

The Objective View

June 2005

Newsletter of the Northern Colorado Astronomical Society

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Next Meeting: HST, the End Game
Dr. James Green
University of Colorado

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
July 7 Dirk Terrell Binary Star Observing

NCAS Dark Sky Star Party Dates
May 6, 7, 27, 28

Cactus Flats site is on undeveloped parcel of prairie about 6 miles West of Briggsdale. Take Colo Hwy 14 East from I-25 (Exit 269). Go 19 miles East to Ault. Continue 18 miles East of Ault. At County Rd 65 (Milepost 170), turn North, go one mile. Site is through the wire gate on the right, no road, close gate and set up. Beware of the cactus. The site is now officially wheelchair accessible, but there are no facilities so bring essentials. Call **Tom Teters**, tomt@starmon.com, with questions about star party status or dates, 482-5702.

Dates for Rocky Mountain National Park 2005

June 10, 17; 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
June 17 7:30 p program Venus, Dr Traub-Metlay
<http://www.starkids.org>

Cheyenne Astronomical Society
June 17 9 pm Cheyenne Botanical Garden
<http://home.bresnan.net/~curranm/>

Open House, Chamberlain Observatory, dusk to 10 pm
Jun 11, Jul 16, Aug 13, Sep 10, Oct 8 303 871 5172
<http://www.du.edu/~rstencil/Chamberlain/>

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

About Our May 5 Speaker

Tom Fay is a software engineer at Agilent Technologies. He's been interested in astronomy since the last passing of Halley's Comet (1985) and a member of NCAS for nearly as long. Astronomy appeals to him as a part of the science world where amateurs can stay close to, and even participate in, cutting edge science. Of course, there's also the combination of imaging/photography, lots of electro/mechanical/optical gadgets, and the application of software and computers, too. On the down side, as a morning person, Tom suffers when he actually spends significant time looking through telescopes in the dark. That has led to his interest in the (day-time) web availability and uses of professionally-gathered astronomical images, the subject of this talk.

May 5 Program

Web Astronomical Images for Science... and Pretty Pictures

Tom Fay, Agilent Technologies

We now have unprecedented access to the same image files used by professional astronomers. After a year of exclusive use by investigators, the Web allows amateurs to download images obtained with cutting-edge observatories. Three sites are a good starting point. Skyview is a multi-image search service which does mosaics, handy for amateurs. National Virtual Observatory links to 350 image databases. For now, STSCI has HST and Spitzer images, plus Palomar Sky Survey 1 and 2. It also has the manual for HST, ACS, and WFPC, handy for seeking the parameters to aid image selection. Aside from HST outreach images, do not expect color. Images are in the monochrome wavelength for a specific problem. No GIFs or JPEGs, files are FITS, the Flexible Image Transport Format. Created in 1982, it stores the image and info on the telescope, date, observer, and filter used. Files range from 300 kB, to the 460 mB set of processed images for the HST Ultra Deep Field. It is 10,000 pixels square. For file viewing, Tom recommends FITS View and FITS Liberator. GIMP is an open source viewer with Windows and Unix versions. He was a regular at the Harmony Library for several Saturdays to download massive image files. Images with high resolution and an interesting target are desired. Sloan DSS and 2MASS have good prospects. NEAT is an asteroid survey, so has sequential images within a few minutes. Some filter knowledge is needed. UBVRI is the set with UV, a broad blue band just outside the visual range, and a Visual band with all visible light. Red and IR complete the set. The Stromgren series is run for metallicity of stars. HST carries dozens of filters, with these plus many narrowband filters,

such as the Hydrogen-alpha line and Oxygen-III. To make a false-color image, select filters to represent red, green, and blue. They should have the same registration (line up). A recent Sky and Telescope article by Robert Gendler has helpful tips for combining images. Alignment may be needed. The image will start as 16 bit, but Photoshop only supports 8 bit for some functions. Care is needed to avoid loss of information as much as possible. Expect to boost the dimmest portions to show. The histogram helps mapping the white and the black levels to the highest and lowest pixel values. Tom then demonstrated generation of an RGB image of Stephan's Quintet, using HST and F814, F569W, and F450W images. For easier projects, Tom advises trying Hubble WFPC2 Associations, which are preprocessed single-filter stacks. This avoids the step of assembling the product of 4 individual chips. It has 150x150 arcsecond images, and ACS has 220x220 arcsecond fields, so think small. A pointings database is a good starting page. Tom then noted scientific applications. Persson's Variable was found by blinking DSS1 and DSS2 images. Downloaded images lend themselves to astrometry. Images are loaded with cosmic ray artifacts, so could be used to census them. The dwarf galaxy Maffei 1 is an example of an object that might be found by an amateur performing image analysis. Tom then showed his work with images of the Horsehead Nebula, M51, and M31, and the Ring Nebula. There is truly a treasure trove of data waiting to be opened.

