

the focal point

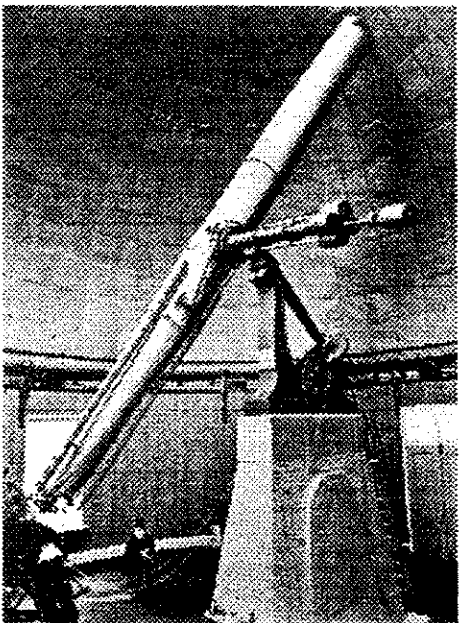
Monthly Notices of the Atlanta Astronomy Club, Inc.

Vol. VII No. 2

July, 1994


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Why is this telescope famous?

See page 12

NEXT MEETING  AT FERNBANK - JULY 15
JERRY ARMSTRONG TELLS ABOUT THE COMET IMPACT
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the focal point

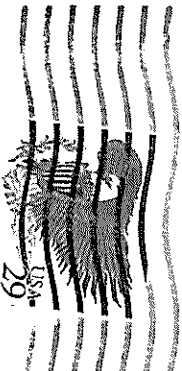
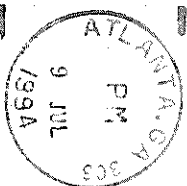
Monthly Notices of the Atlanta Astronomy Club, Inc.

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

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.



First Class

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

9410.

WHAT'S UP

MOON			
Date	Rise	Azi	Age
7/15/94	6:38	13:38	0:22
7/16/94	6:38	14:44	0:25
7/17/94	6:39	15:50	0:25
7/18/94	6:39	16:55	0:27
7/19/94	6:40	17:57	0:28
7/20/94	6:41	18:55	0:29
7/21/94	6:41	19:46	0:30
7/22/94	6:42	20:31	0:31
7/23/94	6:43	21:11	0:32
7/24/94	6:43	21:47	0:33
7/25/94	6:44	22:21	0:34
7/26/94	6:45	22:42	0:35
7/27/94	6:46	23:04	0:36
7/28/94	6:46	23:24	0:37
7/29/94	6:47	23:41	0:38
7/30/94	6:48	23:57	0:39
7/31/94	6:48	24:11	0:40
8/1/94	6:49	24:22	0:41
8/2/94	6:50	24:31	0:42
8/3/94	6:50	24:38	0:43
8/4/94	6:51	24:43	0:44
8/5/94	6:52	24:46	0:45
8/6/94	6:53	24:48	0:46
8/7/94	6:53	24:49	0:47
8/8/94	6:54	24:49	0:48
8/9/94	6:55	24:48	0:49
8/10/94	6:56	24:46	0:50
8/11/94	6:56	24:43	0:51
8/12/94	6:57	24:38	0:52
8/13/94	6:58	24:31	0:53
8/14/94	6:58	24:22	0:54
8/15/94	6:59	24:11	0:55

SUN			
Date	Rise	Azi	Age
7/15/94	6:38	13:38	0:22
7/16/94	6:38	14:44	0:25
7/17/94	6:39	15:50	0:25
7/18/94	6:39	16:55	0:27
7/19/94	6:40	17:57	0:28
7/20/94	6:41	18:55	0:29
7/21/94	6:41	19:46	0:30
7/22/94	6:42	20:31	0:31
7/23/94	6:43	21:11	0:32
7/24/94	6:43	21:47	0:33
7/25/94	6:44	22:21	0:34
7/26/94	6:45	22:42	0:35
7/27/94	6:46	23:04	0:36
7/28/94	6:46	23:24	0:37
7/29/94	6:47	23:41	0:38
7/30/94	6:48	23:57	0:39
7/31/94	6:48	24:11	0:40
8/1/94	6:49	24:22	0:41
8/2/94	6:50	24:31	0:42
8/3/94	6:50	24:38	0:43
8/4/94	6:51	24:43	0:44
8/5/94	6:52	24:46	0:45
8/6/94	6:53	24:48	0:46
8/7/94	6:53	24:49	0:47
8/8/94	6:54	24:49	0:48
8/9/94	6:55	24:48	0:49
8/10/94	6:56	24:46	0:50
8/11/94	6:56	24:43	0:51
8/12/94	6:57	24:38	0:52
8/13/94	6:58	24:31	0:53
8/14/94	6:58	24:22	0:54
8/15/94	6:59	24:11	0:55

OFFICERS AND OTHER DIGNITARIES

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Publicity:	Ken Poshedly	979-9842

Astrophoto (Contrast Enhancement)
by Drarell Green, Burbank, California

What is the one major problem that every astrophotographer faces? Low contrast! This problem has several causes: too short an exposure, poor sky conditions, too much light pollution, and wrong choice of film. And the list goes on. Is there anything you can do to remedy this dilemma? Yes!

The next step is to convert the negative back into a slide. This is where the greatest contrast enhancement is gained. The film of choice for this step of photographing the negative is Kodak 5072 Verticolor Slide

Fujichrome (600)	12 Hours
Konica SR1600	14 Hours

To perform this step I obtained a low cost slide duplicator (about \$80.00). The duplicator fits onto my 35-mm camera in place of a lens. The color negative is inserted into the duplicator and the whole set-up is pointed at a bare light bulb which serves as the light source.

