observe the mass distribution in clusters of galaxies, and how clusters evolve over time. Finally, he will show some recent data obtained on a set of merging clusters of galaxies and how this data can be used to directly detect and constrain the nature of dark matter.

Douglas Clowe received his Ph.D. in Astronomy from the University of Hawaii in 1998 for a thesis "Weak Lensing by High-Redshift Clusters of Galaxies". He previously was a postdoc at the Max-Planck-Institut fuer Astrophysik and the Universitaet Bonn in Germany before starting a postdoc position at Steward Observatory in September 2003.

* Note: The term "lensing" is used in the sense that a massive object bends light similar to a lens bending (or more accurately refracting) light in an optical system

BOARD OF DIRECTORS MEETING: Wednesday, Sept. 8, 6:30 pm at Steward Observatory Conference Room N305

STAR PARTIES AND EVENTS:
09 Sept - AstroPhoto SIG
11 Sept - TAAA Star Party at Las Cienegas
15 Sept – Mason Audubon Center Astronomy Program

Meeting Information and Calendar of Events

17 Sept - Mesquite Elementary Star Party
18 Sept - TAAA Star Party at TIMPA

NEWSLETTER SCHEDULE: Deadline for articles: Sat, Sept. 18. Printing: Mon, Sept. 20. Folding Party: Tues, Sept. 21. Mailing: Wed, Sept. 22. The newsletter is mailed at least one week prior to the following month's General Meeting.

Club News

Member News

We welcome the most recent members to join the TAAA Laurel Dunlap (returning member), Katharine Hanna, Dennis Nendza (returning member and past president from 1978 to 1980), and Alfredo Somolinos. Glad to have all of you join! New members should be sure to pick up a new members pack at a meeting. Hope you'll make it to our star parties or meetings so we can all get to know you. (Updated membership lists are available to any member at most meetings, so pick one up if you need it.)

Club Apparel

T-shirts, baseball hats, denim shirts, and sew-on patches - all with the TAAA logo - will be for sale at the September meeting. Only cash or checks can be accepted.

Astro-photo SIG Meeting

Sept. 9, 7pm
China Rose, NE corner Speedway/Rosemont

We've had some great presentations lately, with CCD images, planetary webcams, and film. Come see some of the state of the imaging art over some Chinese food. Just show up and enjoy the show!

TAAA Board of Directors Adopts New Mission Statement

By Bill Lofquist, Board Member-at-Large

At its August 2004 meeting the TAAA Board of Directors adopted the mission statement that was drafted at the strategic planning session on April 3, 2004. The draft was presented to the membership during the beginner's lecture at the May, 2004 meeting and published in the June, 2004 issue of Desert Skies. The Board did not receive any suggestions about how to change or edit the draft, and it was approved unanimously.

The new mission statement is as follows:

"The mission of the Tucson Amateur Astronomy Association is to provide opportunities for members and the public to share the joy and excitement of astronomy through observing, education and fun."

Basha's Thanks A Million Program

The Basha's Thanks A Million Program will begin on September 13th. If you shop at Basha's, ask the cashier to link your Thank You card to the Tucson Amateur Astronomy Association. (Basha's customer service is supposed to have a list of ID numbers – we don't ours yet as of this writing.) At the end of the program, the TAAA will receive a donation from Basha's based on how much our members spend. Last year we received about $75. So, if you shop Basha's, remember to have your Thank You card linked to the TAAA.

Annual Picnic – October 30

This year's annual picnic will be held on Saturday, October 30th at Reid Park Ramada 16 starting at 2pm. Ramada 16 is a large area with lots of picnic tables located at the west end of Reid Park. (Detailed directions will appear in the October newsletter.) We'll be making comets and have some solar viewing going on, as well as a general good time. (Anyone interested in going to the zoo or to the lake?). Evening observing is questionable since we will be in town, but that hasn't been decided yet. If you want to help with the planning of this event let any board member know.

Calendars for 2005

Calendars for 2005 will be sold at regular meetings beginning in September at the same table where you can purchase TAAA apparel. (Ann Scott will also have new apparel available this fall.) The calendar we have selected is called Deep Space Mysteries and is published by the same people who bring us Astronomy magazine each month. The cost for the calendars is $10 each (~$2 off the regular selling price), or $9 each for more than one. This calendar has daily information about astronomical events, both historical and observational...plus space for adding important events you need to remember. Each month features a full-color astronomical image of a deep sky object.

Proceeds from the sale of these calendars will be used appropriately as decided by the board. Thank you to all who support the TAAA through the purchase of the yearly calendars.

Club News (cont.)

Upcoming Lecture Schedule

Next month is Members Night. These meetings give us a chance to talk about what we've been up to. A sign up sheet will be available at this month's meeting (September 3rd) so be sure to get your name and topic on the agenda. Presentations are generally limited to 10 – 15 minutes.

Below is our lecture schedule for the next 6 months. We are working at scheduling speakers to tell us about Mars, Saturn & Titan, and Arizona weather patterns for observing. Hopefully these invited speakers will fill in the openings in the Invited Speakers slots.

TAAA Speaker Schedule		
Oct 8	Members Night (No Beginners Lecture, meeting starts at 6:30pm	
Nov 5	Beginners	Dean Salman Constellation ID
	Invited	Open
Dec 3	Beginners	Nick DeMesa Astronomical League Observing Program
	Invited	Dr. Andrew Potter Mercury & Messenger Mission
Jan 7	Beginners	Bill Owens Imaginary Lines
	Invited	Open
Feb 4	Members Night (No Beginners Lecture, meeting starts at 6:30pm	
Mar 4	Beginners	Vivian Lewis Solstices
	Invited	Open

Astronomers needed for Project ASTRO - Year Nine!

