



First Light

The Newsletter of the Cape Cod Astronomical Society



March, 2007

Vol. 18 No. 3

Mooncusser's 21 st Century Almanac			
By Jim Carlson			
Full Moon – Sat. March 03 at 18:20 EST Last Quarter – Sun. March 11 at 22:55 EST New Moon – Sun. March 18 at 21:44 EDT First Quarter – Sun. March 25 at 13:17 EDT			
Object	March 01 (EST)	March 16 (EDT)	March 31 (EDT)
Sun	R: 06:16 S: 17:31	05:51 17:48	05:26 18:05
Mercury	R: 05:32 S: 16:28	04:50 15:28	04:39 15:48
Venus	R: 07:28 S: 19:59	07:09 20:35	06:53 21:11
Moon	R: 15:18 S: 05:22	04:38 14:56	16:20 04:33
Mars	R: 04:40 S: 14:11	04:16 14:11	03:49 14:11
Jupiter	R: 01:35 S: 10:50	00:42 09:56	23:42 09:00
Saturn	R: 15:33 S: 05:40	14:29 04:38	13:27 03:37
Uranus	R: 06:30 S: 17:46	05:33 16:51	04:36 15:57
Neptune	R: 05:28 S: 15:43	04:31 14:47	03:33 13:50
Pluto	R: 01:58 S: 12:01	01:00 11:03	00:01 10:04
March 2007 Events (UT)			
01 – CCAS Meeting at 7:30 at D-Y Regional High School. Jarvis Hunt is the speaker for the evening. The title of his talk is, "Meteorites, Asteroids, Comets and Collisions" Bring a friend and enjoy the program.			
01 – Moon 1.9° north of M44 at 01:00 UT (subtract 5 hours for EST, 20:00 EST on Feb. 28).			
02 – Saturn 1.1° south of the Moon at 02:00 UT (21:00 EST on March, 1). Regulus 1.1° south of the Moon at 21:00 UT (16:00 EST).			
03 – Total Lunar Eclipse. The Moon will enter Earth's umbra (first contact) at approximately 16:30 EST when the Sun is roughly 10° above the horizon. The Sun will set an hour later and by that time the Moon will be entirely inside the umbra. Mid eclipse at approximately 18:15 , shortly after the end of civil twilight. Last umbra contact will arrive at approximately 20:15 EST. Get out your camera, take a few photos, and send them to CCAS webmaster Tom Leach at harbor@town.harwich.ma.us.			

05 – Uranus in conjunction with the Sun.
06 – Zodiacal light visible in the west after evening twilight for the next two weeks.
07 – Moon at apogee (252,185 miles). Mercury stationary. Spica 1.3° north of the Moon at 11:00 UT (06:00 EST).
11 – Daylight Savings Time begins. Spring forward, fall back. Subtract 4 hours from UT. Antares 0.7° north of the Moon at 06:00 UT (02:00 EDT)
12 – Jupiter 6° north of the Moon at 00:00 UT (20:00 EDT on the March 11).
15 – Mercury at descending node.
16 – Venus at ascending node. Mars 1.9° north of the Moon at 01:00 UT (21:00 EDT on March 15).
17 – Mercury 1.4° north of the Moon when it's below the horizon from the Cape.
19 – Partial solar eclipse not visible from the Cape. Moon at perigee (222,335 miles).
21 – Vernal Equinox at 00:07 UT or 20:07 EDT on March 20. Venus 4° south of the Moon, not visible from the Cape.
22 – (1) Ceres in conjunction with the Sun. Mercury at greatest western elongation rising before the Sun in the am. Double shadow transit on Jupiter during the day time (not visible from the Cape).
23 – Moon 1.0° north of M45 at 06:00 UT (02:00 EDT), below the horizon from the Cape.
25 – Mars 0.1° south of Neptune at 07:00 UT (03:00 EDT), below the horizon from the Cape.
26 – Mercury at aphelion.
28 – Moon 1.8° north of M44 at 06:00 UT (02:00 EDT), low in the west from the Cape
29 – Saturn 1.2° south of the Moon, and visible from the Cape. Double shadow transit on Jupiter in the daytime, not visible from the Cape.
30 – Regulus 1.1° south of the Moon at 03:00 UT (23:00 EDT on the March 29) visible from the Cape.

