WEST VIRGINIA UNIVERSITY
EBERLY COLLEGE OF ARTS AND SCIENCES
DEPARTMENT OF PHYSICS AND ASTRONOMY
WVU PLANETARIUM AND OBSERVATORY

Mountaineer Skies

Volume 15, Issue 2 | http://planetarium.wvu.edu/ | April – May – June 2015

For those of you who are confused about "**what is a planet**", why Pluto was demoted, and have a little over an hour's spare time, you might try this youtube video streamed from Harvard on September 18, 2014:
https://www.youtube.com/watch?v=2RNGSuFqmro
The thought processes and conclusions might surprise you.

April 04 - Total Lunar Eclipse

Moonrise	2015 April 03 19:13
Moon enters penumbra	2015 April 04 05:00
Moon enters umbra	2015 April 04 06:15
Moonset	2015 April 04 07:04

The moon sets at 07:04 A.M. on April 4, so you will not be able to see any more of the eclipse after this.
A better Total Lunar Eclipse will occur on September 28.
Other upcoming **lunar eclipses** (times/dates/location) can be found at http://eclipse.gsfc.nasa.gov/lunar.html and upcoming solar eclipses can be found at http://eclipse.gsfc.nasa.gov/solar.html

The best time to view the Lyrids Meteor Shower will be early on the morning of Wednesday, April 22. Looking easterly about 40 degrees above the horizon, you should be able to see (hopefully) 10 – 20 per hour, although more is possible. A dark sky is essential for good viewing.

INSIDE THIS ISSUE

In The Sky This Quarter

Visible Planets in the Night Sky

Beginning of April, 2015

	Const	Rise	Transit	Set	Mag
Sun		07:03	13:24	19:44	-26.8
Mercury	Psc	06:54	12:55	18:58	-1.1
Venus	Ari	08:36	15:43	22:50	-4.0
Mars	Ari	07:52	14:35	21:18	1.4
Jupiter	Cnc	14:37	21:41	04:45	-2.4
Saturn	Sco	23:54	04:51	09:47	0.3

Beginning of May, 2015

	Const	Rise	Transit	Set	Mag
Sun		06:20	13:17	20:14	-26.8
Mercury	Tau	07:11	14:35	22:01	-0.3
Venus	Tau	08:35	16:12	23:50	-4.1
Mars	Ari	06:54	14:03	21:11	1.4
Jupiter	Cnc	12:43	19:46	02:49	-2.2
Saturn	Sco	21:49	02:46	07:44	0.1

Beginning of June, 2015

	Const	Rise	Transit	Set	Mag
Sun		05:54	13:18	20:41	-26.8
Mercury	Tau	05:53	13:06	20:14	5.2
Venus	Gem	09:08	16:35	00:03	-4.3
Mars	Tau	06:06	13:32	20:58	1.5
Jupiter	Cnc	10:55	17:57	00:57	-2.0
Saturn	Lib	19:36	00:35	05:34	0.1

Psc	Pisces, The Fishes
Lib	Libra, The Scales
Ari	Aries, The Ram
Tau	Taurus, The Bull
Cnc	Cancer, The Crab
Sco	Scorpius, The Scorpion
Gem	Gemini, The Twins

About: **Columbus, Regiomontanus, and the Blood Red Total Lunar Eclipse of February 29/ March 1, 1504**

Of Christopher Columbus' four voyages to the New World, the first one has been the one most remembered and celebrated. It is the source of the old rhyming mnemonic "Columbus sailed the ocean blue in fourteen hundred and ninety-two (1492)". He was actually looking for a direct sea route to China, rather than a place for a Caribbean vacation. Leaving Spain on August 3, 1492, and sailing westward with three small ships, the Pinta (56 feet in length with a crew of 26), the Niña (50 feet in length with a crew of 24), and Columbus' flag ship, the Santa María (62 feet long with a crew of 40), the commodore and his little band of reluctant sailors crossed the Atlantic Ocean in ten weeks, having unusually good weather (it being hurricane season). He sighted land, an island, which he named San Salvadore, on October 12. The only bother came when he had to put down a minor mutiny (if there is such a thing) that included both seamen and officers. After many adventures, he returned first to Portugal on January 16, 1493, and, finally, two months later to Spain, where he was hailed a national hero.

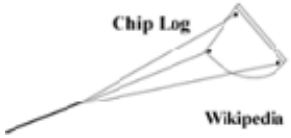
His second voyage, with a significantly larger fleet of seventeen vessels, began in September 1493, and concluded on June 8, 1496.

