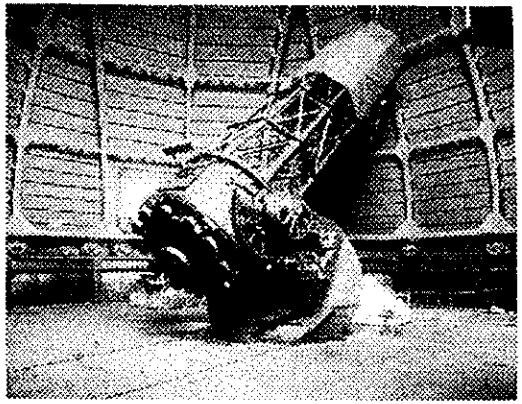
the focal point

Monthly Notices of the Atlanta Astronomy Club, Inc.

Vol. VII No. 3 August, 1994



Why is this telescope famous?

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NEXT MEETING AT FERNBANK – AUGUST 19

TOM CROWLEY TELLS ABOUT RADIO ASTRONOMY

MEETING NOTICE ON PAGE 18

the focal point

Monthly Notices of the Atlanta Astronomy Club, Inc.

FROM:
Leonard B. Abbey, Editor
1002 Citadel Drive
Atlanta, Georgia 30324

First Class

9510
W. Tom Buchanan
105 Carriage Station Circle
Roswell, Georgia 30075

The Atlanta Astronomy Club Inc., the South's largest and oldest astronomical society, meets at 8:00 p.m. on the third Friday of each month at Agnes Scott College's Bradley Observatory. Occasional meetings are held at other locations (check the hot line for details). Membership is open to all. Annual dues are $20 ($10 for students). Discounted subscriptions to *Astronomy* ($18), and *Sky & Telescope* ($20) magazines are available. Send dues to: **Alex Langoussis, Treasurer, 3595 Canton Road, Suite A9-305, Marietta, Ga. 30066**

Hot Line: Timely information on the night sky and astronomy in the Atlanta area is available on a twenty-four hour basis on the Atlanta Astronomy Club hot line: 621-2661.

BBS: The Atlanta Astronomy Club operates a computer bulletin board at 455-3089. The BBS, which is free and open to the public, provides contact with both amateur and professional astronomers around the world.

Off-Axis Guiding with the ST-4

by Jason Ware, Frisco Texas

The Santa Barbara Instruments Group ST-4 has the ability To track on faint guide stars, enabling auto-guided long exposure photographs. With this in mind you might expect a flood of publication quality photographs from amateurs using the ST-4. Some, however, have become frustrated and have expressed disappointment in the ST-4 as a tracker. I have been using an ST-4, off-axis, with an 8 inch Meade SCT, and have produced many perfectly guided exposures. Three of which will appear in the March, 1991 *Sky & Telescope*. I have a few hints which may help others who are having problems.

First of all, let me say that if you do not already have a good understanding of guided deep sky astrophotography, do not expect the ST-4 to magically produce observatory-quality photographs. The age old requirements such as accurate polar alignment, a stable mount, and acquiring a suitable guide star still exist. This article will address the problems associated with the latter two requirements.

Astrophotographers have always known that a stable, well tracking mount is invaluable for perfectly guided photos. This is still true when using an auto tracker. Although an auto tracker can "guide out" some amount of drive error, do not expect it to cure gross periodic errors of the kind found in many commercial telescopes. I have had the opportunity to use the ST-4 on a drive with about 100 arc seconds of periodic error, and a Meade Smart Drive with a periodic error of about 25 arc seconds before programming, and less than 5 after.

Several problems arise as drive errors increase. The tracker's integration time must be kept low in order to quickly catch trailing. This reduces the ability of the tracker to guide on faint guide stars. The ST-4 seems to track better with integration times of 5 or 7 seconds, rather than 0.5 seconds. I believe this is because the longer integration time tends to average the random motion of the guide star, due to atmospheric scintillation. As you might guess, a drive with a large periodic error cannot be left unguided for 5 seconds or tailing will appear on the photograph. I also believe that the ST-4 can be confused if the image of the guide star is "smeared" across the pixels. Because the ST-4 calculates the centroid of the smear, the star will have actually moved more than the ST-4 calculates.

How good is good enough? Although I have not done any controlled experiments, my feeling, based on around 100 hours of using the instrument as a tracker, leads me to believe that drive errors which cause a drift of over 1.0 arc second per second are unacceptable for use with an off-axis guider, and fine grain film. This assumes a focal length of 2000 mm (8" SCT at f10). Telescopes with different focal lengths should be scaled accordingly. For example a telescope with a focal length of 1000 mm could stand a drift of 2 arc-seconds per second. Users who have telescopes with large periodic errors may be able to use a separate guide scope. This would allow guiding on brighter guide stars, thus smaller integration times. I have not tried this approach. I welcome comments from other users which would confirm or deny these figures.

As I stated I have been using the ST-4 off-axis with a 8" Meade. I do most of my photography at f10. I use a Celestron off-axis guider which has a fixed eyepiece tube. Users of guiders with a sliding tube

