

The Objective View

Newsletter of the Northern Colorado Astronomical Society

November 2010

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Next Meeting: November 4 7:30 pm

Astrophotography

By Robert Arn

CSU Dept of Mathematics

Club Business at 7:15 pm

**Fort Collins Museum, 200 Mathews St
Fort Collins CO**

http://nightsky.jpl.nasa.gov/club-view-directions.cfm?Adress_ID=2810

NCAS Programs

Dec 2 Bill Tschumy Escape from Plato's Cave: The
MW Galactic Coordinate System

NCAS Public Starwatch at Fossil Creek Reservoir

Nov 12, Dec 20

http://www.co.larimer.co.us/naturalresources/fossil_creek.htm

City of Fort Collins Natural Area Program at Sunset

Bobcat Ridge: Dec 28

<http://www.fcgov.com/naturalareas/finder/bobcat>

Dark Site Observing Dates

November 5, 6 Keota, or other dark site, ask FRAC

Other Events

Chamberlin Observatory Open House, 7 to 10 pm

Nov 13, Dec 11

303 871 5172 <http://www.du.edu/~rstencel/Chamberlin/>

Cheyenne Astronomical Society 7 pm Nov 19 TBA

Cheyenne Botanical Gardens

<http://home.bresnan.net/~curranm/>

CSU Madison Macdonald Observatory Public Nights

On East Drive, north of Pitkin Street

Tuesdays after dusk if clear, when class is in session

Estes Park Memorial Observatory. 7 pm Nov 18

<http://www.angelsabove.org/>

Little Thompson Observatory, Berthoud 7 pm Nov 19 TBA

<http://www.starkids.org>

Longmont Astronomical Society 7 pm Nov 18 at IHOP, 2040

Ken Pratt Blvd. Dr James Elkins, NOAA, Research with

Unmanned Aerial Vehicles <http://www.longmontastro.org/>

Oct 7 Program: Telescopes + Rockets: Bigger and Better Astronomy from Space, by Dr. Paul Lightsey

Lyman Spitzer produced the first well thought out exposition of the space telescope. Spitzer's contribution was commemorated in naming of the SIRTf. Ground based telescopes cannot see into UV and IR wavelengths, and optical turbulence limits resolution. Adaptive optics gives some benefit, but the field of correction is limited. Peak energy in the spectrum is about 10 microns. Getting a telescope into space is as important as making the telescope. GSFC is named for the American pioneer in liquid fueled rockets, Robert Goddard. Werner Von Braun and his mentor Hermann Oberth were in Huntsville AL in 1956. HST is the culmination of the efforts of rocket scientists and astronomers.

Ball Aerospace instruments included GHRS, COSPAR, NICMOS, STIS, ACS. The other NASA Great Observatories are CGRO, Chandra, and Spitzer. The HST timeline started at 15 years and it just passed its 20 year anniversary. Ability to incorporate advances in instruments was critical to its success.

When the HST optical error was discovered, the High Speed Photometer was sacrificed for the corrective optics package. Some highlights were the STIS detection of rotation of M84 which implied a central mass of 300 million solar masses. NICMOS showed stellar systems growing in interstellar dust. The Egg Nebula was revealed to have structure and compression waves. Paul then shifted to address the question, "Why JWST?" The short answer is to fill the gap between COBE and HST. Slight inhomogeneities in the beginning ultimately lead to galaxy formation. In the first 400,000 years of expansion, the energy density came down. Neutral

hydrogen could form. We hope to see light from the first reionization as clumps of matter collapsed into stars. JWST continues the progression of telescope sensitivity. 1 photon from the target will come in per 30 seconds. The energy will be in nanojanskys. A jansky is about 10^{-26} Watt. It will show the first light and reionization, assembly of galaxies, birth of stars and protoplanetary systems, and studying planetary systems for the origin of life. There are ESA and Canadian partners. An Ariane 5 rocket governs the dimensions of the components. Paul reviewed the instruments. STSCI will perform the ground control segment. He showed a video of spacecraft deployment from 2008. The systems need durability to protons and plasma. Radiation hardness is critical. The telescope passively cools below 50 Kelvin, and active cryo brings the temperature to 6 Kelvin. It will be placed at the L2 Lagrange point, 1.5 million km from Earth, opposite the Sun. It can aim 5 degrees toward the Sun, out to 45 degrees away. Over a whole year it can access the whole sky. Much of the structure is beryllium. It is selected for its mass to stiffness coefficient. Below 100K, the structure does not move. 2MASS will provide guide stars to 18th magnitude. The optics are a 3 mirror anastigmat design. Steps in alignment are a first image, 2nd mirror focus sweep, segment ID, global alignment, coarse phasing and fine phasing. Each mirror starts as a 500 lb sintered block, and the final mirror is 40-50 lb. The mirrors cross the country a few times for initial fabrication, test, a cryo test to document deviation. Then, figuring is done at room temperature that will alter the surface to give the proper shape in the space environment. They then get a gold coating. Ball has a 1/6 scale fully functional model to validate mirror alignment. The cost is \$4.5 billion, which is less than HST. Launch is slated for June 2014. It will produce 63 Gb of data daily, and this puts a constraint on its distance from Earth. See Astronomy Magazine 2010 for more details.

