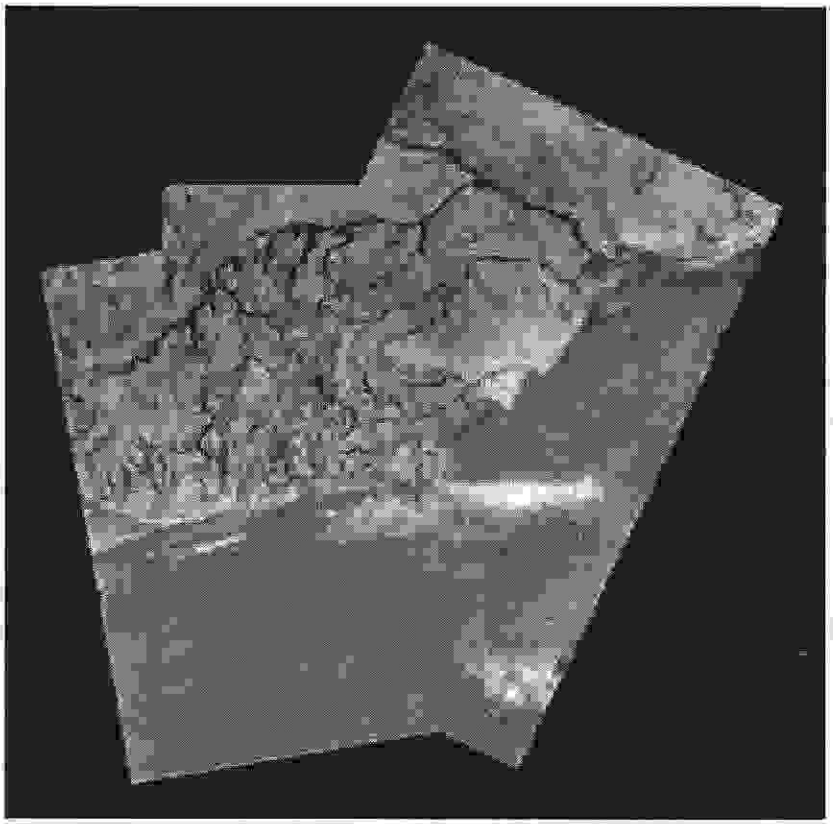
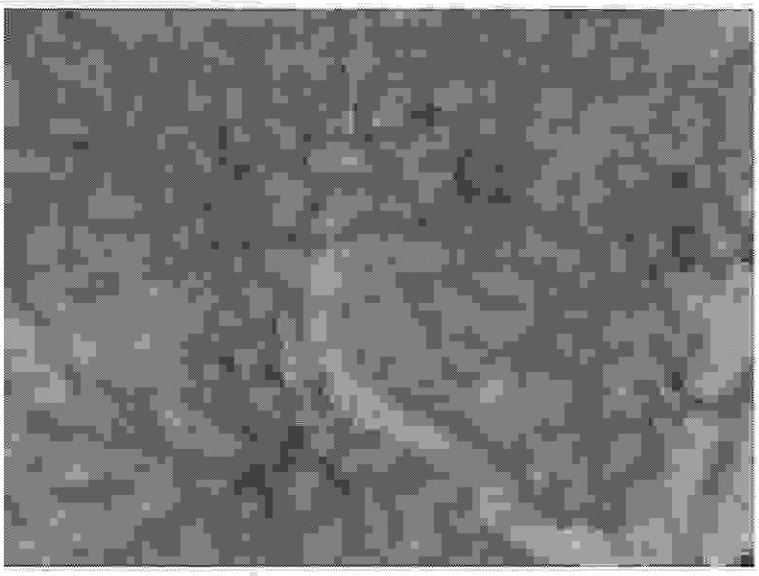
Desert Skies

Tucson Amateur Astronomy Association

Volume LI, Number 2 February, 2005





Huygens on Titan

Cover Photo: The top photo shows a river channel and ridge area. The bottom photo shows water ice and methane springs. Photos from http://saturn.jpl.nasa.gov.

TAAA Web Page: http://www.tucsonastronomy.org **TAAA Phone Number: (520) 792-6414**

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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 Magazine 1 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. No reproduction without permission, all rights reserved. We will not publish slanderous or libelous material! Send submissions to:

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President's Message

We certainly have been blessed with a celestial event such as Comet Machholz. I hope you got out to look for it with whatever means you have, including your unaided eyes.

We are rapidly approaching the springtime viewing season-warmer weather, clearer (hopefully) nights, and lots of objects to bag. Don't forget the Messier Marathons coming up on March 12 and 13th. You can get all but one object this year, I'm told.

"Thanks again" goes to Tom Polakis for such a wonderful talk last month. He shows us that we don't need to get extremely technical to have a good time with our hobby, and that there are many side interests we can pursue with astronomy as the focal point.

The 30 inch telescope project is moving right along. The primary mirror is getting closer to figure, and we are fortunate to have Mike Grindle as our project manager to help keep things on track.

We still need someone to manage the TIMPA 16 foot dome project. If interested, please contact a board member.

We also need people interested in forming a spring picnic committee. Contact a board member for this, too.

The meeting this month is Members' Night. Contact me by January 28 to get your presentation in early. Otherwise, we fill in spots as best we can. Limit your presentation to 15, maybe 20, minutes. And PowerPoint is probably the best mode.

Thom Peck

Meeting Information and Calendar of Events

TAAA MEETING DATE: Friday, Feb. 4 at the Steward Observatory Auditorium - Room N210

Pizza and Tours: 5:00 pm

SPECIAL START TIME!!!!

Have some pizza and see astronomical research in action! Begins at 5pm, when the TAAA will provide pizza, followed by tours of the some of the most advanced labs in astronomical research at Steward Observatory. See details in the "Steward Observatory Lab Tours" article in this newsletter.

GENERAL MEETING: 7:30 pm
Member's Night

Tonight is your night to share the spotlight! If you have an astronomy-related topic you would like to present, contact Thom Peck to reserve a time slot during the main meeting.

BOARD OF DIRECTORS MEETING: Wednesday, February 9, 6:30 pm at Steward Observatory Conference Room N305.

STAR PARTIES AND EVENTS:
01 Feb - Lyons Elementary Star Party
03 Feb - Hohokam Middle School Star Party
05 Feb - TAAA Star Party at Las Cienegas (Empire Ranch)
08 Feb – Manzanita Elementary Star Party
09 Feb – Tortolita Middle School Star Party
10 Feb - Van Buskirk Elementary Star Party
10 Feb – Astrophoto SIG
12 Feb – TAAA Star Party at TIMPA
13 Feb - UofA Astronomy Students Star Party
15 Feb – Ironwood Elementary School Star Party
18 Feb – Accelerated Learning Laboratory Star Party
26 Feb – Whipple Star Party
03 Mar - Robison Elementary Star Party

NEWSLETTER SCHEDULE: Deadline for articles: Sat, Feb. 19. Printing: Mon, Feb. 21. Folding Party: Tues, Feb. 22. Mailing: Wed, Feb. 23. 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: Paul and Cathy Anderson, Patty Cooper, Thomas E Devine, M Christina Donnadieu, Brian Halbrook, Marc J Kobayashi, Buddy Mizelle, Amanda Saganitso, Marilyn and Chuck Schall (reinstated members), and Christopher Taylor. (This list includes several Project ASTRO teachers!) 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.)

Steward Observatory Lab Tours

We have made arrangements for TAAA members to tour several Steward Observatory research laboratories before the start of our Members Night meeting on February 4th. The following labs will be open:

Club News (cont.)