Astronomical Image URLs

Hubble preview search form:

<http://archive.stsci.edu/hst/search.php>

Hubble WFPC2 Associations (calibrated, cleaned images)

<http://archive.stsci.edu/hst/wfpc2/search.html>

DSS search form: [beware: this one doesn't save things with the .fits extension...]

http://archive.stsci.edu/cgi-bin/dss_form/

Space Telescope Science Institute

<http://www.stsci.edu>

Public image access for STSCI

<http://archive.stsci.edu>

SkyView multi-image search image (preceded NVO, does mosaics)

<http://skyview.gsfc.nasa.gov>

2MASS site (infrared survey)

<http://irsa.ipac.caltech.edu>

Public outreach Hubble site

<http://www.hubblesite.org>

National Virtual Observatory site (registers & searches ~355 image databases)

<http://www.us-vo.org/>

NVO search page (Datascope)

<http://heasarc.gsfc.nasa.gov/cgi-bin/vo/datascope/init.pl>

SkyMorph (provides access to NEAT near earth asteroid images):

<http://skys.gsfc.nasa.gov/cgi-bin/skymorph>

Sloan Digital Sky Survey (SDSS) Search page

<http://skyserver.sdss.org/dr1/en/tools/search/IQS.asp>

Astropix web site (Using Photoshop for Astro pictures) Jerry Lodriguss

<http://www.astropix.com/INDEX.HTM>

FITS Liberator download site (Photoshop plug-in for FITS files)

http://www.spacetelescope.org/projects/fits_liberator/

NCAS Business, May 5 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 Discovery Center Starwatch on May 13. Dorothy Pillmore's husband Dick Pillmore presented her astronomy library to the club. Her gift was gratefully acknowledged. Lee Gregory will create a listing and hold the library. The treasurer's report was given by Nate Perkins. Nate brought his homemade 12" ultralight telescope, with design elements in common with designs of Albert Highe. Brad Jarvis invited members to the Mars Society convention in Boulder, August 2005, see www.marsociety.org. NCAS volunteers for RMNP starwatching were recruited.

Last Titan 4 Launch Visible from Quebec

Hi again,

At first, I want to say that I had only 10 minutes to take my messages and get prepared for this observation. It has been raining here for a week and was too busy to read my messages everyday. Miraculously, the skies cleared in the area of the rocket trajectory and I remembered 10 minutes before launch that there was a Titan 4 launch tonight and rushed to be ready on time. I've not been able to run pass predictions with Ted's elsets because I was too short on time but relied on my estimate of Az and elevation based on my Shuttle launch obs in Washington in 2001. It worked !

I spotted a fast moving light coming from the southwest at about mag 1. It looked like the ISS but faster. No plume was visible with my 20x80. Then, at about 00:59:15 UTC, a triangular plume emerged from behind the dot of light. There was an interruption in the plume as it took a more linear shape. Then I saw two jets projected at about a 100 degree angle between them and directed forward. These two jets were, for

