



THE PINE MOUNTAIN OBSERVER

Volume XXII, No. 1

Celebrating 38 Years of Observing

Spring 2005

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MEETING NOTICE

Spring Meeting
 Saturday, April 2nd
 2005
12:00 PM
Intel
Jones Farm Campus
Hillsboro, OR
details on page 15
 for more information:
 Sean McGonigal
 seanmcgonigal@verizon.net

Little Fuzz Ball

WANT TO HAVE A GOOD TIME? WANT to get a thrill? Want to ooh and aah like a little kid? Step outside on a clear night and check out Comet Machholz. All you need is binoculars and a warm coat. It is becoming fainter as the days pass. But a month ago it was terrific. What a cutie! The winter skies are just as exciting as the summer skies, maybe more so, only colder. The comet is near Polaris at this time. See *Sky and Telescope's* January issue. I hope it stays visible for a long time to come. What fun! It really gets me all hopped up for summer tours.



Mary's Comet adorns the hood of her Metro.

See you all at the Spring meeting April 2, noon, at Intel. See meeting notice on page 15 for more information.

Clear, exciting skies to all. ❖ Mary Hill, President FOPMO ❖

2004 Observatory Report

by Mark Dunaway

THE SNOWS ARE BLANKETING THE OBSERVATORY EARLY THIS YEAR. During the last weeks of October PMO has had almost a foot of snow. We normally have snow on the ground from mid to late November through April of the following year. If this is any indication of the type of winter we are in for in 2004-2005 it will be a long one.

Our 2004 season began with another round of house cleaning. The gift shop area below the 24" scope was the focus. Many buckets of old paint, cleaners, photo supplies from the mid 70's along with an array of containers and miscellaneous junk were removed from the area. The result was much more useable space for the gift shop. The stairs between the upper viewing area and astronomers quarters were re-built and shored up. They will now serve a few more seasons until the new facility is built.

On June 25 2004 Deschutes National Forest Supervisor Leslie Weldon signed the final document in the Environmental Assessment "EA" process. The finding of

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4480 Miles to Pine Mountain Observatory

by N. Leistikio

IDIDN'T INTEND TO DRIVE SO FAR, BUT I REALLY wanted to experience every weekend of viewing the sky this summer. I knew the clarity of the sky, the atmosphere, would vary the quality of what I could see at Pine Mountain Observatory.

I didn't intend to run the telescope, the big 24 inch that we use for public viewing. I just wanted to run the gift shop and schmooze with visitors, then go outside about midnight and see what the local astronomers with their own telescopes were viewing.

I planned an easy summer away from my office administration work in Bend. An adventure in the sky, an escape from reality, a touch of wonder on Friday and Saturday nights. I prescribed for myself travel and a change of scene. I found the scene changed me.

There were few volunteers. I found myself operating the 24 inch telescope almost every Friday and Saturday and night while the crew chief did the lecture, answered questions, talked to the public. I had to decide what to view through the telescope. I had no idea what to view. Clueless. Lost in the darkness of inexperience. A quick consultation by email with the crew chief astronomers at Pine Mountain Observatory (Tracy, Rick, Greg H., Reed) and I soon had a list of 5 - 6 objects with visible brightness and of varying shapes – a double star (not a “real” double the children told me), a double

double star (four stars - I was absolutely astounded to discover I could actually see the two sets of two stars), and then on into globs of stars and whirling swirling arms of tiny lights, and cigar shaped, needle shaped groups of lights, and later a blue green planet in a boat

shaped constellation, and on and on into the nights, warm warm nights, us all in Hawaiian shirts and shorts for two thirds of this wonderful summer.

Sure, I wanted to show the most spectacular objects, so visitors would be as thrilled as I on first looking at anything in the big dome shaped, grinding halting noisy 30 year old machine of a telescope the first summer I lived in Oregon and stumbled upon the observatory. Coming upon the Pine

Mt. Observatory mark on the map I drove out one late afternoon thinking, mmm sounds interesting, think I'll go look!

So when I drove up there the first time it was daylight, wanted to be sure I could find the place. I didn't see any telescopes for a long time driving up, but I did see people flying in the sky! What are they doing? How do they stay up there? Are they inventors? Is this some club, could I do this? Suddenly someone was flying dangerously close to the top of my car. I saw the silky parachute-like cloth, the metal struts, some kind of person in ski cloths all covered up with goggles, headgear, and lying stomach down, horizontal in the air. Lying on their stomach in the air, as I would later that year find myself lying on my back horizontal on gravel and dirt, star gazing, floating in another kind of sky.

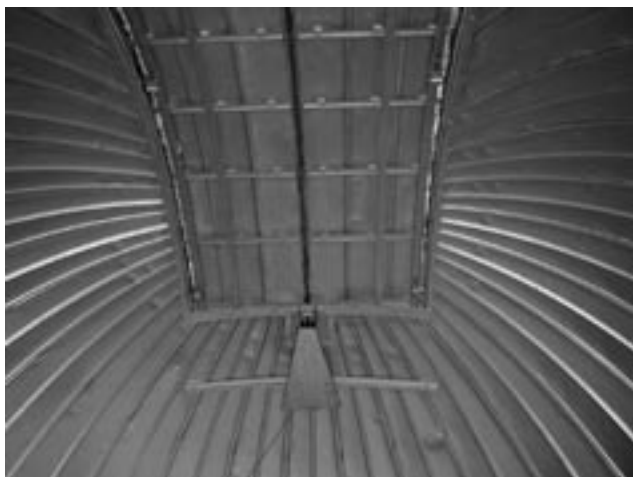
Well that was pretty nifty, the floating person swimming in air, I thought as I continued driving up - - until I came to those darn cows on the road, standing right in front of me with big eyes, just daring me to go on. I cautiously opened my window and told them to get out of the way and nudged my way forward, and they leisurely moved, those black and white big eyed critters, moved off into the Deschutes National Forest their range and domain!

Hey, isn't this a national forest, isn't that suppose to mean, no cows? Or did the cows just take over, natural like over the years. Is this a herd of wild cows, breed-

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New gift shop manager Norma Leistikio sports a Cosmic Gift Shop sweatshirt, now available at the observatory.



Looking up inside the 24 inch dome.

