

The Objective View

August 2003

Newsletter of the Northern Colorado Astronomical Society

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Next Meeting: August 7 7:30 PM

Astronomical League Convention 2003

By Max Moe, NCAS Vice President

Max is the 2003 winner of the Astronomical League's National Young Astronomer Award. He attended the Nashville convention as a guest of the League, and will present his experiences.

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 Meetings

Sept 4 Dr Roger Culver Mars Mythology & Mania
Oct 2 Dr Joe DiVerdi VLF radio as probe for energetic events, GRB & more

NCAS Star Party Dates

August 23, Hosted by Roger Appeldorn

Roger has again invited NCAS members to join him in the foothills near Red Feather Lakes, directions to follow.

August 29, 30

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. Our standard nights are the weekend of the New Moon, sometimes a weekend before and after. 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.

Rocky Mountain National Park Starwatching 2003

Contact Dan Laszlo, djlaszlo@aol.com, if you wish to volunteer with your telescope for programs in the park this summer. Date is: August 22. A weather cancellation message can be consulted at 472-3990 after 5 PM.

Longmont Astronomical Society 1st Quarter Moon Public Viewing Nights, Flanders Park

August 30

Other Events

Little Thompson Observatory Star Night, Berthoud
Brad Jarvis, Mars Society Chapter President
August 15 Star Night 7 – 10 pm
<http://www.starkids.org>

Cheyenne Astronomical Society, Cheyenne Botanical Garden
Aug 22 9 pm
Sep 19 8 pm
<http://home.bresnan.net/~curran/>

Open House, Chamberlain Observatory, dusk to 10 pm
Aug 9, Sep 6, Oct 4, Nov 8 303 871 5172
<http://www.du.edu/~rstencel/Chamberlin/>

Longmont Astronomical Society
Aug 21 7 pm Longmont Christian School, 550 Coffman St
Aug 30 Flanders Park Public Starwatch, sunset
<http://laps.fsl.noaa.gov/cgi/las.cgi>

July 10 Program

Stellar Evolution, by Drs. Steve & Irene Little

What determines the Main Sequence lifetime of stars? Why do stars become giants or supergiants? What becomes of inner planets when their star becomes a giant? What happens to stars at the end of their lifetimes? Why do some stars become White Dwarfs, and others Supernovae? The Little's wide-ranging talk began with a review of the Hertzsprung-Russell diagram. The log-log plot of stars is arranged by their temperature versus luminosity. Most stars are clumped in a band running through the center of the plot, the Main Sequence. Stars with extremes of mass and temperature are outliers. At first, stars were believed to progress down the Main Sequence from blue to red, but we now know their paths are more complex. Stars form from collapsing regions within clouds of gas. Protostars form when radiation is unable to escape from a clump of gas, and it shrinks due to gravitation. Their temperature rises. Fusion releases heat, which promotes expansion in the star, and it equilibrates with the opposing force of gravitational collapse. Fusion of 4 H atoms to 1 He converts 0.7% of the starting mass to energy. A penny-sized mass converts to the energy equivalent of a good-sized hydrogen bomb. 600 million tons of hydrogen are converted to helium in the Sun every second. H is the most efficient element for fusion energy release. Protostars up to 15

