

August 1992

What's so exciting about CCD detectors? See for yourself: on the left is an image on a photographic plate; on the right, the same star field with the same scope on a CCD.

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:

**August 21 – Meeting at the Detroit Observatory in Ann Arbor.** Our own Doug Nelle will talk about (and hopefully demonstrate and test, if the weather's good) his latest astronomical project – a lightweight, portable 8" scope.

**August 22 – Public Open House at the Peach Mountain Observatory** (on North Territorial Road, 1.1 miles west of Dexter-Pinkney Road). D.C. Moons will be our host this evening, and with a little luck the 24" scope will be fully operational. The skies at the August 1 star party were fantastic - let's hope this is the beginning of a trend!

**August 28-30 – Fish Lake Under the Stars** The EMU astronomy club is sponsoring this star party near Lapeer MI. You must register by August 21 – the cost is \$15 to get in (no on-site camping!), or \$45 to get three meals and two nights in the dorm at Fish Lake. Stu Cohen has some fliers, or call Norb Vance (days, 313/487-4144) or Kevin Dehne (any time, 313/347-5844) for more information.

**August 29 – Public Open House at the Peach Mountain Observatory.** I don't know who's on gate duty tonight, but he / she / it had better show up....

### A word from the editor:

Due to vacation and other conflicts, the August and September issues of *Reflections* will only have six pages instead of eight. If you'd like to see an article by someone other than me, please submit one! (The deadline for the October issue is October 2.) Items for the calendar should be submitted at least three months in advance.

### Next Month and Beyond:

**September 1 – Computer Subgroup Meeting at Doug Nelle's house** (a Tuesday). The computer subgroup will take a look at an asteroid database and some software to help determine accurate orbits and brightness profiles of comets (if you're lucky enough to discover one).

**September 18 – Meeting at the Detroit Observatory in Ann Arbor.** Not sure who's going to talk yet....

**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, just west of Dexter-Pinkney Road). We should be seeing some nice fall color in the sky – if it's clear, come on out!

**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.

# First Light!

## The Lowbrow Astronomers Open House of August 1, 1992

by Kurt Hillig

It's been a cloudy, wet, some would say dismal summer. Rainfall for July was nearly three times above normal, and we had hotter weather in February than in much of the month. I had gotten my scope out only once in July – while visiting my sister in upstate New York – and once in May, and once in March, and I was beginning to wonder whether astronomy has any future in this state.

Of course it's not Michigan's fault that some volcano half-way around the world had knocked global warming back 25 years, but even the reports from the Texas Star Party last spring complained of hazy skies and only fair (by Texas standards) seeing. So on Saturday morning, I wasn't very surprised to see clouds and haze above a rain-soaked lawn. Still, the Star Party must go on....

The Lowbrows have been working for a long time on renovating the half-century old McMath telescope at Peach Mountain, and though most of the work had been done before I joined the club, I'd managed to put in enough time on it (mostly painting, but we also serve who only scrape and prime) to feel like I was a part of it. So when Stu Cohen told us at the computer group meeting the night before that they were ready to install the mirrors if the weather was good, I wanted to do my share. Of course, I had already made plans for Saturday evening (though I also planned on cutting them short if the skies weren't *too* bad), but Doug's house – where the mirrors were – was on the way to where I was headed, so I volunteered to help load them into a car a 5:30 Saturday afternoon.

As the day wore on, the clouds got smaller and smaller, and the humidity somehow vanished as though it hadn't rained in weeks – things were starting to look promising. But, good weather brings its own set of problems; in my case, gardens ravaged by neglect and a lawn in need of major therapy. Still, with some advice to keep the out-of-shape muscles from complaining too loudly, I managed to get everything done and made it to Doug's house only ten minutes late. By this time, we were pretty sure that it would be a clear night, so as we loaded 150 pounds of glass and 150 milligrams of aluminum into the back of a car, I decided I'd get to Peach Mountain at sunset.

