I went to the SMURFS star party which was held on August 4-7 at an old airstrip about 25 miles north of Mio, Michigan. The star party was sponsored by the Genesee Astronomical Society, and was really a good time for anyone who is into serious observing. Other attendees from our club were Tom Bader, Mike Cyrek, Dave D’Onofrio, Fred Judd, and Angie Judd. I didn’t really count, but I’d guess there were about 40 people there, with telescopes ranging in size from a 60mm refractor to a 20" Obsession dobsonian. Perhaps the most interesting was a 12" f9 dobsonian dubbed "Merlin". Luckily, not many steps of the 12’ ladder were required for a good view of Jupiter.

During our Cranbrook meeting of August 4 a cold front moved through southern Michigan, dropping us out of our humid mid-80o week and into a gorgeous mid-70o weekend. I went to the star party on Friday morning. The skies on both Friday and Saturday night were superb. These were the best skies I’ve ever seen in terms of transparency, except those at the Grand Canyon. The seeing left a bit to be desired, and a planetary observer would have been a bit disappointed. I rated the transparency as 8 of 9 both nights, and the seeing as 6 of 9 on Friday night and 5 of 9 on Saturday. Both nights showed a tremendously bright and detailed Milky Way arching overhead, visible down into the teapot of Sagittarius. The only light pollution I noticed was a very faint and unobtrusive glow about 30 degrees wide and 10 degrees tall on the eastern horizon. These skies, and the company of the other attendees made for an observer’s paradise. The only real down-side to the weekend was the heavy dew which fell both nights. The sound of dew-zappers was pretty constant over the field on Friday night.

At about 2AM on Saturday morning, the Andromeda Galaxy, M31, was up high enough in the sky to do some serious observing, and I decided to take advantage of the transparency of these skies to find out just how much I could see in M31. Many of you know that I like to push my telescope a level or two beyond the norm, and my new telescope has not yet changed my observing personality. What started as a curiosity to see real dust lanes in M31 turned into a 2 hour connection with the ancient light of our nearest large neighbor. This article details what I saw. The abbreviations I have used are ’ for arcminutes, N, S, E and W for north, south, east and west.

Unless otherwise noted, all observations were made with a 20mm Erfle eyepiece which yields a 40’ field of view at 85 power with Felicity. Because of my field size and the elongated shape of M31, it was convenient for me to divide the galaxy into thirds, and the first part of my study was of the central third. When confronted with describing a monstrous object like M31 verbally, it becomes necessary to come up with some names. I used the word nucleus to mean the very center of the galaxy, core to mean the very bright area in the immediately vicinity of the nucleus, halo to mean the moderately bright large region surrounding the core, and arms to

Continued on Page 3
1994 Officers
President: Jeff Bondono 810-731-4706
1st VP: Marty Kunz 810-477-0546
2nd VP: Riyad Matti 810-548-2323
Secretary: John Herrgott 313-506-9346
Treasurer: Mike O'Dowd 810-288-7125

The Warren Astronomical Society, Inc. is a local, non-profit organization of amateur astronomers. The Society holds meetings on the first and third Thursdays of each month, starting at 7:30 p.m.

General meeting on first Thursdays:
Cranbrook Institute of Science
1221 North Woodward Avenue
Bloomfield Hills, Michigan

Business meeting on third Thursdays:
Macomb Community College
South Campus, Building B, Room 209
14500 Twelve Mile Road
Warren, Michigan

Membership and Dues
Membership in the Society is open to all. Annual dues are:
Student $12.00
College $17.00
Individual $25.00
Family $30.00
Senior Citizen $17.00

Among the many benefits of membership are:
- Discount magazine subscriptions: Astronomy $16.00 (12 monthly issues)
  Sky & Telescope $20.00 (12 monthly issues)
- Loaner telescopes (with deposit). See 2nd VP.
- Free copy of each WASP newsletter.
- Free use of Stargate Observatory.
- Special interest subgroups. See chairpersons.
- Free use of WAS. library. See Librarian.
- Call list: don't miss unexpected events.
- Free membership in Astronomical League.
- Free Reflector (Astronomical League newsletter).

Send membership applications and dues to the treasurer:
Mike O'Dowd
4734 Brockham Way
Sterling Heights, Michigan 48310

Disclaimer: The articles presented herein represent the opinions of their authors and are not necessarily the opinions of the Warren Astronomical Society or this editor. The WASP reserves the right to edit or deny publication of any submission.

