

Abrams Planetarium Skywatcher's Diary July 2000

To the reader:

The Skywatcher's Diary for July 2000 has been prepared by D. David Batch. Credit to the author and to Abrams Planetarium, Department of Physics and Astronomy at Michigan State University, and mention of our *Sky Calendar*, would be appreciated.

A sample issue of the *Sky Calendar* is available over the Internet. It can be viewed via the World-Wide Web at <http://www.pa.msu.edu/abrams/SkyCalendar/Index.html>

If you would like a printed sample of the July issue, please send a long, self-addressed stamped envelope to:

July Sky Calendar
Abrams Planetarium
Michigan State University
East Lansing, MI 48824

Each month, the Department of Physics and Astronomy at Michigan State University makes the Skywatcher's Diary available over the Internet. It can be accessed at <http://www.pa.msu.edu/abrams/SkyWatchersDiary/Diary.html>

Current and back-issues of the Skywatcher's Diary are available in our archives at <http://www.pa.msu.edu/abrams/SkyWatchersDiary/Archives.html>
<ftp://www.pa.msu.edu/pub/swd/>

Skywatcher's Diary: July 2000

Saturday, July 1

The Moon is New at 3:20 p.m. EDT this afternoon. About three hours later the Moon reaches its closest point to Earth (perigee) for the year, a mere 222,054 miles away. With New Moon happening so close to this minimum perigee, larger than normal tides will occur on the seacoasts.

Sunday, July 2

The first crescent Moon of the month sets an hour after sunset in the WNW. For a real challenge

look 15 minutes after sunset to find Venus 10 degrees to the Moon's lower right. Find an observing site with a flat western horizon and bring along your binoculars.

Monday, July 3

The thin Moon is picture-perfect tonight about an hour after sunset. Look for the dark portion of the Moon cradled in the bright crescent. You may be able to detect shadowy features within the Moon's night side. "Earthshine" is the term used to describe the phenomenon of seeing the dark part of the Moon. If you were standing on the Moon in that dark area, you would see a very bright, almost full, Earth.

The Earth is farthest from the Sun today; 94,512,388 miles separate the two bodies. If you think winter is caused by Earth's distance from the Sun, think again.

Tuesday, July 4

When you are out this Independence Day evening waiting for the sky to become dark enough for fireworks, glance in the west to pick up the crescent Moon. Just to the Moon's lower left, four moon-diameters away, is the star Regulus, the heart of Leo the Lion. The "Sickle" shape of Leo's head extends to the upper right of the Moon.

Wednesday, July 5

If you've had reason to be up an hour before sunup, you've probably seen the bright "stars" in the eastern sky. Jupiter is brilliant, brighter than any other object in the sky at that time. Saturn is also bright and to Jupiter's upper right. More directly above Jupiter is the pretty cluster of stars known as the Pleiades, or Seven Sisters. Below Jupiter and to the left is the bright star Aldebaran, the eye of Taurus.

Thursday, July 6

Mercury passes Inferior Conjunction today, a completely unobservable event. The term signifies that Mercury's orbit has carried the planet between the Sun and Earth. Although the planet could be directly in line with the other two bodies and appear in silhouette against the Sun's disk, Mercury usually skirts a little above or a little below the imaginary Earth-Sun line. Today Mercury passes several degrees below the Sun.

Friday, July 7

The Moon has not quite reached First Quarter tonight. Can you tell? Use binoculars or a telescope to examine the shadow's edge, or terminator, for craters. Sunlight hitting the craters there produces the longest shadows and exaggerates the rugged terrain.

Saturday, July 8

The Moon passed First Quarter this morning at 8:53 a.m. EDT, but then it was on the other side of the Earth. Tonight the Moon will appear just beyond "half" full. The star Spica, in Virgo, shows 6 degrees below the Moon in the early evening. Virgo is the longest of the zodiacal constellations, spanning over 40 degrees of the zodiac.

Sunday, July 9

The Moon travels around the sky through the zodiac constellations, making a circuit in just over 27 days. The Moon therefore moves about 13 degrees a night relative to the stars. Last night the Moon was above the star Spica. Tonight it is a little more than 13 degrees to Spica's upper left.