Infrared Detector Testing (Dr. Eric Young): This is the lab, which tested the Spitzer Space Telescope instrumentation which operates in the infrared, looking through thick dust to see amazing sights of new star birth. Several infrared detectors built in the lab will be seen, as well as the equipment used in their operation.

Infrared Lab (Dr Don McCarthy and Craig Kulesa): Two infrared cameras, named PISCES and ARIES, will be on display. These are used in ground-based infrared observing at the 90" telescope on Kitt Peak and at the MMT on Mt Hopkins, respectively. PISCES is a wide-field camera and ARIES is a narrow-field camera, which is used in concert with the adaptive optics system at the MMT.

Adaptive Optics Lab (Dr. Michael Lloyd-Hart, Prof. Laird Close, and Dr. John Codona): Three separate areas will be open. The first is the latest research into laser guide stars in use at the MMT. The second is a brand new method of sensing wavefront errors from images and will include a live demo. The third area is a bench-top prototype of a coronagraph for use at the Gemini North 8-meter telescope on Mauna Kea. Much of this research is part of Steward Observatory's commitment to the search for extra-solar planets.

Sub-millimeter and Millimeter Astronomy/Astro-chemistry (Dr. Lucy M. Ziurys, Dr. Aldo Apponi, and Mr. DeWayne Halfen): Using an instrument called a spectrometer, researchers are able to detect the spectral signature of interstellar molecules. The spectrometers built at Steward Observatory are highly accurate, making measurements precise to 1 part in 10 million. Four spectrometers of three different types will be on display.

Obviously, there's a lot to be seen. Those arriving early will have a better chance to see all the sights. A leader will be assigned to each group of 10. Groups will have 15 minutes in each Lab. The leader will watch the clock and move the group to the next lab at the appropriate time. The first groups will begin the rotation through the labs at 5:30pm. As others arrive and time permits, additional groups will start the rotation around the labs.

Instead of meeting in the lecture hall, we are asking all members to come to the conference room on the third floor (Room N305). In room N305, you will be given a nametag to wear while on the tour and you will be assigned to a group. This is also where pizza and beverages will be served beginning at 5pm. Last month we asked for RSVPs, so if you didn't get your name on the sign up sheet or didn't contact Terri directly, please don't plan on eating pizza (although there may be leftovers at the end so check if you are hungry).

Signs will be posted directing members to Room N305 and to the labs. Please do not go into a lab without being part of a group. And, it goes without saying, please don't touch sensitive equipment.

Here's a rough schedule for the night (subject to problems as they occur!):

Set up: anytime after 4:30pm
Pizza Served: 5:00pm to 7:00pm
Lab Tours (leaving Room N305): 5:30pm to 6:45pm, on approximately 15-minute increments
Clean up: 7:00pm to 7:30pm
Members Night Presentations (in the lecture hall): begins at 7:30pm as usual

Volunteers are needed for this activity. Please contact Terri Lappin at 579-0185, tklappin@earthlink.net if you want to help or if you have general questions.

We hope you enjoy the evening and learn something about the cutting edge astronomical research going on in the same building where we hold our meetings each month.

Astro-photo SIG Meeting

February 10, 7pm
China Rose, NE corner Speedway/Rosemont

Our presentations feature 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!

Basha's Thanks A Million Program

The Basha's Thanks A Million for Friends and Neighbors program is underway through March 31, 2005. If you shop at Basha's, ask the cashier to link your Thank You card to the Tucson Amateur Astronomy Association. Our ID # is 23178. (Basha's customer service also has a list of ID numbers if you forget this number.) If you participated last year, you still need to sign up at the register again. Good news - as of this month we have cleared the minimum $2500 in combined sales and we are set to receive a donation at the end of the campaign. If you shop Basha's, remember to have your Thank You card linked to the TAAA (ID #23178).

Nominating Committee

By Thom Peck

This month we need to choose a nominating committee for the next term of the Board of Directors. If you are interested in helping find those who are willing to serve on the Board of TAAA, contact Thom Peck or another Board member. The TAAA constitution calls for 3 TAAA members for the committee. We have 2 interested parties as of this writing. Also, if you are interested, and eligible, to serve on the next Board, let a member of the nominating committee know. Elections are held during the May meeting.

Nominating Committee Duties:

1. The nominating committee has the following responsibilities. These responsibilities can be divided as the

Club News (cont.)

committee sees fit.

2. It is the duty of the nominating committee to find qualified members to hold positions on the Board of Directors. These nominees must be over 18 years of age and have been a member in good standing for at least one year prior to the May election. Nominees must also be current members to hold an office.
3. The constitution includes requirements for holding an office and the official job duties of board members.
4. A current membership list containing membership start dates is required. The treasurer will provide this information. If a question arises, contact the treasurer.

1. It is the committee's responsibility to find at least one member to run for each office. If more than one member wishes to run for an office, it is up to the membership (not the committee) to decide through the election process who will hold that position. However, there is **no requirement** for the committee to find more than one person for each office. **The positions that the committee is responsible for finding nominees are: President, Vice President, Treasurer, Secretary, and three Members-at-Large.**
2. Contact ALL current members of the Board of Directors and find out if they wish to run or not. They are also a source for possible nominees for other offices.
4. The TAAA has been successful due to the abilities of its board members and their willingness to work together. Nominees do not have to be knowledgeable about astronomy but they should be supportive of TAAA goals and activities and have an interest in seeing them carried out. The nominating committee should find out how serious the prospective board member is in making a commitment to serve on the board. Explain to the prospective nominee that attendance at board meetings is important (at least 4 board members are needed to conduct business). Input from every officer is important to the board's ability to make decisions. Board meetings are held monthly, starting at 6:30pm and usually over by 9pm.
5. If a prospective nominee meets the membership requirement and seems sincere in their commitment, then they should be listed as a nominee. The list of nominees must be in the hands of the newsletter editor(s) by the April newsletter deadline which is in Mid-March.

Public Contact person(s) for TAAA

We are looking for one or more people to be a TAAA point of contact(s) with the media. If you have interest, and especially experience, in PR, please contact a board member. This appointed office is very important to the club.

Job description from TAA Handbook (this is very simplified)

Publicist

The Publicist shall be the official contact between the association and the media. The Publicist maintains a database of media contacts. Upon approval of the Board of directors, the Publicist shall forward news releases to the media. The publicist does not need to be present at the event but should find a representative if he/she will not be there.

Astrophoto SIG: CCD Image Processing Workshops

Preparations are underway for the two remaining sessions. These workshops are intended for those imaging with dedicated astronomical CCD cameras such as SBIG and Starlight Xpress. Webcam imaging and processing require different software and techniques that will not be covered in these workshops.

By the time you read this, the 2nd workshop should have been completed, on January 29th. I was unable to find a room for the planned January 15th session so that workshop and the two later ones were pushed back to the next available dates. Due to this shuffling, a date for the 4th and final session must now be determined (it'll likely be late March).

Saturday February 26th – Workshop 3: Color image acquisition and processing

STARIZONA
ADVENTURES IN ASTRONOMY AND NATURE
5201 N. Oracle Rd. Tucson, AZ 85704
www.starizona.com 292-5010

Sky Works
9401 E. 22nd Street Tucson AZ 85710
520-751-6752 fax 520-751-6758
info@sky-works.com www.sky-works.com

Kitt Peak National Observatory Visitor's Center

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http://chartmarker.tripod.com chartmarker@cox.net

Club News (cont.)

Saturday TBD - Workshop 4: Other image processing techniques

Each session runs 5-6 hours and is split between lecture and hands-on lab work. You'll need your own laptop and software to follow along. Workshop 3 will primarily utilize MaxIm DL, while Adobe Photoshop will be used for the 4th workshop.