Dr. Marling recommends using a normal 100-watt light bulb. However, in my tests I found that unsatisfactory for two reasons. The relative low intensity of the light resulted in longer exposures, and the resultant slides have a strong blue tint. The light source I finally settled on was the General Electric B1 Photo Flood (BCA-No. 1). This blue light bulb is available in most photo stores. The B1 is a very intense light resulting in shorter exposures, plus it yields a

In deep-sky astrophotography we are often dealing with subjects which have very little intrinsic contrast. Consequently the astrophotographer is constantly striving to increase the contrast of his photos in order to make the details of the subject more pronounced.

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At first glance, this may sound a little crazy.

You begin by shooting your astrophotos with the gas-hypersensitized color film of your choice. You may use either film for prints or slides. But the important thing is always develop the film as a negative, even and it has a colorless base. Kodak 5072 is only available in 100-foot bulk reels. However, Kodak markets a 36-exposure cassette version under the name SC-279.

At first glance, this may sound a little crazy. Would you take a picture with slide film, develop it as a negative, and then re-photograph the negative to turn it back into a slide (which you had in the first place)? Well if you do, don't tell your friends because they will think you are nuts! But there just might be a very good reason for going through that involved process.

THE JUNE MEETING

Between July 16 and 22, Earthbound observers will have the chance to witness the collision of two solar system members, when the shattered Comet Shoemaker-Levy 9 (1993e) is expected to collide with Jupiter.

The Atlanta Astronomy Club has planned a series of events about the comet impact for the general public, including observing sessions at the club's Walter F. Barber, Jr. Observatory in Villa Rica.

On Friday, July 15, at 8:00 p.m., the Club meeting will feature club vice president Jerry Armstrong, local comet-hunter and a co-discoverer last April of the supernova in the Whirlpool galaxy (M51). Jerry's program will be held at the Fernbank Science Center and include an audiovisual presentation about comets in general, his own personal experiences in finding comets and advice for anyone with a telescope who wants to share in this once-in-a-generation experience.

The Club will open its observatory in Villa Rica to the public on Saturday night, July 16, Sunday night, July 17 and again on Thursday, July 21, specifically for those wishing to view the fragment "B", "F" and "V" impacts.

At the end of June, calculations by the Jet Propulsion Laboratory indicated that only a few of the impacts will occur while the planet is visible in Atlanta's night sky:

➤ Fragment "B" will plow into the Jovian atmosphere just after 10:30 p.m. Eastern Time, Saturday, July 16. The impact site should be visible about 30 minutes or so later, just after 11 p.m.

➤ Fragment "F" will impact at 8:12 p.m. Eastern Time, Sunday, July 17, which is just around sunset. The impact site will roate into view by 9 p.m., after sunset.

➤ Fragment "V" will impact about 11:44 p.m. Eastern Time, Thursday, July 21, and the impact site should come into view before 12:30 a.m.

Other comet fragment impacts will occur throughout the day and night from July 16 through the 22, even though the planet will not be visible here.

All of the comet fragments will hit on the dark far side of Jupiter, out of sight from Earth, but close enough to the Jovian terminator that possible disturbances in the planet's cloud bands may become visible a half hour or so later from Earth-based telescopes and the orbiting Hubble telescope as the planet rapidly turns on its axis.

For more information about the observing sessions, contact Eric Shelton.

nice black background. I position the bare bulb about 5 inches away from the aperture of the slide duplicator.

Also through experimentation, I determined that the proper exposure was about one second. This could vary greatly depending upon many factors including f-ratio of the duplicator, the particular emulsions of both the negative and slide films, the light source, and any filters which are being used. It is only through extensive experimentation that the optimum exposure time will be determined. Remember, the longer the exposure, the *darker* the result.

This method also allows you to control color balance. In fact it requires it. Due to the color response of both the original film and the film used to make the slides, the color balance of the end product will be pretty wacky – but this is where the fun comes in! You can now be in complete control of the resultant colors. What you need is a set of 2" x 2" color correcting filters. These filters are available in "units" which designate the density of the particular color. You will probably need a 10, 20, and 40 of each of the colors of YELLOW, MAGENTA, and CYAN. They are designated CCuu; where CC is the "color correcting, uu is the density, and c is the color. For example a filter of 20 units of yellow would be CC20Y.

The filters are placed between the light source and the negative being photographed. Again, experimentation will be required to determine the proper filter "pack" for each negative emulsion you use.

Color to		
Remove	Add	Subtract
Blue	Cyan + Magenta	Yellow
Red	Yellow + Magenta	Cyan
Green	Cyan + Yellow	Magenta

(Note: If at all possible always *subtract* the filter. *adding* a filter increases density and therefore exposure. And, never have all three colors in the filter pack as this increases the neutral density and exposure.)

This technique may seem like a lot of work. But it is worth it!

Once you have determined the proper filter pack for a particular negative type, write it down so you will have a good starting point next time. For KONICA SR1600 or FUJICHROME 400 color negatives and a B1 photo flood here are the filter packs I use:

- Galaxies - CC20C
- Nebulae - CC20C + CC10M

With a 100-watt white light bulb here are the starting filter packs used by Dr. Marling:

Film	Yellow	Mag.	Cyan
Konica SR1600	40	10	00
Kodak VR200	10	30	00
Kodak VR1000	00	00	20
Fujichrome RD100	30	10	00
Fujichrome 400	40	10	00
Fuji HR1600	00	00	00

Obtaining the correct color balance is probably the most difficult part of the whole process. It requires extensive trial-and-error testing. However, once you have established the correct filter pack for your particular configuration of films and lights you can get slides of celestial objects that look like you think they should look.

This technique may seem like a lot of work. And it is! But, if you want to obtain a near-black sky background and higher

RAC ACTIVITIES

TREASURER'S REPORT

by Alex Langoussis

One of the benefits of club membership is getting magazine subscriptions at reduced rates. If you get *Sky and Telescope* through the club, you pay only \$20, a savings of \$7. *Astronomy Magazine* is \$18 a year, a savings of \$6 from the regular subscription price. Besides being a way to pass the time during the opaque summer nights, the magazines are an excellent way to keep up with new astronomical theories, discoveries and events.

