

The Objective View

Newsletter of the Northern Colorado Astronomical Society

April 2011

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Next Meeting: April 7 7:30 pm

All-Sky Camera Design and Construction

By Vern Raben

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

May 5 NCAS Members Show and Tell

June 2 Max Moe Research Update

NCAS Public Starwatch at Fossil Creek Reservoir

Apr 23 Sat 8:30 pm

May 6 Fri 8:30 pm

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

City of Fort Collins Natural Area Program at Sunset

Bobcat Ridge: TBA

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

Dark Site Observing Dates

April 1, 2, 29: Keota, or RMNP, ask FRAC newsgroup.

Other Events

Chamberlin Observatory Open House, 7 to 10 pm

Apr 9 May 14, June 11, July 9, Aug 6, Oct 1, Nov 5, Dec 3
303 871 5172 <http://www.du.edu/~rstencil/Chamberlin/>

Cheyenne Astronomical Society 7 pm Apr 15 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 April 28 Open

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

Little Thompson Observatory, Berthoud 7 pm doors open;

7:30 program March 18. Jim Tolstrup, High Plains

Environmental Center: Lakota Native American and other

Ancient Astronomy Traditions. <http://www.starkids.org>

Longmont Astronomical Society 7 pm Apr 21 Mike Hotka,

Evolution of my Telescope. IHOP 2040 Ken Pratt Blvd

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

Feb 3 Program: Adventures in Operating a Space

Mission: Kepler and MAVEN

By Bill Possel

The Laboratory for Atmospheric and Space Physics at the University of Colorado at Boulder is unique for its synergy of science and engineering. It harnesses the energy of students, led by capable staff. There is a cycle of scientific questions, engineering, testing and calibration, mission and science operations, which elicits new questions. Students are involved at every level. They are operating 4 satellites: QuickSCAT, SORCE, AIM (noctilucent cloud mission), and Kepler. ICESAT was deorbited when its laser altimeter quit. Their instrument count was slated to reach 15, but the Glory launch failed. Additional spacecraft on their plate are the Solar Dynamics Observatory/EVE, Cassini UVIS, MESSENGER MASCs (to study Mercury's atmosphere and surface), and New Horizons SDC measuring dust en route to Pluto. There were some tense hours when they directed Cassini to sample the plumes of Enceladus by skimming 30 km from its surface. Mission has been extended to 2017. It is possible for Bill to receive telemetry with his iPhone, he just can't send commands up. Students are the ones sending commands, with a professional beside them. The Mars Science Laboratory will bring a capable chemistry lab to the surface. It is the size of a VW Beetle, but its schedule has slipped. The MAVEN

mission is progressing well. Its design is based on MRO which reduces cost. Mass is 2500 kg. It has magnetometers, ion detectors and a UV sensor to sense starlight through the atmosphere. An eccentric orbit with nominal periapsis will be 150 km to measure Mars upper atmosphere. There are deeper passes planned to sample as low as 125 km. Mars clearly had more surface water, and MAVEN will aim to address where it went. Over 1 Earth year it will sample all latitudes and longitudes. It makes 5 orbits per Earth day. It precesses in latitude and local solar time. We suspect Mars' loss of magnetic field resulted in stripping of the atmosphere. Planetary protection requires a controlled deorbit. Lockheed-Martin in Waterton Canyon will operate the spacecraft while LASP will do science operations. With 3 instruments and a 2 axis gimbal, there will be priorities discussions. Communication via DSN will be for 8 hours twice a week.. The interim web site is at:

<http://lasp.colorado.edu/maven>

Bill then discussed the spectacular success of the Kepler Mission. It is determining the frequency of Earth-size and larger planets in the habitable zone of sun-like stars. It measures the size and orbital period distributions of planets. It just passed its 2 year anniversary. There were 3 planets known in its field of view. The current number is over 1200 candidates. So far most are Neptune-sized. There are 68 Earth size, 288 super-Earth size, 662 Neptune size, 165 Jupiter size, and 19 super-Jupiter size. Pre-Kepler, all but five were about 10-20 Earth masses. On data as of Feb 2011, Kepler candidates are in a bimodal distribution, most about 3 Earth masses. The five smallest are 0.9 to 2x Earth size. Orbital periods under 100 days are common at this point in the survey. 54 planetary candidates are in the habitable zone of their host stars. Kepler-10b is its first rocky planet. The spacecraft has semiweekly contact to uplink command sequences, downlink files, engineering data and reference pixels. Monthly is maneuver to Earthpoint, downlink science data including retransmission, high res engineering data, and return to science collection. Quarterly is a quarterly roll maneuver, delta quaternion maneuver, and full field images of CCDs. Science data gets transmitted twice before getting overwritten. We are making excellent progress toward determining the frequency of Earth-size planets orbiting sun-like stars. With 1200 candidates yielding 54 candidates in the habitable zone. Kepler views 1/400 of the Milky Way. 1 in 2 stars have planets. 1 in 200 stars have planets in the habitable zone. 50 billion planets means 500 million in the habitable zone. A striking estimate.

March 3 2011 NCAS Business

President Robert Grover called the meeting to order. Treasurer Dave Auter gave his report, total funds at \$1301 with some additional to come. Tim Antonsen reported that his grant is in, but would not be one of their projects in the First Quarter of 2011. The outreach event schedule was announced by Greg Halac. Tavelli, Bethke, and Poudre High School events are in March. Starwatch at Fossil Creek Reservoir is March 25. IDSA renewal was discussed for promotion of dark skies, and \$100 donation was approved.

Astrophoto Analysis Tool, from Greg Halac

I stumbled across a tool/service (<http://astrometry.net>) that identifies the region of the sky shown in astro images.

The example that I first saw was:

<http://www.flickr.com/photos/33442240@N06/5541792636/>

If you look at the image, the tool feeds back coordinates of the image center, pixel scale, etc. ... and identifies other objects in the image for you.

From Robert Arn: Discover no more . . .

Greetings,

The recent pass of the Space Shuttle Discovery and the International Space Station has brought some great images on these lists. Even though I am a few days late in posting, I thought I would add mine to the mix. Sadly the delay was caused by my own stupidity. I was able to grab a few extra cameras for an upcoming trip, so I shot this with 3 cameras. Needless to say, getting the geometry of the shot correct during processing has been painful; the result is an image that took 18 hours to process.

<http://barn.zenfolio.com/p1068266116/hb478f55#hb478f55>

The original file was a 400MP image. While processing, I had to reduce the image to 1/4 of its real size, just to be able to save it (apparently PS has a 4GB saving cap). It was then further reduced to its current size (roughly 70MP).

Due to the huge field of view (roughly 180 x 90 degrees), it was necessary to introduce a lot of geometric projections. After creating the landscape automatically, I manually calculated and did the non-linear transformations necessary for the sky. While this method was a bit imprecise, it seemed to mostly work. If anyone is familiar with a program that will allow for precise non-linear warping of images, I would be grateful for the info.

(Ed. : APOD! March 14 2011)

<http://apod.nasa.gov/apod/ap110314.html>

Astrolandscape images from this world (or beyond?)

Ahhh, spring break. The time when college students put down their books and travel to someplace with a sandy vista, lots to drink, and plenty of hot bodies to look at. And this was exactly what I did. Yes, I mean I traveled to Canyonland and Arches National Parks. There, during the daytime, I fought with sand and dust storms. After searching for a day and a half, I stocked up on water after finding portable water - only a hours drive away! But at night, I got a treat; the skies opened up and thousands of hot, burning, celestial bodies came into view.

It has taken me a while, but I have the first batch of astro-images from that trip processed. You can click on the image for a larger view.

Image details and a caption are below each image.

Alien World:

<http://barn.zenfolio.com/p1068266116/h15b98baa#h15b98baa>

Simplicity:

<http://barn.zenfolio.com/p1068266116/h15b98baa#h1813ea9a>

Double Arch:

<http://barn.zenfolio.com/p1068266116/h15b98baa#h3dd79de>

Thanks for looking (and a few more to come later).

