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

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Meetings first Thursday of each Month

Next Meeting:
November 1 7:30 PM
To Be Announced
Club business from 7-7:30 PM

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.

NCAS Public Starwatch at Discovery Center
Bring a scope or binoculars to share on Friday nights near First Quarter Moon. Set up in the South parking lot. Contact Dan Laszlo with questions: djlaszlo@aol.com 498-9226
January 18 6:30PM

NCAS Star Party Dates November 9, 10, 16, 17
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.

Other Events
Little Thompson Observatory Star Night, Berthoud
November 16 7PM
http://www.starkids.org

Cheyenne Astronomical Society
November 16 7PM
http://users.sisna.com/mcurran

Open House, Chamberlain Observatory, dusk to 10 PM
http://www.du.edu/~rstencel/Chamberlin/
November 24 303 871 5172

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

October 4 Meeting
Martian Geology, Signs of Water and the Possibility of Life
by Bruce Jakosky, University of Colorado

Amateur and professional astronomers inhabit very different worlds, which blend from 2 ends of a continuum. Amateurs observe and image with small telescopes, and professionals launch spacecraft for their observations. All are posing interesting questions as they look at Mars. All are wondering, could it harbor life? Professionals attempted to solve the problem 25 years ago with the Viking lander. It found none, but the question was not settled. Scientists run hot and cold on the problem, but the public does not waver in their interest. The answer is exciting and touches on everyone. We could be the generation with the answer (we have been saying this for 100 years). Some visitors in our audience have the potential to walk on Mars. The quest for life begins with the needs of life on Earth. Liquid water is one ingredient.

There is a running debate about the suitability of other solvents. Earth has all the elements needed, C, H, O, N, S, P, Ca, Fe, Mg. A geologically active planet will have these. Carbon atoms are the best atomic basis for life, with their capacity for chemical bonding and wide availability. Silicon is the other common candidate, but stays locked up in quartz on Earth. Life needs an energy source to dri ve metabolism, the Sun in our case. There are also organisms which tap rock chemistry for energy around hydrothermal vents. Twenty-five years ago, we thought only our planet was suitable for life. With our current knowledge of the Solar System, Mars is the top of the list of planets which might harbor life. It is half the Earth's size, has 1% of the Earth's atmosphere density, and is half-again as far away from the Sun, giving a surface temperature of -12 C. Mars has a geologic history. The Southern Hemisphere is has old, cratered bluish and gray areas which are 3.5 to 4 billion years old. The orange and red features date from 3.5 billion years to the present. The cratered areas have not been resurfaced. There are valleys which branch like river drainage systems. These indicate liquid water on the surface, 3.5 to 4 billion years ago. A warmer surface is needed for water to flow so far. Younger srufaces show large flood channels up to 100 km across. Something carved these channels, probably water. There are teardrop-shaped islands like those seen in floods on Earth. There was probably a catastrophic release of water. The source area looks like jumbled chaotic debris, no obvious mountains or lake. A different climate is not needed to support these flows. Liquid water can flow a long distance before it freezes. Water in Mars' crust is now likely over 2 km deep. Liquid water at the surface is suggested by terrain which shows layers. Wind might also create layered features, however. An upcoming Nature magazine article proposes a role for liguid CO2, which Jakosky doubts. For life, a source of energy is needed. Olympus Mons is a shield volcano 600 km across. Circulation of water through hydrothermal vents is known to support colonies of organisms on Earth. There is a large flood channel by the flanks of the volcano, suggesting a site for hydrothermal energy. Mars Pathfinder established the presence of the elements necessary for life. Life apparently took hold promptly on the Earth. The status of life on Mars is a test of theories about origin of life on Earth. Is life in the Universe abundant or rare? Recent excitement about life on Mars derived from anaylsis of the meteorite found in Allen Hills Antarctica, ALH 84001. The ice sheet is covered with meteorites, and the 10,000 collected there represent 80 to 90% of meteorites in collections. There are now about 15 Martian meteorites. They are chemically related. They have internal gas bubbles which match the Martian atmosphere. Jakosky bought a piece of the Zagami meteorite when it cost $100 per gram. The rate went to $10,000 a gram during the excitement about ALH 84001, but now is back to $2K to $3K a gram. The Antarctic meteorite dated to the earliest epoch with liquid water on Mars. It had evidence of water flow through the rock. There were tiny carbonate mineral deposits. The rock had some complex organic molecules. Outer layers had magnetite grains shaped like bacteria. Could they be microfossils? They were 1/1000 the size of terrestrial bacteria, comparable to a ribosome or virus in scale. All but one of the lines of evidence pointing to life could be due to contamination or an artifact of preparation. This meteorite will not answer our question. We need specimens from the most promising spot, uncontaminated. Last year, Mars Global Surveyor images led to many new discoveries. Evidence of water is more widespread. In a region with prior catastrophic flooding, large gullies formed in the side of a scarp. It looks like seepage a couple hundred km below the surface. Sediment fans overly sand dunes, and the sand dunes are thought to be less than a million years old. This image therefore points to water on Mars within the last million years, very recently in geologic terms. The South Polar Region has gullies and debris fields which also suggest liquid water within a few hundred meters of the surface. A impact crater image has seeps in its rim. Dark material in the crater is reminiscent of a frozen lake. Mars also has layered material, raising the possibility of lake bottom deposits (although layers of windblown sediment can also develop). There is therefore evidence of liquid water near the surface in the recent epoch. Mars Odyssey's mission focuses on mapping minerals on the surface of Mars, to a resolution of 100 meters. It will look for ground ice. The minerals will tell us how much water has acted. Jakosky hopes to find a hydrothermal area like Yellowstone. This data will guide future sample return missions. 2003 will bring a Mars rover, 2005 an orbiter for climate studies. If all goes well, a sample return mission will fly in 2007, 9 or 11. We can't be certain a sample return mission will settle our question about life on Mars. We continue to debate even the nature of life. For more discussion, NCAS members were invited to a forum on life at the University of Colorado.

