The Objective View February 2001
Newsletter of the Northern Colorado Astronomical Society

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Meetings first Thursday of each Month

Next Meeting:
February 1 7:30 PM
Pluto and Charon
by Ken VanLew, Front Range Community College

February 1 NCAS Meeting Directions
Discovery Center Science Museum
703 E Prospect Rd, Fort Collins
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 its NE corner. From I-25, take Exit 268, West to Lemay Ave, continue West 1/2 mile, see Discovery Center on the left.

Starwatch at at Discovery Center
Scopes are appreciated at monthly evening starwatches. Set up in the South parking lot on the Friday nights near 1st quarter Moon. Contact Dan Laszlo if you can come, 498-9226, djlaszlo@aol.com. Weather cancellations will be posted at 472-3990. Events to come:

February 2	7 PM
March 2	7 PM
March 30	7 PM
April 27	8 PM
May 25	8:30 PM

NCAS Star Party Dates February 16, 17, 23, 24
Cactus Flats site is on undeveloped parcel of prairie about 6 miles west of Briggsdale. Take Colo Highway 14 East from I-25 (Exit 269). From there about 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 gate on the right (no road), close gate and set up. Beware of the cactus! Our standard nights are the weekend of the New Moon, sometimes a weekend before and after. If the weather is bad on a Friday night we will try the following night . The site is now offically wheelchair accessible, but there are no facilities so bring essentials. Call Tom Teters, tom@ezlink.com, with questions about the star party status, site or dates, 482-5702 or 482-0807.

N.C.A.S. Invitaional Star Party- May 17-19, 2001
This will be the First Star Party of the 2001 season to be held in the M.A.R.S. area. It will be held at Virginia Dale, Colorado (Two Chicks Paintball), just South of the Wyoming border on Hwy 287. This is 40 miles north from the 'Y' in N. Ft. Collins, Colorado and approximately 28 miles South of Laramie, Wyoming at an elevation of 7560'. More to come from Tom T.

Other Events

Little Thompson Observatory Star Night, Berthoud 7 p.m.
Bryan White 3 D Space Photography
February 16 http://www.starkids.org

Cheyenne Astronomical Society
http://users.sisna.com/mcurran/events.htm
February 16 7 p.m.

Open House, Chamberlain Observatory, dusk
http://www.du.edu/~rstencel/Chamberlin/
February 3 303 871 5172

Longmont Astronomical Society 7PM
http://laps.fsl.noaa.gov/cgi/las.cgi
February 15 Longmont Christian School 550 Coffman St

January 4 Meeting: Astronomical Image Processing by Gerry Reynolds

Wringing the most from his astronomical images is a source of satisfaction for Gerry. Digital image processing requires direct formation of a digital image with a detector, or an indirect route from a film image which is scanned into the computer. A CCD color camera performs spatial sampling and color space sampling. Analog data (accumulated charge) for each red, green, and blue component of each pixel is converted to a digital RGB representation for that pixel. A black & white camera converts the accumulated charge into a digital intensity representation for that pixel. A color wheel and 3 image-captures allow a B&W camera to reconstruct a color image. Film can be used to perform the spatial and color space sampling, and then is placed in a scanner to digitize the image. For best results, resolution of the detector and the optical system should be matched. Film grain should be about the size of the projected Airy disk of stars. Finer grain will not improve resolution and film speed will be unnecessarily lowered. CCD sensitivity would also be suboptimal if pixels are much smaller than the Airy disk of the system. A film and scanner combination should have their resolution matched as well. Color space sampling governs color fidelity in the image. Both film and

