University Lowbrow Astronomers
Ann Arbor, Michigan

REFLECTIONS AND REFRACTIONS

OF THE UNIVERSITY LOWBROW ASTRONOMERS

October 2003

Upcoming Events

October 2003

- **Saturday, October 18 (Starting at Sunset) Regular Scheduled Open House and Star Party at the Peach Mt. Observatory. Weather permitting**
- **Saturday, October 25 (Starting at Sunset) Regular Scheduled Open House and Star Party at the Peach Mt. Observatory. Weather Permitting.**
- **Friday, November 7, Cosmic Origins Public Lecture Series. "Future of Life, Universe, Everything." 7:30 p.m. Angell Hall.**
- **Friday, November 21. (Starting at 7:30) Monthly Club Meeting held in either room 130 or 807 in the Dennison Building.**
- **Satuday, November 22, (Starting at Sunset) Regular Scheduled Open House and Star Party at the Peach Mt. Observatory. Weather permitting**
- **Saturday, November 29, (Starting at Sunset) Regular Scheduled Open House and Star Party at the Peach Mt. Observatory. Weather permitting**

Mars Sketches by Doug Scobel

A "Shaggy-Dog-Star" Astronomical Anti-discovery Tale

by Lorna Simmons

My doctor has urged me, a mild heart patient (if there is anything about a heart condition which is truly "mild") to stay away from chilly places at all times. The term "chilly places" particularly includes chilly places like Peach Mountain in Fall, Winter, and Spring. Then again, because of the arrival of "civilization" near the Dexter/Pinckney intersection, Peach Mountain has become a partial-or-semi-dark site and, as a result, is less chilly. Dark sites are reported to be 20 degrees cooler than are non-dark sites which offer light-polluted warmth. For heart patients, breathing cold air is the problem. Peach Mountain seems to have a lot of cold air for the greater part of the year. Very, very frustrating!

For the past late Spring and Summer months I have waited each Saturday, before and after the full Moon, with my equipment all spread out in my living room, ready to be transported to Peach Mountain at a second's notice. However, it was not to be. This year, after the temperature cooperated on each and every Saturday night, before and after the full Moon, the weather has been (a) cloudy, (b) completely overcast, (c) drizzly, (d) raining, (e) thunderstorming, (f) you name it. In each case, since "hope springs eternal," there was always the promise of clear weather on a future Peach Mountain Open House Night. But that was not to be the case this year. (Excuses, excuses...)

Finally, nearing the end of Summer, along comes ASTRONOMY ON THE BEACH with its Saturday night clear-sky forecast. Excitedly, I gathered together the necessary equipment and dragged everything out to my car. I gently placed my Questar telescope vertically in its case on the front passenger seat of my car, carefully sliding the seat belt through the handle at the top of the beautiful Questar case, and securely fastening the seat belt on the other side, leaving no slack in the seat belt. I then loaded everything else into the back seat or into the trunk. Everything was looking up. Whee!

It was not to be! At ASTRONOMY ON THE BEACH, Saturday, September 6, 2003, all joy became frustration as my cute little Questar rebelled and simply refused to bring anything at all into focus. I could find the celestial object, but I could not focus it in the eyepiece. I could not even focus the Moon, for crying out loud! Obviously, as I was to find out later from Questar, I had forgotten to be gentle, probably had been too aggressive, and most assuredly had turned the focuser too quickly (perhaps wildly, in my haste). All broken! I suppose it (the telescope) decided that I had not earned the right or the privilege of viewing Mars or anything else through it for a long, long time.

There goes Questar viewing for the year -- out the window, up in flames, so to speak! At least I was able to view Mars and everything else through my wonderful 10mm x 40 mm Zeiss binoculars, so the evening was not a total loss. Almost...

I did not throw my beautiful Questar into the trash bin. At least, it can make a great "conversation piece" until next year. When it is repaired, I shall try again. Just watch me goof all over again. Anybody want to take any bets?

About 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 130 or 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-Pinckney Road; further directions at the end of the newsletter) on Saturdays before and after the new Moon. The party may be canceled if it's cloudy or very cold at sunset. For further information call (734) 480-4514.

Black Forest Star Party Revisited

By Mark Deprest

By now you've probably heard at least a little something about the Black Forest Star Party, but just in case you haven't, I'll start this article with a little info about the party and the people who put it on.