A thin crescent moon was just above the horizon when I finally headed out to the mountain, and the twilight came up faster than I'd expected, but there was still plenty of light to see by as I carried my scope and tripod down from the car. There were plenty of mosquitos too, but a bottle of Cutter's does a pretty good job. I set up my little 4" Schmidt-Cass scope between a new 10" f6.3 Meade and one of the three 17.5" Dobsons on the hill, getting a good case of aperture envy in the process. It was still too light to see Polaris, so I wandered into the observatory to see how far they'd gotten with the mirror installation.

(A few words at this point about D.C. Moons, the club's Observatory Director: First, the "D" in "D.C." stands for Douglas - one of his sisters was there to make sure we

knew that, and it was strange finding out that he really has a first name. Second, that guy is good! He's careful, resourceful, and he knows that scope inside and out. Whenever we had something tricky to do, he made sure everyone knew every step they should take before we could start. And, when you get right down to it, that's the right way to do it, and most of us wouldn't have bothered.)

The team of workers had gotten the secondary mount and focusing mechanism in place, and were just about ready to install the big mirror. Four of us carefully lifted the primary out of its shipping crate (two young boys from the crowd were volunteered to get the crate out of the way), and we set it on the spiders in its cell (no, it's not a torture chamber – the spiders are three-legged holders for the mirror, and the cell is the plate it all rests on). After checking the clearances several times, we removed the cotton cover from the mirror and got our first good look at the surface.

Fifty years is a good long life for a telescope mirror, especially one that's been used and abused by countless students over the decades. But with its new coating so reflective it was hard to see, the few little chips and bubbles seemed more like battle scars than defects.

Gently, carefully, we raised the mirror cell, and slowly rotated it to until the mounting holes lined up. Then came the bolts to hold it in place, and the stops to keep it from falling out. It sounds so easy, but it took about half an hour to get this little part done.

Since there was a good crowd of visitors that night, I headed back out to get my scope aligned and to start showing off some of the sky. And, surprisingly, it was dark outside! This may seem strange to some of you, but I'm used to having enough glare from the lights of Ann Arbor to be able to read (well, newspaper headlines) on a moonless night. But this time there was no moon, no haze, no clouds, even the AA sky glow was faint. And, as a pleasant surprise, I had Polaris centered in my scope the first time I looked – my usual 15 minute polar alignment only took five minutes, and (for a change) seemed to be dead on.

Now a guy with a 4" scope just can't compete with the big light buckets for faint extended objects, but it's still good for a few things. Alberio, Mizar, M3 and M13 all look pretty good, and my SCT doesn't have the coma problems that the big newts have, so I can hold my own on a good night. And of course, while the big boys all work on those faint planetary nebulae and galaxies (which still all look like a smudge to me), my 4" gives a pretty nice view of Saturn (especially with the 6mm eyepiece I borrowed - gotta get one of those some day).

So I spent an hour or so showing people some of the wonders of the sky, sneaking in a peek on one of the big scopes now and then, and just looking up at the sky. And what a sky! It was dark, and it was clear, and the stars just jumped out at me. This is what astronomy's all about! Yes, there's the thirst for knowledge, the drive to understand

how the universe works, and why it's put together the way it is, and the marvelous way in which the smallest particles known and the largest structures seen are all related by quantum electrochromodynamics and the GUT, but to stand on a hilltop on a dark night and to get lost in the immensity of the sky – well, that kind of inspiration is open to everyone, it doesn't need a Ph.D or a \$5000 scope.

Of course, I am a scientist by training, and a computer jockey by trade, so I'm lucky enough to appreciate it from both ends! Recently, I've spent a lot of time on the net (usenet news - an collection of electronic conferences with a few million subscribers worldwide) following the astronomy group. You find all kinds of questions and discussions there: one long-standing debate is on the nature of black holes, another is on the optical properties of gravitational lenses, a third argues over whether quasars are distant or nearby objects and whether their red-shifts come from their velocity (and thus their distance) or from their gravity; other people ask about the best kinds of binoculars to use, or post daily sunspot data or earth-crossing asteroid ephemerides, or advertise used (very slightly, and in mint condition!) scopes for sale. On Friday, someone asked "I know that light takes a long time to get here from the stars, but how far can a person really see?"

