

The Objective View

September 2005

Newsletter of the Northern Colorado Astronomical Society

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30min or so to give club members views thru the observatory 14" scope. He also thought that attendance from his class

might be "light" as the students have all semester to log a viewing session, and 9/1 is the first lab night for the semester.) I told him that he could invite his class out so that they could look through a number of our scopes as well.

August 4 Program

Settling Space: Implications for Population Growth Mr. Brad Jarvis

Brad has become interested in sustainability within the past 2 years. How rapidly can the human population grow? If we could reach the stars, could we continue at our current rate. We are at a critical point in history. We may be at the peak in the growth rate now. Those alive today will determine whether the human population will reach its peak in this century, or continue growing. Business-as-usual will mean the end of civilization. Our energy use is $\frac{3}{4}$ fossil fuel, and the energy consumption peak would occur about 2020 at about 2.5 times the 1970 level, given current consumption and reserves.

We will also strain fresh water supplies, and species diversity will nosedive, due to competition from humanity. It will be impossible for our economy to support the continued rate of energy use, and the human population would peak in 2030 at 9 to 10 billion. If we manage to double our available production soon, this only postpones our decline by 10 to 20 years. To survive, we need to achieve zero population growth, improve farmland, stop unsustainable irrigation practices that are dropping the water table. We could then foresee a plateau at 8 billion between 2050 and 2100. If we look at geologic timescales, staying on Earth guarantees extinction. We are overdue for a glaciation episode by about 1000 years. These have occurred about every 100,000 years. Threatening asteroid impacts average 1 per million years. Continental drift will create a supercontinent in about 250 million years, and it will have a dry, inhospitable interior. The carbon cycle would be disrupted. In 1 billion years, the warming Sun will make the Earth too hot for microbes. We will be like Venus. By 6 billion years from now, the Sun's atmosphere will extend to Earth's orbit and the planet will be vaporized. For our population to survive and grow, we will need to settle space. The Moon might maintain a small population with supplies from Earth. Mars has surface area equal to Earth's continents, and it is conceivable that as many as 8 billion people might one day call Mars home. Nuclear power and geothermal energy would be necessary. This would take about 6000 years, starting with 200 colonists and a 1% annual growth rate.

The asteroid belt could host a million times the Earth's population according to John S. Lewis. Stars are our next available sites. There is about 0.02 star per cubic light-year. The density of habitable regions is estimated at 0.00005 and 0.001 per cubic light year. In one scenario, a crew of 200 is sent to another world. This number is selected to meet needs for work and genetic diversity. The colony assembles equipment and stocks energy for the next flight. Then ships are sent to other worlds. Inhabited space grows like a bubble centered on the Sun. Surprisingly, growth of the population is

Next Meeting: September 1, 6:30 PM

Potluck Picnic at Observatory Village

NCAS Programs

Oct 6 John Spencer Cassini Report

Discovery Science Center Starwatch

September 9 8:30 p.m.
October 7 6:30 p.m.
November 11 6:30 p.m.
January 6 6:30 p.m.

Other Events

Little Thompson Observatory Star Night, Berthoud
September 16 7 p.m. Star Night
<http://www.starkids.org>

Cheyenne Astronomical Society
September 16 8 pm Cheyenne Botanical Garden
<http://home.bresnan.net/~curranm/>

Open House, Chamberlain Observatory, dusk to 10 pm
Sep 10, Oct 8, Nov 5, Dec 10 303 871 5172
<http://www.du.edu/~rstencil/Chamberlin/>

Longmont Astronomical Society
September 15 7 pm FRCC, 2121 Miller Rd
<http://longmontastro.org/>

September 1 NCAS Meeting

We're on for the pot-luck/picnic at Observatory Village at 6:30p on 9/1. I'll bring my solar scope, and if we're lucky, Dan will bring his also. Sunset is 7:30p, and we'll probably get fleeting views of Jupiter and Venus which set about 9:00p. If the weather is bad, we'll meet inside and have an alternate program after dinner.

Pat plans to invite Observatory Village residents, and interested teachers from the nearby schools. Mike Smith of FRCC does have an observing lab session scheduled for from ~8-10pm. He said that he'd be glad to stay around for another

constrained by competition with other colonies. Even if colonists advance at 50% of light speed, the rate of total human population growth is slower than our current rate (your planet may differ temporarily). We will never likely approach our current growth rate, subsidized by easily available fossil fuels. The speed of light and the distance to stars are constraints. If we move at light speed, growth is still limited to 0.5%. The growth in population plotted vs year is approximately linear, on a log-log plot as we occupy the nearby stars, then the galaxy, then the local group. The near term choice is ours. We can do nothing, and commit to a minimal population living a brutal life. We can live sustainably, with a limited population living well until a natural disaster strikes. Asteroid deflection defense would extend this time. Or, while living sustainably, we can settle the Solar System until the Sun dies. This buys time to develop the technology for interstellar travel, which might help us outlast the Sun.

