

Norfolk Astronomical Society



<http://norfolkastronomical.org>

November 2013

Monthly Sky Calendar
Prepared Specifically For
The Hampton Roads Area

Upcoming Regular Meetings

DATE	Monday, Nov. 18, 2013
TIME	6 - 8 PM EDT
WHERE	Chesapeake Public Library, Major Hillard branch Conf. Room
TOPIC	Spacewatch Comet and Asteroid Hunting Project (rescheduled)

DATE	Monday, Dec. 16, 2013
TIME	6 - 8 PM EDT
WHERE	At a restaurant to be determined
TOPIC	Annual dinner meeting

NGC281: The Pac Man Nebula In Cassiopeia

Photo By Glendon L. Howell



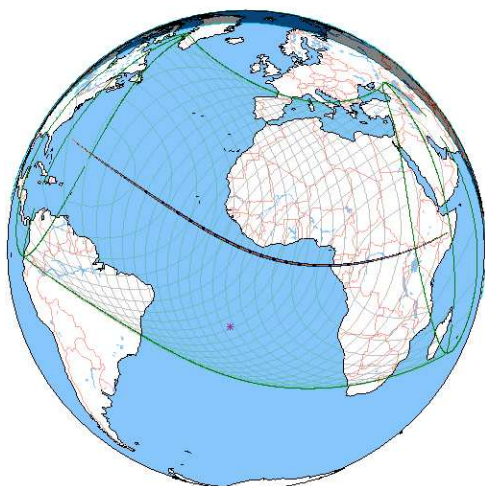
Glen imaged NGC281 on October 26, 2013 from dark rural Gates County, NC. This image is a stack of 17 each 4 minute exposures sigma-combined in AstroArt 4.0. Noiseware was used to remove background graininess. An S-curve stretch was then applied using Paint Shop Pro XI. Look for more of his work on his website Glen's Universe at <http://www.freewebs.com/howellgl>

A Sunrise Solar Eclipse For Hampton Roads

Glendon L. Howell

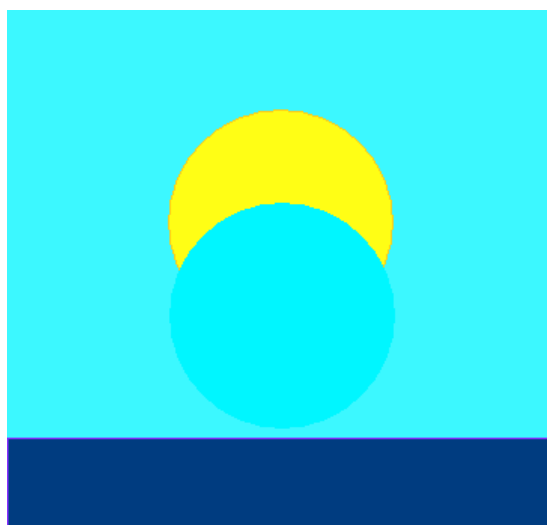
Norfolk Astronomical Society

On Sunday, November 3, 2013, there will be a hybrid Annular-Total solar eclipse that begins as annular at sunrise in the western Atlantic Ocean. The shadow races eastward across the Atlantic, to become total just off the coast of Africa. As the shadow continues eastward, the eclipse again becomes annular as the eclipse ends at sunset in eastern Africa. The change from annular to total to annular is due to the difference in distance that the Moon's shadow must traverse to reach Earth's surface.



Here in the Hampton Roads area, we will see a partial solar eclipse for about 40 minutes, beginning at sunrise and ending at 7:10 AM EST. Should the sky be clear that morning, we will have an excellent photo opportunity to catch scenery in near silhouette against the sunrise. To view the event, a low horizon such as at the ocean front will be essential.

As the Sun rises at 6:30 AM EST that morning, expect to see a notch cut from its bottom by the Moon. Prediction software suggests 50% of the diameter will be covered at that time, with the coverage diminishing rapidly to nothing by 7:10 AM. Being so low in the atmosphere, an unfiltered view should be possible with the unaided eye. Safe solar filtration may be needed long before the end of the eclipse. To add to the view, there are presently several large sunspot groups located toward the central and western limb of the Sun that will have moved closer to the western limb by eclipse morning.

