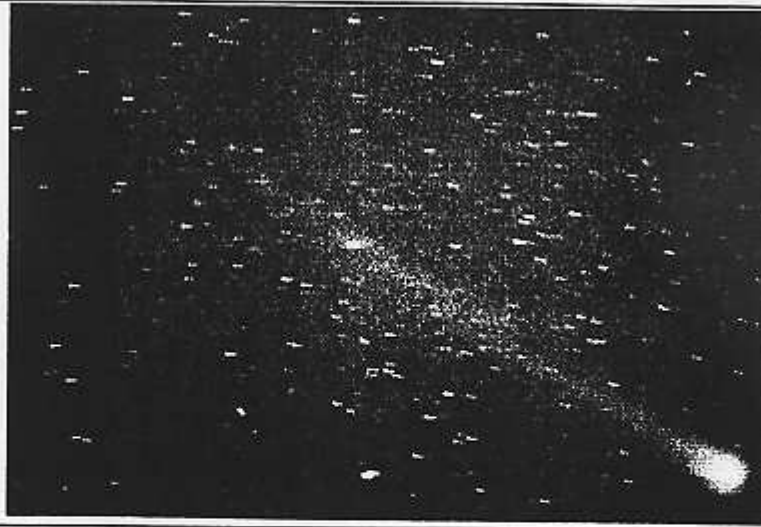


REFLECTIONS



REFLECTIONS

**April  
1996**

Comet Hyakutake as photographed by Ken Friberg (that's Bernard's son) on Mt. Wilson, CA, at 12:30 PST (1 hr past Earth closest approach) on March 25, 1996. This is approximately a 1 min exposure with Kodak 200 gold film using a Pentax K1000 35mm SLR set at F2 with a standard 50mm lens. Some LA Basin light is evident in the exposure, but the image does capture the long tail through the sky, including the first two stars in the big dipper (center tail and lower center of image). Also the remnants of a jet or fragment can be seen 40% away from the comet in the tail.

**Chris  
Sarnecki  
Editor**

## Of the University Lowbrow Astronomers

The University Lowbrow Astronomers is a club of Astronomy enthusiasts which meets on the third Friday of each month in the University of Michigan's Physics and Astronomy building (Dennison Hall, Room 807). Meetings begin at 7:30 pm and are open to the public. Public star parties are held twice a month at the University's Peach Mountain Observatory on North Territorial Road (1.1 miles west of Dexter-Pinkney Road; further directions at the end of the newsletter) on Saturdays before and after the new Moon. The party is canceled if it's cloudy or very cold at sunset. For further information call club officers listed at the end of the newsletter.

### **This Month:**

- April 17 - New Moon** at 6:49 pm EDT.
- April 19 - Meeting at 807 Dennison** Annual club elections. Be there so you can elect the Lowbrows who did not show up to club positions.
- April 20 - Public Star Party at Peach Mountain Observatory** - Astronomy Day Events with The Friends of Stichfield Woods.
- April 26 - Leslie Science Center** - General observing starting at sunset.

### **Next Month:**

- May 11 - Public Star Party at Peach Mountain Observatory** Comet Hyakutake is in the southern sky so now we can get back to our observing.
- May 17 - New Moon** at 7:46 am EST and **Meeting at 807 Dennison** - Topic and subject to be determined.
- May 18 - Public Star Party at Peach Mountain Observatory** - Annual feeding of Peach Mountain's mosquitos begins.

**The April 20th Open House coincides with ASTRONOMY DAY and The Friends of Stichfield Woods Open House** - The University Lowbrow Astronomers are looking for volunteers to help with parking and general crowd control up at the top of the hill next to the radio telescope. Those that are interested, please leave a message at 480-4514, E-mail to Bf747@aol.com, or call me at 761-1875. Your participation is the key to the success of events such as this. Please consider donating some of your time as a large crowd is expected. - Bernard Friberg, Observatory Director

# The Messier Marathon A Personal View

by Mark Deprest

Collecting and cataloging the 110 Messier objects has been my observational passion since I first got into telescopic astronomy, a little over a year ago. I had managed to "collect" 75 of these deep-sky splendors and developed quite a hunger for more. Enter the Astronomical Societies of Lenawee and Hillsdale Counties. Who, through the superb direction and tireless efforts of Wes Boyd, sponsor a Messier Marathon Night on March 16, 1996, created a chance to collect all 110 of these deep-sky objects in one night!! Well, this was an opportunity that this observer could not pass up.

But to collect all 110 in one night? Can this really be accomplished? In theory yes; but for all practical purposes there are a few object that just defy the theory. M30 is one of these, since its rising time is within 40 minutes of sunrise. This makes it almost impossible to see this "faint-fuzzy" in the early morning twilight of the predawn sky. So other than a couple of exceptions it is possible to observe the entire Messier catalog in a single night, but, it takes some preparation.