NCAS Business, August 4 2005

President Greg Halac called the meeting to order. He announced Weekend Under The Stars at Foxpark Wyoming August 4 to 7. He announced the RMNP Starwatching for the summer. New material is needed for the NCAS website, Tom T prefers images at 80 to 100K in size. Members are encouraged to keep their \$15 annual dues current. Club funds total \$335. Dues will be requested in January of each year to simplify the process. Dave Chamness asked for volunteers for the Crow Valley Campground Star Party, in October 2005. James Holland will start a Mars Society Chapter in Fort Collins, he may be contacted at jamesho81@aol.com. The Mars Society convention in Boulder is in August 2005, see www.marsociety.org. Nate Perkins will schedule a fall picnic for NCAS in September.

Lowell Observatory Star Party

New dates - Thursday, September 29, 2005 through Sunday, October 2, 2005

* Mars viewing with Percival Lowell's 24-inch Clark refractor.

* A new dark observing site at 7,500 feet with unobstructed horizons

* Tours of the research telescopes

* Presentations from our astronomers

Details are available at

<http://kraken.lowell.edu/lsp3/index.html>

Questions can be directed to russell.tweed@lowell.edu or at the phone number below. Thanks for your help.

Russell Tweed, Lowell Observatory 928-774-3358

www.lowell.edu

Super-vision: Fighting Night Myopia From Mike Prochoda, M.D.

Dan:

I got my new "night myopia" glasses today. Despite a waxing gibbous moon, the effect was obvious - I see much better at night than before. Stars were sharper, better defined, and I could see at least 1/2 magnitude fainter than with my regular

glasses (even with the bright moon present). Epsilon Lyrae shows up as two distinct but very close stars, several stars near the bright moon could be seen with the new glasses, but not with my regular glasses, and I could see M31 despite bright moonlight with the new glasses, but not with the old glasses. Interestingly, the surface features and mare on the moon's disk did not appear any sharper than with the old glasses (likely due to its brightness which makes night myopia less of an issue). My overall night vision is also better with more details seen in the shadows of houses and trees at night. Some orographic clouds over Long's Peak showed much more structure in the new glasses than with my regular glasses in the bright moonlight. I can hardly wait to try the new glasses out under truly dark-sky conditions!

- Mike

Nebraska Star Party 2005

Dear Folks:

I have just returned from the Nebraska Star Party (NSP). Saturday through Wednesday nights were pretty poor with one night with no holes whatsoever, and the other four nights with only about an hour or so of somewhat clear skies before clouds moved in, leaving only the occasional sucker hole. However, Thursday was absolutely wonderful, and Friday was almost wonderful, except for a bit of wind that occasionally had the Dob owners limited with what they were looking at. Friday was highlighted by a fairly bright display of aurora (around midnight), that lasted for about 40 minutes with spikes going quite high in the sky. Visually, the aurora looked light blue to me, but I saw a digital photo of it later which showed it as mostly green with red tops.

In terms of observing, M31 was naked-eye visible, not just as a smudge but as an oval. The Milky Way was very very bright. The Double Cluster and all the stars in the Little Dipper were easily naked-eye visible as well (I thought I could see the North American Nebula, though I could have hallucinated that), though I was unable to see M81 or M33 naked-eye (could be a function of my eyesight). Oddly enough, the Veil was more visible without the OIII filter than with it. I did most of my observing with an 8" SCT, and if I had my log unpacked, I could tell you more about some of the other objects I observed (I'm a little sleep-deprived right now). At one point on Thursday night, I was able to split the Double Double, so seeing was pretty good. The observing site is wonderful with the only light dome being a really tiny one to the north, which comes from Valentine, a town of about 2800 people that is 27 miles away. A space is reserved for the big Dobs on a road (near a bathroom, thank God) that cuts through the observing field. The organizers do a good job of putting up signs on the access road warning non-astronomers that the area is being used by astronomers, and that light restrictions are in effect (though one fisherman on Thursday night apparently couldn't read). The skies at a minimum rivaled Fox Park, and were certainly better than O'Brien's Gulch (where Rocky Mountain Star Stare is held)

Many people stay in hotels in Valentine, though I suspect the majority camped out. The park facilities were really well-maintained, with really nice clean coin operated showers available. The food supplied by the star party was a little

disappointing, being primarily hot dogs, brats and stuff. Not at all like that catered BBQ (ah, food of the Gods) they have at Star Stare. I only knew of one other Colorado person there, with the majority of attendees coming from Nebraska, Illinois and Iowa.