Viewing The Transit of Venus From Iran

by Richard Berry

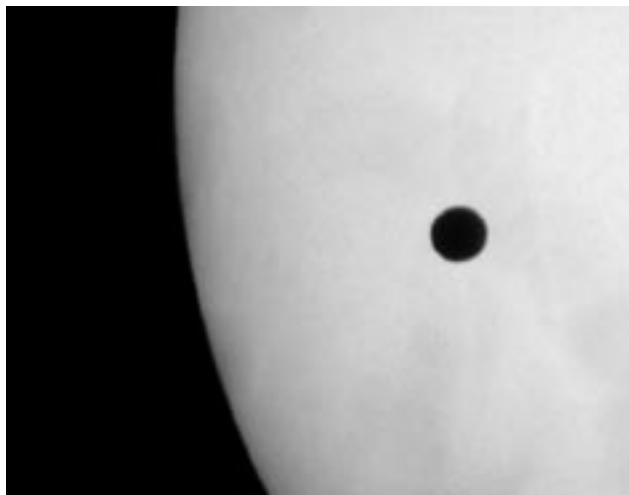


The Berrys on location the day of the Venus transit.

THIS SUMMER, MY WIFE ELEANOR AND I VISITED Iran to view the transit of Venus. I had been invited to participate in a two-day conference on astronomy education co-sponsored by the International Astronomical Union and Iran's ministry of science and culture. We traveled with a tour put together by Mike Simmons (an American who has visited Iran as an amateur astronomer twice before), Babak Tafreshi of Nojum (astronomy) magazine in Iran, and Cyrus Travel, a California travel agency with excellent connections in Iran.

Mike and I had had first spoken about viewing the conference and the transit Iran two years earlier at the Riverside Telescope Makers Conference. Ele and I were dubious at first, but Mike convinced us that travel in Iran would be both pleasant and safe -- and he turned out to be entirely correct. In fact, Ele and I had never enjoyed traveling in another country as much as we did in Iran, and the people of Iran were both welcoming and friendly. Our tour included (of course!) visits to Iranian observatories and meetings with Iranian amateur astronomers, as well as the conference and viewing the transit of Venus from the tomb of Cyrus the Great, at Pasagadae, near the city of Shiraz.

We flew on Lufthansa to Frankfurt, Munich, and then to Tehran. Since the US does not have diplomatic relations with Iran, we had to obtain our visas through a "desk" that Iran maintains at the Pakistani embassy in Washington, and the pictures we submitted for the visas had to conform to Islamic dress codes, i.e., in her photo, Ele had to have her hair covered and she had to be wearing a dress with a modest neckline. About 30 minutes before landing, all of the women in the airplane put on their headscarves. It would also be necessary for her to wear a garment, called a mantou, that "concealed the shape of her body," which is something like a beige housecoat. For entering the country, however, a light



Venus transit. Captured from Pasagadae near Shiraz, Iran.

Photos courtesy Richard Berry, 2004.

raincoat would suffice. Men are required to wear long pants. A few years ago, men also had to wear a shirt with long sleeves, but nowadays on warm days many men wear tee-shirts.

We arrived in the wee hours. Plopping into middle eastern county when you are dead tired is somewhat psychedelic. Outside Mehrabad airport we met our Iranian host Babak, and piled into cars for ten-mile drive to the hotel. It was a hot night; the streets were filled with young men out playing soccer on the side streets or just hanging out on a night too warm for sleeping.

In the morning we went down to breakfast. (Hotel breakfast in Iran is a buffet with delicious flatbread, tomatoes, cucumbers, goat cheese, eggs, and sometimes little pancakes.) Our Iranian tour guide, Cyrus, was a man of incredible energy. Since it was Saturday, holy day, we spent the day visiting palaces and parks, getting to know the other ten Americans, Brits, and Germans in our group, and then took a hair-raising ski-lift ride into the mountains on the north side of Tehran for lunch (Iranian style) in a little mountain cafe. We were eating when an earthquake struck -- no damage where we were on bedrock, but 60 miles north, people were killed when their houses collapsed.

I'll skip the museums and palaces we visited, suffice it to say that we came to deeply appreciate the long and complex history of the Persian empire, a history that is still very much present in daily life there.

The conference was held at the Sharif University of Technology, and I was scheduled to give four talks. The buildings, classrooms, and auditoriums were modern and equipped with video projection equipment -- Iran is decidedly not behind the times -- and the conference attendees were a mixture of teachers and students from all over Iran. I estimate that more than half the students were young women (girls?) -- an interesting comparison

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Education Activities Report, Fall 2004

by Rick Kang

OUR OUTREACH EFFORTS CONTINUE. I HAVE visited many classrooms starting in September, traveling already to rural mid-Oregon and to the mid-Columbia Gorge area as well as to schools in the Willamette valley and in Madras. This is the first year where I've been contacted frequently enough by teachers that I haven't had to call classrooms to suggest visits. I'm slated to visit the Oregon Coast shortly, plus a trip to the Medford area. I continue to present the How We Know What We Know program that introduces students to digital imaging including basic photometry and astrometry. The Sun-Earth-Moon program is also very popular particularly with grades K-6 as introduction to their Solar System unit. The Cassini-Huygens overview program has been presented to an entire elementary school at Hood River, and should become more popular as the mission approaches the critical Huygens launch to Saturn's moon, Titan, in December. Oregon Space Grant continues to support our efforts, and I've made many pitches to high school students to consider careers in aerospace/astrophysics and to get involved with local Space Grant projects such as the robotics program and balloon launches. Many teachers (over half of our mailing list) changed schools or retired this year, so we have quite a few new contacts. If you'd like me to visit your school, please get in touch with me ASAP as my schedule is full usually several weeks in advance.

We are doing collaborations with local Astronomy Clubs/Societies to furnish portable telescopes for evening sky observing sessions at various schools, this fits in well with the missions of most clubs to provide observing opportunities for the community and adds a major supplement to the Electronic Universe program. Eugene Astronomical Society under President A. C. Illig has been especially involved, with members traveling to Central Oregon on several occasions.

The Method is the Message The Philosophy of Scientific Inquiry

by Rick Kang

THIS ARTICLE DISCUSSES THE APPLICATION OF current strategy for effective science education developed by leading educators such as Professor Bothun at the University of Oregon, and by Dr. Dean Inman of the Oregon Research Institute (ORI). The emphasis on Scientific Inquiry (learning the methods and process of doing science, not just the content and vocabulary,) has been adopted and promoted by major educational institutions such as the American Association for the Advancement of Science (AAAS), American Astronomical Society (AAS), Astronomical Society of the Pacific (ASP), as well as by the Departments of Edu-

We held a pair of teacher workshops at PMO this past summer, a "technical" and a "novice" group, funded through residual STSci IDEAS grant dollars. If we can generate more funding we hope to be able to hold annual workshops and have received requests from several more teachers already.