The 2003 Black Forest Star Party marked the fifth official year of its existence, and in that short span of time the event has grown into one of the premier events of the summer for us astronomy enthusiasts. The Central Pennsylvania Observers (CPO) in cooperation with and full support of the Pennsylvania Department of Conservation and Natural Resources have managed to put together an event at a truly "Dark Sky" site, that is an Observer's Star Party! What I mean is; although there are a number of vendors that come to the BFSP and there are some talks scheduled for the daylight hours, they do an ATM walk-about and a number of "door prizes" are raffled off, these take a back seat to the skies, which are some of the darkest east of the Mississippi river. This event has become so popular with astronomers that the organizers had to limit the number of registrants to 300. In 2002 the BFSP saw crowds of 550+ and those crowds experienced a weekend of incredible skies, but also facilities which were taxed to their limits, at one point the organizers asked that the participants practice water conservation as the supply was getting very low. The BFSP for 2003 set the number of participants at 300; this number of people was very easily tolerated and managed by the facilities and organizers.

The BFSP is held at Cherry Springs State Park in Potter County, Pennsylvania, at an elevation of over 2300 feet, in the middle of Susquehannock State Forest. Cherry Springs State Park is Pennsylvania's First Official "Dark Sky" Park; the nearest town is Coudersport, PA. (Pop. ~3k) about 20 miles and one range away to the northwest. After just one night of observing it becomes obvious that this is one of the very darkest sites in the eastern U.S. The local area is dominated by farmland and vast tracts of state forest lands so there are very few sources of local light pollution. Potter County has only three traffic lights and a total population of ~17,000. The nearest sources of significant light pollution in the region are State College, PA (metro pop. ~80,000) ~75 miles and several mountain ranges to the south and Olean, NY (metro pop. ~30,000) about 50 miles to the northwest, so as you can imagine THE SKIES ARE VERY DARK! The limiting magnitude is usually in the 6.7 range and approaches magnitude 7 on very dark, transparent nights. Cherry Springs is also far enough inland from Lakes Erie and Ontario to escape most lake-effect cloud cover events. A good illustration of the sky darkness at this location is that when a cloud drifts by it is BLACK; there is simply no sky glow to illuminate it.

I went to this event last year and had such an incredible time that there was no doubt in my mind, where I would be when this year's event was happening. The 2003 Black Forest Star Party would find me as one of the guest speakers but I am getting a little ahead of myself though. Let me go back to the Wednesday before the Star Party weekend; John Causland, Jim Wadsworth and I decided to caravan the 430 miles to Cherry Springs. Chris Sarnecki joined our little group for the first part of our trek, at least as far as Cleveland. Chris wanted to take a little more adventurous route; Jim and John were both pulling trailers and preferred to stay on the main highways, so we stayed on the interstate while Chris went on his way. I had 4 of those 2-way radios that have a +2 mile range, so when the four of us met up at Cabella's in Dundee, MI and headed down the road, we had a good way to keep in touch. I had planned a route that I liked and took the lead followed by John, and then Chris and Jim brought up the rear of our little caravan. Jim and I were having a wonderful time with the 2-way radios and Jim provided some geological history of the area we were driving through during the first part of our trip, which I found rather interesting. I also found it rather interesting that after a few miles down the road John and Chris were unusually quiet. I found out why when we got to the first rest stop. When they had set their radios down they inadvertently changed channels …. somewhere between Dundee and Toledo! No matter, we got that fixed at the first rest stop and we all had fun chatting as we drove on toward Cleveland. After Chris had left our little group, the three of us settled into some very leisurely driving across northern Ohio and Pennsylvania's northwestern corner to New York's southern tier Freeway I-86. We got to Cherry Spring's at about 4:00 pm, which was just enough time to get our tents and scopes set up for what would be the first of three very good nights of observing. Wednesday night was clear (4 out of 5) and steady (5 out of 5) but not very transparent (3 out of 5). We all got some great views of Mars and John's new 24" was 'kicking butt' on some very faint fuzzies. I spent most of that night working one constellation; Cassiopeia. I like to do this every now and then,

just work one constellation and find every deep-sky object that it has to offer. Jim Forrester and his delightful wife Jenna had arrived earlier that day, and although he had to park his camper across the road from our little group, he did set up his scopes in our 'observing field.' After driving all day, most of us kind of 'pooped-out' around 2:00 am, I was looking forward to a long weekend of great astronomy.