Stargate Observatory is owned and operated by the Society. Located on the grounds of Camp Rotary on 29 Mile Road, 1.8 miles east of Romeo Plank Road, Stargate features a 12.5 inch f/17 club-built Cassegrainian telescope under a steel dome. The observatory is open to all club members in accordance to the "Stargate Observatory Rules." Those wishing to use the observatory must call the 2nd VP by 7:00 p.m. on the evening of the session. The coordinates for Stargate Observatory are 82°55'04"W, 42°45'29"N.

Library: The Society maintains a library of astronomy-related books and periodicals at the Macomb County Community College meeting room. See the Librarian, Louis Namee, for rules or to check out a book.

Special interest subgroups exist for those interested in specialized areas of astronomy. Contact the chairperson of each subgroup for more information on that group.
- Computers: Larry Kalinowski 810-776-9720
- Deep Sky: Doug Bock 810-750-0273
- Lunar/Planetary: Riyad Matti 810-648-7511
- Solar: Marty Kunz 810-477-0546
- Math: Al Vandermarliere 810-575-9086

Call List: The Call List is a list of people who wish to be alerted of spectacular and unexpected astronomical events, at any time of the day or night. Anyone who notices such an event calls the next person on the call list. That person in turn calls the next person, etc. Any Society member is welcome to join the call list by notifying Marty Kunz at 810-477-0546.
Seeing M31 continued....

mean the subtle faint spiral arm regions surrounding the halo. At the center of the galaxy was an extremely bright and sharp 9th magnitude stellar nucleus, which still appeared stellar at 170 power. Moving outward from this nucleus, the core of the galaxy remained very bright for the 1/2' radius surrounding the nucleus, then faded pretty rapidly out to a 3' radius where it blended into the galaxy's large central halo. The core extended a bit further into the halo toward the SW and NE, making its total size about 12'x6', but the extensions beyond the 6' diameter round part were not appreciably brighter than the halo beyond. A 10th magnitude star was superimposed on the core 3' SW of the nucleus, and an 11th magnitude star was superimposed on the halo 6' SW of the nucleus, however, these magnitudes were difficult for me to estimate since they lay atop the galaxy's already-bright glow. The halo remained relatively bright for an oval-shaped area of 35'x8' in a SSW-NNE direction (position angle 30 degrees), and this direction defined the major axis of the galaxy. From here on I will simplify these directions calling the ends of the major axis ~ and ~, and the ends of the minor axis W and E. Directions not underlined will still be true sky directions. The W edge of the halo was very abruptly cut off by a 3' wide dark dust lane which showed several Milky Way stars atop its blackness. Moving outward from the dust lane, still W, was a bright 5' wide swath of light, presumably a spiral arm, then a 2' wide second dust lane, then a very faint 1' wide second spiral arm. Both of the dust lanes and both of the arms were arcs which ran "parallel" to the sharply cut-off W edge of the halo. The inner arm could be traced from where it split away from the galaxy's S tip, to due W of the nucleus where it rapidly faded to black sky. The outer arm was only visible as a 15'x1' arc which ended 15' due W the nucleus and began 15' S-ward. The N side of the halo had no dust lanes and did not reach quite as far from the nucleus as the inner edge of the dust lane on the W side.

Flanking either side of the halo were much fainter but equally large extensions to both the N and the S. The S third of the galaxy looked more interesting than the N third, so that's where I gazed next. The inner dust lane described above is what terminated the halo, cutting it off from the fainter S arms. The cut was clean and black from the central major axis toward the W, but E of the major axis, the faint glow of the S arms reached inward to touch the inner halo. At the point along the major axis where the inner dust lane ended, a straight line of 3 superimposed 11th magnitude stars separated by about 5' each ran along the major axis. The first was right at the S outer edge of the halo, the 3rd was at the inner edge of the innermost arm, and the 2nd was centered both between those 2 stars and within the dust lane. Just E of those stars, the inner arm reached out from behind the halo, running~ past the start of the
dust lane, curving W around the S edge of the inner dust lane, and continuing its curve until it was heading N under the outer edge of the inner dust lane as described above in the central region. As the arm curved around the S of the halo, it, as well as all features S-ward were pretty faint. Only when the telescope was swept W and E and the brightness of the sky in this region was compared against the background sky outside the arms did it become obvious that I was still seeing M31's glow. About 20' S along the major axis from the central one of the 3 stars at the start of the dust lane, and a bit W the major axis, was NGC 206, a 4'x2' brightening in the outer arm aligned N to S which is actually a huge star cloud of young stars and nebulae within M31. At 170 power, NGC 206 showed a few stellar dots with bright underlying nebulosity, but I don't know whether those stars are really within NGC 206 or simply superimposed. NGC 206 is the brightest feature in M31 outside of the core. It shows up on any picture, and from prior experience, is just barely visible in an 8" scope. The part of the arms S of NGC 206 was filled with dark patches and the arms of M31 in this region became harder to trace as connected features. However, one clear feature was a dust lane which began at the E edge of NGC 206. It ran S, then curved a bit toward the E and forked into one branch which continued running U, and another branch which rapidly curved E and ran off toward the NE. S-ward still, the galaxy's glow eventually disappeared about 15' S of NGC 206, which in turn was 45' S of the nucleus of M31.