Casting off on May 30, 1498, this time with a smaller flotilla of just six ships, his third expedition ended in October 1500.

But it is his fourth and final voyage to the New World that is the main subject of this article. It began on May 11, 1502, with Columbus commanding a small group of four boats, all in poor condition and in serious need of repair. It lasted until November 7, 1504, when he was able to limp back to Spain as a passenger on a slow rescue boat after losing all of his ships and almost his life.

Celestial navigation during the time of Columbus was useful mainly on land because clocks were fairly accurate there, unlike at sea where, until 1737 when the naval chronometer was invented by John Harrison, time pieces were not accurate enough for navigation using the stars and sun.

Dead Reckoning is a system that uses a compass for direction. Then, to know how far you have sailed in a particular direction required knowing the approximate distance your ship traveled for a particular time, say, one hour or one day. This is where this method gets a little inaccurate.



A **chip log**, which is simply a small piece of flat wood connected to a line with knots tied at regular intervals, is thrown overboard. Since there were no accurate time pieces, a chant, essentially "one-thousand one, one-thousand two," and so on, was used to determine average distance traveled (speed x time).

Fortunately Columbus also had an almanac by **Regiomontanus** called by the riveting name of *Ephemerides for the years 1475 -1506* which gave the rising, transit, and setting of the sun, the moon, and several planets. It also predicted solar and lunar eclipses.

Columbus' Fourth Voyage

It is during his last voyage to the New World that astronomy became a major player in his and his men's survival. On May 11, 1502, Columbus, now 51 years old and not well, accompanied by Bartolomeo, his brother, and Fernando, his thirteen year old son, set sail from Cádiz, Spain, still looking for China with four, barely seaworthy ships: his flagship, the Capitana, the Gallega, the Vizcaína, and, lastly, the Santiago de Palos. None of these ships was destined to return home. Two of his ships succumbed to a fatal infestation of shipworms. His final two ships he beached on Jamaican sand on June 30, 1503, and the lumber was used for various things including a defensive structure.

Initially, the natives welcomed Columbus and his crew, and even fed them for nearly six months. In thanks for this very generous gesture by the indigenous Jamaicans, Columbus' crew cheated and stole from them, thus wearing out their welcome. This was a serious setback as they had no other source of food, a true example of biting the hand that fed them.

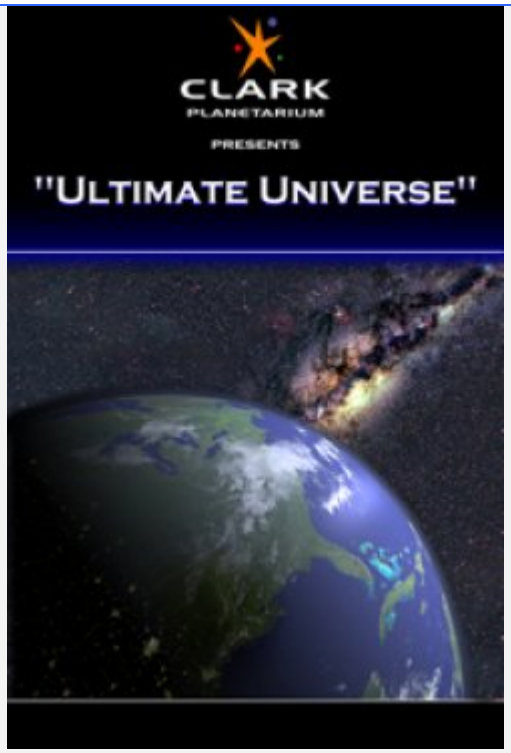
Fortunately for his crew of ingrates, Columbus had an excellent memory. After consulting his Regiomontanus almanac for the night of February 29, 1504, he asked for a meeting with the local chief and told him that if they did not continue feeding the Spaniards, the gods would make the Moon turn blood red and then disappear forever. The chief was, of course, quite skeptical. He had had enough of these freeloading Europeans. But Columbus was persistent in his threat to remove the moon, and, just as the almanac predicted, the eclipse occurred on schedule, though Columbus did have to do a bit of estimating, as the times of the eclipse in the almanac were based on Nuremberg, Germany, not Jamaica. This profoundly impressed the local people and the feeding was restored.