I will send in subscriptions monthly on the Monday after the club meeting. This will allow the fastest order processing for the most members. Those wishing to subscribe or renew may pay at the meeting, or send the money to the address below. To those renewing, please include the renewal card sent by the publisher. Because these publishers can be slow, you may wish to send in your renewals quickly in order to avoid missing any issues.

Membership dues and magazine subscriptions should be sent to the following address:

Atlanta Astronomy Club, Inc.
3595 Canton Rd. Ste. A9-305
Marietta, GA 30066

Terry McHann has been doing a wonderful job every month supplying the delicious snacks at our meetings. Please be generous when donating to the kitty. We're not trying to make money on this, but we don't want to fall short every month, either!

David Levy, co-discoverer of the Jupiter Comet, will be autographing books at the Nature Company (Lenox Square) from 12:00 - 1:30 on July 13th. If you are unable to get there, but would like to get an autographed book, give me a call at 429-8384.

Where Credit is Due...

Readers have probably noticed that the meeting notices (and meeting reports) are a little easier to read. That is because they are now written by Ken Fosheddy, who is a writer and publisher during the day. The Focal Point, and the Club, are fortunate to have Ken available for these notices, and for the Club's general publicity as well. Thanks, Ken!

contrast photos this is the way to do it. I am convinced that this method results in substantially better astrophotos and I now use it exclusively. Even when I shoot astrophotos with slide film, I still develop them as a negative and then take them through the conversion process. The results are definitely worth the effort.

SUMMARY

- Step 4: Re-photograph negative with Kodak 5072 or SO-279 using duplicator.
- Step 5: During Step 4, balance color if necessary and record all data.
- Step 6: Develop final result in C-41 and display PROUDLY!
- Step 1: Hyper color film of choice.
- Step 2: Photograph object.
- Step 3: Develop film using C-41 process or equivalent - BOTH slides and negatives.

OVERHEARD ON THE INTERNET

RON FLORENCE COMMENTS ON LAST MONTH'S ARTICLE ON THE SNOW TELESCOPE

Lenny Abbey writes:

The Snow telescope [...] was the first major instrument produced by Ritchey, who later produced the optics for the 60" and 100" telescopes.

Ritchey began the grinding and polishing of the mirror for the 100-inch Hooker telescope. He was relieved from all responsibilities for the optics of the telescope in 1916, and the mirror was finished by other opticians at the Santa Barbara Street optics lab of the Mount Wilson Observatory. After he was fired,

Ronald Florence
ron@mflfarm.com

For more details on this story, see my forthcoming "The Perfect Machine" (Harper Collins, 1994), which should be in bookstores in early September. The focus of the book is the 200-inch Hale telescope, but there is quite a bit of material on the 100- and 60-inch telescopes. You'll find another perspective on Ritchey in Donald E. Osterbrock, Pauper & Prince (University of Arizona, 1993).

Ritchey declared that the 100-inch mirror blank was fundamentally flawed and could never be figured into the required surface. Fortunately, he was wrong.

it will not be directly observable. The splash will be heavily enriched with cometary volatiles such as water or ammonia, and so may contribute to significant high hazes.

Meanwhile, the downward moving shock wave will heat the local clouds, causing them to buoyantly rise up into the stratosphere. This will allow spectroscopists to attempt to directly study cloud material, a unique opportunity to confirm theories of the composition of the Jovian clouds.

Furthermore, the downward moving shock may drive seismic waves (similar to those from terrestrial earthquakes) that might be detected over much of the planet by infrared telescopes in the first hour or two after each impact.

The strength of these two effects remains a topic of research. The disturbance of the atmosphere will drive internal gravity waves ("ripples in a pond") outwards. Over the days following the impact, these waves will travel over much of the planet, yielding information on the structure of the atmosphere if they can be observed (as yet an open question).

The "wings" of the comet will interact with the planet before and after the collision of the major fragments. The so-called "wings" are defined to be the distinct boundary along the lines extending in both directions from the line of the major fragments; some call these 'trails'. Astronomers Sekanina, Chodas and Yeomans have shown that the trails consist of larger debris, not dust: 5-cm rock-sized material and bigger (boulder-sized and building-sized).

Dust gets swept back above (north) of the trail-fragment line due to solar radiation pressure. The tails emanating from the major fragments consist of dust being swept in this manner. Only the small portion of the eastern debris trail nearest the main fragments will actually impact Jupiter, according to the model, with impacts starting only a week before the major impacts. The western debris trail, on the other hand, will impact Jupiter over a period of months following the main impacts, with the latter portion of the trail actually impacting on the front side of Jupiter as viewed from Earth.

The injection of dust from the wings and tail into the Jovian system may have several consequences. First, the dust will absorb many of the energetic particles that currently produce radio emissions in the Jovian magnetosphere. The expected decline and recovery of the radio emission may occur over as long as several years, and yield information on the nature and origin of the energetic particles. Second, the dust may actually form a second faint ring around the planet.

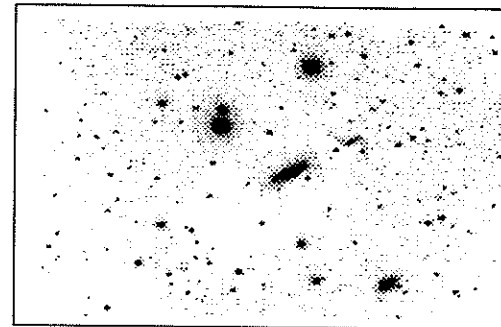
One might be able to detect atmospheric changes on Jupiter using photography or CCD imaging. It is important, however, to observe Jupiter for several months in advance in order to know which features are due to impacts and which are naturally occurring. It appears more and more likely that most effects will be quite subtle. Without a large (> 15" ?) telescope and good detector, little is likely to be seen.

It is possible that the impacts may create a new, temporary storm at the latitude of the impacts. The 21 nuclei of comet Shoemaker-Levy 9 will strike just south of the South Temperate Zone of Jupiter. Reta Beebe of New Mexico State points out that if the nuclei penetrate deep enough, water vapor may shoot high into the atmosphere where it could turn into a bluish shroud over a portion of the South Temperate Zone.

