

The Objective View

Newsletter of the Northern Colorado Astronomical Society

September 2006

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Club Potluck Sept 1 7 PM Observatory Village 3933 Galileo Dr Ft Collins

From I 25 exit 265, Harmony Rd, west 1 mile to Lady Moon.
Go South 0.5 mile to Rock Creek Dr, east to Cinquefoil Ln,
south to Galileo Dr.

Bring a dish you'd like to share, plus any show and tell items
for observing. The dome will be open, weather permitting.
Indoor meeting, if we have clouds.

NCAS Programs

October 5 Joseph DiVerdi
Radio Astronomy at Colorado's Table Mtn
November 2 TBA

NCAS Public Starwatch

September 30 7 pm Discovery Science Center
October 27 6 pm Discovery Science Center
November 24 6 pm Observatory Village

Other Events

Little Thompson Observatory Star Night
Sep 15 7:00 pm
<http://www.starkids.org>

CSU Madison Macdonald Observatory Public Nights
On East Drive, north of Pitkin Street
Tuesday 8 or 9 pm if clear, when class is in session

Cheyenne Astronomical Society, Cheyenne Botanical Garden
September 15 8 pm
<http://home.bresnan.net/~curranm/wuts.html>

Pawnee National Grassland/Greeley Visitors Starwatch
September 23 6:30 – 10 pm Crow Valley Campground
sproctor@fs.fed.us

Chamberlin Observatory Open House, dusk to 10 pm
Sep 30, Oct 28, Dec 2, Dec 30 303 871 5172
<http://www.du.edu/~rstence/Chamberlin/>

Longmont Astronomical Society
Sep 21 7 pm FRCC, 2121 Miller Rd
<http://longmontastro.org/>

August 3 Program Astrophotography Roger Appeldorn, NCAS

The 3M Corporation pioneered products familiar to all: adhesive tape, sticky notes, and sandpaper. There are many industrial products that were not marketed to consumers. Roger worked for 41 years, trained in physics, but mainly involved in optics work for the chemistry company. His division produced optics for photocopiers. They developed optical products based on microreplication, optics on a minute scale. He brought samples of retroreflector material we know from safety vests and highway signs. They proposed shipping a retroreflector sheet on the Apollo spacecraft to the Moon, as a couple hundred feet could be taken for the weight of the laser retroreflector that was taken, at a fraction of the cost. Another product is total internal reflection film which replaces a polarizing filter in LCD displays. Instead of absorbing as the traditional film, the material uses internal reflection to redirect light. Salvaging light that would be wasted in scatter yields a final 4x to 6x increase in brightness over the usual absorbing screen. He brought a small sample of T-tape, their hook-and-catch fastener that works like Velcro but is produced in a single sheet with hooks on one side and catches on the other. Roger got his first scope at 8 years old. He built a scope at 10 years old, followed by an 8 inch Newtonian he still uses. To build his department at 3M, he hired physicists and they learned optics. One assignment was building a telescope, so a group of amateur astronomers grew. His Newtonian sat on a pipe mount. He lived within 2 blocks of 45 degrees N latitude, so a pipe elbow made good polar axis. He built a sidereal drive with clutch, and setting circles which can be read to 1/4 degree. His focuser has a helical eyepiece holder. His scope has no spider diffraction. A friend had a 4 foot piece of window glass from offices built 1940 and 1950s. Since it was ground and polished, it had 3 regions good enough for optical window use. He cut a piece out for Roger. The float glass sold today is too irregular for telescopes, unfortunately. Spectrophysics has accumulated the old stock for its beam splitters, so it is no longer available. Roger's scope is not hobbled by tube currents and could be used immediately in the Minnesota winter. Roger has kept his older Orthoscopic eyepieces which work well. He has also built his own. He has tired of setup time and the Minnesota cold, dew and mosquitoes, so he built an observatory by his retirement cottage near Red Feather Lakes. He dubbed a rocky outcrop Mt. Fritz, after their dog, so his site appears on the Clear Sky Clock as Mt. Fritz Observatory. He had a few adventures with his development, and aligning North. His concrete purchase ran a bit short, so his wife kindly hauled rocks before the pier set. The rolloff roof was built on rails. It rolls on 4.5 inch casters rated for 800 lb each, so they won't get flat spots. He installed a 12" LX200. Sky darkness is good except for rare hazy days. 16th magnitude galaxies are detectable. The scope is supported on an 8 inch steel tube. The Meade Superwedge sits on 3 point suspension plus 2 stabilizing bolts. He enjoys viewing with 35mm and 19mm Panoptics, a 26 mm Plossl, and a 9mm Nagler. A 2 inch



M95 by Roger Appeldorn. Trails are likely from Clarke Belt.

