

The Objective View

Newsletter of the Northern Colorado Astronomical Society

August 2007

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

Cheyenne Astronomical Society Aug 9 - 11
17th Annual Weekend Under the Stars, Foxpark
<http://home.bresnan.net/%7Ecurranm/wuts.html>

Chamberlin Observatory Open House, dusk to 10 pm
Aug 18, Sep 22, Oct 20, Nov 17, Dec 15 303 871 5172
<http://www.du.edu/~rstencel/Chamberlin/>

Longmont Astronomical Society Aug 16 7 pm
FRCC, 2121 Miller Rd <http://longmontastro.org/>

Next Meeting: Aug 2 7:30 PM

What's New with GNAT: Global Network of Astronomical Telescopes

Dr. Roger Culver, CSU

**Discovery Science Center
703 E Prospect Ave, Fort Collins**

Club business at 7:15 pm

Meeting directions:

In Fort Collins, from the intersection of College Ave and Prospect Rd, head East about 1/2 mile. See the Discovery Center sign to the South. From I-25, take Exit 268, West to Lemay Ave, continue West 1/2 mile, see Discovery Science Center on the left.

NCAS Programs

Sept 6 NCAS Potluck at Little Thompson Observatory
850 Spartan Ave, Berthoud

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

Oct 4 Greg Halac Skygazing in Australia

Rocky Mountain National Park Starwatch

Remaining dates for 2007 are Aug 3 & 17 at dusk. Site is the end of the Upper Beaver Meadows Road.

Discovery Science Center Starwatch, 703 E Prospect

Sept 21 7 pm

Oct 19 7 pm

Bobcat Ridge Starwatch August 15 8:30 pm

Bobcat Ridge is just south of Masonville. Directions to the site can be found at <http://fcgov.com/naturalareas/bobcat.php>

Other Events

Little Thompson Observatory Star Night: TBA

Aug 17 7:30 pm <http://www.starkids.org>

July 5 Program

New Developments in Solar Physics

Dr Craig DeForest, Southwest Research Institute

Some people are surprised to hear that our Sun is a star. It is a typical yellow dwarf. It was born in the second generation of stars with material from a supernova remnant. We know this because the Earth has elements heavier than iron, which require a supernova explosion for synthesis. It is in midlife. It deserves close study because it is the only star we can see clearly. It is the source of nearly all our energy, directly or indirectly. The Sun creates space weather in our vicinity. It can impact power transmission and communications. Any long piece of wire is a potential target for solar activity. Plus, the Sun is the only star proven to grow vegetables. The Sun surrounds us with its heliosphere. This bubble protects us from the interstellar medium. Most galactic cosmic rays are blocked. Many solar mysteries remain. What causes solar flares?. What accelerates the solar wind to 500,000 mph? Why do the chromosphere and corona exist? How is the Sun's luminosity changing. The heat comes from fusion of hydrogen atoms to helium in the core. The source is confirmed by neutrino detection. Fusion is the only mechanism that could power the Sun for geologic time. A sun-size lump of coal would only burn for 6000 years. The apparent age of the Earth puzzled astronomers until the early 1900s. Heat crosses the radiative zone by emission. The temp gradient does not support convection. The outer 1/3 radius is the convective zone and circulates like boiling oatmeal. Plasma granules drift to the surface then sink in 5 minutes. The poles rotate once per 35 days, the equator once in 27 days. Sliding motion at the tachocline gives a global dynamo. Magnetic fields escape through the surface and shape sunspots and prominences. A continuum (white-light) image of the photosphere shows granulation. Each granule is the size of Texas. Sunspots were observed by Galileo by projection and he determined the rotation rate. We now recognize that his data support differential rotation. The Sun is electrically conductive. Magnetic field lines move with the plasma as if stuck to it. With rotation, the field lines wrap many times around the Sun. Magnetic field ropes are lower density and

float to the surface. A high-resolution time lapse video shows the action of granulation by a sunspot:
<http://antwarp.gsfc.nasa.gov/apod/ap070522.html>

