

Norfolk Astronomical Society



<http://norfolkastronomical.org>

December 2013

Monthly Sky Calendar
Prepared Specifically For
The Hampton Roads Area

Upcoming Regular Meetings

DATE	Monday, Dec. 16, 2013
TIME	6 - 8 PM EST
WHERE	Applebees outside Chesapeake Square Mall
TOPIC	Dinner meeting (RSVP by Sat., Dec. 14 to howellgl@mindspring.com)

DATE	Monday, Jan. 13, 2014
TIME	6 - 8 PM EST
WHERE	Chesapeake Public Library, Major Hillard branch Conf. Room
TOPIC	Earth's Magnetic Field

Solar Eclipse Over Corolla Beach Lighthouse

Photo By Glendon L. Howell



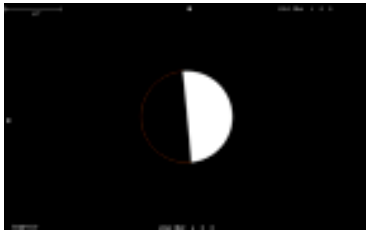
The beginnings of an annular-total solar eclipse were visible at sunrise on Sunday, November 3, 2013 over Currituck Sound. Glen used the Multi-year Interactive Computer Almanac (MICA) to calculate azimuth of sunrise and a Magellan GPS 310 locked in on the lighthouse position to help lineup the two. Exposure was 1/1000 second at f/11 at ISO 100, taken using a Canon Digital Rebel XTi equipped with a 75-300mm zoom lens at 300mm.

Observe The Phases of Venus

Glendon L. Howell

In January 1610, Galileo turned his improved 30x telescope skyward to the planet Jupiter and discovered the 4 largest moons of that planet. Later that same year in September, he turned his telescope toward Venus and discovered that it exhibited just phases like the Moon. These discoveries, he later argued, were proof that Ptolemy's Earth centered universe was wrong, and Copernicus' Sun centered universe was correct. How else could he see the shadowed side of a planet?

This month we can easily repeat both of his observations that revolutionized observational astronomy. Jupiter will reach opposition with our Sun on January 5, 2014, and is already well up in the eastern sky before midnight. Venus, on the other hand sits brilliantly low in the southwestern sky, and will reach inferior conjunction with our Sun on January 11, almost a week later. Unlike our last inferior conjunction on June 8, 2012, the planet will pass just to the north of the Sun versus passing directly in front.



Nov. 1

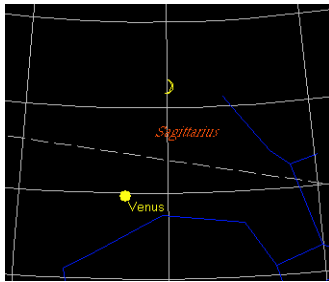


Dec. 9



Jan. 1

Last November 1, Venus was at its greatest elongation of 47 degrees east of the Sun. At that time it exhibited a phase of half illumination (50%), shining at magnitude -4.4 with a 25 arcsec disk. On



December 9, when it reaches greatest brilliancy of -4.7 , the phase will have shrunk to 23.5% illumination while the size of the disk will have grown to 43 arcsec. Thereafter the planet will begin to dim in brightness while continuing to grow larger, reaching its largest disk size of almost 63 arcsec at inferior conjunction.

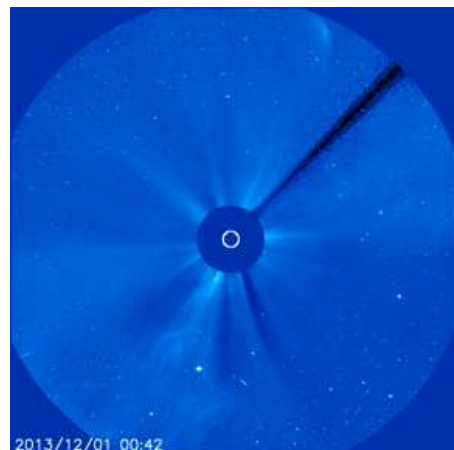
When Venus is at its brightest is a splendid time to try to spot it in broad daylight! While it is plenty bright enough to see, actually spotting it takes some effort. It helps to have a landmark like our Moon nearby, and this occurs on **December 5**, close to when Venus is at its brightest. While you can try at other times that day, at 2: 45 PM EST the crescent Moon will lie on the noon meridian with Venus sitting 6 degrees south and slightly to the east of it, at 7 o'clock position.

Comet C/2012 S1 ISON Sizzles, Then Fizzles

Glendon L. Howell

It appears that the "Comet of the Century" has died. Evidence began to mount early Thanksgiving Day when the brightening comet suddenly began to diminish in brightness. Closest approach of this sun-grazer was at about 1:30 PM local time, with the comet less than a Sun's diameter above its surface. At first it appeared that at least part of the comet had survived, but the remains have continued to disperse into a large cloud of gas and dust. Whether anything will remain to be seen in the morning sky in the next few days as it climbs away from the sun is much in doubt.

In the Solar and Heliospheric Observatory (SOHO) LASCO C3 image at right, the cloud at 1 o'clock from the sun is what remains at the time of this writing.



2013/12/01 00:42

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7				1	2	3	4
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30	31	

Calendar

	Start	End	Category	Description
1 Dec 2013	2:51 AM	2:51 AM	Jup GRS	GRS Transit (CML=203)
	3:56 AM	3:56 AM	Jup Sats	IV.Sh.I
	5:00 AM	5:00 AM	Diary	Saturn 1.2N of Moon Occn
	5:18 AM	5:18 AM	Moon	Moonrise
	5:29 AM	5:29 AM	Twilight	Astronomical Twilight begins
	7:01 AM	7:01 AM	Sun	Sunrise
	10:02 AM	10:02 AM	Jupiter	Jupiter sets
	12:47 PM	12:47 PM	Jup GRS	GRS Transit (CML=203)
	3:58 PM	3:58 PM	Moon	Moonset
	4:52 PM	4:52 PM	Sun	Sunset
	6:00 PM	6:00 PM	Diary	Mercury 0.5S of Moon Occn
	6:23 PM	6:23 PM	Twilight	Astronomical Twilight ends
	7:35 PM	7:35 PM	Jupiter	Jupiter rises
	7:40 PM	7:40 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 230.0 Alt 14)
10:43 PM	10:43 PM	Jup GRS	GRS Transit (CML=203)	
2 Dec 2013	4:21 AM	4:21 AM	Sat Pass (ISS)	CHES:ISS Passes NW to SE (Azm 119.1 Alt 11)
	5:30 AM	5:30 AM	Twilight	Astronomical Twilight begins
	5:54 AM	5:54 AM	Sat Pass (ISS)	CHES:ISS Passes W to S (Azm 232.6 Alt 12)
	6:25 AM	6:25 AM	Moon	Moonrise
	7:01 AM	7:01 AM	Sun	Sunrise
	8:38 AM	8:38 AM	Jup GRS	GRS Transit (CML=203)
	9:58 AM	9:58 AM	Jupiter	Jupiter sets
	10:40 AM	10:40 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	4:52 PM	4:52 PM	Sun	Sunset
	4:52 PM	4:52 PM	Moon	Moonset
	5:56 PM	5:56 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 181.7 Alt 26)
	6:23 PM	6:23 PM	Twilight	Astronomical Twilight ends
	6:34 PM	6:34 PM	Jup GRS	GRS Transit (CML=203)
	7:30 PM	7:30 PM	Jupiter	Jupiter rises
7:35 PM	7:35 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 222.5 Alt 15)	
8:00 PM	8:00 PM	Diary	NEW MOON	
10:22 PM	10:22 PM	Jup Sats	III.Ec.R	
10:26 PM	10:26 PM	Jup Sats	III.Oc.D	
3 Dec 2013	1:40 AM	1:40 AM	Jup Sats	III.Oc.R
	4:29 AM	4:29 AM	Jup Sats	I.Ec.D
	4:29 AM	4:29 AM	Jup GRS	GRS Transit (CML=203)
	5:07 AM	5:07 AM	Sat Pass (ISS)	CHES:ISS Passes NW to S (Azm 184.0 Alt 13)
	5:31 AM	5:31 AM	Twilight	Astronomical Twilight begins
	7:02 AM	7:02 AM	Sun	Sunrise
	7:30 AM	7:30 AM	Moon	Moonrise