Dr. Paul Lightsey is currently the mission systems engineer for the optical system on the James Webb Space Telescope. He developed a system optical performance model of COSTAR, the corrective optics for the HST. He received NASA's Distinguished Public Service Medal in 2007.

Okie-Tex Oct 2010 Report, from Rob Grover

Wanted to send out a midweek report but had troubles getting on the Okie-Tex internet. Always managed to connect, but at extremely slow speeds. Made old dial-up connections look like a T1.

Anyway, I headed down to Kenton last Monday. Took a more direct route than 287. In Limon, I headed straight south to Rocky Ford, then to La Junta and south to Kim. East on US160 to Baca County Road 8 and south into Oklahoma. That road came out on the hwy between Boise City & Kenton about 200 yards from the entrance to the star party. Gravel roads were in great condition other than a couple rough bumps and a few hard cattle guard crossings.

Fields were already quite full when I arrived about 5PM. Got registered and looked for a place to set up. Ended up on the west field, at the south end - on the basketball court. Was next to Randy and his vendor canopy setup - until he left on Wednesday morning. Nice & level for the camper but the asphalt took a little while to cool at night. I was typically getting good, steady views of Jupiter by 10:30 MDT. Much of the lower southern sky was behind a low mesa from that location, but Sagittarius was just visible above it as twilight ebbed. Made it until 2:30 or so Monday night and then until around 3:30 or 4 on the others - except Saturday when I got plenty of sleep for the drive home. Darn clouds.

Skies all week were not as transparent as I'd hoped, but every night except Saturday had many hours of decent observing. I imaged on Wednesday night but had some guide Camera issues. Managed to get about an hour's worth of 3 minute exposures on M31 with the Canon 450D & the old 300mm lens before the guider acted up. First processing attempt is attached. (not sure what the artifact is near M110) After that, all the stars were ovals - no matter where I pointed the camera.

Also imaged on Friday, but went simpler - just the camera on the CG-5 - unguided with the 18-55mm lens. Got tons of 30 second exposures of the Double Cluster (with comet Hartley (which I began calling "Bob"), many more of the Cygnus area and even more of Orion. About 40 minutes of exposure time on each area. Didn't hook up to the laptop so I was limited to 30 second exposures and knew that would not have any star trailing issues with the short focal length. Would have liked to go longer - 1 or 2 minute shots. But the data I collected in those 30 second shots looks pretty good so far.

My original observing plan was to go hunting for a few ARPs. I had a list of a dozen I wanted to find - all in the mag 13 - 14.5 range. With 13.1 inches, I am a little aperture limited for hunting the fainter stuff, but I wanted a bit of a challenge. Swung up to Stephan's Quintet every night to check the transparency and could always see three of the members but the dimmer one was averted vision and the pair wouldn't split because of the poor contrast. They were pretty easy for me earlier this year on Independence Mountain. I never saw any detail at all in them. So, I just went through the Okie-Tex intermediate list and the list of suggested targets Randy supplies with the Telekits. Used the Sky Commander for some of the Okie-Tex list so I didn't qualify for their certificate.

Found a few really nice open clusters. I've never really appreciated their beauty until last week. I still find many of them quite subtle and only slightly tighter than the field stars around them. However, I found a few real gems. The "White Rose Cluster" near Cassiopeia is a real beauty. Took me a while to see the rose, but when I did, it just popped out. Nearly 3D appearing with the dark lanes in it making the shadow

areas of the rose petals. Don't have my notes unpacked & at hand for the NGC number, but it is well worth a look.

Was nice seeing friends I had met there last year, making new friends this year and enjoyed the large star party atmosphere. Traveled there & back with fellow NCAS Member David Auter and Jolene Pilcher made the long round trip for Friday & Saturday nights. Too bad the skies didn't cooperate for her - especially on Saturday.

