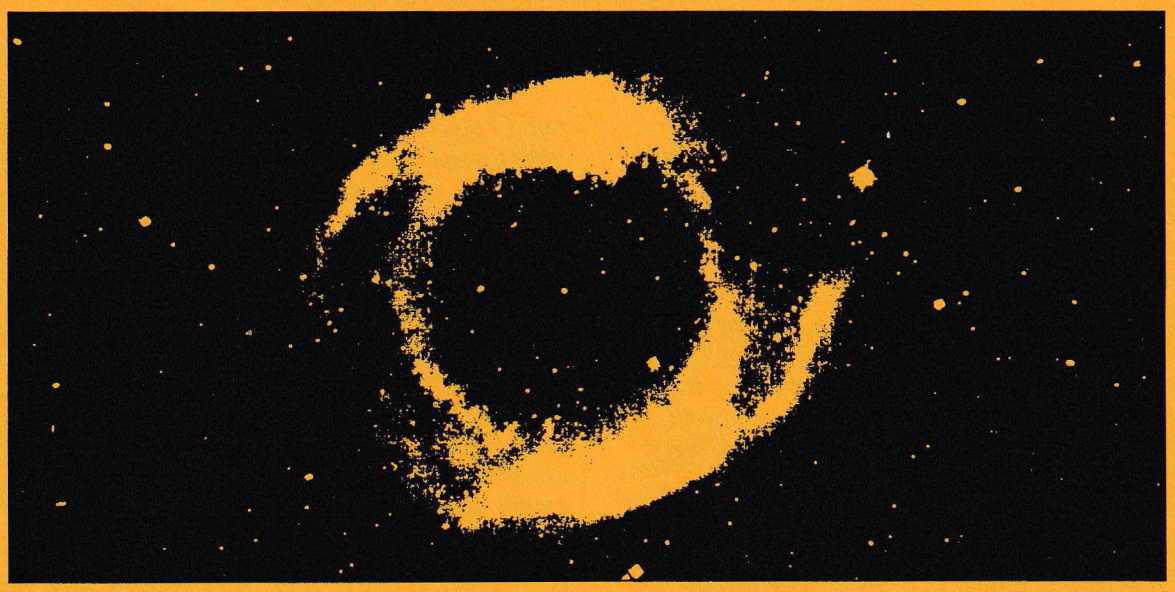
REFLECTIONS



REFLECTIONS

September 1992

The Helix Nebula, NGC 7293, in Aquarius. Doppler shift measurements show the expansion velocity to be 20 - 40 kilometers per second.

Kurt Hillig
Editor

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 Detroit Observatory at the corner of Observatory and Ann Streets in Ann Arbor. Meetings begin at 7:30 PM and are open to the public. For further information, call Stuart Cohen at 665-0131.

This Month:

September 18 – Meeting at the **Detroit Observatory** in **Ann Arbor**. Many of our members will be at Astrofest, but the show will go on! On the schedule: a slide presentation from the Dark Sky Association, and a video on the big new scopes from JMI.

September 18-20 – Astrofest! The midwest's biggest gathering of amateur telescope makers, near Kankakee IL (1/2 hour south of Chicago). They can house and feed 300 people, but there are also plenty of tent sites. Several club members will be attending; contact Alan Birkner at (708) 966-6214, or talk to Fred Schebor (426-2363).

September 25-26 – Hidden Hollow '92 in Mansfield OH. Contact Keith Moore, PO Box 1118, Mansfield OH 44901-9998; (419) 755-7796 (w) / 468-3542 (h).

September 25-26 – NIAGFest '92 in N. Webster IN. Contact Michiana Astronomical Society, PO Box 262, South Bend, IN, 46624-0262.

September 26 – Public Open House at the **Peach Mountain Observatory** (on North Territorial Road, 1.1 miles west of Dexter-Pinkney Road). Kurt Hillig will be our host this evening. The 24" scope is operational again – hopefully someone checked out on it will be there to run it!

Next Month:

October 1 – Computer Subgroup Meeting at **Kurt Hillig's** house (a Thursday). Subjects to be decided at the club meeting on the 18th.

October 3 –Public Open House at the **Peach Mountain Observatory.** We should be seeing some nice fall color in the sky. If it's clear, come on out! Club members: see the call for volunteers below – Uncle Stu wants you!