These workshops are limited to TAAA members and advance sign-up is required. For more information or to register contact Ray Toscano at ray_toscano@earthlink.net or 529-3074. Questions can also be posted to the TAAA's Member forum: http://groups.yahoo.com/group/taaaforum/

Upcoming Lecture Schedule

Below is our upcoming lecture schedule. Topics under consideration: Mars/Spirit & Opportunity, Saturn & Titan, and Arizona weather patterns for observing. If you have a suggested topic or speaker in mind send an email to Terri at tklappin@earthlink.net or call her at 579-0185.

TAAA Speaker Schedule		
Feb 4	Steward Open House (5:30- 7:00pm) Members Night (7:30pm, no Astro-Essentials lecture)	
Mar 4	Astro-Essentials	Nick DeMesa Astronomical League Observing Program
	General	Hyman Kaplan Sustainable Lighting
Apr 1	Astro-Essentials	Mary Turner Single Mirror Telescopes
	General	Open
May 6	Astro-Essentials	Open
	General	Open

NOAO
CCD Workshops March 26 and 27

Learn how to produce stunning images of deep sky objects. These workshops, conducted by Adam Block, cover a full range of topics, from basic equipment set-up, use, and problem solving to compressing the dynamic range of the data for the best possible aesthetic results. The workshops take place on two consecutive days. For details visit www.noao.edu and follow the Tourist Information link to Special Events or Public Programs. Call (520) 318-8440 for reservations or email rwilson@noao.edu.

Astronomy Eagle Project: Thank You
By Carter Smith

I am writing this on January 21st. I just had my Eagle Scout Board of Review last night, and I am now an Eagle Scout waiting for about three months to be able to have the ceremony in which I receive the badge. I wanted to thank all the club members who participated in my Eagle Scout Service Project, the Star Party at the Arizona Schools for Deaf and Blind: George Barber, Bob Gilroy (and the helpful friend he brought), Nick DeMesa, John Kalas, Katt Kestler, Paul Olson, and John and Deb Seule. Terri Lappin not only helped that night by making a comet twice, but she worked throughout the planning of the project, helping in designing special activities and helping me to connect with people who had special experiences in working with this population. The TAAA Board was great in approving my project and also in giving me lots of helpful suggestions. We were rained out on the first date and some people who were supportive along the way were unable to participate on the rain date. I would like to thank Steve Marten for all his patience in scheduling this and Bill Lofquist and Andy Cooper for "being there" throughout. This event was more than a regular star party. It was a star party that was especially designed to provide accommodations that might be helpful to the students attending the Deaf and Blind Schools. So, we offered a variety of activities that are not usually provided at star parties. I think it was a special experience for all of us: TAAA participants, the Scouts, people from the UA who helped, and the 43 participants from ASDB. I would like to share more about the accommodations we provided in a later newsletter. However, I also would like to get feedback on a question. My question is: "How would other TAAA members feel about making this type of star party at ASDB an annual TAAA event?"

Estate Sale a Success
By Valerie Goff

Thank you to everyone who came to the Bob Goff Estate Sale on January 15th. I feared the sale would be emotionally difficult for me, but you made the occasion pleasurable and fun, and I thank you for it. It was wonderful to see you all and your kindness and enthusiasm were greatly appreciated. It feels good to know Bob's things will be out and being used rather than sitting in a drawer or on a shelf. Thanks again to all of you.

AUCTION

6-foot diameter Technical Innovation Domed Observatory. The dome has some damage that will require repair and/or replacement parts:

1. Dome support ring -- It is not repairable. Cost of replacement is $180.00 plus UPS shipping.
2. The hemispherical dome has a tear on one half --

Club News (cont.)

Replacement of that half would be $690.00 plus crating and freight. Otherwise, it could be repairable using a fiberglass kit or the services of a local fiberglass expert.

3. The automatic drive system is designed to work with a Meade LX200 classic mount.

More information will be provided to interested parties. This will be a silent auction. Minimum bid is $200.00. Even in its present condition, the approximated value is $2000.00 to $2800.00. A user's manual is available. Bids will be accepted starting in February. Groups may view the dome during February and March by making an appointment with Ed Finney.

Point of contact: Ed Finney, TAAA Member at Large

Grand Canyon Star Party

4-11 June 2005
North and South Rims, Grand Canyon National Park

Hello All - we have been approved for the 15th annual Grand Canyon Star Party, to be held Saturday thru Saturday, 4th-11th of June. If you would like to attend and need real housing, like a motel room, you need to think about making reservations now. Campers and RVers can wait for months yet, but for those needing civilized accommodations, right now is not too early! The website needs some work, but you can call the listed numbers for the search for housing. That site is linked from the TAAA's website at www.tucsonastronomy.org/gcsp.html. Feel free to e-mail me for any questions you have.

Items of Interest

WEBSITES: TRIPS ON THE INTERNET SUPER-SKYWAY

By Rik Hill

Truly Star Gazing

This is one of the prettiest times of the year to just sit out in the backyard and just stare at the sky. When 6 hours is on the meridian you have more first and second magnitude stars visible than at any other time of the year. This year we have the added bonus of Saturn. Besides just eyeballing this sky, take some of this in with a pair of binoculars. There are so many available today from many companies that getting a decent pair is not difficult. I must have a dozen different ones at my house from pre-World War I Galilean military binoculars to my old Jaegers 20x70s. There are some fantastic bargains out there. You can spend $20 for a pair of 7x35s or thousands of dollars for a pair of tripod mounted, super-multi-hyper-mega-coated motion-stopping whiz-bang monster eyes.

The "Binocular Astronomy Resource Page" is good website where you can check out not only vendors but also some reviews and books: http://www.uvaa.org/BinocularResources.htm

But what to look at while your sipping your coffee on the back porch agog at the starry firmament? No problem, there are lots of websites to direct your gaze.

Of course, right now we have a nice comet, Comet Machholz, to view. It is an excellent binocular object. In fact, I find that he tails are much easier to see in binoculars than my 10" f/4. There is almost always a comet available that can be seen in 10x50 binoculars.

For the double star enthusiasts there's: http://www.carbonar.es/s33/binodoubles/Binodoubles.html

This is a sub-page of the "Spirit of 33" double star group that appeared in Sky and telescope about 5 years ago. Remember, stars in binoculars will appear more colorful. This is one of the benefits of using both eyes. It's a big benefit for people like me that are nearly color blind in the night.

You may find that you enjoy this casual, relaxed appreciation of the night sky. If so you might want to set aside one night a month to do this. A nice list of monthly objects can be found at the website of Lake Afton Public Observatory: http://webs.wichita.edu/lapo/binocs/charts.htm

For the more competitive among us, the Astronomical League has several certificates that can be earned by binocular observers. For the Messier objects they have the Binocular Messier Club: http://www.corvus.com/aa02401.htm

And for those that want to go beyond this they have the Deep Sky Binocular Club: http://www.corvus.com/aa02501.htm

So sit back, put on your favorite music, get a cup of coffee or hot chocolate and take the broader view of the night sky.

As always, if you know of a particularly good website you would like mentioned here, drop me a line at: rhill@lpl.arizona.edu

Lectures in Astronomy

Smithsonian Institution, Fred Lawrence Whipple Observatory. Free to the Public in the Santa Cruz Valley

The Fred Lawrence Whipple Observatory takes pleasure in presenting its 35th year of public lectures on astronomy and astrophysics for the Southern Arizona community. The series presents recent discoveries in astronomy, local research projects, and modern methods used to explore

Items of Interest (cont.)

the universe.
Tuesday, February 8
9 a.m. "Aliens" Deirdre Horan, Fred Lawrence Whipple Observatory

Tuesday, February 23
9 a.m. "Gamma-Ray Bursts: Spectacular Cosmic Explosions" Grant Williams, 6.5-meter MMT Observatory

Tuesday, March 8
9 a.m. "Looking for Heat in a Cold Universe" Emilio Falco, Fred Lawrence Whipple Observatory

All lectures are held in the Green Valley Recreation Center West Auditorium, Green Valley, Ariz. Each 45-minute illustrated lecture is non-technical and intended for the interested layperson. A question-and-answer period follows each lecture. Admission is free and open to the public. For more information, call the Whipple Observatory Visitors Center at 670-5707.

