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

Mountaineer Skies

Volume 14, Issue 2 http://planetarium.wvu.edu/ April – June, 2014

***Total Lunar Eclipse on Tuesday, April 15, 2014**

Moonrise	**19:34**	**April 14**	**EST**
Moon enters penumbra	**00:52**	**April 15**	**EST**
Moon enters umbra	**01:58**	**April 15**	**EST**
Moon enters totality	**03:06**	**April 15**	**EST**
Middle of eclipse	**03:46**	**April 15**	**EST**
Moon leaves totality	**04:25**	**April 15**	**EST**
Moon leaves umbra	**05:33**	**April 15**	**EST**
Moon leaves penumbra	**06:39**	**April 15**	**EST**
Moonset	**06:50**	**April 15**	**EST**

On the night of May 5/6, the **Eta Aquarid Meteor Shower** will peak with an estimated maximum occurrence of between 20 up to 60 incidences per hour. This meteor shower debris comes from the famous **Halley's Comet** which is scheduled to visit again in 2061.

Summer or the **Summer Solstice** begins this year on Saturday, June 21. The first day of **autumn**, or the **Autumnal Equinox,** is on Monday, September 22 and, finally, the **Winter Solstice** or the first day of winter occurs on Sunday, December 21.

***Data courtesy of the US Naval Observatory**

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In The Sky This Quarter

Visible Planets in the Night Sky

Beginning of April, 2014

	Const	Rise	Transit	Set	Mag
Sun		06:02	12:24	18:44	-26.8
Mercury	Aqr	05:25	11:10	16:51	-0.2
Venus	Cap	04:08	09:30	14:52	-4.3
Mars	Vir	19:19	01:01	06:43	-1.4
Jupiter	Gem	11:00	18:29	01:55	-2.2
Saturn	Lib	21:53	03:01	08:08	0.3

Beginning of May, 2014

	Const	Rise	Transit	Set	Mag
Sun		05:19	12:17	19:14	-26.8
Mercury	Ari	05:39	12:42	19:49	-1.7
Venus	Psc	03:40	09:38	15:35	-4.1
Mars	Vir	16:31	22:23	04:15	-1.1
Jupiter	Gem	09:19	16:47	00:11	-2.1
Saturn	Lib	19:46	00:55	06:04	0.1

Beginning of June, 2014

	Const	Rise	Transit	Set	Mag
Sun		04:54	12:18	19:41	-26.8
Mercury	Gem	06:15	13:48	21:18	1.4
Venus	Ari	03:09	09:51	16:31	-4.0
Mars	Vir	14:26	20:15	02:05	-0.5
Jupiter	Gem	07:43	15:08	22:29	-1.9
Saturn	Lib	17:33	22:44	03:55	0.2

Aqr	Aquarius, the Water Bearer
Lib	Libra, the Scales
Ari	Aries, the Ram
Cap	Capricornus, the Goat
Psc	Pisces, the Fishes
Vir	Virgo, the Maid
Gem	Gemini, the Twins

About: Eighteen Hundred and Froze to Death

April 5, 1815, was really not just a day like any other. Thomas Stamford Raffles (later Sir Thomas Raffles and founder of Singapore) was serving as Lt. Governor of Java when he heard what he thought was a nearby cannon firing. He was startled, but not concerned, as he thought the navy was practicing with their guns. What he really heard was the first in a series of mighty eruptions of Mt. Tambora (aka Tamboro) located some eight hundred miles away. That gives you an idea as to how loud the sound was. The eruptions continued until the largest and final explosion came some ten days later on April 15. It was determined that the eruption was a **7** on the **Volcanic Explosivity Index (VEI)** (**see table below**), and consequently the largest, most powerful volcanic eruption in recorded history. This enormous discharge was directly responsible for the deaths of nearly 100,000 nearby residents. The reason that this terrible tragedy was not initially reported by the world's press was due to the remoteness of Java, an island group located about 225 miles south of Indonesia. Besides the local deaths and destruction, the eruption of Mt. Tambora was to have worldwide consequences. Why should an eruption on a remote Pacific island be so significant to the rest of the world?