Name	Type	Wheel	Slo t	Notes	In WF/PC-1?	$\bar{\lambda}$ (Å)	$\Delta\bar{\lambda}$ (Å)	Peak T (%)	Peak λ (Å)
F122M	A	1	4	H Ly α - Red Leak	Y	1259	224.4	19.3	1240
F130LP	B	2	1	CaF2 Blocker (zero focus)	N	2681	5568.3	94.5	8852
F160AW	A	1	3	Woods A - redleak from pinholes	N	1471	457.2	10.1	1403
F160BW	A	1	2	Woods B	N	1446	457.1	12.1	1400
F165LP	B	2	2	Suprasil Blocker (zero focus)	N	3301	5533.2	95.4	5796
F170W	A	8	1	-	N	1666	434.6	30.7	1655
F185W	A	8	2	-	N	1899	297.4	25.9	1849
F218W	A	8	3	Interstellar feature	N	2117	367.9	21.1	2092
F255W	A	8	4	-	N	2545	408.2	14.8	2489
F300W	A	9	4	Wide U	N	2892	727.6	50.8	2760
F336W	A	3	1	WFPC2 U, Strömgren <i>u</i>	Y	3317	370.5	82.6	3447
F343N	A	5	1	Ne V	N	3427	23.5	9.3	3432
F375N	A	5	2	[OIII] 3727 RS	Y	3732	24.4	19.5	3736
F380W	A	9	1	-	N	3912	694.8	65.0	3980
F390N	A	5	3	CN	N	3888	45.0	36.5	3886
F410M	A	3	2	Strömgren <i>v</i>	N	4086	147.0	70.4	4097
F437N	A	5	4	[OIII]	Y	4369	25.2	52.0	4368
F439W	A	4	4	WFPC2 B	Y	4283	464.4	68.2	4176
F450W	A	10	4	Wide B	N	4410	925.1	91.4	5060
F467M	A	3	3	Strömgren <i>b</i>	N	4663	166.4	75.3	4728
F469N	A	6	1	He II	Y	4694	25.0	52.4	4697
F487N	A	6	2	H β	Y	4865	25.9	58.6	4862
F502N	A	6	3	[OIII]	Y	5012	26.9	63.7	5008
F547M	A	3	4	Strömgren <i>y</i> (but wider)	Y	5446	486.6	91.3	5360
F555W	A	9	2	WFPC2 V	Y	5202	1222.6	94.6	5148
F569W	A	4	2	F555W generally preferred ^a	Y	5524	965.7	94.2	5310
F588N	A	6	4	He I & Na I (NaD)	Y	5893	49.0	91.4	5894
F606W	A	10	2	Wide V	Y	5767	1579.0	96.7	6186
F622W	A	9	3	-	Y	6131	935.4	95.6	6034
F631N	A	7	1	[OI]	Y	6306	30.9	85.7	6301
F656N	A	7	2	H α	Y	6564	21.5	77.8	6562
F658N	A	7	3	[NII]	Y	6591	28.5	79.7	6591
F673N	A	7	4	[SII]	Y	6732	47.2	87.0	6732
F675W	A	4	3	WFPC2 R	Y	6714	889.5	97.3	6780
F702W	A	10	3	Wide R	Y	6940	1480.6	97.1	6538
F785LP	A	2	3	F814W generally preferred ^a	Y	9283	2096.1	91.7	9959
F791W	A	4	1	F814W generally preferred ^a	Y	7969	1304.6	95.9	8082
F814W	A	10	1	WFPC2 I	Y	8203	1758.0	94.8	8387
F850LP	A	2	4	-	Y	9650	1672.4	89.2	10028
F953N	A	1	1	[SIII]	N	9546	52.5	95.6	9528
F1042M	A	11	2	-	Y	10437	611.0	81.6	10139

a. Filters F555W and F814W are generally preferred, as they are part of the "standard" WFPC2 filter set, and will tend to have slightly better photometric calibration. See "Choice of Broad Band Filters" on page 47.

HST Filter Characteristics

me, a separation manoeuvre designed to slow the rocket stage. Soon after, I could resolve two identical dots of light. I presume they were the rocket stage and the payload. They were identical in colour and magnitude. Colour was quite white.

I followed the objects with my 20x80 while Lucille was watching at 1x and with her 8x40. The fuel venting and exhaust plumes were short lived but were amazing to see expanding rapidly. I was too unprepared for accurate timings and positions but was thrilled to see my second live spacecraft separation.

Daniel Deak, Webmestre, site Obsat L'Avenir, Quebec

Best Looks

Moon By Venus 6/8; by Saturn 6/9
 Near Jupiter 6/15; by Mars 6/28 & 29
 Mercury Low in W last 2 weeks
 Venus W at dusk
 Mars In SE at dawn
 Jupiter In S evenings
 Saturn In W early evening

Trio of Mercury, Venus and Saturn After June 15
 Venus and Mercury are within 1 degree from 6/26 to 7/1. Saturn is nearest 24 through 26.