It is time to recruit astronomers for Year 9 of Project ASTRO! Please pass the word along to veteran astronomer partners as well as new astronomer partners who have not participated in the Project ASTRO program.

The Educational Outreach Office at the National Optical Astronomy Observatory is now accepting applications from ASTRONOMERS (professional, amateur, and students) and TEACHERS (grades 3 -- 9) who wish to take part in Project ASTRO's ninth year in Tucson. This program forms partnerships between scientists and teachers and provides training, materials, and support for teaching astronomy through hands-on classroom activities.

Partnerships will take place this coming academic year (2004/2005) and the training workshop is scheduled for September 17-18, 2004. (A sample agenda of a past workshop can be found at <http://www.noao.edu/education/astro_agenda.pdf>http://www.noao.edu/education/astro_agenda.pdf.)
The free workshop includes an evening at the Kitt Peak Visitor Center 20" and 16" telescopes; hands-on, inquiry-based activities from the resource book, Universe in the Classroom and a talk by world-renown comet discoverer, David Levy. The book and accompanying classroom activity kits are supplied at no cost to participants. During the workshop and throughout the year resources (including a library of classroom supplies for activities, solar telescopes, a star party at David Levy's, and staff help) are available at no charge. During the school year, the teacher and astronomer partners decide the astronomical topic and dates for a minimum of 4 classroom visits.

Involvement in Project ASTRO is a way to give to the community, get children curious about science and possibly develop their interest into future careers. Your help in recruiting or participating would also enhance a teacher's content knowledge and confidence-level in teaching astronomy. Be a part of fostering the future.

Club News (cont.)

To date, Project ASTRO astronomers and teachers have reached nearly 24,000 students throughout Arizona. The Astronomical Society of the Pacific in San Francisco began project ASTRO in 1993. Since then it has expanded into a national program. Project ASTRO-Tucson is one of a dozen Project ASTRO sites nationwide. Visit <http://www.noao.edu/education/astro_poster.jpg>http://www.noao.edu/education/astro_poster.jpg for a composite of photos and key elements describing Project ASTRO-Tucson, http://www.noao.edu/education/astrogram/news_05_04.pdf for the latest news about the Project ASTRO-Tucson program, <http://www.noao.edu/education/astro_testimonials.jpg>http://www.noao.edu/education/astro_testimonials.jpg for testimonials supporting Project ASTRO and <http://www.astrosociety.org/education/astro/project_astro.html>http://www.astrosociety.org/education/astro/project_astro.html for the Project ASTRO national website.

Applications will be accepted through September 10. Consider applying as an astronomer partner. (A degree in astronomy is not required.) Get involved in this worthwhile science education program. An application for astronomers can be found at http://www.noao.edu/education/astronomerapp_2003.pdf . Applications can be sent to Connie Walker's address below or faxed to 318-8451. A flyer advertising the workshop can be found at <http://www.noao.edu/education/astrogram/fall2003_workshop.pdf>http://www.noao.edu/education/astrogram/workshopflyer_051104.pdf. For more information about Project ASTRO, visit this web page, <http://www.noao.edu/education/astrotucson.html>http://www.noao.edu/education/astrotucson.html, or contact Connie Walker at:

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Family ASTRO

Family ASTRO needs amateur astronomers who are willing to pair up with teachers and other community outreach volunteers to launch this new program into its third year. Family ASTRO is an extracurricular variation on the Project ASTRO theme, another program that has enjoyed immense success in Tucson for the last eight years with the generous support of TAAA members.

Family ASTRO involves event leaders who host after school or weekend events focused on astronomy themes: Moon Mission, Race to The Planets, Night Sky Adventure, and Cosmic Decoders. Family members interact to learn about astronomy through hands-on activities and board games. After the event, the board games or other activities go home with the participants to encourage family fun with astronomy. School star-party volunteers will recognize the atmosphere of the Family ASTRO events as similar to those casual evenings under the stars that are so enjoyable and enlightening for students and their parents.

The duration of the events is about two hours and the commitment is two events during the year following training. But the partnerships may continue for as long as the partners are willing to introduce astronomy education to the families of Tucson. Training is courtesy of NOAO. Volunteers may attend one or more of the training workshops, each of which involves one of the event themes. Volunteers receive an Event Leader Kit and the partners receive an initial supply of games. The first training workshop occurs September 28th. All of the workshops are held in the late afternoon and evening.

Information and applications are available on our web site at http://www.noao.edu/education/families.html or by contacting Robert Wilson at 318-8440 or rwilson@noao.edu. Downloaded applications may be sent to the same email or through the post to Robert Wilson, 950 N. Cherry Ave., Tucson, AZ, 85719. Thank you again for supporting Project ASTRO these past eight years and for your future involvement in Family ASTRO.

Items of Interest

Necessary But Not Sufficient!

What is the one thing absolutely necessary for observing or just gazing into the heavens? Clear skies! And, if you are lucky to have that, the next most important aspect is dark skies. We can't do much about creating clear skies except to move locations on a given night to get away from a cloud cover but we can do a lot about having dark skies!

We are fortunate in Southern Arizona to have Outdoor Lighting Codes to help minimize the amount of light pollution that is generated each night. As Tucson keeps growing at about 4% per year, we are struggling to keep our lighting levels low and ideally we would reduce them as more citizens become educated as to the light pollution problem and take action to help reduce it. Light Pollution not only has very adverse effects on astronomy and associated businesses; it also can affect human health, our safety, our wild life and plant life.