Cherry Springs State Park is a rustic campground with few amenities; it does have clean pit toilets and potable water, and a few recently added electrical outlets for running laptops, telescope drives or recharging battery packs. But that is about it, so, if you camp there you really need to bring everything necessary to sustain yourself for the duration of your stay. CSSP does not have any showers or vending machines, and the nearest restaurant is in Sweden Valley, PA about 11 miles north. There is a small but well stocked country store up the road about 2 miles and other than the pay phone across the road at the little unattended airfield, there is nothing but forests and hunting lodges within a 15 mile radius of the park.

Thursday morning was cool and clear, and after a breakfast of coffee, 2 hard boiled eggs and peanut butter and orange marmalade sandwich, I was ready for the day. Bobby G and his wife Joanie, Gary Perrine and his wife Cy, Doug Scobel, and Doug Nell would be arriving sometime during the day. As the park began to fill up with more and more people, it became evident that we would have to save some spaces for the rest of our Lowbrow contingent. I had planned to make some of my famous Jambalaya that night and I needed a larger pan than I had, so John, Jim and I went into Coudersport, PA around lunch time for some shopping, sight seeing and lunch at May's Family Diner. Jim was looking for a bolt for one of his scopes, and John needed to find some mounting screws for the license plate on his trailer, so we needed to hit a hardware store. Luckily Coudersport had a well stocked "Pro-Hardware" and we able to satisfy our needs, I even found the pan I needed. We picked up a few odds and sods from the local super-market and then headed back to camp. About mid-afternoon the rest of the Lowbrows showed up and without too much effort we got Doug Scobel and Doug Nell's pop-up campers in place next to Jim Wadsworth's "Scamp" trailer. Bobby and Joanie G setup their tent next to John's and Gary and Cy parked their camper next to Jim and Jenna Forrester. The telescopes were placed in the open area encircled by our tents and pop-ups. John ran into Bill Denkmeier who manufactures his own version of the binoviewer and somehow managed to talk Bill into letting John use a sample of his binoviewer for that night's observing session. The weather reports for Friday were not good at all and Saturday was not real promising either, so we were thinking that Thursday night's session might be the best. After dinner we started to get ready for a long night of observing. My Jambalaya was a hit with all who tried it.

The sky was clear (5 of 5) and much more transparent (4.5 of 5) than Wednesday night, however the seeing or steadiness had dropped off a bit (3.5 of 5), which was an indication of a low pressure system moving in. There were moments of steadiness and the night would have rated EXCELLENT at Peach Mt. and by 4:00 am most everyone had called it a night. The binoviewers on John's 24" Starmaster gave us some of the most incredible views of the night. It did take a little practice to get the two images to merge into one, but once you relaxed and allowed you eyes and brain to put them together the views were AWE-SOME! Using both eyes is a very comfortable way to observe.

Friday morning came with overcast skies and rain which would continue on and off all day long and through the night. Jim and Jenna Forrester, Chris Sarnecki, Doug Nell and I decided that a shower and some sightseeing would fill the day nicely. So, after breakfast we headed down to Ole Bull State Park and the nearest showers (10 miles south of Cherry Springs). We had also noted on our map that the "Grand Canyon of Pennsylvania" was only a few miles east of our camp and this seemed like a nice way to spend the day, driving along what was noted on my map as the "west rim" road. With Jenna riding shotgun and doing a superb job of navigating cross country and over at least one range of the mountains we were in, Chris and Doug dutifully followed in Chris's SUV and probably wondered if this was such a great idea. We managed to come out of the forest at the bottom of the south end of the canyon. There was a nice little restaurant and bar situated over looking Pine Creek (the river that carved the canyon) and it was close enough to lunchtime for us, so we had a nice little meal on the deck before we made our way north along the river. Now the "West Rim" road showed as a paved road on my map, but we soon found out that my map had some short comings. Although well maintained, the West Rim road was not paved. The road cut through some incredible forests of maple, ash, poplar and birch trees, and I kept thinking that this must be an indescribably beautiful place in the fall. Although the road wound its

way along the western rim of the canyon, there were very few places that afforded any view of the canyon below. However every once in awhile a scenic vista would be cut out of the forest to reveal the grandeur of the canyon and river some 3000 feet below us. As the afternoon went on the clouds began to thicken and we realized that sky was not going to afford us any views of the stars and planets that night. So, we drove back to CSSP and stopped by the registration tent to check in and get our door prize raffle tickets. I took some time before dinner to do a practice run through my talk up at the pavilion, and while I was going through my talk one of the members of the CPO stopped by to see what I was doing. Richard (I can't remember his last name) and I talked about comet discoveries and the BFSP. He mentioned that this year's original chief organizer backed out rather suddenly and kind of left a lot of things unfinished. The previous chief organizer had to come in and get the event back on track. He explained that although they don't lack volunteers and support, it is always difficult to find the right one person to coordinate and bring everything together.

