

# The Objective View

Newsletter of the Northern Colorado Astronomical Society

May 2010

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add ncastro.org to complete email address

**Next Meeting: May 6 7:30 pm**

**Chimney Rock: the Chaco Connection  
by Dr. Steve Little**

**Club Business at 7:15 pm**

**Estes Park Memorial Observatory  
Estes Park CO**

<http://www.aaf-epmo.org/AngelsAbove/Common/Map2EPMO.html>

**Club Brochure:**

[http://www.ncastro.org/Contrib/2009\\_Brochure.pdf](http://www.ncastro.org/Contrib/2009_Brochure.pdf)

**NCAS Programs**

June 3 Bob Webb Astrophotography, Film to Digital

July 1 Chip Kobulnicky Wyoming Infrared Observatory

Aug 12 Club picnic at Bobcat Ridge Natural Area, 6:30 pm

**NCAS Public Starwatch at Fossil Creek Reservoir**

May 21 8 pm

June 19 8:30 pm

July 17 8:30 pm

Aug 20 8 pm

[http://www.co.larimer.co.us/naturalresources/fossil\\_creek.htm](http://www.co.larimer.co.us/naturalresources/fossil_creek.htm)

**City of Fort Collins Natural Area Program at Sunset**

Bobcat Ridge: May 13, Jun 10, Jul 8, Aug 12, Sep 9

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

**Dark Site Observing Dates**

May 14, 15 Keota site, ask FRAC

**Rocky Mountain National Park at Upper Beaver Meadows**

June 4, 18. July 2, 16, 30. August 13, 27.

<http://www.ncastro.org/Sites/RockyMtnNP.htm>

**Other Events**

Chamberlin Observatory Open House, 7 to 10 pm

May 22, Jun 19, Jul 17, Aug 14 303 871 5172

<http://www.du.edu/~rstencil/Chamberlin/>

Cheyenne Astronomical Society 7 pm May 21 MJ Schutz,

Spring Constellations Cheyenne Botanic 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. May 27

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

Little Thompson Observatory, Berthoud open 7 pm May 21

<http://www.starkids.org>

Longmont Astronomical Society 7 pm May 20 at IHOP, 2040

Ken Pratt Blvd. Craig Betzina, Home Observatory Building

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

**April 1 Program: Amateur Telescope Making, by Jon Caldwell**

Jon grew up in St. Paul, Minnesota and learned mechanical engineering at the University of Minnesota. He was a Naval Weapons Officer for 3 years. He retired a few years ago as project manager at the largest trona mine, by Green River, Wyoming. As a student he created a foundry at home for telescope parts. Jon is intrigued by telescope building since it combines art and science. At times it takes brute force.

Telescopes date to the early 1600s. Hans Lippershey attempted to patent a refracting telescope in 1608. Galileo observed Jupiter and the Moon in 1609. Newton built his reflecting telescope in 1668 to avoid chromatic aberration. From the late 1800s to the 1920s, telescopes were made by large companies for colleges and professional astronomers. There were no vendors for amateur equipment. The general public was enthusiastic to learn about everything. It was 30 years after the transcontinental railroad was finished. Skyscrapers, autos and airplanes were new. Movies, radio and electric service were introduced. The people read about the

achievements of the highest, largest and fastest. Telescopes were in the news as the 40 inch was followed by the 60 and 100 inch. Each new telescope brought new discoveries. The home of the telescope building hobby was Springfield, Vermont. There were factories there producing military equipment. Here Russell W. Porter started a group of telescope builders. He was a renaissance man. He studied engineering and art at Vermont University. He went to MIT for architecture. He heard a lecture about the Arctic by Peary, and volunteered to go. He went to 2 North Pole expeditions. His ship was stranded in the ice for 3 years. He produced artist sketches, paintings and journals. Temperatures of -20 to -60 F forced him to make charcoal drawings. He taught architecture at MIT. He looked at engineering plans and made drawings of observatory telescopes before any parts were fabricated. At the time of WWI, he made prisms, and experimented with mirror silvering. Porter had articles in Popular Astronomy. Albert Ingalls was editor at Scientific American, and reprinted Porter's telescope building techniques in the Amateur Scientist column. Only one book on telescope making was available at the time, by Ellison in Ireland. Porter and Ingalls collaborated to produce Amateur Telescope Making. It ultimately comprised 3 volumes and some sophisticated instruments, such as a quartz monochromator. The basic outline of telescope making has not changed. Mirror making starts out with some brute force work. To grind a curve in a glass mirror blank, it is rubbed on a similar sized disk. A coarse abrasive is between them at first. The mirror blank starts on top, and this hollows out its center. Progressively finer grades of abrasive are used, and grinding takes about 8 or 10 hours. The mirror is then polished and Jon uses pitch and cerium oxide or zirconium oxide. The glass is induced to flow in the polishing process. This is proven by the fact that fragments of polishing agent can be detected embedded below the surface of a polished mirror. Leon Foucault determined how to test a parabolic mirror. Jon illustrated the setup and showed how to perform the test. Extreme precision is needed for good images. If an 8 inch mirror were enlarged to 1 mile in diameter, the Foucault test's precision would allow you to see a defect as thin as a playing card. The Foucault test is a null test for a sphere. Mirror makers place Couder masks with cutouts over the mirror and apply the test to a series of zones to guide the process. A parabolic section is needed. Other shapes need correction. There are null tests for paraboloids. The autocollimation test requires a flat as large as the tested mirror. The Horace Dall null test can be done with the aid of a decent quality glass convex lens. The Hubble Space Telescope mirror had a target of 1/90 wavelength accuracy. Its test was performed with a test optic which was not assembled accurately. The HST primary has simple spherical aberration ground into it, and has been straightforward to correct with compensation in its instrument packages. Jon has the investigative report if we are interested. A backup mirror for the HST is in the Smithsonian, and it is perfect. The person with the greatest influence on amateur telescope makers since Porter has been John Dobson. He was born in 1915, studied chemistry in 1943, and joined a monastery in 1944. He started the Sidewalk Astronomers in 1968. He had no resources, so