Co-sponsored by Green Valley Recreation, Inc.

"Look at Yourself" - - - From Your Neighbor's View
And WIN A CASH PRIZE!!!!

We all know how important it is to keep the sky dark. Here's a way to save money as well, and maybe win a prize.

Have you ever stepped over to your neighbor's property at night and looked back at your house, to see how your outdoor lights look from their perspective??? Have you ever thought about whether any of your outdoor lights are offensive? Does light "trespass" from your property onto theirs???

The Southern Arizona section of the International Dark-Sky Association (SA-IDA) will award a **$25.00 cash prize** for the best improvement in outdoor lighting by a TAAA Member during February. This is part of SA-IDA's challenge to all TAAA Members, to look at outdoor lights at your home and change out any glaring bulbs or fixtures to fully shielded (full cut off, i.e. no light exiting above the lowest part of the fixture).
This is also a great opportunity to share good outdoor lighting information with your neighbors and businesses, and let them know that you are concerned about good outdoor lights. After all, how can we be critical of others when we don't lead the way by example?

Be sure to mention that poor outdoor lights might not only be in violation of outdoor lighting codes, but they also steal the beauty above, for all to enjoy. Research has shown that they can also cause harm to human health, wildlife, plant life, and our safety. And every kilowatt of electricity generated in our area consumes two thirds of a gallon of water, not to mention the airborne pollutants and other environmental concerns.

Here's a suggestion: Use motion sensors on outdoor lights to save energy. When they turn on, they not only surprise a burglar, they may also catch someone's attention, to see why the lights turned on. By contrast, lights left on all night illuminate items that may be valuable for others to steal. So use outdoor lights only when needed, and keep the wattage down, too. Often 60 watts or less will do the job. Or use compact fluorescent, which uses 13 watts or less.

Ace Hardware now sells the Glare Buster fixture, and Lowes has a couple of full cut off fixtures for sale. For more Dark Skies information, see the SA-IDA web site (www.sa-ida.org) or the IDA web site (www.darksky.org).

To be considered for the prize, please contact John Polacheck, SA-IDA President, by E-mail, telephone or mail (jpolach@dakotacom.net; 743-1362; 1701 W. St. Mary's Rd., Suite 102, Tucson AZ 85745). Please include a brief description of the changes that you made (before and after). Pictures are not necessary, but are encouraged. The deadline for submission is March 4th. The decision of the judges will, of course, be final.

Reduce your outdoor lighting pollution, and just maybe you'll win the prize.

Written by Joe Frannea and Dave Bilgray. Submitted by John Polacheck

Star Parties & Events

Lyons Elementary Star Party — East
Tuesday, 2/1/2005 — No. of Scopes: 7

Lyons Elementary will prepare for Family Science Night at 7555 E. Dogwood St. From Kolb and Speedway take Kolb Rd. south, past Golf Links to Escalante. Turn left (east) on Escalante and proceed about ¾ mile to Evergreen. Turn right (south) on Evergreen and proceed about half a mile to Dogwood, turn right (west) and proceed 1/4 mile to school. Viewing will be on the playground area behind the school. Contact person Sandy Blitz can be reached at 584-6600 or email sandra.blitz@tusd.k12.az.us. Set-Up Time: 6:00pm. Observing will be from 6:30pm to 8:00pm. Sunset: 5:58pm Dark Sky: 6:53pm Moon Phase: (no moon during viewing).

Hohokam Middle School Star Party — Southwest
Thursday, 2/3/2005 — No. of Scopes: 6

Hohokam Middle School will be presenting "The Night Sky" at 7400 S Settler Avenue. Take Park south to Valencia and turn right (west). Continue past I-19 for approx 2.5 mi to Cardinal Ave, turn left (south). At Los Reales

Star Parties & Events (cont.)

turn right (west) and continue to Brackenbury, turn right (west). Brackenbury becomes Tetakusim. Turn right (north) at Settler to school (half-block from corner). Viewing will be on the large open field; vehicle access permitted. Contact person David Jones can be reached at 908-3700 or email dbjones@cox.net. Set-Up Time: 6:00pm. Observing will be from 7:00pm to 8:30pm. Sunset: 6:00pm Dark Sky: 6:55pm Moon Phase: (no moon during viewing).

TAAA Star Party at Las Cienegas (Empire Ranch)
Saturday, 2/5/2005

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 cold temperatures. 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.

Manzanita Elementary Star Party — Foothills
Tuesday, 2/8/2005 — No. of Scopes: 5

Manzanita Elementary will be hosting Exploring the Night Sky at 3000 E Manzanita Ave. Go north on Campbell past Sunrise. Turn left at Manzanita and go a very short distance to school entrance. Viewing will be on the basketball courts. Contact person Theodora Lamantia can be reached at 577.5320 or email lamanti@mindspring.com. Pizza & coke will be available for TAAA volunteers! Set-Up Time: 6:00pm. Observing will be from 6:30pm to 8:00pm, Sunset: 6:04pm Dark Sky: 6:59pm Moon Phase: New Moon.

Tortolita Middle School Star Party — Northwest
Wednesday, 2/9/2005 — No. of Scopes: 5

Tortolita Middle School will be planning for their "Copper Team Star Party" at 3601 W Hardy Rd. The Copper Team students have been preparing for this event by studying a thematic unit on stars that includes other disciplines such as geometry, algebra and art. Take I-10 west and get off at Cortaro Farms Road and turn right (east). Proceed on Cortaro Farms and turn left (north) on Thornydale and continue to first light (Hardy Rd) and turn left (west). Go to the end of the road to school on left. Go through parking lot to the east side of building and drive to the back--football field (viewing location). Contact person Ann Zawada can be reached at 579.4600 or email zawadab@aol.com. Set-Up Time: 6:00pm. Observing will be from 6:30pm to 8:30 pm. Sunset: 6:06pm Dark Sky: 7:00pm Moon Phase: Crescent after New Moon.

Van Buskirk Elementary Star Party — Central
Thursday, 2/10/2005 — No. of Scopes: 6

Van Buskirk Elementary will celebrating MoonScope at 725 E. Fair Drive. From Ajo and Park go south to Fair Dr (stoplight) then right (west) to Van Buskirk School. Follow signs from Fair Dr to entry gate located at very east end of parking lot. Go into lot, go through playground gates and follow signs to viewing area, which is behind school on playground. Contact person Dolores Lopez can be reached at 227.3750 or email dlopezsol@aol.com. Set-Up Time: 6:30 pm. Observing will be from 7:00 pm to 8:30 pm. Sunset: 6:06pm Dark Sky: 7:00pm Moon Phase: Crescent after New Moon.

TAAA Star Party at TIMPA
Saturday, 2/12/2005

Come on out and enjoy the winter 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 cold temperatures. Directions to the TIMPA site are located on the outside flap of this newsletter.

UofA Astronomy Students Star Party — West
Sunday, 2/13/2005 — No. of Scopes: 5

UofA Astronomy Students will be conducting one of their two spring Star Party events at Saguaro Nat'l Park West. Take Speedway Blvd. west past I-10 and continue about 3.5 mi. where Speedway becomes Gates Pass Road. Go over Gates Pass and continue about 5 mi. west to Kinney Road. Turn right (north) on Kinney Road and continue past the Desert Museum for about a mile. Observing will be in the parking lot of the Visitor Center. Contact person Tom Fleming can be reached at 621-5049 or email taf@viking.as.arizona.edu. Set-Up Time: 6:00pm. Observing will be from 6:30 pm to 8:00pm. Sunset: 6:09pm, Dark Sky: 7:03pm Moon Phase: Late Crescent.