The rain started to fall around 6:00 pm and lasted all night long. John Causland decided sometime during the afternoon that the weather was not going to cooperate, so he packed up and left to visit some relatives in Connecticut. The organizers provided some video tapes and were showing movies in the pavilion that evening, which was a good diversion from the weather. Perhaps Saturday would bring clear skies.

Saturday started out with rain and overcast skies but the forecast called for clearing by the late afternoon. Bobby and Joanie G decided not to hang around and packed it in about noon. I was a guest speaker and I am also an eternal optimist, so leaving wasn't even a remote possibility for me. Our little group spent the day browsing through the vendor's tent and listening to the scheduled talks. The time came to give my talk and although I was bit nervous and this was evident at the beginning of my talk, I did loosen up and finished well. I may have over practiced and seemed a little stiff at the beginning.

By mid-afternoon the skies started to open up and after the door prizes were raffled off it was clear and steady. The temperature was dropping quickly and it was going to hit the dew point very fast. Despite the start of the day this was going to be an unbelievable night. Clear (5 of 5), Transparency (5 of 5), Steadiness or Seeing (5 of 5). Other than the dew forming on the scopes very quickly after 10:00 pm, the sky was crystalline and the sounds of 12 volt hair dryers filled the air as everyone battled to keep their optics dry. I found myself time after time being pulled away from the eyepiece and just staring naked-eyed at firmament of the night. The Milky Way stretched from horizon to horizon and was bright enough to cast a shadow. Throughout the evening meteors streaked across the sky and one was so bright that even with your eye at the scope looking in the opposite direction you knew that it had lit the sky. By mid-night I had given up on trying to keep the dew off my 12.5" dob and concentrated on the 5" f/6.5 refractor. The views of Mars were fabulous and both Doug Scobel and I spent a long time drawing the red planet. Doug was so taken with the clarity of the night that he made two separate drawing several hours apart. By 3:00 am many of the astronomers had given up on the dew battle and crawled of to the warmth of the sleeping bags. Saturn was rising and I could not pass up a chance to turn the scope to the ringed jewel. Saturn never disappoints and while I was sharing my scope's view of Saturn with Jim Forrester and Gary Perrine, I turned my gaze toward the western horizon and that's when it happened. The Milky Way was now traversing the sky from east to west and the meatiest part of it (the Aquilla Rift and Cygnus Star cloud) was illuminating the western sky. The trees at the edge of the observing field looked like the backlit shadows of the three of us against an infinite screen of stars. I kept waiting for someone to yell, "Down in front!" I suddenly felt infinitely small and infinitely large at the same time, I felt somehow changed in a way that I cannot put into words. I hope that someday all of you find this same kind of feeling in something you love. Even after I packed up my equipment for the night and crawled into my tent, I sat there on the edge of my cot looking out through my door flap to the west, just trying to savor every last bit of the night. As the first signs of dawn began to show in the east, I laid my head back and fell deep into restful sleep. I will remember this night forever. My wife calls it, "My Astronomical Epiphany."

Sunday morning came cold and damp from the dew of the night before, and breaking camp was the activity of the day. By noon Chris, Doug Scobel, Doug Nell and Jim Wadsworth had all packed up and left for Michigan. Gary and Cy decided to stay one more day, Jim and Jenna would stay an additional night also. I finally got my stuff dried and packed up shortly after noon and headed home. I will be back again.

Confessions of an Eclipse Chaser

By Brian Ottum

I have the bug. The totality flu. It became apparent when I punched pinholes in cardboard and viewed those tiny little crescents of a partial solar eclipse. That was in the mid 1970's in my boyhood home of Wisconsin. Since then, I've been blessed to see three total solar eclipses. This is a summary of my adventures.

NORTH DAKOTA FEBRUARY, 1979

I became interested in astronomy and telescopes at age 12, in 1973. At age 14, a couple adult members of the local astronomical society approached me to start a Boy Scout Explorer Post focused on astronomy. That was the start of a great experience. We spent many a late night at the observatory drinking Mountain Dew and laughing at each others' stories. We even did a little observing. The dozen of us found out that a total solar eclipse was going to happen a few states away in February, 1979. So we made plans and raised money for two years. Parents were worried and had a lot of questions: "Are you really going to drive to North Dakota in the Winter?" "Where will you stay?" "What if it's cloudy?" With adult guidance we came up with a plan that was acceptable to all.