We continue to try to prompt students to request data from PMO to use for actual research projects. This has been a challenge as the time required for students and teachers to formulate a project is high, they need to learn about the sky and about the hardware, and this steep learning curve has discouraged most classes. Several students have submitted initial ideas, but often these projects are much more extensive than the students realize, and the students also don't take into account how winter weather minimizes data acquisition opportunities. We are looking at perhaps furnishing more "canned" projects with archived data, this would give students an initial exposure to the nature of astrophysical research. The tradeoffs are the major hassles of the data acquisition process versus the learning experience of collecting data versus the overall learning of how to use the data (rather than the acquisition itself).

We contemplate doing a major web site facelift to make the site easier to access as well as to improve appearance. I've been working with Frank Gornto to provide more current updates using banner lines at the site to announce major upcoming events (sky observing events as well as FOPMO happenings), so check our website often. We are working with Amy McGrew to post the PMO *Observer* newsletter online as well as several resources specifically for teachers and students, so stay tuned.

Greg Hogue and I will be headed to the American Astronomical Society meeting in San Diego in January to learn about the latest research topics and to share information with other educators. Thanks for your support of our efforts, best wishes for a joyous Holiday Season! ❖

cation in many states including Oregon. We develop and use a variety of science inquiry programs within the Friends of Pine Mountain/U of O Electronic Universe outreach effort and we encourage all teachers of science to practice this strategy.

BACKGROUND The US educational system felt tremendous pressure in the early 1970s to teach more science and math in response to the race with the old Soviet Union to the Moon. Schoolchildren were crammed with all kinds of science facts and tested by being asked to regurgitate these facts. The problem

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LOCAL

WEDNESDAY, MARCH 17, 2004 • THE BULLETIN

Observatory prepares for big upgrade

By Rachel Odell
The Bulletin

MILICAN — Snow still clogs the dirt Forest Service road that winds from Highway 20 up Pine Mountain to an observatory run by the University of Oregon.

And this time of year, cloudy night skies make star-gazing tough for the full-time researcher who mans the station.

But though the cold season has rendered the observatory relatively dormant, the station's manager is active these days. Working with Deschutes National Forest officials on plans to upgrade the observatory, manager Mark Dunaway is awaiting agency approval to begin the improvements.

Inside

► See plan, Page C7.

The plans are ambitious: Provide a public education building with classrooms and scopes that can double as an entertainment facility for functions.

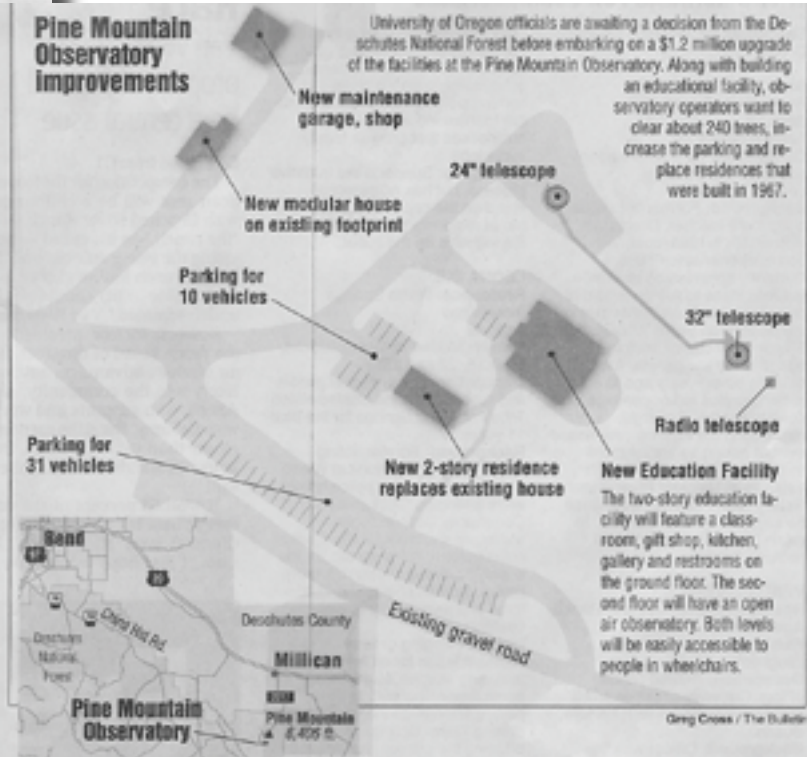
Simultaneously, officials want to:

- Make the observatory more accessible to people who use wheelchairs;
- Create a private zone for researchers to work in without interruption;
- Improve the skyscape by cutting down about 240 trees;
- Improve the parking areas;
- Make the observatory manager's and researcher's living facilities more comfortable;
- And create an endowment to ensure the long-term viability of the place.

See Stars / C7

Pine Mountain in the News

Observatory Upgrade. This recent article from "The Bend Bulletin" outlines Pine Mountain's planned and approved improvements. Courtesy Mark Dunaway.



Stars

Education building to include classroom and observation deck

Continued from C1

And the observatory's operator — the University of Oregon — wants to do it all without increasing the annual amount of visitors from its current levels of 4,000 to 5,000 people.

"Public education is a major goal here, but so is research," manager Dunaway said. "If we can separate the two, we can really accomplish a lot."

Since its inception in 1967, the observatory has contributed to the education of doctoral researchers and middle school science students. Situated atop Pine Mountain on the Deschutes National Forest, today's observatory looks more like a High Desert hamlet tucked into a pine forest.

It's cozy, but not conducive to star gazing, Dunaway said. That's why he wants to remove the trees that have grown around the telescopes.

Pictures taken from the observatory's creation to present day show the progression of the forest as trees sprouted and grew, essentially covering an area that was once nearly denuded.

If the Forest Service approves the plans — cutting down trees

"This is really cool because the students are actually gathering data, crunching data and writing reports."

—Researcher Al Chambers, on educational programs at Pine Mountain Observatory

building an education facility and more — the observatory will begin fund-raising about \$1.2 million to pay for the upgrades, Dunaway said.

When the new education building is installed, the public will have a two-story building complete with a classroom that seats 100, a kitchen, a gift shop, an observation deck and restrooms.

Forest Service officials are accepting comments on the proposal to upgrade the facility through March 22. For more information, or to comment, call 541-383-6000.

The observatory is open to the public on Fridays and Saturdays, and on Sundays during long holiday weekends, from late May through September.

A nonprofit group hosts organizations on the weekends. Dunaway also organizes some classroom tours during the week.

