Abrams Planetarium Skywatcher's Diary December 2000

To the reader:

The Skywatcher's Diary for December 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 December issue, please send a long, self-addressed stamped envelope to:

December 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: December 2000

Friday, December 1

The waxing crescent Moon sits in the SSW at the end of evening twilight. Uranus is 3 degrees (6 moon diameters) directly above the Moon. The planet is barely visible to the unaided eye under the best of conditions, so tonight is not the best time to look for it. Venus is the brilliant object 23 degrees (about two "fist widths") to the Moon's lower right.

Saturday, December 2

The fat crescent Moon makes a good binocular target tonight. The large, dark, roughly circular area nearest the top of the Moon is Mare Serenitatis, the "Sea of Serenity." Although the name implies a body of water, the feature is a huge ancient crater that was filled by lava.

Sunday, December 3

The Moon is exactly First Quarter at 10:55 p.m. EST, so the terminator, separating the light and dark halves, will be perfectly straight. If your calendar uses Greenwich Time for moon phases, it will indicate tomorrow as the date of First Quarter.

Monday, December 4

Pluto is in conjunction with the sun today, which means it lies most directly behind our daytime star. The moment is of no practical or astronomical significance, except, perhaps, to "Plutophiles." The light from this most distant planet takes 4 hours and 20 minutes to reach us today.

Tuesday, December 5

Should you be outdoors before 6 a.m. these mornings, look low in the WNW. Jupiter is the brilliant object, and Saturn is one fist width to Jove’s lower right, just above the treetops. The orientation may seem strange, if by now you are use to seeing these planets in the east at the end of evening twilight.

Wednesday, December 6

To fans of fleet-footed Mercury, December will be a disappointment. The planet has disappeared into morning twilight, not to reappear until mid-January in the evening sky. Mercury stands in conjunction with the sun, on the far side, on Christmas Day.

Thursday, December 7

Today marks the earliest sunset of the year for those of us living around 40¡ N latitude. The shortest day is, yet, two weeks away, and the latest sunrise two weeks beyond that. If the earth’s orbit were a circle rather than an ellipse we wouldn’t have this apparent inconsistency.

Friday, December 8

The Moon approaches Saturn tonight. At the end of evening twilight the planet is 10 degrees (one fist) to the left, and slightly below, the Moon. By tomorrow morning the Moon will be within 6 degrees of Saturn. During the middle of the day tomorrow, invisible to us, the Moon will pass 2 degrees below the planet. Look at the configuration again tomorrow night.

Saturday, December 9

The Moon is nicely place between and below the two bright giant planets tonight. To the upper right is Saturn; to the upper left is Jupiter. At the end of evening twilight the Moon is slightly nearer the ringed planet, but within three hours it’s slid closer to Jupiter. Try predicting where the Moon will be tomorrow night, and then check your estimate against the sky.

Sunday, December 10

Tonight the Moon has moved 10 degrees to the left of Jupiter. Can you tell if the Moon is full, yet? Use binoculars to look around the Moon's edge. Is it completely round and smooth as it would be if sunlight is hitting it straight on, or does one side look rougher, as though it is illuminated more obliquely? The Moon is precisely full at 4:03 a.m. tomorrow morning.

Monday, December 11

The Moon rises about 35 minutes after sunset tonight. Notice the direction of its rising point, slightly north of ENE. Where do you expect it to set tomorrow morning, about a hour after sunrise? Due west? South of west? North of west? In December the Full Moon's path during the night mimics the sun's daytime journey in June, following a long, high arc from approximately ENE to WNW.

Tuesday, December 12

The Moon rises about 2 hours after sunset tonight. Once it gets up over the treeline, look one "fist" (about 10 degrees) to its left for two bright stars, one 5 degrees above the other. You have found the Gemini twins, Pollux and Castor. Pollux is the slightly brighter brother, the one on the bottom. Can you detect a difference?

Wednesday, December 13

The Geminid meteor shower, named after the Twins constellation, should reach its peak tonight and tomorrow morning. An average of one meteor sighting per minute is the usual anticipated rate. Unfortunately, bright moonlight will greatly hamper viewing. Expect to see significantly less.

Thursday, December 14

If you haven't looked carefully at the area of the sky surrounding Jupiter and Saturn, do so some clear night with unaided eye and binoculars. Jupiter lies between two interesting objects. Seven degrees above is the fascinating Pleiades star cluster. Below Jupiter is the bright orange star, Aldebaran, the eye of Taurus, the Bull. To that star's right, the Hyades, a much looser cluster of stars, marks the face of the bull.

Friday, December 15

Over the next couple of nights the Moon passes through the constellation of Leo. Near 11 p.m. tonight, the Moon rises with Regulus, the heart of the lion, just 3 degrees (6 moon diameters) to Luna's right. Tomorrow morning 6 degrees separate the Moon and star. By Sunday morning the Last Quarter Moon is 8 degrees below Denebola, the lion's tail.

Saturday, December 16

Mars' rotational axis is tipped over similar to earth's, so the Red Planet also experiences seasons. Today marks the summer solstice for that planet's northern hemisphere, and winter for the south. The northern polar ice cap is now near minimum size. If you meet anyone today who acts like they are from

Mars, wish them a happy summer (or winter) solstice.