Our group drove from Madison, Wisconsin to Grand Forks, North Dakota. Boy Scouts were welcome at military bases back then, so we slept on the floor of the officer's rec. center. The next day we listened to weather forecasts during our entire drive toward the northwest part of the state. It didn't sound good. Not surprising for a North Dakota winter, a low pressure system was rapidly moving through. (Clouds are a four-letter word for eclipse chasers.) Soon there were heated arguments and a split in the group. A minority wanted to dash north into Canada in hopes of catching clear weather further along the eclipse path. The majority won out and we stuck to our plan of going to the Minot Air Force Base. When we arrived the weather was cloudy, so we did our cloud dance and went to sleep on the floor of the gymnasium. (Teenagers are crazy, and amateur astronomer teenagers are just plain weird.)

We awakened the next morning to a beautiful sunrise and balmy (by North Dakota standards) temperatures in the 20's. The eclipse was to reach totality by about 11am, so we started setting up after breakfast. We had cameras, tripods and a couple telescopes. The Air Force officers gave us a lot of quizzical looks, but few asked us any questions.

We started monitoring the progressing partial eclipse phases by projecting the sun onto the snow. Now the passers by stopped to look and chat. One of the most exciting times for me is to see those sunset colors of orange and red approaching. Below that on the horizon you could see the black total eclipse line moving toward us.

One of the Scouts had a shortwave radio so we started the countdown to totality. About a minute before totality we could easily the shadow bands moving across the snow. All of a sudden there was a huge siren and blaring horn. We asked someone and they said it was a "scramble" where B-52 pilots rush to get their planes into the air as quick as possible. Amazingly, there were cars driving down the roads at mid-day with their lights on!

I had many plans on things to look at and photograph during totality. However, I spent the first 30 seconds looking upward with my mouth open. The prominences stuck out from behind the moon with the richest "shocking pink" color. The corona was bright and had about 6 points extending out. We could see many stars, along with Venus. When I came to my senses, I started clicking away with my camera. Quickly, I changed lenses from a wide angle to a telephoto. I had a lot of plans for different shots, but it all went out the window in the excitement of the moment.

Soon a small but dazzling bit of the sun came back, shining through a valley on the edge of the moon. We were sorry to see it all end after 2 minutes, 12 seconds. But the shadow bands came back even stronger against the snow and sides of buildings.

We knew we had an 18 hour drive back home, so we didn't stay to observe all the outgoing partial phases. But the trip home went fast as everyone emphatically shared their own perceptions of the spectacular event.

BAJA CALIFORNIA, JULY 1991

In July, 1990 my wife and I quit our perfectly good jobs so she could have our first child and I could go to grad school. So we went from two incomes to less than half of one. Therefore, when people asked me if I was going to try to see the upcoming Mexican eclipse I said I did not want to spend the money. Also, I had lost 6 lbs. (all of it brown) the previous year after returning from a Mexican business trip. I was not eager to return. However, enthusiasts from the Salt Lake City Astronomical Society arranged to charter a plane for

just a 20 hour trip. I could bring all my own food and water! The price was low, and my loving wife urged me to sign up.

We left at about 11pm, arriving at the La Paz airport at about 1am. After disembarking and walking out of the tiny airport we realized we were in a desert. We rolled out our tarps and blankets onto the sand and tried to catch some shuteye before the sun was to come up. However, sleep would not come easily. There was too much excitement in the air.

The sun blazed hot by 6am, waking everyone up. The sweating began immediately. Just as in my previous eclipse, there was much excited discussion on where to set up. Most wanted to stay near the airport since time was short. However, I saw that it was an ochre dustbowl (which would play havoc on any photographic equipment not to mention lungs). I invited anyone who wished to accompany me into town via a cab. The cabbie let us off at the harbor's beach. The town was quaint and the floating boats completed the idyllic scene.

We carried our equipment to the edge of the beach to set up. Surprisingly, there were no other eclipse chasers in town. We heard the big Sky & Telescope and National Geographic groups were just south of town. But we were quite happy with our seaside observatory. I continued to videotape the journey in segments. The western horizon began to darken by 11am. The waves on the harbor began to flatten. As totality approached, I could see that the shadows became very sharp. The light from the 95% eclipsed sun was gray and weak. Some local folks began to talk excitedly, not quite knowing what they were about to see.