Star Parties & Events (cont.)

Ironwood Elementary School Star Party Northwest
Tuesday, 2/15/2005 No. of Scopes: 7

Ironwood Elementary School will be presenting a Star Party at 3300 W. Freer Dr.. Take the Ina exit from I-10 and proceed east to Thornydale, and take a left (north). At Overton (Walgreens on northeast corner - 3rd stoplight north of Ina) make a right (east). Go 1/2 mile to Camino de la Tierra and make a left into Overton Heights (community name). Follow Camino de la Tierra to the end. School will be on right. Drive through the gates to the left of the school to access the playground (viewing area). Contact person Linda Penny can be reached at 579-5150 or email L.K.Penny@maranausd.org. Set-Up Time: 6:00pm. Observing will be from 6:30pm to 8:00pm. Sunset: 6:10pm Dark Sky: 7:04pm Moon Phase: First Quarter.

Accelerated Learning Laboratory Northwest
Friday, 2/18/2005 No. of Scopes: 4

Accelerated Learning Laboratory will be conducting "Exploring the Night Sky" at 5245 N Camino de Oeste. Go west on Camino del Cerro (same as Ruthrauff), past Silverbell and continue to Camino del Cerro, turn right (north). After the first small hill, look for a wash; the school driveway is at the top of the very next hill, on the left (look for mailbox and a brick pillar with the school sign). The observing site is on the basketball courts; go to end of drive, turn left and go to end of parking lot. Contact person Legail Pearson can be reached at 743.1113. Set-Up Time: 6:00pm. Observing will be from 6:45pm to 8:30 pm. Sunset: 6:13pm Dark Sky: 7:07pm Moon Phase: First Quarter.

Whipple Star Party Far South
Saturday, 2/26/2005

Contact person Dan Brocious can be reached at 670-5706 or email dbrocious@cfa.harvard.edu Set-Up Time: 6:00pm. Observing will be from 7:00 pm to 9:00 pm. Sunset: 6.20pm Dark Sky: 7.13pm Moon Phase: near Full Moon.

March Star Party Events prior to March General Meeting:

Robison Elementary Star Party South-Central
Thursday, 3/3/2005 No. of Scopes: 5

Robison Elementary will be hosting "Astro Science Night" at 2745 E. 18th Street. Go south on Tucson Blvd to 18th street then east (left) on 18th one block. School is at corner of 18th and Treat. Viewing will be on the school playground and in the adjacent new building. Contact person Elizabeth Fulcomer/Roberta Toussaint, PhD can be reached at 232-7865 or email fulco@frontiernet.net. Set-Up Time: 6:30 pm. Observing will be from 7:00 pm to 8:30 pm. Sunset: 6:23pm Dark Sky: 7:16pm Moon Phase: (no moon during viewing).

Dark Skies for February 2005

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

Mo/Tu	31/ 1	19:21 - 0:00	Fr/Sa	11/12	21:29 - 5:47	Mo/Tu	21/22	- - -
Tu/We	1/ 2	19:22 - 1:04	Sa/Su	12/13	22:32 - 5:46	Tu/We	22/23	- - -
We/Th	2/ 3	19:23 - 2:11				We/Th	23/24	Full Moon
Th/Fr	3/ 4	19:23 - 3:22	Su/Mo	13/14	23:34 - 5:45	Th/Fr	24/25	- - -
Fr/Sa	4/ 5	19:24 - 4:32	Mo/Tu	14/15	0:36 - 5:44	Fr/Sa	25/26	19:40 - 19:56
Sa/Su	5/ 6	19:25 - 5:37	Tu/We	15/16	1:37 - 5:43	Sa/Su	26/27	19:41 - 20:54
			We/Th	16/17	2:36 - 5:42			
Su/Mo	6/ 7	19:26 - 5:50	Th/Fr	17/18	3:33 - 5:41	Su/Mo	27/28	19:42 - 21:54
Mo/Tu	7/ 8	19:27 - 5:50	Fr/Sa	18/19	4:24 - 5:41	Mo/Tu	28/ 1	19:43 - 22:57
Tu/We	8/ 9	19:27 - 5:49	Sa/Su	19/20	5:11 - 5:40	Tu/We	1/ 2	19:43 - 0:02
We/Th	9/10	19:28 - 5:48				We/Th	2/ 3	19:44 - 1:10
Th/Fr	10/11	20:23 - 5:47	Su/Mo	20/21	- - -	Th/Fr	3/ 4	19:45 - 2:19

Weekend Sa/Su	Sun Set	Sun Rise	Mercury Rise	Vi	Venus Rise	Vi	Mars Rise	Vi	Jupiter Rise	Vi	Saturn Set	Vi
5/ 6	18:00	7:12	7:03	-	6:34	5	4:16	2	22:41	-2	5:51	0
12/13	18:06	7:06	Set:	-	6:36	6	4:10	2	22:12	-2	5:22	0
19/20	18:12	6:59	18:31	-	6:37	7	4:03	2	21:43	-2	4:53	0
26/27	18:17	6:51	19:06	6	6:36	8	3:56	2	21:13	-2	4:24	0
5/ 6	18:23	6:43	19:37	3	6:33	-	3:49	2	20:43	-2	3:56	0

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

By Erich Karkoschka

TAAA Board of Directors Meeting—January 12, 2005

Attending: TAAA Board members Thom Peck, Michael Turner, Steve Marten, Terri Lappin, Ed Finney, Ray Toscano, Bill Lofquist. Robert Crawford, Rob Nelson, Mike Grindle, Nora Toscano. The meeting was opened at 6.41pm.

1. December minutes accepted/unanimous.
2. Rob Nelson described North Shore Amateur Astronomy Club (NSAAC) S.H.A.R.E. System that could be contributed to TAAA and he agreed to manage the system for TAAA. Minimal operational expenses. Steve and Bill volunteered to be on a SHARE committee and invite two more from the membership. Board requested Rob write TAAA proposal to NSAAC and coordinate with Steve; Steve will provide progress report to Board monthly and on Announcements Group. Shipping/transit insurance costs will be paid by TAAA. [ACTION]
3. Member Feedback. Review of Jan meeting presentations, some details too long. Microphone on a lanyard would be helpful to speakers. Suggestion to put star party cancellations on TAAA Information Line (Astroline). Good feedback on Carter's star party; he accomplished goals outlined for his event.
4. Tom appointed Mike Grindle for the 30" Scope Project Manager position. Mike briefly reviewed his personal and professional background. Discussion on 30" parts, labor to complete project. We are looking for a qualified optical mechanical engineer and a person that can interpret and modify the drawings made by Roger Tanner. Roger is busy on Mars project. Gary Rosenbaum will ask someone in the drafting department to look at the drawings and tell us how we should proceed. Terri will arrange a meeting between those already involved in the project and Mike Grindle so that he could be brought up to speed on the project. Robert Crawford said that he would assist Mike. Mike will keep the Board informed quarterly, monthly if necessary. Discussion to pay engineer to complete project, which might be preferable to continued (fruitless) search for someone to do the work part time. [ACTION]
5. Terri reviewed quarterly Treasurer Report. $500 to be transferred from Unrestricted Donations to Education fund. Taxes, under extension, will be reviewed this week and mailed to IRS. [ACTION]
6. Discussion of Publicist duties. Only a few permanent requirements (e.g., ASDM) and publicity contact list maintenance but some Board members would like to offer announcements of current sky and TAAA activity on the web and in print.
7. 2005 Schedule.
    a. Move 4.30.05 TIMPA date to 5.6.05 (share date with Las Cienegas). [ACTION; Ray and Steve]
    b. ASDM has confirmed star party events for 4.2.05 and 10.8.05.
    c. Thom will ensure that Kitt Peak Star B Q is scheduled there for 5.28.05 and 9.24.05. [ACTION]
8. Spring Picnic. Terri will check on details for holding picnic at Catalina State Park. Thom will check with Wayne Johnson of Vega-Bray. Thom suggested that the event could be catered with tickets and payment in advance. Thom will send a request for picnic committee members via our announcement site. [ACTION]
9. D&O Insurance. Terri contacted Mr. Koty but he is willing to meet with Board members during business hours only. Some facts provided by insurance agents are in conflict; further research required. Mike suggested each board member check with their insurance agents; there is a list of ten liability questions Mike has compiled and posted on BOD Group site files.
10. Past President Membership. Board agreed that a Past President Paid Membership amendment to the constitution prepared by Bill be considered at the next board meeting. [ACTION]
11. Annual Officer Election Nomination Committee. Steve will post an announcement on the Tucson Astronomy Group site (TAAA Announcements site) that a Nomination Committee for 2005 elections will be assembling and needs one additional nomination committee volunteer. [ACTION]
12. Michael asked that Astronomy Services Web page be added to the agenda for next meeting. [ACTION]