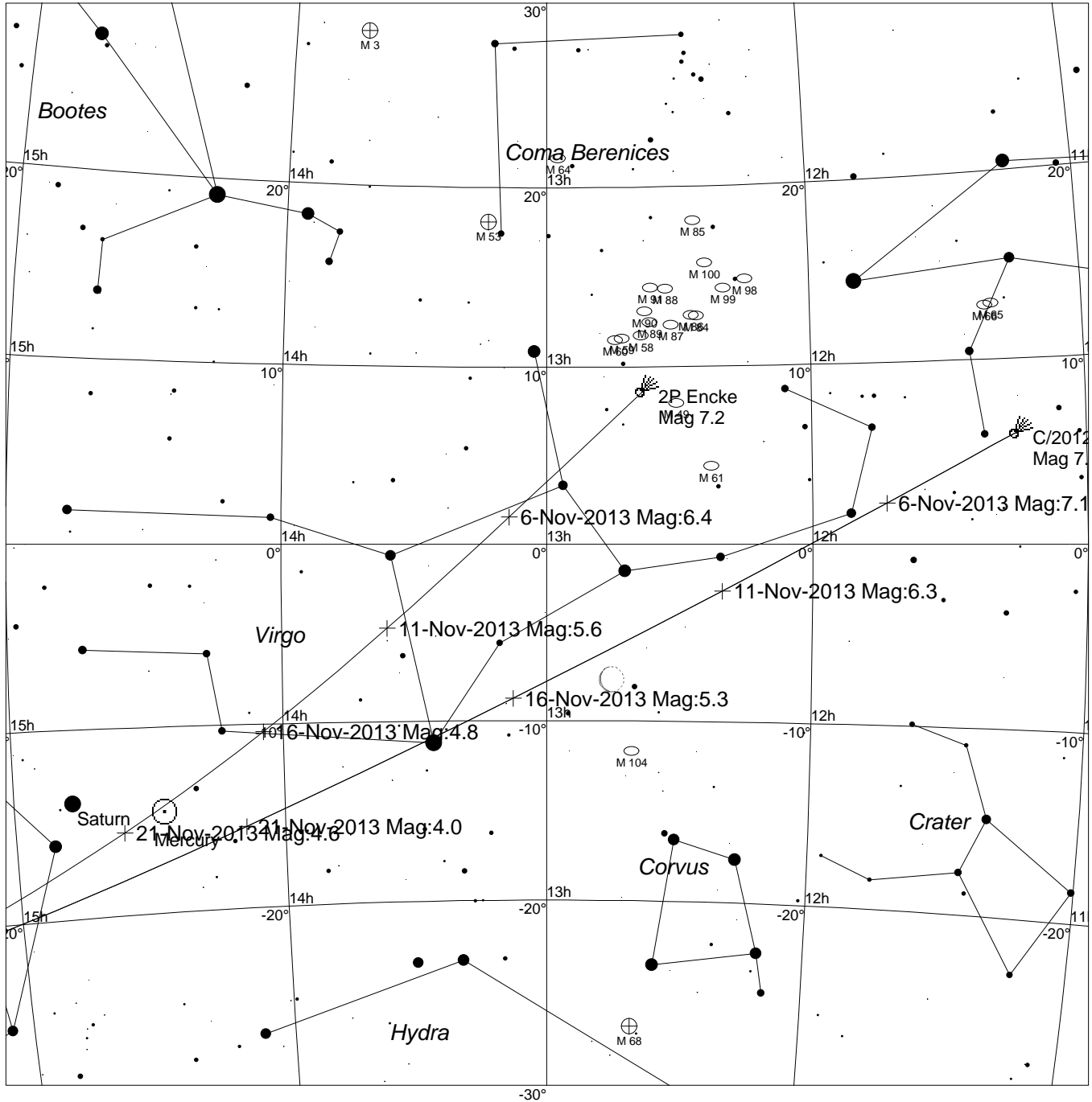


Local circumstances calculated by USNO's MICA 2.0 are as follows:

Solar Eclipse of 2013 Nov. 03
Sun in Partial Eclipse at this Location

	EST	Sun's Altitude	Sun's Azimuth	Position Angle	Vertex Angle
	h m s	°	°	°	°
Sunrise	6:30	----	107.9	----	
Eclipse Ends	7:10:05.1	6.1	113.9	116.8	166.5
Duration:	0h 39m 37.7s				
Magnitude:	0.865				
Obscuration:	82.8%				