perfected telescope building with scrounged components. He assembled 12 inch home ground mirrors in cardboard tubes from 3 or 4 cable reels. The tubes were mounted on plywood mounts, and used Teflon on Formica bearings. Before the Dobsonian revolution, 12 inch telescopes were rare in part due to cost and mass of the German equatorial mounts they need. The traditional amateur telescope making community dismissed him at first, but his approach has transformed amateur astronomy, and now even telescopes of 16 to 18 inches are relatively common. John has personally ground the mirror in his 12 inch telescope. He uses it on homemade equatorial or Dobsonian mounts. He estimates it took 48 hours to grind and polish his mirror, and 2 hours of that was figuring. He previously made a 6 inch and two 8 inch mirrors. If you have a mirror-making dilemma, he would be delighted to assist!

### April 1 Club Business

President Bob Michael called the meeting to order. 400 Years of the Telescope is to show on PBS on April 9. National Astronomy Day is coming up April 25. Events were reviewed. The club treasurer account report was given by Jon Caldwell. Upcoming outreach events in 2010 were at Kruse Elementary in Fort Collins, and then Monfort Park in Greeley. Paul Price announced observing at Sky Ranch by Pingree Park Campus of CSU. Next public starwatch at Fossil Creek Reservoir is April 16.

### Great First Light Images from Solar Dynamics Observatory

Here's the Channel 7 video report -

<http://www.thedenverchannel.com/news/23226320/detail.html>

Bill Possel

--- On **Wed, 4/21/10**, Vern Raben <[vraben@rabens.com](mailto:vraben@rabens.com)> wrote:

From: Vern Raben <[vraben@rabens.com](mailto:vraben@rabens.com)>

Date: Wednesday, April 21, 2010, 4:05 PM

The solar dynamics solar observatory space telescope has released some impressive first light solar images.

See [http://science.nasa.gov/science-news/science-at-nasa/2010/21apr\\_firstlight/](http://science.nasa.gov/science-news/science-at-nasa/2010/21apr_firstlight/)

### From Andrea Schweitzer: Source of Zodiacal Light

SOURCE OF ZODIAC GLOW IDENTIFIED

The eerie glow that straddles the night time zodiac in the

eastern sky is no longer a mystery. First explained by Joshua Childrey in 1661 as sunlight scattered in our direction by dust particles in the solar system, the source of that dust was long debated. In a paper to appear in the April 20 issue of The Astrophysical Journal, David Nesvorny and Peter Jenniskens put the stake in asteroids. More than 85 percent of the dust, they conclude, originated from Jupiter Family comets, not asteroids.

“This is the first fully dynamical model of the zodiacal cloud,” says planetary scientist Nesvorny of the Southwest Research Institute in Boulder, Colo. “We find that the dust of asteroids is not stirred up enough over its lifetime to make the zodiacal dust cloud as thick as observed. Only the dust of short-period comets is scattered enough by Jupiter to do so.”

This result confirms what meteor astronomer Jenniskens of the SETI Institute in Mountain View, Calif., had long suspected. An expert on meteor showers, he had noticed that most consist of dust moving in orbits similar to those of Jupiter Family comets, but without having active dust-oozing comets associated with them.

Instead, Jenniskens discovered a dormant comet in the Quadrantid meteor shower in 2003 and has since identified a number of other such parent bodies. While most are inactive in their present orbit around the Sun, all have in common that they broke apart violently at some point in time in the past few thousand years, creating dust streams that now have migrated into Earth’s path.

Nesvorny and Jenniskens, with the help of Harold Levison and William Bottke of the Southwest Research Institute, David Vokrouhlicky of the Institute of Astronomy at Charles University in Prague, and Matthieu Gounelle of the Natural History Museum in Paris, demonstrated that these comet disruptions can account for the observed thickness of the dust layer in the zodiacal cloud.