When totality started, I quickly pulled my solar filter off of the video camera lens and zoomed in to catch the prominences. Again, I was struck with the bright pink-orange color. The corona this time looked like a giant eye, with just two spikes, one on either side of the sun. You could see Venus, Mars, Saturn and several stars. The very hot day suddenly got quite cool. The wind stopped. The sea became calm. The streetlights flickered on. The party boat's tiki lights automatically turned on. The most amazing thing was seeing a local citizen yell something and jump into his car. Spitting gravel, he took off into town. I do not know why.

Totality this time lasted over 4 minutes, so I had time to take it all in. I could see constellations and sunset colors 360 degrees all round. Each time I'm under the shadow of the moon, my spine tingles almost continuously.

When the sun came back, the heat came back with a vengeance. Strangers came together to compare perceptions. We slowly packed up, noting the smaller and smaller bite the moon was taking out of the sun. It was fun to stroll around town, but the July Mexican weather started to become a problem. I came up with a solution. Why don't we rent a hotel room and hang out in air conditioning? I collected a couple bucks from each person and we got a very nice room. The eclipse coverage was on Mexican TV, and CNN interviewed folks in Hawaii who were clouded out.

About dinner time, we headed back to the airport. The sunset was spectacularly orange due to the Philippine volcano, Mt. Pinatubo. It was the end of a perfect day.

Over the following weeks, I produced a 16 minute videotape of the eclipse. It was fun to splice the good parts together and set it to music. (The original audio contained a few overexcited exclamations that I was glad to remove.)

EASTERN CARIBBEAN, FEBRUARY 1997

I decided to try to see the 1997 eclipse right after 1991's. It was just too much fun. Royal Caribbean had a special eclipse cruise and I booked a room for my wife, two small children and me. When I told my mother about the trip she sounded interested. I asked if she wanted to come along and she said "sure." Then my sister said she'd share a room with my mom. The family reunion became complete when my brother and his family decided to come.

A cruise is a great vacation for extended families because there are so many things to do. You can stay together or split up. We flew to Puerto Rico and departed for St. Thomas, Barbados, Martinique, Antigua & St. Maarten/St. Martin. Some highlights were a hair-raising St. Thomas cab ride, the secluded beaches of Antigua, playing basketball on back of the ship and a train ride deep into a Barbadian cave.

On the day of the eclipse, the crew gave out eclipse glasses. The captain announced that he was moving toward the clearest location and pointing the bow toward the sun. As eclipse time approached, I noted that we were coming alongside the mountainous island of Montserrat. The volcano there had been erupting for a few weeks, forcing people from the island. As the partial phases of the eclipse started, the volcano began belching plumes of gray ash into the atmosphere.

The ship's captain announced over the P.A. when there was 5 minutes remaining. About that time, my video camera decided to quit. I nearly tossed it overboard (which would have been easy since I was at the railing). But I didn't let that setback affect my en-

joyment. Having my mother, brother and sister nearby during the eclipse was special. My wife was with the kids in the pool (with the other not-so-dedicated observers). Her sole picture was the best. She turned around during totality and shot a picture of the hundreds of smiling faces with those silly eclipse glasses.

This third eclipse was the most striking with the volcano, the sea and the massed crowd. It was definitely the way to go (but maybe a little too posh).

MEDITERRANEAN, MARCH 2006

I'd love to see the eclipse cutting through the corner of Egypt, the eastern Med and Turkey in 2006. Maybe there will be another family reunion. But something in the back of my head has me a bit worried. I'm "three-for-three" with eclipses. Three cloud-free views. Maybe my luck will run out.

But wait: I've also gone to one Super Bowl and one Rose Bowl and my team won each time. So actually, I'm a charmed five-for-five! Aw heck, if it's cloudy on March 29th, 2006 I can still go see the pyramids. Does anyone else want to come?

Telescope Topics

By Tom Ryan

"October Skies"

Most of the columns I write for Telescope Topics concern the design, building, and testing of telescopes, or telescope optics. But the glass and its mechanical supports are only a part of the system that enables us to explore the universe. The remaining part is the atmosphere.