Sunday, December 17

Last Quarter Moon occurs at 7:41 p.m. EST tonight. You won't be able to see the Moon at that exact moment, it doesn't rise until after midnight. The Summer Triangle, that familiar evening companion since June, is soon to be lost in evening twilight. Take a parting look, and remember the summer past. The three bright, widely spaced stars are 1/3 to 1/2 way up in the west at the end of twilight.

Monday, December 18

Robert Frost, in his poem The Star-Splitter, describes Orion as coming up sideways. ". . . Throwing a leg up over our fence of mountains. . .". You can understand what Frost meant by observing the eastern horizon any evening this time of year at the end of twilight and watching Orion rise.

Tuesday, December 19

The ancient Roman midwinter festival of Saturnalia began on this date in an age long past. The root of the observance was the winter solstice, when the life-giving sun halted its descent and once more began its northward return. During the celebration masters feasted with slaves and gifts were exchanged. The holiday was eventually overshadowed by Christmas and New Year's Day.

Wednesday, December 20

Mars is easy to find this morning with the help of the Moon. Before dawn look in the SE. The Moon is 4 degrees (8 moon diameters) to the upper left of Mars. You may be fooled if you are expecting the planet to be as bright as the current evening planets. Mars is only 2nd magnitude. The 1st magnitude star Spica, in Virgo, is 5 degrees to the right of Mars. The planet should appear redder than the star.

Thursday, December 21

The solstice occurs at 8:37 a.m. EST. Traditional winter begins for the northern hemisphere, although many ancient cultures considered this midwinter. We experience the longest night of the year, about 15 hours of darkness for midnorthern latitudes. For everyone above the arctic circle, the sun never breaks the horizon at all.

Friday, December 22

Tomorrow morning, an hour before sunrise, the thin crescent Moon stands 9 degrees (a fist) above the SE horizon and 8 degrees to the upper left of the ruddy star Antares, heart of Scorpius. The following morning (Sunday) is the last chance to catch the Moon before New. A hairline Moon sits just above the horizon 45 minutes before sunup. Antares, then, is 12 degrees to the upper right of Luna.

Saturday, December 23

The Moon is New in two days, on Christmas. Most of North America receives a gift when the Moon passes across the face of the sun, casting a shadow on us and creating a partial solar eclipse. For

most of Michigan the sun will be about half covered near 12:25 p.m. The eclipse begins around 11 a.m. and ends near 2 p.m. For your local circumstances see:

http://sunearth.gsfc.nasa.gov/eclipse/extra/PSE2000Dec25city1/PSE2000Dec25city1.html

***[EDITORS: You may also call or email David Batch at Abrams Planetarium, (517) 355-4676, *dbatch@msu.edu* for the information.]

Sunday, December 24

Tomorrow's partial solar eclipse can severely damage eyesight without adequate precautions. A homemade filter is never safe. Sunglasses are not safe. Filters which attach to telescope eyepieces are not safe. An indirect method of viewing, such as pinhole projection, is recommended. For more information on this procedure, see the following website:

http://sunearth.gsfc.nasa.gov/eclipse/SEhelp/safety.html

Monday, December 25

New Moon occurs at 12:22 p.m. EST. This is near the time of maximum for the partial solar eclipse, as well. Although caution is necessary, don't let the warnings frighten you into missing the eclipse. Eye damage occurs only from staring at the sun without adequate protection. The procedures for safe viewing are not difficult, but you'll need to do a little homework ahead of time.

Tuesday, December 26

Try to find the young Moon only 29 hours after it passed in front of the sun. You need a flat, clear southwestern horizon and binoculars. Look 30 minutes after sunset 10 degrees to the north of due southwest and less than 5 degrees above the horizon. The Moon sets just under an hour after sunset.

Wednesday, December 27

An hour after sunset the pretty crescent Moon sits low in the SW. Brilliant Venus hangs much higher, 22 degrees (about two fists) to the Moon's upper left. Binoculars reveal a 3rd-magnitude star (Delta in Capricornus) 1 degree (two moon widths) to the left of Venus and a 4th-magnitude star (Gamma in Capricornus) 1 degree below the planet.

Thursday, December 28

The Moon is only 12 degrees to the lower right of Venus this evening. Guess where the Moon will be tomorrow night, relative to Venus. If you picked out the 3rd-magnitude star Delta Capricorni with binoculars to the left of Venus last night, note that it appears below the planet tonight. Venus' orbital motion against the starry backdrop has been revealed.

Friday, December 29

This evening the Moon and Venus create a sight you won't want to miss. The Moon is only 2 degrees (4 moon diameters) to the lower left of Venus.Try taking a photo. Go out early enough, say 30

minutes after sunset, to wait for good background twilight colors.

Thursday, December 30

At the end of evening twilight Venus and the Moon blaze in the SW, and Jupiter and Saturn dangle high in the SE, among some of the brightest stars of the sky. They are like celestial ornaments hanging from the holiday firmament, as if to signal the coming of the new year.

Friday, December 31

Today marks the last day of the second millennium of the Christian era. If you celebrated a year early, no matter. It was simply a dress rehearsal for the real thing. On your way to or from your celebrations tonight, pause to look up. And remember that the stars, planets, Moon that you view are the same ones seen by your ancestors who were present at the beginning of the millennium.

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