November Comets

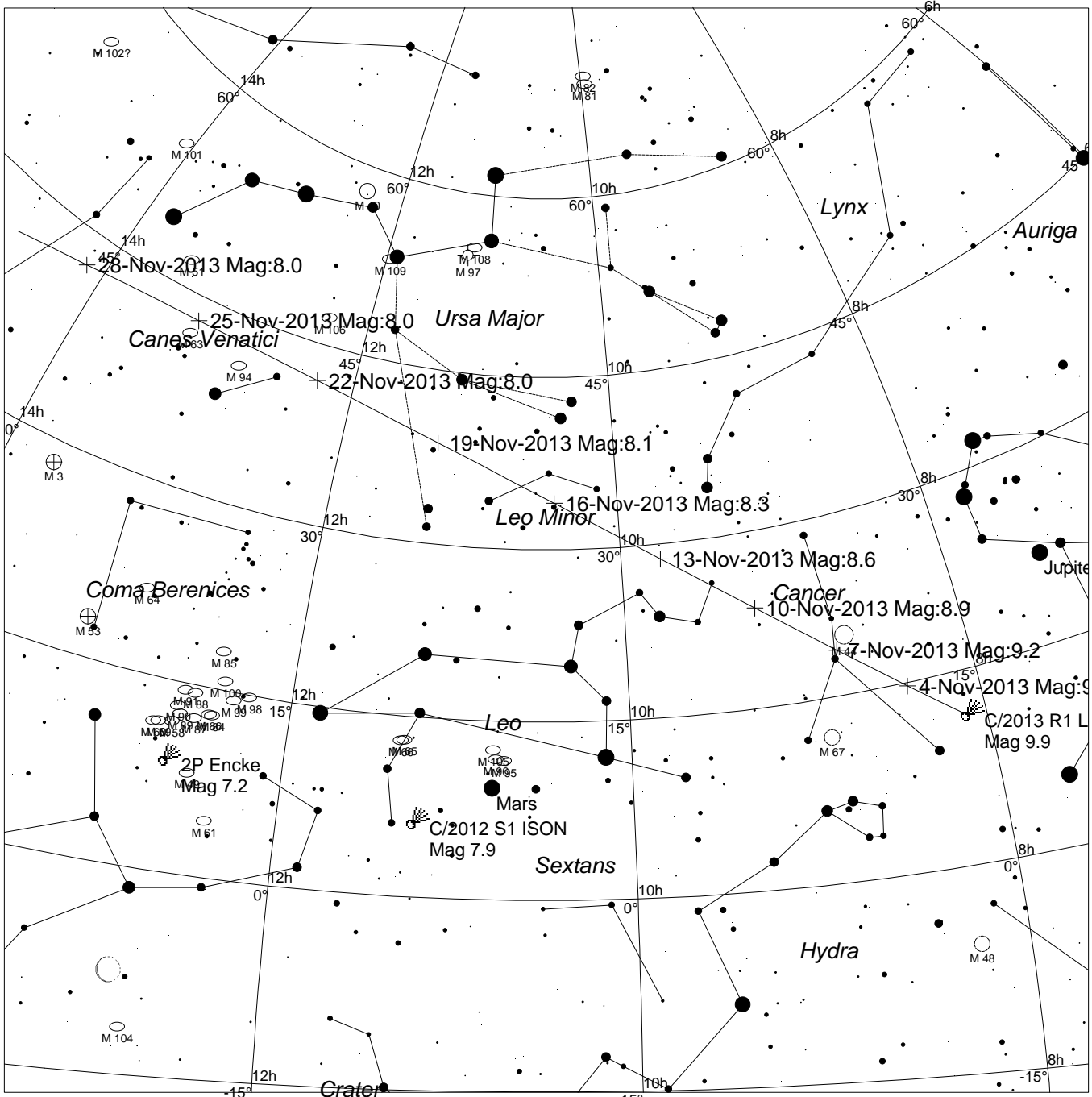


STARS	SYMBOLS	
● <2	☄ Comet	⊕ Globular Cluster
● 2.5	☾ Asteroid	⊖ Planetary Nebula
● 3	☾ Galaxy	☉ Quasar
● 3.5	○ Open Cluster	○ Other Object
● 4	☐ Bright Nebula	

Comets Encke and ISON are both low in the morning sky this month and will be difficult to view by month's end.

Local Time: 06:00:00 1-Nov-2013 UTC: 11:00:00 1-Nov-2013 Sidereal Time: 08:38:28
 Location: 36° 49' 48" N 76° 16' 48" W RA: 13h00m00s Dec: +0° 00' Field: 60.0° Julian Day: 2456597.9583

November Comets



STARS	SYMBOLS	
● <2	☄ Comet	⊕ Globular Cluster
● 2.5	☄ Asteroid	⊖ Planetary Nebula
● 3	☄ Galaxy	☉ Quasar
● 3.5	☄ Open Cluster	○ Other Object
● 4	☄ Bright Nebula	

Comet C/2013 R1 Lovejoy becomes circumpolar this month while continuing to brighten.

Local Time: 06:00:00 1-Nov-2013 UTC: 11:00:00 1-Nov-2013 Sidereal Time: 08:38:28
 Location: 36° 49' 48" N 76° 16' 48" W RA: 10h30m00s Dec: +30° 00' Field: 90.0° Julian Day: 2456597.9583

C/2012 S1 (ISON)

Epoch 2013 Nov. 4.0 TT = JDT 2456600.5

T 2013 Nov. 28.7749 TT

q	0.012444	(2000.0)	P	Q	MPC
z	-0.000162	Peri.	345.5644	+0.3151345	+0.5123878
	+/-0.000001	Node	295.6530	-0.7589371	-0.3693355
e	1.000002	Incl.	62.3985	-0.5698287	+0.7752741

From 3997 observations 2011 Sept. 30-2013 Sept. 16, mean residual 0".5.

Date	TT	R. A. (2000)	Decl.	Delta	r	Elong.	Phase	m1	m2
2013 10 06		09 45 40.8	+16 31 35	2.0028	1.5553	49.7	29.3	10.5	
2013 10 13		10 03 12.0	+14 41 15	1.7926	1.4161	52.0	33.7	10.0	
2013 10 20		10 23 57.6	+12 21 06	1.5814	1.2698	53.4	39.0	9.3	
2013 10 27		10 49 36.7	+09 15 33	1.3732	1.1146	53.3	45.6	8.6	
2013 11 03		11 22 55.2	+04 59 17	1.1751	0.9479	51.0	54.5	7.7	
2013 11 10		12 08 32.5	-01 05 08	1.0016	0.7651	45.2	66.6	6.6	
2013 11 17		13 13 37.4	-09 27 27	0.8813	0.5574	34.1	83.6	5.2	
2013 11 24		14 45 42.6	-18 53 55	0.8693	0.3002	17.1	104.3	3.0	
2013 12 01		16 19 11.9	-13 59 09	0.8681	0.1756	8.1	128.1	1.1	
2013 12 08		16 11 28.1	-00 41 59	0.6666	0.4717	24.8	118.9	4.0	
2013 12 15		16 10 35.3	+14 39 44	0.5322	0.6928	42.5	106.2	4.9	
2013 12 22		16 14 46.0	+35 19 13	0.4484	0.8832	63.9	89.0	5.3	
2013 12 29		16 27 33.5	+60 16 06	0.4326	1.0552	87.2	68.6	5.9	

NOTE: Peak magnitude of -4.5 reached 11/29.

2P/Encke

Epoch 2013 Nov. 4.0 TT = JDT 2456600.5

T 2013 Nov. 21.6940 TT

q	0.336128	(2000.0)	P	Q	MPC
n	0.2990318	Peri.	186.5358	-0.9451060	-0.3147896
a	2.214749	Node	334.5730	+0.3082838	-0.7700539
e	0.848232	Incl.	11.7789	+0.1083320	-0.5549095
P	3.30				

From 1478 observations 1993-2011, mean residual 0".6. Nongravitational parameters A1 = -0.01, A2 = -0.0007.