Tim And Jerry's Excellent Adventure At The Texas Star Party

By Jerry Armstrong

The 1994 Texas Star Party was the biggest ever, with a total attendance of over 800. One reason for this spectacular turnout was the annular eclipse of the Sun that occurred on May 10th. The center line passed near the Texas-New Mexico state line and taking in the eclipse required only a short a side trip.



The NGC 3190 group. NGC 3187 is the galaxy with right-angle arms.

Tim Puckett and I spent 24 hours driving to the Prude Ranch, the TSP's location. We arrived around noon on Sunday, May 8. Due to the number of wires we had to string for our telescope and CCD camera, we chose a spot in the upper corner of the "football field", outside the largest conglomeration of telescopes. We did not want our little electrician's nightmare to cause an accident in the dark! Our location did have a slightly negative effect, as was evidenced by the few visitors we had at first. They found us later!

During our stay we were joined by Phil Bracken and Dave Riddle. This was convenient, as we were able to convince Phil to let us use his tent for our "control room." Both of us brought computers and we used Tim's computer-controlled 8-inch Meade LX200 as our main instrument. We used the ST-6 CCD camera (the same one we used for our discovery of the supernova in M 51). We also brought along an assortment of books, atlases, and computer programs for reference. Several people remarked that the interior of the tent looked like the cockpit of a 747! I wonder what these folks would say if they could see our control room at home, with its four computers, micro-fiche and additional monitors?

Unfortunately, the weather was very uncooperative. Large thunderheads began to gather in the late evenings and diminished our observing opportunities considerably. We had better conditions on the last two days and were able to secure thirty-five images. Tim remarked that he had never seen the Milky Way as it appeared from Texas, and I must say it was a magnificent sight. The star clouds stood out vividly. M8 and other usually-faint objects were easily visible to the unaided eye.

We decided that we would use a telecompressor, which reduced the focal ratio to approximately $f/4.5$. We were then able to capture some unique images which would have been impossible with the 16-inch $f/6$. One of our first images was the NGC 3190 group of four galaxies. The faint extensions of NGC 3190 were plainly visible. Another of the better images was M51. Almost everyone is familiar with M 51, so we decided to make a

"Astronomical Book Collecting: The Lunar 2 VHS cassettes of most sessions for sale for only \$15.

Besides the formal stuff, Roper Mountain Astronomer Doug Cegen's thorough program on "The War of the Worlds Telescope: The 23-inch Alvan Clark Refractor,"

came to total demise. It started at Princeton University, later became the property of the U.S. Naval Observatories and was totally disassembled, crated and shipped out to the southwestern U.S., then later given to the Roper Mountain Science Center on a fluke. There's so much more to the convention that would make this article far too long, but I do have for sale a 12-hour package of

Observers:
Please make checks payable to Ken Poshedly. All net proceeds will be donated to the Association of Lunar and Planetary

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More on the Comet... Exactly What Will Happen?

(Excerpts from the "Frequently-Asked Questions About Comet Shoemaker-Levy9" document on the Internet sci.astro newsgroup.)

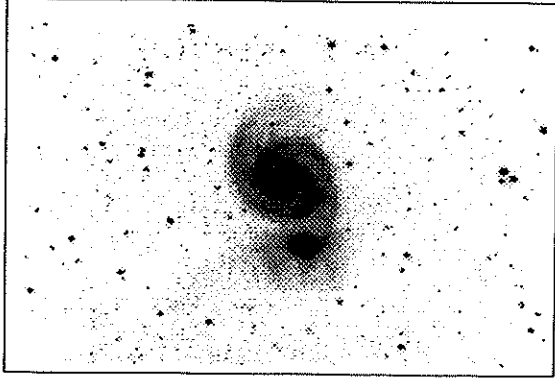
Each comet fragment will enter the atmosphere at a speed of 130,000 mph (60 km/s). At an altitude of 100 km above the visible cloud decks, aerodynamic forces will overwhelm the material strength of the comet, beginning to squeeze it and tear it apart. Five seconds after entry, the comet fragment will deposit its kinetic energy of around 10^{28} ergs (equivalent to around 200,000 megatons of TNT) at 100-150 km below the cloud layer. Bigger fragments will have more energy and go deeper. The hot (30,000 K) gas resulting from the stopped comet will explode, forming a fireball similar to a nuclear explosion, but much larger.

The visible fireball will only rise 100 km or so above the cloudtops. Above that height the density will drop so that it will become transparent. The fireball material will continue to rise, reaching a height of perhaps 1000 km before falling back down to 300 km. The fireball will spread out over the top of the stratosphere to a radius of 2000-3000 km from the point of impact (or so the preliminary calculations say). The top of the resulting shock wave will accelerate up out of the Jovian atmosphere in less than two minutes, while the fireball will be as bright as the entire sunlit surface of Jupiter for around 45 sec.

The fireball will be somewhat red, with a characteristic temperature of 2000 K - 4000 K (slightly redder than the sun, which is 5000 K). One series of simulations indicate that virtually all of the shocked cometary material will rise behind the shock wave, leaving the Jovian atmosphere and then splashing back down on top of the stratosphere at an altitude of 300 km above the clouds. Not much mass is involved in this splash, so

longer exposure in order to record the faint extensions of the companion galaxy. Actually we did not know what would show up, but with a little manipulating of the CCD files the faint arms were obvious.

One of our favorite images from the party was the comet P/Shoemaker-Levy 9 (1993c) that is to strike Jupiter later this summer. Even though this exposure was made with an 8-inch telescope, we were surprised at the quality of the small-scale image. The comet appears to emerge from the small spiral galaxy IC 991.



M51, showing the extensions from the companion galaxy. Notice the loop originating in the galaxy's main arm and curving back to the companion. With some imagination the loop appears complete.