Along with on-site visits, Dunaway and researcher Al Chambers incorporate remote

computer technology to bring classrooms into the observatory — from a distance.

Essentially, teachers may undertake a science experiment and tap into Chambers' computers using computers from their classrooms.

Then, the class can take over the telescope and use the high-technology equipment to photograph the night sky and study it as part of the classroom curriculum. Chambers said the program allows kids to experience science firsthand. By accessing the equipment at the Pine Mountain Observatory, teachers and their students can study galaxies, meteors and other aspects of astronomy.

"This is really cool because the students are actually gathering data, crunching data and writing reports," Chambers said. "They are really doing science."

Rachel Odell can be reached at 541-617-7811 or rodel@bendbulletin.com

Observatory Report continued from pg. 1

no significant impact or "FONSI" - as the acronym-loving federal agency refers to it - is the last step in the EA process. For an in depth look at the EA go to this web link: <http://www.fs.fed.us/r6/centraloregon/projects/units/bendrock/pinemtnobs/pinemtn-ea.shtml>

They chose alternative 3 in the EA proposal. Among other improvements this allows PMO to go ahead with plans to build a new educational facility. Other planned improvements can be read about in detail at the Forest Service website link. The newspaper the Bend Bulletin did an article on our plans in a March issue this year (see the Bulletin article in this Observer). This article also shows the planned and approved upgrades.

We began tree removal right after the FONSI document was signed. The J bar J boy's ranch brought up 15 teenage youth. They made quick work of stacking the trees felled between the domes. The rounds were taken to the campground for campfires and the other slash was stacked to be burned this winter. The rest of the trees above the walkway on the hill will be removed next year before the season starts. The other tree removal areas are being addressed this winter and will also be implemented in 2005. Several other projects were done by Boy Scout troops. They re-built the trail from the parking lot around the gate creating a path that takes visitors by the kiosk, raked and weeded around the 24 dome viewing area and cleaned up the path of rocks that goes up to the viewpoint above the observatory. Many thanks to these groups for their help to keep the observatory grounds looking great!

The Oregon Quarterly published an excellent article on the observatory this summer. The magazine used a photo of the 24" dome for the front cover of the summer issue. If any one wants a copy I'd be happy to send you one. Just e-mail me your mailing address at: markpmo@uoregon.edu. Or call the observatory at (541) 382-8331 and talk to one of us. Calls from Friends of Pine

Mountain Observatory are always welcome, especially during the long lonely winters here!

The August Perseid Star party was a great success. The event was attended by over 40 folks. The meteor shower was spectacular and we had many telescopes and staff to show and explain to the attendee's deep sky wonders. Dr Greg Bothun gave an excellent lecture. He projected his program on the 24 dome ... very cool! Dean of The College of Arts and Sciences Joe Stone attended and delivered an inspiring talk on the importance of this facility for public outreach and education. Many thanks to Dr. Bothun and Dean Stone for their continuing support of the facility! Also very special thanks to Ken and Noreen Robbins for underwriting this event. If you are interested in attending the August 12th 2005 star party contact me for details!

University of Oregon's College of Arts and Sciences has begun fundraising effort for our new educational facility and observatory upgrades. We have come a long way towards our vision of a new Science Education facility here at Pine Mountain Observatory. There is much more to be accomplished during the next year. Please take some time to check out what we have accomplished. If you can help with this effort contact CAS at:

College of Arts and Sciences
1245 University of Oregon
Eugene, OR 97403-1245
541-346-3236
<http://cas.uoregon.edu>

Remember to specify donations to the Pine Mountain Observatory Educational Facility fund. Pine Mountain Observatory needs your help and support to make this happen. ❖

Scientific Inquiry Method continued from pg. 4

then became that although more people were aware of science, nobody knew how to practice science. The teaching methods actually alienated many students from ever getting near science again, science was a dry, overwhelmingly non-understandable topic and the scientists were retreating to their ivory towers. After studying and doing extensive research about teaching and learning methods (by Piaget and others), a new cadre of science teachers began to emerge in the 1990s. This cadre, coached by a handful of authentic scientists who wanted to expose real science with all its accompanying uncertainties to the public rather than hide behind "magic", espoused a completely different teaching strategy: Let's teach science by having students practice actual science, the process of making observations to collect, measure, and analyze data, from which they can attempt to draw rational conclusions. This experience would show students the process as

well as the methods, results, and pitfalls. The "right answer" is no longer the goal, instead, learning the analytical process is the goal (there aren't any right answers anyhow in science, only data). The scary part about teaching science this way is that teachers as well as students are breaking new ground, doing actual research where answers may not be known, and the practice of methods of the process, not the answers, are what get graded (the jargon is "work samples"). The results are rather dramatic, though: students suddenly feel empowered, find science very challenging and interesting, learn to work collaboratively, and become much more intellectually literate as they begin to grasp the power of analysis based on observations, and see the inherent uncertainties that sampling produces.

THE FOPMO CONNECTION The above description is a very brief summary, but I bring this to your atten-

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4480 Miles to PMO

continued from pg. 2

ing off alone in the desert and wandering up in the woods to cool off? Does someone own them? Do they get milked? Or worse, do they get chopped up and put into my hamburger!?

Not too bad a road, dirt and gravel, lots of curves and turns, and what is this, someone camping! Well it is a national forest. Further up the road a pretty big RV was sitting (taking over the wilderness I grumbled). A summer later I would shiver in my car, sleeping sidewise in the back trunk wishing I had a nice warm and cozy RV in which to fall down deep in a crazy sleep after all night viewing and after seeing the heavenly object, the Veil for the first time in my life. (I don't know what it is either, well I know more now, but then it

looks like a chiffon scarf spread across the sky, and if you begin to grasp in your mind, even a tiny little bit, that you are looking through glass at something really really far away...gosh it must be huge, I thought. I mean, it would more than cover earth's sky above me in a summer night if it were close to earth). The idea here being, that the car was cramped for sleeping but the view of the Veil more that made up for any discomforts I experienced.

But that was in the first thousand miles of my trip. Now I see such remnants of super novas and exploded gases from old and forming stars every weekend. I can imagine how my body shape and size would be measured if I was floating near and in the Veil. Ever since then that has been my criteria for understanding the objects in the sky – I imagine myself floating through them (forget the temperature; this is about shape and size of celestial objects).

When I look at the moon and see all those craters through our 24 inch telescope and someone asks the size of a crater, how wide across is it, and I tell them if I know. I also take this opportunity to ask them to imagine floating across the crater, a few feet from the surface and to observe the details in their imagination all the while looking through the telescope. I think that using your own body and the kinesthetic sense as a guide makes a more involved viewer. Well, I have to become a tour guide with my own sensibilities.