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7			1	2	3	4	
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30	31	

Calendar

	Start	End	Category	Description
3 Dec 2013	9:54 AM	9:54 AM	Jupiter	Jupiter sets
	2:25 PM	2:25 PM	Jup GRS	GRS Transit (CML=203)
	4:52 PM	4:52 PM	Sun	Sunset
	5:39 PM	5:39 PM	Iridium Flare	CHES:Iridium 19 Flares at mag. 1.9 (Azm 278 Alt 13)
	5:48 PM	5:48 PM	Iridium Flare	CHES:Iridium 34 Flares at mag.-0.8 (Azm 280 Alt 11)
	5:50 PM	5:50 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 185.1 Alt 25)
	5:53 PM	5:53 PM	Moon	Moonset
	6:23 PM	6:23 PM	Twilight	Astronomical Twilight ends
	6:23 PM	6:23 PM	Iridium Flare	CHES:Iridium 10 Flares at mag. 1.6 (Azm 178 Alt 30)
7:26 PM	7:26 PM	Jupiter	Jupiter rises	
7:30 PM	7:30 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 213.2 Alt 14)	
4 Dec 2013	12:20 AM	12:20 AM	Jup GRS	GRS Transit (CML=203)
	1:40 AM	1:40 AM	Jup Sats	I.Sh.I
	2:26 AM	2:26 AM	Jup Sats	I.Tr.I
	3:55 AM	3:55 AM	Jup Sats	I.Sh.E
	4:41 AM	4:41 AM	Jup Sats	I.Tr.E
	5:32 AM	5:32 AM	Twilight	Astronomical Twilight begins
	5:56 AM	5:56 AM	Jup Sats	II.Sh.I
	7:00 AM	7:00 AM	Diary	Moon at perigee
	7:03 AM	7:03 AM	Sun	Sunrise
	8:31 AM	8:31 AM	Moon	Moonrise
	9:49 AM	9:49 AM	Jupiter	Jupiter sets
	10:16 AM	10:16 AM	Jup GRS	GRS Transit (CML=203)
	12:05 PM	12:05 PM	Iridium Flare	CHES:Iridium 22 Flares at mag.-7.0 (Azm 188 Alt 62)
	4:52 PM	4:52 PM	Sun	Sunset
	5:33 PM	5:33 PM	Iridium Flare	CHES:Iridium 97 Flares at mag.-0.5 (Azm 277 Alt 14)
	5:42 PM	5:42 PM	Iridium Flare	CHES:Iridium 5 Flares at mag.-3.3 (Azm 279 Alt 11)
	5:45 PM	5:45 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 188.2 Alt 23)
6:17 PM	6:17 PM	Iridium Flare	CHES:Iridium 13 Flares at mag.-3.9 (Azm 177 Alt 31)	
6:23 PM	6:23 PM	Twilight	Astronomical Twilight ends	
6:59 PM	6:59 PM	Moon	Moonset	
7:00 PM	7:00 PM	Diary	Pluto 1.8S of Moon	
7:22 PM	7:22 PM	Jupiter	Jupiter rises	
7:25 PM	7:25 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 203.3 Alt 12)	
8:12 PM	8:12 PM	Jup GRS	GRS Transit (CML=203)	
10:57 PM	10:57 PM	Jup Sats	I.Ec.D	
5 Dec 2013	1:59 AM	1:59 AM	Jup Sats	I.Oc.R
	5:32 AM	5:32 AM	Twilight	Astronomical Twilight begins
	6:07 AM	6:07 AM	Jup GRS	GRS Transit (CML=203)
	7:04 AM	7:04 AM	Sun	Sunrise

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
5 Dec 2013	7:29 AM	7:29 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	9:25 AM	9:25 AM	Moon	Moonrise
	9:45 AM	9:45 AM	Jupiter	Jupiter sets
	4:03 PM	4:03 PM	Jup GRS	GRS Transit (CML=203)
	4:52 PM	4:52 PM	Sun	Sunset
	5:27 PM	5:27 PM	Iridium Flare	CHES:Iridium 51 Flares at mag.-5.1 (Azm 276 Alt 14)
	5:27 PM	5:27 PM	Iridium Flare	CHES:Iridium 7 Flares at mag.-3.1 (Azm 276 Alt 14)
	5:39 PM	5:39 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 191.1 Alt 21)
	6:11 PM	6:11 PM	Iridium Flare	CHES:Iridium 50 Flares at mag. 0.3 (Azm 175 Alt 31)
	6:23 PM	6:23 PM	Twilight	Astronomical Twilight ends
	7:17 PM	7:17 PM	Jupiter	Jupiter rises
	8:08 PM	8:08 PM	Moon	Moonset
	8:08 PM	8:08 PM	Jup Sats	I.Sh.I
	8:52 PM	8:52 PM	Jup Sats	I.Tr.I
10:23 PM	10:23 PM	Jup Sats	I.Sh.E	
11:07 PM	11:07 PM	Jup Sats	I.Tr.E	
6 Dec 2013	12:16 AM	12:16 AM	Jup Sats	II.Ec.D
	1:58 AM	1:58 AM	Jup GRS	GRS Transit (CML=203)
	3:43 AM	3:43 AM	Meteor Shower	Phoenicids meteor peak (zhr= 6)
	4:24 AM	4:24 AM	Jup Sats	II.Oc.R
	5:33 AM	5:33 AM	Twilight	Astronomical Twilight begins
	6:36 AM	6:36 AM	Iridium Flare	CHES:Iridium 13 Flares at mag.-4.3 (Azm 338 Alt 66)
	7:05 AM	7:05 AM	Sun	Sunrise
	9:41 AM	9:41 AM	Jupiter	Jupiter sets
	10:13 AM	10:13 AM	Moon	Moonrise
	11:54 AM	11:54 AM	Jup GRS	GRS Transit (CML=203)
	4:52 PM	4:52 PM	Sun	Sunset
	5:12 PM	5:12 PM	Iridium Flare	CHES:Iridium 96 Flares at mag.-5.6 (Azm 273 Alt 17)
	5:21 PM	5:21 PM	Iridium Flare	CHES:Iridium 37 Flares at mag. 1.8 (Azm 275 Alt 14)
	5:33 PM	5:33 PM	Lunar Occult	Moon occults 7.3 mag. double star ZC3021(d)
	5:33 PM	5:33 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 194.1 Alt 18)
	6:23 PM	6:23 PM	Twilight	Astronomical Twilight ends
	7:13 PM	7:13 PM	Jupiter	Jupiter rises
7:14 PM	7:14 PM	Sat Pass (ISS)	CHES:ISS Passes SW to NE (Azm 215.4 Alt 12)	
8:26 PM	8:26 PM	Jup Sats	I.Oc.R	
9:17 PM	9:17 PM	Moon	Moonset	
9:50 PM	9:50 PM	Jup GRS	GRS Transit (CML=203)	
7 Dec 2013	5:34 AM	5:34 AM	Twilight	Astronomical Twilight begins
	6:30 AM	6:30 AM	Iridium Flare	CHES:Iridium 50 Flares at mag.-1.7 (Azm 343 Alt 65)
	7:06 AM	7:06 AM	Sun	Sunrise