October 16-18 – Antique Telescope Convention and Show at the **U.S. Naval Observatory, Washington D.C.** Walt Breyer, 30 Green Valley Road, Wallingford PA 19086.

October 26 –Public Open House at **Peach Mountain.**

Call for Volunteers!

We still need people to host the last few star parties of the year, on October 3 and 26, and maybe the 31st if it's not too cold. If you're interested, talk to Doug Nelle at the September 18 meeting, or call him at 996-8784.

A word from the editor:

Due to vacation conflicts with just about everybody, the September issue of *Reflections* has only six pages instead of eight. If you'd like to see an article by someone other than me, please submit one! No reasonable subject will be refused. The deadline for the next issue is Oct. 2. Please submit calendar items three months in advance.

Reflections on Mirror Making

by Tom Ryan

Back in 1967, when I was 14 years old, big telescopes were rare and very expensive. My parents had bought an Edmund 4.25 inch reflector for me, and I immediately got a case of aperture fever. At the time, however, Edmund wanted $200 for their 6" reflector. While this was a sum that seemed beyond all possibility of attaining, I nevertheless started saving for it.

While patiently accumulating my dollars, I joined the Black River Astronomical Society and attended my first star party. It was at the house of Diane Lucas, and during the night she rolled a 12.5" Cassegrain out of her garage. It was the biggest scope I had seen in my life! It was all black and could only be seen in outline where it blotted out the stars. She explained that she had made it herself, and then showed several of us her basement workshop. She told us that she made the optics while her husband did the machine work. She showed us her grinding machine and Foucault tester, and in a corner a Newtonian interferometer for testing convex surfaces. We saw the 4" Maksutov which was later displayed in the pages of Henry Paul's "Telescopes for Skygazing". I realizeded then and there that the best way for me to afford a big scope would be to make it myself.

Through another member of the club, Jim Thomas, I found out that there was going to be a telescope-making class starting up at a nearby Nature and Science center. Jim was three years older than I was, and had already made two 16" reflectors, and was going to be one of the instructors. He also had a car, so every Wednesday evening I hitched a ride with him to telescope class.

Everyone in the class started with a 6" f8 reflector. The class rules were that once you completed that one, the next scope you made could be anything at all. We had to pay for the glass, abrasives, and donuts, and the Science center provided the space, water and electricity. Even though we mopped the floor after every class, I think they lost their shirts on the deal – but it was a great deal for us! It was there that I learned how easy it is to make a mirror. All you need is patience, and a little help in avoiding the bigger mistakes. No time limits on mirror completion were imposed, and after I finished my 6" scope I stayed on as an instructor until I left for college. (Jim Thomas later went on to grind and figure the 31" f8 fused quartz mirror for the Warren Rupp Observatory, among other projects.)

With the Dobsonian revolution of the past several years, amateur telescopes suddenly became much larger and much less expensive. In fact, it seemed to me that with prices dropping so low nobody in his right mind (nobody in her left mind?) would ever consider grinding a mirror. However, joining the Lowbrows brought me into contact with some unusual people – they *did* want to grind mirrors. Their reason was simple - they wanted optics which couldn't be bought. Doug Nelle wanted a perfectly figured 8" scope. Brain Close wanted a tri-Schiefspiegler. Doug Scobel bought a commercial mirror of average quality and wanted to make it better. (And with the new batch of 16" blanks in the club, more new unique scopes are on the horizon - Ed.)

I've helped all of them to create something with accuracies of a millionth of an inch or better. I can't speak for them, but when I do this it's heaven on earth for me.

The End of an Era

Sometime between now and the end of the year, the Pioneer Venus Orbiter will end its 14-year life of studying our nearest planetary neighbor. During this final phase of its mission, it will conduct new experiments on the upper atmosphere regions which have never before been reached, helping to answer questions about Venus' environment – whether there is lightning on the planet and whether Venus once had oceans. It will then enter Venus' atmosphere at hypersonic speed and burn up.

Pioneer provided data for the first topographic maps of 90 percent of Venus' surface, identifying mountain ranges, plateaus, plains and deep depressions. In its final weeks, it will explore the interaction of the solar wind with Venus' atmosphere, and examine the composition of the upper atmosphere and lower ionosphere.

Its first exploration of Venus was from an orbit with a periapsis of 93 miles; solar gravity slowly raised this to 1500 miles, and then lowered it again. By June 1992, periapsis had dropped to 125 miles, and Pioneer began measuring Venus' ionisphere again. By Sept. 7 periapsis dropped to 82 miles, and Pioneer's thrusters were used to raise it; sufficient fuel remains to repeat this eight more times, but on December 10 the fuel will run out.