The depth of the view changes with the wavelength selected. A deeper layer is seen with red. There is an 11 year activity cycle. There is a chaotic component so it varies in period and intensity. The 11 year period appears to match the time to complete a passage in the Sun's meridional flow, in the convective zone. The Butterfly diagram is a plot of sunspot latitude vs time. In 2007 we begin a new sunspot cycle. What is the magnetic field like? At solar maximum there are complex strands of solar flux. The magnetic field polarizes light. Spectral lines are used to map the field. The image codes the field ropes as white if they are approaching, black if going away. The strength is -250 to +250 gauss, this is 500x the Earth's field. Differential motion in the Sun generates the fields. The solar spectrum is laced with absorption lines. Each can be assessed for Doppler shift and polarization. The Sun in Doppler mode shows supergranules the size of the Earth, each lasting about 1 day. The surface oscillates by 75 km continuously at 0.5 km/s. It resonates at a million nodes. The radiative zone acts solid. The convective zone is divided into bands of differential rotation. The bands are where the sunspots come up. Oscillation occurs at the tachocline. The corona is a source of mystery. The photosphere is at 6000 K, hot as an arc lamp. The corona is at a million to 10 million K. It is shaped by magnetic fields. The effect is seen in a movie from 2000/1/21. Active regions in the corona are atmospheric manifestations of the Sun's magnetic field. The corona is escaping. The field lines extend to the heliopause. Images from the Skylab mission on film are still available and used. Magnetic instability at the surface leads to field collapse and plasma is spit out like a watermelon seed. The Bastille Day flare on 2000/Jul/14 hit 20 million K. Loops the size of Jupiter collapsed. Space travelers would have received a lethal dose of protons. It spread across the solar system at 4 million mph. Storms strip bits from planet atmospheres, this is why Mars has so little after billions of years. Earth is protected by its magnetic field. The Earth's field is buffeted by solar wind. It can be compressed. This can expose spacecraft to the wind, and bombardment converts insulation to a source of static discharge. Suddenly bundles of wires act uninsulated with fatal consequences. The solar telescope at Sunspot NM is among the top 3 solar telescopes. The site is at the top of a 2000 foot cliff east of Alamogordo. Seeing is excellent. Amateurs can submit proposals and free telescope time is available. A 4 meter Advanced Solar Telescope will be sited on Maui. It will have 0.02 arcsecond resolution. Craig concluded with 3 D images from the STEREO spacecraft. Coronal features will be imaged with unprecedented clarity as the paired spacecraft slowly diverge.

NCAS Business, July 5 2007

President Nate Perkins called the meeting to order. The meeting schedule and observing nights were announced. Treasurer Bob Michael reported on the club account. Tom Fay has a 10" Meade Starfinder for sale, with equatorial and

Dob mounts. Weather has favored the RMNP nights so far and turnouts were 50 to 80 visitors.

From Andrea Schweitzer

Mars Rovers on Power Restriction

<http://www.planetary.org/blog/article/00001042/>

Mars Exploration Rovers update: Spirit and Opportunity are both still talking to Earth
Jul. 23, 2007 | 15:04 PDT | 22:04 UTC
RSS 2.0 News Feed
Weblog Archive

By Emily Lakdawalla

As I mentioned in my 2007 Mars dust storm update on Friday, both Spirit and Opportunity have been commanded into modes where they consume as little power as possible -- no driving, no arm movements, no science, and, most recently, some communications sessions have been canceled -- so that they can ration the remaining supply of power hoarded in their batteries until the skies begin to clear. I can now report that both rovers were heard from this morning after a couple-day silence. They are both still suffering under incredibly dark skies, but, amazingly, they are both "power-positive," meaning that they are managing to produce enough power from the limited amount of sunlight to keep the batteries fully charged.

NASA FY 2008 Budget

To see where your tax dollars are going and how NASA and the various federal agencies stack up relative to each other:
<http://www.thebudgetgraph.com/>
NASA \$17.3 billion (+7%)

The NASA portion is on the poster at about 5:00 (to the lower right) of the main circle of the discretionary budget. You can also use the "Find A Department" tool on the right side, and select "NASA".

In terms of actual dollars appropriated for NASA:
This week's Space News has a nice break-down of deltas between the FY08 budget request and what was actually appropriated.
<http://www.space.com/spacenews/>
(need to register to read)

The delta for NASA Science is +139.01

In Astrophysics, the total delta is -0.87 breaking-down as:

Navigator -29.6
JWST 0 (i.e., no change)
International Collaboration -6.5
Beyond Einstein +5

On the Planetary side of the house, the net change is -29.45 with 29.54 coming out of Mars Exploration.