Don't know if I'll go again next year. After two years of lesser skies than we typically have available here, it seems like a long ways to go. The social aspects and speakers are great, but I want dark & transparent skies. After two journeys down there, getting very few hours of observable skies last year and soft transparency this year, I'm losing a bit of enthusiasm for Okie-Tex. Still, it is a lot of fun with many great people and a generally well run event. I echo Bill's comments of too many small give-away items. They need to run the second give-away on Saturday afternoon instead of the evening.

Will post more images when I get them processed over the next day or two. Also tentatively planning on a Keota trip for some imaging this weekend if anyone is interested.

Robert Grover

Taylor Park Site Report, from Tim Antonsen

Trip Report: Date: Sept. 17-20, 2010

Location: Taylor Park, CO (see attachments)

Distance: Round trip from Ft. Collins: 432 miles

I had hoped to make this trip the week prior to these dates to catch the new moon, but work interfered (dang!).

JOURNEY: In my '83 Land Cruiser towing the popup camper, I don't make great time. It took me six hours from Fort Collins (via U.S. 285) to the Dinner Station Campground; that included lunch, fuel, and taking on 23 gallons of water in Buena Vista. (Google maps estimate 5 hrs.)

Traffic on 285 was light, and I made decent time to BV. The colors on Kenosha Pass were breathtaking; in fact, the aspens were peaking along the whole way. I had lunch at the "Garden Song" cafe in BV; good prices, good food (motto: "nothing fried, nothing gained!"). The ascent of Cottonwood Pass was very slow; 2nd and 3rd gear most of the way (4-speed transmission). I pulled over a lot for faster traffic, namely, everyone else on the road! Crested the pass and cruised down

the graveled west side with no problems (engine braking much of the way). Cottonwood Pass is a *haul*! I camped the first two nights at Dinner Station Campground. After that, I moved up to "Potholes Reservoir wild campsite B" (see attached KMZ files for Google Earth).

GENERAL: Taylor Park is an astronomical *nirvana*. I stayed up until well after moonset on the 17th, and could detect only the most *tenuous* light dome in the ESE, probably from Buena Vista. It was hardly visible at all. I'm not sure it was really there, but if so, it's *much* fainter than the Front Range Nebula from Independence Mountain. There are scads of wild campsites in the valley, many of which offer flat, grassy, and very sky-exposed spots for setup; some are in sight of the county road through the valley, but most are set well away from it. At 9500+ feet of elevation, it does cool off at night. This is a *major* dark sky site.

Taylor Park gets a lot of ATV/OHV traffic in the summer. However, they motor up into the surrounding mountains in the daytime and party at night. The county road kicks up dust, but most campsites--including the Dinner Station and Dorchester Forest Service campgrounds--are at least 200 yards away from that nuisance, often 1/4 to 1/2 mile. Furthermore, most wild campsites are set along dead-end spurs or short loops that don't attract the ATV/OHV dust-factories.

There is a small store at Taylor Park Reservoir, a couple of miles south of the Cottonwood Pass junction. Prices are *very* high (\$6.31 for a small box of Wheat Thins), but they do have the bare essentials if you need something like ice or failed to fuel up in BV.

DINNER STATION CAMPGROUND: This would be a great spot for a small astronomy gathering. All the sites numbered 13 through 22 would offer astronomers excellent views, especially sites 17 thru 22. They all include large clear areas for setup and *amazing* views to the north, east, south, and southwest. The west and northwestern view is cut off at about 15° by a timbered ridge (more like 25° from sites 13, 14, 15, & 16 due to nearby trees). My first two nights were in site 13; for general camping this is the pick site: burbling river, good privacy, good views. It's not #1 for astronomy, but as Kris would arrive for the remainder of the trip, I thought I'd take it despite somewhat better astronomical sites available. That night four visitors were impressed by the Moon, Jupiter, M13, M31, and M27. I watched the shadow transit of Ganymede in concert with the GRS; what a fantastic sight! This was my only astronomical night; after Kris arrived the moon and daytime activities precluded astronomy.

Notes on Dinner Station Campground, site 13:

Great campsite! Burbling river at the back, good privacy, decent sky access (some trees & ridge to west). Large enough for any rig. Faces southeast, so no daytime shade. Vehicles descending Cottonwood pass visible (very distant!) NOTE: Pump-handle well

may be unavailable due to contamination or other issues; bring plenty of water and/or be ready to purify river water.