My preparation started almost a month before the actual night of the marathon, with a list of the Messier objects in the proper viewing sequence. I found out that there are a number of different lists, but they all tend to come together after the first 10 - 15 objects are found. The list that I finally decided on was one that I obtained off the Internet, from the Web site of Students for the Exploration and Development of Space (SEDS) out of the University of Arizona, Tucson. They have a very comprehensive section on the Messier Objects, and a wonderful library of images to download. Now, with list in hand it was time to make use of the PC and two planetarium style programs called "Distant Suns," by Virtual Reality Laboratories, Inc. and "GUIDE Star Chart," by Project Pluto, to determine each of their positions in the sky at a specific time when viewed from a specific site. My telescope is an 8" f/6 Meade Dobsonian style reflector, therefore, I use altitude and azimuth coordinates for locating objects in the sky. I also use a "Telrad" device as a finder scope. I was lucky enough to work a deal out with the salesman to provide me with a nice set of laminated "Finder Charts of The Messier Objects" by Brent Watson, that perfectly compliment the "Telrad" device, by showing a target on each of objects' chart which matches the reticule that is projected by the "Telrad". These finder charts have been one of the best acquisitions and have been invaluable to me for locating 75 of the Messier Objects.

All right now, I have a good list in a logical sequence, an excellent set of finder charts, a good scope to see them with, and the desire to spend all night in the cold to find them. All I needed now was for the actual night to arrive. I decided to see if any of the other Lowbrows were planning to go, and possibly join up with them as part of a Lowbrow contingent. It was no surprise to me, to find that a number of Lowbrows were also planning on going. I decided to see if I could tag along with Chris Sarnecki. He along with Doug Scobel had their doubts as to whether or not the weather would be good enough to warrant the one hour road trip down to Lake Hudson, where the joint sponsoring clubs had their dark-sky site. Personally I think they were using some kind of reverse psychology on Mother Nature, whatever it was, it worked. We had a huge seven hour window of beautifully clear skies. With a window this size we had a great chance to get more than half way through the list of 110 objects. So, Chris and I decided to carpool and meet Doug and the others down there.

I met Chris at about 5:30 pm and we loaded up his scope and stuff in the back of my van, and we headed on down to Lake Hudson State Recreation Area. This was a great dark site for a very good reason. The Michigan State park system name this site a dark sky preserve in 1993. We arrived just as the Sun touched the horizon. As we unloaded our equipment we met up with Doug Nelle, Jim Abshier and Jim Wadsworth already there and waiting for darkness to set in. A few minutes after Chris and I got our equipment out and set up Doug Scobel showed up and we found Brian Ottum down at the other end of the parking lot where all the telescopes were being set up. The ground was just a little to soft to put the scopes on the grass. The Lowbrows were well represented and of the 18 telescopes that were set up 7 were Lowbrow owned.

As we waited for astronomical twilight to come we registered with the coordinator of this event Wes Boyd and compared lists, scopes, and even took a look at Venus. The sky was growing darker by the minute and we tried to see M42 but only the Trapezium was visible. To confirm seeing it you need to see the nebula. Doug Nelle got the first Messier of the night down at our end. He picked off M41 (an open cluster in Canis Major) at about 7:22 pm. I found it about 2 minutes later and that got things started for me. After M41 I picked off M45 (the Pleiades) and then M35. It was now more than dark enough to get the diffused nebula of M42 but almost an hour before I could see M43. I then got the open clusters in Cassiopeia M52 & M103. The sky was plenty dark by now and anything that was high enough above the horizon was easy to collect. So after starting to collect Messiers at about 7:20 pm, we took our first break at about 10:00 pm. By then we had picked off the



galaxies in Andromeda, the open clusters in Auriga, Puppis, Monoceros, Hydra and Cancer. I made my way through the galaxies in Ursa Major, Leo, Canes Venatici and Coma Berenices and was ready to take on the Virgo Cluster of Galaxies when Chris and I decided to take our break. We hopped into my van, kicked on the heat, and had a little snack while we watched Doug Scobel work the Virgo Cluster. I took a quick count of how many Messiers I had by then. I figured out that I found 50 of these deep-sky objects and picked up 6 that I had never spotted before. I was very pumped up [*That's an understatement - Ed*] and ready to tackle the rest of them. Now for the Virgo Galaxies, I started with the eastern most one M60 and galaxy hop west. This method proved to be very effective with my relatively small 8" scope and a very low power ocular, I was able to see the brightest and largest galaxies only, which happens to be the Messiers. I completed the Virgo group by 11:15 pm and picked off 4 more objects before the clouds moved in and spoiled the rest of the night at about Midnight.

Oh yeah, there was one other object that got some attention that night. Comet Hyakutake 1996/B2 made its naked eye appearance at about 11:30 pm. After all Charles Messier was a comet hunter, and his catalog was one of the first of its kind and put together so that other comet hunters would not mistake them for comets. Hyakutake B2 did not disappoint anyone, it was big and bright and had a very stellar like nucleus. The coma was almost 3/4 of a degree in diameter and as it moved between two 7th magnitude stars in the northern edge of Libra, one could just begin to see traces of a tail. Truly a spectacular sight and one that this observer will never forget, you see this was the first comet I have ever seen!

Well it was getting to cloudy to see anymore Messiers and it was going to get worse, so we packed up the scopes and the Lowbrow contingent headed home. It was 1:00 am and we had a better than average night, the seeing conditions were excellent until the clouds moved in and when all was said and done I had collected 67 out of 110, 21 that I had never seen before and my first comet. Not a bad night, if I do say so myself.