In doing so, they solved another mystery. It was long known that snow in Antarctica is laced with micro-meteorites, some 80 to 90 percent of which have a peculiar primitive composition, rare among the larger meteorites that we know originated from asteroids. Instead, Nesvorny and Jenniskens suggest that most antarctic micro-meteorites are pieces of comets. According to their calculations, cometary grains dive into Earth’s atmosphere at entry speeds low enough for them to survive, reach the ground, and be picked up later by a curious micro-meteorite hunter.

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This work was funded by the NASA Planetary Geology and Geophysics Program and the NASA Planetary Astronomy programs.

An image to accompany this story is available:  
<http://www.swri.org/press/2010/Comet.htm>

More information:  
<http://cams.seti.org>

### **Lunar Crescent Caught at the Moment of New Moon**

See:

[http://astrosurf.com/legault/new\\_moon\\_2010april14.html](http://astrosurf.com/legault/new_moon_2010april14.html)

### **Shuttle Sonic Booms Heard April 20 in Western Nebraska, from Bruce Mues**

One of our club members up here in Western Nebraska heard the sonic boom from the shuttle this morning. He said it was pretty cool. (No reports to my knowledge from NE Colorado, we were clouded out here, Ed.).

### **Eta Aquarii Meteor Shower May 6**

**Heads up, binocular target Comet McNaught C/2009 R1 brightest in June 2010. May 2010 chart link:**

[http://cometchasing.skyhound.com/comets/2009\\_R1.gif](http://cometchasing.skyhound.com/comets/2009_R1.gif)

### **Best Looks**

Moon	By Jupiter May 9; by Venus May 15 and 16 By Mars May 19; by Saturn May 22 By Antares May 27
Mercury	Difficult in SE at dawn end of month
Venus	In WSW at twilight
Mars	High in S at sunset
Jupiter	In E predawn
Saturn	In S in evening

International Space Station Passes for Loveland – Fort Collins

May 2010

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>
<a href="#">04 May</a>	0.1	21:16:15	10	NW	21:17:32	12	NNW	21:18:50	10	NNE
<a href="#">04 May</a>	0.1	22:52:53	10	N	22:53:50	11	N	22:53:52	11	N
<a href="#">05 May</a>	0.2	21:43:00	10	N	21:43:11	10	N	21:43:23	10	N
<a href="#">05 May</a>	0.3	23:17:27	10	NNW	23:17:52	12	NNW	23:17:52	12	NNW
<a href="#">06 May</a>	0.0	20:31:19	10	NW	20:32:32	12	N	20:33:45	10	NNE
<a href="#">06 May</a>	-0.1	22:07:49	10	N	22:08:49	11	N	22:09:50	10	NNE
<a href="#">07 May</a>	0.1	20:58:05	10	N	20:58:08	10	N	20:58:11	10	N
<a href="#">07 May</a>	-0.6	22:32:20	10	NNW	22:34:12	16	NNE	22:34:12	16	NNE
<a href="#">08 May</a>	-0.2	21:22:39	10	NNW	21:23:43	11	N	21:24:46	10	NNE
<a href="#">08 May</a>	-0.4	22:56:56	10	NW	22:58:03	19	NNW	22:58:03	19	NNW
<a href="#">09 May</a>	-0.8	21:47:06	10	NNW	21:49:10	17	NNE	21:50:24	14	NE
<a href="#">09 May</a>	0.2	23:21:46	10	NW	23:21:54	11	NW	23:21:54	11	NW
<a href="#">10 May</a>	-0.3	20:37:22	10	NNW	20:38:29	12	N	20:39:37	10	NNE
<a href="#">10 May</a>	-1.9	22:11:40	10	NW	22:14:14	33	NNE	22:14:14	33	NNE
<a href="#">11 May</a>	-0.9	21:01:46	10	NNW	21:03:53	17	NNE	21:05:59	10	ENE
<a href="#">11 May</a>	-1.3	22:36:27	10	NW	22:38:04	29	WNW	22:38:04	29	WNW
<a href="#">12 May</a>	-2.1	21:26:17	10	NW	21:29:01	36	NNE	21:30:25	22	E
<a href="#">12 May</a>	-0.0	23:01:50	10	W	23:01:54	10	W	23:01:54	10	W
<a href="#">13 May</a>	-3.3	21:51:03	10	WNW	21:53:58	70	SW	21:54:16	64	S
<a href="#">14 May</a>	-2.3	20:40:48	10	NW	20:43:35	37	NNE	20:46:23	10	E
<a href="#">14 May</a>	-1.1	22:16:25	10	W	22:18:08	19	WSW	22:18:08	19	WSW
<a href="#">15 May</a>	-3.1	21:05:32	10	WNW	21:08:28	65	SW	21:10:33	17	SE
<a href="#">16 May</a>	-1.1	21:30:55	10	W	21:33:04	18	SW	21:34:30	14	SSW
<a href="#">18 May</a>	-0.9	20:45:18	10	W	20:47:21	17	SW	20:49:25	10	S

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>