The answer is 2.6 million light years. On a good dark night a person can see the Andromeda galaxy (M31) without a telescope or binoculars. I've known about this for quite a while, and someone else posted it to the net before I could, but I'd never actually been able to verify this myself. Saturday night, I did! Maybe the old-timers out there were bothered by the light pollution (and, I must admit, I've seen darker skies), but I don't think I've ever seen a prettier night.

Back inside the observatory the crew, with great dedication (they must have, since they were willing to miss the best night we've had in many months), had gotten the secondary mirror installed, along with the baffle tube and eyepiece mount (and other miscellaneous hardware - I'd

been outside and didn't take an inventory). It looked like everything was together – it was time to try it!

D.C. Moons was the first to apply eye to ocular. Of course only a rough optical alignment had been done, and neither the finder nor guide scopes had been aligned with the main scope – he spent quite a while trying to point the thing at some recognizable bright object (Saturn was the most obvious one, but anything would do). Alas, while he saw a few "bright flashes", the job of manually pointing a ten-foot, half-ton scope with an 1/8 degree field of view eluded him. Tom Ryan gave it a try, but while he managed to find a star or two, they quickly drifted out of the field.

We all did a bit of head scratching about this - after all, we could hear the RA drive motor turning, so how come it wasn't tracking? Maybe the drive motor was jammed, and we only heard it *trying* to turn? We checked the differential gear which couples the drive and slew motors to the RA worm gear – no motion. We unlocked the slew shaft and tried to turn it by hand – no motion. We uncoupled the drive motor and tried to turn the worm by hand – no motion. Finally, we saw the problem: the lower bearing block holding the polar axis bearing had slipped an eighth of an inch, and the RA drive gear – that great four-foot bronze wheel – was pushed up against the worm gear housing.

With horrific visions of bent shafts and scored gear teeth in our minds, we took off the worm gear housing, and inspected the pieces. Luck was with us – nothing was damaged. But, at this point, it was nearing 2 AM, and we had neither the equipment nor the energy to reposition the bearing block. Disappointing? Yes, it was for a group who'd spent years working on it. But, still, the new McMath scope had seen first light yet again, and we all knew that it wouldn't be long before this venerable instrument was back on the job it was designed to do – to explore the heavens.

[Editor's note: The McMath scope is now operational, although optical and polar alignment are not yet finished.]

## Computer Subgroup Report

by Kurt Hillig

The Computer Group met at Roger Tanner's house again; this time we were a bit more organized, and began by choosing the site for next month's meeting – Doug Nelle's house, Tuesday, September 1 1992; call Doug at 996-8784 for directions. (Make sure someone prepares a report for the next newsletter, as I won't be there - Ed.)

The next order of business was to take a look at a shareware sky-map program which we've been meaning to get to for the past few months. This one is called Sky Globe (or was it StarGaze? As a Mac user in a DOS-dominated field, I tend to lose track of these things – if you're interested, ask Doug Nelle), and it turned out to be very nice! While it sometimes took some doing to figure out how to make things work, it makes very effective use of a color display (Roger's machine has super-VGA graphics, but this isn't required). It includes an extensive catalog of stars and deep-space objects, including hundreds of stars by name (do you know where Zubinelgenubi is?).