**Any Lowbrows with slides of Comet Hyakutake are requested to bring them to the April meeting to show to the membership. A slide projector will be provided.**

## **From the Observatory - Comet Hyakutake Meanderings**

by Bernard Friberg

Our guests are arriving by the hundreds, in a steady stream. The parking lots are soon filled up and they remain mostly full the entire evening. Cars parked along side the road create a small bottleneck, but the members easily minimize the problems. A flyer is handed out that includes a map and general information. Verbal instructions are given and questions answered. There are lots of kids, very hopeful and excited about seeing the brightest comet in many years. This is the perspective of the March 23rd open house at PEACH MOUNTAIN from the viewpoint of the members working parking and traffic control under the direction of Kurt Hillig.

The observatory is opened about an hour before sunset. Even though the sky is hazy the Moon and its craters are easily seen. Seeing the Moon under these conditions and with clouds gently moving across the field is a very pretty sight. We of course prefer a crystal clear sky. The large 24 inch telescope is pointed to the planet Venus. The crescent shape of the planet, easily discernible, almost always prompts a few questions from the guests. Time passes, and still no comet. The eastern sky glow, haze, and clouds prevents an early sighting of the comet. At last, the comet! First spotted by a club member on the hillside along side of the observatory. More telescopes are pointed towards the newly found object. Visibility is still very poor requiring a lot of searching before others are successful. The visibility remains marginal preventing a clear view of the comet for most of the time. The bright patch, looking a little like a comet, changes to a gently glow, and then it disappears. The view changes back to a gentle glow, a fuzzy blob, and then - it looks pretty much what a comet is suppose to look like. A bright central nucleus, a glowing coma and a tail. The 6 inch refractor built by Mark Cray and recently added to the 24 inch telescope complex is a great addition. The coma clearly has an unsymmetrical shape, and the start of a tail is seen. Binoculars provide a nice wide field view of the coma and tail. The haze dissipates for a short period of time later in the evening. The comet and tail are clearly visible without optical aid. The guests are finally rewarded.

Several of us were viewing the comet in the previous early morning hours (Friday evening-early Saturday morning). A crystal clear window occurred. The tail was seen spanning an arc of over 20 degrees, without

using optical aid. A sight we were wishing for but not entirely believing it would happen. The comet was nearly overhead, positioned about as good as it gets. Again this is Friday night sighting (evening of the 22nd-23rd), not Saturday night.

(Returning to the commentary on the open house :-). The comet is moving, mostly in declination and at a fast rate, it drifts out of the field of view. Its time to reposition the scope. The declination is unlocked and a couple of us (club members) make a quick scan. The comet is not sighted. The comet has disappeared. Would you like to try (directing the question to the next person in line). "Sure comes the response". She searches and searches, and then a gleeful reply, "I found it, I found it". Everyone gives a joyful response. The scope is locked in declination and the guests continue to view the comet.

Many of the guests that persevered that evening are rewarded with a nice view of the comet, but not all of them. The window of opportunity (when the comet is at its best for the evening) is not a long one, so the guests have to be lucky to be at the right place at the right time. The overcast gradually increases and the number of guests are diminishing at a fast rate. There are only three of us club members now remaining. We hear voices in the distance, another group is arriving. We were just about ready to pack it in about ten minutes earlier, but we decided to wait. We quickly give instructions to view the comet, since it is fading fast. This group of about six came from Detroit via the expressway M-23 going south. They missed the North Territorial road turnoff. This group didn't miss the turnoff just a little bit, they missed it by a whale of a lot. They ended up in Toledo before they realized their error, but they did see the comet.

The comet is traversing an angle of 12 degrees in a 24 hour period, increasing to about 17 degrees on March 24th - 25th. On April 13th, the comet will be slightly more than 30 degrees from the sun at a distance of about 0.6 AU from the earth and 0.6 AU from the sun. This angle decreases to about 24 degrees on April 20th, 17 degrees on April 25th, and 7 degrees on April 30th. The number of days are waning for viewing (in Michigan) one of the best comets in a long time, Comet B2/Hyakutake.

**"I don't care about the naming of the comet. If many people could enjoy that comet, that is the happiest thing for me." - Yuji Hyakutake**

## **Calling all Lowbrows @ cyber.astro.nuts!**

by Doug Scobel

Over the past year or more I have been collecting email addresses from you on your membership renewal forms. I have finally put them all together into a single list for distribution back to you. This will allow those of us on the (astronomical, of course) information superhighway to better keep in touch, distribute late breaking news.

Those of you I know about have already received my preliminary list. But, some of you may be on the "net" and I just don't have your email address. If you suspect that that may be the case, simply shoot me an email at [djscobel@ann-arbor.applicon.com](mailto:djscobel@ann-arbor.applicon.com), and I'll get you included too. Thanks!

