THE FOCAL POINT

Vol. III, No. VI *The Newsletter of the Atlanta Astronomy Club* **March 1991**

CLUB CALENDAR

Next Meeting: March 15, 1991, 8:00 P.M. at the Fernbank Science Center in Classroom 1. (**Not** Bradley Observatory)

Program: The speaker will be Jim Buckley. He is a meteorologist at Fernbank Science Center who will present a talk entitled "Weather and Astronomy". He will discuss how the amateur astronomer (or anyone else) can better predict the weather given information which is normally available.

Editor: .....Dr. Mike Kazmierczak
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The Focal Point is published monthly during the academic year by the Atlanta Astronomy Club, Inc. The AAC is a non-profit organization dedicated to the advancement of amateur astronomy. Meetings are held on the third Friday of each month (the second Friday in December) at the Bradley Observatory on the Agnes Scott College campus. Dues are $35 annually and include a subscription to *Sky & Telescope* magazine and use of the observatory in Villa Rica.

Submissions: Article submissions are welcome and encouraged. Please deliver to the editor for consideration. Electronic submissions are accepted at mike%beow.uucp@gatech.edu. The submission deadline for the next issue is *April 10*.

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REPORT OF LIGHT POLLUTION COMMITTEE

by Tom Buchanan, Chairman

On December 5, 1990, the Fulton County Board of Commissioners adopted modifications to the sign ordinance. Article 33.4.8 reads as follows:

"SIGN LIGHTING. Lighting shall not be directed skyward and the source of light shall be effectively shielded from adjacent residential properties and streets. Light intensity shall not exceed 1.1 footcandles measured at a residential property line." This provision applies to new signs and is not retroactive.

Several individuals worked on this effort, including Lee Wilson, Evelyn Whalen, Linwood Beck, as well as several allies who are not members of the AAC. Now that a precedent has been established to prohibit upward shining lights on billboards, several other counties probably can be persuaded to adopt similar or stricter ordinances.

The Committee needs help from residents of other counties who want to work toward similar ordinances there. Please contact Tom Buchanan to volunteer!

Preliminary calculations indicate that billboards contribute 59% of all light directed into the sky in the Atlanta metropolitan area. There are over 7,000 billboards in the 10-county metropolitan area, the vast majority of which have either 4, 6, or 8 upward shining lights.

If you are bothered by an undesirable streetlight or security light which is owned by Georgia Power Company, the light can usually be simply shielded. The first step is to contact the person who pays the electric bill and explain the problem. If he agrees to allow the light to be modified to solve your problem, the second step is to contact Mr. Carl Loper, Lighting Engineer with Georgia Power, at 526-7342. Georgia Power will not charge either you or the billpayer for shielding the light.

MEMBERS VISIT ROPER MOUNTAIN

by Hal Crawford

On December 7, a group of intrepid AAC members drove through miserable weather conditions to visit the Roper Mountain Science Center in Greenville, SC. Members Rick Clark, Jackie Cochran, Rich Jakiel, Bud Rosser, Bill Snell and myself arrived that Friday evening at the top of Roper Mountain. There we were introduced to the Roper Mountain Astronomers, a group of volunteers who conduct tours of the observatory facilities.

The Roper Mountain Science Center (RMSC) is operated by the School District of Greenville County. The centerpiece of the observatory complex is the Charles E. Daniel Observatory, which houses the "Great Refractor," a 23-inch refractor telescope featuring

lenses crafted by Alvan Clark. The RMSC's operations include astronomy classes for students, teacher workshops and public observations.

The 23" telescope began its life back in 1882 at Princeton University, in what was called the Halstead Observatory. At that time it was the 2nd largest telescope in America. The lenses were crafted by the optical firm of Alvan Clark & Sons of Cambridge, Massachusetts. It does not need to be pointed out to AAC readers that the Clarks were responsible for the largest and finest telescopes built during the last century. During those early years this telescope was extensively used by astronomers like Harlow Shapley, Charles Young and Henry Norris Russell.