Cheers,
Robert Arn

From Andrea Schweitzer: Creating a Hubble Galaxy in 2 Minutes

A quick overview of the image processing behind the stunning Hubble images -- Andrea

Creating a Hubble Galaxy in Two Minutes

<http://www.youtube.com/watch?v=p5c1XoL1KFs>

Uploaded by HubbleSiteChannel on Feb 17, 2011

Hubble images are made, not born. Images must be woven together from the incoming data from the cameras, cleaned up and given colors that bring out features that eyes would otherwise miss. In this video from HubbleSite.org, online home of the Hubble Space Telescope, a Hubble-imaged galaxy comes together on the screen at super-fast speed.

Learn more about how Hubble images are made by visiting Behind the Pictures.

http://hubblesite.org/gallery/behind_the_pictures/

30 Nights of Starpeace

Call to Action for 30 Nights of StarPeace

Astronomy groups should organize now to be part of a chain of events traveling around the world in 30 nights, beginning April 1...

THIRTY NIGHTS OF STARPEACE, a global project inspired by the idea of sharing the starry-night experience among neighboring astronomy groups across national borders, will take place April 1-3 for the segment of west longitude from 180 degrees (the International Dateline) eastward to 144 degrees. This includes Alaska (U.S.), Hawaii

(U.S.) and French Polynesia. The StarPeace experience will move eastward, one segment of the globe at a time, on successive nights in 3-day increments during the month of April.

Using geographical longitude as a reference, we've divided the earth into ten equal segments, each one spanning 36 degrees of longitude. Countries located in each of these 10 segments will have a period of three days to participate in the 30 Nights of StarPeace project. Thus, countries located between 180 and 144 degrees west longitude will pick a night from April 1-3 for their public night of observation; those between 144 and 108 degrees west (West Canada, West U.S., and West Mexico) will have the April 4-6 time-slot; and so forth. In this way, through the month, the starry-night experience will progress around the globe eastward in ten stages.

For the rest of the dates assigned to each country, see:

<http://www.astronomerswithoutborders.org/programs/program-schedule/588.html>

Most essential to achieving the StarPeace goals is for your club to team up for a simultaneous activity with a group in another country within your longitudinal segment. Live communication between the two groups, talking online on Skype or via cell phone, is recommended.

To contact the StarPeace team, write to:

info@astronomerswithoutborders.org.

www.astronomerswithoutborders.org

Memories of Mir from SeeSat-L

My personal memories of Mir:

<http://www.zarya.info/Diaries/StationsMir/Farewell.php>

Bob Christy

On 22/03/2011 14:53, gambaro@videotron.ca wrote:

> Allow me to share a short story about my MIR observations.

>

> Back then, when an interesting pass was predicted on HA, I would call my father 10 minutes before, tell him what time to go out and where to look. He would watch then call me back, take a deep voice and say «Pass confirmed» with his unique north european accent, and we would laugh.

> On a particular evening, a bright and high pass was predicted, so I called him. He told me he was watching my 8 year old niece so he would go out with her to watch the pass. Just after the pass, he called and said «Pass confirmed» as usual but in the background, I could hear my niece shouting «GRANDMA - GRANDMA - I SAW MIR - I SAW MIR !»

My father is 87 now and still enjoys a nice pass. My niece is twenty and doesn't care that much anymore.

Pat Gambaro
45.8379°N, 73.9162°W

with the astro/cosmonauts on board via Amateur Radio. I saw them pass into Earth's shadow, and mentioned that "I bet you just had a lovely sunset." He was amazed that I knew that, and was amazed that I was watching them fly directly overhead.

--
David Tiller
Lead Consultant/Architect | CapTech

Lyrid Meteors April 16-25, peak Apr 22

Best Looks

Moon	By Pleiades Apr 7; by Saturn Apr 17; By Venus Apr 1 and 30
Mercury	Hidden in glare
Venus	Bright in dawn SE
Mars	Hidden in glare.
Jupiter	Hidden in glare
Saturn	In S middle of night
Uranus	Hidden in glare
Neptune	Predawn in Aquarius