Monday, July 10

Tonight the Moon has moved into the constellation of Libra the Scales, a faint group of stars forming a rough parallelogram. The two brightest stars are only 3rd magnitude, similar to the faintest star in the Big Dipper. These stars have intriguing names of ancient Arabic origin: Zubenelgenubi and Zubeneschamali. Loosely translated they mean "southern claw" and "northern claw," respectively, referring to claws of the scorpion to which constellation the stars once belonged.

Tuesday, July 11

The waxing gibbous Moon is due south an hour after sunset, near the head of Scorpius the Scorpion. The head region is marked by three equally spaced stars that form a gently curving vertical arc a few degrees below the Moon. The middle star is 2nd magnitude (like the majority of stars in the Big Dipper); the top and bottom stars, each 3 degrees from the center star, are a magnitude fainter. Bright moonlight will make them difficult to see.

Wednesday, July 12

Today the Moon passes Antares, the brightest star in Scorpius. By evening the Moon stands 8 degrees to the upper left of that star. Antares is a large, cool star. Its outer surface temperature is about 5,000 degrees Fahrenheit. The Sun's surface temperature, for comparison, is 10,000 degrees F.

Thursday, July 13

Tonight the Moon lies on the border between Scorpius and Sagittarius. It stands about 6 degrees above the place that marks the center of the Milky Way, our home galaxy. On a moonless night from a dark location the spot looks unremarkable. Nothing you see with the naked eye suggests that 35,000 light years off in that direction lies a tumultuous realm flooded with deadly radiation and harboring an enormous black hole.

Friday, July 14

Look at the Moon closely. Is it full tonight? Can you guess when it will be full?

This evening the Moon stands directly over the "Teapot," the most recognizable part of Sagittarius. Although the constellation is named after the mythical centaur, amateur astronomers universally know it by the eight-star teapot pattern. The top of the lid is marked by the 3rd-magnitude star 3 degrees to the Moon's lower right. The handle is 8 degrees to the lower left, and the spout is 9 degrees to the lower right. On a dark night, faint "steam," in the form of the Milky Way, rises from the spout.

Saturday, July 15

The Moon approaches Full tonight, attaining that phase exactly at 9:55 a.m. EDT tomorrow morning. Near that time a total lunar eclipse occurs. The Moon, unfortunately, sets before then for the eastern two-thirds of North America, making the eclipse unobservable.

Sunday, July 16

The brightest star-like object in the eastern morning sky is Jupiter. To its upper right Saturn appears 5 degrees (a "half-fist") away. Saturn is the showpiece for small telescopes. Its rings are now tipped so that we see their underside. Careful inspection also reveals the planet's shadow cast on the ring system, giving the scene a distinctly three-dimensional feel. If you want to catch the planetary duo you must get up early. Jupiter and Saturn won't move into the evening sky until November, rising then as the Sun sets.

Monday, July 17

The time of sunrise and sunset change very gradually during this part of the year. At mid-northern latitudes it takes nearly two months for the times to shift by ten minutes, in contrast to the more than minute-per-day change that occurs around the equinoxes. This "stationary-sun" phenomenon is expressed in the term "solstice" which literally means "sun stands still."

Tuesday, July 18

What is the brightest star visible at the end of evening twilight tonight? Try to determine this by observing. There are two likely choices. See if you can tell which is brighter. Answer given tomorrow.

The Moon rises tonight about the time twilight ends. For the next two weeks a portion of the night will be moonless, growing longer each night. This period of the month is favored by most serious star-gazers who often plan their observing projects for the "dark of the moon."

Wednesday, July 19

The two brightest stars visible in the early evening are Vega, high up in the east, and Arcturus, halfway up in the SW. Which is brighter? Technically Arcturus is 0.08 magnitudes brighter, so don't be surprised if you couldn't tell. What should have been more noticeable is the color contrast between the two stars. One is considered white, the other orange. Which color would you assign to which star? And what causes the colors? Answers tomorrow.

Thursday, July 20

Vega, the bright star high in the east in the early evening, is a brilliant white, particularly when compared to Arcturus, the bright star in the SW. Most observers describe Arcturus as yellow or orange. The colors come from the stars' surface temperatures—the hotter, the whiter; the cooler, the redder. Vega's surface temperature is about 16,000 degrees F. Arcturus is a "cool" 7,000 degrees F.