Returning back to the central region and heading N, the galaxy showed much less detail than in the S third. This N third consisted of a much more homogenous glow with no dark lanes, abrupt edges, or intense brightenings. It was simply half of a very large oval, running for a total distance of about 80' N from the nucleus. It was 20' wide at the N edge of the halo, and gradually tapered off to 10' in width at a point 10' from the N edge, after which it rapidly came to a rounded end with black sky beyond.

Switching to 44 power and returning to the central region, more glow appeared on the ~ side of the major axis than had at 85 power. This extremely faint glow appeared brighter on the N and S thirds of the galaxy than in the central third. In the S region, it reached its peak brightness in the area S of M32. In the N region, it appeared equally bright for the entire N 40' of the galaxy. I couldn't see this faint glow as easily in the central 60' of the galaxy, but comparison with the sky field following it showed that an extremely faint glow was still present there. All told the galaxy showed me light from a 140'x40' area of the sky.

After I thought I had seen all the features that
Continued on Page 4
Seeing M31 continued....
were available to me, I opened my copy of the Observing Handbook and Catalog of Deep Sky Objects, by Lugnibuhl and Skiff. It has a picture of M31 which identifies about 50 globular and open clusters. Using 131 power, I star-hopped from NGC 206 to the globular cluster labelled G76, which was easily visible as a 13th magnitude stellar dot just 30° WNW of a 13th magnitude superimposed star. I'd never have known I was looking at a globular cluster without the labeled picture, but it was a thrill to be viewing a globular in another galaxy with an amateur telescope. Open clusters C202 and C203 appeared as 13th magnitude stellar dots separated by about 15' from each other with a little bit of surrounding fuzz. They were located on the SE edge of the halo. Open cluster C410 was just a 14th magnitude dot near my limit of detection, located a bit outside the NE edge of the halo. Imagine...a whole open cluster, perhaps with nebulosity, appearing as a 14th magnitude star.

These 4 clusters were described in the book as the brightest in the galaxy, and after the faintness of this last one, a glance at my much-too-long list of still-to-observe-objects, and the realization that dawn would begin in about 90 minutes, I decided to stop pushing my luck and quit on a still-positive note. I spent about 30 minutes on M32, M110, and M15, then let my tired eyes and legs rest while watching about 15 early Perseids zip through this beautiful sky until dawn arrived.

I've never spent this much time on M31 before, and I've certainly never seen nearly as much in it. Next time you strain to see the dust lanes in M81 or the arms of M51, think about spending some time with M31. Compare the outer reaches of the galaxy with the purer black skies surrounding them. Take your time and perhaps bring along a picture to help you trace the ghostly arms. It is, after all, the brightest and nearest spiral galaxy to us. Its been right under our noses the whole time.

-Jeff is the President of the Warren Astronomical Society and an active observer. In his spare time, he also writes articles for the WASP.

Computer Chatter
Larry F. Kalinowski

Amateur astronomers all over the world are examining those comet collision spots on Jupiter. They’re so big that a 2.4 inch telescope should be able to see them. The spots most prominent are the ones caused by the fragments H, K, L, and the grouping of G, D, S, and R. On July 23, at Camp Rotary, all telescopes were trained on Jupiter for the entire evening. No one seemed to be interested in anything else in the sky. The 'scopes ranged from three inches to fourteen inches and all were being utilized to study the collision marks. One looked bigger than the Red Spot and even seemed to be a double. There's going to be some interesting reports from all the magazines devoted to space and astronomy. Cameras all over the world will be photographing those spots. I can't wait to see what The Hubble Space Telescope and the Galileo Jupiter probe reports. Microsoft, Inc. has taken another pounding from our federal government. The company has been accused of dishonesty in distribution of its famous operating system, MS-DOS. Of course, Microsoft won't admit it but they've dropped the requirement to have computer companies pay a royalty to them for each computer produced. Original equipment manufacturers didn't have any choice before. Now they can make computers with any operating system they wish. Its really quite amazing that Microsoft has operated so many years illegally and doesn't even get fined for its discrepancies. Another telescopic comet has entered the northern sky. This one is Comet Nakamura-Nishimura-Macholz(1994m). It'll reach magnitude 7.5 during the last week of August and stay that way through the first week in September. The comet will be leaving Lacerta and entering Pegasus during that time interval. If you have the shareware program DEEP SPACE 3-D, plug these orbital elements in the program to print your own finder map. These elements are revised and come from the IAU circular #6036.