Happy Anniversary!

At 2:08 AM PDT on September 1, 1992, the Tidbinbilla Deep Space Network tracking station in Australia lost the downlink signal from Voyager 1. Telemetry data indicated a failure in the Voyager transmitter's ultra-stable oscillator.

Voyager responded autonomously to the problem and switched itself to its auxiliary oscillator. The spacecraft reconfigured itself in less than ten minutes and resumed sending telemetry back to Earth.

Voyager 1 was launched fifteen years ago, on September 5, 1977. It is still conducting experiments on deep-space fields and particle composition and making UV observations. It is presently 4.6 billion miles from Earth.

Computers In Astronomy Subgroup Report

August is that time of year when everything slows down, people travel to far and distant climes, children start to seriously dread the return of school, and everyone prays for good weather over Labor Day weekend. Unfortunately, this is also the time of year when nobody comes to meetings (well, two people did show up, but that's hardly a quorum). So the only order of business was to decide to try again next month (It will be at Kurt & Kathy Hillig's house – call 663-8699 for directions). See you there!

The Fish Lake Episode

by Gary Miller

On August 28 - 30, 1992, Eastern Michigan University sponsored the "Fish Lake Under the Stars" party . Fish Lake is located about five miles northeast of Lapeer, MI There were two options for attending; the first was to utilize their overnight lodging and meals, and the other was to attend only the activities and otherwise fend for yourself. Since Fish Lake is only an hour or so from my home in Livonia, I chose the latter. Since I only participated in the activities for one day, my comments will focus there.

I arrived at Fish Lake around 11 AM Saturday morning. There were three scopes set up for solar viewing; a 4" and a 6" refractor, and an 8" Schmidt-Cassegrain telescope. The 6" and 8" scopes presented their views in white light, using the Thousand Oaks solar filters – basically full-aperture glass plates with a highly reflective Nickel-Chromium coating, to allow only a fraction of a percent of the light to get through. The 4" scope used an H-α (Hydrogen-alpha) filter, which has a very narrow bandwidth centered on a strong red emission line of Hydrogen. The nichrome filters gave a white (well, yellow-orange) image, with several sunspots clearly visible near the limb. With the deep red H-alpha view, prominences could be seen around the edge. I liked the H-α view better, as more detail was visible even with the smaller scope, but at $3000 for the filter I think the white view will suffice.

Inside the meeting hall there were several telescopes on display, ranging from a 3" refractor to a 12" Parks reflector to SCT's of 8" – 14" aperture. Some were "factory stock" units, but many had been customized to accommodate their owners' special interests.

Most of the day was spent talking with others about their equipment and interests. There was a flea market, a nature walk around the lake, a rocket-launching session in the afternoon, a lecture on solar observing, and after dinner a drawing for door prizes. The weather had been pretty iffy all day, and looked to be pretty bad in the afternoon with lots of wind and clouds, but as the sun set the sky cleared, and we were off to the races....

There must have been at least 20 telescopes set up that night. There were many SCT's, a couple of refractors, a home-brew 8" Dobsonian, and several Newtonian reflectors including a 17" on an equatorial mount. Very impressive turnout! I saw the Veil nebula through the 17" – what a sight! Tried to see the same thing in many of the smaller scopes but they just didn't compare.

The one setup which was most impressive, at least from a technological standpoint, was a programmable computer-driven 10" SCT – the ultimate "dial-a-matic" scope! This system consisted of a Meade 10" SCT (probably their LX200 - Ed.) with an RS-232 connection to a PC running "The Sky". As it was explained to me, this system could work with almost any sky-map program when coupled with the interface software they'd written, and it would drive the scope to any celestial coordinate on the screen. Just click with the mouse on the desired object and stand back – when the scope stops, it's pointing dead on. Couple this system with a CCD camera and a high-quality monitor and you don't even have to go outside. All it takes is lotsa dollars....

I spent the next three hours traveling from scope to scope just enjoying the views. I finally forced myself to leave about 1 AM. I was glad that I'd had the opportunity to participate. I'd never been to a start party before, and after going to this one I can hardly wait for the next!