There was plenty to do at the TSP and after a week one becomes afflicted with SPS (Star Party Syndrome), which is manifested by such symptoms as grogginess, blood-shot eyes, and mindless babbling. The annular eclipse of the Sun on May 10th didn't help matters. It only enhanced our SPS. We drove for about three hours to the site we had chosen. As we started, the sky was clear. But after only one hour on the road, it began to cloud up. By the time we arrived there was a solid overcast and it was raining!

Our pre-selected site was none other than Carlsbad Caverns, which we planned to visit after the eclipse. We wanted to know if the bats might emerge during the eclipse, but we never found out. We raced northward in an attempt to find a hole in the cloud cover, but I spoke with one of the park rangers and remarked that nature had dealt us a cruel blow. He told me it is usually clear there and that a solid overcast is rare. However, he did venture that "we needed the rain!" I explained to him that it can rain on any day of the year, but that his grandchildren's grandchildren will probably not have the opportunity to view an eclipse from Carlsbad Caverns. After explaining to him just how an eclipse occurs he agreed that maybe the rain should have waited a day.

After our eclipse expedition we headed down into the cavern, which was a wonderful experience. Carlsbad Caverns is an easy cave to explore, and our enjoyment of it mitigated our disappointment at not being able to see the eclipse. On another trip we spent most of a day visiting Big Bend National Park. All four of us partook in the delightful game of skip-ping stones across the Rio Grande. Unfortunately, none of them made it into Mexico. Again the scenery was spectacular, with the Rio Grande slowly flowing between desert scenery and majestic high cliffs.

By Wednesday afternoon our SPS was so advanced that we were forced to take a nap...or so we had hoped. Unfortunately this was not to be! We were staying in a bunk

Highlights of the 44th ALPO Convention in Greenville, South Carolina June 15 - 18, 1994

by Ken Poshedly

Okay, you've got that new telescope or, you finally know how to use it and are now wondering "what next?"

If it's solar system observing you're interested in, "next" should be membership in the Association of Lunar and Planetary Observers. This organization was featured in a recent issue of *Sky & Telescope* magazine, so I won't try to duplicate that splendid write-up here.

The group's gathering in Greenville, South Carolina, in mid-June featured presentations of papers, evening sky gazes and social get-togethers that made it a most enjoyably long weekend for me.

The speakers came from all walks of life – professional astronomers and others not professionally involved, but who all share the enthusiasm of contributing detailed observational data to this organization. And they know this data won't just sit in a drawer someplace but will be used by professionals in future studies.

If you're a novice at observing, don't fret, Matthew Will's talks on "The New A.L.P.O. Lunar and Planetary Training Program: A Fresh Start," and his workshop in "Getting Started in Solar System Observing" showed just how interested the organization is in helping even the unsure observers on the how-to's of using their equipment.

Here's a brief rundown of the talks – all of which were accompanied by overhead slides, photo transparencies and/or videotapes:

Are you really into lunar observing? Harry Jamieson's talk on "Domes in the Hortensius-T.Mayer Cluster" was food for

thought on doing more than just scanning the terminator every other night or so. Those familiar with ALPO already know that the lunar dome survey has been a major project with this organization for many, many years.

And if you're a CCD-enthusiast, talks by Jim Phillips ("CCD Imaging: If I Can Do It, Anybody Can"), John Westfall ("Lunar Surveying with a CCD Camera"), and Don Parker ("The Amateur/Professional Mars CCD Project") were right up your alley with loads of tips and tricks.

Got the "video bug"? Dan Troiani covered the "Video Mapping of Mars" which was followed by a video astronomy workshop.

Yes, there was a great set of videotapes shown and lots of discussion about the May 10 annular solar eclipse.

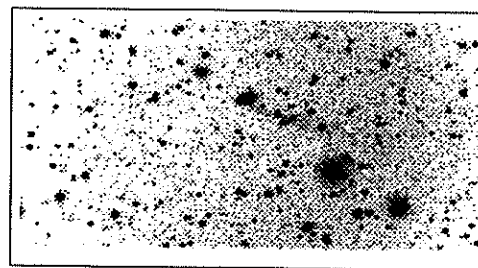
Planet Jupiter received a lion's share of attention with Philip Budine's "Brief History of the Great Red Spot and the STB Long-Enduring Ovals", Jose Olivarez's "Recent and Current Activity on Jupiter," and two workshop/panel discussions on "Comet Shoemaker-Levy9 Impact Observations."

The planet Mars was also covered in Jeff Beish's "The 1994-95 Aphelic Apparition of Mars – Things to Come"; while Saturn was the topic of Julius Benton's "Observational Prospects for the 1995-96 Apparition of Saturn and the Edgewise Presentation of the Rings."

Rich Schmude detailed observations gathered on Uranus and Neptune from 1989 through 1994, and Jose Olivarez returned to present a super talk with slides on

house and the snoring that went on was beyond description. This was probably the only real down side of our entire stay and if I ever go back (and I do intend to go back) I will NOT sleep in the bunk house!

The meals were interesting. They were "healthy." If you like cauliflower, squash, broccoli, and their assorted crunchy cousins, you will love the TSP. As for me, I don't mind saying it did taste good; but I'm a typical Southern boy at heart, and I love good wholesome junk food!



Comet P/Shoemaker-Levy 9 (1993e)

If you plan to go to the TSP be sure you bring something to cover your telescope and equipment with. Not only does it rain but the dust is everywhere. I know that may sound strange, but when you get there you'll understand about the dust and rain. Take my word for it and bring a tarp.