It was a really good time, with lots of good people, and my only regret was that there weren't more than 2 clear nights. Surprisingly, many people who have attended NSP multiple times told me that the average is about 2 clear nights each time for that star party.

I wonder how things were at WUTS?

Bernie Poskus

Oregon Trip by Dan LaFaive

I left Wednesday morning and jumped on I-80 heading west. Made it to Elko, Nevada at around 7pm. I got a hotel room in Elko, and then headed north on Nevada Highway 225. About 60-65 miles north I came to the Wild Horse State Recreation Area (WHSR - not to be confused with the Wild Horse campground which is a few miles south of there). As you come to the WHSR, you'll come to an intersection with a sign pointing to the left for the WHSR and another sign pointing to the right for the Big Bend campground. I turned right (onto a gravel road) because there were too many lights at WHSR. I went about 1/4 mile down the road and then took a left and went about 1000 feet to the top of a small hill. Despite the fact that I was surrounded by mountains, the horizon was minimally obstructed. I could look at everything I wanted. The area where I was at was not in a state park. Elevation was between 4-5,000 feet. Basically, once you get 40 miles north of Elko, you could take any of the dirt roads to the side and setup on them. I'd recommend going there with at least 2 people since you are in such a remote area.

The skies that night were perfectly clear. No clouds or haze. The Milky Way was breathtaking. Seeing was about 7/10. Jupiter was setting when I got there, so I didn't get a chance to take a look. I looked at M13 and various other objects. On Thursday, I traveled to Steens Mountain in Oregon. To get there, I took I-80 west to Winnemucca, Nevada, and then I took Highway 95 north to Burns Junction, Oregon. Then I took highway 78 to Burns, Oregon. Burns is the only town of any size within 300 drive miles of Steens Mountain, so I gassed up there and got a good meal. Then I headed south on State Hwy 205 to Frenchglen, which is a small community at the western base of Steens Mountain.

The area is officially called the Steens Mountain National Recreation lands. Parts of it are run by BLM and part of it are owned by local ranchers. On the south side of Frenchglen, on the left hand side, there's a dirt road that goes in a loop to the top of the mountain and then back down, coming back out on 205 about 10 to 15 miles south of Frenchglen.

I took this dirt road loop to the Jackman Park campground and setup my tent there. This campground is about 21 miles down the Steens Mountain loop. The road there is very dusty, so make sure your optical equipment is covered.

For observing, I went a few miles up the loop to the Kieger Gorge road. About 1000 feet up this road you come to the top of a small hill. I setup my scope alongside the road on Thursday night, at 9100 feet in elevation.

The skies were perfectly clear. Darker and more clear than Foxpark. You can see some lights from Burns which is about 60 miles away, very dim and they don't cast any light dome. This area is the farthest point from an interstate highway in the lower 48 states. It has the darkest skies and the greatest transparency of the lower 48. The weather can be problematic, however, so I wouldn't recommend going there unless the weather forecast clearly shows that there will be a period of several days of clear skies.

The Milky Way was incredible. The dark dust clouds clearly stood out against the background of stars. I looked at M13 and it was stunning. With my C9.25, I could resolve stars to the center of the glob. Seeing was awesome at 8 to 9/10. I could easily split the double double into 4 distinct stars. At 454x I could discern airy disks with the relatively stable surrounding diffraction rings. I was out until 4am that night. Temperature was 58 degrees when I packed it in. It was somewhat breezy. May have been a problem with a Dob. A person could easily setup in the lower elevations along the road and get unobstructed views without the winds as well. For more information check out this web-site: <http://www.patch.com/astro/starsites/#steens>

On the second night, clouds came in during the day and they didn't break up until late in the evening. I got about 3 hours of observing in, however, and it was very calm with seeing at 9/10.

On Saturday night, I drove to Twin Falls, Idaho. To get there, you take Highway 20 out of Burns, Oregon, east to Ontario, Oregon and then get on I-84 east. Twin Falls is something like 100 miles east of Boise. I stayed at a hotel in Twin Falls and did a late night viewing session about 60 miles south of Highway 93 just a few miles south of Jackpot, Nevada. There was some light pollution there, but nothing that was problematic. Still great views. I just took one of the dirt roads and drove 1/2 mile off the highway and setup on the side of the road. Skies were perfectly clear. Not as good as Steens, but at least as good as Foxpark. No wind. Seeing was 7/10. I stayed there for 3 hours and then headed back to Twin Falls, got to sleep at 5:30am.