In 1933, the telescope was disassembled, and the lens was installed on a new telescope at Princeton. In 1964 the instrument was eventually sold to the U.S. Naval Observatory. The Navy had planned to use the telescope to measure star positions, but funding cutbacks forced the Navy to mothball the instrument in Flagstaff, Arizona. In 1978 the telescope was offered to the Greenville County School District. Through private funding and many, many hours of volunteer work, the telescope was carefully renovated and housed in a specially-built observatory at the top of Roper Mountain. It was dedicated on September 20, 1987.

The weather was anything but ideal for observing that Friday evening, but RMSC astronomer Doug Gegen was more than happy to open the building and let us stand in awe and admiration of the century-old masterpiece. Many RMA members were on hand to describe the operation of the mechanisms that power the Clark telescope.

One aspect made the weather much more bearable. AAC members were treated to a special presentation of the RMSC's new planetarium. Having been installed only a couple of months prior, no completed programs were yet available for the show. We were instead treated to a demonstration of the planetarium's vast cornucopia of features. The planetarium is of "SkyGlobe" design – meaning that a special hemispherical television projection lens is used to generate the images of the night sky. A MicroVax computer system with a special graphics processor powers the projection system, and the effect is quite impressive.

In addition to being able to display stellar views from any place and time on Earth, the system is capable of simulating movement among the heavens to distant stars. We took a 30 second trip to Betelgeuse, and sat in amazement as stars zipped by during our flight into the constellation Orion. Future shows at the planetarium promise to be as exciting as they are educational.

After the observatory was closed, both RMA and AAC members had a late meal at a nearby diner. I'm looking forward to when we can schedule the next time to head back to SC – hopefully the weather will be a bit more cooperative in the coming months. Many thanks to Doug Gegen, Planetarium Curator Rick Greenawald, and the volunteers of the Roper Mountain Astronomers for hosting a fun event.

NEW ALCOR ANNOUNCED!

Beginning with the January meeting, Larry Daniel will be the club ALCOR (Astronomical League Correspondent). He will be responsible for receiving information from the AL, and making sure that our voice is heard at AL functions. Please see Larry if you have any questions concerning your Astronomical League affiliation.

GRAZING OCCULTATION HIGHLIGHTS FOR EARLY 1991

by Mike Kazmierczak

Here it is March already and you haven't been inundated with the upcoming grazing occultations for this year. Last month's rush issue, combined with late arriving predictions are to blame. But now that is history, and the forecast for this early 1991 isn't too bad. One graze has already been attempted late in January. Read about it in Recent Observations. If you don't know what a graze is, raise your hand. I see lots of hands, so here goes (again). A grazing occultation is a special case of a total occultation (previously described in January). A total occultation has two distinct events, a disappearance and a reappearance. If the time difference between these events is very small, then the star would disappear and reappear at the northern (or southern) edge of the moon. Since the moon isn't a smooth sphere, any mountains and valleys can cause many reappearances and disappearances over several minutes of time.

Factors which affect the observability of a graze are the star's magnitude, the percentage of moon which is sunlit, the moon's altitude (if low), the sun's altitude and the cusp angle. The cusp angle is the distance in degrees on the moon's perimeter from the event to the terminator. Obviously, events on the bright (sunlit) limb are much more difficult to observe. Listed below are events for early 1991 which are within 150 miles of Conyers. The time below is in Eastern Time, with April and later assumed to be Daylight Time.

DATE	UT	MAG	MN	SN	CA	%SN	DIST
MAR 18	21:03	8.2	7		14N	9+	86
MAR 20	18:37	4.0	61	2	7N	25+	134
MAR 20	20:21	8.3	40		12N	25+	31
MAR 20	20:23	6.6	39		12N	25+	98
APR 18	22:26	8.5	26		15N	23+	40
MAY 16	20:30	8.2	34	-2	16N	11+	138
JUN 16	22:34	6.3	22		8N	27+	77*
JUN 17	22:01	8.4	34		10N	38+	21*

I am planning to observe the above grazes which are marked with asterisks. If you have any questions about grazes or equipment needed or are interested in observing one of these wonderful astronomical events, give me a call at 760-8502.