Our third side trip was a visit to McDonald Observatory which is only a few miles away. There we met Bill Wren (discoverer of supernova 1992H) who guided us on a tour of the 107-inch and the Struve 82-inch reflectors. Tim and I left the observatory with several ideas about the 24-inch telescope we have under construction

We took approximately thirty-five images, and the image quality was impressive. It was a pleasure using the 8-inch on loan from Astronomical Enterprise (a small advertisement here!), and it was fascinating to watch the little telescope in action as it slewed from one object to the next. We brought the Project Pluto Guide, which helped in locating the faint objects we wanted to image. If the telescope was set up properly (at $f/4.5$), our prey was in the center of the field each time. Some others, who were also imaging with an eight-inch, did not record more than two or three objects. I don't profess that we were experts, but the $f/4.5$ focal ratio plus the Pluto Guide helped tremendously in acquiring the images. We concentrated on objects that required either a large field of view or a fast focal ratio.

There were many speakers, but the highlights were Dr. Paul Hodge of Washington State University and Steven J. O'Meara of *Sky & Telescope*. Dr. Hodge gave a delightful lecture on his specialty, the Andromeda Galaxy. Steve O'Meara talked about Atmospheric Phenomena. Now this subject may at first seem out of place or even boring, but it did relate to astronomy and it was anything but boring. His illustrations on cloud and atmospheric phenomena were incredible. Dr. J. Whipple (no relation to Dr. Fred Whipple...I know because I asked), gave a talk on the impending crash of P/Shoemaker-Levy 9 into Jupiter. As I am a comet observer this is the talk that interested me most.

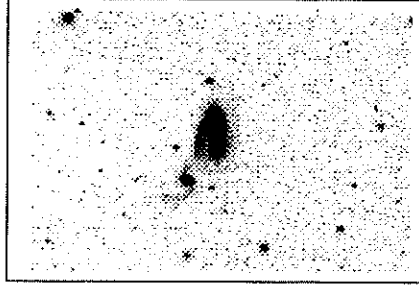
As the last day rolled around Tim and I were persuaded to enter the astrophoto contest (against our will, of course!). We hurriedly put together some images we had taken over the last couple of years, and submitted them. (There was no requirement as to when or where the images were made.) I even loaned the judges my computer to view the images with. One of the judges was Brian Skiff whom I had met several years earlier at Lowell

that there were many old buildings in the Yard, but nobody was very familiar with them. He recalled that there was an old employe here who had at one time made a study of the Yard's history, but he was now dead or retired, no one was sure which. At this point the explorer within us rebelled, and we decided to visit the Navy Yard in person to seek out the hallowed spot. After all, who was better qualified to recognize an ex-observatory? After a mean-dering, error-ridden journey through parts of Virginia, Maryland, and the District of Columbia, we finally located the Yard. A lens which had once belonged to the Naval Observatory. At f/16, this lens would have a focal length of 13-feet, fitting rather nicely into the Bureau of Medicine's modest dome.) Further investigation revealed a likely solution to the problem. Extending south from the small dome was a narrow room, about 100 feet long. This must have been the transit room, hence the name "Old Transit House". The Washington Meridian, which was almost selected as the Prime Meridian, must have been defined by the instruments in this room. At the southern end of the transit room is a large circular room approximately 50 feet in diameter. This would in no way cramp the style of a 35-foot telescope tube. The room is at it, was located on the top of a modest hill. This was a good sign. When we had found the main building, we asked for the Public Information Office, and were ushered into the office of the Assistant Surgeon General, who doubled in this capacity. This, he told us, was indeed the site of the original Naval Observatory. The building next door had once housed the Great Refractor. Looking out his window, we saw our goal: a shining silver dome atop a rather large building.

Asaph Hall and Alvan Clark have been gone for many years, but to stand on this spot is to remember their achievement, and to somehow share in their great discovery. It is an experience to be recommended to everyone.

The building is now used for office space. Even though the dome still sits regally above the roof, the observing room below is now used as a reception room for several offices. No trace of the telescope's old pier remains. The wheels have been removed from the dome, and it is bolted in place. A number of large pictures about the

room commemorate the telescope and that famous night ninety-five years ago. But something was wrong. A 26-inch, f/16 refractor would have a focal length of almost thirty-five feet. This room was a scant twenty-five feet in diameter. As the twenty-six inch was not part of the observatory's original equipment, it was reasonable to assume that there had been another, smaller equatorial refractor which dated from its inception. (A later trip to the Smithsonian Institution revealed a 9.5-inch lens which had once belonged to the Naval Observatory. At f/16, this lens would have a focal length of 13-feet, fitting rather nicely into the Bureau of Medicine's modest dome.) Further investigation revealed a likely solution to the problem. Extending south from the small dome was a narrow room, about 100 feet long. This must have been the transit room, hence the name "Old Transit House". The Washington Meridian, which was almost selected as the Prime Meridian, must have been defined by the instruments in this room. At the southern end of the transit room is a large circular room approximately 50 feet in diameter. This would in no way cramp the style of a 35-foot telescope tube. The room is at it, was located on the top of a modest hill. This was a good sign. When we had found the main building, we asked for the Public Information Office, and were ushered into the office of the Assistant Surgeon General, who doubled in this capacity. This, he told us, was indeed the site of the original Naval Observatory. The building next door had once housed the Great Refractor. Looking out his window, we saw our goal: a shining silver dome atop a rather large building.



Arp 84, a tidally-distorted galaxy.

Observatory, where he is a resident astronomer. I warned Tim not to get his hopes up because Brian is a very demanding astronomer and judges astro-photos with a critical eye. We were very pleased when it was announced that Tim and I had indeed won the CCD Imaging Award! Our entry was Arp 84, a double spiral galaxy with tidal distortions (illustrated here). After the award ceremony came the door prizes and I won a six inch Byers gear and worn.

We finished up our last night in the "control tent" with the flight director of Shuttle High STS-61 and friends from the Webb Society (England) enjoying the images we had taken. The final night was cloudy so we were unable to acquire more images. Our new-found British friends were delighted at our photos, and instead of going "ooohhh" or "aaahhh" they would simply exclaim, "My! Isn't that a PEACH!" We were very pleased to be able to share our images with them and as a token of our friendship we gave them approximately eight-five images to carry back with them to England. Don Milles said he thought they will probably be able to use them in their publications.