times the Sun's mass produce Main Sequence stars. Larger stars use the Carbon Cycle fusion reactions. When the hydrogen in the core is exhausted, the star will leave the Main Sequence. Gravitation causes it to shrink. This ignites a shell of hydrogen around the core. There is a large release of energy around the core, and the star puffs out. The Earth may not be habitable when the Sun emits more energy just before it swells at this stage. It fuses He in the core, producing carbon and oxygen. There is a layer fusing He around the core, and H burning outside the He layer. He fusion creates not Beryllium 8 but Carbon 12 by the triple-Alpha process. The star swells to form a Red Giant. It can swell so large, its outer layers escape. It can lose 20% of its mass in each of two giant stages. A planetary nebula will form, with the hot core (the 60% remaining mass), and expelled outer layers. The Sun is then a White Dwarf. A sugar cube of White Dwarf matter would weigh several tons, and explode if released on Earth's surface. A White Dwarf's diameter is inversely proportional to its mass. A nova is a type of binary star. A White Dwarf accumulates hydrogen from its companion, and there are periodic ignition events on the surface, about every 30-40 years. A type 1A Supernova occurs if a White Dwarf accumulates matter then explodes, with total destruction of the star. The future is bad for the Sun's planets. Mars will be more habitable after 700 million years in the future, and Jupiter's moons could be better. Earth may get some respite if the Sun sheds mass, and Earth's orbit moves out. It would orbit the solar White Dwarf as a cold cinder. Mercury and Venus are destined to vaporize. A star's lifetime is fixed by its starting mass. A star 100 times a solar mass lives 3 million years. The Sun will last a total of 10 billion years, and a star with 1/2 solar mass would last 100 billion years. A 20 solar-mass star burns H for 10⁷ years, He for 10⁶ years, C for 10³ years, Ne for 3 years, O for 1 year, Si for 1 day. It collapses in 0.1 second. When neutron stars are formed, gravitational collapse produces a 20 mile nucleus, with electrons forced to join protons and form neutrons. Density is 10⁹ tons/cc. If dropped on Earth, it could fall through the planet twice, overshooting the core. When a supergiant star collapses, the outer layers rebound off the core in a Type II Supernova explosion. The star brightens by 20 magnitudes and will outshine a whole galaxy. One percent of the supernova output is visible light, 99% is neutrinos. The 1987 LMC Supernova set off neutrino detectors on the opposite side of the Earth. A supernova remnant can be a pulsar, detectable by radio emission. The spinning pulsar has precession, and escaping electrons give synchrotron emission. The Crab Nebula rate is 30 per second. If massive enough, a black hole will form. Escape velocity exceeds the speed of light. The event horizon radius is 3 km/solar mass. To find black holes, gamma ray and xray emission can help. If an unseen companion in a binary is over 3 solar masses, it cannot be a neutron star. Hypernovae and gamma-ray bursters have energy output 100x a supernova. They are distributed evenly around the sky, so are outside our galaxy. They are thought to be the product of very massive stars at the edge of the universe, or matter falling into the polar region of black holes, resulting in emission in a restricted direction. Census data on star clusters is used to support this scenario for stellar evolution. The Earth is formed of elements which require Type 1a and II supernovae for production. So, we are made of old stars debris.

NCAS Business, July 10

President Dan Laszlo called the meeting to order. Views of the Sun with a hydrogen alpha filter accompanied the business meeting. Corey Radman announced a shuttle astronaut visit on July 26. Dan Laszlo invited members to join the public starwatches in Rocky Mountain National Park this summer.

From Andrea Schweitzer:

A great link to check out- Ed Lu's website.

He is an astronaut on board the International Space Station, and is writing updates about what life is like up there.

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

From Jim S: Notes on Rocky Mtn Star Stare 2003

For Those that are Interested:

Rocky Mountain Star Stare 2003 was a gas as usual. Fortunately, last year's "Hayman" fire left the CSAS observing sites unscathed, but since the Colorado Springs Astronomical Society is the sister club to the Aussie club down under at Stromlo in Oz, this year's proceeds from Star Stare are going down south to help out with the recovery effort from the recent fire which destroyed the Mt. Stromlo observatory (many buildings, domes, and historical instruments) which housed the library and meeting place for the club.

In contrast to last year's sun-scorched and dessicated landscape where not one green blade of grass was to be seen, the observing fields at Star Stare were lush and grassy with flowers this year, and the sweet tang of fresh sage was thick in the air night and day. Last year's hot wind was pleasantly absent as well, and the single fat hummingbird observed bore testament to the high level of food supply, as they obviously had more to keep them occupied than last year when the hungry little buggers buzzed us like flies. Mosquitos were few and far between and the little biting flies in the day time posed the greatest nuisance, which was minimal at worst.