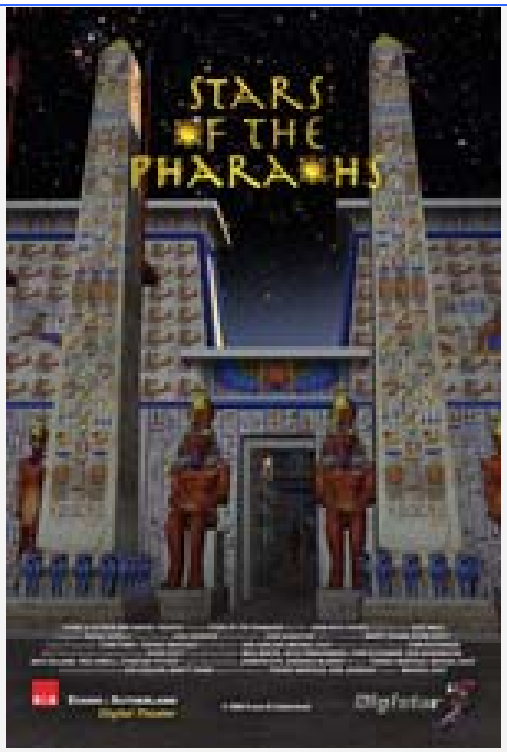
A few months later, on June 29, 1504, a Spanish ship arrived to take the survivors aboard and transport them back to Spain. After some adventures, they arrived in Spain on November 7, 1504. His declining health finally took his life on May 20, 1506. Though he never found the Orient, his efforts made Spain the wealthiest country in Europe for many years.

Several writers of fiction based story plots on this event, notably H. Rider Haggard's *King Solomon's Mines* (1885) and then later *A Connecticut Yankee in King Arthur's Court (1889)* by Mark Twain. I am sure there are others.

Wood cut of Columbus and the lunar eclipse.

2015 Planetarium Shows





April 10 & 24	May 8 & 22	June 12
8:00 P.M. *Ultimate Universe* 9:00 P.M. *Stars of the Pharaohs*	8:00 P.M. *Ultimate Universe* 9:00 P.M. *Stars of the Pharaohs*	8:00 P.M. *Ultimate Universe* 9:00 P.M. *Stars of the Pharaohs*

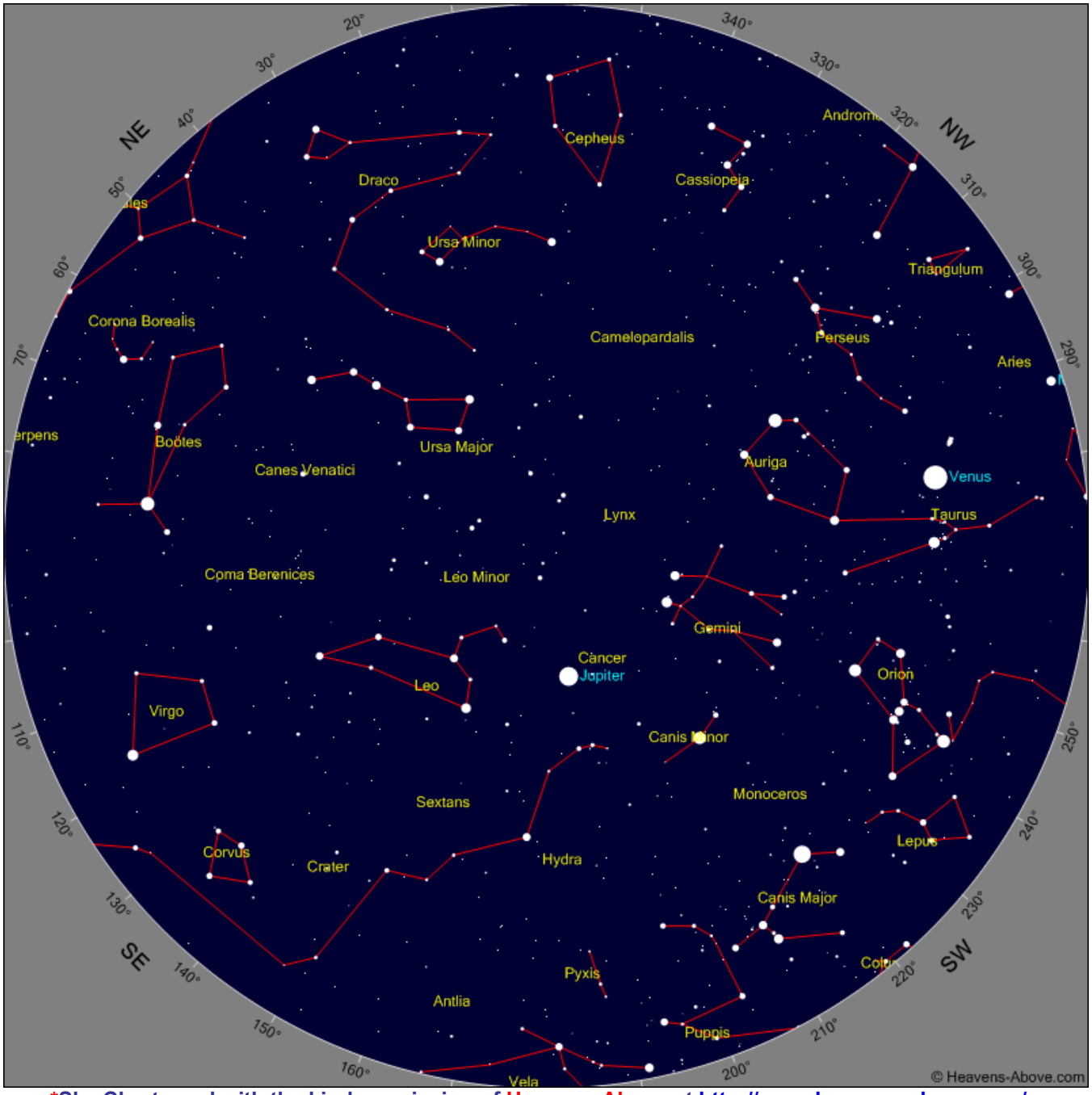
For those who are interested in bringing a group, such as schools or scouts, during the day, please call for more information. These shows are usually given on Tuesday or Thursday mornings.