Our Building Code Officials are the ones that enforce violations but if not caught during construction of a residence or business, the non-compliant lighting fixture

Tucson Amateur Astronomy Association

Astrophoto SIG: CCD Workshops

We will be conducting a series of seminars covering CCD imaging and image processing. The seminars are free but attendance will be limited to TAAA members. The first session will be the morning of Saturday September 25th. and cover the following topics:

- CCD Physics – basics overview of CCD chips and how they work
- Camera Basics – overview of what's in a CCD camera, how it works
- Taking an Image – how to use the camera to take pretty pictures (this will be the main part of the session)
- Equipment Choices – overview of CCD cameras and related equipment

This first session will be lecture only, presented by Andrew Cooper and Steve Peterson. Subsequent sessions by Dean Salman and Gil Jones will cover image processing techniques. These later sessions will be split between lecture and hands-on lab work (you will need your own laptop and software). Attendance at this first session is not a prerequisite for the later sessions, but is strongly encouraged. At the end of this first session we'll also survey the attendees for inputs that will help us develop the later sessions (software choices in particular).

Advance sign-up is required. For more information or to register contact Ray Toscano at ray_toscano@earthlink.net or 529-3074.

Items of Interest (cont.)

(s) may never be found so they can be modified or replaced. And many fixtures are added or changed out without permits. Our Building Code Inspectors do not drive around looking for bad fixtures; they only take action when a formal complaint is filed with their department.

The International Dark-Sky Association (IDA) and the local Southern Arizona Section of the IDA (SA-IDA) are committed to "Helping to Preserve and Protect the Nighttime Environment and Our Heritage of Dark Skies..." but their role is to be an ***enabler*** to make this happen. Professionals and lots and lots of concerned citizens need to take action to get the actual work done to ensure that we have only good light fixtures. See the SA-IDA.ORG Web site for more information including Obtrusive Lighting Complaint forms.

ARCHAEOASTRONOMY

Presented by the Arizona Archaeological and Historical Society
Tuesday evenings, 7 p.m. - 9 p.m., November 9, 16, and 23, 2004
John Fountain, Instructor

This course will cover the history of archaeoastronomy, the many forms it takes, and review major examples throughout the world. There will be special emphasis on examples of archaeoastronomy in the southwestern United States and relevant ethnography. Methods of archaeoastronomical research will be reviewed. We will discuss basic concepts of astronomy without a telescope and consider how they may be applied to studying archaeological sites. We seek to better understand how astronomy played a role in the life, society, and religious practice of early people. No background in astronomy or mathematics is required.

John Fountain is retired from the Lunar and Planetary Laboratory at the U of A. During his 25 years there he studied the moon and planets by earth-based observation and with the NASA Ranger, Pioneer, and Voyager programs. He is co-author of the *Consolidated Lunar Atlas*, used by the Apollo astronauts, and co-discoverer of two satellites of Saturn. For the past 12 years he has done research in archaeoastronomy. His co-edited volume, Current *Studies in Archaeoastronomy: Conversations Across Time and Space* (with Rolf M. Sinclair) is due out this fall.

Suggested reading: There are no good comprehensive texts on archaeoastronomy. *Prehistoric Astronomy in the Southwest* by Malville and Putnam has a good introduction to astronomy relevant to archaeoastronomy and some examples of its application. *Living the Sky* by Ray Williamson gives more examples of archaeoastronomy and related ethnography. While not required for the course, both could be useful to class participants.

Cost is $30 for AAHS members and $40 for non-members; $10 discount available for students and K-12 teachers. Pre-registration is required. To register, please contact Laurie Webster at (520) 325-5435 or Lwebster1@mindspring.com <mailto:lwebster1@mindspring.com> (please note the 1).

Observing Down Under

By George Barber

While in Australia last July, I had the opportunity to enjoy two clear nights under the Southern Hemisphere's unique skies. I spent one of these evenings at the darkest accessible spot I could find at the Ayers Rock Resort, and the second evening at Wiruna, the remote observing site of the Astronomic Society of New South Wales [ASNSW]. This club's website is at www.asnsw.com.

Finding a dark spot at the resort was a challenge. Even though the resort is far from any cities, being in the center of the continent, it generates a significant amount of light pollution. Architects seem to know very little about effective lighting. They tend to choose fixtures that are visually appealing but not dark sky friendly. But, I did find a good spot off the beaten path, which I could access using the resort's shuttle bus. So, I bundled up my large binoculars and mount, a tripod and camera, various night sky references, and even a camp chair, and headed out to my site. I spent most of the evening just amazed at the nebula, dust lanes, and star clusters in the portion of the Milky Way visible to the southern astronomer. Observing with my 15X80's binoculars, I made some sketches of the Coalsack, which is a huge dark nebula near the Southern Cross, as well as the Jewel Box, an open star cluster. I

also enjoyed my view of the Eta Carinae nebula. I tried a couple of astrophotos of star trails over Ayers Rock [Uluru], but vehicular and air traffic kept interfering during the long intervals of time I needed.

Items of Interest (cont.)

During the planning for my trip, I was quite fortunate to find the ASNSW. They are a large club, very similar to ours. I enjoyed two nights at their remote observing facility, which was about a 4-hour drive from downtown Sydney. I know this sounds like a long way, but my efforts were equally rewarded. Here's what I wrote in my observing journal:

"How could one come here, see this majestic sky, and not simply be awed by the spectacle overhead? By far the most marvelous view of the Milky Way I have ever seen. The Coalsack at the Southern Cross is a blackness surrounded by the radiation of our Galaxy. This site is incredibly dark, even more so than the Grand Canyon."

I spent a lot of time simply looking at the Milky Way. I learned that to the Australian Aboriginals, the Milky Way with its dark lanes forms a giant emu across the sky. The CoalSack is the head of the emu, with the body of the emu following the main spiral arm and dust lanes toward the north. From where I stood, the Milky Way was directly overhead, and stretched from the southern horizon all the way to the northern one. Its light was so bright I could easily see the surrounding landscape.