We finally got to bed around 2:00 a.m. and after some much-needed sleep began packing for the long drive home. This time we set out at a leisurely pace, but it still took over twenty-three hours.

To sum it all up, I would have to say that the TSP was an experience which will not soon be forgotten. I would recommend the trip to anyone interested in the stars.

IT HAPPENED IN JULY

- July 9, 1979 - Voyager has closest encounter with Jupiter at 71,400 km.
- July 20, 1969 - Apollo 11 lands astronauts on the Moon, in Mare Tranquillitatis (Armstrong, Aldrin, Collins).
- July 20, 1976 - Viking 1 lands on Chryse Planitia, Mars.
- July 25, 1978 - Viking 2 orbiter ceases operation.
- July 29, 1958 - NASA officially came into existence.
- July 30, 1971 - Apollo 15 lands astronauts on the Moon at Hadley Rille (Scott, Irwin, Worden).

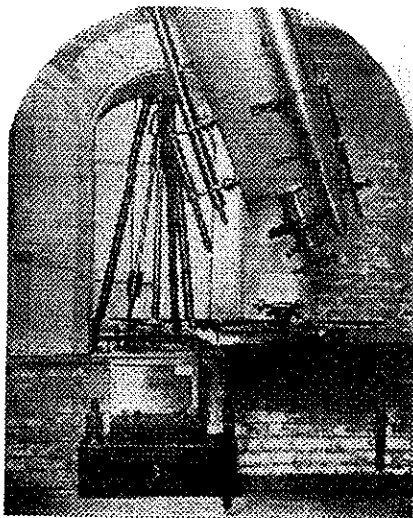
The Washington Refractor - A Journey Into History

by Lenny Abbey

Anyone who has studied history in high school or college knows that a text book is a poor source of education. The images conjured up by even the most skillful of writers are at best fleeting. You are lucky to remember them until exam time. On the other hand, experience is a powerful teacher. An actual visit to the scene of a great event enables you to take home a memory which will live for years. The sites of many historical events have been preserved for our education and enjoyment. The scenes of other historical events, perhaps of less interest to our teachers, have been forgotten, and put to other uses. Finding these places, many of which may be of importance to you, even if not to the general population, can be a rewarding experience.

Your editor recently (1972) made a trip to Washington, D.C. A highlight of this trip was to be a visit to the original location of the Naval Observatory's 26" refractor, where Asaph Hall discovered the satellites of Mars in 1877. The 26" refractor was at the time the largest refracting telescope in the world. It was Alvan Clark's first really large instrument, and it was this telescope that catapulted the Clarks to fame. Though the big refractor now enjoys a modern mounting on the outskirts of Washington, it was originally located in a building in town, "near the river and the Navy Yard", as one history book put it. That was our only clue.

Before departing for the nation's capital, a long-distance phone call was made to Bob Wright, President of the Astronomical League, and long a resident of the D.C. area. He said that he would be out of town while we were there, but would find out what he could about the old observatory.



The Washington Refractor. Detail of the Clock Drive.

We arrived on a very rainy day. Bob Wright had left a message that the original Naval Observatory, now called "The Old Transit House", was part of the present Navy Bureau of Medicine and Surgery, near the Lincoln Memorial. Calling the Navy Bureau of Medicine and Surgery, we were told that no one there was really sure which telescope had actually been located on the grounds. Now a "Transit House" surely does not suggest a very large refractor, and besides, the Lincoln Memorial is nowhere near the Navy Yard. We decided to gamble on a visit to the Navy Yard.

A quick call to the Pentagon – if you have ever called the Pentagon, you know how funny that is – resulted, after a number of transfers, in a conversation with the Navy's Public Information Office. They said

The Star Hill Inn, Or, What I Did Over My Summer Vacation

By Sheldon Cohen, Knoxville

This is a report on the Star Hill Inn, which my wife and I and our two daughters visited for five days at the new Moon in early August, 1989.

The Inn, billed as "an astronomer's retreat," has a mailing address in Sapello, New Mexico, but since Sapello (pronounced "Sapeyo") is essentially a grocery store, we might as well say it's almost ten miles north of Las Vegas, which in turn is about 60 miles east of Santa Fe via Interstate 25. The Inn is at 7200 feet, in the foothills of the Sangre de Christo mountains.

Entry is by a 2.5 mile gravel road you can see in the film "Red Dawn" – the scene where the little tykes jump out of spider-holes to ambush the enemy. (The film producers added a prop gas station.) The setting is very pleasant and wooded.

Once on the grounds proper we found a large but cozy red-light warming cabin equipped with sofas and desks, coffee makers with reloads of coffee, tea, and cocoa, a weather radio, an astronomy library, and, for cloudy nights, a VCR and a chess set. The library had *Burnham's, Sky Atlas 2000*, and a lot of standard resources – the only books I had brought that it didn't have were *Uranometria 2000* and *Sky Catalog 2000*.

Adjacent to the warming cabin is the viewing area, with pedestals rising through a deck for the Inn's Meade and Celestron rental scopes – Star Hill has a rental 8" LX2, 10" LX6, and 8" Celestron Compustar – and a large concrete pad for folks who bring their own scopes (electricity is available) and for the Inn's rental 13" Odyssey. (The pedestals can also be used by people

who bring their own scopes – contact Star Hill for information about available adapters.) In an adjoining cabin with a roll-off roof we examined the massive fork mount that will handle the Inn's rental CAT-equipped Observatories International 24" SCT. Unfortunately, there was a problem with this thing's mirror, which during our visit was in Flagstaff being refigured by Dave Dodgen. It was due back in late August.

Further on down the road, shielded by trees, are the cabins. In front of one cabin we saw a car with Arizona tags that said "C-11." Guess what kind of scope they had? These nice folks said the Star Hill skies were better than theirs, which are in Tucson or Phoenix (they knew which – my memory is faulty). They had already made reservations at Star Hill for next summer.

There are two cabins, each divided into two units. Three of these units rent to guests. The fourth is a darkroom equipped for B/W and color, which rents for \$5/hour plus the cost of chemistry and paper.