(Perihelion date) T: 1994 Jul 12.9020
eccentricity) e: 1.000000
(Perihelion distance) q: 1.14080 A.U.
(Argument of perihelion) Peri: 123.0050 degrees
(Longitude of Ascending) Node: 158.9600 degrees
(Inclination) i: 94.3880 degrees
Absolute Mag.: 8.05
Mag. Coefficient: 10.0
Epoch: J2000

Notice that even though closest approach to the Sun (perihelion) is on July 12, maximum brightness occurs late in August because it's closer to the Earth at that time (about 0.4 astronomical units). The comet is well placed for observing. It's traversing the northern sky and visible all night long. Call me for further updates (810-776-9720). Microsoft has delayed Windows 4.0 again. Make Spring of '95 the new introduction date. The new operating system, actually a pared down version of Windows NT, has been delayed for a year now. The original date was Spring '94. The more time Microsoft spends delaying the system, the more chances other companies have of selling competitive systems like OS2, which has all the features VWindows4.0 has to offer.

COMPUTER TIP OF THE MONTH. Don't rely on any special commercial software to manipulate your computer files. Learn to use the DOS operating sys-

Continued on Page 5
I went to my cousins house with my friend Nancy Binson for a barbecue. My cousin lives at 9 1/2 Mile Rd., west of Gratiot, in Eastpointe.

Luckily, Jupiter is a bright planet, we were able to pick it out of a light blue, twilight sky. I had brought my telescope over to show them Jupiter and the planet's moons. They were thrilled when they saw the planet, 3 of it's moons and the bands of Jupiter. I think I was even more thrilled, when I saw for the first time a large dark area on the upper left part of Jupiter. We all saw the impact area easily! I went into the house and called a few people from the club. At 9:40 half of it had rotated to the backside of the planet.

Under higher power (177x), the impact area became softer looking, north equatorial belt looked good, a lot of boiling from the atmosphere. I went back to 100x, looked much better. The clouds rolled in at 9:43 EDT, my observing was done for the evening.

It was great seeing comet fragments, re-designing the familiar features we have seen through our telescopes.

-Frank has been member of the club for a very long time. Thanks for your great contribution.

---

Minutes from John

MACOMB 6/16/94
The Warren Astronomical Society's Macomb meeting was held on June 16, 1994. Twenty members and two guests were in attendance. The evening commenced with observation reports from the members. An active Sun was seen in a Hydrogen-Alpha at Doug Bock's Solstice party. Jupiter's bands were noted in the evening at the same event. Marty Kunz observed a comet and this writer reported eleven naked-eye sightings of the planet Mercury.

Club business began with the treasurer's report and a reading of June's Cranbrook minutes. Riyad Matti announced additional clean-up plans for Stargate. The club will host a Star Party-Comet Bash on Saturday, July 16, 1994 and on Saturday, July 23, 1994 at Stargate. An additional item noted is for members to bring telescopes to our next Macomb meeting on July 21, 1994.

With business out of the way, the meeting broke into open discussion revolving around Jupiter and Comet SL-9. Following a snack and social break, Jeff Bondono gave a presentation on the constellation Lyra and its interesting star systems. Toni Bondono concluded the evening with demonstrations on how club lecturers can be more effective with the very young, through the use of "Hands-On" astronomy related science demonstrations.

CRANBROOK 7/7/94
The Warren Astronomical Society held its monthly Cranbrook meeting on July 7, 1994. Twenty three members and one guest were in attendance.

Marty Kunz began the evening by welcoming Ben Tolbert and his son Jason as new members to our club. Riyad Matti followed with a report on the status of Stargate. Riyad stated...
progress has been made and that the services of a club member with electrical experience is needed.