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
7 Dec 2013	7:45 AM	7:45 AM	Jup GRS	GRS Transit (CML=203)
	9:37 AM	9:37 AM	Jupiter	Jupiter sets
	10:55 AM	10:55 AM	Moon	Moonrise
	4:52 PM	4:52 PM	Sun	Sunset
	4:59 PM	4:59 PM	Iridium Flare	CHES:Iridium 36 Flares at mag.-5.7 (Azm 271 Alt 20)
	5:28 PM	5:28 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 196.7 Alt 16)
	5:41 PM	5:41 PM	Jup GRS	GRS Transit (CML=203)
	6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends
	6:27 PM	6:27 PM	Sat Pass (ISS)	CHES:ISS Passes SW to NE (Azm 153.6 Alt 27)
	7:08 PM	7:08 PM	Jupiter	Jupiter rises
	8:37 PM	8:37 PM	Jup Sats	II.Tr.I
	9:54 PM	9:54 PM	Jup Sats	II.Sh.E
	10:24 PM	10:24 PM	Moon	Moonsset
	11:20 PM	11:20 PM	Jup Sats	II.Tr.E
8 Dec 2013	3:36 AM	3:36 AM	Jup GRS	GRS Transit (CML=203)
	4:18 AM	4:18 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	5:35 AM	5:35 AM	Twilight	Astronomical Twilight begins
	6:24 AM	6:24 AM	Iridium Flare	CHES:Iridium 53 Flares at mag. 0.6 (Azm 345 Alt 64)
	7:07 AM	7:07 AM	Sun	Sunrise
	9:00 AM	9:00 AM	Diary	Neptune 5.3S of Moon
	9:32 AM	9:32 AM	Jupiter	Jupiter sets
	11:33 AM	11:33 AM	Moon	Moonrise
	1:32 PM	1:32 PM	Jup GRS	GRS Transit (CML=203)
	4:51 PM	4:51 PM	Iridium Flare	CHES:Iridium 35 Flares at mag.-5.8 (Azm 269 Alt 21)
	4:52 PM	4:52 PM	Sun	Sunset
	5:22 PM	5:22 PM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 199.4 Alt 13)
	5:38 PM	5:38 PM	Sat Pass (ISS)	CHES:ISS Passes S to NE (Azm 128.9 Alt 16)
	6:02 PM	6:02 PM	Iridium Flare	CHES:Iridium 86 Flares at mag. 1.7 (Azm 188 Alt 29)
	6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends
	7:04 PM	7:04 PM	Jupiter	Jupiter rises
	7:12 PM	7:12 PM	Sat Pass (ISS)	CHES:ISS Passes SW to NE (Azm 259.4 Alt 21)
	9:02 PM	9:02 PM	Lunar Occult	Moon occults 5.0 mag. double star ZC3320(D) Kappa Aqr
	11:28 PM	11:28 PM	Jup GRS	GRS Transit (CML=203)
	11:30 PM	11:30 PM	Moon	Moonsset
9 Dec 2013	5:35 AM	5:35 AM	Twilight	Astronomical Twilight begins
	7:07 AM	7:07 AM	Sun	Sunrise
	8:20 AM	8:20 AM	Iridium Flare	CHES:Iridium 82 Flares at mag.-5.0 (Azm 200 Alt 83)
	9:23 AM	9:23 AM	Jup GRS	GRS Transit (CML=203)
	9:28 AM	9:28 AM	Jupiter	Jupiter sets
	11:00 AM	11:00 AM	Diary	FIRST QUARTER

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	1	2	3	4			
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30	31	

Calendar

	Start	End	Category	Description
9 Dec 2013	12:09 PM	12:09 PM	Moon	Moonrise
	4:52 PM	4:52 PM	Sun	Sunset
	5:56 PM	5:56 PM	Iridium Flare	CHES:Iridium 52 Flares at mag.-3.3 (AzM 185 Alt 30)
	6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends
	6:24 PM	6:24 PM	Sat Pass (ISS)	CHES:ISS Passes SW to NE (AzM 318.9 Alt 87)
	7:00 PM	7:00 PM	Jupiter	Jupiter rises
	7:19 PM	7:19 PM	Jup GRS	GRS Transit (CML=203)
	8:48 PM	8:48 PM	Jup Sats	IV.Oc.R
	11:12 PM	11:12 PM	Jup Sats	III.Ec.D
10 Dec 2013	12:34 AM	12:34 AM	Moon	Moonset
	5:03 AM	5:03 AM	Jup Sats	III.Oc.R
	5:14 AM	5:14 AM	Jup GRS	GRS Transit (CML=203)
	5:36 AM	5:36 AM	Twilight	Astronomical Twilight begins
	6:23 AM	6:23 AM	Jup Sats	IEc.D
	7:08 AM	7:08 AM	Sun	Sunrise
	8:14 AM	8:14 AM	Iridium Flare	CHES:Iridium 18 Flares at mag.-4.9 (AzM 200 Alt 85)
	9:24 AM	9:24 AM	Jupiter	Jupiter sets
	12:43 PM	12:43 PM	Moon	Moonrise
	3:10 PM	3:10 PM	Jup GRS	GRS Transit (CML=203)
	4:42 PM	4:42 PM	Iridium Flare	CHES:Iridium 96 Flares at mag.-4.2 (AzM 229 Alt 11)
	4:52 PM	4:52 PM	Sun	Sunset
	5:34 PM	5:34 PM	Sat Pass (ISS)	CHES:ISS Passes SW to NE (AzM 135.4 Alt 45)
	5:42 PM	5:42 PM	Lunar Occult	Moon occults 7.1 mag. star 30(d)
5:50 PM	5:50 PM	Iridium Flare	CHES:Iridium 10 Flares at mag. 0.6 (AzM 186 Alt 30)	
6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends	
6:55 PM	6:55 PM	Jupiter	Jupiter rises	
7:10 PM	7:10 PM	Sat Pass (ISS)	CHES:ISS Passes W to NE (AzM 301.7 Alt 17)	
11 Dec 2013	12:00 AM	12:00 AM	Diary	Uranus 3.1S of Moon
	1:00 AM	1:00 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	1:05 AM	1:05 AM	Jup GRS	GRS Transit (CML=203)
	1:35 AM	1:35 AM	Moon	Moonset
	3:34 AM	3:34 AM	Jup Sats	I.Sh.I
	4:10 AM	4:10 AM	Jup Sats	I.Tr.I
	5:37 AM	5:37 AM	Twilight	Astronomical Twilight begins
	5:48 AM	5:48 AM	Jup Sats	I.Sh.E
	6:26 AM	6:26 AM	Jup Sats	I.Tr.E
	7:09 AM	7:09 AM	Sun	Sunrise
	9:00 AM	9:00 AM	Diary	Mercury 4.6N of Antares
9:19 AM	9:19 AM	Jupiter	Jupiter sets	
	11:01 AM	11:01 AM	Jup GRS	GRS Transit (CML=203)