I was in for a real treat, because the club owned a 17 ½" reflector on a dobsonian mount. Using this instrument, I was able to see many familiar objects, as well as new ones. Instead of being on the horizon, my targets were now directly overhead. The view of Omega Centauri was Incredible. You literally felt like you had stuck your head inside this snowball of a million stars. The stars made intricate arcs and lines. With this scope, you could see the "cheese" line of the "cheeseburger" they jokingly call the Centaurus A galaxy. The central star of the Eta Carina nebula could be seen to have two "bumps", which we know from Hubble images are the lobes of the stars. This nebula is as fascinating to observe as the Great Orion nebula.

My binoculars also let me explore the Small Magallenic cloud, with its nearby star clusters. Both the Large and Small Magallenic clouds were easily visible to the naked eye.

As the evening wore on, we could see evidence of a weather change. Clouds began to scuttle across the sky. This didn't stop our viewing, but did interfere with my attempts at astrophotography. The next day, the weather changed for the worse. In fact, I was present for a rather rare event - the Blue Mountains received about 2" of snow that day! Everyone was jumping around like a kid on Christmas. I simply grumbled under my breath. We spent the day, and that evening, sitting around the fireplace and talking about nearly everything under the sun. The Aussies are very friendly, and I had a great time getting to know them.

I was very impressed with the facility they had built. They had a few acres out there, where their members were free to camp out. Some members had built equipment sheds, and even roll-off scope sheds. There were two main buildings. The first had a large room where meetings could be held, as well as 4 smaller rooms with twin-sized beds. I brought my own sleeping bag, and rented one of the

rooms for about $10 a night. Cheaper than a hotel!

The second building had their main cooking area, as well as a fireplace - handy on a snow day! They also had showers and flush toilets. Large tanks were used to collect rainwater as it ran off the roofs. A pump moved the water into a water tower, where gravity generated enough water pressure to run the showers and commodes. 12 volt DC power for the water pump and red lights in the rooms was generated from solar cells and stored in a bank of batteries. The facility did not have AC (220 VAC in Australia), so members would have needed their own batteries and inverters for computers and imaging equipment. Propane provided gas for cooking as well as hot water for doing dishes and taking showers. Truly, this is a facility that they could take great pride in.

The site was remote, but their monthly star party ran for

Items of Interest (cont.)

two evenings – Friday and Saturday. The camping and housing facilities made this possible. I have always felt that camping overnight and spending a second evening can offset distance! I would estimate that there were about 15 members at the site that weekend. However, star parties in the spring, summer, and fall would draw many more members. They probably saw the weather forecast and decided not to come out that weekend!

So, here I was, a visiting astronomer from half a world away. I found their club on the Internet, made contact, and arranged for my stay. I was able to drive to a facility where I could stay overnight, make my own meals (although they were so hospitable I didn't have to!), take a warm shower, and enjoy the night skies through their telescopes. I was very appreciative of their hospitality, and very much enjoyed my stay at their remote site.

Star Parties & Events

TAAA Star Party at Las Cienegas (Empire Ranch)

Saturday, 11 Sept., 2004

Las Cienegas (formerly Empire Ranch) has been our normal dark-sky observing site for quite a number of years. Please try to arrive before sunset. Stay as long as you like, but let everyone know when you are ready to leave; someone may be taking astrophotos. Bring a telescope if you have one, but you don't need one to attend. Any member would be glad to let you look through their telescope. There are no restroom facilities at the site, so be prepared. Las Cienegas is at 4000 feet so be prepared for cool temperatures after sunset. It's also a good idea to bring insect repellent. Attendees should park their vehicles either perpendicular to the airstrip facing toward the center of the strip, or parallel to the airstrip along either side facing west. That way, when you are ready to leave, you will not have to back up and turn on your bright white backup lights. See the directions to Las Cienegas on the outside flap of this newsletter.

Mason Audubon Center Astronomy Program

Wednesday, 15 September 2004 No. of Scopes: 2

The Mason Audubon Center Astronomy Program will be hosting a Star Party at 8751 N. Thornydale Road. Take the I-10 freeway to Cortaro Farms Rd and proceed east. Turn left (north) and find the center about a mile up Thornydale on left side of road. If you get to Magee Rd you have gone too far. Contact person Jamie Brown can be reached at email masonoutreach@mindspring.com. Set-Up Time: 7:30 pm. Observing will be from 8 pm to around 9:15 pm. Sunset: 6:08pm, Dark Sky: 7:51pm Moon Phase: near New Moon.

Mesquite Elementary Star Party

Friday, 17 September 2004 No. of Scopes: 5

Mesquite Elementary will be hosting a Star Party at 9455 E. Rita Rd. Go south on Kolb to Valencia and turn left (east). At Nexus turn right (south) for 3 mi. At Rita Rd. turn left and go east for .5 mi. At the stop sign pull a U turn and backtrack about 50 yards to Mesquite Elementary School. Contact persons Marcia or Bill Aurand can be reached at email wraurand@cox.net. Set-Up Time: 6:30 pm. Observing will be from 7 pm to around 8:30pm. Sunset: 6:28pm, Dark Sky: 7:50pm Moon Phase: Crescent.

TAAA Star Party at TIMPA

Saturday, 18 Sept., 2004

Come on out and enjoy the summer skies! TIMPA star parties are great for both beginners and experienced observers. Our novice members can get help with observing issues or equipment problems, as there are many experienced members there who would be happy to help. If you don't own a telescope, come anyways, because there are lots of telescopes set up and everyone is invited to look through them. This is a great way to check out different telescope designs before you make that all-important decision to buy. There is no scheduled talk for this activity, just come out and enjoy. We'll do our best to get you the answers you need. If you have friends or relatives who are curious about amateur astronomy, feel free to bring them along. The TIMPA site features a large parking area, and full restroom facilities. Be prepared for cool temperatures after sunset. It's also a good idea to bring insect repellent. Directions to the TIMPA site are located on the outside flap of this newsletter.