Adjourned at 9.20pm
Respectfully Submitted,
Steve Marten, Secretary

Basha's Thanks a Million
TAAA number 23178

SPECIAL STARTING TIME
FOR FRIDAY'S MEETING
5:00 PM
Pizza and tours of the Steward
Observatory Astronomy Labs

Telescopes for Borrowing

Don't own a telescope?
The TAAA Loaner Program is your answer!
There's no cost to you.
We have the following telescopes:

Sears 60mmf/15 on equatorial mount
Unitron 62mmf/14.5 on equatorial mount
Meade 90mm ETX
Coulter Odyssey8 8-inch f/4.5 Dobson
Meade10-inch f/4.5 on equatorial mount
Meade 10" LX200 GPS (requires training session)

New members, here's your chance to begin learning and observing the sky before buying any equipment. Loaner Program is available to any current member after meeting requirements detailed in the TAAA Loan Policy. Contact the Equipment Loan Coordinator listed in the "Desert Skies" for details about the telescopes.

Desert Skies Classified

For Sale	Meade 12" LX200, classic, heavy duty field tripod, 2" star diagnonal, 8 x 50 finder, dew shield, 4 eyepieces - 40mm, 32mm, 26mm, 13.8mm, AC adaptor, hand controller with 3.21 revision. $2500. Jeff Brydges, 888-0591. [02/05]
For Sale	f/15 LX 50 Meade Maksutov-Cassegrain. $1300. Digital Setting Circles installed with large hand paddle, Wedge, Electric focuser Counterweight, bar Plate for Telrad installed; I can include Telrad in deal if you wish. Instruction manual, 1.25 inch Diagonal. This fine telescope has been in my observatory for 5 years and has provided excellent views of the Moon and planets. I have decided to install a larger scope in the observatory so this scope is up for sale. I live in the Phoenix, Arizona area and the scope is still installed in the observatory if you would like to view with this scope before purchase. I will deliver the scope within 100 miles. I really do not wish to ship this telescope, so I am hoping for a local buyer in central Arizona. Steve Coe, stevecoe@ngcic.org, 602-789-7786 [02/05]
For Sale	10" diameter EQ Reflector telescope of heavy duty stand plus 8" diameter Schmidt camera to mount on telescope. Each telescope was hand built by the premier custom telescope maker in the Los Angeles area, Bill Schaefer of Fullerton, CA, several years ago. Neither telecope has ever been used. Mirrors of each have been stored in their own custom wooden boxes and are essentially in new condition. Also included is a 2"mm ER 2" eyepiece. $1000 or best offer. Schmidt Camera requires a film holder depending on your film & an opening to it depending on your hand size. Harry King, 219-3056. [02/05]
For Sale	For Sale: Canon 12 X 36 IS Binoculars with Canon's "Vari Angle Prism" Image Stabilization system. Image remains steady with the press of a button, no need for a tripod. Includes hard case, neck strap, removable switch lock, and manual. Rubberized (not water-proof) body. Great for both astronomy (Messier objects like M51 and M81/82 visible) and bird watching (close focus of ~12 feet). Excellent color correction. Clean, well cared for optics. $350.00 Terri Lappin, 579-0185, tklappin@earthlink.net. [05/05]

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.

Object of the Month by Alfredo Garcia

Welcome to the 48th issue of the OTM. Hard to believe four years have gone by since my first OTM article, but they have. I have enjoyed composing the past articles and hope you have enjoyed reading them as well. If you have any comments and/or suggestions, you may e-mail me at alfredogarciajr@cox.net. In addition, I hope you enjoyed the views we were afforded by last month's OTM: Comet C/2004 Q2 (Machholz). Though we did have a lot of clouds throughout the month, some observing opportunities presented themselves and the comet was an excellent view!

This month, the OTM is a group of three objects rather than a single object. They are easily visible this time of year and all lie in the same constellation. They belong to the class of objects known as open star clusters. There are many examples of open star clusters in our galaxy, but this month's OTMs are some fine examples to observe with telescopes and/or binoculars.

Object of the Month by Alfredo Garcia (cont.)

Open clusters are physically related groups of stars held together by that powerful, governing force of the universe known as gravity. They are believed to originate from large cosmic gas and dust clouds in the galaxy and orbit the galaxy through the disk. Most open clusters have only a short life as a cluster. As they drift along in space, some members escape the cluster due to velocity changes in mutual closer encounters; tidal forces in the galactic gravitational field; and encounters with field stars and interstellar clouds crossing their way. On average, an open cluster has spread most of its member stars along its path after several 100 million years and only few of them have an age counted by billions of years.

Without any further introduction, I present to you the OTM group that consists of open clusters Messier 36, 37, and 38. And of course, they are found in the constellation of Auriga, the Charioteer. For those of you who have observed these before, you will most certainly agree with me that they are some fine objects to observe. If you have never seen them, then you are in for some nice viewing treats.