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
11 Dec 2013	1:17 PM	1:17 PM	Moon	Moonrise
	1:44 PM	1:44 PM	Iridium Flare	CHES:Iridium 30 Flares at mag.-6.2 (Azm 227 Alt 52)
	4:23 PM	4:23 PM	Iridium Flare	CHES:Iridium 36 Flares at mag.-6.0 (Azm 264 Alt 27)
	4:24 PM	4:24 PM	Iridium Flare	CHES:Iridium 61 Flares at mag.-5.7 (Azm 264 Alt 27)
	4:52 PM	4:52 PM	Sun	Sunset
	5:41 PM	5:41 PM	Lunar Occult	Moon occults 6.9 mag. star 162(d)
	5:51 PM	5:51 PM	Iridium Flare	CHES:Iridium 16 Flares at mag.-0.7 (Azm 191 Alt 28)
	6:21 PM	6:21 PM	Sat Pass (ISS)	CHES:ISS Passes W to NE (Azm 326.2 Alt 31)
	6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends
	6:51 PM	6:51 PM	Jupiter	Jupiter rises
8:57 PM	8:57 PM	Jup GRS	GRS Transit (CML=203)	
12 Dec 2013	12:51 AM	12:51 AM	Jup Sats	I.Ec.D
	2:36 AM	2:36 AM	Moon	Moonsset
	3:44 AM	3:44 AM	Jup Sats	I.Oc.R
	5:37 AM	5:37 AM	Twilight	Astronomical Twilight begins
	6:52 AM	6:52 AM	Jup GRS	GRS Transit (CML=203)
	7:10 AM	7:10 AM	Sun	Sunrise
	9:15 AM	9:15 AM	Jupiter	Jupiter sets
	1:53 PM	1:53 PM	Moon	Moonrise
	4:48 PM	4:48 PM	Jup GRS	GRS Transit (CML=203)
	4:52 PM	4:52 PM	Sun	Sunset
	5:30 PM	5:30 PM	Sat Pass (ISS)	CHES:ISS Passes SW to NE (Azm 320.9 Alt 57)
	5:47 PM	5:47 PM	Iridium Flare	CHES:Iridium 56 Flares at mag. 0.7 (Azm 194 Alt 27)
	6:25 PM	6:25 PM	Twilight	Astronomical Twilight ends
	6:46 PM	6:46 PM	Jupiter	Jupiter rises
	7:07 PM	7:07 PM	Sat Pass (ISS)	CHES:ISS Passes W to NE (Azm 321.1 Alt 10)
	7:22 PM	7:22 PM	Lunar Occult	Moon occults 6.1 mag. star 290(d)
9:49 PM	9:49 PM	Lunar Occult	Moon occults 6.9 mag. star SAO92761(d)	
10:02 PM	10:02 PM	Jup Sats	I.Sh.I	
10:36 PM	10:36 PM	Jup Sats	I.Tr.I	
13 Dec 2013	12:17 AM	12:17 AM	Jup Sats	I.Sh.E
	12:52 AM	12:52 AM	Jup Sats	I.Tr.E
	2:43 AM	2:43 AM	Jup GRS	GRS Transit (CML=203)
	2:50 AM	2:50 AM	Jup Sats	II.Ec.D
	3:35 AM	3:35 AM	Moon	Moonsset
	5:38 AM	5:38 AM	Twilight	Astronomical Twilight begins
	6:40 AM	6:40 AM	Jup Sats	II.Oc.R
	7:10 AM	7:10 AM	Sun	Sunrise
9:11 AM	9:11 AM	Jupiter	Jupiter sets	
12:39 PM	12:39 PM	Jup GRS	GRS Transit (CML=203)	

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2		1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
13 Dec 2013	2:30 PM	2:30 PM	Moon	Moonrise
	4:53 PM	4:53 PM	Sun	Sunset
	5:41 PM	5:41 PM	Iridium Flare	CHES:Iridium 84 Flares at mag.-1.5 (Azm 195 Alt 27)
	6:17 PM	6:17 PM	Sat Pass (ISS)	CHES:ISS Passes W to NE (Azm 334.1 Alt 16)
	6:25 PM	6:25 PM	Twilight	Astronomical Twilight ends
	6:42 PM	6:42 PM	Jupiter	Jupiter rises
	7:20 PM	7:20 PM	Jup Sats	I.Ec.D
	8:06 PM	8:06 PM	Lunar Occult	Moon occults 5.5 mag. star 422(D) Sigma Ari
	9:56 PM	9:56 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	10:10 PM	10:10 PM	Jup Sats	I.Oc.R
10:35 PM	10:35 PM	Jup GRS	GRS Transit (CML=203)	
14 Dec 2013	4:32 AM	4:32 AM	Moon	Moonset
	5:39 AM	5:39 AM	Twilight	Astronomical Twilight begins
	5:57 AM	5:57 AM	Iridium Flare	CHES:Iridium 50 Flares at mag. 0.1 (Azm 337 Alt 51)
	7:11 AM	7:11 AM	Sun	Sunrise
	8:30 AM	8:30 AM	Jup GRS	GRS Transit (CML=203)
	9:06 AM	9:06 AM	Jupiter	Jupiter sets
	3:10 PM	3:10 PM	Moon	Moonrise
	4:53 PM	4:53 PM	Sun	Sunset
	5:26 PM	5:26 PM	Sat Pass (ISS)	CHES:ISS Passes W to NE (Azm 329.1 Alt 24)
	5:35 PM	5:35 PM	Iridium Flare	CHES:Iridium 12 Flares at mag.-1.2 (Azm 195 Alt 28)
	6:25 PM	6:25 PM	Twilight	Astronomical Twilight ends
	6:26 PM	6:26 PM	Jup GRS	GRS Transit (CML=203)
	6:37 PM	6:37 PM	Jupiter	Jupiter rises
7:18 PM	7:18 PM	Jup Sats	I.Tr.E	
9:50 PM	9:50 PM	Jup Sats	II.Sh.I	
10:18 PM	10:18 PM	Meteor Shower	Geminids (Phaethon) meteor peak (zhr=90)	
10:55 PM	10:55 PM	Jup Sats	II.Tr.I	
15 Dec 2013	12:31 AM	12:31 AM	Jup Sats	II.Sh.E
	1:37 AM	1:37 AM	Jup Sats	II.Tr.E
	4:21 AM	4:21 AM	Jup GRS	GRS Transit (CML=203)
	5:28 AM	5:28 AM	Moon	Moonset
	5:39 AM	5:39 AM	Twilight	Astronomical Twilight begins
	5:51 AM	5:51 AM	Iridium Flare	CHES:Iridium 53 Flares at mag.-2.7 (Azm 339 Alt 50)
	7:12 AM	7:12 AM	Sun	Sunrise
	9:02 AM	9:02 AM	Jupiter	Jupiter sets
	2:17 PM	2:17 PM	Jup GRS	GRS Transit (CML=203)
	3:54 PM	3:54 PM	Moon	Moonrise
4:53 PM	4:53 PM	Sun	Sunset	
5:29 PM	5:29 PM	Iridium Flare	CHES:Iridium 86 Flares at mag. 1.5 (Azm 196 Alt 29)	