## **Press Statement by Mr. Yuji Hyakutake, Discoverer of Comet Hyakutake**

March 29, 1996,

[Comet 1996 B2 Hyakutake Home Page](#)

I am a 45-year old amateur astronomer from Kagoshima, Japan. My name, Hyakutake, means "100 samurai, or chivalry," in Japanese. It is not a very common name in Japan. I graduated from the Art Department at Kyushu Industry University, where I majored in photography. I live in the village of Hayato, in the southernmost prefecture located 600 miles southwest of Tokyo on the island of Kyushu. I lived in Fukuoka for many years, but moved to Kagoshima because the skies are much clearer there. I have been married for 15 years, and have two sons, ages 10 and 13. I am the only one in my family whose hobby is searching for comets. My younger son likes the television show, "The X-Files". I've been interested in comets since I was 15 years old, after I heard of the Japanese Comet Ikeya-Seki which appeared in 1965. My interest in astronomy has increased steadily since then. I wanted to discover a comet that had a very far orbit. Although I started searching for comets about seven years ago when I lived in Fukuoka, I have concentrated my efforts more intensely since I moved to Kagoshima two years ago. Since last July, I have been avidly searching the night sky for comets from 2 am to 5 am, about four nights a month. I want to continue searching for comets while my eyesight is reasonably good. Many people have asked me how I discovered Comet Hyakutake. I live in the countryside and travel to a rural mountain top area about 10 miles from my home



to get a better view of the night sky. (Before I was married, I enjoyed mountain climbing.)

Actually, I discovered two comets. I spotted the first one at 5:40 am on December 26 (1995). I wasn't sure it was a comet, but I reported the sighting anyway. This first comet is still there, but it's not very bright. A month later, I went back to the area to take photos of the first comet. I looked up at the sky where it should have been at that point in its path. However, that particular spot was filled with clouds. I tried to find an area in the sky that was unobscured. The clouds led me back to the same spot in the sky where I had originally found the first comet, but it didn't make sense that it would be there. That is when I discovered the second Comet Hyakutake, the one the media now refers to as "The Comet of the Century". I've been asked about 75 times how I felt when I discovered this comet. Actually, I was feeling a bit confused. My reaction was somewhat complicated, since I had originally intended to go to the viewing spot to take a picture of my first comet. I found the second comet in the same area as the first one, near the constellations of Libra and Hydra.

I discovered Comet Hyakutake at 4:50 in the morning, and usually a person can report a comet after 8 am, but I decided to take some photos of the comet, using my camera with telephoto lenses, and got them developed. It wasn't until 11 am that I called the National Astronomy Observatory in Tokyo to report my new comet. I followed the formal procedure of gathering data and documenting my new comet discovery with photos. Then two other amateur astronomers in Japan recognized the comet.

It's interesting that my discovery wasn't reported very widely by the Japanese media until recently. The first media reports were from London. Then the American press became very interested. Now the Japanese media is covering the comet story. My wife can't make phone calls because the phone is always ringing. I'm happy that this Comet Hyakutake was the second one I discovered, because it wasn't mere coincidence. This proved to me that my method of searching for comets is working, and I will continue to look for them. I use high-powered, field binoculars with 6-inch lenses, mounted on a stand. This is the only equipment I own. Comet Hyakutake has the longest tail that I have ever observed, although the new Hubble images show that this comet is breaking into fragments. I am a bit perplexed by all the attention paid to me, when it is the comet that deserves the credit.

## Comet Hyakutake Observations

Thx to Bernard Friberg for downloading this article from JPL's Comet Homepage  
*[some Lowbrow's observations included. - Ed]*

*1996 Mar. 16, 11:00 pm EST, Overheard at the Lake Hudson Messier Marathon - "Comet is up!" When Mark Deprest and I look (naked-eye) for the comet, still in Libra, we are momentarily confused by the "3rd" 4th mag star (the comet) between Zubenelgenbi and Zubeneshamali. See Mark's additional description in his Messier Marathon article in this month's newsletter. - Ed*

*1996 Mar. 20, 12:00 midnight and 2:00 am later that night. Observing w/ a "Cray" 85mm, f5 finder scope from Shanty Creek, northern MI, the 3rd mag comet looks bluish in color and an obvious tail goes right off the five degree field of the scope. Seeing is excellent up here. I can see naked eye stars in between the constellation stars of Virgo! - Ed*

*1996 Mar. 22, sometime in the late evening. Neighbor's show up in my backyard looking for the comet. "Comet is in the front yard", I indicate to them trying to convey the correct celestial position. It is already overcast but, the comet can be seen right through the clouds. This is going to be a bright one. - Ed*

*1996 Mar. 23 Its an open house at Peach Mountain. See Bernard Friberg's excellent article in this month's newsletter.*

1996 Mar. 25.28 UT:  $m_1=0.1$ , Dia.=1.3 deg, DC=6, Tail: 54 deg in PA 215 NE Alan Hale (Cloudcroft, NM) WOW! A stunning sight in the nighttime sky. The first 35 degrees of the tail were fairly bright and obvious, while the remainder could be faintly seen once the comet was high in the sky and the Moon had set. In 41 cm L, the bright needle-shaped tailward jet in about 10' lon diffusing and spreading out toward its end; on the anti-tailward side, this feature fans out into three fainter short jets.

1996 Mar. 25.854 UT:  $m_1=0.2$ , Dia.~60', DC=7, Tail: 5 deg. in PA210, 10x80 B., Mieczyslaw Parafowski (Lublin, POLAND) In 15 cm L f/9 (80x), two jets from the stellar central condensation were seen: 10' long in PA210, and 3' long in PA350. NE lim. magnitude at 4 (light pollution).

