

The Objective View

Newsletter of the Northern Colorado Astronomical Society

July 2005

Greg Halac, President 970 223 7210
astro@halac.com
Nate Perkins, Vice President 970 207 0863
tracyperkins@earthlink.net
Dave Chamness, Treasurer and AL Correspondent
dec@frii.com 970 482 1794
Dan Laszlo, Secretary and Newsletter Editor
djlaszlo@aol.com office 970 498 9226
Tom Teters, Web Site Editor
tomt@starmon.com 970 482 5702

Next Meeting: July 7, 7:30 PM

**Binary Star Observing
Dr. Dirk Terrell**

NCAS Business at 7 PM

Meeting directions Discovery Science Center

703 East Prospect Rd, Fort Collins

<http://www.dcsm.org/index.html>

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. Enter the West Wing at the NE corner. From I-25, take Exit 268, West to Lemay Ave, continue West 1/2 mile, see Discovery Center on the left.

NCAS Programs

Aug 4 Brad Jarvis Space Colonization

Dates for Rocky Mountain National Park 2005

July 1, 15, 29; Aug 12, 26

Contact Dan Laszlo if you wish to volunteer at the Upper Beaver Meadows site this summer. djlaszlo@aol.com

Other Events

Little Thompson Observatory Star Night, Berthoud

July 15 Closed for service

<http://www.starkids.org>

Cheyenne Astronomical Society

July 15 9 pm Cheyenne Botanical Garden

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

Open House, Chamberlain Observatory, dusk to 10 pm

Jul 16, Aug 13, Sep 10, Oct 8 303 871 5172

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

Longmont Astronomical Society

July 21 7 pm FRCC, 2121 Miller Rd

<http://longmontastro.org/>

Rocky Mountain Star Stare by CSAS

July 7-10 Pike Natl Forest w of Colo Springs

<http://www.rmss.org>

About Our July 7 Program

Dr. Dirk Terrell is the Computer and Mission Systems section manager at the Southwest Research Institute in Boulder, CO. His research covers topics in stellar astrophysics, primarily binary stars. He operates a robotic 10" telescope at his home in Boulder and a 14" telescope in Sonoita, AZ observing eclipsing binary stars and asteroids. He notes:

Binary stars provide the vast majority of data on the fundamental properties of stars such as masses and radii. Eclipsing binaries in particular can provide very accurate data on stars. My talk will be an introduction on observing and analyzing binary star data, areas that provide amateur astronomers the opportunity to do unique work and address issues that cannot be solved at professional observatories because of resource constraints. I will discuss a few existing research projects by amateur astronomers that are breaking new ground in our understanding of binary stars.

June 2 Program

HST, The Final Chapter

Dr. James Green, Chairman, Astronomy and Astrophysics, University of Colorado

A large telescope in orbit was first proposed by Lyman Spitzer in 1946. His vision was realized with the launch of HST in 1990. It brought astronomers new UV and visual capability. To their dismay, operators could not focus the telescope, and determined that the primary surface was precisely finished with a 2 micrometer error. A null test assembly had been incorrectly assembled, and its result was believed in spite of conflict with another instrument. An end-to-end test was not thought possible at the time (we later learned of an Air Force facility large enough to accommodate the telescope). A swap with an existing primary mirror on the ground was not considered due to expense. The University of Colorado was refused its offer to build a terrestrial telescope for the HST backup mirror, so it will hang in the Smithsonian. Some science was performed with the original WF/PC, FOC, and Goddard high resolution spectrograph. The High Speed Photometer was never used because the defocused spot was too large. The first servicing mission included COSTAR to correct for the other instruments. It is now sharp, but the extra reflections take a toll in sensitivity, especially UV. At Servicing Mission 2, GHRS was replaced by STIS, and FOC came home without use. NICMOS was installed. Service Mission 3A changed gyros, and SM 3b installed ACS and a cryocooler for NICMOS. Current instruments are working well, from UV to near IR. The primary is at 26C, too warm for far IR. HST images brought new appreciation for complexities of planetary nebulae, gave a view of the central disk of the Milky Way, showed hundreds of protoplanetary disks in the Orion Nebula. HST shows individual stars in M51, and the structure of the density wave for theorists to contemplate. There is no good adaptive optics alternative to HST. IR can work, but field is very limited. Optical adaptive optics is decades away. The Hubble Deep Field was tried to seek the earliest galaxies, and the most distant objects detected are galaxies. HST shows fine structure in SN 1987A, which