I arrived noonish on Thursday to find only the north end of the main O'Brien gulch field occupied and only two other campsites in the southern area staked out. Later in the afternoon a slow stream of vehicles bearing scopes and photon seekers began trickling in, and shortly after sunset the remainder of the attending Dark Sky Marines had circled their wagons. By Saturday evening some 325 folks had registered.

Thursday night was mostly clear until astronomical twilight was over, when the sky socked in pretty well with only a few sucker holes popping open from time to time until midnightish when it cleared up nicely, promptly after sacrificially putting my eyepieces away and unplugging my telescope's drive, but I then crawled in the sack around 1 AM for a "good" night's sleep to keep a little energy for the remaining nights at hand.

Friday morning was clear and calm and pleasant. The seeing from about 7 to 8:30 AM was very good to excellent, with a black sky surrounding a speckley sun with much fine spot detail, Venus showing as an almost perfectly round steady bright ball, and beautiful orange Mars showing the most detail I've seen since last apparition surrounded by a "Colorado Blue"

sky. Mercury was a bit too close to the sun this time to spot with the finder. (Equatorials Rule! Lemme see ya find Mars in a daylight sky with a plywood push-along!). hee hee :O) Views of the sun in Ha light revealed a number of nice prominences. In white light the large dark spot coming around the solar limb was seen by Sunday morning to have a long train of interesting smaller spots in tow. It should be rather nice today. Check it out.

Friday afternoon the place filled up fast, and by evening we were treated to a beautiful, transparent sky which remained cloud free all night. There was a period from about 11:30 till midnight that the seeing steadied down to "very good to excellent". Star images became pinpoints surrounded by steady diffraction rings and the stars in globular clusters reached out to grab you. Once again the period of good seeing was marked by everyone becoming abnormally quiet and using their own telescopes. It happens every time. Unfortunately, Mars was still low in the eastern sky at that time, so we missed a crack at the cities and canals. :O)

About 2 AM someone's car alarm went off and the vehicle's horn honked and headlights flashed across the field for about 3 or 5 minutes. Oops! Someone was embarrassed for sure. Luckily, a photon war did not ensue.

After a grand tour of the outer solar system from Pluto to Mars (less Saturn and Jupiter of course) and a few extra doses of photons from the galactic center, I called it good, beat the sun, and hit the sack about 3:15 AM.

Saturday morning was reported to produce another period of above average seeing, but after sleeping in until 7 or 8 I missed it. :(

The swap meet at high noon was fairly well attended, but most folks were a little slow to deal this year and those that did got good deals.

Disappointingly, the ATM walkabout had only 7 entrants this year. :(That is the main reason I go to this gathering - to see (steal) the great ideas that are brought to public light by the gadget guys that attend. The highlights are listed below in no particular order - just the things that I can remember that stuck in my sun-scorched, withered little brain. I'll scan a few pictures and post them to a website when the slides are developed next week for those that are interested.

A fellow from Kansas had come across a used ambulance with heavy duty suspension for a song. He cut a round hole in the roof and mounted it with a dome covering a C-11 and a world of accessories including CCD camera and TV monitor. Nice! Lots of storage space. A truly awesome ATM project.

Another fellow brought a beautiful wood observing table that doubled as a satin-lined eyepiece case, tripled as a map case, and featured legs that folded up and recessed into the bottom. Very nice. A gadget like that would eliminate my card table, map case, and eyepiece case in one swoop.

There was an interesting counterweight system for a Dob made from a PVC pipe cap fixed to the back of the mirror cell with a small hole in the top. It was filled with BB's to the proper weight then corked shut with a rubber stopper. Simple and elegant.