Powermate and Williams 2 inch diagonal work well. He images with a Starlight Instruments MX7C one-shot color camera. For wider fields he adds f/ 6.3 and 3.3 reducers. He is very happy with his JMI crayford focuser which eliminates image shift. He added a scale so he begins to image very close to focus. The CCD is a 752 by 580 array with a Peltier cooler. He usually images with the simultaneous track and record function. He uses Astroart software. The software offers a simulator mode for daytime practice. For each photo, a dark frame is needed. This is used to remove missing pixels, account for bias of pixels, and account for any difference in response across the array. The dark frame is subtracted to eliminate these artifacts. A flat frame is used to subtract dust.



M27 by Roger Appeldorn

Images are assembled by stacking images. This improves the signal to noise ratio. The stack is processed with unsharp masking, high pass or low pass filters, and Gaussian sharpening. Plugins are available for processing functions,



Horsehead Nebula by Roger Appeldorn.

such as repair of blooming stars. The software can select the sharpest planet images for stacking, and fix some distortion. Roger estimates his routine takes about 200 steps for his current images. He has developed a scale that uses the mirror lock port to precisely measure the primary mirror position. He authored an Excel spreadsheet which calculates the field of view for each imaging setup. His field of view calculator will work with any folded telescope. He shared early images of M16, M17, M51, M27. With experience he developed exposure guidelines. More recent images included of the Helix Nebula, M57, M33, M27, the Veil Nebula, NGC 891, NGC 253, M1, M20. For M95 he made a relatively long exposure, 120 seconds times 10. The Horsehead Nebula was harder to get as he liked. He took multiple images of Jupiter



M100 by Roger Appeldorn.

in March 2006, which make a brief time-lapse movie. Seeing allowed only 1 of 10 images to keep. In 2003 he captured the division in Mars' North Polar Cap, and in 2005 he caught the dust storm in Vallis Marineris. He has also imaged Saturn and

the Moon. For wider fields of bright objects, he is trying a Nikon CP 5700 digital camera.



M51 by Roger Appeldorn.

An outline of his image processing is:

- Calibrate raw frames, subtract dark frame
- Select one of the best frames
- Select the pixel x pixel size
- Select a sunlike star in frame, use it to set color balance
- Adjust color layers, to fix atmospheric dispersion if needed
- Batch process
- Separate luminance, R, G, B
- Make master luminance frame
- Pick alignment stars in it
- Repeat for Red, Green, Blue images
- Tune color balance by eye
- Stack
- Normalize R, G, B at same size and format
- Add to luminance
- He can process an image while taking one.

See more images at:

http://www.ncastro.org/Pix/Appeldorn_R/Appeldorn_R.htm

NCAS Business, July 6 2006

President Greg Halac called the meeting to order. NCAS Potluck at Observatory Village was announced. Dates for starwatching at Rocky Mountain National Park are August 4 and 18. Tom Teters brought astrophotos to show. The treasurer's report was given by Dave Chamness. The Sky Quality Meter was received. Members may use the NCAS site for email and web space is available. More images are needed to illustrate the site.

Little Thompson Observatory Press Release, Monday July 31, 2006

Meinte Veldhuis, President of the Board, LTO Foundation, meinte-at-frii.com
Andrea Schweitzer, Ph.D., Board Member, LTO Foundation, andrea-at-starkids.org
Larry Westrum, Ph.D., Board Member, LTO Foundation

Historic Mount Wilson Telescope Coming to the Little Thompson Observatory

Berthoud, Colorado

The Little Thompson Observatory has been chosen as the new home for the retired 24-inch telescope from Mount Wilson Observatory in California. The telescope, originally built to support NASA's Apollo missions, was donated to Telescopes in Education, which in turn offered the telescope on long-term loan to the Little Thompson Observatory (LTO).

"We are thrilled, not just to get a larger second telescope for the observatory, but to provide a new home for an instrument of NASA history," said Andrea Schweitzer, astronomer and board member of the LTO.

The LTO already has an 18-inch telescope loaned by Telescopes in Education and the estate of Mr. C.F. Rehnberg. More than 25,000 people have visited the LTO, located on the grounds of Berthoud High School, since its opening in 1999.

Volunteers are constructing an addition to double the size of the observatory. This addition will make room for larger audiences, and will include a second telescope dome. "The expansion work is nearly completed, thanks to the dedication and effort of many volunteers," said Meinte Veldhuis, LTO board president, "and then we were selected to get the Mount Wilson 24-inch. For the LTO and Berthoud to get it is an honor."