1996 Mar. 25.875 UT:  $m_1=0$ , DC=4, No visible tail  
Andrew Roberts  
(Cambridge, England) Seeing was very bad, fairly thick

haze and low cloud, but the first chance we in England have had to Hyakutake at all :-). Apart from the comet, the only other things visible were the Moon, and when the murk cleared a little, Venus. Nonetheless, it was easy to find, most satisfying, but I can't describe it as spectacular, tonight perhaps? Occasionally visible to naked eye. No visible tail. Bonus, while I was setting up, a bright meteor, (?m -3) crossed the same patch of sky. Marvelous.

1996 Mar. 26, all night. Numerous Lowbrows show up at Peach Mountain for what is probably the best night in the Ann Arbor area to see and photograph the comet. A 25 degree tail naked eye tail is seen by some members. - Ed

1996 Mar. 26.05 UT,  $m_1 = -0.5$ , Dia.=1.7 deg., DC=6, Tail: 23 deg. in PA 206 deg. NE Björn H. Granslo (Fjellhamar, Norway) In the telescope (20.3-cm SCT, f/10, 123x) a ~14' long jet was seen from the nucleus in the same direction as the tail. The was connected to a bright nebulous region ~30" in diameter. The magnitude of nucleus was  $m_2 = 7.9$ . NLM = 5.5.

1996 Mar. 26.08 UT,  $m_1 = +0.6$ , Dia.=60', Tail: 55 deg. in PA 205 deg. NE. Trond Erik Hillestad (Kongsberg, Norway) The diameter and magnitude of the central part of coma was estimated as 12' and 2.4, respectively. The nucleus was offset by 1/3 of the distance from the centre of the coma. Tail was straight and easily seen for 45 degrees and the width was ~3 degrees from a distance of 10-15 deg. from the coma. The innermost ~5 deg. showed a distinct bluish color. Very favorable conditions with a clean atmosphere, NLM = 6.7.

1996 Mar. 26.19 UT:  $m_1=+0.3$ , Dia=1.1 degrees, DC=6-7...naked eye...J.Bortle (Stormville,NY) Tail 54 degrees long in p.a. 207 near Moon set - amazing structure visible in coma with 41-cmL

1996 Mar. 26.19 UT:  $m_1=0.3$ , Dia=95', DC=6-7, main tail 15 degrees, PA 205, naked-eye...Chris. Spratt, Victoria, BC. Even in moonlight the coma is still large. In an 0.08-m refractor F/3.7 (19x), despite the Moon, the comet is still an impressive sight, with a very bright star-like centre from which there is a short bluish tailward 15' fan-tailed "spike" or jet at PA 205.

1996 Mar. 26.34 UT  $m_1=-0.2$ , Dia.=85',DC=8, Tail: 45deg in PA~210 deg...NE...Brian Adams (near Prairie City, IA) [NLM=6.5, scattered clouds. Absolutely breathtaking! I almost didn't notice the sub-zero(Fahr.) wind chill! The tail was much stronger (as well as longer) than it was on previous nights. [Many Lowbrows can relate to this observer's comment on the

cold. - Ed]

1996 Mar. 26.40 UT:  $m_1=0.4$ , Dia.=1.3 deg, DC=6, Tail: 56 deg in PA 204 NE Alan Hale (Cloudcroft, NM) [once again, a grand sight with the naked eye. In 41 cm L the needle-shaped bright tailward bright jet isn't as bright as it was before, and it appears to be diffusing into the ion tail. Three bright jets on the anti-tailward side appear to create a bright fan, with the outer peripheries of this appearing to extend into a set of hoods sweeping back to the tailward side of the coma.

1996 Mar. 26.48 UT:  $m_1=-0.4$ , DC=7, Tail: ~70 deg in PA 203 (at the head)...NE... Charles Morris (Pine Mountain Club, CA) The comet remains a magnificent object! Much of the internal detail in the inner coma is similar to previous nights although differences are noted.

1996 Mar 26.95: $m_1=0.0$ ,dia=90',DC=7....10 x 50 B... Brian O'Halloran (Maynooth, Ireland) First clear skies in 10 days....and what a sight awaited us!!! Main tail could be discerned out to 30 deg,with a fainter tail visible in binoculars at PA=210 deg. A lot of detail visible in inner coma, the hood being sharp and obvious,blue-green in color. Moonlight interfered somewhat,probably drowning out the far outer reaches of the tail. Comet was so bright, it even was visible through cloud passing over it!!!!

1996 Mar. 27.08 UT:  $m_1=-0.1$ , Dia.=90', DC=7, Tail: 67 deg in PA ~145 NE Hartwig Luethen (Itzehoe, Germany) What a sight!!! Very transparent sky after passage of cold front. Amazingly high surface brightness of the tail. The first 20 degrees were very bright, with intricate rays visible in binoculars. With direct vision, the tail was clearly visible down to CnV, even before moon set. After Moon set, indirect vision revealed the tail passing and exceeding CBr!!