Sources: TheSky6, Software Bisque
Observer's Handbook 2007 Royal Astronomical Society of Canada

The times of rise, transit, and set are for the days listed. On March 1st, for example, the Moon will set at 05:22, and rise at 15:18 EST.

As you can tell from the size of Mooncusser's, March will be a busy month for skywatchers. Keep in mind that www.heavens-above.com is a good source for information on satellite passes. Iridium flares, the reflection of Sun light from the solar panels of Iridium communication satellites, are quite spectacular.

March 1st Meeting

The program for the March meeting of the Cape Cod Astronomical Society will be on "Meteorites, Asteroids, Comets and Collisions." The speaker for the evening will be CCAS member Jarvis Hunt. The meeting will begin at 7:30 in the Dennis-Yarmouth Regional High School library.

Astro Trivia

What is the precession of the equinoxes"?

AAVSO Alert Notice 345

Jim Carlson

I recently participated in a program sponsored by the American Association of Variable Star Observers (AAVSO) to track the behavior of a group of stars called cataclysmic variables (CV) and report when they become active. A cataclysmic variable occurs in a binary star system containing a white dwarf (the primary) and a main sequence star. The two stars are semi-detached, meaning that one star, the main sequence star in this case, pours gas onto the other. Due to the conservation of angular momentum, however, the gas cannot land directly on the white dwarf's surface, so falls instead on an accretion disk where it explodes periodically. The two stars are so close together that the orbital period is only a few hours.

When does a CV become a Type 1A supernova? No one knows, but finding a jet could lead to an answer. If you're interested in helping let me know and we can meet at the observatory during the next several weeks.

AAVSO ALERT NOTICE 345 (February 15, 2007)

SUBJECT: REQUEST TO MONITOR CATAclysmic VARIABLES FOR RADIO OBSERVATIONS

Dr. Christian Knigge, University of Southampton, England, has requested our assistance in monitoring ten (10) dwarf novae cataclysmic variables as part of a search for radio jet formation

during outbursts. Dr. Knigge is attempting to observe a dwarf nova outburst within six hours of the outburst onset using the NRAO Very Large Array (VLA) telescope in New Mexico and the Jodrell Bank MERLIN telescope in the United Kingdom. Rapid optical detection of an outburst onset will be used to trigger target-of-opportunity (TOO) observations with both radio telescopes to study the behavior of dwarf novae outbursts in the radio region of the spectrum, and to determine whether CV systems are capable of forming radio jets similar to those observed in X-ray bursters and other X-ray binaries.

Continuous optical monitoring and rapid reporting of these dwarf novae is requested beginning February 21. The program will continue for at least several weeks, as Dr. Knigge has been allocated six TOO activations of the VLA-MERLIN network.

Rapid reporting of observations is critical to the success of this project. Observers are requested to report observations within one (1) hour to the AAVSO using WebObs or EmailObs, especially if an object appears to be in transition to outburst. Quiescent and full outburst observations are also important, so please report all observations promptly.

Both visual and CCD observations are requested, but CCD time-series should only be performed if the data can be reduced and submitted immediately.

The table below lists, in comma delimited format, the ten target dwarf novae, and for each gives the type, the range according to visual/V observations in the AAVSO International Database, and the outburst threshold, that is, the magnitude that when reached by the star usually indicates an outburst is truly underway.

Desig., Name, R.A, Dec, Type, Range, Outburst, (V or visual) threshold

0058+40, RX AND,	01:04:35.55, +41:17:58.0,	UGZ,
10.2 - 15.6,	12.5 V	
0749+22, U GEM,	07:55:05.2, +22:00:04,	UGSS+E,
8.8 - 15.3,	13.5	
0803+62, SU UMA,	08:12:28.20, +62:36:22.6m	UGSum
10.8 - 15.6,	13.6	

0804+28, YZ CNC, 08:10:56.62, +28:08:33.6, UGSU,
 10.4 - 16.3, 13.5
 0814+73, Z CAM, 08:25:13.20, +73:06:39.23, UGZ,
 10.2 - 14.0, 11.4
 0855+18, SY CNC, 09:01:03.35, +17:53:56.1, UGZ,
 10.8 - 14.1, 12.7
 1804+67, EX DRA, 18:04:14.12, +67:54:12.2, UG+E,
 12.3 - 17.0, 14.1
 1934+30, EM CYG, 19:38:40.10, +30:30:28.0, UGZ,
 11.8 - 14.4, 13.4
 1953+77, AB DRA, 19:49:06.50, +77:44:23.5, UGZ,
 12.0 - 15.4, 14.0
 2138+43, SS CYG, 21:42:42.80, +43:35:09.88, UGSS,
 8.2 - 12.4, 11.0

NASA News Release

Lunar Eclipse

02.12.2007

February 12, 2007: Picture this: The year is 2025 and you're on the moon. "Home" is 100 meters away—an outpost on the rim of Shackleton Crater. NASA started building it five years earlier, and it is growing fast. You're one of the construction workers.