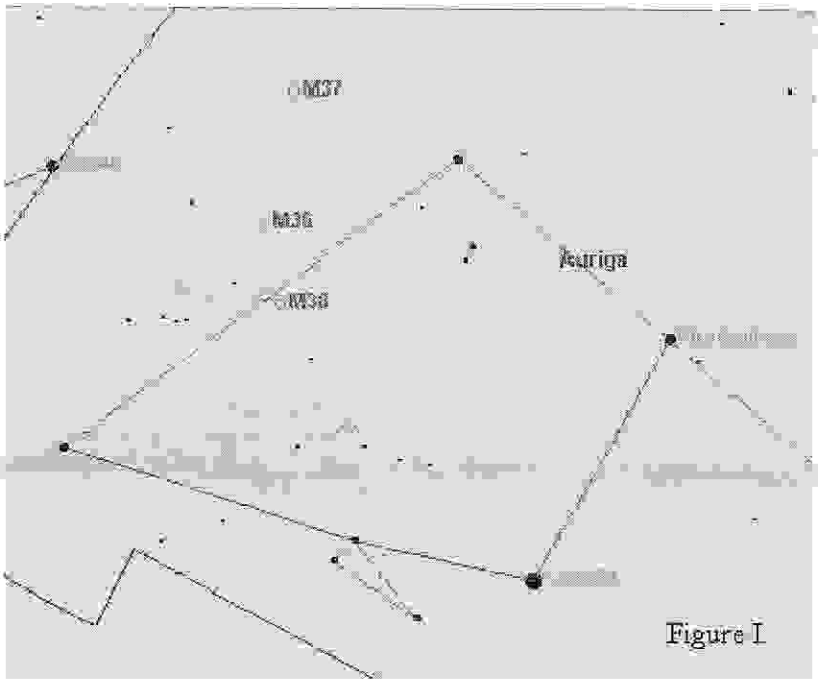


Figure I

Charles Messier noted M36 in his catalog in September 1764. Of the cluster he said this: "Cluster of stars in Auriga, near the star Phi: with an ordinary telescope of 3.5 foot [FL] one has pain to distinguish the stars, the cluster contains no nebulosity. Its position determined from Phi [Aurigae]. (diam. 9')". Actually, the Italian astronomer Giovanni Batista Hodierna first discovered the cluster before 1654 and then it was independently rediscovered it in 1749 by the French astronomer Le Gentil. Modern observing methods show the cluster is composed of about 60 stars in the magnitude 9 to 14 range, with the brighter stars classified as hot-bluish spectral type B stars. The cluster's stars spread just under a 12 arc minute field (or slightly under one half the size of the Full Moon). The age of M36 is approximately 25 million years. It measures about 14 light-years across and its distance is 4,100 light-years. Its magnitude is 6.0 placing it right at the limit of naked eye visibility from a dark site.

Next in our cluster trio is M37. The Italian astronomer Giovanni Batista Hodierna first discovered the cluster we know as M37 before 1654. Charles Messier independently rediscovered the cluster in September 1764. His observations on the cluster were: "Cluster of small stars, little remote from the preceding M36, above the parallel of chi Aurigae; the stars are smaller, more close together and enclosing some nebulosity; with an ordinary telescope of 3.5 feet [FL], one has pain to see the stars: this cluster is reported on the Chart of the second Comet of 1771, *Mem. Acad. 1777.* (diam. 9')". M37 is the most impressive of the trio and is composed of about 500 stars in the magnitude 10 to 15 range. The cluster also contains red giant stars. The cluster's stars subtend an angle in the sky of about 24 arc minutes (or just slightly under the size of the Full Moon). It measures about 20 light-years across and is 4,400 light-years away. M37 is the brightest of the cluster trio coming in at magnitude 5.6. To me, this cluster resembles a large, sparsely populated globular cluster.

And lastly, we have M38. Like the previous two clusters, the Italian astronomer Giovanni Batista Hodierna first discovered the cluster we know as M38 before 1654. And it too was independently rediscovered by the French astronomer Le Gentil in 1749. Messier catalogued M38 in September 1764 and made these observations: "Cluster of small stars in Auriga, near the star Sigma, little distant from the two preceding clusters M36 and M37; this one is of square shape & contains no nebulosity, if one takes care to examine it with a good telescope. Its extension is about 15' of arc. (diam. 15')". Modern observing methods show M38 to be a cluster composed of probably 100 stars with many of the brighter stars classified as hot-bluish (spectral type-B2) stars. In addition, the cluster also contains several type-G giants, with the brightest star in the cluster being a yellow star. M38 has a slightly smaller angular size than that of M37 with a measurement of 21 arc minutes (or again just slightly under the size of the Full Moon). It measures about 25 light-years across and is 4,200 light-years from Earth. Its magnitude is 6.4.

For those with setting circles and/or automated go to telescopes, you can find open clusters: M36 at RA: 05h 36m 26s and DEC: +34° 08' 18"; M37 at RA: 05h 52m 43s and DEC: +32 ° 33' 10"; and M38 at: RA: 05h 29m 02s and DEC: +35° 50' 21". If you don't have either, you can easily find all three clusters using the map at Figure I. It shows the clusters' loca-

Object of the Month by Alfredo Garcia (cont.)

tion in the constellation of Auriga. From Tucson, the clusters will be high in the west to west by northwest sky at 2100 MST as the month progresses.

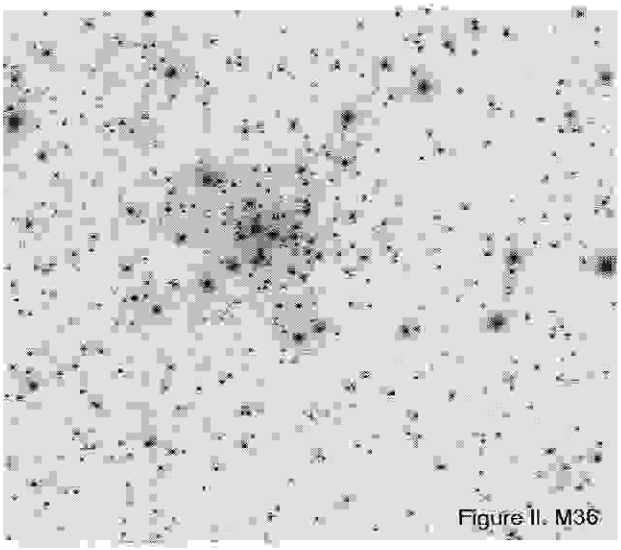


Figure II. M36

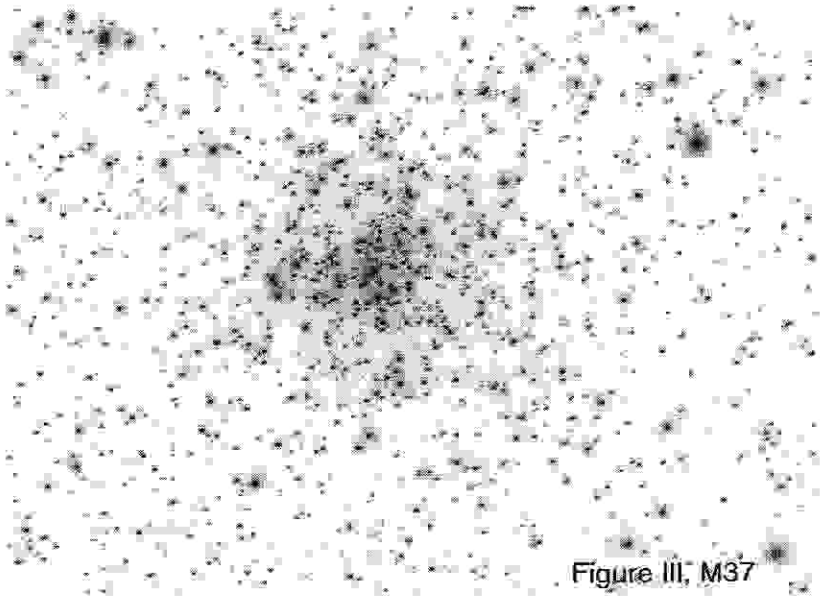


Figure III. M37

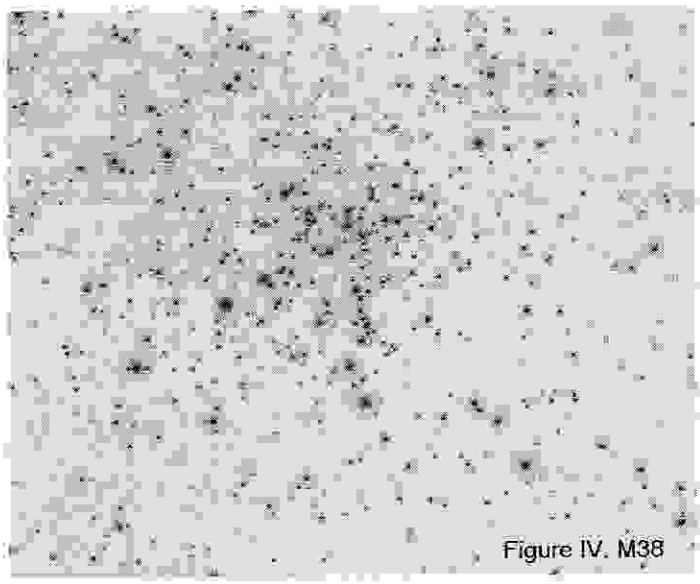


Figure IV. M38

Though M36, M37, and M38 are great "eye candy" in a telescopic field, they are also a great view in wide field astrophotographs or CCD images. This author took CCD images of each cluster shown at Figures II, III, and IV, respectively. Each was using a taken with a Starlight X-Press SXV H9 monochrome CCD camera through a 80mm f/5 Orion ShortTube refractor piggybacked on a 10" f/6.3 Meade LX 200. The clusters were exposed for 5 minutes each with minimal processing to allow a better comparison of the three. Due to their inherent brightness and ease to locate, these clusters are excellent targets for beginning and advanced astrophotographers and CCDers alike.