Friday, July 21

The Summer Triangle dominates the eastern sky these evenings. In addition to Vega, mentioned previously, the triangle is composed of Altair, lower in the ESE, and Deneb, the faintest of the trio, in

the NE. One degree away from Vega toward the direction of Deneb is the famous "double-double" star, Epsilon Lyrae. What appears as a single 4th-magnitude star becomes two stars in binoculars or to the keen unaided eye, and each of those in turn split in two under a moderate amateur telescope.

Saturday, July 22

The Moon is out of the way, so once evening twilight ends the sky will be completely dark. A perfect time to enjoy the Milky Way. The hazy pathway that marks the rim of our home galaxy rises out of the south, passes through the Summer Triangle in the east and disappears in the north. Binoculars are the instrument of choice for the Milky Way, although a comfortable lounge chair alone is sufficient. The most important requirement: a pitch-black sky.

Sunday, July 23

While looking at the Milky Way these evenings, stand facing east. To your right, above the southern horizon, is the direction toward the galaxy's center. To the left leads us away to the edges of our great spiral galaxy. In front, up near the bright star Vega, is the direction in which the Earth and solar system are traveling, relative to the stars around us. Allow your mind to relax and you can almost feel yourself hurtling through space.

Monday, July 24

The Moon reaches Last Quarter at 7:02 a.m. EDT this morning. Look for the Moon at the exact moment of Last Quarter. There is absolutely no practical reason for doing this, but you need to do something frivolous now and then.

Tuesday, July 25

The Moon passes through the region of the sky where Jupiter and Saturn reside over the next several mornings. An hour before sunrise this morning Saturn is 15 degrees (1 1/2 "fists") to the lower left of the Moon. The Pleiades star cluster is 17 degrees due left of the Moon.

Wednesday, July 26

A pretty sight awaits early risers this morning. Saturn is just 3 degrees to the upper left of the Moon, and Jupiter is twice as far to the Moon's left. The Pleiades star cluster is above the two planets, and the Hyades star cluster, more spread out than the Pleiades, is below. The bright star Aldebaran is among the stars of the Hyades but is not a physical member of the group.

Thursday, July 27

An hour before sunrise this morning the crescent Moon, three days before New, appears in the east just to the left of Aldebaran, the eye of Taurus the Bull. Jupiter and Saturn are to the upper right, and the stars of Orion are starting to rise below the Moon. The planet Mercury begins a morning appearance, too, very low in the ENE. Today it is at its farthest angle from the Sun (greatest elongation, 20 degrees), but will become brighter the first week of August.

Friday, July 28

An hour before sunrise this morning the Moon resides between Aldebaran, to the upper right, and Mercury, to the lower left, just above the horizon. Tomorrow morning the Moon will be only 4 degrees to the upper right of Mercury, making both objects easier to spot in the bright twilight.

Saturday, July 29

The asteroid Vesta is at its brightest for the year, just above the naked-eye limit. You'll need a dark sky, binoculars and a good finder chart to locate it. Try this website for a chart:
<http://www.skypub.com/sights/skyevents/0003skyevents.html>.

Vesta is between Sagittarius and Capricornus, so familiarity with those constellations is helpful. The minor planet is at its highest about 4 hours after sunset, but it is high enough (19 degrees) by the end of twilight, 2 hours after sunset. Uranus and Neptune are in the vicinity. If you are successful at finding Vesta, Uranus will offer a similar challenge next month.

Sunday, July 30

The closest Moon of the year occurred on the first day of this month. The second closest happens today at 4 a.m. when the Moon comes within 222,685 miles of Earth. The close approach coupled with New Moon (10:25 p.m. tonight) means higher than normal tides once again.

Monday, July 31

Tonight offers the opportunity to see a young (less than 24 hours old) Moon. Look 15 minutes after sunset in the WNW. You will need a flat horizon and binoculars. Venus is only 1 degree to the upper left of the Moon, so it makes a useful marker. As the morning continues the Moon passes in front of Venus (an occultation), but this happens too late to see for all but some parts of western North America. The Moon will have set by then for the rest of us.

*Please send any comments, suggestions, or questions to
Thomas G. Ferguson: fergus52@pilot.msu.edu*