When you think about it, it seems pretty amazing that we can see through a mixture of different gasses, vapors, and dusts. I mean, there are days when I wouldn't be surprised if I looked out the window and saw a thick green fog, slowly dissolving the creatures too slow to get out of it. (Although that may just be nostalgia for my lost youth, which was spent in an industrial town in Ohio).

I realize that we have evolved to be able to see through the air, so from a standpoint far from the exhaust of the smokestacks of H—w Chemical, perhaps a transparent atmosphere is not so remarkable after all.

Our atmosphere is not really perfectly transparent, though, even to our highly evolved eyes. Dust makes it translucent, the scattering of light from molecules adds background noise in the form of the blue color in the sky, and temperature and pressure variations can cause one of the atmosphere's components to become opaque and condense, which is good for the grass, but bad for concrete, especially if it happens near H—w Chemical.

All of these things are generally bad for astronomers, too, but perhaps the worst thing is the fact that the air has an index of refraction that is not 1.0000. It's almost 1.0000 (actually about 1.0003 on a good day), and since most optical work is done in air, it is usually taken to be exactly 1.0000, but it really isn't.

That, and the fact that the air is made out of relatively heavy gas molecules (the light ones having escaped long ago), conspires to create the condition known as "bad seeing".

When the temperature and pressure and chemical content of the air changes abruptly, it affects its index of refraction. The effect would seem not to be very great. For example, the heat waves rising from the hood of a car on a hot summer day are changing the index of refraction of air in the seventh decimal place. Nevertheless, for some reason, we can see these changes clearly. Very clearly. Punishment for misdeeds, perhaps?

Moreover, the heaviness of the gas molecules makes them move slowly, so they don't readily get mixed up and even things out. The result is blobs of air at the same STP (that's Same Temperature and Pressure, not what first came to your mind, which was the thick goop you add to your engine oil to get up enough compression to drive it to the junk yard). These blobs of air have a given index of refraction, but it's not necessarily the same index as the blob on either side of them. So each blob acts like a lens, sort of like a shower door, moving fast across the sky, and like a shower door, it's usually between you and what you're trying to see.

We'd really be better off if we had an atmosphere that was composed strictly of Hydrogen and Helium. Fill your telescope tube with that and you can kiss tube currents goodbye, as long as you can keep the stuff in there. The lighter gasses have indices that really are almost 1.0000, and they mix together quite well, thank you.

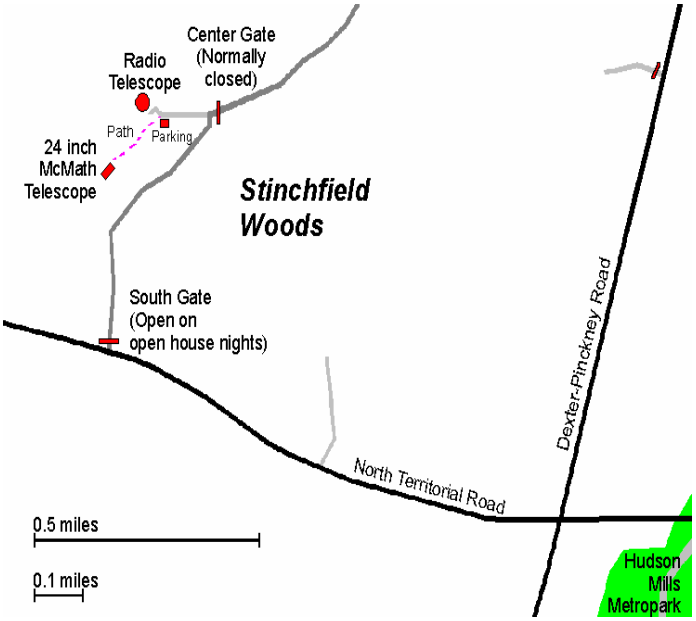
Failing that, we have to settle for observing when the blobs are at their most languid, or least disturbed. If there is not a lot of heat being input to them, or radiated from them, they may have time to merge and form large (up to 8 to 12" diameter) blobs, which bob like waves in a tidal pool, and only cause us to refocus our eyes, instead of cursing our luck.

When does this happen? When the daytime and nighttime temperatures are about the same. Say, on some days in the spring, or in October.

P.S. My son heartily recommends the movie of the same name. Go see it, and also, see the real thing while you're out there in that strange mixture of gasses.

Places and Times

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



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-Pinckney 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.

Public Star Parties

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 4332-9132 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 mosquitoes - bring insect repellent, and it does get cold at night so dress warmly !