1996 Mar. 27.08 UT,  $m_1 = -0.1$ , Dia.=1.4 deg., DC=6-7, Tail: 45 deg. in PA 143 deg. ... NE ... Björn H. Granslo (Losby, near Fjellhamar, Norway) The comet was a spectacular sight with the naked eye and 10x50 B. Conditions were favorable (the Moon had set, NLM=6.2-6.3). I was observing with T. V. Bjerved and his impressions agreed with mine. With the naked eye the tail was very distinct to 15 degrees from the coma, clearly visible to 30 degrees, and faintly seen to 45 degrees. It was narrow, but the end of the tail appeared broader (width ~4 degrees). The magnitude of an apparently stellar central condensation was 2.8. In 10x50 B several details and structures were visible in the coma and the tail. There was a bright and slightly curved streamer that was more than 10 degrees long. It was apparently connected to a jet from the nucleus in



the coma. The shape and intensity distribution of the coma was clearly asymmetric. In a 20.3-cm f/10 SCT (123x) on Mar. 27.14 UT an ~7' long and straight jet was visible from the nucleus and in the direction of the tail. The nucleus was also connected to a bright fan-shaped nebulous region (~1' in size) in the direction opposite to the jet. The m2-magnitude was 8.4. The rapid decrease in the PA of the tail from Mar. 26.80 UT is due to the comet's close passage to the North Celestial Pole.

1996 Mar. 27.43 UT: m1=1.0, Dia.=1.0 deg, DC=6, Tail: 70 deg in PA 074 NE Alan Hale (Cloudcroft, NM) [the comet is noticeably fainter than it was over the weekend, but is still a conspicuous naked-eye object. In the 41 cm L the inner coma exhibits the "fountain" structure that is remarkably similar to those of the classic drawings of 19th Century comets, with fairly bright tailward jet, and parabolic jets on the anti-tailward side outlining a bright fan-shaped inner coma.

1996 Mar 27.83 UT: m1=1.2 mag, dia=40', DC=8, tail=4 deg, 12 deg with averted vision ... NE ... Josef Liebl (Freising, 30 km N of Munich, Germany) [limiting magnitude around 3.5, first quarter moon high in the sky; comet seen through car window while driving to the observing site; no color seen in comet *[While it is not recommended or encouraged to perform your celestial observing while driving down the Autobahn, it is not surprising that this observer has experienced limited results from his observing run - Ed]*

1996 Mar. 27.95 UT: m1=0.6, Dia=1 deg, DC=6-7, tail: 35 deg. NE Xavier Leprette (Ablis, France) Observation done with moonlight. After the Moon set (28.18 UT) the inner coma shows a splendid fountain structure with a short bright spike (SCT at 210x).

1996 Mar. 28.125, m1=1.0, Dia.=60<sup>TM</sup>, DC=7, Tail: 52 deg...NE...Gunnar Glietscher, (Ulrichstein, Germany) Naked eye limit: 6.5 magnitudes, coma and tail obviously getting fainter now, but still very impressive; much activity near the "nucleus" (pale orange colored fountains of cometary material on the nucleus<sup>TM</sup> leading side visible in 20-inch-Dobsonian at 100x); possibly one or two condensations in the spine on the "nucleus" trailing side; comas leading edge strikingly parabolically shaped (20-inch-reflector); tail ended for my eyes just west of the Coma Berenices star.

1996 Mar. 28.19 UT: m1=1.3, Dia=50', DC=6-7, main tail 15 degrees, PA 50, NE Chris Spratt, Victoria, BC. Faded over past two days. Even in moonlight the coma is still large. In an 10-cm RF/5.4 (150x), despite the first-quarter moon, the comet is still an impressive

sight, with a very bright star-like centre from which there is a short tail-ward 10' fan-tailed "spike" and three curved fountains about 2' in length surrounding the slightly flattened sunward side of the coma.

1996 Mar 28.99: m1=0.5, dia=1 deg, DC=6.10 x 50 B...Brian O'Halloran (Maynooth, Ireland) Coma much smaller than previous nights, and much more diffuse. An elongation of inner coma noted at PA=90 deg. Tail was seen out to a greater distance than earlier in the night, length approx 30 deg, despite the moonlight and some light pollution. One wonders how long it would be if we had dark skies!!



Comet Hyakutake, 1996/B2, March 26th at 11:00 pm EST as seen by Mark Deprest with 7x35 binoculars. Drawing made with Aldus Photostyler SE.

## New Type of Astronomical Object Discovered in our Galaxy

- RELEASE: 96-37 (Feb 28, 1996)

Ron Baalke (baalke@kelvin.jpl.nasa.gov)

NASA astronomers have discovered a new type of object towards the center of our Milky Way galaxy exhibiting a combination of behaviors never before seen in the 35-year history of gamma-ray astronomy. During the first day it was observed, the source produced over 140 powerful bursts of gamma-rays; since then, it has settled down to a daily rate of about twenty bursts, and it is currently the brightest source of hard X-ray/gamma-rays in the sky. The discovery will be announced tomorrow in a paper published in the scientific journal "Nature" by scientists from NASA's Marshall Space Flight Center, Huntsville, AL; the University of Alabama in Huntsville; the Massachusetts Institute of Technology in Cambridge, MA; and the University of Amsterdam in the Netherlands.

The unusual object in the southern sky was discovered in early December 1995 by researchers using an instrument known as the Burst and Transient Source Experiment, aboard NASA's Compton Gamma Ray Observatory spacecraft. Since December 2, the new burster has produced more than 1,000 hard X-ray bursts. "We're particularly excited about the discovery of a new X-ray source," said NASA Marshall astrophysicist Dr. Gerald Fishman. "The object's strange behavior is one of the major discoveries in X-ray astronomy in the past decade."