NCAS Business October 4

President Jan Kok called the meeting to order. He announced the prediction of a Leonid meteor storm for the morning of November 18. He invited members to coordinate an effort to capture meteors simultaneously with two or more cameras, and construct pairs of images for stereo viewing. From dark sky sites, 1600 speed film was recommended, with 5 minute exposures at f/2.8, 50mm lens. Notification of dinner before the NCAS meeting is going out on the mailing list ncastro@jymis.com. The meeting of the MARS section of the Astronomical League on October 20 was announced. New resident Roger Appledorn has built a home observatory and anticipates inviting members to a star party there sometime next year. The location of the club scope is needed.

Local Astronomy Internet Group

"Astro-Colorado" is a Yahoo Group moderated by NCAS member Dave Larison intended to serve popular astronomy interests in the region. The site can also be used as a supplement to the NCAS webpage for announcements, discussions, and file uploads. Anyone can view the page contents, but only list members may post.

See: http://groups.yahoo.com/group/astro-colo

Software For Sale SkyMap Pro version 4. $25
By Chris Marriot of the UK. Includes printed manual.
Current version is Seven which goes for $95 these days.
Randy Moench, 7348 Poudre Canyon Hwy, Bellvue CO
970-491-8429

Best Looks

Moon	Harvest Moon Oct 2, by Saturn 10/6,7 By Jupiter 10/9, by Mars 10/23
Mercury	Within 1 degree of Venus 10/26 to 11/5
Venus	10/29 and 11/4 less than a half degree from Mercury
Mars	Bright all month in Sagittarius & Capricornus
Jupiter & Saturn	In E at dawn
Uranus & Neptune	Evenings in Capricornus

Leonid Meteors best around 3 AM November 18
The US is in line for a meteor storm for 2 hours, centered on 3AM. Rates are projected to reach 1000 to 2000 meteors/hour in clear, dark locations. Past storms are described as a once in a lifetime event. This is one to get up for. More info is available at:

http://www.skypub.com/sights/meteors/meteors.html

Saturn Occultation by the Moon, Evening of November 30
Disappearance for Denver is 17:56:02 PM., reappearance 18:10:46PM. The event will be a bit later and shorter for us. The planet should barely disappear. Watching from moonrise about 16:45PM will be interesting.