CCD chips have an unexposed state, and a maximally exposed state. Latitude is a measure of the range of exposure the detectors can handle. How many bits is enough? An 8 bit B&W camera can deliver 256 gray shades. If a color detector can handle 8 bits per color, it can reproduce 256 shades of each color. When mixed, it can reproduce 256 e3 or 16.7 million colors, often considered to be "true color." This is adequate as long as color transitions are abrupt, but if colors blend gradually, banding can be noticeable in the image. Low levels are a problem. The eye will likely notice the pixel change from 10 to 11, a 10% change, while the high level change from 254 to 255 is less than 1% and will be invisible. For scenes with a narrow distribution of intensities, 12 or more bits per color allows contrast expansion. Multiple sampling consists of capturing multiple images and averaging the results. Multiple spatial sampling improves resolution when film grain or pixel size is limiting resolution. Multiple color sampling improves the dynamic range (more bits per component) and averages out random noise introduced by the film or CCD. It is also possible to capture one image on film and multiply sample and average results with a film scanner. There is some spatial resampling during the scan, and there is a predictable benefit: 4x sampling adds 2 bits per component, 16x sampling adds 4 bits/component. There is noise reduction. Intensity or color mapping is a powerful process for wringing detail from an image. An image will have a dark point, a white point, and a range of values in between. Software will offer a variety of functions which take input values and respond in a nonlinear fashion to produce desired output values. Intensity mapping is applied equally to red, green and blue to transform the intensity. The dark point is adjusted to suppress skyglow. The white point is adjusted to change contrast. In between, a curve relating output values to input values is adjusted for appropriate Gamma correction. Color mapping is applied individually to each color component to transform color. Software which shows a histogram aids in setting the curve. The curve can be thought of a correction applied to stored pixel values to compensate for the nonlinear response of the output device, either a monitor or printer. It can also be used to compensate for the logarithmic sensitivity of the human eye. Image cropping is used to select areas of interest and remove defects. Color balance adjustments correct for imbalances in the film, CCD, or scanner;. Color space conversion is required for the monitor which is additive (RGB), or printing which is subtractive (CMY). Computer format conversion from memory-hungry TIFF files to GIF or JPEG facilitates image transfer and storage. Gerry then demonstrated the slide scanner, revealing spiral arms on M51 when they were invisible on the original scan, and scanning and manipulating members' slides.

NCAS Business for January 4

Elected NCAS 2001 officers are: President: Jan Kok. Vice President: Kimon Berlin. Treasurer: Gerry Reynolds. Secretary: Tom Teters. Congratulations to our new officers! Outgoing treasurer Dee Wanger reported club funds at $1680. Improvements in the club scope were requested by users, to include a laser collimator and a dolly. Meeting discussion focused on Colorado House Bill 618, requiring state-funded entities to use shielded lighting. Jan Kok provided information. Members were encouraged to communicate their personal opinions to their elected representatives. Doug Moench announced the Moench family star party on Jan 12 near the Rawhide Power Plant. Dave Chamness invited members to his home for starwatching on January 20.

Taos Native American Full Moon Names

January	Man Moon
February	Winter Moon
March	Wind Strong Moon
April	Ashes Moon
May	Corn Planting Moon
June	Corn Tassel Appear Moon
July	Sun House Moon
August	Autumn Moon
September	Leaf Yellow Moon
October	Corn Ripe Moon
November	Corn Harvest Moon
December	Night Moon

Scope For Sale Meade 8" f/6.3 LX 200 $1600
12v version. Includes tripod, wedge, 25mm and 40mm eyepieces, diagonal, padded fiberglas carrying case. High precision guiding, 65000 object chip. 5 years old, excellent condition. Queries to Dan Laszlo, 498-9226 days, djlaszlo@aol.com

Software For Sale SkyMap Pro version 4. $25
By Chris Marriot of the UK. Includes printed manual. I also downloaded the last 'service pack' for the program which handles any bugs from its original release date. It is a powerful program comparable to the Sky. Current version is Seven which goes for $95 these days. Contact Randy Moench, 7348 Poudre Canyon Hwy, Bellvue CO 970-491-8429

Best Looks

Moon	By Saturn & Jupiter 2/1-3
	by Mars 2/15, by Venus 2/25, 26
Mercury	In WSW, eves, last week
Venus	Brilliant in W eves
Mars	By Antares last 2 weeks, predawn
	by Beta Sco 2/21
Jupiter & Saturn	Overhead at dusk

Comet McNaught-Hartley 8th magnitude in Hercules

Great views of Jupiter from the Cassini flyby:
http://www.jpl.nasa.gov/pictures/jupiter/

From:
Dan Laszlo
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TO:

Iridium flares

Calculated for the intersection of Lemay and Trilby in S Fort Collins.