WHAT'S UP

	SUN				MOON				
Date	Rise	Azi	Set	Azi	Rise	Azi	Set	Azi	Age
8/15/94	6:59	72.4	20:24	287.3	15:49	114.8	1:21	245.9	9.4
8/16/94	7:00	72.8	20:23	286.9	16:47	114.7	2:16	245.0	10.5
8/17/94	7:01	73.2	20:22	286.5	17:39	113.0	3:16	245.8	11.6
8/18/94	7:01	73.5	20:21	286.1	18:26	109.9	4:18	248.2	12.6
8/19/94	7:02	73.9	20:19	285.7	19:07	105.6	5:21	251.9	13.6
8/20/94	7:03	74.3	20:18	285.3	19:45	100.8	6:23	256.5	14.6
8/21/94	7:03	74.7	20:17	284.9	20:19	95.4	7:23	261.8	15.6
8/22/94	7:04	75.2	20:16	284.5	20:52	90.0	8:22	267.3	16.6
8/23/94	7:05	75.6	20:15	284.1	21:24	84.7	9:20	272.8	17.6
8/24/94	7:05	76.0	20:13	283.7	21:56	79.7	10:16	278.0	18.5
8/25/94	7:06	76.4	20:12	283.3	22:30	75.2	11:11	282.8	19.4
8/26/94	7:07	76.8	20:11	282.8	23:06	71.3	12:06	287.0	20.3
8/27/94	7:08	77.2	20:10	282.4	23:44	68.4	13:00	290.4	21.2
8/28/94	7:08	77.7	20:08	282.0	-----	-----	13:53	292.9	22.0
8/29/94	7:09	78.1	20:07	281.6	0:26	66.3	14:45	294.3	22.9
8/30/94	7:10	78.5	20:06	281.1	1:12	65.4	15:34	294.6	23.9
8/31/94	7:10	79.0	20:04	280.7	2:02	65.7	16:21	293.6	24.8
9/1/94	7:11	79.4	20:03	280.3	2:56	67.2	17:06	291.2	25.8
9/2/94	7:12	79.8	20:02	279.8	3:54	70.1	17:48	287.8	26.8
9/3/94	7:12	80.3	20:01	279.4	4:55	74.2	18:28	283.2	27.8
9/4/94	7:13	80.7	19:59	278.9	5:58	79.2	19:06	277.7	28.9
9/5/94	7:14	81.2	19:58	278.5	7:03	85.2	19:43	271.8	0.4
9/6/94	7:14	81.6	19:56	278.0	8:09	91.4	20:21	265.5	1.5
9/7/94	7:15	82.1	19:55	277.6	9:16	97.7	21:00	259.5	2.6
9/8/94	7:16	82.5	19:54	277.1	10:24	103.5	21:42	254.2	3.8
9/9/94	7:16	83.0	19:52	276.7	11:32	108.4	22:28	249.8	4.9
9/10/94	7:17	83.4	19:51	276.2	12:39	112.1	23:18	246.8	6.0
9/11/94	7:18	83.9	19:50	275.8	13:42	114.2	-----	-----	7.0
9/12/94	7:18	84.4	19:48	275.3	14:42	114.7	0:12	245.4	8.1
9/13/94	7:19	84.8	19:47	274.8	15:35	113.4	1:11	245.7	9.2
9/14/94	7:20	85.3	19:45	274.4	16:23	110.8	2:12	247.6	10.2
9/15/94	7:21	85.8	19:44	273.9	17:06	107.0	3:13	250.8	11.2

OFFICERS AND OTHER DIGNITARIES

President:	Steve Gilbreath	409-1915
First Vice-President: (Program)	Jerry Armstrong	942-4249
Second Vice-President: (Observing)	Eric Shelton	664-2837
Recording Secretary:	Terry McHann	441-9097
Corresponding Secretary:	Leonard Abbey	634-1222
Treasurer:	Alex Langoussis	429-8384
BBS:	Doug Chesser	457-5743
Edibles:	Terry McHann	441-9097
Facilities	Leonard Abbey	634-1222
Light Pollution:	Tom Buchanan	587-0774

THE AUGUST MEETING

Certainly you've heard of the famous composition, *The Planets* by Gustav Holst. Now how about listening to the REAL music of the planets – or at least Jupiter? Amateur radio astronomer Tom Crowley does. And this month he'll demonstrate how. Tom's been a radio astronomer for about four years and is also a member of the Society of Amateur Radio Astronomers (SARA).

Radio astronomy is a relatively new method of studying the skies, having only been discovered during World War II. It was then that radio technicians found that radio "noise" from the sky was really emitted from specific sources – Jupiter, for one, and certain stars and galaxies, as well. Even meteors, as they plow into the Earth's atmosphere, leave a telltale radio signal as they burn up miles high above us. Besides, you don't have to worry about being clouded out.

Mark you calendar now for **8 p.m., Friday, August 19**, at **Fernbank Science Center**. Directions are available by fax. Contact Lenny Abbey at 634-1222.

THE WELCOME MAT

The AAC welcomes the following new members, who have joined since May:

Stephanie Andrews	840-0847	Loren McFarlane	509-1101
Dagmar Biellmann		Richard and Ginny Mintz	422-7640
Greg Bosworth		Ed Naramore	
Vernon & Kitty Cope		Mark D. Nicol	396-2481
Scott & Gary Courter	949-0261	Don & Patricia Noland	948-2407
Tom & Lynn Crowley		Lewis Olin	728-9482
Marian Duckwitz	923-5878	John Piazza	952-6336
Lawrence and Patricia Eastwood		Paul Scher	518-7171
Dick Evelyn	971-2925	Alejandro Soto	992-0671
Joseph Gibson		Laura & Thom Sukalac	325-9308
Eric Greene	315-7428	Ingrid Tanghe	873-1453
Frank Guyton	922-3386	Patrick L. Thompson	352-4396
Helen Han	497-1789	Jeff Tonge	
James and Artistee Harris	432-4298	Jim Waystack	
David Howell	942-0273	Richard M. Willamon	
Dennis R. Leyden	919-1777	Jim Young	
Robert I. Marcus	578-0514		

should check to be sure that weight of the CCD head does not cause flexure. In fact, I did have some unexplained trailing that was traced to a loose set screw. This allowed the CCD head to shift during long exposures. The Celestron guider's pick-off prism is closer to the center of the telescope's field than some guiders. This gives sharper star images. Although I have not used them, I believe the Meade and Orion off-axis guiders are of similar design.

Assuming you have a stable, accurate mount, the next challenge is to find a guide star. Don't try to find a guide star with the CCD. Use a high power eyepiece, preferably with a cross hair, to center a star. Then slew the telescope in Right Ascension to determine which way to orient the CCD head. Be sure to position the label on the back of the CCD parallel with the direction of R.A. This will align the pixels so that the "X" direction corresponds to RA drift. The pixels are slightly smaller in the "X" direction so the resolution should be better.