Amateur Telescope Making Group meets monthly, with the location rotating among member's houses. See the calendar on the front cover page for the time and location of next meeting.

Membership

Membership dues in the University Lowbrow Astronomers are $20 per year for individuals or families, and $12 per year for students and seniors (age 55/+). This entitles you to the monthly REFLECTIONS newsletter and the use of the 24" McMath telescope (after some training).

Dues can be paid at the monthly meeting or by mail to this address:

Mike Garrahan
7676 Grand Street
Dexter, MI 48130

Magazines

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

Sky and Telescope: $29.95 / year
Astronomy: $29.00 / 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. Make the check payable to "University Lowbrow Astronomers".

Newsletter Contributions

Members and (non-members) are encouraged to write about any astronomy related topic of interest. Call or Email to Newsletter Editor at: John Ryan (734) 662-4188 john_edward_ryan@hotmail.com to discuss length and format. Announcements and articles are due by the first Friday of each month.

Telephone Numbers

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Vice Presidents:	Jim Forrester	(734) 663-1638
	Bernard Friberg	(734) 761-1875
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Newsletter Editor:	John Ryan	(734) 662-4188
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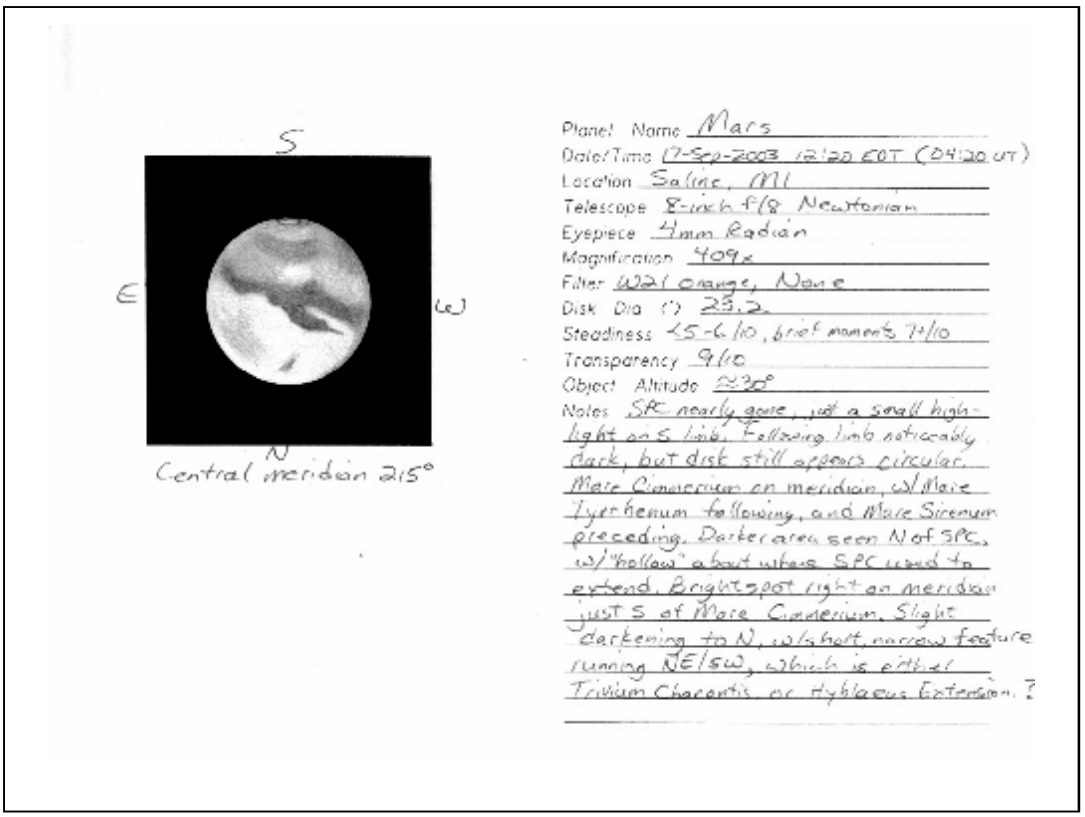
Webmaster	Dave Snyder	(734) 747-6537

Lowbrow's Home Page

http://www.umich.edu/~lowbrows/



Mars sketch made by Doug Scobel on September 17th from his backyard in Saline, Michigan.

UNIVERSITY LOWBROW
ASTRONOMERS
7676 Grand Street
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