Date	LocalTime	Mag	Alt.	Azimuth	Distance to flare centre	Intensity at flare centre	Satellite
01 Feb	18:32:52	-7	39	172 (S)	4.3 km (E)	-8	Iridium 23
02 Feb	18:29:31	-3	40	176 (S)	15.4 km (W)	-8	Iridium 20
03 Feb	06:54:21	-2	65	352 (N)	16.5 km (W)	-8	Iridium 23
04 Feb	06:48:21	-8	64	355 (N)	2.6 km (W)	-8	Iridium 45
05 Feb	06:42:21	-6	62	356 (N)	4.8 km (E)	-8	Iridium 11
05 Feb	17:34:53	-4	13	269 (W)	39.1 km (E)	-5	Iridium 68
06 Feb	06:36:21	-2	61	358 (N)	18.0 km (E)	-8	Iridium 3
06 Feb	18:11:37	-8	40	183 (S)	1.2 km (E)	-8	Iridium 47

International Space Station and Mir. Expect changes with the upcoming shuttle mission, and deorbit maneuvers for Mir: Check for current passes with this link for our area: http://www.heavens-above.com/main.asp?Loc=Fort+Collins&Lat=40.585&Lng=-105.084&TZ=MST

International Space Station

Date	Mag	Starts			Max. Altitude			Ends		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
29 Jan	2.4	04:50:42	16	ESE	04:50:42	16	ESE	04:51:25	10	ESE
29 Jan	1.3	06:22:28	12	WSW	06:23:44	15	SW	06:25:32	10	S
30 Jan	1.3	05:18:54	21	SSE	05:18:54	21	SSE	05:20:10	10	SSE
06 Feb	0.2	18:41:22	10	SSW	18:44:03	31	SE	18:44:08	31	SE
07 Feb	-0.2	19:09:11	10	WSW	19:11:44	57	W	19:11:44	57	W
08 Feb	-0.1	18:02:04	10	SSW	18:04:51	39	SE	18:07:27	11	ENE
09 Feb	-0.2	18:29:55	10	WSW	18:32:49	53	NNW	18:34:42	19	NE
10 Feb	1.3	18:58:36	10	WNW	19:00:57	21	NNW	19:01:49	19	N
12 Feb	1.4	18:19:01	10	WNW	18:21:15	19	NNW	18:23:29	10	NNE
13 Feb	2.0	18:48:09	10	NW	18:49:24	12	N	18:50:39	10	NNE
20 Feb	0.8	18:49:33	10	NNW	18:51:59	22	NNE	18:52:26	22	NE
21 Feb	-0.3	19:16:18	10	NW	19:18:48	50	N	19:18:48	50	N
22 Feb	0.6	18:08:11	10	NNW	18:10:43	25	NNE	18:13:13	10	E
22 Feb	1.3	19:43:23	10	WNW	19:45:12	28	W	19:45:12	28	W
23 Feb	-0.8	18:34:49	10	NW	18:37:45	69	NNE	18:40:02	15	ESE
24 Feb	0.9	19:01:50	10	WNW	19:04:29	30	SW	19:06:37	14	SSE

Mir Complex

Date	Mag	Starts			Max. Altitude			Ends		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
29 Jan	-0.7	06:04:53	31	W	06:05:42	46	NNW	06:08:15	10	NE
30 Jan	0.4	06:11:46	21	NW	06:12:25	23	NNW	06:14:37	10	NNE
11 Feb	0.8	05:43:29	18	NNW	05:44:34	24	NNE	05:46:43	10	E
12 Feb	-0.3	05:47:31	24	NNW	05:48:41	46	NNE	05:51:07	10	ESE
13 Feb	-1.2	05:51:27	30	WNW	05:52:29	75	SW	05:55:00	10	SE
14 Feb	-0.1	05:55:18	24	WSW	05:56:03	30	SW	05:58:18	10	SSE
22 Feb	0.3	19:18:43	10	SW	19:20:19	35	SW	19:20:19	35	SW
23 Feb	0.2	19:20:31	10	WSW	19:22:34	40	WNW	19:22:34	40	WNW
24 Feb	0.9	19:22:23	10	W	19:24:31	24	NNW	19:24:31	24	NNW