For further information or reservations, please call John Hopkins at (304)293-4961, or by email at: jghopkins@mail.wvu.edu

Selected Sunrise/Sunset and Moon Rise/Moon Set Times

Date	Sunrise	Sunset	Moon Rise	Moon Set	Moon Phase
April 4	7:00 A.M.	7:46 P.M.	8:10 P.M.	7:04 A.M.	Full Moon
April 11	6:50 A.M.	7:53 P.M.	1:46 A.M.	12:05 P.M.	Last Qtr
April 18	6:39 A.M.	8:00 P.M.	6:38 A.M.	8:07 P.M.	New Moon
April 25	6:29 A.M.	8:07 P.M.	12:27 P.M.	1:52 A.M.	First Qtr
May 3	6:19 A.M.	8:15 P.M.	7:57 P.M.	6:10 A.M.	Full Moon
May 11	6:10 A.M.	8:22 P.M.	2:01 A.M.	1:11 P.M.	Last Qtr
May 18	6:03 A.M.	8:29 P.M.	6:39 A.M.	9:07 P.M.	New Moon
May 25	5:58 A.M.	8:35 P.M.	1:04 P.M.	1:37 A.M.	First Qtr
June 2	5:54 A.M.	8:41 P.M.	8:42 P.M.	6:06 A.M.	Full Moon
June 9	5:52 A.M.	8:46 P.M.	1:20 A.M.	1:18 P.M.	Last Qtr
June 16	5:52 A.M.	8:49 P.M.	6:10 A.M.	8:49 P.M.	New Moon
June 24	5:53 A.M.	8:51 P.M.	1:40 P.M.	1:09 A.M.	First Qtr

April 2015 Year Sky Chart* for:
10:00 P.M. at the beginning of the month
9:00 P.M. in the middle of the month
8:00 P.M. at the end of the month