A Few Iridium Flares
Calculated for Lemay and Trilby, Ft Collins

Date	LocalTime	Mag	Alt	Azimuth
04 Oct	20:19:57	-8	47	130 (SE)
07 Oct	05:08:48	-4	41	207 (SSW)

From:
Dan Laszlo
2001 S Shields St Building H
Fort Collins CO 80525

TO:

International Space Station Passes for Loveland/Fort Collins November 2001

		Starts			Max Altitude			Ends		
Date	Mag	Time	Alt	Az.	Time	Alt	Az.	Time	Alt	Az.
05 Nov	2.2	05:15:12	10	S	05:17:32	19	SE	05:19:53	10	E
06 Nov	-0.6	05:52:47	10	SW	05:55:56	86	SSE	05:59:09	10	NE
07 Nov	0.8	04:57:07	24	S	04:58:28	36	SE	05:01:26	10	ENE
08 Nov	2.8	04:02:35	12	E	04:02:35	12	E	04:03:06	10	E
08 Nov	-0.4	05:34:56	21	W	05:36:48	49	NNW	05:39:55	10	NE
09 Nov	0.8	04:40:02	38	ENE	04:40:02	38	ENE	04:42:08	10	ENE
09 Nov	1.1	06:12:58	10	WNW	06:15:22	19	NNW	06:17:46	10	NNE
10 Nov	0.4	05:17:11	30	NNW	05:17:12	30	NNW	05:20:04	10	NE
11 Nov	2.4	04:21:45	13	NE	04:21:45	13	NE	04:22:10	10	NE
11 Nov	1.5	05:54:03	11	NW	05:55:38	15	NNW	05:57:35	10	NNE
12 Nov	1.6	04:58:24	17	N	04:58:24	17	N	04:59:39	10	NNE
13 Nov	1.8	05:34:50	12	NNW	05:35:26	13	N	05:36:55	10	NNE
14 Nov	1.9	06:12:34	10	NNW	06:13:43	11	N	06:14:52	10	NNE
15 Nov	2.0	05:14:54	11	N	05:14:54	11	N	05:15:53	10	NNE
16 Nov	1.9	05:51:17	10	NNW	05:52:46	13	N	05:54:14	10	NE
17 Nov	2.3	04:54:23	10	NNE	04:54:23	10	NNE	04:54:37	10	NNE
18 Nov	1.8	05:30:03	13	N	05:31:16	15	NNE	05:33:09	10	NE
19 Nov	0.9	06:05:49	10	NW	06:08:37	29	NNE	06:11:25	10	E
20 Nov	1.6	05:08:52	18	N	05:09:12	18	NNE	05:11:30	10	ENE
21 Nov	0.2	05:44:16	19	NW	05:46:11	44	NNE	05:49:11	10	ESE
22 Nov	1.6	04:47:22	22	NE	04:47:22	22	NE	04:49:14	10	E
22 Nov	-0.0	06:19:42	10	WNW	06:22:41	42	SW	06:25:38	10	SSE
23 Nov	-0.7	05:22:37	56	NW	05:23:10	78	NE	05:26:16	10	ESE
24 Nov	2.6	04:25:37	15	E	04:25:37	15	E	04:26:19	10	E
24 Nov	0.8	05:57:49	17	W	05:59:14	23	SW	06:01:48	10	S
25 Nov	0.9	05:00:47	32	SSE	05:00:47	32	SSE	05:02:38	10	SE
26 Nov	1.7	05:35:53	13	SW	05:35:53	13	SW	05:36:55	10	SSW