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
15 Dec 2013	6:26 PM	6:26 PM	Twilight	Astronomical Twilight ends
	6:33 PM	6:33 PM	Jupiter	Jupiter rises
	10:00 PM	10:00 PM	Diary	Aldebaran 2.6S of Moon
16 Dec 2013	12:12 AM	12:12 AM	Jup GRS	GRS Transit (CML=203)
	5:40 AM	5:40 AM	Twilight	Astronomical Twilight begins
	5:45 AM	5:45 AM	Iridium Flare	CHES:Iridium 90 Flares at mag.-1.7 (Azm 339 Alt 48)
	5:45 AM	5:45 AM	Iridium Flare	CHES:Iridium 54 Flares at mag.-3.8 (Azm 342 Alt 49)
	6:20 AM	6:20 AM	Moon	Moonset
	7:12 AM	7:12 AM	Sun	Sunrise
	8:58 AM	8:58 AM	Jupiter	Jupiter sets
	10:08 AM	10:08 AM	Jup GRS	GRS Transit (CML=203)
	4:40 PM	4:40 PM	Moon	Moonrise
	4:53 PM	4:53 PM	Sun	Sunset
	5:22 PM	5:22 PM	Sat Pass (ISS)	CHES:ISS Passes W to NE (Azm 337.0 Alt 13)
	5:32 PM	5:32 PM	Iridium Flare	CHES:Iridium 53 Flares at mag. 1.3 (Azm 202 Alt 25)
	6:00 PM	6:00 PM	Meetings	NAS Annual Dinner Meeting
	6:26 PM	6:26 PM	Twilight	Astronomical Twilight ends
	6:28 PM	6:28 PM	Jupiter	Jupiter rises
	6:45 PM	6:45 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
6:59 PM	6:59 PM	Iridium Flare	CHES:Iridium 42 Flares at mag. 1.2 (Azm 157 Alt 23)	
7:47 PM	7:47 PM	Jup Sats	II.Oc.R	
8:04 PM	8:04 PM	Jup GRS	GRS Transit (CML=203)	
17 Dec 2013	3:11 AM	3:11 AM	Jup Sats	III.Ec.D
	5:00 AM	5:00 AM	Diary	FULL MOON
	5:39 AM	5:39 AM	Iridium Flare	CHES:Iridium 83 Flares at mag.-3.7 (Azm 342 Alt 47)
	5:41 AM	5:41 AM	Twilight	Astronomical Twilight begins
	5:59 AM	5:59 AM	Jup GRS	GRS Transit (CML=203)
	7:09 AM	7:09 AM	Moon	Moonset
	7:13 AM	7:13 AM	Sun	Sunrise
	8:53 AM	8:53 AM	Jupiter	Jupiter sets
	3:55 PM	3:55 PM	Jup GRS	GRS Transit (CML=203)
	4:54 PM	4:54 PM	Sun	Sunset
	5:26 PM	5:26 PM	Iridium Flare	CHES:Iridium 54 Flares at mag.-6.4 (Azm 202 Alt 26)
	5:30 PM	5:30 PM	Moon	Moonrise
	6:24 PM	6:24 PM	Jupiter	Jupiter rises
6:26 PM	6:26 PM	Twilight	Astronomical Twilight ends	
9:00 PM	9:00 PM	Diary	Uranus stationary	
9:55 PM	9:55 PM	Jup Sats	IV.Sh.I	

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	1	2	3	4
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30	31	

Calendar

	Start	End	Category	Description
18 Dec 2013	1:19 AM	1:19 AM	Jup Sats	IV.Sh.E
	1:50 AM	1:50 AM	Jup GRS	GRS Transit (CML=203)
	2:12 AM	2:12 AM	Jup Sats	IV.Tr.I
	5:27 AM	5:27 AM	Jup Sats	I.Sh.I
	5:33 AM	5:33 AM	Iridium Flare	CHES:Iridium 56 Flares at mag. 1.6 (Azm 345 Alt 47)
	5:41 AM	5:41 AM	Twilight	Astronomical Twilight begins
	5:49 AM	5:49 AM	Jup Sats	IV.Tr.E
	5:55 AM	5:55 AM	Jup Sats	I.Tr.I
	7:14 AM	7:14 AM	Sun	Sunrise
	7:54 AM	7:54 AM	Moon	Moonset
	8:49 AM	8:49 AM	Jupiter	Jupiter sets
	11:46 AM	11:46 AM	Jup GRS	GRS Transit (CML=203)
	4:54 PM	4:54 PM	Sun	Sunset
	6:19 PM	6:19 PM	Jupiter	Jupiter rises
	6:22 PM	6:22 PM	Moon	Moonrise
	6:27 PM	6:27 PM	Twilight	Astronomical Twilight ends
	6:56 PM	6:56 PM	Iridium Flare	CHES:Iridium 82 Flares at mag.-0.7 (Azm 165 Alt 27)
	9:42 PM	9:42 PM	Jup GRS	GRS Transit (CML=203)
19 Dec 2013	1:00 AM	1:00 AM	Diary	Jupiter 4.9N of Moon
	2:46 AM	2:46 AM	Jup Sats	I.Ec.D
	5:27 AM	5:27 AM	Iridium Flare	CHES:Iridium 84 Flares at mag. 1.2 (Azm 345 Alt 45)
	5:29 AM	5:29 AM	Jup Sats	I.Oc.R
	5:42 AM	5:42 AM	Twilight	Astronomical Twilight begins
	7:14 AM	7:14 AM	Sun	Sunrise
	7:37 AM	7:37 AM	Jup GRS	GRS Transit (CML=203)
	8:35 AM	8:35 AM	Moon	Moonset
	8:45 AM	8:45 AM	Jupiter	Jupiter sets
	3:34 PM	3:34 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	4:55 PM	4:55 PM	Sun	Sunset
	5:33 PM	5:33 PM	Jup GRS	GRS Transit (CML=203)
	6:15 PM	6:15 PM	Jupiter	Jupiter rises
	6:27 PM	6:27 PM	Twilight	Astronomical Twilight ends
	6:50 PM	6:50 PM	Iridium Flare	CHES:Iridium 18 Flares at mag.-3.5 (Azm 164 Alt 27)
	7:15 PM	7:15 PM	Moon	Moonrise
	8:00 PM	8:00 PM	Diary	Moon at apogee
	11:56 PM	11:56 PM	Jup Sats	I.Sh.I
20 Dec 2013	12:20 AM	12:20 AM	Jup Sats	I.Tr.I
	2:11 AM	2:11 AM	Jup Sats	I.Sh.E
	2:36 AM	2:36 AM	Jup Sats	I.Tr.E
	3:28 AM	3:28 AM	Jup GRS	GRS Transit (CML=203)