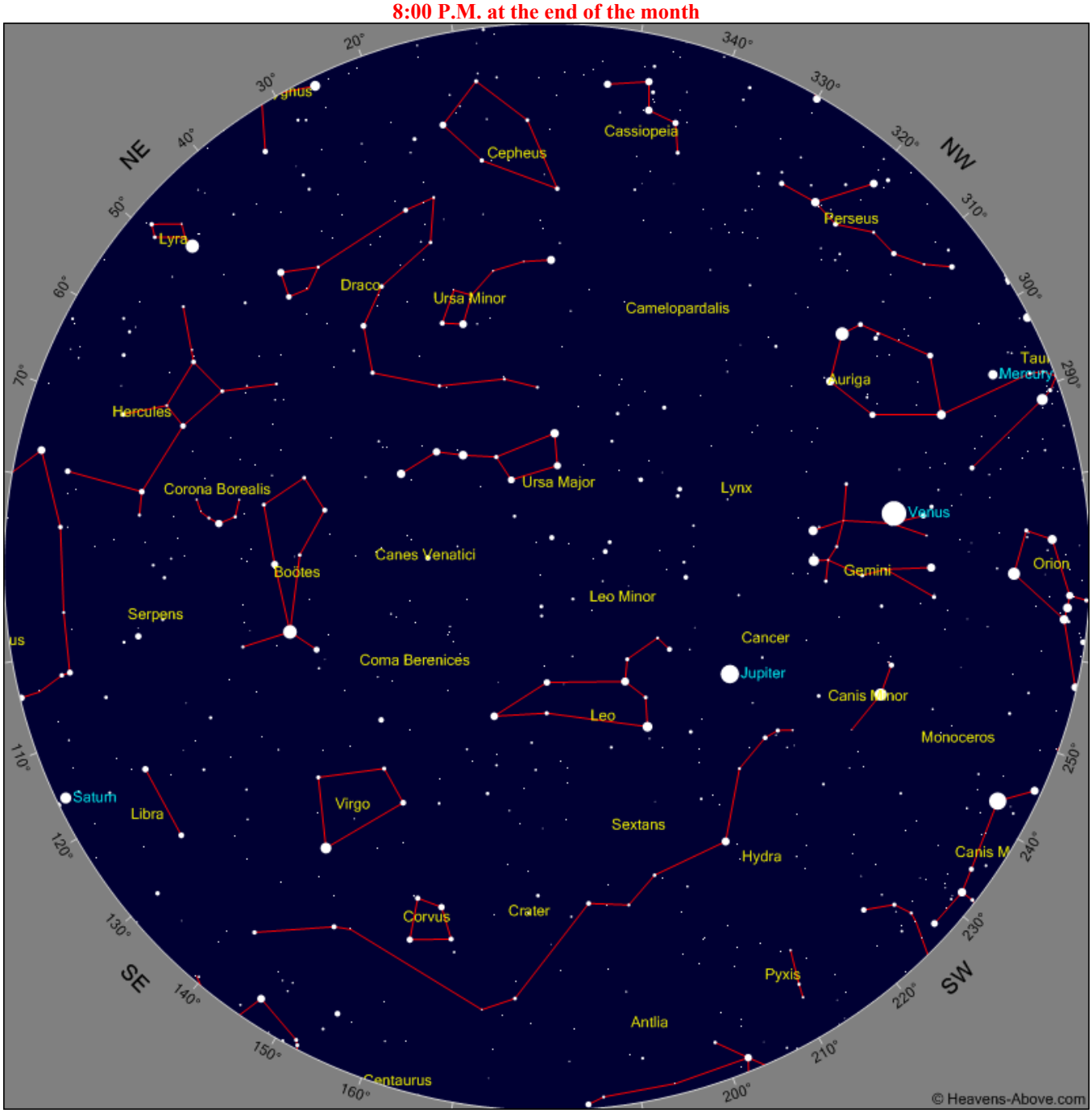


*Sky Chart used with the kind permission of Heavens-Above at http://www.heavens-above.com/

The WVU PLANETARIUM is for the educational benefit of WVU students, staff, and faculty members, as well as the local community. Should you wish to make a contribution to the planetarium, it can be made through the WVU Planetarium Project at the WVU Foundation, Inc., phone (304)284-4000. Thank You.

Edited by John Hopkins
(304)293-4961
jghopkins@mail.wvu.edu

May 2015 Sky Chart* for:
10:00 P.M. at the beginning of the month
9:00 P.M. in the middle of the month
8:00 P.M. at the end of the month