NEW HORIZONS SUBSCRIPTIONS

Many members don't know this, but *New Horizons* is the official newsletter of the Southeast Region of the Astronomical League.

Issues feature reviews and updates from club SERAL newsletters, as well as important SERAL business information. AL's southeast region doesn't have the funds to send a copy to everyone, but interested members can subscribe by sending $3.00 to:

Vic Menard, *New Horizons* Editor
2311 23rd Avenue West
Bradenton, FL 34205

WELCOME NEW MEMBERS

We would like to welcome the following new members who have joined the Club recently.

Bruce Sheffer, Robert E. Taylor, Krishna Prasad, David M. Fellows and family, Timothy E. Davis, Art Russell, Victor A. Ignacio and family.

Please take a moment to welcome these new members when you see them at our meetings or at our observing sessions.

OBSERVING MESSIER OBJECTS

by Bill Snell

In a previous article I wrote that winter skies are often clear. However, a few days later some of the cloudiest, wettest weather I can remember descended upon us and wiped out not only the December observing session but two in January as well. February was a little better but clouds built up before midnight during both observing sessions. Several members did get in some observing and on another night David Riddle took some amazing astrophotos through the twenty-inch using ISO 400 film and one minute exposures! Not too bad; you just have to be ready to observe on almost any night.

You have probably heard of the Messier Marathon, an event that has been popular among amateur astronomers for many years. During most of March, you can supposedly find all but one of the one hundred seven "actual" objects in the Messier Catalog during a single dusk to dawn observing session. The catalog contains one hundred ten entries but of these, M-40 is a double star, M-73 is an asterism, M-102 is a duplication of M-101 and M-30 is too close to the sun to be visible in March. Assuming that the sky is dark for nine hours each night during March you will have to find one Messier object every five minutes, not too hard with practice. With today's fast films photographic marathons can be and have been done!

However, do not confuse such insanity with membership in the Astronomical League's Messier Club which sets no time limit. You can spend as many months, years or decades as you want looking for Messier objects. To qualify for a Messier Club certificate you must observe seventy objects for the Regular Membership or one hundred seven for the Honorary Membership. You can avoid the infamous Virgo Galaxy Cluster entirely and still have more than seventy objects to observe. Most of the objects can be seen in a four-inch telescope, about forty can be seen in large binoculars and several can be seen with the naked eye.

What are the ground rules? First, you must find all of the objects yourself. You can't simply take a look at an object that someone else finds and attempt to claim it!

Second, you are not allowed to use electronic setting circles. You can use mechanical circles but most of these are too small and inaccurate to be of much help. The Messier Club was formed partly for the purpose of increasing your familiarity with the sky and setting circles tend to isolate you from the sky. Most club members will want to star-hop anyway.

Third, you must keep a log book of your observations. You should include, for each object you observe, the time, date and the site from which you observed. You must also include the type of instrument that you used, the magnification(s) used and notes about the sky conditions, i.e. the transparency (1-10), the seeing (1-10) and the limiting magnitude for the naked eye. You must also give as detailed a written description of each object as possible. Drawings are optional but couldn't hurt. You should report your observations to the observing chairman, who will record your progress and inform the Astronomical League when you reach either the seventy or the one hundred seven object mark.

Detailed star atlases such as Tirion, Uranometria, Norton's and the Skalnate Pleso show most, if not all, of the Messier Objects. The Astronomical League publishes a book, Guide to the Messier Objects that is reasonably priced at $3.50. However, you will probably have just as much fun looking over your atlas in order to find out where the objects are. If you observe all or most of the M-Objects you will have developed a good knowledge of the constellations, learned how to use a telescope and probably come across many very pleasing NGC objects in the process. Your next step will probably be the Herschel Club's four hundred objects; the League has a very useful guide to these as well.