VEI	Discharge Volume	Examples
0	< 10,000 m^3	Kilauea
1	>10,000 m^3	Raoul Island (2006)
2	>1,000,000 m^3	Sinabung (2010)
3	>10,000,000 m^3	Nabro (2011)
4	>0.1 km^3	Pelee (1902)
5	>1 km^3	St. Helens (1980)
6	>10 km^3	Krakatoa (1883)
7	>100 km^3	Tambora (1815)
8	>1,000 km^3	Yellowstone (640,000 BC)

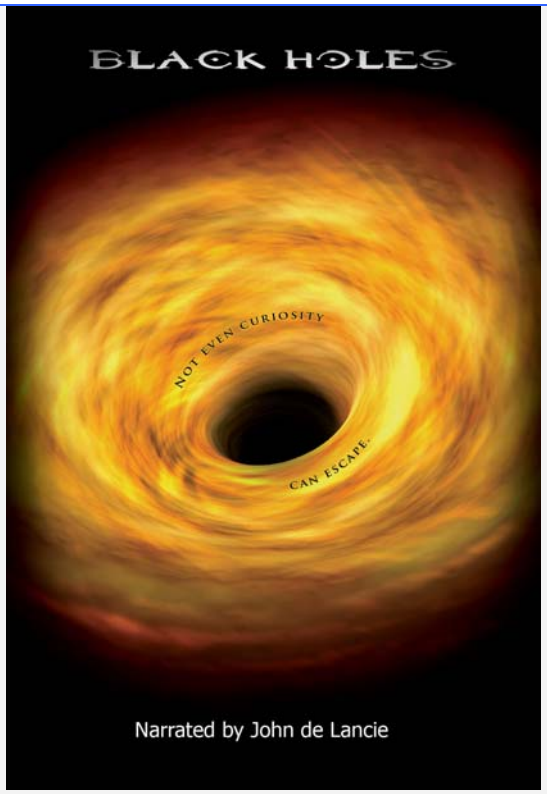
This gigantic eruption put an enormous amount of ash and sulfur into the atmosphere so that the climate of much of the world was temporarily changed. There was so much debris that it significantly reduced the amount of sunlight that reached the earth's surface, and consequently, temperatures fell. It did not happen immediately as the earth is large and so the obscuration took a while to affect the weather patterns. Ultimately, it altered weather in the U.S. from Maine to as far south as Georgia, parts of Europe, and Asia. Consequently, the summer of 1816, especially on the east coast of the U.S., became known as the year without summer or colloquially "eighteen hundred and froze to death."

In New England and eastern Canada an early frost in May and June killed off most of the crops. It snowed in July and August, pilling up as much as twenty inches in some places. As far south as Georgia, during the same period, the temperature was as low as 46 degrees. No more than a quarter of the harvest was usable, and consequently, livestock died in droves. Many farmers, their farms in ruins, moved to the American mid-west where the effect of the weather was much less severe. Vermont was especially hard hit, losing between 10,000 to 15,000 skilled agrarians.

Nor was Europe or Asia spared. As in America, crop damage was widespread, because of both the low temperatures and the accompanying heavy rain. The scarcity of crops caused a significant upsurge in the cost of wheat, rice, and various other grains and vegetables, for both human and animal consumption. This, naturally, increased the cost of meat and dairy products. Parts of the European continent experienced a terrible famine, a result of the meager harvest.

As bad as the Mt. Tambora eruption was, the eruption of our own Yellowstone would probably change civilization as we know it. Mankind would most likely have to return to subsistence farming. Life would be much as it was during the European dark ages.

2014 Planetarium Shows



April 11 & 25 **8:00 P.M. Dawn of the Space Age** **9:00 P.M. Black Holes**	**May 9 & 23** **8:00 P.M. Dawn of the Space Age** **9:00 P.M. Black Holes**	**June 13** **8:00 P.M. Dawn of the Space Age** **9:00 P.M. Black Holes**