Date	TT	R. A. (2000)	Decl.	Delta	r	Elong.	Phase	m1	m2
2013 10 06		07 48 22.7	+43 17 05	0.5419	1.0722	82.4	67.6	10.6	17.7
2013 10 13		09 21 27.5	+39 04 49	0.4874	0.9570	71.0	80.3	9.7	17.6
2013 10 20		10 49 39.0	+29 30 27	0.4824	0.8362	56.9	94.2	8.8	17.9
2013 10 27		11 57 51.1	+17 28 55	0.5327	0.7103	43.6	105.3	7.9	18.3
2013 11 03		12 48 00.1	+06 20 34	0.6340	0.5811	33.5	109.4	7.0	18.5
2013 11 10		13 28 17.0	-02 59 22	0.7806	0.4561	26.6	103.3	5.8	18.0
2013 11 17		14 07 41.6	-11 00 27	0.9677	0.3595	21.1	82.7	4.8	17.1
2013 11 24		14 53 53.8	-17 57 13	1.1715	0.3419	15.4	50.0	4.9	16.4
2013 12 01		15 44 43.6	-23 04 03	1.3509	0.4177	10.1	24.5	6.5	16.4
2013 12 08		16 32 50.8	-26 08 52	1.5024	0.5371	6.8	12.5	8.3	16.8
2013 12 15		17 15 35.7	-27 43 43	1.6393	0.6661	5.5	8.1	9.9	17.3
2013 12 22		17 52 57.7	-28 19 22	1.7683	0.7936	5.2	6.4	11.2	17.7
2013 12 29		18 25 35.2	-28 16 57	1.8912	0.9162	5.2	5.6	12.3	18.1

C/2013 R1 (Lovejoy)

T 2013 Dec. 22.9688 TT

q	0.817711	(2000.0)	P	Q	MPC
		Peri.	66.7748	-0.2541275	-0.4645501
		Node	70.9320	+0.1353100	-0.8855449
e	1.0	Incl.	63.8374	+0.9576588	+0.0018463

From 188 observations 2013 Sept. 7-16.

Date	TT	R. A. (2000)	Decl.	Delta	r	Elong.	Phase	m1	m2
2013 10 06		06 45 42.7	-02 20 54	1.2404	1.5940	90.1	38.8	12.5	
2013 10 13		07 00 40.0	-00 20 37	1.0710	1.5000	92.9	41.6	11.9	
2013 10 20		07 18 36.3	+02 29 41	0.9048	1.4066	95.4	44.8	11.3	
2013 10 27		07 41 44.3	+06 40 33	0.7451	1.3144	97.2	48.6	10.5	
2013 11 03		08 14 29.7	+13 03 05	0.5982	1.2243	97.6	53.4	9.8	
2013 11 10		09 06 20.7	+22 42 58	0.4771	1.1375	95.2	60.1	9.0	
2013 11 17		10 35 18.2	+35 00 37	0.4062	1.0556	88.0	69.4	8.3	
2013 11 24		12 47 10.8	+42 49 44	0.4115	0.9810	77.1	78.8	8.0	
2013 12 01		14 45 19.7	+41 12 21	0.4887	0.9164	67.3	83.2	8.1	
2013 12 08		15 56 23.9	+35 55 47	0.6079	0.8654	60.4	81.9	8.3	
2013 12 15		16 37 24.4	+30 45 56	0.7445	0.8316	55.4	77.1	8.6	
2013 12 22		17 03 21.9	+26 17 07	0.8842	0.8179	51.6	70.5	8.9	
2013 12 29		17 21 35.4	+22 22 29	1.0185	0.8257	48.7	63.4	9.2	

A Report On VAAS 2013
Glendon L Howell
Norfolk Astronomical Society



Fall foliage



Solar viewing



John Raymond's refractor

The 37th convention of the Virginia Association of Astronomical Societies was held Saturday, October 5, 2013 at C. M. Crockett State Park, near Warrenton, VA. Host for this year's convention was the Northern Virginia Astronomy Club (NOVAC). The event was held in conjunction with the annual NOVAC Stargaze. An estimated 40 persons attended the event, from various clubs around the state. In attendance from our area were Mike Beale, Bird Taylor, and Glen Howell.

The event was free this year, and NOVAC graciously provided breakfast and lunch, catered by Panera Bread. There was some concern that some of the scheduled NASA speakers might not show due to the federal furlough, but these proved to be unfounded.



Alan Goldberg



Round-table discussion



Sean O'Brian

For VAAS, only 2 speakers were scheduled this year, along with a round-table discussion. The first talk "Color Perception and Meaning in Astronomy" by NOVAC member Alan Goldberg discussed some of the different color pallets used in astronomical imaging. This was followed by "An Astronomy Round-Table Discussion", with members of various clubs around the state talking about what their club was trying to do to curb the "greying" in the amateur astronomer's average age, and bring more youth involvement. After lunch and a raffle, the final talk was by Sean O'Brien of the National Air & Space Museum on "Some Observations by a Planetarium Educator".

Telescopes were setup in the adjacent field for safe solar viewing in white light and hydrogen alpha. I was particularly impressed by the size of RAS member John Raymond's refractor. VAAS officially ended at 3 PM, with several more speakers scheduled that evening for the Stargaze. Not wishing to get home so late, we left by about 4 PM.