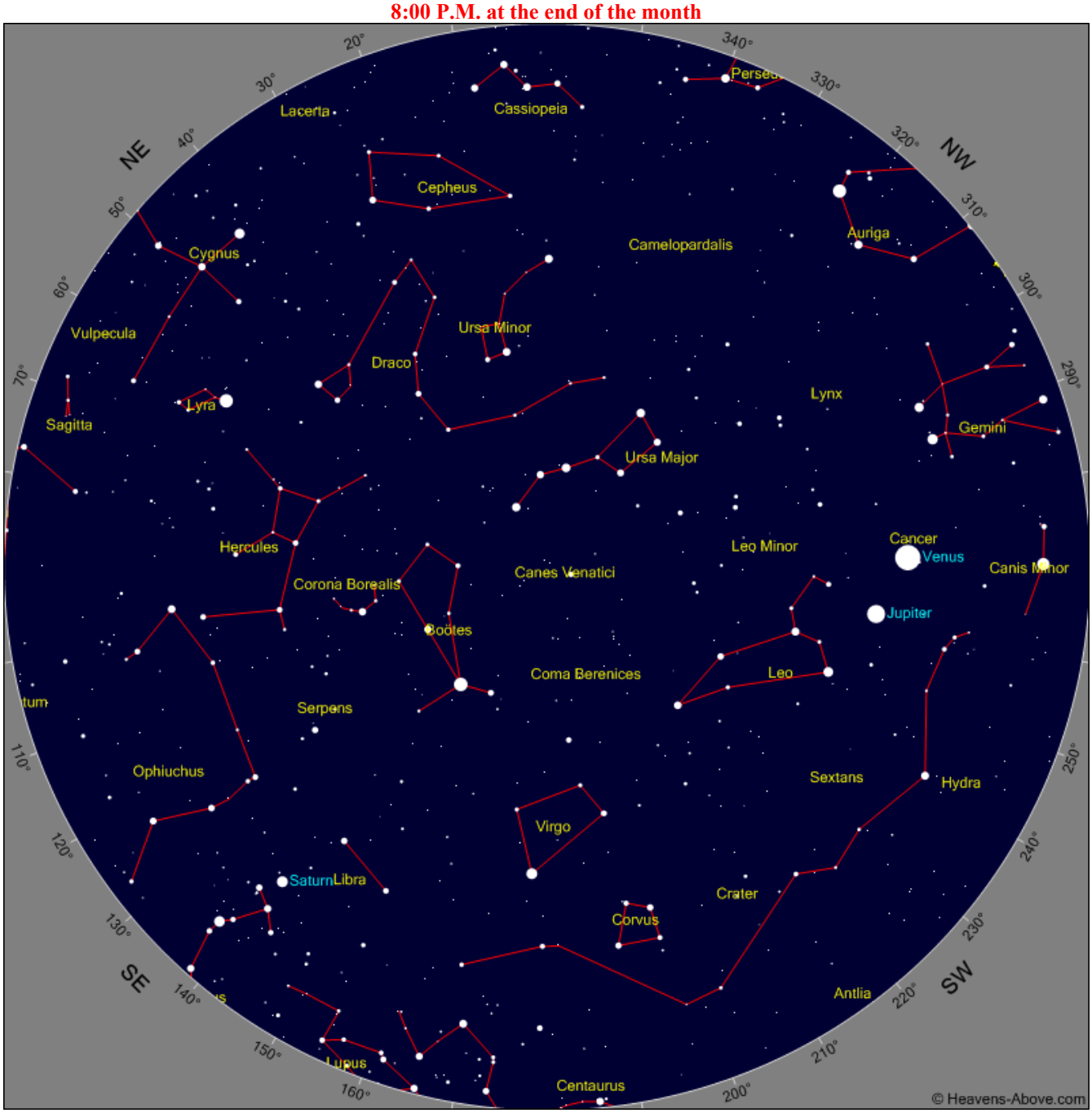


*Sky Chart used with the kind permission of Heavens-Above at http://www.heavens-above.com/

The WVU PLANETARIUM is for the educational benefit of WVU students, staff, and faculty members, as well as the local community. Should you wish to make a contribution to the planetarium, it can be made through the WVU Planetarium Project at the WVU Foundation, Inc., phone (304)284-4000. Thank You.

Edited by John Hopkins
(304)293-4961
jghopkins@mail.wvu.edu

June 2015 Sky Chart* for:
10:00 P.M. at the beginning of the month
9:00 P.M. in the middle of the month
8:00 P.M. at the end of the month



*Sky Chart used with the kind permission of Heavens-Above at http://www.heavens-above.com/

The WVU PLANETARIUM is for the educational benefit of WVU students, staff, and faculty members, as well as the local community. Should you wish to make a contribution to the planetarium, it can be made through the WVU Planetarium Project at the WVU Foundation, Inc., phone (304)284-4000. Thank You.

Edited by John Hopkins
(304)293-4961
jghopkins@mail.wvu.edu