> ----- Message d'origine -----
> De: Kevin Fetter<kfetter@yahoo.com>
> Date: Mardi, 22 Mars 2011, 6:51 am
> Objet: alomost 10 years since Mir space station went bye
bye
> À: seesat-l@satobs.org
>
>> It's almost been 10 years, since Mir was deorbited.
>>
>> Video of its re-entry.
>>
>> <http://www.youtube.com/watch?v=fVQd9Ejkiw>
>>
>> I only got to observe a few passes of it, none on video
since I didn't have any video stuff back then.
>>
>> Kevin

I'll add my two cents - my fondest memory of MIR was standing in the parking lot of my then employer, Concurrent Computer, in Oceanport, NJ in the late 80's/early 90's. MIR was passing overhead, and I was lucky enough to be chatting

International Space Station Passes for Loveland – Fort Collins April 2010

Date	Mag	Starts			Max. <u>Altitude</u>			Ends		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
9 Apr	-0.6	05:19:23	10	NNW	05:20:57	13	NNE	05:22:29	10	NE
10 Apr	-0.2	04:10:37	10	N	04:10:50	10	N	04:11:03	10	N
10 Apr	-1.3	05:44:29	10	NNW	05:46:55	24	NNE	05:49:21	10	E
11 Apr	-0.5	04:35:13	10	NNW	04:36:52	14	NNE	04:38:31	10	NE
11 Apr	-3.1	06:09:43	10	NW	06:12:36	64	NE	06:15:29	10	ESE
12 Apr	-1.4	05:00:10	10	NNW	05:02:40	25	NNE	05:05:09	10	E
13 Apr	-0.4	03:52:49	14	NNE	03:52:49	14	NNE	03:54:11	10	NE
13 Apr	-3.4	05:25:16	10	NW	05:28:11	70	NE	05:31:04	10	ESE
14 Apr	-1.5	04:17:44	25	NNE	04:18:07	26	NNE	04:20:38	10	E
14 Apr	-2.8	05:50:45	10	WNW	05:53:22	30	SW	05:55:58	10	SSE

15 Apr	-3.6	04:42:58	57	NNW	04:43:27	77	NE	04:46:20	10	ESE
16 Apr	-2.7	05:08:39	28	SW	05:08:39	28	SW	05:11:00	10	SSE
16 Apr	-0.9	21:32:02	10	SW	21:32:17	12	SW	21:32:17	12	SW
17 Apr	-2.2	20:22:39	10	S	20:24:52	20	SE	20:26:50	11	E
17 Apr	-1.1	21:57:13	10	W	21:58:27	21	W	21:58:27	21	W
18 Apr	-3.8	20:46:43	10	SW	20:49:36	73	SE	20:52:24	11	ENE
18 Apr	-0.3	22:23:03	10	WNW	22:23:59	14	NW	22:23:59	14	NW
19 Apr	-1.9	21:11:48	10	W	21:14:29	34	NNW	21:17:12	10	NE
20 Apr	-3.7	20:01:07	10	SW	20:03:59	78	SE	20:06:54	10	NE
20 Apr	-0.7	21:37:31	10	WNW	21:39:31	17	NNW	21:41:32	10	NNE
21 Apr	-1.8	20:26:05	10	W	20:28:44	33	NNW	20:31:25	10	NE
21 Apr	-0.2	22:03:42	10	NNW	22:04:39	11	N	22:05:35	10	N
22 Apr	-0.7	20:51:39	10	WNW	20:53:37	16	NNW	20:55:36	10	NNE
23 Apr	-0.2	21:17:43	10	NNW	21:18:36	11	N	21:19:28	10	N
24 Apr	-0.7	20:05:29	10	WNW	20:07:25	16	NNW	20:09:20	10	NNE
25 Apr	-0.3	20:31:25	10	NNW	20:32:14	11	N	20:33:02	10	N
25 Apr	-0.5	22:07:28	10	N	22:08:28	11	N	22:08:45	11	NNE
26 Apr	-0.5	22:31:08	10	NNW	22:31:59	14	N	22:31:59	14	N
27 Apr	-0.6	21:20:47	10	N	21:21:48	11	N	21:22:49	10	NNE
27 Apr	0.0	22:54:55	10	NW	22:55:08	11	NW	22:55:08	11	NW

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>