When guiding off-axis the CCD camera should be made parfocal with the camera. Using the Celestron guider I am able to do this without using and extender tube. Once you have found focus, mark the CCD so that you can easily find focus after the CCD has been removed. My procedure went something like this. I first attached the off-axis guider and camera body to the telescope. Next, I found a bright star, and focused the camera using a 2.5X focusing magnifier. I then located a star off-axis using a high powered eyepiece, and replaced the eyepiece with the CCD. I found focus by sliding the CCD up and down until the highest brightness reading was obtained, the image was then examined on a PC to confirm that best focus was obtained. The barrel of the CCD was then marked. I later made a "stop" from a plastic film canister. The canister was cut so that when inserted into the eyepiece tube, ahead of the CCD, the CCD was automatically parfocal with the camera.

In closing I would like to say a word about the scintillation adjust (SA) setting on the ST-4. I believe this is one of the biggest problem areas for users of the ST-4. There seems to be a misconception that setting the SA to 10 will average the last ten corrections made. According to the manual this is not true. During the calibrate process, the ST-4 determines the length of time it should close a relay, in order to make a correction. This parameter is stored in memory. While tracking, the ST-4 has the ability to learn from it's mistakes. If, after a correction, it finds that it has over, or under corrected, it will alter the correction parameter in memory to improve tracking. This alteration will only occur if the mistake is greater than the SA setting. SA numbers are in units of pixels. If the SA is set to 10 the ST-4 will only alter its memory if it over, or under corrects by 10 pixels. This is over 10 arc-seconds with an 8" SCT! I have found best results with the SA set to 1. This is particularly important if the drive has a large periodic error. The correction rate will change as a function of the error, therefore, the ST-4 needs to be able make adjustments. The SA parameter may need to be increased when a separate guide scope with a long focal length is used.

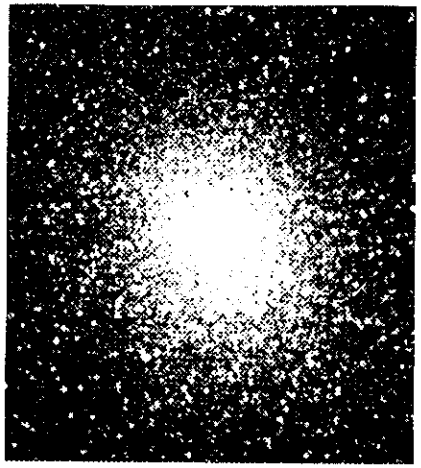
I hope these hints will help users get good results using the SBIG ST-4 as a tracker. I welcome any comments from other users.

Observing Globular Clusters

by Jack Kramer, Libertyville, Illinois

It seems as though each season of the year is known for a certain type of deep sky object. While there are exceptions, we do tend to associate winter with open clusters and spring with galaxies. If that's the case, then summer surely has to be the season of globular clusters. It's easy for the average observer to tick off some of the more renowned gems, such as M13, M4 and M22. Understanding something about their nature will make the observation of these objects more interesting.

...globulars are one of the more mysterious deep sky objects...



M13 Globular Cluster in Hercules.

The above picture is a CCD image of M13, and while the reproduction process hardly does it justice, it does illustrate a common feature of globulars – their increasing degree of concentration toward the center. But they're not all alike; prolonged observation will reveal both major and subtle differences from one to another.

In a way, globulars are one of the more mysterious deep sky objects, because little is known about how or why they came to be formed. In general, they are composed of older stars, though they are not all of the same age. They also tend to be concentrated toward the center of our galaxy...that's why there are more of them visible in the summer sky. There are two types – halo globulars and disk globulars. The more numerous halo type are located at the very edge of the Milky Way scattered "above" and "below" the hub of our galaxy. The disk type are located within the plane of the galaxy, but they, too, are congregated toward the center of the galaxy. Deep photographs of other nearby galaxies show many with their own halos of globular clusters.

Now for the fun part. Globulars take high magnification very well, and may require it in order to resolve the components. What else should you look for in your telescope?

Color. Visual observation with observatory-size telescopes readily shows a variety of different colors in the stars that make up globulars. One observer described the effect as though he were looking into a "jewel box". Those of you with larger telescopes also may be able to detect some colors. Since the eye is not sensitive to color at

AAC COMET OBSERVING ACTIVITIES

It's not often that celestial events occur with the perfect timing that we had in July with the impacts of Comet Shoemaker-Levy9 fragments into Jupiter.

But this was our time to shine.

Mike Toner's excellent piece on the comet filled most of a full page in the Wednesday, July 13, *Atlanta Journal-Constitution*, complete with notes about our upcoming meeting and observing site activities. With over 90 persons attending, the July 15 meeting was probably the largest meeting of the Club in recent memory (some of the old-timers may know of larger gatherings, but this had to be very close to the top). The Fernbank Science Center was very gracious in their handling of the crowds on meeting night, some of whom were there for our meeting and others who were there for the planetarium show.

A reminder note the next day in the Journal-Constitution about the observing session that night resulted constant phone calls from the public wanting observing info, route directions and club info. That night, July 16, was First Impact night, and we were well prepared with some topnotch Club observing experts on hand at Villa Rica. Kudos go to Alex Langoussis, Eric Shelton, Rich Jakiel and other regular attendees who answered questions and shared their observing equipment with the public as they trudged onto the observing field.

Our thanks also to Journal-Constitution photographer Kimberly Smith and reporter Christy Harrison. Both found themselves caught up in the enthusiasm (Christy said it was her first time to ever look at the Moon through a telescope).

And the weather? What started out as "iffy" turned out to be just great. Just when you thought it was "curtains" for the night with a cloud bank rolling in, a huge hole would open up or the bank would shift direction. As a result we had great views of the First Quarter Moon, Venus and, the subject of it all, Jupiter. Even later that evening, nearly the entire sky opened up for some great views of the summer constellations.

But the huge color photo of an observer and telescope at our Villa Rica site on the front page of the Sunday *Journal-Constitution*, July 17, probably did more to get the idea across to all that amateurs really CAN do this and have fun.