TAAA Board of Directors Meeting - August 11, 2004

Attending. TAAA Board members Thom Peck, Michael Turner, Steve Marten, Terri Lappin, Bill Lofquist, Ed Finney, Ray Toscano. TAAA members Nora Toscano and Darrenn Jackson. The board meeting was called to order at 6:35pm.

1. Darrenn Jackson announced that he and Jacob Lauser have written TAAA Star Party brochure as project from English 308 Technical communications.
2. SEDS/TAAA Internet site cooperation briefly discussed: tabled until next month.
3. Lost one person from forum due to political items on forum; discussion of limiting non-astronomy topics by promulgating guidelines periodically. Mike will draft guidelines.
4. Thom reported a star party security agreement was reached in discussions with Tim Vemmerstedt of Arizona Sonoran Desert Museum. Our mutual events will continue and TAAA will share costs for additional security only for larger events.
5. Bill suggested establishing mentor list; he will email proposal to all BOD members.
6. Terri moved that draft Mission Statement as appearing in Desert Skies June 2004 issue be accepted. Unanimous.
7. TAAA Board approved, prior to this meeting, repair of TAAA 10" Meade LX-200 GPS scopes. As the scope was out of warranty the repairs cost $395. Mike provided Equipment Loan Policy draft for 10" LX-200GPS (only). Borrowers are not responsible for equipment failure that did not result due to misuse, abuse or neglect. Unanimous. Terri moved that Equipment Loan Policy Rev 2 to include same sentence. Unanimous. Mike will make changes to online docs.
8. Mike Cummins was unable to attend meeting but relayed information thru Thom including status of gate cards charges, new TAAA representative to TIMPA, possibility of joint event next April, purchase of additional picnic tables possibly with covers, and upcoming contract renewal with City of Tucson. Also Oct 23-24 weekend-big event will have 1-2000 cars and many children; our side has hazardous re-bar preventing proper trimming, etc. requiring a weekend clean-up by TAAA (probably 2 Oct).
9. Board voted for Orion Nebula background for our business cards unless expense is too great. Terri will post the pictures considered for the cards.
10. Review of some general meeting technical problems and guidelines for speakers. Meetings are again too long. Bill motioned that the following policy be adopted immediately: Presentations and announcements during regular monthly meetings (with exception of Members Night) must be submitted to the President at least one week in advance and are subject to approval in view of time constraints and other factors. Unanimous.
11. Ed Vega Award for Community Outreach. A new committee will establish guidelines by Board. Discuss Bakke award; general consensus that Board should be involved more than it is now. Terri will post or email draft for both awards.
12. Rio Nuevo letter: Terri will send Steve letter outline and Steve will write letter.

Dark Skies for September 2004

DARK SKIES (no twilight, no moonlight) for Tucson in 24-hour MST: 18=6pm, 20=8pm, 22=10pm, 0=12am
RISE, SET, VISIBILITY for sun and bright planets: rise for morning object, set for evening object

Tu/We	31/ 1	- - -	Sa/Su	11/12	19:57 - 4:05	Tu/We	21/22	23:34 - 4:51
We/Th	1/ 2	20:12 - 20:34				We/Th	22/23	0:41 - 4:51
Th/Fr	2/ 3	20:10 - 21:03	Su/Mo	12/13	19:56 - 4:44	Th/Fr	23/24	1:51 - 4:52
Fr/Sa	3/ 4	20:09 - 21:33	Mo/Tu	13/14	19:54 - 4:45	Fr/Sa	24/25	3:02 - 4:53
Sa/Su	4/ 5	20:07 - 22:06	Tu/We	14/15	19:53 - 4:46	Sa/Su	25/26	4:10 - 4:53
			We/Th	15/16	19:51 - 4:46			
Su/Mo	5/ 6	20:06 - 22:44	Th/Fr	16/17	19:50 - 4:47	Su/Mo	26/27	- - -
Mo/Tu	6/ 7	20:04 - 23:26	Fr/Sa	17/18	20:22 - 4:48	Mo/Tu	27/28	Full Moon
Tu/We	7/ 8	20:03 - 0:15	Sa/Su	18/19	20:59 - 4:48	Tu/We	28/29	- - -
We/Th	8/ 9	20:01 - 1:08				We/Th	29/30	- - -
Th/Fr	9/10	20:00 - 2:05	Su/Mo	19/20	21:42 - 4:49	Th/Fr	30/ 1	19:30 - 19:31
Fr/Sa	10/11	19:59 - 3:05	Mo/Tu	20/21	22:34 - 4:50	Fr/Sa	1/ 2	19:29 - 20:03

Weekend Sa/Su	Sun Set	Sun Rise	Mercury Rise	Vi	Venus Rise	Vi	Mars Set	Vi	Jupiter Set	Vi	Saturn Rise	Vi
4/ 5	18:42	6:00	4:42	5	2:31	-4	18:54	-	19:19	7	2:06	1
11/12	18:33	6:04	4:42	3	2:38	-4	18:38	-	18:56	-	1:42	0
18/19	18:23	6:09	5:06	4	2:47	-4	Rise:	-	Rise:	-	1:17	0
25/26	18:14	6:13	5:38	8	2:56	-4	5:57	-	5:57	-	0:52	0
2/ 3	18:05	6:18	6:10	-	3:06	-4	5:50	-	5:37	7	0:27	0

Vi=Visibility
-3 brilliant
0 conspicuous
3 moderate
6 naked eye limit
9 binoculars limit

By Erich Karkoschka

Object of the Month by Alfredo Garcia

This month's OTM has a bit of an identity crisis. It is a member of the class of objects known as nebulae, but some classifications place it in the type of nebulae known as emission nebulae, some in the type known as planetary nebulae, and some even in the type known as supernova remnants. So which type is it? Well, according to data from web sites at the Students for the Exploration and Development of Space (SEDS) and the HST Heritage Project Center, the OTM is classified as an emission nebula.