All the cabins are a year old. Our unit had a living-kitchen room, a small bedroom, a bathroom with shower, and a porch with hanging plants visited daily by hummingbirds. The living room sofa opened into a bed where our kids slept. The kitchen had an electric stove, oven, refrigerator-freezer, toaster-broiler, and Mr. Coffee machine, and the whole cabin was pleasantly decorated, clean, and quite decent for cooking, eating, and hanging around, though had our family had a fifth member it would have been cramped. Pots, pans, dishes, glasses, bedding, and so on are provided. There was a wood stove for charming heat,

Cabins rent for \$65/night for one person, with an extra \$10 for every other person over 12. The minimum stay is two nights. Equipment rental fees are:

Meade 11 X 80 or 20 X 80 binocs -

\$3/night,

8" LX2 - \$4/hour or \$12/night

8" Compustar - \$6/hour or \$18/night

10" LX6 - \$6/hour or \$18/night

13" Odyssey - \$3/hour or \$10/night

24" SCT - \$10/hour or \$40/night

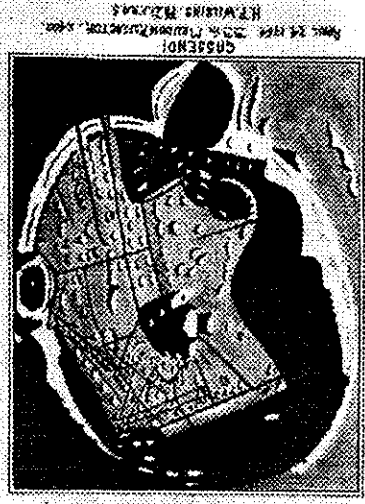
Weekly rates are available.

Sheldon Cohen is an amateur astronomer in Knoxville, Tennessee. When he is not observing, or participating in Computer's Astroforum, Dr. Cohen is a professor of philosophy at the University of Tennessee.

is set up for astronomy and astrophotography - their line about "an astronomer's retreat" is no gimmick. And my non-astronomical kin enjoyed the hiking, the nearby horseback riding, day trips to Santa Fe, the smell of the woods, and the sense of peaceful, pine-forested, seclusion.

The Mahons are fine people, and went out of their way to make our stay pleasant. We also liked their dog, Sullivan. But for those of us accustomed to observing from road shoulders, perhaps the best part of being at Star Hill is the feeling of being among your own kind, in what really is a private astronomy retreat. There is something wonderful about being able to set up, wander up to your cabin to check on the family, and then wander back to rejoin the observers.

If you go there, be sure to grab a Mexican meal at the Spic and Span Bakery and Cafe in Las Vegas, and take a few loaves of their bread back to your cabin. Las Vegas has several other amenities, including a K-Mart.



CRATER GASSENDI
 10000 10000 10000
 H. P. WILKINS, 1954

The lunar crater Gassendi as seen through the 33" refractor at Meudon. Drawn by great British selenographer, H. P. Wilkins. Dr. Wilkins visited Atlanta in 1954, and spoke to an AAC meeting which was attended by over 500 people! The next day, he agreed to meet with a 16-year old lunar observer named Lemmy Abbey. At the end of their conversation Lemmy was presented with this drawing, which appears in Wilkins' last book *The Moon*, which he wrote with Patrick Moore. In the early 50's Wilkins produced a 300" map of the Moon, which was the standard map until the U.S. Coast and Geodetic Survey assembled a more accurate one from spacecraft photos.

and a real heating system for plain heat, though during our stay the nights were only pleasantly cool.

If you're hungry, sober, and angry, the little grocery store in Sapello will sell you hot dogs and buns, a fifth of bourbon, and a loaded .38 caliber revolver. This is the west. For more serious shopping you go to Las Vegas.

Summer is their rainy season and our first two nights were cloudy, but the weather broke up on our third night, and stayed clear for our remaining two nights. Unfortunately, I had torn a muscle in my chest the day before we set out on our 2 1/2 day drive, and I was barely able to bend for the whole five days.

Now here's a puzzle for atmosphere maintenance. The first clear night I could hardly bend my neck, and it was all I could do to handle my Celestron Classical 7 X 50's. With me at the viewing area was a very nice amateur from Minneapolis, testing his newly-built 12.5" Dobsonian. He normally views from a Minneapolis suburb. I live in Knoxville, Tennessee, and normally view from foothills 40 miles out of town, overlooking the Great Smoky Mts. National Park. My sky is, by average eastern standards, muggy but dark. His, he said, is typically suburban. The puzzle is that neither of us thought the sky at Star Hill was very dark. In fact, neither of us thought the LX6 the last night, but my guiding was poor and I realized later that my Konica 3200 had expired 12 months earlier. I threw out the results, chalking up my problem to fatigue on two shots and to the film on the third - a 20-minute exposure of M31 that showed less dust banding than appears on shots I've taken in Tennessee, same exposure, with my 8" LX3 and a Lumicon D6.3 reducer. In the past I never paid much attention to film expiration dates - could it be that K3200 dates need to be treated more seriously?

I tried astrophotography with the 10" LX6 the last night, but my guiding was poor and I realized later that my Konica 3200 had expired 12 months earlier. I threw out the results, chalking up my problem to fatigue on two shots and to the film on the third - a 20-minute exposure of M31 that showed less dust banding than appears on shots I've taken in Tennessee, same exposure, with my 8" LX3 and a Lumicon D6.3 reducer. In the past I never paid much attention to film expiration dates - could it be that K3200 dates need to be treated more seriously?

As I said, I wasn't in peak form. The important thing is that the Star Hill Inn really

has ever seemed to me in Tennessee. I had brighter than any portion of the Milky Way - an incredibly obvious naked eye object - that dark the North American Nebula was

Similarly, though the sky didn't seem that dark the North American Nebula was brighter than any portion of the Milky Way - an incredibly obvious naked eye object - that dark the North American Nebula was