One-Night Stands
– or –
How I Spent My Summer Vacation

by Kurt Hillig

Those of you who've been around the Lowbrows for a while may have noticed that there are quite a few big scopes in the club; if you made it to the last meeting you heard about Doug Nelle's new 8" that he hopes is small enough to take on vacation. I, on the other hand and not knowing any better, started out small. All I've got is a Meade 2045D – a 4" f10 Schmidt-Cassegrain – but it's hard to beat for portability. With its fork mount (built-in clock drive) and my meager collection of eyepieces etc., but excluding the tripod and wedge, it packs into a case which fits under an airplane seat. So when we took off a couple weeks ago for Colorado (which is why we weren't at the meeting), it was easy to stuff everything in the trunk (of the car, we didn't fly), along with clothes and camping gear, in the hopes of finding some clear skies somewhere along the way.

Of course by the time we got to Denver it was pouring rain, but we checked the forecasts and kept going west to Dinosaur National Monument (wonderful place!). And as the sun slowly sank in the west I trundled my hardware to the far end of the campground (after the first 200 yards it sure doesn't feel portable). I invited everyone I passed to join me, and by the time I had everything set up and the polar alignment reasonably close, there were a dozen onlookers. Unfortunately, there were also clouds drifting overhead, but we managed to work around them. And even with a 4" scope at only 100X, Saturn really impressed the crowd, and those M's we managed to find before the clouds got too thick (3, 8, 13, 31, etc.) were well received by all.

Our next stop was Colorado National Monument – beautiful, hot and very dry. This time the skies were clear, though the lights from Grand Junction were annoying, and I didn't have so far to walk. I only drew six others this time, but there was plenty for all to see. By now I'd worked out my patter, so this time I started big and far away (with the Andromeda galaxy) and worked my way in to Saturn.

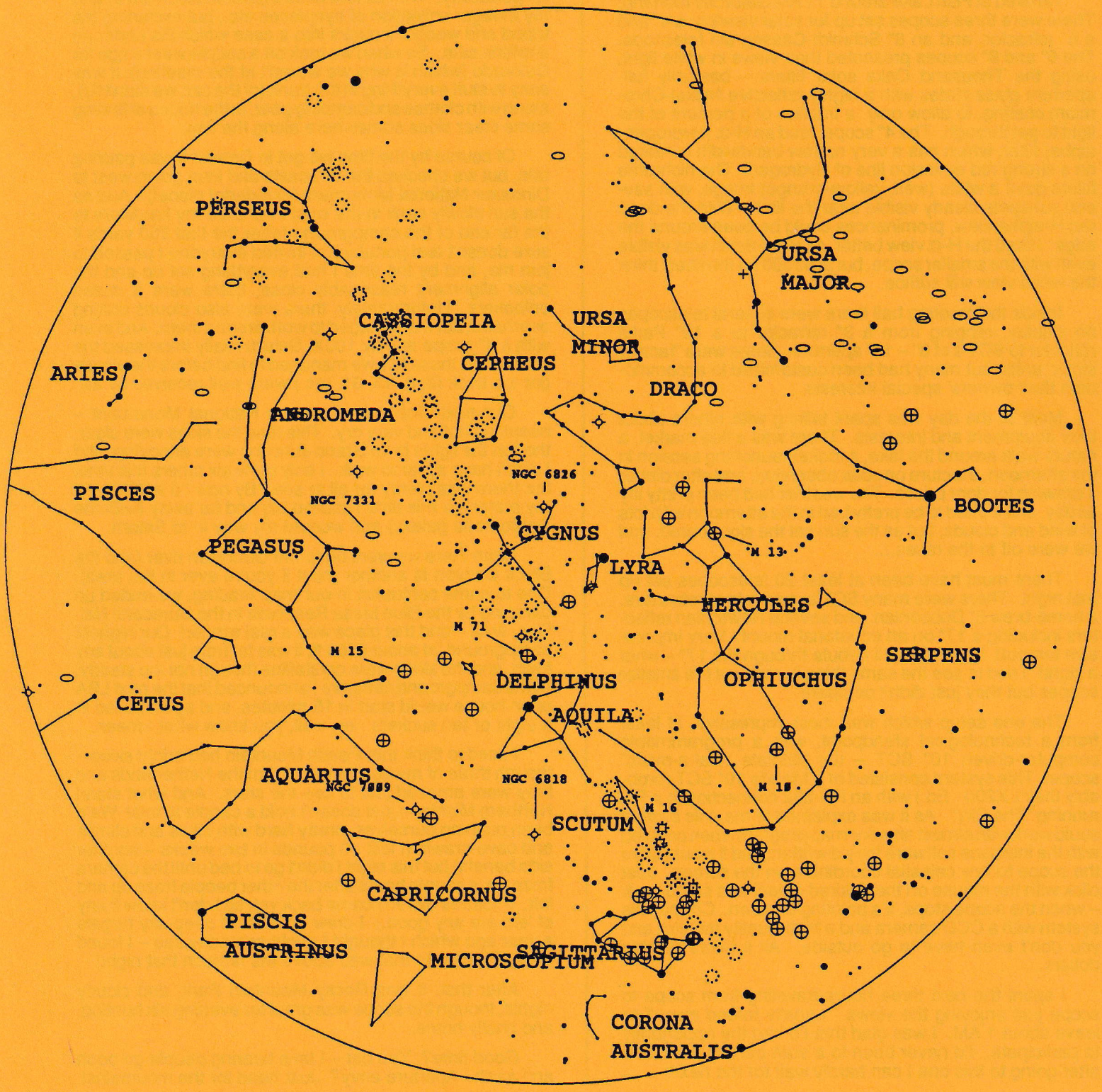
From there we went on to the Gunnison river (and the Black Canyon is another must if you're ever in the area). Due to some confusion in our map reading, we ended up camping by the Blue Mesa Reservoir in the Curecanti Nat. Rec. area – and this place was a real winner! Our highest campground, at abour 8300 ft, it was far from just about any town, and the skies were crystalline though not too steady. At the campground campfire I announced that the next LBA open house would start in 15 minutes, and again pulled in a eight or ten suckers - er, well, you know what I mean.