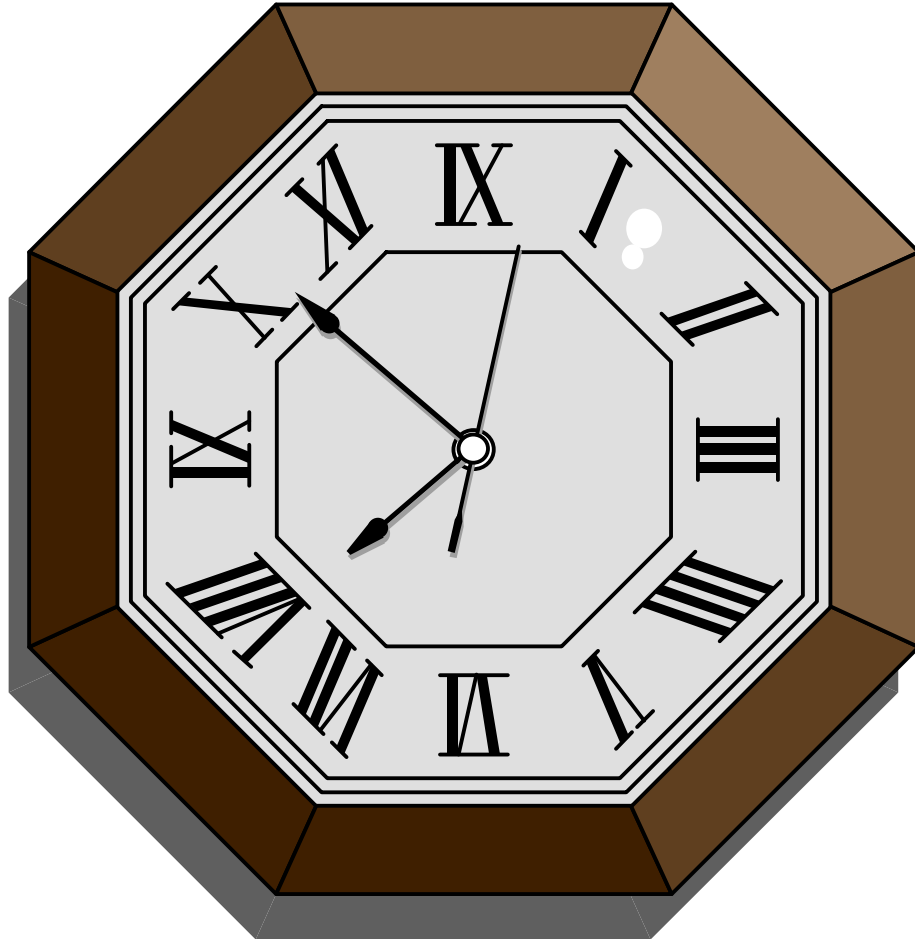
Next year's VAAS 2014 will be hosted by the Norfolk Astronomical Society.

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
1 Nov 2013	4:00 AM	4:00 AM	Diary	Venus greatest elong E(47)
	5:24 AM	5:24 AM	Moon	Moonrise
	6:03 AM	6:03 AM	Twilight	Astronomical Twilight begins
	6:05 AM	6:05 AM	Lunar Occult	Moon occults 6.8 mag. star ZC1822(R)
	7:31 AM	7:31 AM	Sun	Sunrise
	1:03 PM	1:03 PM	Jupiter	Jupiter sets
	2:00 PM	2:00 PM		East Coast Star Party (ECSP) continues
	4:59 PM	4:59 PM	Moon	Moonset
	5:00 PM	5:00 PM	Diary	Mercury inferior conjunction
	6:10 PM	6:10 PM	Sun	Sunset
7:38 PM	7:38 PM	Twilight	Astronomical Twilight ends	
10:37 PM	10:37 PM	Jupiter	Jupiter rises	
2 Nov 2013	4:00 AM	4:00 AM	Diary	Spica 0.8S of Moon Occn
	6:04 AM	6:04 AM	Twilight	Astronomical Twilight begins
	6:11 AM	6:11 AM	Jup Sats	I.Sh.I
	6:28 AM	6:28 AM	Moon	Moonrise
	7:13 AM	7:13 AM	Jup Sats	II.Sh.I
	7:32 AM	7:32 AM	Sun	Sunrise
	5:00 PM	5:00 PM		East Coast Star Party (ECSP) cookout
	5:39 PM	5:39 PM	Moon	Moonset
	6:09 PM	6:09 PM	Sun	Sunset
	7:37 PM	7:37 PM	Twilight	Astronomical Twilight ends
10:34 PM	10:34 PM	Jupiter	Jupiter rises	
3 Nov 2013	2:00 AM	2:00 AM		Fall back to EST
	3:24 AM	3:24 AM	Jup Sats	I.Ec.D
	4:00 AM	4:00 AM	Diary	Mercury 0.0N of Moon Occn
	6:05 AM	6:05 AM	Twilight	Astronomical Twilight begins
	6:54 AM	6:54 AM	Jup Sats	I.Oc.R
	7:33 AM	7:33 AM	Sun	Sunrise (Eclipse in progress 57% covered)
	7:34 AM	7:34 AM	Moon	Moonrise
	8:09 AM	8:09 AM		Solar Eclipse ends
	10:00 AM	10:00 AM	Diary	NEW MOON Eclipse
	12:56 PM	12:56 PM	Jupiter	Jupiter sets
	2:00 PM	2:00 PM	Diary	Saturn 1.6N of Moon
	6:08 PM	6:08 PM	Sun	Sunset
	6:23 PM	6:23 PM	Moon	Moonset
	7:30 PM	7:30 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
7:36 PM	7:36 PM	Twilight	Astronomical Twilight ends	
10:30 PM	10:30 PM	Jupiter	Jupiter rises	
11:48 PM	11:48 PM	Meteor Shower	S Taurids (Encke) meteor peak (zhr=15)	



2 AM Sunday, November 3, 2013

Fall Back To EDT

(Set clocks back 1 hour)

DAYLIGHT SAVING TIME

Year	DST Begins 2 a.m. (Second Sunday in March)	DST Ends 2 a.m. (First Sunday in November)
2007	Sun 11 March 2007	Sun 04 November 2007
2008	Sun 09 March 2008	Sun 02 November 2008
2009	Sun 08 March 2009	Sun 01 November 2009
2010	Sun 14 March 2010	Sun 07 November 2010
2011	Sun 13 March 2011	Sun 06 November 2011
2012	Sun 11 March 2012	Sun 04 November 2012
2013	Sun 10 March 2013	Sun 03 November 2013
2014	Sun 09 March 2014	Sun 02 November 2014
2015	Sun 08 March 2015	Sun 01 November 2015
2016	Sun 13 March 2016	Sun 06 November 2016
2017	Sun 12 March 2017	Sun 05 November 2017
2018	Sun 11 March 2018	Sun 04 November 2018
2019	Sun 10 March 2019	Sun 03 November 2019
2020	Sun 08 March 2020	Sun 01 November 2020
2021	Sun 14 March 2021	Sun 07 November 2021
2022	Sun 13 March 2022	Sun 06 November 2022
2023	Sun 12 March 2023	Sun 05 November 2023
2024	Sun 10 March 2024	Sun 03 November 2024
2025	Sun 09 March 2025	Sun 02 November 2025