The telescope, which has a large 24-inch diameter mirror, was designed and built by Caltech in the early 1960's to support NASA's Apollo program. The telescope studied the Moon to prove that the lunar surface was solid. The telescope observations were also used to find landing sites on the Moon, since areas with too thick of a layer of lunar dust could have been hazardous for the astronauts.

Following the Apollo program, the 24-inch telescope was used for astronomical research and made some of the first infrared observations of the center of our Milky Way galaxy, according to Mount Wilson astronomers. After its two-decade-long research career, it continued operating under the Telescopes in Education program. Then the telescope was decommissioned last year from Mount Wilson to make room for more modern instruments. LTO board member Larry Westrum said, "People at Mount Wilson were very emotional about this telescope, and happy to see somebody like LTO take it and put it into public use."

Meinte Veldhuis and Larry Westrum made the drive to California through 114-degree heat to get the telescope and bring it back to its new home in Colorado.

The massive 1-ton telescope will have to be refurbished and reassembled, and the supporting pier and dome completed, before the telescope can be installed. Donations and volunteer assistance will be needed to complete the project, since the LTO is an all-volunteer non-profit organization. "It's a pretty beefy instrument, not like what you'd buy retail. It was built to be used for a long time," said Larry Westrum.

The telescope will be enabled to run remotely over the internet, from classroom computers around the world. "It will amplify public access to the skies both locally and over the internet," said Larry Westrum.

The LTO and Berthoud High School offer a magnet astronomy course for high school students run by teacher Scott Kindt, as well as sponsoring teacher education workshops. The LTO has received grant money from NASA and donations from local residents so that the workshops can be offered free to teachers. "We have gotten good reviews from both teachers and the school district," said Andrea Schweitzer. "The teachers are very enthusiastic about visiting the observatory, and as part of the building expansion we're planning a small library area with classroom teaching materials about astronomy."

According to Larry Westrum, outreach to the schools was a factor in the selection of the LTO to receive the 24-inch telescope. "One of the things that they [Mount Wilson astronomers] were very excited about was the opportunity for the telescope to be used for teacher education," said Westrum.

Those who would like to contribute, either with donations or by volunteering, can find more information on the observatory website at www.starkids.org.

For further information, please visit:

Little Thompson Observatory homepage
<http://www.starkids.org/>

History of the 24-inch telescope
<http://www.telescopesineducation.com/history.html>

Telescopes in Education
<http://www.telescopesineducation.com/>

For images, please visit:
<http://www.starkids.org/> and select "construction photos," then scroll to the bottom for the most recent LTO images, or contact the LTO board members listed above for photos of the 24-inch telescope.

To add a little levity -- Andrea

http://www.nasawatch.com/archives/2006/08/this_is_making_html#more

This is Making The Rounds at JPL

Union of Plutonic States Contests Earthlings' Demotion of its Status
No Retaliation Planned, But Planned Aid May Be Delayed

FOR IMMEDIATE RELEASE - FRIGEON, August 24, 2006/Plutonic News via Deep Space Net/ -- /The High Council of the Union of Plutonic States notes with the greatest disappointment that the inhabitants of the third rock from the Sun, otherwise known as Earth, have unilaterally declared that Pluto is no longer a planet.

"It is very odd that a group of university professors a billion klurchniks from here would presume to change the status of our home planet" said High Council General Convener Blanpik Vogonj. "Nothing is any different here, in spite of their unfortunate action."

Other members of the High Council were less diplomatic in their comments. "For heaven's sake, they don't even know what we look like," barked Council Under-Minion Tork Uwapht. "The most they've seen of us is a smudge from their Rubble [sic] Space Telescope. They haven't the foggiest idea what this place is like."

Large crowds of demonstrators were reported in several cities. The perseverance and dedication of the people was evident, given that with the atmosphere beginning to freeze, breathing outdoors can be painful. Demands for retaliation could be heard in some quarters, but most people expressed disappointment and surprise at the Earthlings' misunderstanding or reality.

Convener Vogonj was quick to assure people that there would be no offensive against Earth. "This is a time for pity and understanding, not anger." When pressed about potential future aid for Earth, though, the Convener was less serene.

"It's well-known that Earth is experiencing a severe global warming phenomenon that has the capability to do great harm to what is considered life on that planet. While Earth should solve this problem on its own, their leadership seems to have a hard time recognizing it, and by the time they do, it will probably be too late" noted his Generality.

Taking a sterner tone, he continued, "We had been considering offering them an interplanetary heat-pump system that would solve their warming problem, as well as give us a slightly milder winter. That doesn't seem workable now, because we're no longer a planet in their opinion. It will be said to see them gradually heat up and drown, but that's their choice."