As the impacts began and continued, the phone calls to the Club followed. Sunday night's observing session brought more folks than the night before, but for a shorter observing window. So it was driveway observing time for the rest of the week for some truly striking views (no pun intended).

The impacts? Oh, yeah. They happened and the results far surpassed what many astronomers theorized would happen – huge, Earth-size smudges in the Jovian cloud bands. Now begins the debate on whether the impact sites will remain permanent, become transformed into their own new belts and bands or wind up part of the existing belts that girdle the planet.

AAC ACTIVITIES

by Ken Poshedly

LAST MONTH'S MEETING

With over 90 members and guests present, perhaps the largest meeting of the Atlanta Astronomy Club ever was called to order just after 8 p.m., Friday, July 15, at the Fernbank Science Center by club president Steve Gilbreath.

The subject of their interest was the latest news on the impacts of planet Jupiter by periodic Comet Shoemaker-Levy9 which were to begin the following evening. Before the main program, though, Steve introduced several club officers with reports of their own:

- Observing Chairman Eric Shelton announced that the next open observing session at Villa Rica after the comet impacts would be Saturday, August 6, a New Moon weekend.
- Refreshments coordinator Terry Mellann asked for others to assist with providing goodies for post-meeting conversations. Hopefully, a number of good folks would volunteer, with each handling refreshments on a monthly rotating schedule.
- Newsletter editor Lenny Abbey reminded visitors to the meeting that we meet EACH month and have much to offer the astronomically curious.
- Treasurer Alex Langoussis announced that the AAC was six members larger from the previous month, a good trend indeed!
- President Steve presented member Art Russell with the Astronomical League's Messier Certificate. Art has finally observed and all 110 of the faint and fuzzy objects listed in Charles Messier's catalog from the 1700's.

Dr. Ralph Buice of the Fernbank Science Center then introduced comet-hunter Jerry Armstrong who used his own personal observational experience to explain what the Shoemaker-Levy9 fuss was all about. Among the points brought out by Jerry was that besides visual observations, radio astronomers were planning to eavesdrop on this event as well.

To provide a taste of that aspect was Tom Crowley, member of the AAC and the Society of Amateur Radio Astronomers. Following a spirited question-and-answer session, the meeting was adjourned for informal conversations, great snacks by Terry and, even later, pizza at Jaggers near Emory.

low light levels, it takes quite a bit of light grasp.

Stellar Distribution. Probably you've read about "star poor" areas in globulars; this is more than just a varying distribution at the edges. M13 is a good example where the density of the stellar components varies, with star poor areas spiraling in toward the center. Sometimes this effect is more pronounced than at other times. M22 also appears to me as though there are sprays of stars emanating from the core, which doesn't seem to be exactly at the center. M30 in Capricornus has two short lines of stars emanating from the hub. M4 in Scorpius is famous for its vertical line of bright stars running through the center.

Density. This refers to the richness of the cluster. Some are so dense that individual components cannot be detected at the center, while others are so loose that they hardly look like globulars. M71 in Sagitta is so loose that it appears fainter than you would expect, and it lacks the typical dense central condensation. In fact, there have been questions as to its status as a globular. M5 in Serpens is very rich and has a bright central hub, but is fairly loose throughout. For this reason, it's one of the most beautiful clusters in our sky. From New Mexico, NGC 288 in Sculptor actually gave the impression of being richer at the edges than at the center. And Omega Centauri is so large and dense that it's almost beyond words...but it's only visible from more southern latitudes.

Shape. As the name implies, globulars are...well...round. But not always! NGC 6934 in Delphinus appeared to have roughly the shape of a gibbous moon in my 10" - this may have been due to a large star-poor area on one side of the cluster. M56 in Lyra and M92 in Hercules also give the impression of irregular shape. In fact, it's quite common for globulars to appear oval, perhaps due to stellar distribution at the edges.

The globulars referred-to here have all been bright and easy objects; of course, many of those in atlases such as the Tirion 2000 are so small that they appear as nothing more than fuzzy stars. But don't be reluctant to hit them with your highest magnification, if conditions permit...you just may be able to break them apart ! What about seeing the globulars in other galaxies? Believe it or not, this is possible with the very largest amateur telescopes. They would appear as very faint stars near the hub of a galaxy such as M31, but they would be fainter than 14th magnitude.

Of Things to Come . . .

In September, we will hear a presentation by **Howard Brewington**, famous observer and discoverer of comets.

Our October speaker will be **April Whitt**, Fernbank's new astronomer and planetarium lecturer.

In November our speaker will be **Don Parker**, perhaps the most famous planetary photographer in the world. The Astronomical Society of the Atlantic will join us for this exciting evening. This meeting will be held at Emory University's White Hall.

In future meetings we look forward to hearing from Dr. Ralph Buice, Dr. Hal McAlister, John Bortle, and Dr. Richard Williamon.

All in all, an exciting lineup for the next ten months.

Impressions of Kitt Peak and McDonald Observatory Public Tours

by Russell Whigham, Tucson

Kitt Peak National Observatory

State Road 86
Box 26732
Tucson, Arizona 85726
(602) 620-5350
Film and lecture at 10:30 a.m. and 1:30 p.m. daily except Christmas. Guided tours at 10:30 a.m. and 1:30 p.m. on Saturday and Sunday.

Kitt Peak is about 50 miles west of Tucson. The gleaming domes are visible for most of the trip. The landscape is essentially barren except for the saguaro cactus and other sparse vegetation. Turning south off SR 86 onto to a crushed gravel, two-lane road to the mountain top, one finds the first two miles of the twelve-mile road as level as the trip from Tucson. Beyond that, the road begins a steep, serpentine route to the 6875-foot summit. The road has a few guard rails but one should not be in a hurry. I was never guilty of exceeding the 25 mph speed limit.