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
20 Dec 2013	5:24 AM	5:24 AM	Jup Sats	II.Ec.D
	5:42 AM	5:42 AM	Twilight	Astronomical Twilight begins
	6:08 AM	6:08 AM	Sat Pass (HST)	CHES:HST Passes SW to E (AzM 160.3 Alt 12)
	7:15 AM	7:15 AM	Sun	Sunrise
	8:40 AM	8:40 AM	Jupiter	Jupiter sets
	9:12 AM	9:12 AM	Moon	Moonset
	10:18 AM	10:18 AM	Iridium Flare	CHES:Iridium 25 Flares at mag.-7.3 (AzM 131 Alt 61)
	1:24 PM	1:24 PM	Jup GRS	GRS Transit (CML=203)
	4:00 PM	4:00 PM	Diary	Venus stationary
	4:55 PM	4:55 PM	Sun	Sunset
	6:10 PM	6:10 PM	Jupiter	Jupiter rises
	6:28 PM	6:28 PM	Twilight	Astronomical Twilight ends
	6:44 PM	6:44 PM	Iridium Flare	CHES:Iridium 39 Flares at mag. 1.8 (AzM 163 Alt 26)
	6:46 PM	6:46 PM	Jup Sats	III.Tr.I
	8:10 PM	8:10 PM	Moon	Moonrise
	8:20 PM	8:20 PM	Jup Sats	III.Sh.E
	9:14 PM	9:14 PM	Jup Sats	I.Ec.D
	9:58 PM	9:58 PM	Jup Sats	III.Tr.E
	11:20 PM	11:20 PM	Jup GRS	GRS Transit (CML=203)
	11:55 PM	11:55 PM	Jup Sats	I.Oc.R
21 Dec 2013	5:24 AM	5:24 AM	Iridium Flare	CHES:Iridium 50 Flares at mag. 2.0 (AzM 339 Alt 37)
	5:43 AM	5:43 AM	Twilight	Astronomical Twilight begins
	5:52 AM	5:52 AM	Lunar Occult	Moon occults 5.4 mag. double star ZC1332(R) 60 Cnc
	6:02 AM	6:02 AM	Sat Pass (HST)	CHES:HST Passes SW to E (AzM 162.8 Alt 15)
	7:15 AM	7:15 AM	Sun	Sunrise
	7:40 AM	7:40 AM	Iridium Flare	CHES:Iridium 72 Flares at mag.-6.9 (AzM 083 Alt 37)
	8:36 AM	8:36 AM	Jupiter	Jupiter sets
	9:15 AM	9:15 AM	Jup GRS	GRS Transit (CML=203)
	9:46 AM	9:46 AM	Moon	Moonset
	1:00 PM	1:00 PM	Diary	Solstice
	4:56 PM	4:56 PM	Sun	Sunset
	5:11 PM	5:11 PM	Iridium Flare	CHES:Iridium 13 Flares at mag.-6.0 (AzM 209 Alt 23)
	6:06 PM	6:06 PM	Jupiter	Jupiter rises
	6:24 PM	6:24 PM	Jup Sats	I.Sh.I
	6:28 PM	6:28 PM	Twilight	Astronomical Twilight ends
	6:46 PM	6:46 PM	Jup Sats	I.Tr.I
	7:11 PM	7:11 PM	Jup GRS	GRS Transit (CML=203)
	8:39 PM	8:39 PM	Jup Sats	I.Sh.E
	9:02 PM	9:02 PM	Jup Sats	I.Tr.E
	9:04 PM	9:04 PM	Moon	Moonrise

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
22 Dec 2013	12:26 AM	12:26 AM	Jup Sats	II.Sh.I
	1:11 AM	1:11 AM	Jup Sats	II.Tr.I
	3:08 AM	3:08 AM	Jup Sats	II.Sh.E
	3:53 AM	3:53 AM	Jup Sats	II.Tr.E
	5:06 AM	5:06 AM	Jup GRS	GRS Transit (CML=203)
	5:19 AM	5:19 AM	Iridium Flare	CHES:Iridium 53 Flares at mag. 0.5 (Azm 340 Alt 36)
	5:43 AM	5:43 AM	Twilight	Astronomical Twilight begins
	5:56 AM	5:56 AM	Sat Pass (HST)	CHES:HST Passes SW to E (Azm 165.7 Alt 18)
	7:11 AM	7:11 AM	Iridium Flare	CHES:Iridium 80 Flares at mag.-7.7 (Azm 334 Alt 74)
	7:16 AM	7:16 AM	Sun	Sunrise
	8:32 AM	8:32 AM	Jupiter	Jupiter sets
	10:06 AM	10:06 AM	Iridium Flare	CHES:Iridium 11 Flares at mag.-5.5 (Azm 126 Alt 59)
	10:18 AM	10:18 AM	Moon	Moonset
	12:23 PM	12:23 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	3:00 PM	3:00 PM	Diary	Regulus 5.1N of Moon
	3:02 PM	3:02 PM	Jup GRS	GRS Transit (CML=203)
	4:56 PM	4:56 PM	Sun	Sunset
	6:01 PM	6:01 PM	Jupiter	Jupiter rises
	6:21 PM	6:21 PM	Jup Sats	I.Oc.R
	6:29 PM	6:29 PM	Twilight	Astronomical Twilight ends
	6:41 PM	6:41 PM	Iridium Flare	CHES:Iridium 43 Flares at mag. 1.1 (Azm 174 Alt 28)
	6:42 PM	6:42 PM	Sat Pass (ISS)	CHES:ISS Passes NW to E (Azm 345.2 Alt 8)
	9:59 PM	9:59 PM	Moon	Moonrise
23 Dec 2013	12:57 AM	12:57 AM	Jup GRS	GRS Transit (CML=203)
	5:44 AM	5:44 AM	Twilight	Astronomical Twilight begins
	5:51 AM	5:51 AM	Sat Pass (HST)	CHES:HST Passes SW to E (Azm 168.6 Alt 21)
	7:05 AM	7:05 AM	Iridium Flare	CHES:Iridium 81 Flares at mag.-8.4 (Azm 335 Alt 72)
	7:16 AM	7:16 AM	Sun	Sunrise
	8:27 AM	8:27 AM	Jupiter	Jupiter sets
	9:59 AM	9:59 AM	Iridium Flare	CHES:Iridium 94 Flares at mag.-7.2 (Azm 123 Alt 59)
	10:49 AM	10:49 AM	Moon	Moonset
	10:53 AM	10:53 AM	Jup GRS	GRS Transit (CML=203)
	2:53 PM	2:53 PM	Iridium Flare	CHES:Iridium 19 Flares at mag.-6.7 (Azm 245 Alt 43)
	4:57 PM	4:57 PM	Sun	Sunset
	5:57 PM	5:57 PM	Jupiter	Jupiter rises
	5:57 PM	5:57 PM	Iridium Flare	CHES:Iridium 90 Flares at mag.-3.3 (Azm 281 Alt 11)
	5:59 PM	5:59 PM	Iridium Flare	CHES:Iridium 86 Flares at mag.-1.5 (Azm 282 Alt 11)
	6:29 PM	6:29 PM	Twilight	Astronomical Twilight ends
	6:35 PM	6:35 PM	Iridium Flare	CHES:Iridium 40 Flares at mag.-3.3 (Azm 174 Alt 29)
	6:37 PM	6:37 PM	Iridium Flare	CHES:Iridium 98 Flares at mag.-0.9 (Azm 174 Alt 29)
	6:41 PM	6:41 PM	Jup Sats	II.Ec.D