Astronomy 101 Instructor Needed

From Dr. John Minors, FRCC Longmont

We are in need of an astronomy teacher to teach a 101 class this fall. The class meets Mon, Tue, Wed and Thur from 1 pm to 2:30 pm and will meet at Erie H.S.

The requirements for an instructor are that they have 18 grad. Credits in astronomy or a grad. degree.

Classes start on August 20th. Pay is about \$2450. for the semester. (303) 678-3867

john.minors@frontrange.edu

Western Nebraska Stargaze

From: [Panhandle Astronomy](#)

To: [Vern Raben](#)

Sent: Monday, July 23, 2007 8:10 AM

Subject: Western Nebraska Star Gaze

The Panhandle Astronomy Club is putting together the 2nd annual Western Nebraska Star Gaze and we would like to invite your clubs to attend. A press release is attached to the email and you can find out more about the event on our website at <http://www.panhandleastronomyclub.com/>

Virginia Mues

From Tom Fay: Galaxy Zoo

Check out : <http://www.galaxyzoo.org/>

It's a new collaborative research web site to help classify ~1 million color galaxy images from the Sloan Digital Sky Survey. After a tutorial and trial, you can create a login and start classifying galaxies as spiral, elliptical, merging, or other. They feed them to you as fast as you can analyze them.

The images vary in clarity from fuzzy blobs to beautiful pictures.

Perseid Meteor Maximum

Night of Aug 12 to 13

Total Lunar Eclipse Predawn August 28

Totality lasts from 3:52 to 5:22 MDT.

Best Looks

Moon By Mars 8/6, 7 by Antares + Jupiter 8/21
Mercury Low in ENE predawn 1st week of month
Venus Inferior conjunction 8/18
Mars In SE predawn
Jupiter Low in S evenings
Uranus In S middle of night
Neptune In S middle of night

From: Daniel Laszlo
2001 S Shields St Bldg H
Fr Collins CO 80526

TO:

Click on the date to get a star chart and other pass details.

Note Endeavour launch Aug 7

Date	Mag	Starts			Max. Altitude			Ends		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
01 Aug	0.3	03:41:51	10	NNW	03:44:11	22	NNE	03:46:31	10	E
01 Aug	-2.0	05:16:40	10	WNW	05:19:22	41	SW	05:22:06	10	SSE
01 Aug	-1.8	21:41:35	10	SSW	21:43:59	38	SSE	21:43:59	38	SSE
02 Aug	-1.6	04:04:35	12	NW	04:07:05	52	NNE	04:09:58	10	ESE
02 Aug	-1.7	22:04:12	10	WSW	22:07:02	57	NW	22:09:07	17	NE
03 Aug	-2.0	04:30:08	42	SSW	04:30:08	42	SSW	04:32:39	10	SSE
03 Aug	-1.9	20:52:06	10	SSW	20:54:51	38	SE	20:57:35	10	ENE
03 Aug	0.2	22:27:36	10	W	22:30:01	23	NNW	22:32:26	10	NNE
04 Aug	-1.7	21:14:41	10	WSW	21:17:34	59	NNW	21:20:26	10	NE
04 Aug	1.1	22:51:33	10	NW	22:53:08	14	NNW	22:54:43	10	NNE
05 Aug	0.2	21:38:02	10	W	21:40:28	24	NNW	21:42:55	10	NNE
05 Aug	1.3	23:16:01	10	NNW	23:16:23	10	N	23:16:44	10	N
06 Aug	1.0	22:01:57	10	NW	22:03:34	14	NNW	22:05:11	10	NNE
07 Aug	0.2	20:48:26	10	W	20:50:53	24	NNW	20:53:21	10	NNE
07 Aug	1.3	22:26:21	10	NNW	22:26:47	10	N	22:27:13	10	N
08 Aug	0.9	21:12:18	10	NW	21:13:57	14	NNW	21:15:36	10	NNE
09 Aug	1.1	21:36:39	10	NNW	21:37:09	10	N	21:37:39	10	N
09 Aug	1.2	23:11:53	10	NNW	23:12:12	11	N	23:12:12	11	N

<http://www.heavens-above.com/PassSummary.asp?satid=25544&lat=40.585&lng=-105.084&loc=Fort+Collins&alt=1525&tz=MST>