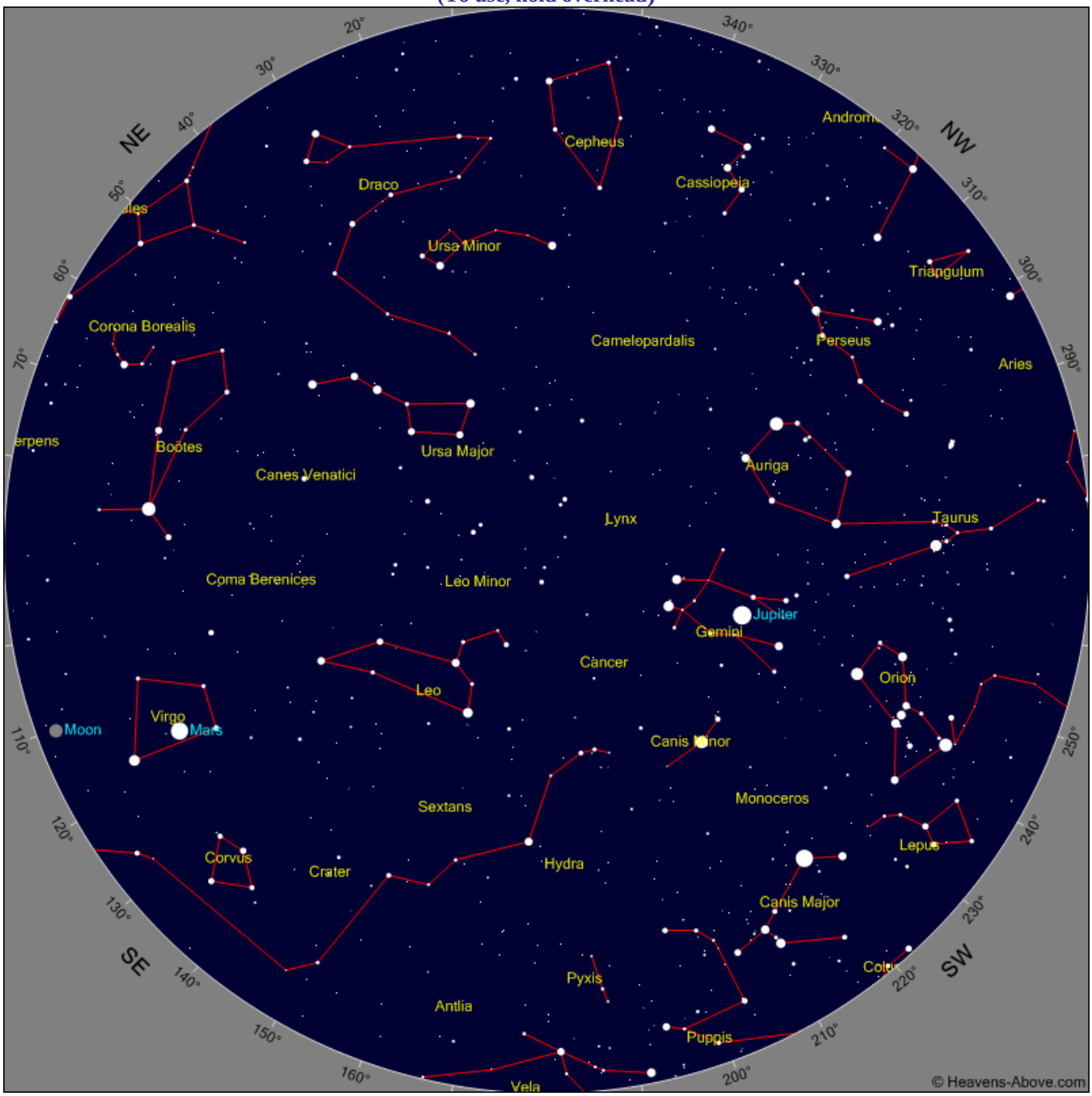
For those who are interested in bringing a group, such as schools or scouts, during the day, please call for more information. These shows are usually given on Tuesday or Thursday mornings.

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
Apr 7	6:55 A.M.	7:49 P.M.	12:50 P.M.	2:26 A.M.	First Qtr
Apr 15	6:43 A.M.	7:57 P.M.	8:38 P.M.	6:50 A.M.	Full Moon
Apr 22	6:33 A.M.	8:04 P.M.	2:19 A.M.	1:06 P.M.	Last Qtr
Apr 29	6:24 A.M.	8:11 P.M.	6:41 A.M.	8:51 P.M.	New Moon
May 6	6:15 A.M.	8:18 P.M.	12:29 P.M.	1:38 A.M.	First Qtr
May 14	6:07 A.M.	8:25 P.M.	8:31 P.M.	6:04 A.M.	Full Moon
May 21	6:01 A.M.	8:32 P.M.	1:41 A.M.	1:14 P.M.	Last Qtr
May 28	5:56 A.M.	8:38 P.M.	6:01 A.M.	8:36 P.M.	New Moon
Jun 5	5:53 A.M.	8:44 P.M.	1:07 P.M.	1:13 A.M.	First Qtr
Jun 13	5:52 A.M.	8:48 P.M.	9:18 P.M.	6:29 A.M.	Full Moon
Jun 19	5:52 A.M.	8:50 P.M.	12:55 A.M.	1:20 P.M.	Last Qtr
Jun 27	5:54 A.M.	8:52 P.M.	6:23 A.M.	8:57 P.M.	New Moon

April 2014 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
(To use, hold overhead)



*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. Contributions can be made in support of the planetarium through the WVU Planetarium Project at the WVU Foundation, Inc., phone (304)284-4000. Thank You.