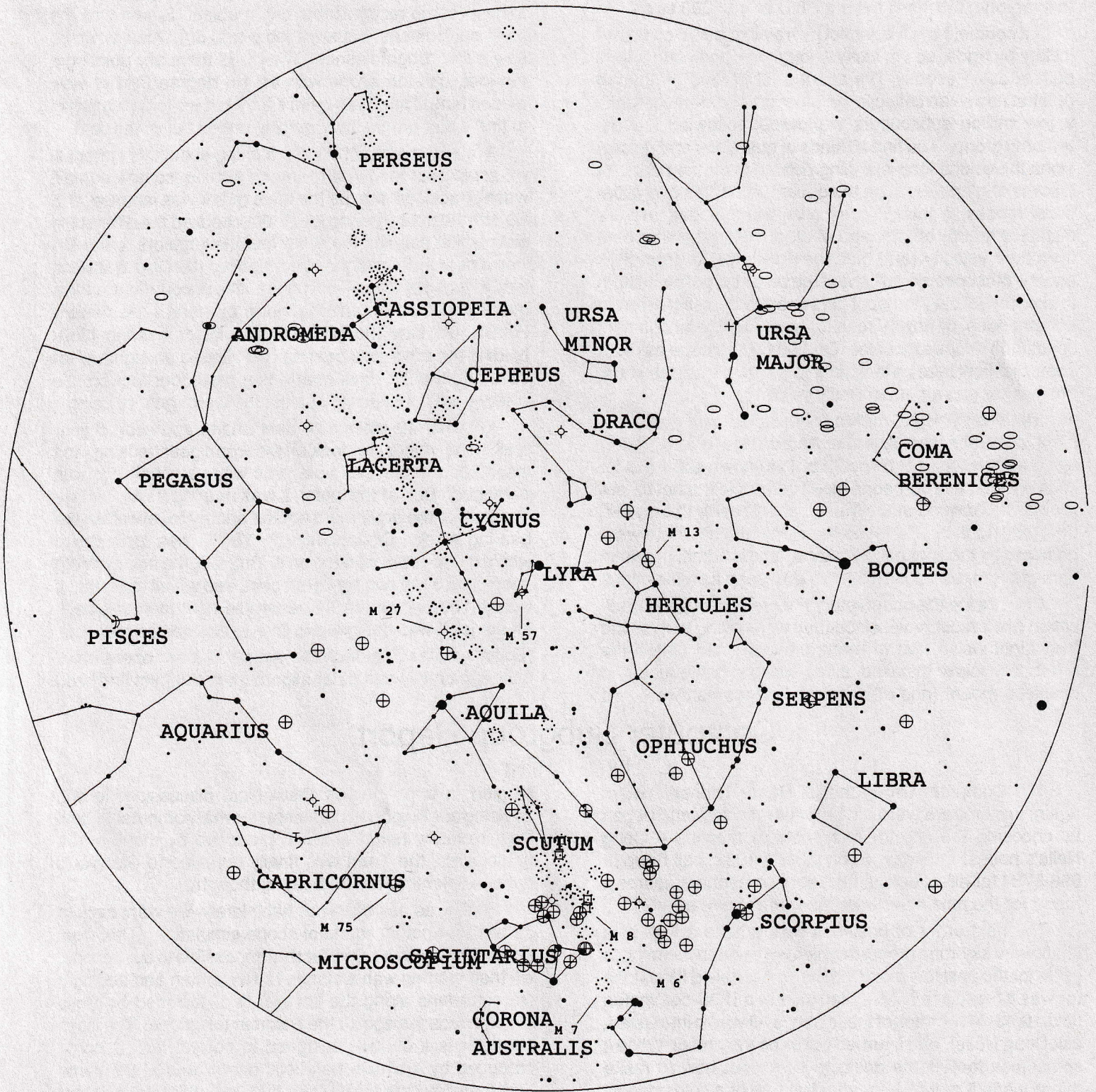
After quite a few oohs and aahs, we somehow got

tangled in a dangerous theological discussion, to wit: advising our illustrious president on what computer to buy. Despite many heretical ideas proposed by many of the participants, the Truth was finally revealed to Stu (you'll have to ask him what he bought, though).