Emission nebulae are so named because their light is emitted from gas excited by energetic radiation ejected from nearby hot stars. The gas is rich in hydrogen and it glows with a distinctive red hue. The hydrogen is often mixed with oxygen, which provides green hues. The green and red light together also provide yellow hues. As a result, emission nebulae are some of the most colorful objects in the sky.

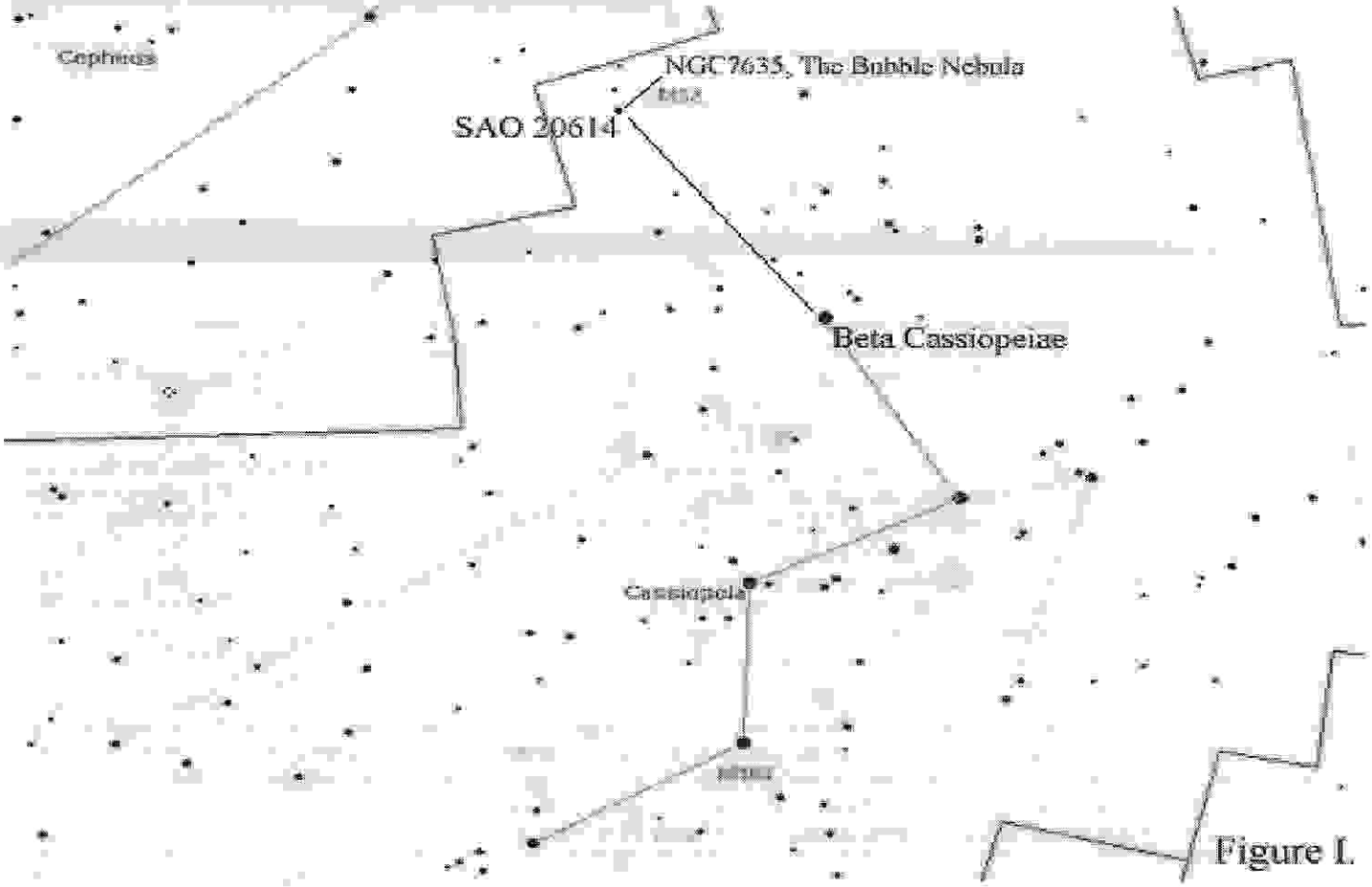


Figure 1.

Without any further introduction, I present the September 2004 OTM: NGC7635 or as it is more commonly known, the Bubble Nebula. NGC7635 is located in the constellation of Cassiopeia. Distance estimates place the nebula as close as 7,100 light-years and as far away as 11,300 light-years. Its apparent dimension in the sky is about 15 arc minutes in diameter or just under one-quarter the size of the Full Moon in the sky. This equates to a linear dimension of about 10 light-years or more than twice the distance from Earth to the nearest star, Proxima Centauri (excluding our Sun of course!).

Magnitude estimates place it in a magnitude range from 8.3 to 11.0. The nebula surrounds a hot, bright blue star roughly 40 times more massive than the Sun. The star is known as BD+602522 and has a magnitude of 6.95. It is so hot and so massive that it is shedding material into space at a tremendous rate. Ultraviolet light from the star causes the gas to emit light and the dense gas surrounding the star is shaping the castoff material into a bubble, hence the Bubble Nebula. The expansion rate of the nebula is calculated at about 4 million miles per hour!