One of my favorites was simply three collimating knobs on the primary cell of another telescope. What's so special about that? Well, they were all of different shapes - round, square,

triangle. This enables an assistant to turn the correct knob when asked by the guy at the eyepiece. Instead of "Turn the first one - no! The other one. No! The other one!", you get "Turn triangle. Now turn square. Back off on round." etc. Pure genius. :O)

My entry was my "FESS" - the Field Expedient Solar Spectroscope, which can be made by anyone from a few beer/pop cans, two small sticks picked up off the ground, some duct tape, a pair of reading glasses, and an AOL CD that came in the mail (or any other junk CD you may happen across) - a pocket knife being the only tool required. When tuned up properly it'll show about 40 Fraunhofer lines. It won't split the magnesium triplet, but you can tell it's fat and multiple. It won't split the sodium pair, but you can tell it's double. Nothing to write home about, but hey - it's free!

One of the kid's activities was kite-building. There were a number of other interesting kites to be seen Saturday as well.

The door prize give-away was the most well-attended event as usual - lotsa cool stuff including a 3-6mm Nagler. For the kids there was a (Orion?) short little green Newtonian on a short one-arm altazimuth fork mount, won by a little girl that fit it cute as a button.

Following that event the world premier showing of "Star Party", a documentary film done by Chris Rock and crew and filmed at RMSS two years ago was presented. This will be available for private acquisition beginning this week and will be sent to PBS, etc. 56 minutes long, it features cameos and commentaries by many of the regular (and irregular) RMSS attendees, and captures a bit of the spirit of what star parties are all about.

By Saturday sunset a couple of small thunderstorm cells moved through the area and we were treated to a lightning show. By 10 PM or so it had cleared off pretty well but there was a lot of murk in the air and transparency was not good. After uncorking the scope for a couple of hours I called it quits and sacked out about 1 AM, about when most of the other folks that stayed up past the storms did the same, but there were still the die-hard few that saw it through till almost sunrise.

As is typical for the Rockies, Sunday morning dawned bright and clear.

Most folks hit the trail by noon. I lazily lolligaged in the sun through most of the day then bugged out in mid-afternoon when a mean-looking, rapidly-building thunderstorm appeared to be heading in. There were only two other campers that remained by that time, in contrast to the dozen or so that you usually see stay for an extra day.

C ya next time maybe, eh?

- Jim S.

As promised I have put together a little web page with some pictures of my unofficial favorites. There is also a telephoto shot of one of the mountains nearby that burned last year.

<http://home.att.net/~jsstars/RMSS03/RMSS03.html>

From Randy Moench:
 Discovered The Planetary Society has a weekly radio show available on the web at:
<http://planetary.org/audio/planetaryradio.html>

Issues of Sky & Telescope available

From tighome@verinet.com:
 I am cleaning house. Is there any interest in the NCAS in my collection of S&T from 1989 to 2002? Free? Like to give them a good home rather than recycle. Thanks.
 Mark

Scope for Sale by lgm@charter.net

For Sale: Meade Instruments Corporation SATURN
 Model DS-114. D=114 mm, F= 910 mm, f/8
 Sells for \$400+ new. Asking \$190.
 Call Estes Park 970-586-1959
lgm@charter.net

Scope for Sale

Coulter 10 inch Dobsonian. Like new. Includes Kellner eyepiece, eyepiece rack, red-dot aiming device, aperture stop, dustcap. \$600. Call Gene, 970-568-0545.

Telescope for Sale: Meade LX200 10 Inch Schmidt-Cassegrain and heavy duty tripod.

	Original cost
10 inch f/10 LX 200	\$2695 (today = \$2495)
Super Wedge	\$ 380
Electronic Focuser #1206	\$ 145
Electronic DC Adapter #1812	\$ 90
LX200 Interface Cable	\$ 25
f/6.3 Focal reducer	\$ 125
Tube balance weight system	\$ 95
Telrad	\$ 37
shipping	\$ 245
GPS	\$ 110
Epoch 2000 Software	\$ 175
TOTAL	\$4122

Used about 2 years. Like new condition.
 Sacrifice for \$1995. Call Patrick Earhart
 (970) 898-1057