POTHOLES RESERVOIR WILD CAMPSITE A: This site, along with nearby site "B", is even better than the Dinner Station campground. The two are situated well out in the valley, so the horizon is wholly unobstructed. I preferred A over B due to the somewhat better privacy (largely invisible from the county road). Site A is the smaller of the two, but would easily accommodate four campers. Site B could probably accommodate six campers. Both are far enough from the county road that dust is not an issue, and they are only 400 yards apart. These are large, flat sites with easy access; even the low-slung Volvo had no trouble. That said, I would caution large RVs or long travel-trailers about abrupt slopes on the three (count 'em, 3!) access roads.

Notes on campsite A:

SITE: Located on a rise overlooking upper Taylor river. National Forest Service land; wild (dispersed) camping allowed. Room for 3 or 4 parties at this site. Stream water ~300' away; **purification required for consumption.** Toilets are 1/4 mile away @ reservoir. In close proximity to "Potholes Reservoir 2, wild campsite B". Gunnison: 44 miles down Taylor Canyon. Buena Vista: 42 miles over Cottonwood Pass.

ACCESS: Three turnoffs from county road to the site; middle one is opposite the restrooms at Potholes Reservoir #2. Access is easy for all vehicles via all turnoffs, excepting large RVs and long trailers. I easily pulled my pop-up camper in, and took a Volvo 850 wagon in and out of all three turnoffs, but would advise caution for long vehicles due to moderately abrupt terrain (scout all three routes to determine feasibility for your rig, as all three have their pros and cons). Roads should be OK after rain, esp. the southern turnoff, due to gravelly soils, but may have minor ruts.

OBSERVING: Extremely dark sky, unobstructed horizon. Excellent protection from passing headlights on county road. Dew possible from nearby stream and/or small reservoir. Due to elevation, expect rapid temperature drop after sunset and very cold overnight temperatures.

NOTES: Considerable ATV/OHV activity in area, but almost entirely confined to county road and

adjoining mountains; all campsites in area, including nearby "Potholes Reservoir 2, wild campsite B" often host ATV/OHV enthusiasts. (All Colorado mountain locations seem to share this burden.)

Free-range cattle in area. *Black bear habitat*; keep a clean camp. Pygmy sagebrush surrounding large grassy camping area. Willows & other brush on bottomland. Elk bugling heard in autumn.

I checked out a few other wild campsites, but there are so many I couldn't begin to check them all. Those I checked out would handle three or six compadres at once. The Dorchester campground is further up the valley. There is a ridge to the south that would interfere with observation low in that direction, and in general the valley is narrower. Dorchester is a pack-in/pack-out campground, and to my knowledge no water is available. It is a pretty place, but not ideal for astronomy.

In any event, Taylor Park is one of the finest places I know of in all of Colorado for both astronomy *and* daytime pleasures. The sky is black, the air is clear, the altitude is high but comfortable, the daytime views are heart-stopping, and you can explore, hike, fish or whatever to your heart's content while our local star owns the sky. As the sign says entering the region: "Oh, now THIS is *Colorado!*"

I think it would be great if a few of us reserved the good astro-sites at Dinner Station Campground for a dark period next summer, sometime say between 8/25-9/1. And if you time it right (Sunday to Wednesday), you could probably nab one of the great wild sites, many of which can easily accommodate three or more at once. Anyone? Anyone? %^)

Cheers!

--Tim

Recheck passes after STS-133 launch

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>
02 Nov	-0.8	19:22:49	10	NNW	19:23:50	11	N	19:24:26	11	N
04 Nov	-0.8	18:40:31	10	NNW	18:41:25	11	N	18:42:18	10	N
06 Nov	-0.7	19:33:51	10	NNW	19:34:03	11	N	19:34:03	11	N
08 Nov	-1.2	17:50:57	10	NNW	17:52:24	13	NNE	17:52:57	12	NNE
09 Nov	-1.7	18:16:36	10	NNW	18:18:14	19	N	18:18:14	19	N
10 Nov	-1.4	18:42:23	10	NW	18:43:34	21	NW	18:43:34	21	NW
11 Nov	-2.2	17:33:28	10	NNW	17:35:54	23	NNE	17:37:24	16	ENE
11 Nov	-0.3	19:08:31	10	WNW	19:08:59	13	WNW	19:08:59	13	WNW

ISS predictions from:

<http://www.heavens-above.com/main.aspx?lat=40.4997&lng=-105.05736&loc=Fort+Collins+CO+USA&alt=0&tz=MST>