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May 2014 Sky Chart* for:
10:00 P.M at the beginning of the month
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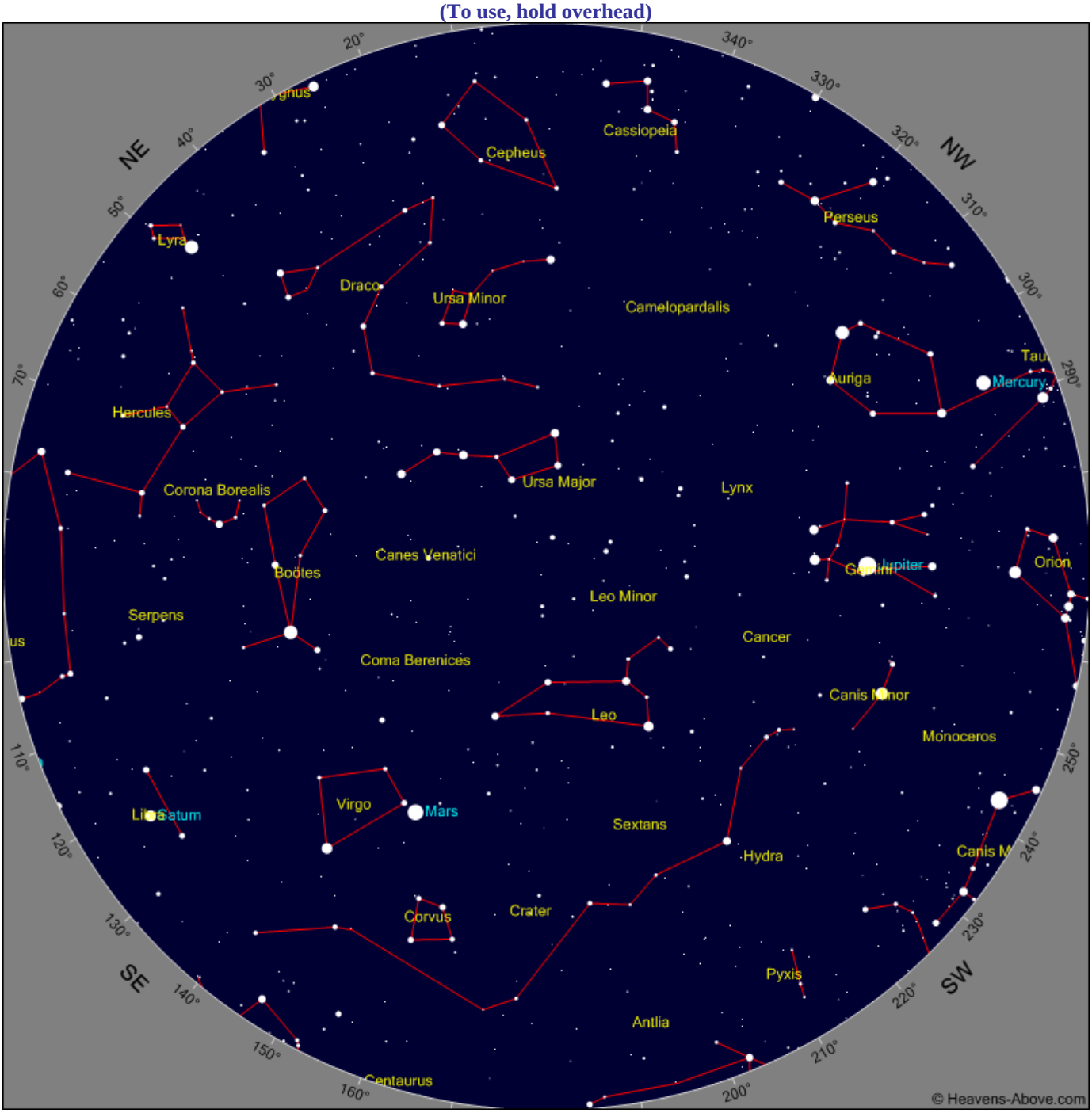
8:00 P.M at the end of the month
(To use, hold overhead)