Once at the summit, visitors find a large parking lot adjacent to the Visitor's Center. Inside is a gift shop well stocked with T-shirts, books, Mars and Milky Way candy bars. Joining the gift shop is the exhibit and lecture area that includes models of some of the telescopes at the facility and a large screen television playing various astronomical tapes. At the appointed time, we were welcomed by our tour guide who recounted the interesting events that were involved in acquiring the mountain top from the Papago Indians. The peak was sacred in Papago lore. To convince the tribal elders that they should permit construction of the observatory on their mountain, astronomers invited the tribal elders to look through one of the telescopes at the University of Arizona in Tucson.

After that visit, the Papago consented to lease the mountain for as long as it was used for astronomical research. We then watched a 30-minute film on the United State's national observatories. Following the film, the tour guide led us a short walk to the 84 inch telescope. A twenty to thirty minute lecture on the instrument's history, vital statistics, and an overview of the types of investigations for which this sleeping instrument was used, was given from inside the dome.

From there, we took a two block walk to the McMath solar telescope. After our guide gave a summary of this instrument, we were allowed to step inside and from the glassed in visitors gallery, see a hydrogen alpha image of the sun on a black and white monitor and peer up and down the diagonal light path. After learning of the engineering and architectural wonders of this telescope (liquid cooling and titanium dioxide paint for temperature stabilization), I was amused to see cinder block size stones used as counterweights. This was the end of the guided tour but we were permitted to tour the 158-inch Mayall telescope on our own.

An elevator carries visitors up to the observation level of the 18-story structure for a magnificent view of the entire mountain top. There are more domes here than telescopes at most star parties. Another flight up is the visitors gallery where the 158-inch telescope can be seen from glassed-in area. A sign warning of possible ice on the floor

are listed by "BD numbers." The Smithsonian Astrophysical Observatory (SAO) Catalogue, the Yale Star Catalog, and The Henry Draper Catalog published by Harvard College Observatory are all widely used by astronomers. The Supernova of 1987 (Supernova 1987a), one of the major astronomical events of this century, was identified with the star named SK -69 degrees 202 in the very specialized catalog, the Deep Objective Prism Survey of the Large Magellanic Cloud, published by the Warner and Swasey Observatory.

These procedures and catalogs accepted by the International Astronomical Union are the only means by which stars receive long-lasting names. Be aware that no one can buy immortality for anyone in the form of a star name.

IPS Permanent Address:

International Planetarium Society
c/o Hansen Planetarium
15 South State Street
Salt Lake City, Utah 84111

LIGHT POLLUTION COMMITTEE

by Tom Buchanan

HELP NEEDED

If you live in the metro Atlanta Area you will be affected by this resolution.

Recently a new ordinance for outdoor signs has been introduced in the Atlanta City Council placing restrictions on the construction of new billboards. The ordinance has not yet been passed. The Atlanta Astronomy Club as well as many amateur astronomers in the atlanta area are asking that bottom mounted luminators (a great source of light pollution) be prohibited on these new signs. Light pollution is a big problem in our area, please help us control it.

Help us control light pollution by faxing your thoughts on this ordinance!

Please write a short letter to the Atlanta City Council asking them to prohibit bottom mounted luminators on billboards in the new outdoor sign ordinance. Address one letter to all city council members, and fax it to:

Carolyn Adamson (Assistant to Councilperson Clair Muller).

Attach a note asking Carolyn to copy and distribute to all council members. The fax number is 658-6454. The phone number is 330-6051.

This should be done as soon as possible. There will be another meeting on August 17 concerning this ordinance.

GUIDELINES FOR STAR NAMING

International Planetarium Society, Richmond

In response to numerous inquiries on the subject of purchasing star names, the International Planetarium Society offers the following information, as stated at their 9th Biennial Conference June 30, 1988 at the Science Museum of Virginia.

Selling Star Names

The star names recognized and used by scientists are those that have been established through long-time usage or published by astronomers at credible scientific institutions. The International Astronomical Union, the worldwide .federation of astronomical societies, accepts and uses *only* those names. Such names are *never* sold.

Private groups in business to make money may claim to "name a star for you or a loved one, providing the perfect gift for many occasions." One organization offers to register that name in a Geneva, Switzerland, vault and to place that name in their beautiful copyrighted catalog. However official-sounding this procedure may seem, the name and the catalog are not recognized or used by any scientific institution. Furthermore, the official-looking star charts that commonly accompany a "purchased star name" are the Becvar charts excerpted from the Atlas Coeli 1950.0. While these are legitimate star charts, published by Sky Publishing Corporation, they have been modified by the private "star name" business unofficially. Unfortunately, there are instances of news media describing the purchase of a star name, apparently not realizing that they are promoting a money-making business only, and not science. Advertising and media promotion both seem to increase during holiday periods.

Planetariums and museums occasionally "sell" stars as a way to raise funds for their non-profit institutions. Normally these institutions are extremely careful to explain that they are not officially naming stars and that the "naming" done for a donation is for amusement only.

Official Star-Naming Procedures

Bright stars from first to third magnitude have proper names that have been in use for hundreds of years. Most of these names are Arabic. Examples are Betelgeuse, the bright orange star in the constellation Orion, and Dubhe, the second-magnitude star at the edge of the Big Dipper's cup (Ursa Major). A few proper star names are not Arabic. One is Polaris, the second-magnitude star at the end of the handle of the Little Dipper (Ursa Minor). Polaris also carries the popular name, the North Star.

A second system for naming bright stars was introduced in 1603 by J. Bayer of Bavaria. In his constellation atlas, Bayer assigned successive letters of the Greek alphabet to the brighter stars of each constellation. Each Bayer designation is the Greek letter with the genitive form of the constellation name. Thus Polaris is Alpha Ursae Minoris. Occasionally, Bayer switched brightness order for serial order in assigning Greek letters. An example of this is Dubhe as Alpha Ursae Majoris, with each star along the Big Dipper from the cup to handle having the next Greek letter.