*By the rules enacted in Energy Policy Act of 2005, beginning in 2007, DST begins on the second Sunday in March and ends on the first Sunday in November. Time changes at 2 AM local time.
<http://www.greenwichmeantime.com/time-zone/rules/usa/>*

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

Calendar

	Start	End	Category	Description
3 Nov 2013	2:00 AM	2:00 AM		Fall back to EST
	2:24 AM	2:24 AM	Jup Sats	I.Ec.D
	3:00 AM	3:00 AM	Diary	Mercury 0.0N of Moon Occn
	5:05 AM	5:05 AM	Twilight	Astronomical Twilight begins
	5:31 AM	5:31 AM	Iridium Flare	CHES:Iridium 95 Flares at mag. 0.7 (Azm 350 Alt 48)
	5:54 AM	5:54 AM	Jup Sats	I.Oc.R
	6:33 AM	6:33 AM	Sun	Sunrise
	6:34 AM	6:34 AM	Moon	Moonrise
	9:00 AM	9:00 AM	Diary	NEW MOON Eclipse
	9:28 AM	9:28 AM	Iridium Flare	CHES:Iridium 16 Flares at mag.-7.0 (Azm 156 Alt 59)
	9:45 AM	9:45 AM	Jup GRS	GRS Transit (CML=203)
	11:56 AM	11:56 AM	Jupiter	Jupiter sets
	1:00 PM	1:00 PM	Diary	Saturn 1.6N of Moon
	5:08 PM	5:08 PM	Sun	Sunset
	5:23 PM	5:23 PM	Moon	Moonsset
	6:30 PM	6:30 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	6:36 PM	6:36 PM	Twilight	Astronomical Twilight ends
	6:54 PM	6:54 PM	Iridium Flare	CHES:Iridium 96 Flares at mag.-7.0 (Azm 155 Alt 36)
	7:41 PM	7:41 PM	Jup GRS	GRS Transit (CML=203)
9:30 PM	9:30 PM	Jupiter	Jupiter rises	
10:48 PM	10:48 PM	Meteor Shower	S Taurids (Encke) meteor peak (zhr=15)	
11:39 PM	11:39 PM	Jup Sats	I.Sh.I	
4 Nov 2013	12:45 AM	12:45 AM	Jup Sats	II.Ec.D
	12:50 AM	12:50 AM	Jup Sats	I.Tr.I
	1:53 AM	1:53 AM	Jup Sats	I.Sh.E
	3:04 AM	3:04 AM	Jup Sats	I.Tr.E
	3:18 AM	3:18 AM	Jup Sats	III.Ec.D
	5:06 AM	5:06 AM	Twilight	Astronomical Twilight begins
	5:25 AM	5:25 AM	Iridium Flare	CHES:Iridium 30 Flares at mag. 0.3 (Azm 350 Alt 46)
	5:37 AM	5:37 AM	Jup GRS	GRS Transit (CML=203)
	5:48 AM	5:48 AM	Jup Sats	II.Oc.R
	6:34 AM	6:34 AM	Sun	Sunrise
	7:40 AM	7:40 AM	Moon	Moonrise
	9:21 AM	9:21 AM	Iridium Flare	CHES:Iridium 13 Flares at mag.-5.9 (Azm 157 Alt 62)
	11:52 AM	11:52 AM	Jupiter	Jupiter sets
	3:32 PM	3:32 PM	Jup GRS	GRS Transit (CML=203)
	5:07 PM	5:07 PM	Sun	Sunset
	6:13 PM	6:13 PM	Moon	Moonsset
	6:35 PM	6:35 PM	Twilight	Astronomical Twilight ends
	6:47 PM	6:47 PM	Iridium Flare	CHES:Iridium 19 Flares at mag.-5.7 (Azm 157 Alt 37)
	9:26 PM	9:26 PM	Jupiter	Jupiter rises