NGC7635 is well placed for observation in the September time frame. From Tucson, if you go out at 9:00 PM on 15 September, you will find NGC7635 at an altitude of about 50 degrees above the northeastern horizon. Since the Bubble Nebula is not visible to the unaided eye, you can use star hopping techniques to find it. Start by first locating the constellation of Cassiopeia. This constellation can easily be identified by looking for its characteristic "w"-shape. Then locate Beta Cassiopeiae, a 2.28 magnitude star that is part of the "w"-shape. Look about six degrees to the northwest of this star and there you will find a fifth

Object of the Month by Alfredo Garcia (cont.)

magnitude star known as SAO 20614. NGC7635 can then be found by looking about 1.5 degrees to the northeast of the star (see Map, Figure I). Between SAO 20614 and the Bubble Nebula, you will also find the 6.9 magnitude open cluster, M52. If you have an automated Go-To telescope or setting circles, you will find NGC7635 at Right Ascension: 23 hours 20.22 minutes and Declination: +61 degrees 11.51 minutes.

NGC7635 is a good view in a telescope at best. But, in a long exposure astrophotograph or CCD image the true nature of the Bubble Nebula comes to light. There are many fine images of the Bubble Nebula on the internet and I advise you to surf the net and find them. You can then really appreciate the beauty of the nebula as imaged through many telescopes by both professional and amateur astronomers. The smallest of telescopes with the right equipment can image NGC7635 with very impressive results. Using a set-up that consisted of a monochrome Starlight X-Press SXV-H9 CCD camera and a 120mm f/5 Orion ShortTube Refractor piggybacked on a 10" f/6.3, this author produced the 30 minute composite exposure shown at Figure II. The image shows plenty of detail in the nebula and you can clearly see why it is called the Bubble Nebula. I would highly recommend this nebula as a CCD imaging or astrophotography object. You will be rewarded with an image you can proudly display. Good luck and have fun!!

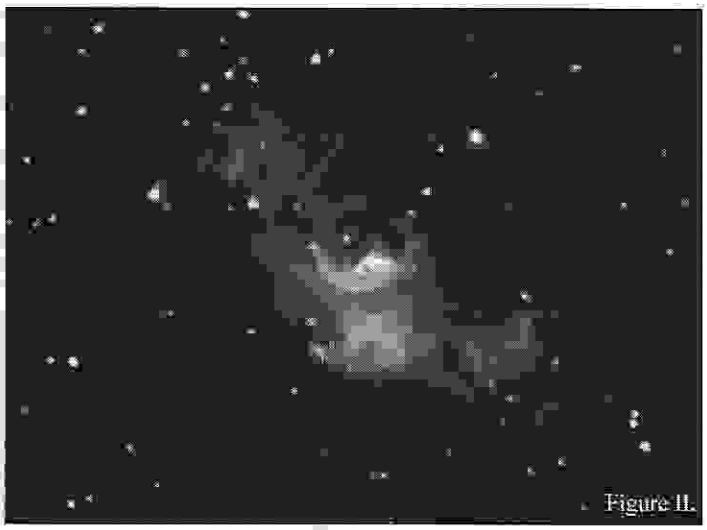


Figure II.

Desert Skies Classified

For Sale	Celestron Pixcell255 320x240 CCD, use for guiding or entry imager $500. Celestron C80 F/5 OTA with rings and case $100. Meade ETX60 with tripod plate and power supply $100. Orion SteadyPix camera mount $25. Orion 7-21mm zoom eyepiece $60. 14mm ifocus for SBIG 237 $80. Contact Richard at 721-0694 or email at richard.schulze@cox.net. [12/04]
For Sale	2004 Meade ETX 125 Ultra.Auto Star. Delux tripod. 6X30 finder & red dot finder. Custom hard case. Five Plossl eyepieces. Meade dew shield. AC/DC. 3 year Meade warranty. This is a new ETX in box. $995.00.Have receipt for $1350.00. Contact Perry at par@gci-net.com, 520-797-1450. [11/04]
For Sale	Meade LX-50 8" Schmidt-Cassegrain, excellent condition, with heavy-duty field tripod, manual, standard accessories (diagonal, occular, motor controller, finderscope, etc). Includes Orion Tele-Extender, Olympus SLR camera "T" mount, Telrad, Celestron 2X Barlow. Asking $1300.00 (cash or cashier's check only). Inspection by prior arrangement. Buyer must pick up. Steve McClain phone: 584-1284, cell: 235-3312, email: armcclain@comcast.net or steven.mcclain@tusd.k12.az.us. [11/04]
For Sale	Unitron 4" f/15 Polarex refractor doublet, excellent condition for it's age (1950's), finder scope, manually operated equatorial mount, wood tripod and tray, eyepieces, tool box, solar screen (all original equipment). Three original wooden boxes (holds the ota, the mount, and the tripod). Stands over 6' tall. Optics show classic airy discs, with excellent stellar views and planetary details. Asking $1200. Contact Jerry Farrar at 731-1104 or e-mail jandkfarrar@earthlink.net. [11/04]
For Sale	Celestron Photographic tripod, 5' max height with center post extended $40. Contact Terri Lappin at 520-579-0185 or tklappin@earthlink.net [11/04]
Service	Laser Repair Works d'Arndt 11994 W. Vomac Rd. Dublin, Ca. 94568. Phone 1-510-816-3752 [12/04]

Your ad will run for 4 months unless specified. Month and year of last appearance is last item of ad. For additions or changes to this list, call George Barber at 822-2392or e-mail at barbergj@flash.net.