Faint stars are designated in different ways in catalogs prepared and used by astronomers. One is the Bonner Durchmusterung, compiled at Bonn Observatory starting in 1837. A third of a million stars

gives a hint that there are refrigeration lines in the floor to minimize the chimney effect through the dome opening on cold nights. This is a scaled down version of the 200 inch telescope at Palomar Mountain.

Mcdonald Observatory

Visitors' Information Center
Box 1337
Fort Davis, TX 79734
(915) 426-3640
9:00 a.m. - 7:00 p.m.,
Mon-Sat.
1:00 p.m. - 7:00 p.m., Sunday
Guided Tours 9:30 a.m. and
2:00 p.m.
Public Star Parties, Tuesday, Friday, and Saturday. at sundown. Closed Thanksgiving, Christmas, and New Years Day.

The sleepy little town of Fort Davis, stands in stark contrast to the metropolis of Tucson. "Main Street" is only 4 or 5 blocks long and while you will not find any "golden arches" or Holiday Inn here, you will find 3 or 4 very nice family style cafes and a couple of quaint but decent hotels.

Just out of town on SR 118 N toward the observatory, is Davis Mountains State Park. The motel style accommodations were built in the thirties with CCC labor but has been and is still very well maintained. The price is right and the restaurant is great. A little farther down the road is the Prude Ranch. Now world famous as the location of the Texas Star Party held there each May, it's just an ordinary dude ranch the rest of the year.

At a distance of 17 miles up the gently curving road and rolling hills, is Mount Locke, site of the McDonald Observatory. The Visitors' Center looks like new, as a good inventory of souvenirs, although higher priced than the same items at Kitt Peak, with books, T-shirts and posters. Here also is the large screen television playing astronomy tapes.

Adjacent to the Visitor's Center is the roll-off-roof observatory which houses a Celestron C-8 for solar observing and a C-14 and Sky Designs, 25" Dobsonian used for public star parties. A crowd of 25 to 30 people had made the mile or so drive to Mount Locke's 6,000-foot summit when the tour began. Following a welcome by the tour guide, a summary of the history of the astronomy program at the University of Texas, and identification of the various facilities on the mountain, we were led up to the observing floor of the 107-inch.

After an litany of facts, feats, and figures about the huge instrument, our guide raised and lowered the observing floor, slewed the telescope several degrees, rotated the dome, opened the shutter doors (only a few feet to limit the amount of daytime heat from entering the dome) briefly. He then returned the telescope to is normal position and started tracking at the sidereal rate. He pointed out the different foci, (prime, Cassegrain, broken Cassegrain, and coude), showed how the entire end ring/secondary assembly was changed with a bridge crane to change the effective focal length, and told how he and other amateurs on the staff were permitted "joy rides" during the rare hours when the telescope was not being used, making visual observations at the coude focus. The mirror had just been realuminumized two weeks before in the lower floor of the four-story dome.

The cryogenic cylinder and CCD were attached to the Cassegrain focus with an ordinary C clamp. At twilight, the shutters are opened a couple of feet for temperature equalization . A canvas inner shutter keeps out dust, flying insects and birds during this time. At dark it too is rolled back.

After about twenty minutes the guide slewed the telescope back to its normal

position again to demonstrate the tracking rate. After realizing that my itinerary would allow me to attend the star party, I fantasized about seeking out some of the objects which are just at limits of my telescope in the fairly light polluted skies at home. I was unpleasantly surprised to see two to three hundred people out in the middle of nowhere had come for the star party.

The C-14 spent half of the evening on Mizar and Alcor and the rest on the M-57. The 25-inch shared time between M-51 and M-13. Because of the large, crowd my request to view Omega Centauri (which along with M-13 were easy naked eye objects) was denied. Most of the visitors, including a bus tour group, had never looked through a telescope and the star party was geared toward them. One of the staff drew off a large group of the novices to point out some of the spring and summer constellations. Others were invited to go in the visitors' center to watch video tapes.

At this time I was permitted to observe M97. The owl's "eyes" and the central star were easy in the 25 inch with almost a hint of color. As the first time viewers returned, I had to relinquish my coveted spot at the eyepiece. I stood just away from the telescopes and easily picked out 6th magnitude stars.

Conclusion

I'm sure I must have had a silly grin on my face the whole time I was at each of these astronomical holy of holies. It is inspiring just to be near these great tools of some very famous astronomers, knowing that the nature's deepest secrets were revealed as a reward for their tireless pursuits. Conversely, it was somewhat frustrating to be near such telescopes and not be able to slip in an eyepiece and have a look around. The difference in the tours is not so much in the facilities themselves as in the personalities of the tour guides. While the guide at Kitt Peak had all the facts right in the lecture and the correct answers to the groups questions, I was a bit disappointed when, after the tour, I asked about all of the high-pressure sodium lights that I had seen the night before in Tucson. I had read of the ordinances restricting HPS lights. The guide's reply was "What is the difference between high and low pressure sodium lights?".

Any amateur who lives in or near a metropolitan area would not have answered this way. At McDonald, the tour guide was an amateur astronomer who knew his way around the night sky who obviously loved his job. In fairness, had I visited on another day at either observatory, the situation may have been completely reversed. Both of these complexes have their own unique personality and well worth effort to reach their remote locations.

COMPARISON

Attribute	Kitt Peak	McDonald
Accessibility	Arduous	Pleasant
Environs	Clear and dry	Clear and dry
Visitors Center	Very good	Very good
Facilities	Awesome	Very impressive
Tour	Informative	More show and tell
Instruments	Greater total #	Had a closer look
Star Party	No	C-14 and 25" reflector
Admission	Donation	Donation

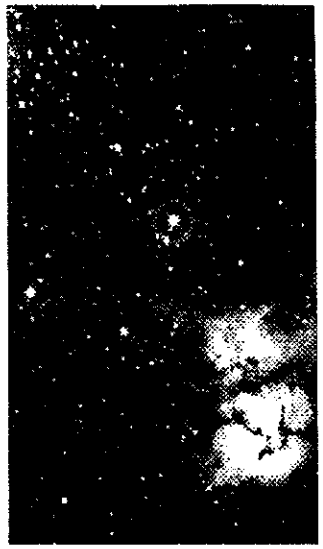
Star Cloud in Sagittarius.

of its brightest members appear to form a bar right through its center, and gives the impression that the cluster is slightly elongated.