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
23 Dec 2013	8:49 PM	8:49 PM	Jup GRS	GRS Transit (CML=203)
	10:01 PM	10:01 PM	Jup Sats	II.Oc.R
	10:55 PM	10:55 PM	Moon	Moonrise
	11:14 PM	11:14 PM	Meteor Shower	Ursids meteor peak (zhr=20)
24 Dec 2013	4:06 AM	4:06 AM	Sat Pass (HST)	CHES:HST Passes SW to E (AzM 129.4 Alt 8)
	5:44 AM	5:44 AM	Twilight	Astronomical Twilight begins
	5:45 AM	5:45 AM	Sat Pass (HST)	CHES:HST Passes SW to E (AzM 171.7 Alt 23)
	6:44 AM	6:44 AM	Jup GRS	GRS Transit (CML=203)
	7:17 AM	7:17 AM	Sun	Sunrise
	8:23 AM	8:23 AM	Jupiter	Jupiter sets
	11:20 AM	11:20 AM	Moon	Moonset
	2:47 PM	2:47 PM	Iridium Flare	CHES:Iridium 97 Flares at mag.-6.8 (AzM 243 Alt 45)
	4:40 PM	4:40 PM	Jup GRS	GRS Transit (CML=203)
	4:57 PM	4:57 PM	Sun	Sunset
	5:02 PM	5:02 PM	Iridium Flare	CHES:Iridium 12 Flares at mag.-5.7 (AzM 216 Alt 20)
	5:44 PM	5:44 PM	Iridium Flare	CHES:Iridium 56 Flares at mag. 1.1 (AzM 279 Alt 15)
	5:52 PM	5:52 PM	Jupiter	Jupiter rises
	5:53 PM	5:53 PM	Iridium Flare	CHES:Iridium 52 Flares at mag.-5.3 (AzM 280 Alt 12)
	6:29 PM	6:29 PM	Iridium Flare	CHES:Iridium 77 Flares at mag.-2.1 (AzM 174 Alt 29)
	6:30 PM	6:30 PM	Twilight	Astronomical Twilight ends
6:36 PM	6:36 PM	Sat Pass (ISS)	CHES:ISS Passes NW to E (AzM 350.4 Alt 17)	
11:52 PM	11:52 PM	Moon	Moonrise	
25 Dec 2013	12:00 AM	12:00 AM	Public Holiday	Christmas Day holiday
	2:35 AM	2:35 AM	Jup GRS	GRS Transit (CML=203)
	4:01 AM	4:01 AM	Sat Pass (HST)	CHES:HST Passes SW to E (AzM 121.5 Alt 8)
	5:39 AM	5:39 AM	Sat Pass (HST)	CHES:HST Passes SW to E (AzM 174.7 Alt 25)
	5:45 AM	5:45 AM	Twilight	Astronomical Twilight begins
	7:17 AM	7:17 AM	Sun	Sunrise
	8:18 AM	8:18 AM	Jupiter	Jupiter sets
	9:00 AM	9:00 AM	Diary	LAST QUARTER
	9:12 AM	9:12 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	11:52 AM	11:52 AM	Moon	Moonset
	12:31 PM	12:31 PM	Jup GRS	GRS Transit (CML=203)
	2:41 PM	2:41 PM	Iridium Flare	CHES:Iridium 51 Flares at mag.-4.7 (AzM 241 Alt 45)
	4:58 PM	4:58 PM	Sun	Sunset
	5:38 PM	5:38 PM	Iridium Flare	CHES:Iridium 84 Flares at mag.-4.9 (AzM 277 Alt 14)
	5:45 PM	5:45 PM	Sat Pass (ISS)	CHES:ISS Passes NW to E (AzM 26.4 Alt 16)
	5:47 PM	5:47 PM	Iridium Flare	CHES:Iridium 10 Flares at mag. 1.5 (AzM 279 Alt 11)
5:48 PM	5:48 PM	Jupiter	Jupiter rises	
6:30 PM	6:30 PM	Twilight	Astronomical Twilight ends	

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	1	2	3	4			
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30	31	

Calendar

	Start	End	Category	Description
25 Dec 2013	7:00 PM	7:00 PM	Diary	Mars 4.4N of Moon
	7:19 PM	7:19 PM	Sat Pass (ISS)	CHES:ISS Passes NW to SE (Azm 305.3 Alt 13)
	10:26 PM	10:26 PM	Jup GRS	GRS Transit (CML=203)
26 Dec 2013	12:51 AM	12:51 AM	Moon	Moonrise
	3:56 AM	3:56 AM	Sat Pass (HST)	CHES:HST Passes SW to E (Azm 115.8 Alt 7)
	4:02 AM	4:02 AM	Lunar Occult	Moon occults 7.0 mag. star ZC1843(r)
	4:40 AM	4:40 AM	Jup Sats	I.Ec.D
	5:03 AM	5:03 AM	Jup Sats	IV.Ec.D
	5:33 AM	5:33 AM	Sat Pass (HST)	CHES:HST Passes SW to E (Azm 177.5 Alt 26)
	5:45 AM	5:45 AM	Twilight	Astronomical Twilight begins
	7:17 AM	7:17 AM	Sun	Sunrise
	8:14 AM	8:14 AM	Jupiter	Jupiter sets
	8:22 AM	8:22 AM	Jup GRS	GRS Transit (CML=203)
	12:26 PM	12:26 PM	Moon	Moonset
	4:58 PM	4:58 PM	Sun	Sunset
	5:33 PM	5:33 PM	Iridium Flare	CHES:Iridium 12 Flares at mag. 0.9 (Azm 276 Alt 15)
	5:43 PM	5:43 PM	Jupiter	Jupiter rises
	6:18 PM	6:18 PM	Jup GRS	GRS Transit (CML=203)
6:30 PM	6:30 PM	Sat Pass (ISS)	CHES:ISS Passes NW to SE (Azm 37.9 Alt 56)	
6:31 PM	6:31 PM	Twilight	Astronomical Twilight ends	
11:00 PM	11:00 PM	Diary	Spica 1.1S of Moon Occn	
27 Dec 2013	1:49 AM	1:49 AM	Jup Sats	I.Sh.I
	1:52 AM	1:52 AM	Moon	Moonrise
	2:04 AM	2:04 AM	Jup Sats	I.Tr.I
	3:51 AM	3:51 AM	Sat Pass (HST)	CHES:HST Passes SW to E (Azm 112.0 Alt 6)
	4:05 AM	4:05 AM	Jup Sats	I.Sh.E
	4:13 AM	4:13 AM	Jup GRS	GRS Transit (CML=203)
	4:20 AM	4:20 AM	Jup Sats	I.Tr.E
	5:28 AM	5:28 AM	Sat Pass (HST)	CHES:HST Passes W to E (Azm 180.8 Alt 26)
	5:45 AM	5:45 AM	Twilight	Astronomical Twilight begins
	7:08 AM	7:08 AM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 207.7 Alt 18)
	7:18 AM	7:18 AM	Sun	Sunrise
	8:09 AM	8:09 AM	Jupiter	Jupiter sets
	1:03 PM	1:03 PM	Moon	Moonset
	2:09 PM	2:09 PM	Jup GRS	GRS Transit (CML=203)
	4:53 PM	4:53 PM	Iridium Flare	CHES:Iridium 90 Flares at mag.-5.3 (Azm 221 Alt 17)
4:59 PM	4:59 PM	Sun	Sunset	
5:38 PM	5:38 PM	Sat Pass (ISS)	CHES:ISS Passes NW to E (Azm 33.3 Alt 30)	
5:39 PM	5:39 PM	Jupiter	Jupiter rises	
6:19 PM	6:19 PM	Iridium Flare	CHES:Iridium 80 Flares at mag.-0.6 (Azm 182 Alt 29)	