Apparently the sky had more surprises in store for the observers. In mid-December, the NASA scientists discovered an additional source of steady radiation that seemed to reside at the same position in the sky with the burster. This new object further surprised scientists when it was observed to continuously emit pulses at a rate of about twice per second. It was now classified as a pulsar, and the question that the observers faced was "what was the relation, if any, between the two objects?" said Dr. Chryssa Kouveliotou of the Universities Space Research Association at the Marshall Center.

The answer soon came back: the burster and the pulsar were one and the same source. "The properties of this X-ray source are unlike those of any we know," explained Dr. Kouveliotou. "The burst repetition rate makes this phenomenon very different from gamma ray bursts that we have observed several thousand times from throughout the universe. Also, the longer duration and persistent bursting makes the object very different from so-called Soft Gamma Ray Repeaters, which have been observed to burst in short, isolated episodes separated by several years." "What's unique about this object is that it does so many different things all at once," said Fred Lamb, an astrophysicist at the University of Illinois at Urbana-Champaign. "We've seen some sources that play the drums, some that crash cymbals, and a few that play the trumpet, but this source is a one-man band."

This bursting pulsar was later found by Dr. Mark Finger of the Universities Space Research Association at NASA Marshall to be a member of a binary system, performing one full revolution around its low-mass companion every 12 days. "The most likely explanation at this time is that the bursts of X-ray energy may result when the lighter of the pair of stars loses its material by gravitational or magnetic forces to the neutron star," said Kouveliotou.

A neutron star is an exotic star with a mass greater

than the Sun and a diameter of only about 10 miles. "The discovery of the new X-ray source may lead to a better understanding of how neutron stars form and evolve," Kouveliotou said. The source was discovered shortly before the recent launch of NASA's Rossi X-ray Timing Explorer (RXTE) spacecraft, which carries the largest collecting area of X-ray detectors ever flown in space. "Our highest scientific priority, after evaluating the operation of the satellite and X-ray instruments, was observing this transient source" said Frank Marshall, Director of RXTE's Science Operations Center.

"With better measurements, we should be able to pin down the theoretical model," says Jean Swank, RXTE Project Scientist. As soon as RXTE could observe the source, its detectors were pointed to obtain detailed information about the X-ray spectrum and its variations. The two large instruments on the spacecraft, provided by teams led by Swank of NASA's Goddard Space Flight Center, Greenbelt, MD, and Richard Rothschild of the University of California at San Diego, quickly found the source to be very bright across the X-ray band from 2 to 60 keV, with strong persistent emission as well as numerous bursts.

"First, matter is accelerated to half the speed of light because of the neutron star's enormous gravitational force. Then, it crashes into the surface of the neutron star and is heated to nearly one billion degrees," Lamb explained. "Because it is so hot, it radiates almost entirely in X-rays rather than visible light, in this case with a power comparable to 1 million times the power of the Sun originating from an area about the size of the National Mall in Washington, DC."

RXTE made repeated scans across the source to determine the position of the source accurately enough to allow astronomers to search for radio or visible light from it. Within the past ten days, a radio source and a very faint visible star have been identified in the direction of the X-ray source. Scientists are working furiously to see if the radio and visible light are coming from this object.

The bursting pulsar is a transient X-ray star that is expected to die out fairly soon, within a few weeks to, at most, a few months. Therefore, scientists are working feverishly to try to unravel its mysteries while it still shines.

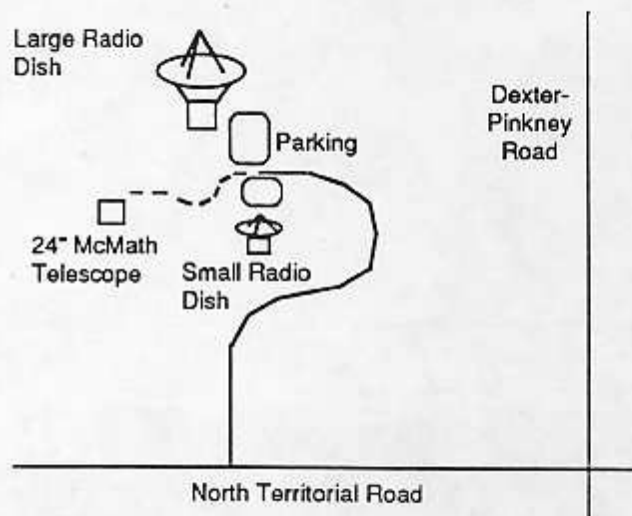
The Compton Gamma Ray Observatory, which was launched in 1991, is managed by NASA's Goddard Space Flight Center, Greenbelt, MD, and the Burst and Transient Source Experiment is managed by NASA Marshall. The Rossi X-Ray Timing Explorer, launched on December 30, 1995, is managed by NASA Goddard.



## Places:

**Dennison Hall**, also known as The University of Michigan's Physics and Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. It is found in Ann Arbor on Church Street about one block north of South University Avenue. The meeting is held in room 807.