It was a great trip. I like to explore new dark sky spots, but I'd prefer to have someone with me in these really remote locations. The problem is that you don't know if it's going to be a good idea to go on one of these drives until the last minute because you have to see what the weather's going to do, first, and I don't want to drive 600-1000 miles just to camp in the rain :)

Dark Skies,
Dan LaFaive

Job Positions at Johnsonian Designs

Johnsonian Designs, a high tech manufacturer of advanced telescopes and robotics, has both full time and part time openings in the mechanical, electrical, and software arts. Applicants must have reliable transportation to Loveland, CO, and be drug free. References indicating prompt and reliable work habits required. The following positions need to be filled immediately:

Production manager (30-40 hrs/week)

Be able to assemble, test, document telescope assemblies. Must be able to use milling machines, lathes, drill presses in a safe and productive manner. Must be able to use Pro-Engineer, Word, and Excel software to document manufacturing procedures. Prior CNC/machine shop experience a plus, as is CNC programming in BobCad/Expert Machinist, and Telescope/Astronomy interest. Responsibilities include customer interfacing and e-mail status and delivery requests, managing part-time interns, and housekeeping shop duties.

CNC Programmer (15-20 hrs/wk)

Be able to design mechanical parts in Pro-Engineer, and use software packages to generate and debug programs on CNC mills and lathes. Machine shop experience helpful, and if coupled with Pro-engineer experience, will substitute for direct CNC programming experience.

Software Programmer (15-20 hrs/wk)

Responsible for writing embedded control applications in C and C++ for MicroChip embedded controllers. Experience with PC board design/debug/soldering, plus robotic actuator control will be required.

Production Assemblers (15-20 hrs/wk)

Work under the direction to assemble and test telescope products. Willingness to get hands dirty in using CNC machines, Mills, and lathes. Prior machine shop experience is helpful, but not necessary.

If you are interested in any of these positions, please contact:

Sam Johnson
Johnsonian Designs
e-mail sam@johnsonian.com
phone (970)-219-6392

Dome for Sale

It is a 12 foot diameter Astro Haven observatory dome (clam shell design) currently installed just south (~20min) of Colorado Springs off Route 115. We have owned the dome for a little less than two years. I am not sure the exact year it was installed, but it was most likely about 3 years prior to our purchase. We are not astronomers ourselves, so we are looking for a potential buyer.

Based on Astro Haven's web site, the 12 foot dome is large enough for several astronomers, or more than one telescope. There is ample room for a computer desk and extra equipment. The dome provides for full opening, as both sides fold down. It is possible to padlock the dome on the outside if desired. The dome itself weighs approximately 550 lbs. It is possible to disassemble the unit for transportation, and this would be the full responsibility of the Buyer. These domes are normally mounted on a concrete pad. The exterior is white and is in good condition and sits on a 12" base. The interior is black and also in good condition. Opening of the hatch appears to be only manual, although motorized operators are apparently an available accessory from Astro Haven. It appears there may have been one installed at one point in time. This dome does not currently house a telescope (and there is not one included in the sale); but at one point it was hooked up to a university via the internet. Also not included in this sale, there is a solar panel and converter on-site. If the buyer is interested, a price could potentially be negotiated for these additional items.

Link to Astro Haven's web site for more information:

http://www.astrohaven.com/Astro_home.html

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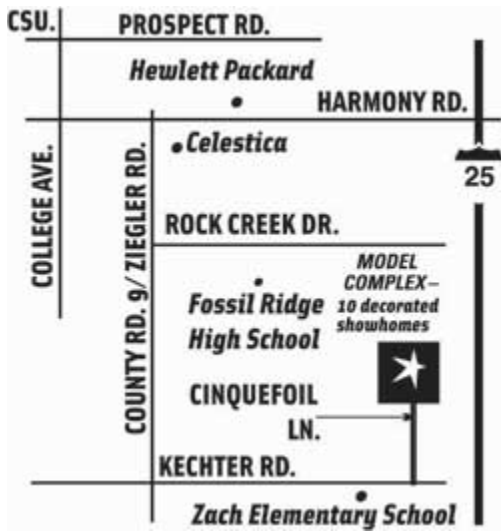
Best Looks

Moon	Near Saturn 8/31, 9/1; By Mercury 9/2 By Venus & Jupiter 9/6; By Mars 9/21
Mercury	Low in ENE predawn 1 st week of month
Venus	WSW at dusk; By Jupiter and Spica 8/31 to 9/10
Mars	High in S predawn
Jupiter	In WSW evenings 1 st 2 weeks
Saturn	In E predawn

From: Dan Laszlo
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TO:

Observatory Village (not to scale)



Landmark map to Observatory Village development



Tom Edgar assembles his airline portable scope at WUTS.



True scale map to meeting site at Observatory Village