"Can we see the footprint they made on the moon?"

Me: "Well, try, I imagine the place is really findable, but gee whiz, how wide an area can you see driving up the road to the observatory? Can you see the coyote footprint up there on the hill? ...or a deer's face?" It is fun to stimulate the viewers to use just common sense when viewing. Any questions probably can encourage curiosity and thoughtfulness.

Well there are a lot of strange shapes up there. To even begin to think of size and distance is mind bending. I feel like a cave-woman looking up for the first time. I do wonder what made us look up that first time.

OK, ok, back to the real story. So I had to run the 24 inch telescope myself, no one else there, the crew chief handling the

crowds outdoors or projecting a lecture in the bigger dome. Yes I did have a darn radio phone to ask questions . . . how do you turn them on? ...I can't hear a thing! I did have the written instructions in a notebook and I followed every step, bit by bit, exactly and to the letter and double checking and worried if I did something incorrectly would I be thrown to the cougar that lives up on the mountain. I am one of those people who make lists, so the how to turn on the 24 inch telescope notebook was perfect for me! But you know the scope swings after you have stopped pushing the button and moves further than you calculated, sliding right passed where you thought it would stop. Well, it took all summer before I really felt confident and at ease. I was an auto mechanic with no idea what a carburetor does let alone where the sparks spark!

I did notice people viewing would gasp when they heard the grinding as I turned the dome to make the big shutter face another group of stars. "Yep, that's it folks, regular old fashion telescope just like in the movies." Is there any other kind of telescope? I mean, do people just push a few buttons and bam the behemoth turns and faces a different glob of stars all nice and pretty there together? I didn't really know. Yes, that naive, I didn't know what them words meant, 'go to.'

"Well, yeah, people", I said one night spontaneously, "that is a 3 dimensional globe of stars. What you are viewing is not just a flat bunch of lights up in

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The behemoth 24 inch scope.

4480 Miles to PMO

continued from pg. 7

the sky. Think of diving into a flat surfaced lake! There is depth." Blah, blah, blah I went on and on because I didn't know a thing, so I just made up things I thought might be true. And well, wouldn't it be neat to swim through the globe of stars? I think it is a globe; I kind of made that up, but then why was it such a perfect circle. My thoughts swam through the night as I watched carefully for the dials to reach the exact coordinates I was steering for next.

Yes, it has depth! Yes, it was fun! Yes, I knew nothing! Yes, there is something in your eyes that allows you to see better at night. And white light destroys that something so please keep your flashlight off!

I was feeling pretty snitty by 2500 miles. I managed to operate the big thing and I managed to get the dials right on the correct coordinates and the darn object looked pretty much like the picture on our software! In fact, I was going bam, right to an object, like those guys outside with there "go to" telescopes. One night, I couldn't see any thing in the eyepiece; I checked the coordinates carefully, saw that I was right on and ...nothing. So I quietly went to another object on my list, nothing, and another, nothing. Not a globe, not a blue green ball, not a crater, not a swirl, not a cigar shape, not a smoke ring, nada, not even a double double star. Nope! "Oh, Riickkkkk, I can't see any of my objects." "Did you calibrate?" He rumbled out of our radio phone. Calibrate?

Calibrate? Whatsthat? You know, point to something then look to see if the dials are the same as the numbers listed as the latitude and longitude for that object (which dial was 'right ascension' anyway and

why was it right?). Oh, yeah, I heard about that, in fact there is some writing here about that C-A-L-I-B-R-A-T-E... with lotsa words after it. Mmmm, ok I will try.

Well the dials were way off! It was suppose to be on 12 and it was on 22 and even I knew that was way way off! It is like a compass (I think). So I fixed it, I found a sky object I recognized with my eye and centered in the telescope. I then moved the hands on the dials to just where they are suppose to be with a little wrench (The dial hands, however, don't stay where you put them, they are really loose and wiggle around about 3 points). An allenwrench can be your friend. One night someone moved the little wrench to a new location. The toads! I used my nail file!

I located the star Vega that night by sight and got it manually into the telescope eyepiece center. Yes, I know, you are thinking, well jimminy crickets it is the brightest star up there, and they made that film on Vega too, the one about a message from outer space - no space aliens, no Godzilla, just people trying to figure out the plan (that was the movie plot, figuring out the plan). That's how you can find the plan in summer, on Vega, straight up!

Well, that is the plan. Calibrate. Would you believe it? I found all my objects that night, just like they were really there! Like I found before. Calibrate. Calibrate. When you come up here to volunteer, please calibrate.

By 3000 miles I was opening the gift shop, selling a few T shirts, then closing the gift shop door, running upstairs to calibrate and show my "list" to who ever

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Photos courtesy N. Leistikko, 2004.

Left: Contemplating the RA and Dec dials of the 24" scope.

Right: Here, push this thing to make it move.

Winter 2004 Meeting Minutes

FRIENDS OF PINE MOUNTAIN OBSERVATORY

DECEMBER 11, 2004

Minutes taken by Sean McGonigal

Meeting was called to order by President Mary Hill at 11:26 am.

Attending

- Executive Committee Members: President Mary Hill, Vice President Bob Ewing, Secretary Sean McGonigal, Treasurer Mark Dunaway, Greg Hogue, Bob McGown
- Board Members: Richard Berry, Dr. Greg Bothun, Lauri Crandall, Frank Crandall, Fred Domineack, Dave Hill, Rick Kang, Norma Leistiko, Dareth Murray, Karl Oestrich
- Guests: Jane Gary

Previous Meeting Minutes

- The summer 2004 meeting minutes were approved with minor corrections.

Treasurer report - Mark Dunaway

- Report handed out*.
- Specific items not found on this report can be acquired from Mark if needed.

2005 Budget - Mark Dunaway

- Budget items discussed. Most items were identical to last year.
- Education / conferences; PO Box; Membership; Visitors Program; President; Secretary; Treasurer; AL dues; Gift shop; Karl 10" scope; Newsletter; Petty cash fund
- Sean moved to accept budget as stated above. Seconded and approved.

Membership report - Bob Ewing

- ~275 members.
- Membership letter discussion.