Finally, as has been our habit lately, we went back to Zemax for another round of scope simulation. This time, rather than trying for a perfect but impossible to build scope, we tried starting with a simple f4 Newtonian and adding a corrector lens along the lines of that designed by Ross several decades ago for the Palomar telescope. The Ross corrector is a doublet designed to correct for the coma produced by a simple parabolic mirror, and at the same time flattening the focal plane to give better photographic performance. And, as with the Rumak we looked at last month, the design straight from the book was already about as good as we could get.

As we're running out of paper, we'll close here (and try to get Tom Ryan to write an article about this soon).

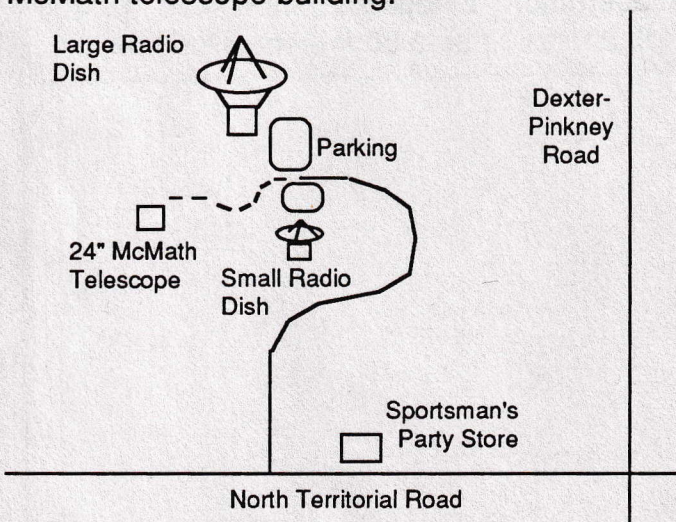
8/15/92 10:25 pm EDT STARS TO 5TH MAG



## ☞ 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 repellent, 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:

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

## **Peach Mountain Keyholder:**

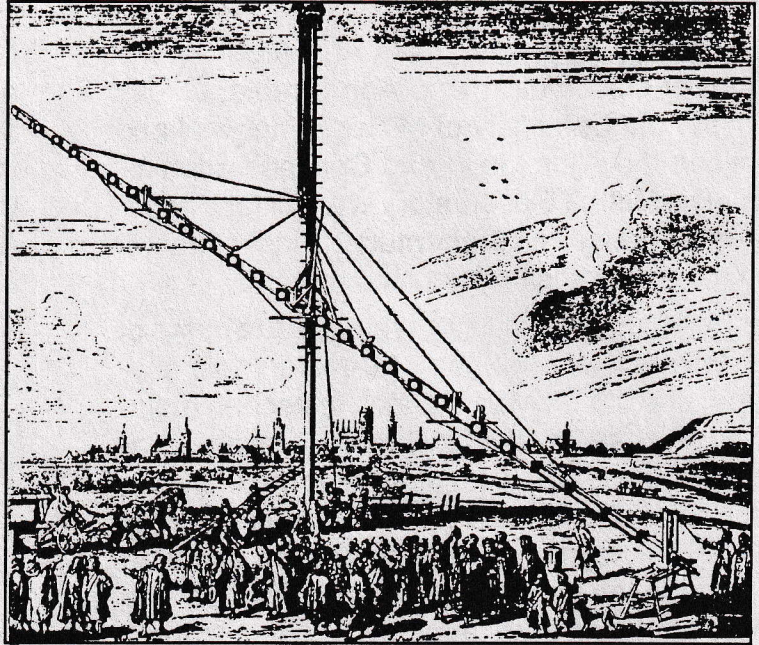
Fred Schebor 426-2363

## Monthly Meeting:

An 8" Scope  
Your Spouse  
Will Let You  
Take on  
Vacation

August 21, 1992 at 7:30 PM

At the  
Detroit Observatory in  
Ann Arbor



This refracting telescope, made by Johann Hevelius about 1670, was enormously long in order to reduce chromatic aberration. It appears to have had about a 6 inch aperture and a 50 foot focal length.

University Lowbrow Astronomers  
840 Starwick  
Ann Arbor, MI 48105