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
5 Nov 2013	12:22 AM	12:22 AM	Jup Sats	I.Oc.R
	1:28 AM	1:28 AM	Jup GRS	GRS Transit (CML=203)
	5:07 AM	5:07 AM	Twilight	Astronomical Twilight begins
	5:19 AM	5:19 AM	Iridium Flare	CHES:Iridium 57 Flares at mag.-5.0 (Azm 352 Alt 45)
	6:35 AM	6:35 AM	Sun	Sunrise
	8:45 AM	8:45 AM	Moon	Moonrise
	11:24 AM	11:24 AM	Jup GRS	GRS Transit (CML=203)
	11:48 AM	11:48 AM	Jupiter	Jupiter sets
	5:06 PM	5:06 PM	Sun	Sunset
	6:34 PM	6:34 PM	Twilight	Astronomical Twilight ends
	6:41 PM	6:41 PM	Iridium Flare	CHES:Iridium 97 Flares at mag. 0.5 (Azm 155 Alt 36)
	7:09 PM	7:09 PM	Moon	Moonset
	9:19 PM	9:19 PM	Jup GRS	GRS Transit (CML=203)
9:22 PM	9:22 PM	Jupiter	Jupiter rises	
9:55 PM	9:55 PM	Jup Sats	II.Tr.I	
10:10 PM	10:10 PM	Jup Sats	II.Sh.E	
11:04 PM	11:04 PM	Jup Sats	IV.Ec.D	
6 Nov 2013	12:36 AM	12:36 AM	Jup Sats	II.Tr.E
	2:06 AM	2:06 AM	Jup Sats	IV.Ec.R
	5:08 AM	5:08 AM	Twilight	Astronomical Twilight begins
	5:13 AM	5:13 AM	Iridium Flare	CHES:Iridium 60 Flares at mag.-7.8 (Azm 352 Alt 43)
	6:00 AM	6:00 AM	Diary	Moon at perigee
	6:36 AM	6:36 AM	Sun	Sunrise
	7:00 AM	7:00 AM	Diary	Saturn at conjunction
	7:15 AM	7:15 AM	Jup GRS	GRS Transit (CML=203)
	9:47 AM	9:47 AM	Moon	Moonrise
	11:44 AM	11:44 AM	Jupiter	Jupiter sets
	3:19 PM	3:19 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	5:06 PM	5:06 PM	Sun	Sunset
	5:11 PM	5:11 PM	Jup GRS	GRS Transit (CML=203)
6:33 PM	6:33 PM	Twilight	Astronomical Twilight ends	
8:10 PM	8:10 PM	Moon	Moonset	
9:18 PM	9:18 PM	Jupiter	Jupiter rises	
7 Nov 2013	3:00 AM	3:00 AM	Diary	Jupiter stationary
	3:06 AM	3:06 AM	Jup GRS	GRS Transit (CML=203)
	5:07 AM	5:07 AM	Iridium Flare	CHES:Iridium 29 Flares at mag.-1.0 (Azm 353 Alt 42)
	5:09 AM	5:09 AM	Twilight	Astronomical Twilight begins
	6:37 AM	6:37 AM	Sun	Sunrise
	9:00 AM	9:00 AM	Diary	Pluto 1.7S of Moon
10:42 AM	10:42 AM	Moon	Moonrise	

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
7 Nov 2013	11:40 AM	11:40 AM	Jupiter	Jupiter sets
	1:02 PM	1:02 PM	Jup GRS	GRS Transit (CML=203)
	5:05 PM	5:05 PM	Sun	Sunset
	6:33 PM	6:33 PM	Twilight	Astronomical Twilight ends
	9:14 PM	9:14 PM	Jupiter	Jupiter rises
	9:15 PM	9:15 PM	Moon	Moonset
	10:00 PM	10:00 PM	Jup Sats	III.Tr.I
	10:57 PM	10:57 PM	Jup GRS	GRS Transit (CML=203)
8 Nov 2013	1:11 AM	1:11 AM	Jup Sats	III.Tr.E
	5:01 AM	5:01 AM	Iridium Flare	CHES:Iridium 32 Flares at mag. 1.3 (Azm 355 Alt 41)
	5:09 AM	5:09 AM	Twilight	Astronomical Twilight begins
	6:38 AM	6:38 AM	Sun	Sunrise
	8:53 AM	8:53 AM	Jup GRS	GRS Transit (CML=203)
	9:00 AM	9:00 AM	Iridium Flare	CHES:Iridium 90 Flares at mag.-4.8 (Azm 156 Alt 68)
	11:32 AM	11:32 AM	Moon	Moonrise
	11:36 AM	11:36 AM	Jupiter	Jupiter sets
	3:02 PM	3:02 PM	Iridium Flare	CHES:Iridium 23 Flares at mag.-5.5 (Azm 242 Alt 33)
	5:04 PM	5:04 PM	Sun	Sunset
	6:27 PM	6:27 PM	Iridium Flare	CHES:Iridium 36 Flares at mag. 0.8 (Azm 162 Alt 36)
	6:32 PM	6:32 PM	Twilight	Astronomical Twilight ends
	6:32 PM	6:32 PM	Iridium Flare	CHES:Iridium 35 Flares at mag. 1.3 (Azm 169 Alt 38)
	6:49 PM	6:49 PM	Jup GRS	GRS Transit (CML=203)
9:10 PM	9:10 PM	Jupiter	Jupiter rises	
10:22 PM	10:22 PM	Moon	Moonset	
9 Nov 2013	4:44 AM	4:44 AM	Jup GRS	GRS Transit (CML=203)
	5:10 AM	5:10 AM	Twilight	Astronomical Twilight begins
	6:39 AM	6:39 AM	Sun	Sunrise
	11:32 AM	11:32 AM	Jupiter	Jupiter sets
	12:00 PM	12:00 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	12:16 PM	12:16 PM	Moon	Moonrise
	2:40 PM	2:40 PM	Jup GRS	GRS Transit (CML=203)
	5:03 PM	5:03 PM	Sun	Sunset
	6:26 PM	6:26 PM	Iridium Flare	CHES:Iridium 6 Flares at mag.-6.0 (Azm 167 Alt 37)
	6:31 PM	6:31 PM	Twilight	Astronomical Twilight ends
	9:06 PM	9:06 PM	Jupiter	Jupiter rises
11:28 PM	11:28 PM	Moon	Moonset	
10 Nov 2013	12:35 AM	12:35 AM	Jup GRS	GRS Transit (CML=203)
	1:00 AM	1:00 AM	Diary	FIRST QUARTER
	4:18 AM	4:18 AM	Jup Sats	I.Ec.D