Jane Gary, Executive Director of College Advancement

- Taking David Begun's role in our fundraising efforts.
- PMO Education Center fundraising discussions and organization. Kickoff events; Ground-breaking event; Success event.
- New Donor Research project needs to be in full swing or near complete by early summer. If anybody has names of potential donors (cash and in-kind), get the names and addresses to Mark ASAP. Do not contact them yet until we get a list and contact strategy together.
- "We're making something wonderful..." attitude needed from all of us.
- Fundraising for the Phase 1 (Education Center, parking area, upgrade infrastructure, new scopes on the existing area) is now in full swing. Spread the word.
- More information needed in a brochure and newsletter.
- Any contacts must go through Mark at this time.

Gift Shop report - Norma Leistiko

- Higher than normal inventory.
- Good sales over the summer.
- New shirt design viewed.*
- Handout of inventory and purchases.*

Observatory report - Mark Dunaway

- Environmental Assessment completed. Final bill from Forest Service received. Under budget. FS will use some of the extra for the planned timber removal based on the Urban Interface Fuels Reduction law. Timber sale will pay for the rest and they will "manicure" around PMOs 9 acres.
- Radio Telescope pad now at 14' x 14'. FS approved. Concrete to be poured in the spring. Radio JOVE kit. Option for regular telescope in the future.
- Leveling and gravelling around the 32" scope for viewing & driving area. Many thanks to Ken Robins for donating \$4800 toward this project. This will help with the Radio telescope space and non-public areas for astrophotography, etc.
- During construction of the education center, we hope to start ground breaking immediately after a season, work until the snow falls, then finish as soon as the snow melts the following spring. Observing may be closed or delayed for part of a season.

Dr. Greg

- Talked about 32" pier issues (cannot track anywhere in the west). Problem root caused and corrected (not yet tested). If it's fixed, secondary issues can now be looked at.

Visitor Program report - Greg Hogue

- Reduced attendance and tour guides over the summer, but still pretty good - ~3000 visitors (Gas prices has likely curtailed travel).
- Mark will get more local publicity for next summer's tour season.
- Training supervisor / tour guide manual - Give any updates to Rick.

Radio Telescope Report - Bob McGown

- Some items covered in telescope report above.
- Lightning protection - Disconnect during the winter. Lightning engineer will look at it. May need larger lightning rod for more than just this scope.

Education Report - Rick Kang

- Greg H. requested to budget an extra \$1000 for AAS conference (original \$1000 was not enough). Fred made motion, seconded and approved.
- Education handout report*.
- Good start for this school year. Rick already getting overbooked.
- Still working on plan to get students better involved in digital imaging.
- Aug - Dec, 53 events, 40 schools, 2700 students, 170 teachers (on track for 10000 students per year).

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Venus Transit in Iran

continued from pg. 3

with the US where young women are relatively rare in the physical sciences. Total attendance at the conference was about 250.

My talks were on Observing the Venus Transit, CCD Imaging, Science from CCD Images, and Building a Dobsonian Telescope -- PowerPoint presentations, of course -- they've become a universal medium. I gave my talks one paragraph at a time, and a translator would then speak in Persian (Parsi or Farsi is Persian for Persian). After each talk I took questions, and later individual students would find me and ask questions. The students I met were very bright and highly engaged in their subjects, which ran the gamut of computer science, nuclear physics, and astrophysics. Quite a few were also amateur astronomers, and that included the young women.

After the conference, we saw more of Tehran, then flew to Shiraz, our base of operations for seeing archaeological sites including Furazabad, Persepolis, and Pasagadae. We also visited the Biruni Observatory which has an elderly 24-inch Cassegrain telescope similar to the 24-inch at PMO. It is used nightly for photometry of eclipsing binary stars. I talked to one of the graduate students who was anxious to know what a CCD (which they cannot afford) might be able to do on a telescope like theirs. Tough question! Any answer highlights the hard truth that equipment is less than half of the research equation; the other half is knowing what problems are interesting and worthwhile. However, Iran has now allocated funds for a 2-meter national telescope that will be located at a good high altitude site.

As the day of the transit drew near, I assembled the system I had designed to fit within the rigorous weight and size limits imposed by international air travel. I had decided to use a webcam because webcams are small, draw their power from the PC, and are well suited for making images that could be assembled into a time-lapse movie. For the optics, I used a 1000 mm f/10 Maksutov telephoto lens that is diffraction limited, mounted on a battery-powered Super-Polaris mount. At the image scale provide by the lens, the image of Venus is about 60 pixels diameter, and just shy of critical sampling. For the 30 minutes spanning ingress and egress, I planned to grab one frame per second; for the remaining five hours of transit, I planned to grab one frame every

ten seconds. This would amount to 6 GB of data, an amount that my laptop computer could store.

The day before the transit, we visited the little town of Sadat Shar. Although it has a population of only 1,500 people, the town is dedicated to astronomy.

On a hill above the town they have constructed a domed observatory and a meeting house, and they plan to install a C11 telescope in the fairly near future. Right now, they are limited by the access road, which is barely negotiable in a 4WD vehicle, and the lack of electric power at the site. They are now trying the raise funds to grade and pave the road, and bring power about 1 kilometer to the observatory.

Anyway, the whole town turned out to greet

us. We piled into tiny little schoolbuses got a hair-raising ride to the observatory, and then everyone posed for pictures in front of the dome. Then we drove back to the town and attended a lengthy awards ceremony, with many speeches in Persian and English, and received frame plaques to remember the town. Then they treated us to a banquet in the cafeteria of the local technical college which, next year, will begin offering undergraduate degrees in astronomy. And we signed autographs. What an experience it was to be famous astronomical celebrities.

Iran was a good place to observe the transit because the middle of the transit occurred at local noon, so the Sun was high for both ingress and egress. At latitude 30 degrees, the Sun was near the zenith at mid-transit, and the probability of clear skies was 88%. (In fact, it was sunny every one of the 19 days we were in

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Eager to view the transit, visitors peer at the laptop under the cover of a survival blanket draped overhead to block glare.



Visitors and astronomers gather for a group photo at the tomb of Cyrus the Great after viewing the transit of Venus.

Photos courtesy Richard Berry, 2004.

Venus Transit in Iran

Iran.) Those of us with equipment to set up rose early and departed for the observing site at 6:30 a.m. We set up on a concrete pad about 100 meters north of the tomb of Cyrus the Great, king of the Persian Empire. (This is the tomb that Alexander the Great despoiled when he conquered Persia.) Local electricians got 220-volt power for us from the floodlights that light the tomb at night, and conveyed it to us through several hundred meters of dicey-looking extension cords. However, juice is juice and my laptop computer booted up and ran just fine on it.