From Patrick Earhart to C8 buyer:

To the person who bought my Celestron C8 about two years ago. I have found some spare parts for your telescope. Please call me, Patrick Earhart (970) 898-1057

Clear Sky Clocks for Colorado

http://cleardarksky.com/csk/prov/Colorado_clocks.shtml

From Jim S: Best Moon Site I've Seen:

<http://www.moon-phases.com/>

Best Looks

Moon	by Jupiter 7/1, 2, by Regulus 7/3 7/17 occults Tau Aquarii about 0000 MDT 7/16, 17 less than 1 degree from Mars from moonrise until dawn, by Saturn 7/26, 27
Mercury	Low in W end of month <2 deg from Jupiter 7/26, 27, 28
Venus	low in ENE predawn first week By Saturn 7/8
Mars	In S predawn
Jupiter	Low in West in evening twilight
Saturn	Low in ENE predawn, easier end of month
Uranus	In Aquarius predawn
Neptune	In Capricornus predawn

From Brad Jarvis:

MarsNews.com will present weekly broadcasts of our hour-long program "Radio Free Mars" starting Tuesday, March 18th. The program will feature a weekly space newscast, information on past, present, and future missions to Mars, and phone interviews with newsmakers and space experts. The program will be hosted by James Burk, Editor-in-chief of MarsNews.com, an expert on the Red Planet and the past President of the Mars Society's Seattle chapter.

The broadcasts will be aired on ZeroPointRadio.com, an Internet radio network and will also be available for listening & download at the following address:
<http://www.marsnews.com/radio/>

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

TO:

International Space Station Passes for Loveland-Fort Collins

August 2003

Date	Mag	Starts			Max. Altitude			Ends		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
06 Aug	-0.2	21:45:00	10	WNW	21:48:03	50	SW	21:48:40	41	S
07 Aug	-0.5	20:46:25	10	NW	20:49:31	69	NNE	20:52:24	12	ESE
07 Aug	2.2	22:23:59	10	WSW	22:24:39	11	WSW	22:24:39	11	WSW
08 Aug	1.0	21:24:09	10	WNW	21:26:49	26	SW	21:28:25	17	S
10 Aug	2.0	21:03:39	10	W	21:05:25	14	SW	21:07:11	10	SSW
27 Aug	1.5	05:56:04	10	S	05:58:40	24	SE	06:01:16	10	ENE
28 Aug	2.5	04:59:11	10	SE	04:59:50	10	SE	05:00:30	10	ESE
29 Aug	0.3	05:33:22	10	SSW	05:36:21	43	SE	05:39:22	10	ENE
30 Aug	1.6	04:36:54	18	SE	04:37:24	19	SE	04:39:43	10	E
31 Aug	-0.7	05:12:33	29	SW	05:13:58	83	SSE	05:17:09	10	NE
01 Sep	1.3	04:15:53	27	E	04:15:53	27	E	04:17:48	10	ENE
01 Sep	0.7	05:48:07	10	W	05:50:55	28	NNW	05:53:44	10	NE
02 Sep	-0.3	04:51:21	53	NW	04:51:35	55	NNW	04:54:42	10	NE
03 Sep	2.3	03:54:31	18	ENE	03:54:31	18	ENE	03:55:30	10	ENE
03 Sep	1.3	05:26:44	13	WNW	05:28:35	21	NNW	05:31:05	10	NNE

A Few Iridium Flares

Calculated by Heavens-Above.com for Lemay and Trilby, Fort Collins

Date	Local Time	Mag	Alt.	Azimuth	Distance to flare centre	Mag at flare centre
07 Aug	04:11:57	-8	49°	261° (W)	2.3 km (W)	-8
09 Aug	05:45:33	-6	69°	206° (SSW)	5.8 km (E)	-8
12 Aug	03:50:39	-4	42°	267° (W)	17.2 km (E)	-8
15 Aug	05:18:17	-5	63°	227° (SW)	8.7 km (W)	-8