I used to think that Peach Mountain had bright skies – though three of my guests were from the Netherlands and they were amazed just to see the stars. And what stars! Northern Michigan just doesn't hold a candle to this! We'd been pushing ourselves pretty hard with hikes and climbs and cave-crawls (I lost 10 pounds in two weeks – another side benefit) but this night I didn't go to bed until the camera froze up, a couple hours after the other people froze up and left. (Pictures haven't come back yet, so I don't know if any of 'em are any good.) I drew up a list of deep-sky targets a year ago which I thought I might someday see – I found every single one that was above the horizon that night!

After that, it was Rocky Mountain Park, and cloudy nights, though the scope was great for evening elk hunting, and finally home.

Good time? You bet – I love hearing people go oooh and aaah. Aperture envy? Just head for the mountains!

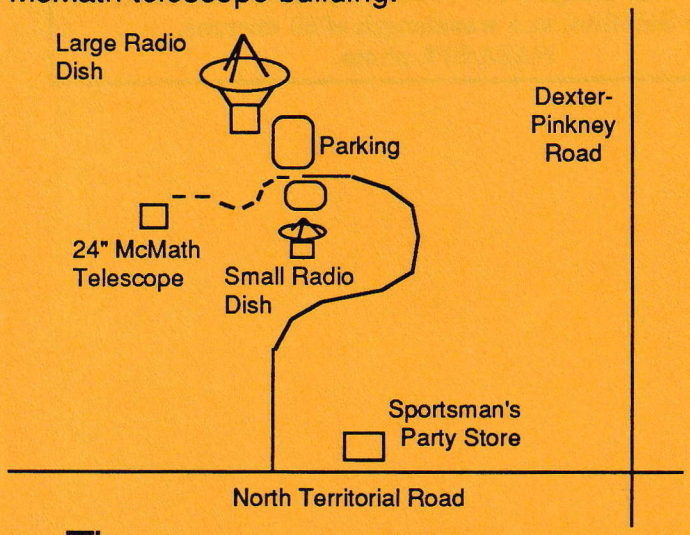
Star Chart for 11:00 PM EDT, Friday September 18, 1992



☞ Places:

The Detroit Observatory is in Ann Arbor, at the corner of Observatory and Ann Streets, across from the old University of Michigan hospital and between the Alice Lloyd and Couzens dormitories. The Detroit Observatory is an historic building which houses a 19th century 12-inch refractor and a 6-inch transit telescope.

The Peach Mountain Observatory is the home of the University of Michigan's 20-meter radio telescope, and the McMath 24-inch telescope maintained and used by the Lowbrows. The observatory is located northwest of Dexter; the entrance is on North Territorial Road, 1.1 miles west of Dexter-Pinkney 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 southwest (between the two fenced-in areas) about 300 feet to reach the McMath telescope building.