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June 2014 Sky Chart* for:
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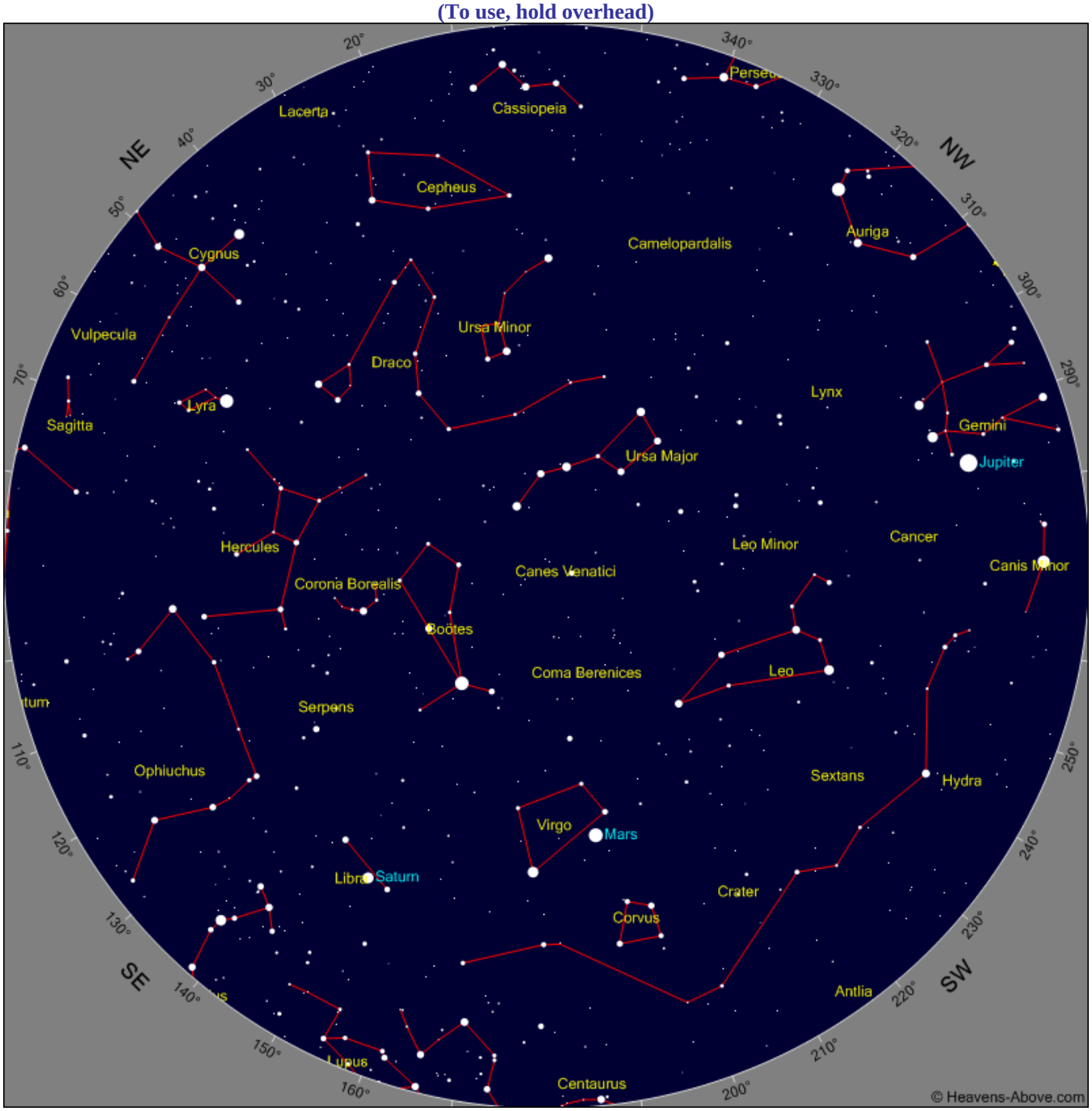
8:00 P.M at the end of the month
(To use, hold overhead)



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