Constellation Report by Chris Lancaster

Auriga

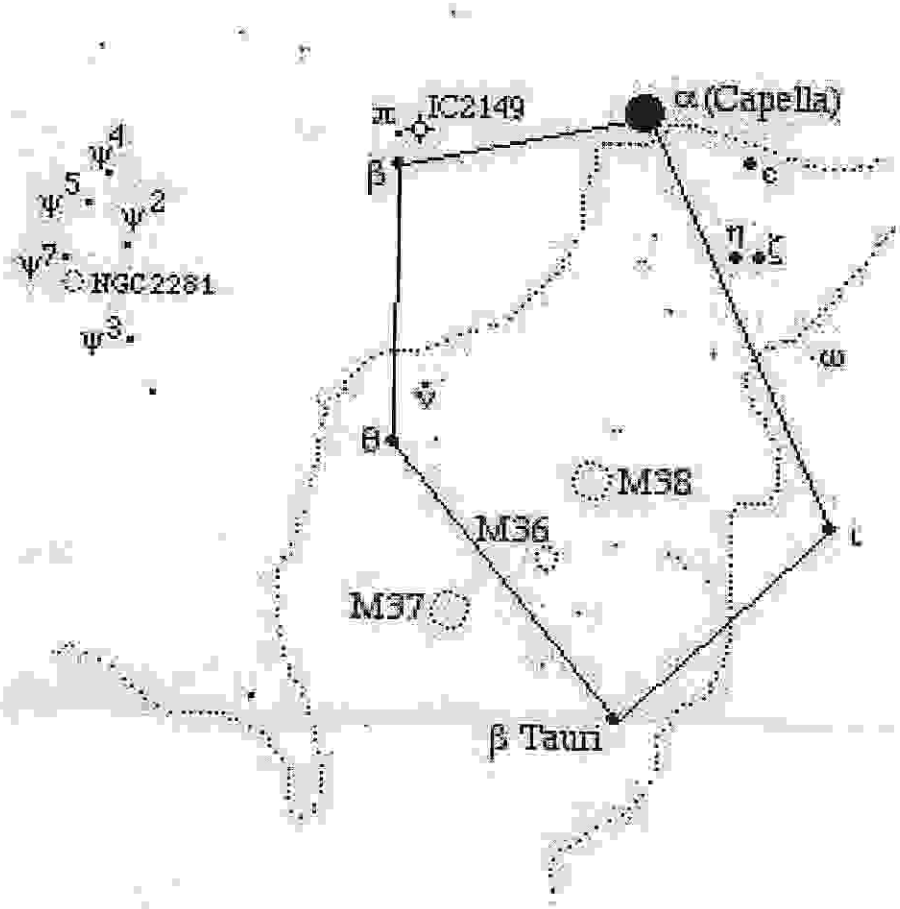
The Charioteer

Auriga is mainly considered to be a charioteer, but it also has a dual role as a goat herder. In some depictions it appears as a man on a chariot, but carrying a goat and three kids in his arms. The identity of Auriga is said to be either the Greek character of Hephaestus, or his son, Erechtheus. These two were both crippled, and thus came to invent the chariot to add to their mobility.

Auriga is easily found if you look to the northeast in the early evening. It forms the shape of a pentagon [with Capella and Beta Tauri (formerly Gamma Aurigae) forming two of the corners opposite each other] north of Orion and sandwiched between Gemini and Perseus.

Constellation Report by Chris Lancaster (cont.)

In the late fall and early winter, Auriga is above the horizon before the sun sets, and by virtue of its northerly declination, it remains in the sky all night, making a slow march toward the west while the constellations farther to the south reach the obscuring earth sooner. Acting as a regional beacon is the sixth brightest star in the sky, Capella. This is a star that is similar to the sun in color and temperature (a spectral type of G8 for Capella and G2 for the sun), but it is a giant star producing the light of 160 suns and thus shining at magnitude +0.1 from a distance of 42 light years. Capella approximates the appearance of the sun if our star were observed from a distance of only a few light years.



Auriga is immersed in the Milky Way, so we don't have to look long for some excellent star clusters. Charles Messier cataloged three in his studies of the constellation--M36, M37, and M38. M37 (mag. 6.2) sits just outside of the pentagon shape and is sure to be a favorite. It is the largest, brightest, and richest of the three, containing over 100 stars near 12th magnitude and brighter and perhaps 500 overall. It rivals the appearance of a loose globular cluster with its dense population of stars. If you draw a line one-third the distance between Theta Aurigae and Beta Tauri and move not quite two degrees southeast you will easily spot M37 (RA 5h 53m Dec +32d 33').

Using the same line connecting Theta Aurigae and Beta Tauri will enable us to find M36 (mag 6.5). This time, look half way between the two stars and about the same distance to the northwest as we used for M37. M36 (RA 5h 36.3' Dec +34d 08') contains about 60 young stars, the brightest of which are all of spectral class B2 through B8, which means they have hot surface temperatures near 20,000 degrees Kelvin. It is the smallest of the trio but shining slightly brighter than our next target that sits 2.3 degrees to the northwest. This is M38 (mag. 7.0; RA 5h 28.7' Dec +35d 50'), a cluster also boasting many hot A and B type stars with some G-type giants interspersed. When looking at M38, you should also spot a small magnitude 8.2 cluster half a degree to the southwest, which is NGC1907. Measuring 7' in diameter, it is less than half the size of M38.

Near the Psi complex of stars is NGC2281. This star cluster measures about 15' across and presents itself as a semi-circle or bowl shaped collection of magnitude 7 and dimmer stars. Look for NGC2281 at RA 6h 49.3' Dec +41d 04', or about 3/4 of a degree to the SSW of Phi7 Aurigae.

For a real challenge, try IC2149. This is a tiny planetary nebula measuring 9" across and glowing weakly at 11th magnitude. While actually spotting the nebula is difficult, its location is easy to pin down since it is about 2/3 of a degree west of Pi (p) Aurigae, which in turn is just north of Beta Aurigae, the NE corner of the pentagon. More precisely, NGC2149 is located at RA 5h 56.3m Dec +46d 07.5'. With sufficient aperture and good seeing, you may have a shot at spying its 14th magnitude central star.

To the area southwest of Capella is a group of three stars, Epsilon, Zeta, and Eta, which comprise an asterism called "the kids." They are in the shape of a tall isosceles triangle, and the star at the point, Epsilon, is of special interest in part due to the fact that it is an eclipsing binary star of spectral type F0 with an exceptionally long period of 27.06 years, with each phase of deepest eclipse lasting an entire year by itself. Furthermore, its distance is estimated to be near 2,040 light years, so to shine at magnitude 3 (3.8 in eclipse) to an observer on Earth indicates that it is one of the most luminous stars known, producing 60,000 times the light of the sun.