M6 This is a fine open cluster just visible to the naked eye. It is sometimes called the Butterfly Cluster, as some observers see the shape of a flying insect amongst its stars. The cluster is large, about 25' in diameter, so use low powers to observe it. Over one hundred stars, many bright or relatively bright can be counted in this area.

M7 One of the finest open clusters visible in the northern hemisphere, this object is best seen using binoculars or a finder. It is large, about 50' in diameter and contains many bright stars loosely concentrated at the center. Telescopic observers are awarded an added treat; at the western edge, but still within the cluster's boundaries, the faint globular cluster NGC 6453 can be seen. How many times have *you* observed M7 without seeing this ghostly globular?

M80 This is a small, tightly concentrated globular cluster which is difficult to resolve into its constituent stars, and then only around the edges. It is seen in binoculars as a fuzzy star.



Region of the Trifid Nebula.

NGC 6231 A fine open cluster, composed of over one hundred stars in a compact 15' area. It actually lies on another spiral arm of our galaxy, closer to the galactic center. According to Burnham's *Celestial Handbook*, if this cluster were at the same distance as the Pleiades, it would appear about the same size as that cluster, but would be about fifty times brighter, with its brightest members shining as brightly as Sirius!

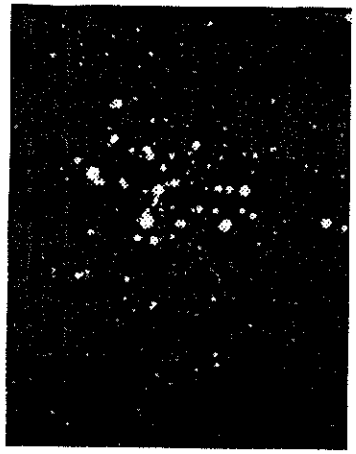
Milky Way. The best view comes in binoculars, which show countless stars and some obvious dark streaks along its length. NGC 6603, which some authors claim erroneously to be M24, lies in its northeastern section. This is a small, tight open cluster bearing no resemblance to Messier's original description.

NGC 6522 & NGC 6528 Anyone who has observed with me will not be surprised by my inclusion of these two faint globular clusters in this article. Every time I observe in the summer, my telescope is at some time pointed at these objects. They are small and moderately faint, but lie within the same field of view of a low power eyepiece in a highly populated region of the Milky Way. The longer they are observed, the more background stars become visible, producing a grainy backdrop for these two twin globulars. A great deep sky double!

NGC 6520 & B86 Another of my personal showpiece objects in Sagittarius. NGC 6520 is a small, rather tight gathering of about twenty stars placed right next to a similarly sized dark nebula, B86. The proximity of the cluster seems to accentuate the darkness of the nebula and make it appear as a hole in the sky, definitely darker than the surrounding region. This dark nebula is commonly known as the Ink Spot because of this.

Scorpius

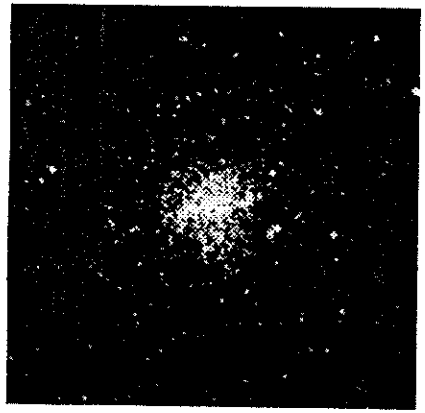
Scorpius is a large and sprawling constellation which lies near the Milky Way, and thus holds many bright open and globular star clusters: a welcome change after hunting down the faint and distant galaxies of the Virgo-Coma galaxy cluster. Both faint reflection nebulae and opaque dark nebulae also abound in this region, particularly in the region between Antares and Rho Ophiuchi. This is due to the fact that we are looking in the direction close to the center of our galaxy. There are many gems in this area, and it is unfortunate for us that



M6. A Magnificent Open Cluster.

the observing season for this constellation is cut short both by the brief summer evenings, and by the constellation's southerly declination.

M4 Lying about 1.5 degrees due west of Antares, this large globular cluster is both easily found, and a treat to observe. It is large, about 15' in diameter and is rather loosely concentrated, letting us resolve its individual stars rather easily. About 8 - 10



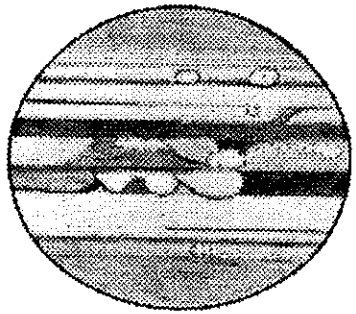
M22. Globular in Sagittarius.

Dawn's Tips on Observing Jupiter

Dawn Jenkins, Cleveland

I thought I would share some of my experience observing Jupiter with others on the ASTRO list. I hope this helps those of you who are just starting out with planetary observing. I also hope that you get clear skies to make observations. I have heard that some of the new features may last more than a month, so sit tight.

For planetary observing with an amateur instrument, use the highest power you find acceptable. Don't underestimate the power of a barlow. I find sometimes a lower power eye piece used with a barlow is better than using a higher power. Although I haven't tried filters on the impacts myself, a blue or yellow filter should add to your observing. I use a pale yellow filter on the planet under "normal" circumstances. I also like neutral density filters Magnification is the key to observing.