The meeting continued with these announcements: A Star Party will be held at Stargate on July 23, 1994. The Perseid outing scheduled for August 11-14. A request for members to bring telescopes to Cranbrook on the evening of July 16 & Doug Bock's Autumn Equinox Star Party to be held at his "Northern Cross Observatory".

A show and tell followed business with an observing equipment demonstration put on by Tom MacLaney. In his demonstration, Ton set up and explained a parallelogram-type binocular mount. The first half of our meeting concluded with Marty Kunz's video presentation of the early years of America's manned spaceflight program.

After a meeting break, Riyad Matti presented slides taken of the Sun through a H2 filter. Marty Kunz concluded our evening with a talk on the impending Jupiter-SL-9 comet bombardment.

MACOMB 7/21/94

Jeff Bondono opened the monthly Macomb meeting held on July 21, 1994. Thirty nine members and three guests were in attendance. Ben Tolbert and his son Jason introduced themselves as new members to our club. The meeting immediately turned to Jupiter observations. Jeff Bondono and this writer spoke of their efforts at Stargate on July 16. Observation of impact marks on Jupiter were reported by Tim Skonieczny, Paul Strong, Blaine McCullough and Frank McCullough. These observation reports were followed by an open discussion of the comet impact event.

The meeting continued with a reading of the Cranbrook minutes and Mike O'Dowd's report on the club treasury. Riyad Matti announced the completion of the Stargate clean-up. The club's refurbished telescope will be installed at a club Star Party to be held on July 23, 1994. Some announcements came next. Lecturers are needed for August 17 at Whispering Woods and August 24 at River Bends Park. Doug Bock will host an Autumnal Equinox Star Party on Sept. 3, 1994. Larry Kalinowski has available an ephemeris for a recently discovered comet.

The second half of the meeting was filled by presentations from Tim Skonieczny and Scott Jorgensen. Tim gave a talk and slide presentation on the Apollo lunar landing sites. Scott wrapped up the meeting with a guided tour of the constellation Scorpio. After our meeting club members gathered outside to observe Jupiter with telescopes. Cloud cover unfortunately prevented any meaningful comet impact observations.

Respectfully,
John Herrgott

FOR SALE
Odyssey 8" Dobsonian Telescope
f.4.5 with 27mm
and 12mm Couler Eyepieces
Telrad Finder
Dust Cover
$250.00
contact: Don Robinson
810-394-1006 (h)
810-377-6547 (w)

SNACKS

from the editor

My apologies for a late edition of the WASP. Other commitments made it impossible for me to fulfill my commitment to you. I will make sure this does not happen again. Really, I will...

A special thank you to Bob Halsall, John Herrgott, Riyad Matti and Jeff Bondono for showing up for the Michi-Gama Day Camp. We had between 75-100 girls who used the telescopes and went to bed with stars in their heads. Thanks guys
Time to start thinking about the WAS Annual Awards Banquet. We will be at the Warren Chateau on Thursday, Dec. 15. Advanced tickets are $17 per person ($20 per person at the door). Look for more information in next months WASP.

**Happenings**

We have a couple of lecturers scheduled at the Vollbrecht Planetarium, Adler Elementary School, Southfield. Call 746-8700, Community Education or contact Frank McCullough for more information. All classes are $5.00 each.

- **9/21 7-9pm** Comet Collision on Big Jupiter
  Marty Kunz

- **10/12 7-9pm** Results of the May Eclipse
  Frank McCullough

- **11/2 7-9pm** Large Star Clusters
  Frank McCullough

- **12/7 7-9pm** Orion, Taurus, & 7 Sisters
  Frank McCullough

The Association of Astronomy Educators is dedicated to improving astronomy education at all levels, from kindergarten to college. Founded in 1977 as an outgrowth of a National Science Teachers Association task force, the Association's goal is to help our members by disseminating activities and information in order to enhance the scientific literacy of our students. We encourage the development and exchange of information about effective curricula, materials, facilities and groups as a means to enhancing the teaching of astronomy. Members receive the AAE newsletter, periodic special publications and announcements of regional, local and world-wide astronomy activities.

To join, contact:
Bart Wormington, Treasurer
Association of Astronomy Educators
12522 Binney
Omaha, NE 68164 USA

Dues are $12 per year (U.S.). Please add $1.50 for postage to Canada and Mexico, $2.50 for other non-U.S. locations
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<tr>
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**WASP**

Warren Astronomical Society, Inc.
P.O. Box 1505
Warren, Michigan 48090-1505