☞ Times:

The monthly meetings are held on the third Friday of each month at 7:30 PM at the Detroit Observatory. During the summer months, and when weather permits, a club observing session at Peach Mountain will follow the meeting.

Public Open House / Star Parties are held on the Saturdays before and after each new moon at the Peach Mountain Observatory. Star Parties are cancelled if the sky is cloudy at sunset – call 426-2363 to check on the status. Many members bring their telescopes; visitors are welcome to do likewise. Peach Mountain is home to millions of hungry mosquitos – bring insect repellant, and wear warm clothes, as it gets cold at night!

☞ Dues:

Membership dues in the Lowbrow Astronomers are $20 per year for individuals or families, and $12 per year for students. This entitles you to use the 24" McMath telescope (after some training). Dues can be paid to the club treasurer, Ron Avers, at a meeting or by mail at this address:

9394 Anne
Pinckney, MI 48169-8912

☞ Magazines:

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

Sky and Telescope: $18/yr
Astronomy: $16/yr
Odyssey: $10/yr

For more information, contact the treasurer.

❒ Sky Map:

The sky map in this issue of *REFLECTIONS* was produced by Doug Nelle using *Deep Space 3D.*

✎ Newsletter Contributions:

Members (and non-members) are encouraged to write about any astronomy-related area in which they are interested. Please call the newsletter editor (Kurt Hillig, 663-8699) to discuss length, format, etc. Announcements and articles are due 14 days before each monthly meeting. Contributions should be mailed to Kurt Hillig, 1718 Longshore Dr., Ann Arbor, MI 48105.

☎ Telephone Numbers:

President:	Stuart Cohen	665-0131
Vice Pres:	Doug Nelle	996-8784
	Paul Etzler	426-2244
	Fred Schebor	426-2363
	Tom Ryan	662-4188
Treasurer:	Ron Avers	426-0375
Observatory:	D. C. Moons	254-9439
Newsletter:	Kurt Hillig	663-8699
Membership:	Steve Musko	426-4547

Peach Mountain Keyholder:

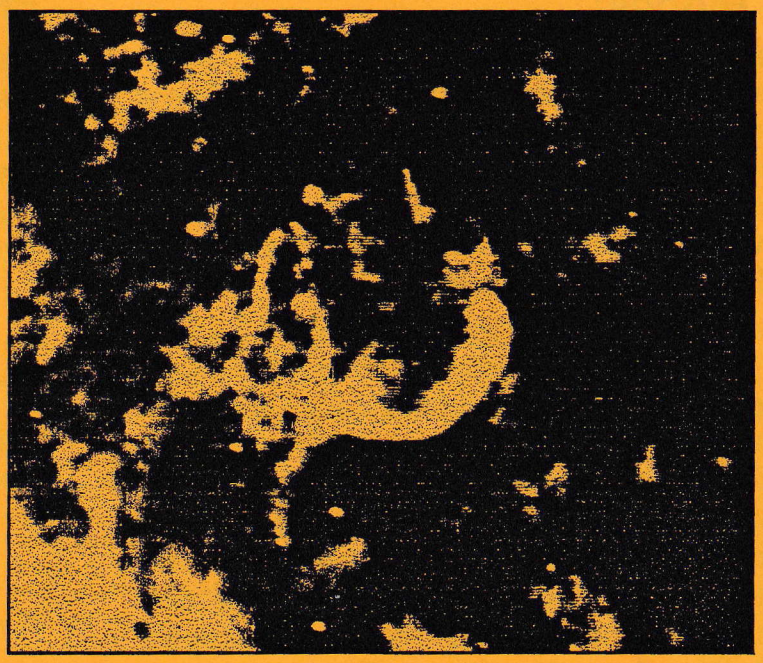
Fred Schebor 426-2363

Monthly Meeting:

The Dark Sky Association Slide Show and the JMI Promo Video

Sept. 18, 1992 at 7:30 PM

At the Detroit Observatory in Ann Arbor



The Cygnus Loop – including NGC 6960, 6979, 6992 (the Veil nebula), and 6995 – is a large a supernova remnant more than 3° across. This image was recorded by IRAS (the InfraRed Astronomy Satellite) at a wavelength of 60 microns. NASA/SPL photo.

University Lowbrow Astronomers
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