will need continued monitoring. In 1997, proposals were received for a single instrument to ride on the final HST servicing mission. The Cosmic Origin Spectrograph won, it has 20 times the sensitivity of STIS. It will target the cosmic web of matter between the galaxies. A direct photograph would take a 4 meter telescope in space. COS will measure absorption of 18th magnitude quasar light by intervening matter. It can reach 1100 Angstroms in orbit. It can aim at thousands of targets, well beyond the ~100 available from the ground at the Keck telescope (3200 Angstrom minimum). A plot of intensity versus redshift gives the Lyman alpha forest, with an absorption trough corresponding to each intervening web of matter. Over half of the universe's hydrogen is not seen with current instruments. COS was accepted, but an electronics upgrade was ordered to stretch its life to 7 years. An upgrade to WF/PC 3 was added to ensure public support. All was deferred with the Columbia disaster on February 1, 2003. The HST mission initially slipped to 2006. In mid 2003, a plan to bring down HST for the Smithsonian was dropped as too risky for human life. In January 2004, Service Mission 4 was cancelled. Options were sought for safe deorbit. A 2.4 meter titanium ring will certainly make it to the ground. Time is limited because gyros and batteries could fail. If the telescope freezes, there is no way to save it. Robot deorbit was studied in Summer 2004 but rejected as too expensive, and too long to achieve, 2008. The US has never performed robotic docking in orbit. In February 2005 Sean O'Keefe resigned, then his successor Mike Griffin has requested reconsideration of HST service, pending 2 successful ISS missions. Timing would be December 2007. The COS, WF/PC 3, and a deorbit rocket would be installed. Support would be expected to 2012. The JWST is suffering overruns and problems with its primary mirror. It may be downsized to 4 meters, which would mean a huge hit in science. Accommodating strains of launch, then deployment to submicron precision is proving non-trivial. A true HST successor would be the proposed 10 meter optical telescope, projected for 2025. It would be launched to L2, and have a 10 gigapixel array detector. Before this we can anticipate space based planet-finders. They would be capable of detecting Earth from 10 parsecs. Both a coronagraph and an interferometer are proceeding in development. The coronagraph uses a complex occulting disk which performs a Fourier transform to cancel diffraction. A contrast ratio of 10 e 10 is necessary. In times of tight budgets, public support for space science remains vital.

NCAS Business, June 2 2005

President Greg Halac called the meeting to order. He announced the the Grand Mesa Star Party June 10-12, the CSAS Star Stare in July and Weekend Under The Stars at Foxpark Wyoming August 4 to 7. He announced the RMNP Starwatching for the summer. Dorothy Pillmore's husband Dick Pillmore contributed 3 astronomy guides from his neighbors the Oltjenbruns. Their gift was gratefully acknowledged. The treasurer's report was deferred. The Mars Society convention in Boulder is in August 2005, see www.marssociety.org.

Auger North to Capture Cosmic Rays in SE Colorado

A twin of the state-of-the-art Argentine facility for extreme cosmic ray studies will grow on the Colorado Plains in the next few years. Dr. Pablo Bauleo of CSU estimates they may break ground in 2008.

<http://www.lamardaily.com/Stories/0,1413,121~7979~2898533,00.html>

http://66.102.7.104/search?q=cache:___5H3pDvAlwJ:www.physics.colostate.edu/users/bauleo/Auger/Meetings/03_AugerUS_CSU/arisaka_why_north.ppt+auger+north+bauleo&hl=en&ie=UTF-8

Deep Impact Did It!

Nice pics and videos at:

http://www.nasa.gov/mission_pages/deepimpact/main/index.html

http://www.nasa.gov/mission_pages/deepimpact/images/index.html

http://www.nasa.gov/externalflash/deepimpact_flash/index.html

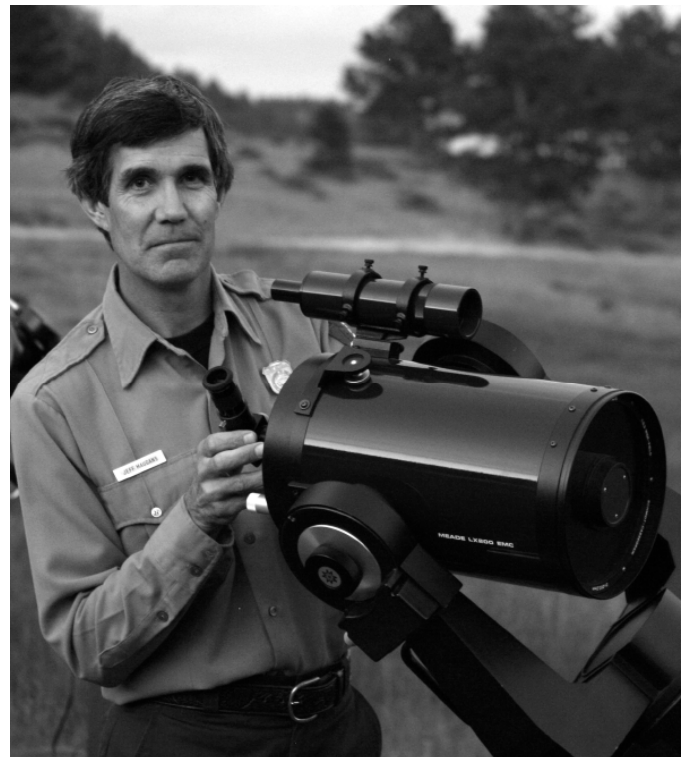
TjT

A website with a great compilation of Deep Impact info, photos and videos is:

<http://www.spaceflightnow.com/>

Andrea

Rocky Mountain National Park Starwatch, July 1, 2005



Ranger Jeff Maugans tweaks his SCT for the evening



Nate Perkins and his hardwood ultralightweight 12



Patrick Earhart sweeps up Venus in twilight



Mike Prochoda fields a traditional 8



Dobsonian builder Phil McCallum with Randy Cunningham and Alan Poppenhagen of Astrosystems

Best Looks

Moon	By Saturn 7/7; by Venus & Mercury 7/8; Near Jupiter 7/13; by Mars 7/27 & 28 Near Antares July 17
Mercury	Low in W first 10 days
Venus	W at dusk
Mars	High in SE predawn
Jupiter	In SW evenings

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

TO:

Date	Mag	Starts		Az.	Max. Altitude		Az.	Ends		Az.
		Time	Alt.		Time	Alt.		Time	Alt.	
05 Jul	2.9	22:14:37	10	NNW	22:15:29	11	N	22:16:21	10	N
05 Jul	2.6	23:50:39	10	NNW	23:51:51	12	NNE	23:53:02	10	NE
06 Jul	2.5	21:04:04	10	WNW	21:05:55	15	NNW	21:07:47	10	NNE
07 Jul	2.2	00:16:15	10	NNW	00:17:47	17	N	00:17:47	17	N
07 Jul	2.8	21:31:51	10	NNW	21:32:34	11	N	21:33:18	10	N
07 Jul	2.5	23:07:37	10	NNW	23:08:56	12	NNE	23:10:14	10	NE
08 Jul	2.5	00:42:01	10	NW	00:42:18	12	NW	00:42:18	12	NW
08 Jul	1.7	23:33:11	10	NNW	23:35:20	20	NNE	23:35:20	20	NNE
09 Jul	2.3	22:24:30	10	NNW	22:25:54	13	NNE	22:27:20	10	NE
09 Jul	2.0	23:58:56	10	NW	23:59:56	19	NW	23:59:56	19	NW
10 Jul	2.6	21:16:06	10	N	21:16:14	10	N	21:16:22	10	N
10 Jul	1.5	22:50:03	10	NNW	22:52:24	21	NNE	22:53:02	20	NE
11 Jul	2.1	21:41:18	10	NNW	21:42:50	13	NNE	21:44:21	10	NE
11 Jul	1.0	23:15:46	10	NW	23:17:41	33	NNW	23:17:41	33	NNW
12 Jul	1.3	22:06:50	10	NNW	22:09:15	23	NNE	22:10:49	15	ENE
12 Jul	2.2	23:41:52	10	WNW	23:42:22	14	WNW	23:42:22	14	WNW
13 Jul	2.0	20:58:02	10	NNW	20:59:39	14	NNE	21:01:16	10	NE
13 Jul	-0.5	22:32:32	10	NW	22:35:26	58	NNE	22:35:31	58	NE
14 Jul	1.1	21:23:31	10	NNW	21:26:01	24	NNE	21:28:30	10	E
14 Jul	1.1	22:58:38	10	WNW	23:00:15	25	W	23:00:15	25	W

Passes calculated with:

<http://www.heavens-above.com/main.asp?Lat=40.5&Lng=-105.06&Alt=1500&Loc=Fort+Collins&TZ=MST>

Predictions should be checked after July 6, a boost will likely change the times. The Shuttle mission planned at midmonth will also likely influence passes soon afterward.



Evening Sky 9 PM July 7 2005