**Peach Mountain Observatory** is the home of The University of Michigan's 25 meter radio telescope as well as the University's McMath 24 inch telescope which is maintained by the Lowbrows. The observatory is located northwest of Dexter. The entrance is on North Territorial Road, 1.1 miles west of Dexter-Pickney Road. A small maize-and-blue sign marks the gate. Follow the gravel road one mile to a parking area near the radio telescopes. Walk along the path between the two fenced in areas (about 300 feet) to reach the McMath telescope building.



## Times:

**Monthly meetings** of the Lowbrows are held on the 3rd Friday of each month at 7:30 PM in 807 Dennison Hall. During the summer months, and when weather permits, a club observing session at Peach Mountain will follow the meeting.

**Computer subgroup meetings** are held on the first of each month, rotating among member's houses. See the calendar on the cover page for the location of next meeting.

**Public Open House/Star Parties** are held on the Saturday before and after each new Moon at the Peach Mountain Observatory. Star Parties are canceled if the sky is cloudy at sunset or the temperature is below 10 degrees F. Call 480-4514 for a recorded message on the afternoon of a scheduled

Star Party to check on the status. Many members bring their telescopes and visitors are welcome to do likewise. Peach Mountain is home to millions of hungry mosquitos - bring insect repellent, and it does get cold at night so dress warmly!

## Dues:

Membership dues in the University Lowbrow Astronomers are \$20 per year for individuals or families, and \$12 per year for students. This entitles you to the monthly REFLECTIONS newsletter and the use of the 24" McMath telescope (after some training). Dues can be paid to the club treasurer Doug Scobel either at the monthly meeting or by mail at:

Doug Scobel  
1426 Wedgewood Drive  
Saline, MI 48176

## Magazines:

Members of the University Lowbrow Astronomers can get a discount on these magazine subscriptions:

*Sky and Telescope*: \$24 / year

*Astronomy*: \$20 / year

*Odyssey*: \$16.95 / year

For more information contact the club Treasurer. Members renewing subscriptions are reminded to send your renewal notice along with your check when applying through the club Treasurer.

## Newsletter Contributions:

Members and (non-members) are encouraged to write about any astronomy related topic of interest. Call the Newsletter Editor Chris Sarnecki at 426-5772 or e-mail to [chrisandi@aol.com](mailto:chrisandi@aol.com) to discuss length and format. Announcements and articles are due by the first Friday of each month. Articles should be mailed to:

Christopher Sarnecki  
4835 Holly Way  
Ann Arbor, MI 48103

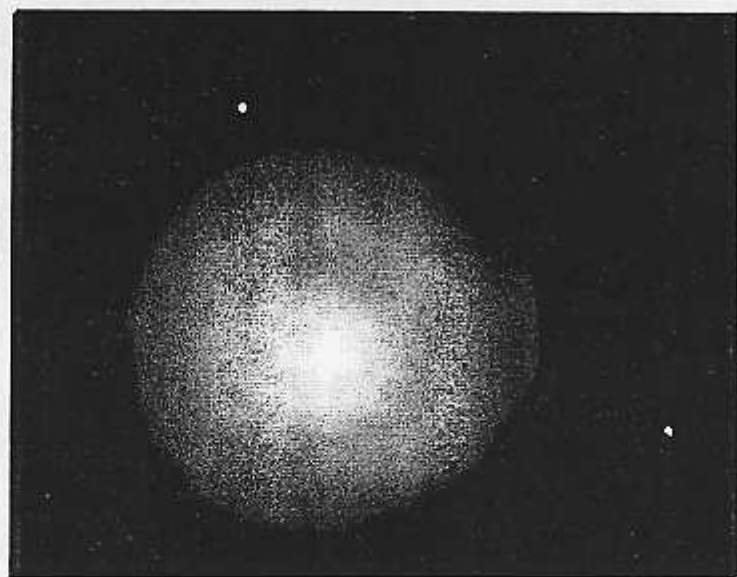
## Telephone Numbers

President:	Bill Razgunas	995-0934
Vice Pres:	Mark Cray	283-6311
	DC Moons	254-9439
	Tom Pettit	878-0438
	Tom Ryan	662-4188
	Randy Stevenson	429-5099
Treasurer:	Doug Scobel	429-4954
Observatory		
Director:	Bernard Friberg	761-1875
Newsletter:	Chris Sarnecki	426-5772
Peach Mtn		
Keyholder:	Fred Schebor	426-2363

University Lowbrow Astronomers  
1740 David Ct.  
Ann Arbor, MI 48105

Check your membership expiration date on the mailing label !

Comet Hayakutake as seen by Mark Deprest on March 16, 1996 at Lake Hudson State Recreation Area during the Messier Marathon. The 1d19' field of view is as observed in a Meade 8" f/6 Newtonian reflector at 38X. North is to the top. The two stars are 7 mag and are separated by 1d15'. The drawing was made with *Aldus Photostyler SE* software.



**MONTHLY MEETING: ANNUAL ELECTRONS - COME AND CAST YOUR VOTES FOR CLUB OFFICES AND HELP CHARGE UP THE LOWBROWS FOR THE NEXT YEAR !**

The meeting starts at 7:30 pm, Friday, April 19th in Room 807 of Dennison Hall (Physics & Astronomy Building).