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
27 Dec 2013	6:32 PM	6:32 PM	Twilight	Astronomical Twilight ends
	7:00 PM	7:00 PM	Meetings	NAS Observing Session (Gates Co., NC)
	7:14 PM	7:14 PM	Sat Pass (ISS)	CHES:ISS Passes NW to S (Azm 240.1 Alt 23)
	9:09 PM	9:09 PM	Jup Sats	III.Sh.I
	10:03 PM	10:03 PM	Jup Sats	III.Tr.I
	11:09 PM	11:09 PM	Jup Sats	I.Ec.D
28 Dec 2013	12:04 AM	12:04 AM	Jup GRS	GRS Transit (CML=203)
	12:20 AM	12:20 AM	Jup Sats	III.Sh.E
	1:15 AM	1:15 AM	Jup Sats	III.Tr.E
	1:38 AM	1:38 AM	Jup Sats	I.Oc.R
	2:56 AM	2:56 AM	Moon	Moonrise
	5:22 AM	5:22 AM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 184.0 Alt 26)
	5:46 AM	5:46 AM	Twilight	Astronomical Twilight begins
	6:00 AM	6:00 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	6:38 AM	6:38 AM	Iridium Flare	CHES:Iridium 67 Flares at mag. 1.4 (Azm 070 Alt 23)
	7:03 AM	7:03 AM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 196.4 Alt 16)
	7:18 AM	7:18 AM	Sun	Sunrise
	8:05 AM	8:05 AM	Jupiter	Jupiter sets
	10:00 AM	10:00 AM	Jup GRS	GRS Transit (CML=203)
	1:45 PM	1:45 PM	Moon	Moonset
	5:00 PM	5:00 PM	Sun	Sunset
	5:34 PM	5:34 PM	Jupiter	Jupiter rises
	6:13 PM	6:13 PM	Iridium Flare	CHES:Iridium 81 Flares at mag.-7.1 (Azm 183 Alt 29)
	6:22 PM	6:22 PM	Sat Pass (ISS)	CHES:ISS Passes NW to SE (Azm 223.9 Alt 50)
	6:32 PM	6:32 PM	Twilight	Astronomical Twilight ends
	7:55 PM	7:55 PM	Jup GRS	GRS Transit (CML=203)
8:00 PM	8:00 PM	Diary	Saturn 0.8N of Moon Occn	
8:18 PM	8:18 PM	Jup Sats	I.Sh.I	
8:30 PM	8:30 PM	Jup Sats	I.Tr.I	
10:33 PM	10:33 PM	Jup Sats	I.Sh.E	
10:45 PM	10:45 PM	Jup Sats	I.Tr.E	
29 Dec 2013	2:00 AM	2:00 AM	Diary	Mercury superior conjunction
	3:02 AM	3:02 AM	Jup Sats	II.Sh.I
	3:25 AM	3:25 AM	Jup Sats	II.Tr.I
	4:01 AM	4:01 AM	Moon	Moonrise
	5:16 AM	5:16 AM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 186.8 Alt 24)
	5:44 AM	5:44 AM	Jup Sats	II.Sh.E
	5:46 AM	5:46 AM	Twilight	Astronomical Twilight begins
	5:51 AM	5:51 AM	Jup GRS	GRS Transit (CML=203)
6:08 AM	6:08 AM	Jup Sats	II.Tr.E	

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7	5	6	7	8	9	10	11
3	4	5	6	7	8	9	8	9	10	11	12	13	14	12	13	14	15	16	17	18
10	11	12	13	14	15	16	15	16	17	18	19	20	21	19	20	21	22	23	24	25
17	18	19	20	21	22	23	22	23	24	25	26	27	28	26	27	28	29	30	31	
24	25	26	27	28	29	30	29	30	31											

Calendar

	Start	End	Category	Description
29 Dec 2013	6:32 AM	6:32 AM	Iridium Flare	CHES:Iridium 72 Flares at mag.-1.4 (Azm 069 Alt 22)
	6:42 AM	6:42 AM	Iridium Flare	CHES:Iridium 75 Flares at mag. 1.4 (Azm 071 Alt 27)
	6:57 AM	6:57 AM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 199.0 Alt 13)
	7:18 AM	7:18 AM	Sun	Sunrise
	8:01 AM	8:01 AM	Jupiter	Jupiter sets
	2:34 PM	2:34 PM	Moon	Moonset
	3:47 PM	3:47 PM	Jup GRS	GRS Transit (CML=203)
	5:01 PM	5:01 PM	Sun	Sunset
	5:30 PM	5:30 PM	Jupiter	Jupiter rises
	5:30 PM	5:30 PM	Sat Pass (ISS)	CHES:ISS Passes NW to SE (Azm 40.3 Alt 74)
	6:07 PM	6:07 PM	Iridium Flare	CHES:Iridium 43 Flares at mag. 1.4 (Azm 181 Alt 30)
	6:33 PM	6:33 PM	Twilight	Astronomical Twilight ends
	8:04 PM	8:04 PM	Jup Sats	I.Oc.R
30 Dec 2013	1:42 AM	1:42 AM	Jup GRS	GRS Transit (CML=203)
	5:07 AM	5:07 AM	Moon	Moonrise
	5:10 AM	5:10 AM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 185.9 Alt 22)
	5:46 AM	5:46 AM	Twilight	Astronomical Twilight begins
	6:26 AM	6:26 AM	Iridium Flare	CHES:Iridium 62 Flares at mag.-6.0 (Azm 068 Alt 22)
	6:32 AM	6:32 AM	Iridium Flare	CHES:Iridium 98 Flares at mag. 0.6 (Azm 334 Alt 59)
	6:37 AM	6:37 AM	Iridium Flare	CHES:Iridium 14 Flares at mag. 0.4 (Azm 070 Alt 25)
	6:41 AM	6:41 AM	Iridium Flare	CHES:Iridium 14 Flares at mag. 0.6 (Azm 135 Alt 11)
	6:51 AM	6:51 AM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 201.7 Alt 10)
	7:19 AM	7:19 AM	Sun	Sunrise
	7:56 AM	7:56 AM	Jupiter	Jupiter sets
	11:38 AM	11:38 AM	Jup GRS	GRS Transit (CML=203)
	3:31 PM	3:31 PM	Moon	Moonset
	5:01 PM	5:01 PM	Sun	Sunset
	5:25 PM	5:25 PM	Jupiter	Jupiter rises
	6:14 PM	6:14 PM	Sat Pass (ISS)	CHES:ISS Passes NW to S (Azm 230.1 Alt 19)
	6:34 PM	6:34 PM	Twilight	Astronomical Twilight ends
	9:15 PM	9:15 PM	Jup Sats	II.Ec.D
	9:33 PM	9:33 PM	Jup GRS	GRS Transit (CML=203)
31 Dec 2013	12:15 AM	12:15 AM	Jup Sats	II.Oc.R
	2:50 AM	2:50 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	5:05 AM	5:05 AM	Sat Pass (HST)	CHES:HST Passes W to SE (Azm 180.2 Alt 19)
	5:47 AM	5:47 AM	Twilight	Astronomical Twilight begins
	6:10 AM	6:10 AM	Moon	Moonrise
	6:10 AM	6:10 AM	Iridium Flare	CHES:Iridium 64 Flares at mag.-0.7 (Azm 064 Alt 17)
	6:20 AM	6:20 AM	Iridium Flare	CHES:Iridium 65 Flares at mag. 0.4 (Azm 067 Alt 22)
	6:26 AM	6:26 AM	Iridium Flare	CHES:Iridium 43 Flares at mag. 0.5 (Azm 335 Alt 57)

Norfolk Astronomical Society Astronomical Calendar

November 2013							December 2013							January 2014						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7			1	2	3	4	
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30	31	

Calendar

	Start	End	Category	Description
31 Dec 2013	6:34 AM	6:34 AM	Iridium Flare	CHES:Iridium 66 Flares at mag. 1.8 (Azm 137 Alt 11)
	7:00 AM	7:00 AM	Diary	Mercury 4.6S of Pluto
	7:19 AM	7:19 AM	Sun	Sunrise
	7:29 AM	7:29 AM	Jup GRS	GRS Transit (CML=203)
	7:52 AM	7:52 AM	Jupiter	Jupiter sets
	11:33 AM	11:33 AM	Iridium Flare	CHES:Iridium 58 Flares at mag.-7.3 (Azm 166 Alt 64)
	4:34 PM	4:34 PM	Moon	Moonset
	5:02 PM	5:02 PM	Sun	Sunset
	5:20 PM	5:20 PM	Jupiter	Jupiter rises
	5:21 PM	5:21 PM	Sat Pass (ISS)	CHES:ISS Passes NW to SE (Azm 225.6 Alt 39)
	5:24 PM	5:24 PM	Jup GRS	GRS Transit (CML=203)
	6:00 PM	6:00 PM	Iridium Flare	CHES:Iridium 98 Flares at mag. 0.5 (Azm 185 Alt 30)
	6:04 PM	6:04 PM	Iridium Flare	CHES:Iridium 15 Flares at mag. 2.0 (Azm 192 Alt 27)
	6:34 PM	6:34 PM	Twilight	Astronomical Twilight ends