Observing sessions are on Saturday March 16th and Friday April 12th; Saturday, April 13th is the rain date. April 6th will also be a reasonable night to try some observing because the moon won't rise until after two a.m. on April 7th. Even if you don't want to try the Marathon, March is still a good time to begin a regular observing program, and the Messier Catalog is a good place to start. Please try to attend as many sessions as possible and remember that the observatory is available any other night too. Call for directions and let me know if you want to be "checked out" on the twenty-inch. Remember, Astronomy Day is April 20th!

Recent Observations

VIEWING EVENTS OF JUPITER'S MOONS

by Tom Buchanan

In the very early morning of January 15, 1991, five events of Jupiter's moons occurred within one hour, while Jupiter was high overhead. The seeing was excellent; even Sirius and Betelgeuse appeared steady without scintillation. This was one of those rare

observing sessions which can be thoroughly enjoyed and long remembered.

I set up my 5-inch f/12 apochromatic refractor in my driveway in a place shaded from streetlights and traffic. My 13mm eyepiece with a 1.8X Barlow yielded 211 power. This worked the best for a low-contrast Jupiter, and various color filters helped in distinguishing detail. When I began observing, Europa and Io were close to each other and close to Jupiter. These two moons approached each other and both approached Jupiter. Soon I saw the shadow of Europa on the edge of Jupiter. Then the two moons merged into one point of light. (Actually, this was an annular occultation of Io by Europa, but I could not distinguish the two moons with my telescope.) Then the shadow of Io started biting into the edge of Jupiter. As the two shadows moved well onto the planet, I could tell that the shadow of Io was larger than the shadow of Europa. A calculation indicates that the area of Io is 1.35 times the area of Europa. Also, Europa subtends very nearly 1.0 arc-second. Soon, the two moons, superimposed, reached the edge of Jupiter and started across the planet. While they were near the edge, I could see the occulted moon combination well, brighter than Jupiter's somewhat darkened limb. I could see a rarity of three objects simultaneously against Jupiter: two moon shadows and what appeared to be one moon. However, as the moon combination got well onto Jupiter's brighter interior, the contrast decreased until it blended into Jupiter and became invisible.

Five events: an occultation of one moon by another, the shadow of each moon entering Jupiter, and each moon beginning to transit Jupiter, all events within one hour! More similar events are predicted within the next few months. I hope many more observers will have the chance to enjoy viewing similar events of Jupiter's moons.

VALUABLE DATA, OR I OBSERVED A MISS

by Mike Kazmierczak

It was a cold (22°) and clear evening, the weather invigorating for outdoor observing. Of all the observers who had planned to accompany me, there were none. Steve Gilbreath, collector of much valuable data(!), had just caught the flu. I was alone in Bold Springs, Georgia, waiting for several people from Jacksonville, Fla. to join me. They did not and I motored to the graze site. Getting lots of events (the disappearances and reappearances) takes luck. Constructing a good profile of the moon from takes lots of observers. I had hoped for the first and did not have the latter.

I set up my 10 inch telescope and waited for the graze. η Piscium (mag. 3.7) shone brightly and was easy to see, even at an altitude of 10°. I watched the star get closer and closer to the moon. When the time of central graze neared, I began to worry that I had the dreaded miss. Misses are valuable data, but are not very exciting at all. Sure enough, the time of central graze came and went and the star never disappeared. I didn't think about it too much until David Dunham, a leading grazemeister, called me and inquired about my results. I informed him of the miss and he replied that only one other observer had observed the graze, and that he had had a miss, but didn't think that he should have. At this writing, I don't know if we have discovered an error in the lunar profile, but the data will improve the prediction for the next observer. Perhaps it will be you!

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First Class Delivery

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