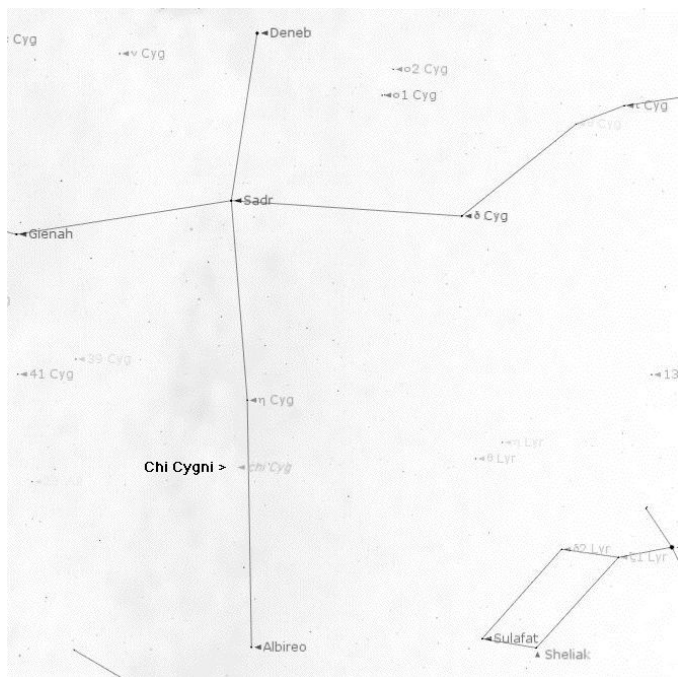
Some High Councilors were less disturbed by the news, while

others were almost elated. Minion Toxbo Frmxi released a statement applauding the decision. "All Plutonians should be relieved to hear that Earthlings don't think of us as a planet. Just look at what they've done to the other planets: Mercury and Venus have been spied upon; Jupiter and Saturn have had orbiting space machines taking photographs of everything, while Uranus and Neptune were nearly impacted by something whizzing past, cameras clicking the whole time. And Mars.it has been landed upon, penetrated, driven over, and even now has a swarm of satellites flying around it. They are as thick as mosquitoes in summertime, whatever summer is. We are fortunate to be saved from this fate."

Best Looks

Moon By Antares 8/31; by Saturn 9/18 and 19
 Difficult by Mercury 9/23; by Jupiter 9/26

Mercury Difficult low in WSW final week
 Venus In E morning twilight 1st 2 weeks. By Regulus 4-7
 Mars Difficult in W at sunset
 Jupiter Low in SW at sunset
 Saturn Improving view in E at dawn, last 2 weeks
 Uranus In Aquarius eves
 Neptune In Capricornus eves
 Pluto In Ophiuchus eves



Chi Cygni at unusually bright maximum, about 4th Mag
 This long period variable was near 10th magnitude in July 2006.
 It typically reaches 5th magnitude at maximum.

From:
 Daniel Laszlo
 2001 S Shields St Building H
 Fort Collins CO 80526

TO:

Date	Mag	Starts			Max. <u>Altitude</u>			Ends		
		Time	<u>Alt.</u>	<u>Az.</u>	Time	<u>Alt.</u>	<u>Az.</u>	Time	<u>Alt.</u>	<u>Az.</u>
29 Aug	1.9	20:38:10	10	NNW	20:39:34	13	NNE	20:40:57	10	NE
29 Aug	2.5	22:12:26	10	NW	22:13:03	15	NW	22:13:03	15	NW
30 Aug	1.2	21:01:00	10	NNW	21:03:18	20	NNE	21:03:55	19	NE
31 Aug	0.4	21:23:58	10	NW	21:26:12	38	N	21:26:12	38	N
01 Sep	1.1	20:12:30	10	NNW	20:14:47	20	NNE	20:17:05	10	ENE
01 Sep	1.7	21:47:14	10	WNW	21:48:31	22	WNW	21:48:31	22	WNW
02 Sep	-0.2	20:35:26	10	NW	20:38:14	45	NNE	20:39:29	27	E
03 Sep	-0.4	20:58:39	10	WNW	21:01:36	52	SSW	21:01:53	48	S
04 Sep	-0.2	19:46:48	10	NW	19:49:39	44	NNE	19:52:28	10	ESE
04 Sep	1.7	21:22:37	10	W	21:24:22	16	SW	21:24:22	16	SW
05 Sep	-0.2	20:09:58	10	WNW	20:12:50	53	SW	20:15:31	11	SE
06 Sep	1.8	20:33:53	10	W	20:35:48	16	SW	20:37:43	10	S
08 Sep	2.0	19:45:04	10	W	19:47:00	16	SW	19:48:56	10	S