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

TO:

International Space Station Passes for Loveland – Fort Collins

June 2005

Date	Mag	Starts Time	Alt.	Az.	Max. Altitude Time	Alt.	Az.	Ends Time	Alt.	Az.
11 Jun	1.2	04:54:37	10	S	04:56:59	22	SE	04:59:23	10	E
13 Jun	0.8	04:12:09	16	S	04:13:47	25	SE	04:16:17	10	ENE
14 Jun	-0.8	04:37:06	13	SW	04:39:39	86	NW	04:42:37	10	NE
15 Jun	0.5	03:30:24	28	SE	03:30:28	28	SE	03:33:03	10	ENE
16 Jun	-0.8	03:55:10	34	WSW	03:56:17	76	NW	03:59:15	10	NE
17 Jun	1.3	02:48:18	21	E	02:48:18	21	E	02:49:42	10	ENE
17 Jun	1.0	04:19:51	10	W	04:22:21	26	NNW	04:24:55	10	NE
18 Jun	-0.6	03:12:55	67	NNW	03:12:55	67	NNW	03:15:45	10	NE
18 Jun	2.0	04:46:49	10	NW	04:48:34	14	NNW	04:50:19	10	NNE
19 Jun	2.3	02:05:54	12	ENE	02:05:54	12	ENE	02:06:12	10	ENE
19 Jun	1.1	03:37:26	18	WNW	03:38:49	25	NNW	03:41:20	10	NNE
20 Jun	1.0	02:30:22	32	NE	02:30:22	32	NE	02:32:09	10	NE
20 Jun	2.1	04:03:21	10	NW	04:05:00	14	NNW	04:06:39	10	NNE
21 Jun	1.3	02:54:44	22	NW	02:55:11	23	NNW	02:57:38	10	NNE
21 Jun	2.6	04:30:53	10	NNW	04:31:18	10	N	04:31:43	10	N
22 Jun	2.0	01:47:31	18	NE	01:47:31	18	NE	01:48:25	10	NE
22 Jun	2.3	03:19:46	10	NW	03:21:19	13	NNW	03:22:53	10	NNE
22 Jun	2.7	04:57:16	10	N	04:57:38	10	N	04:58:00	10	NNE
23 Jun	1.7	02:11:45	21	NNW	02:11:45	21	NNW	02:13:49	10	NNE
23 Jun	2.7	03:47:21	10	N	03:47:34	10	N	03:47:48	10	N
24 Jun	2.5	01:04:22	11	NE	01:04:22	11	NE	01:04:34	10	NE
24 Jun	2.5	02:36:04	10	NW	02:37:31	13	NNW	02:38:59	10	NNE
24 Jun	2.9	04:13:21	10	N	04:13:50	10	N	04:14:20	10	NNE
25 Jun	2.1	01:28:23	18	N	01:28:23	18	N	01:29:53	10	NNE
25 Jun	2.6	04:38:19	10	NNW	04:40:01	14	NNE	04:41:42	10	NE
26 Jun	2.6	01:52:15	10	NW	01:53:36	12	NNW	01:54:58	10	NNE
26 Jun	3.0	03:29:19	10	N	03:29:56	10	N	03:30:32	10	NNE
27 Jun	2.2	00:44:19	18	N	00:44:19	18	N	00:45:50	10	NNE
27 Jun	2.6	03:54:15	10	NNW	03:56:02	15	NNE	03:57:48	10	NE
27 Jun	1.9	23:35:47	15	NE	23:35:47	15	NE	23:36:30	10	NE
28 Jun	2.8	01:08:19	10	NW	01:09:35	12	NNW	01:10:51	10	NNE
28 Jun	3.0	02:45:11	10	N	02:45:54	11	N	02:46:36	10	NNE
28 Jun	1.6	04:19:21	10	NW	04:21:56	27	NNE	04:24:31	10	E
28 Jun	-1.0	22:21:04	10	SW	22:23:59	63	SE	22:26:52	10	ENE
28 Jun	2.1	23:57:18	10	WNW	23:59:29	18	NNW	00:01:39	10	NNE
29 Jun	2.6	03:10:04	10	NNW	03:11:55	15	NNE	03:13:46	10	ENE
29 Jun	-0.7	04:44:39	10	NW	04:47:35	79	NNE	04:50:31	10	SE
29 Jun	0.6	21:12:13	10	S	21:14:25	19	SE	21:16:36	10	E
29 Jun	0.8	22:46:45	10	WSW	22:49:28	37	NNW	22:52:17	10	NE
30 Jun	2.9	00:24:16	10	NW	00:25:26	12	NNW	00:26:36	10	NNE
30 Jun	3.0	02:00:56	10	N	02:01:44	11	N	02:02:33	10	NNE
30 Jun	1.4	03:35:07	10	NW	03:37:46	29	NNE	03:40:22	10	