As always in these polar regions, the sun hangs low, barely above the craggy lunar horizon. You adjust your visor. It amazes you how bright a low sun can be when there's no atmosphere to dim it.



Sudden-ly, the lights go out.

Up in the sky, a big black disk covers

the sun. A red "ring of fire" appears where the sun was only moments before, and its glow turns the ground red beneath your feet.

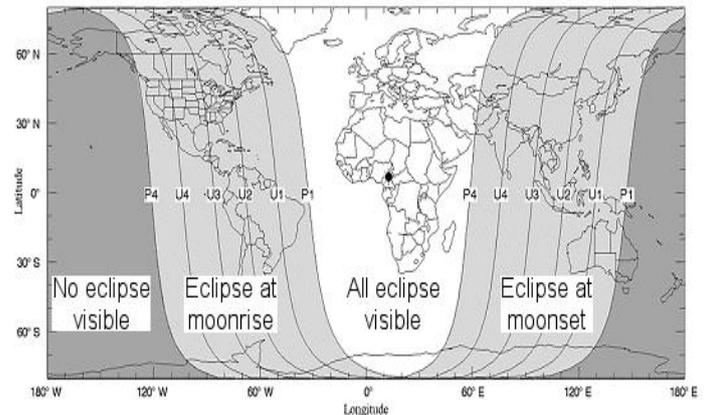
You've been waiting for this. It's an eclipse.

Right: On the moon, the ground turns red during a lunar eclipse. This photo was taken by Doug Murray of Palm Beach Gardens, Florida, during the total lunar eclipse of Oct. 27, 2004.

Astronauts on the moon are going to experience eclipses typically once or twice a year: Earth glides in front of the sun turning lunar day into a strange kind of ruddy night. It'll be one of the highlights of any lunar tour.

The charm of the eclipse comes from Earth. Our planet is big enough by a factor of three to block the entire sun but, curiously, this doesn't cause complete darkness. Rays of sunlight bend around the edge of Earth, filtering through the atmosphere. As seen from the moon, the edge of Earth lights up like a sunset-red ring of fire—one of the most beautiful sights in the solar system. (A simplified, 1.2 MB animation of the process may be seen [here](#). Credit: Graphic artist Larry Koehn.)

Can't wait until 2025? The next eclipse is right around the corner: Saturday, March 3, 2007. Stuck on Earth, we can't see the ring of fire, but we can see the red glow it produces on the moon. The phenomenon will be visible from parts of all seven continents including the eastern half of North America.



Above: A visibility map of the March 3, 2007, total lunar eclipse. Credit: Fred Espenak, NASA/GSFC.]

In the USA, the eclipse will already be underway when the moon rises on Saturday evening. Observing tip: Find a place with a clear view of the eastern horizon and station yourself there at sunset. As the sun goes down behind you, a red moon will rise before your eyes.

Rising moons are often reddened by clouds or pollution, but this moon will be the deep, extraordinary red only seen during a lunar eclipse. As you watch it ascend into the night, imagine what it would be like to stand by Shackleton Crater watching from the opposite direction.

It's not so far-fetched. NASA plans to return astronauts to the moon no later than 2020. From their polar base camp, humans will explore the countryside hunting for resources they can use to "live off the land." They'll study the moon's geology, learning more about the unique potential of the moon to reveal [ancient secrets](#) of Earth and the solar system. They'll also evaluate technologies needed for future missions to Mars.

And occasionally when the ground turns red, they'll pause and look up at a glowing ring in the sky.

March 3rd is a good night to imagine that.

Cape Cod Astronomical Society

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The **Cape Cod Astronomical Society** meets at 7:30 pm on the first Thursday of every month at the Dennis-Yarmouth Regional High School in Yarmouth, Massachusetts. Meetings are open to the public. Membership dues are \$30 for adults, \$15 for students in two year colleges, no charge for students in K-12 schools.

Cape Cod Astronomical Foundation

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