Because it's impossible to see the screen of a laptop computer in full sunlight, before we left for Iran, I devised and tested a scheme for staying cool and seeing the computer screen. I put the computer in a large cardboard box, and then covered the box with a survival blanket, a large sheet of aluminized plastic. This reflected most of the sunlight and kept me, the box, and the computer reasonably cool.

I started taking images five minutes before the time of first contact. The transit began right on time with a tiny dent in the limb of the Sun. Ingress took about eighteen minutes, and I continued taking images at one per second until Venus was well inside the limb. I had hoped to capture images of the transilluminated Venus atmosphere, but glowing rim was not bright enough to show in my images.

At the time of ingress, the dozen members of our tour and about fifty Iranian amateur astronomers were at the site, and during the day, hundreds of Iranians dropped by to see that dark dot move across the Sun. Many of the visitors were high-school age students and their teachers -- again it was striking that over half the visitors were young women. In Iran young women apparently see science as an opportunity to have an interesting and influential career.

The transit lasted six hours. By the end, everybody was dead tired. During egress, I let my equipment take care of itself and watched through a small telescope



Caretaker's house perched in the mountains of Iran.

-- and was rewarded with a fine view of the illuminated ring of Venus atmosphere.

With the transit over, we packed up and headed for Isfahan, the fabled city of gardens and poets. That is really another story, but we did visit the astronomical society there. They have a splendid large meeting room on the penthouse of an apartment building, an outdoor observing patio roughly 40 feet long by 20 feet wide, and a very respectable club library with books in Persian, English, French, and German. Very few astronomy clubs in the USA have as nice or comfortable a setup for meeting and observing as they do. The night we visited, about forty members of the club came to greet us and "talk shop" about telescopes, observing, and even a little about politics.

I'll conclude with a chance "sighting" of earlier Venus Transit expedition. While in Isfahan, we visited the Vank Cathedral, and the associated Armenian museum. Beside the steps of the museum were two stone blocks bearing the words, "Deutsche Venus Expedition 1874."

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Above: group photo from Isfahan.

Below: group at Nojum.



Photos courtesy Richard Berry, 2004.

Scientific Inquiry Method

continued from pg. 6

tion as this process is what guides our curriculum for Electronic Universe outreach presentations and on-line programs.

Almost every day I see in classrooms (as I do outreach) the extreme lack of experience of students to be able to observe, measure, and describe the physical world, the starting place for doing science. Students expect a "sound bite" to describe what they are supposed to learn, and expect to only be asked to repeat this information back. When asked to think or analyze, panic sets in. Communication skills are extremely weak, particularly in writing up procedures and results, or even outlining the purpose of a research project, and math skills are almost non-exis-

Venus Transit in Iran

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These stones had been embedded in the base of the German photoheliograph that brought to Iran to observe and photograph the 1874 transit of Venus! I sent a letter about our "sighting" to Sky and Telescope (it appeared in the September issue), and since then I have been in contact with Dr Hilmar Duerbeck, a Belgian scholar who has researched the five German transit expeditions, and was delighted that we had located the stones! It is a small world indeed. ❖

tent. Again I'm generalizing. There are certainly some major exceptions in terms of particular schools, classes, students, and teachers, who are blazing spectacular trails in science education.

Our Electronic Universe program is an attempt to prompt teachers and students to indulge in scientific inquiry, to use actual data (in our case mostly from the sky), within actual (like Astronomical Image Processing (AIP) software) or simulation (Professor Bothun's amazing suite of JAVA labs, or Oregon Research Institute's Sun-Earth-Moon and Zoom) software to practice doing the scientific process.

The digital technology itself is only a tool, very powerful and useful though, and has two sides: Very appealing to students, interestingly often to students who don't perform well in "regular" class situations, formatted for "distance learning" over networks, and very suitable for assembling collaborative investigations over networks (like Professor Bothun's latest wireless laptop lab series where students "publish" and discuss results in a virtual environment) but also requires a lot of technical support and can be frustrating to implement. The really key advantage is access to the method: For students to collect and examine data, and to try to reach conclusions by analyzing the data.

Here is an example of the scientific inquiry process: We all notice the Moon. If you are familiar with why the Moon displays "phases" (we view different amounts illuminated in sunshine and shadowed (by the Moon itself, not the Earth!) due to angle changes with the Sun, as the Moon orbits Earth), you could explain what you know to someone else interested in the Moon. But, if you really want that person to understand the changing phases and be able to explain Moon phases to a third party, ask them what they notice about the Moon from night to night. Suggest they keep a log. Suggest they consider how a source of light illuminates any sphere, and how the appearance of the sphere might change as the viewpoint changes or the sphere moves relative to the observer. An actual physical experiment is certainly in order. Instead of furnishing an explanation that probably won't make sense and will soon be forgotten, prompt your student to do an investigation to make their own discovery. Use a variety of teaching methods from conventional "Moon on a stick" modeling to other kinesthetic activities supplemented by virtual views such as ORI's Sun-Earth-Moon software. This empowers students to really understand the concept. And, the more opportunities they have to do science inquiry, the better they will become at doing these investigations, and the more they will see how to apply the scientific process to any situation requiring a conclusion based on data including many applications far from formal science!

GET INVOLVED We offer a variety of inquiry programs directly through our extensive classroom out-

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Ali Abad Observatory group photo.



Richard Berry at the Tomb of Cyrus the Great.

Photos courtesy Richard Berry, 2004.

Winter Meeting Minutes continued from pg. 9

- Rick's expenses all covered by IDEAS grant and OSG.
- Software / hardware - possibly new star program, "planetarium". Rick is researching.
- Oregon State Fair display.
- Oregon Science Teachers Association conference in October. Lots of interest.
- TAG event at Inn at 7th Mountain.
- Looking into Deschutes County teachers conference.
- AAS Conference in San Diego in January. Rick and Greg H. attending.
- ASP organizing major outreach conference in the fall of 2005 in Arizona, we should attend.

Publicity Report - Rick Kang

- PowerPoint presentation available for public tours. Updating monthly for current events.
- Radio / TV / Newspaper seem to be increasing our attendance more than our brochures.
- Plain-paper brochures in draft.
- Publicity chair needed. Contact Rick or bring a name to the next meeting.
- Dareth and Bob M. created poster board, set up at RCA in Portland.

Web Site Report - Rick Kang

- Upgrades planned - line item in budget for 2005.

Awards / MOY - Rick & Tracy

- Norma was named as the Member of the Year for her dedication and working her fingers to the bone. "She practically lives at the mountain", according to Mary.