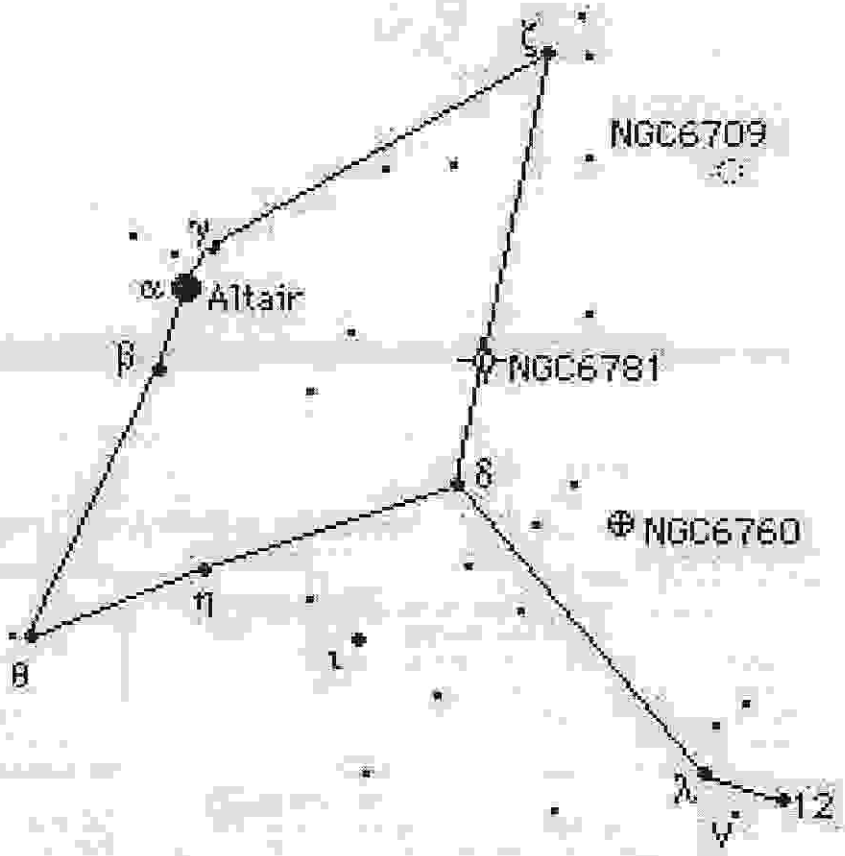
Constellation Report by Chris Lancaster

Aquila

The Eagle

The constellation of Aquila dates back to about 1200 BC. It was then that early astronomers began seeing it as a bird or, more specifically, the eagle, which was something of a companion or servant to the ruler of the gods, Zeus. Aquila held Zeus's thunderbolts until he decided to use them, and the eagle went to Mount Ida on Zeus's orders to kidnap a young shepherd called Ganymede and bring him to Olympus so he could serve as the gods' cupbearer. In the Far East, Altair, the brightest star of the constellation, represented a royal herdsman who began neglecting his duties when he fell in love with a young maiden, herself preserved in the sky as the star Vega. The sun god, who was the maiden's father, took displeasure in this and separated the two by placing them on opposite sides of a mighty river, and this was the reason given to explain why Altair and Vega appear on opposite edges of the "river" which we call the Milky Way. In addition, Indian folklore describes some of Aquila's stars as the footprints of the god Vishnu. It's not surprising that Aquila's distinctive shape and bright stars have produced such stories among these widely separated cultures.

The individual stars which shine among the star fields of the Milky Way, along which Aquila flies, include Altair, of spectral type A7 IV-V, magnitude 0.8, and a mere 17 light years away. Altair forms one corner of the pattern called the Summer Triangle. (Deneb in Cygnus and Vega in Lyra comprise the other two corners of the triangle.) To the south lies Eta Aquilae, which is a member of the class of giant variable stars called Cepheid variables. Its magnitude changes from 3.7 to 4.5 every 7 days and 4 hours, and in the process undergoes a change in spectral type from G2 to F6. Near the tail of the eagle, approximately one degree to the southwest of Lambda Aquilae, is V Aquilae. This is another variable star ranging between magnitudes 6.6 and 8.4, but what sets this star apart from the others is its deep red color. Its surface temperature is less than 2000 degrees K, which classifies it as a star of spectral type N. Point your telescope in its direction and you should be able to easily distinguish it by its color. It lies at the end of an arc of 7th and 8th magnitude stars curving away from 4th magnitude 12 Aquilae.



Although Aquila does not contain any bright Messier objects, it is, however, host to some deep sky targets which are observable through small telescopes, provided you have dark skies. One of these is NGC6709, a magnitude 7.5 open cluster located 3.5 degrees south and 14' west of Zeta Aquilae (RA: 18h 51' 29" Dec: +10d 21' 01"). About 30 to 40 stars reside in this modest cluster. NGC6781, one of the 11 planetary nebulae within Aquila, is more of a challenge and can be found about 3/4 of the way along a line drawn from Zeta to Delta Aquilae (RA: 19h 18' 20" Dec: +6d 30' 00"). This is one of the larger and brighter planetary nebulae in this region, but still no brighter than 11th magnitude. It appears as a neatly circular smudge of light about 4 minutes of arc in size. A 6" or larger scope is required to make this dim nebula obvious, although it can just be discerned in instruments as small as 80mm.

Another 11th magnitude object nearby is NGC6760, a globular cluster 2 degrees south and 15' west of Delta Aquilae (RA: 19h 11' 10" Dec: +01d 01' 42"). Use magnification of 80x or more to bring this small globular into view.

There is much more to discover within the boundaries of Aquila. Arming yourself with a medium sized telescope and a good star chart may keep you scrutinizing Aquila for hours.