Jupiter, October 16, 1962. 8" Reflector. 225X Drawn by Lenny Abbey

Set up early, before sunset. The best observations of Jupiter will come as soon as you can see it. It is in the southwest, of course. If there is a large difference in the temperature of your mirror and the temperature of its surroundings, you may not get a good view until the optics have equalized. (Set Up Early, the session will end soon enough)

Overheard On The Internet

When looking at Jupiter, imagine a line down the center of the disk. The satellites help to determine North and South on the disk because they orbit Jupiter at it's equator (roughly). This is the central meridian of Jupiter. Watch the spots as they hit the center of the disk. The leading edge of a feature is called the preceding edge and the later edge is called the following edge. Times of impact transits over the central meridian should be available from astronomical sources. This is your key to knowing what to look for and which impact you are seeing.

The technique I use to see the impacts is to focus my eye on some spot on the SEB (Southern Equatorial Belt). But I *concentrate* on seeing the details in the south polar area. This is averted vision for planetary observers.

One more thing, sometimes good results can be obtained by making an aperture stop for your telescope. With a 12.5" mirror on a telescope with a conventional spider, a clear aperture of nearly 4" can be obtained. A direct benefit from this arrangement, is that much of the light from the planet is "cut down". Secondly, this will be a clear aperture, with none of the support structure in the way. Some mirrors that suffer from bad edges can get improved results. Making a 12" aperture stop for a 12.5" can make a difference.

What is considered optimum magnification for planetary observing is 30 power per inch of aperture. Because cutting down the aperture of the mirror doesn't change the focal length of the instrument, the same magnification results. On a 10" instrument 100 power is 10 power per inch of aperture. If the aperture is cut down to 2", 100 power is 50 power per inch of aperture. I find the more power per aperture the better. As always, atmosphere and local conditions are limiting factors.

Ritchey's 60-Inch
The First Modern Giant

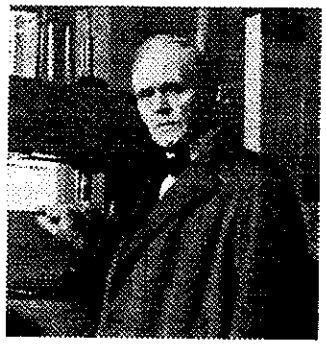
by Lenny Abbey

George Willys Ritchey, son of a pioneer farmer and cabinet maker, joined George Ellery Hale's "telescope team" at Yerkes in 1897. The 40" refractor was almost complete, and Ritchey and Hale planned their next step, a giant reflector. Reflectors had been out of fashion for over 50 years, and nobody knew how to make a large, accurate, glass mirror.

As a test project, Ritchey completed a 24" f/5 which was a spectacular success. It surpassed all existing telescopes in its ability to produce photographs of faint nebulosity. About this time St.Gobain glass works, near Paris, announced that they were willing to attempt a large diameter glass blank. As a birthday present to his son, Hale's father ordered a 60" disk. (What a father!)

The disk was delivered in due course. It was 60 inches in diameter, 8 inches thick, and weighed over a ton. Ritchey designed and built the grinding and polishing machines and set to work. The mirror was begun in the Yerkes optical shop, and finished in Pasadena in 1908.

The telescope, mounted on a huge cast-iron fork, went into service in December, 1908. It was an unqualified success. Edward Emerson Barnard described his first



George Willys Ritchey.

view through it: "The stars looked like jewels on black velvet. The sky was rich and dark, and every star was a glowing, living point of light..." The first photographic plates revealed star images only 1.03" in diameter after 11 hours of exposure. They soon reached stars of the 20th magnitude!

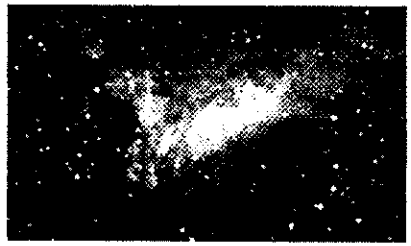
But this telescope was not the final accomplishment of the "telescope team." For before it was completed plans were made for a larger instrument. The 100-inch mirror blank arrived in Pasadena in the same week that the 60-inch saw its first star.

Constellations Of The Month

by Rick Raasch, Dallas

Sagittarius

Sagittarius is the happy hunting ground of the summer observer. Within it lies the very heart of the Milky Way itself, providing vistas which are unparalleled in grandeur and diversity. Our southerly latitude provides us with views unattainable by our more northerly brethren, for whom this constellation lies just along the southern horizon. Diffuse nebulae abound in this region, along with their associated open star clusters. As globular clusters orbit around the center of our galaxy, many of this beautiful class of objects are also found within its boundaries. The recent August issue of *Astronomy* magazine highlighted planetary nebulae in this region, and I highly recommend consulting that article. In the present article, I will only be able to highlight objects which I found to be particularly fascinating, and will almost assuredly leave out somebody's favPorite objects. The truth is, this constellation is worthy of several night's observing, and not just for Messier



M17. The Omega Nebula.

objects. Many beautiful non-Messier objects can be found by examining a star chart and pointing a telescope.

M8 The Lagoon Nebula. One of the finest cluster/nebula combinations in the sky. The large, scattered open cluster lies at the eastern edge of a large, swirling cloud of nebulosity. The nebula has obvious dark lanes and looping patterns, which in long exposure photography are shown to be dense star-forming regions. This is a fine sight in almost any telescope, and is easily seen by both the naked eye and in binoculars.

M20 The Trifid Nebula. This often photographed nebula is rather faint in small telescopes, but in moderate size instruments shows a circular patch of light surrounding a double star. This patch of light is more or less equally divided by three intersecting dark lanes meeting near its center. A fainter region of reflection nebulosity can be seen to the north.

M17 The Omega or Swan Nebula. This is one of my favorite objects in this region. This bright nebula looks like a check mark or swan floating in a heavenly pond. It consists of a curving arc of nebulosity connected to a straighter bar shape. The bar portion shows a lot of intricate mottling and streaks. Photography shows this region to be only a small part of a larger, billowing nebulous region.

M22 This is one of the finest globular clusters in the sky visible from northern latitudes. It is large, about 15' - 20' in diameter, and is rather loosely gathered, allowing us to resolve many individual stars across its face. Some consider this globular to be second only to Omega Centauri in beauty.

M24 The Small Sagittarius Star Cloud. This is a large, disconnected portion of the