Next Meeting

- The Spring 2005 Board of Directors meeting will be Saturday, April 2, 2005, 12:00 noon at Intel, Jones Farm campus, room JF3-101. Please send agenda items to President Mary Hill @ visions@pacifier.com. All members and guests are welcome to attend.

New Business

- Newsletter discussion. No newsletter delivered yet. Backup discussed for when Amy is not available to publish. Further discussion of emailing vs. snail-mail of newsletter. Sean was designated as backup for the time being. Anything that anybody emails to Amy, please copy Sean at seanmcgonigal@verizon.net.
- Richard Berry is rewriting his software program
- Dr. Greg brought up idea of digital photography interface for the public.
- Dr. Greg upgrade to wireless upload to monitors around the mountain.
- Don't forget to get reimbursement forms to Mark
- Lauri - when newsletters are available on line, maybe buying mailing lists from other astronomical companies / sites or other avenues.
- Article deadline for next newsletter is March 1. Send articles to Amy McGrew at a.mcgreg@comcast.net and copy Sean at seanmcgonigal@verizon.net.

Meeting was adjourned at 2:18pm ❖

** All handouts on file with the secretary. Copies provided upon request.*

Scientific Inquiry Method continued from pg. 12

reach, and also online, for teachers and students of all ages, with many program components readily available to anyone who can get online. As we revise our web pages we'll be adding links to science inquiry topics. Look for "teachable moments" where you can prompt a child, friend, colleague, or family member to collect and analyze data. The sky is rich in opportunities: For example, on early November mornings this year, you may have noticed the pair of bright dots in the pre-dawn eastern sky and received questions about them. If you observe them even over just a pair of mornings, you'll notice their shifts in position to each other and to the other brighter dots visible in that area of the sky. Experiment with two upright fingers, one held steady at arms' length and the other halfway to your nose, observe how your fingers shift position as you blink your eyes back and forth without moving your head, to discover the "rule" that closer objects appear to shift more. Using this experimental data and your observations of the sky, you can conclude that the two bright dots are planets, much closer to Earth than the stars (the

planets observably shift over days/weeks, stars only appear to shift over many years). The next question is to determine which of the other 8 major planets you are observing. Think about observing auto headlights at night, and other lights at night, why would one light appear brighter than another? Do some experiments and collect some data to discover that distance and diameter of light source are major factors that influence how bright the source appears. These planets must thus either be relatively close and/or relatively large. You can consider the eight planets one by one and readily eliminate Mercury and Saturn and beyond, leaving only Venus, Mars, and Jupiter as viable candidates. Since neither dot appears "ruddy", that eliminates Mars, and you've completed your investigation! (The dot that shifts more each day must be the closer of the two, Venus...watch Venus "approach" another planet in a few weeks!)

Contact Rick or Greg for more details about our programs. ❖

The Sidewalk Astronomer

by Bob McGown & Dareth Murray

Once a monk named John, studied mystic verse
From a monastery window, he peered at the moon
That window became his doorway to the universe
Inspired to gaze further, he heard the cosmic tune.

He wondered about the world of wonder beyond
Hands and imagination crafted a 'scope to see the stars
Using silvered porthole glass he found photons
Could he know his inspiration in time would travel far?

In his wandering journey of astronomical discovery
From Stellefane to San Francisco, they came from afar
He brought stars to the sidewalk, passers by looked for free
Seeing Saturn's rings brought children near and far

At many a star party, he spoke like an avatar
And he shared his philosophy for amateurs to hear
John taught telescope making to share the evening star
His purpose was exploring the starry frontier

John's clever and useful mount become renowned
The mount and man were known the Dobson
Sidewalk astronomers built scopes around the town
Solar 'Dobs' were also built to show the world the Sun.

He shared the cosmic laws of wonder in the night
Scientists and philosophers listened to his reasoning
His soul searches lead him to believe that he was right
It mattered not to him what others were believing.

4480 Miles to PMO ————— continued from pg. 8

walked up the stairs, including, one night, a little person about 4 years old whom I had to hold up to the eyepiece due to his shortness. We were looking at the moon. He didn't see anything at first so I told him to make a ring with two fingers and hold this against the eye piece and look. He did see then, and he said after a long long time, "Wow!"

I thought that said it all. And that's why I did it...for the 'wow!' ❖

* The title of this piece refers to driving 35 miles one way from Bend to the observatory every Friday and Saturday night from Memorial Day through the end of September. Over one summer it is 2240 miles, but over three summers it is was 4480 miles as I increased my volunteer visits each summer.

Like Galileo his stargazing challenged ancient belief
To a Vandantan, the universe must undergo death and rebirth
To scientists and cosmologists space/time has curvature relief
But to John the universe is an illusion - like the flat Earth.

A rope or snake, from a distance, can be taken for the same
What is the difference between a nebula and star cloud?
What about a black hole? Is it something to tame?
What happened about the big bang? Was it loud?

Was it God or Gödel that gave us uncertainty?
Debating Einstein's Law, John cannot bend.
Is there a quantum reality? How could there be?
Vandantan teaching refutes a heat death end.

Questing Nirvana, John seeks truth and clarity
The Maya within us is where we must start
John is driven to share his insight of reality
The universe of wonder is inside our heart

2004 The journey is the reward



Photo courtesy N. Leistikio, 2004.

Cosmic cap sold at Pine Mountain Observatory.

NORMA LEISTIKO, AN ORDINARY VOLUNTEER, if I can do it, you can do it, volunteer, be amazed, make your summer, camp with your family, learn the sky at night by looking at it. Thanks crew chiefs!

nleistikio@cooc.edu

Bend, Oregon ❖



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About the Friends of Pine Mountain Observatory

Friends are citizens across the globe who help PMO by contributing voluntary labor, materials, and/or funds. You are welcome to join the more than 200 current Friends by sending the attached form, with your check, to the address below.

Benefits of Membership and Activities of Friends

Friends may visit PMO free of charge. Members receive several copies of the newsletter each year. The newsletter describes current **Friends** projects, the status of the Observatory's operations, occasional technical articles about ongoing research, and informs

members about upcoming activities. Various **Friends** are directly involved with upgrading telescopes, improving educational programs, organizing publicity, and producing fact sheets, brochures and documents.

The **Friends Board of Directors** meets three times per year, usually in Portland, Eugene, and Bend. All members are welcome. There is also the tradition of a **Special Star Party for Friends**, at Pine Mountain, each summer. Check your newsletter. Contact any Friends officer about meetings. Get involved!

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<http://pmo-sun.uoregon.edu/~pmo/>
Contact V.P. Bob Ewing to cancel hardcopy.