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
10 Nov 2013	4:59 AM	4:59 AM	Iridium Flare	CHES:Iridium 95 Flares at mag. 1.9 (Azm 347 Alt 35)
	5:11 AM	5:11 AM	Twilight	Astronomical Twilight begins
	6:40 AM	6:40 AM	Sun	Sunrise
	10:00 AM	10:00 AM	Diary	Mercury stationary
	10:31 AM	10:31 AM	Jup GRS	GRS Transit (CML=203)
	11:28 AM	11:28 AM	Jupiter	Jupiter sets
	12:55 PM	12:55 PM	Moon	Moonrise
	5:02 PM	5:02 PM	Sun	Sunset
	6:31 PM	6:31 PM	Twilight	Astronomical Twilight ends
	8:27 PM	8:27 PM	Jup GRS	GRS Transit (CML=203)
9:02 PM	9:02 PM	Jupiter	Jupiter rises	
11 Nov 2013	12:00 AM	12:00 AM	Public Holiday	Veterans Day holiday
	12:33 AM	12:33 AM	Moon	Moonset
	1:32 AM	1:32 AM	Jup Sats	I.Sh.I
	2:00 AM	2:00 AM	Diary	Neptune 5.4S of Moon
	2:39 AM	2:39 AM	Jup Sats	I.Tr.I
	3:18 AM	3:18 AM	Jup Sats	II.Ec.D
	3:46 AM	3:46 AM	Jup Sats	I.Sh.E
	4:53 AM	4:53 AM	Jup Sats	I.Tr.E
	4:53 AM	4:53 AM	Iridium Flare	CHES:Iridium 30 Flares at mag. 1.4 (Azm 348 Alt 33)
	5:12 AM	5:12 AM	Twilight	Astronomical Twilight begins
	6:22 AM	6:22 AM	Jup GRS	GRS Transit (CML=203)
	6:41 AM	6:41 AM	Sun	Sunrise
	11:24 AM	11:24 AM	Jupiter	Jupiter sets
	1:31 PM	1:31 PM	Moon	Moonrise
	4:18 PM	4:18 PM	Jup GRS	GRS Transit (CML=203)
5:01 PM	5:01 PM	Sun	Sunset	
6:14 PM	6:14 PM	Iridium Flare	CHES:Iridium 19 Flares at mag. 1.6 (Azm 167 Alt 36)	
6:30 PM	6:30 PM	Twilight	Astronomical Twilight ends	
8:58 PM	8:58 PM	Jupiter	Jupiter rises	
10:47 PM	10:47 PM	Jup Sats	I.Ec.D	
12 Nov 2013	1:37 AM	1:37 AM	Moon	Moonset
	2:11 AM	2:11 AM	Jup Sats	I.Oc.R
	2:14 AM	2:14 AM	Jup GRS	GRS Transit (CML=203)
	4:47 AM	4:47 AM	Iridium Flare	CHES:Iridium 57 Flares at mag.-1.7 (Azm 349 Alt 32)
	5:13 AM	5:13 AM	Twilight	Astronomical Twilight begins
	6:42 AM	6:42 AM	Sun	Sunrise
	8:57 AM	8:57 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	11:20 AM	11:20 AM	Jupiter	Jupiter sets
	12:09 PM	12:09 PM	Jup GRS	GRS Transit (CML=203)

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
12 Nov 2013	2:06 PM	2:06 PM	Moon	Moonrise
	5:01 PM	5:01 PM	Sun	Sunset
	6:29 PM	6:29 PM	Twilight	Astronomical Twilight ends
	8:54 PM	8:54 PM	Jupiter	Jupiter rises
	9:06 PM	9:06 PM	Jup Sats	I.Tr.I
	10:05 PM	10:05 PM	Jup GRS	GRS Transit (CML=203)
	10:07 PM	10:07 PM	Jup Sats	II.Sh.I
	10:14 PM	10:14 PM	Jup Sats	I.Sh.E
	11:20 PM	11:20 PM	Jup Sats	I.Tr.E
13 Nov 2013	12:22 AM	12:22 AM	Jup Sats	II.Tr.I
	12:46 AM	12:46 AM	Jup Sats	II.Sh.E
	2:40 AM	2:40 AM	Moon	Moonset
	3:04 AM	3:04 AM	Jup Sats	II.Tr.E
	4:41 AM	4:41 AM	Iridium Flare	CHES:Iridium 60 Flares at mag.-3.7 (Azm 349 Alt 30)
	5:14 AM	5:14 AM	Twilight	Astronomical Twilight begins
	6:43 AM	6:43 AM	Sun	Sunrise
	8:00 AM	8:00 AM	Jup GRS	GRS Transit (CML=203)
	11:16 AM	11:16 AM	Jupiter	Jupiter sets
	2:40 PM	2:40 PM	Moon	Moonrise
	5:00 PM	5:00 PM	Sun	Sunset
	5:00 PM	5:00 PM	Diary	Neptune stationary
	5:56 PM	5:56 PM	Jup GRS	GRS Transit (CML=203)
	6:29 PM	6:29 PM	Twilight	Astronomical Twilight ends
7:00 PM	7:00 PM	Diary	Uranus 3.2S of Moon	
8:50 PM	8:50 PM	Jupiter	Jupiter rises	
9:52 PM	9:52 PM	Meteor Shower	N Taurids (Encke) meteor peak (zhr=15)	
14 Nov 2013	3:41 AM	3:41 AM	Moon	Moonset
	3:52 AM	3:52 AM	Jup GRS	GRS Transit (CML=203)
	5:15 AM	5:15 AM	Twilight	Astronomical Twilight begins
	6:44 AM	6:44 AM	Sun	Sunrise
	8:30 AM	8:30 AM	Iridium Flare	CHES:Iridium 54 Flares at mag.-6.6 (Azm 157 Alt 78)
	11:12 AM	11:12 AM	Jupiter	Jupiter sets
	1:47 PM	1:47 PM	Jup GRS	GRS Transit (CML=203)
	3:15 PM	3:15 PM	Moon	Moonrise
	4:59 PM	4:59 PM	Sun	Sunset
	5:30 PM	5:30 PM	Iridium Flare	CHES:Iridium 33 Flares at mag.-1.3 (Azm 273 Alt 10)
	6:05 PM	6:05 PM	Iridium Flare	CHES:Iridium 61 Flares at mag.-2.5 (Azm 179 Alt 36)
	6:28 PM	6:28 PM	Twilight	Astronomical Twilight ends
	8:46 PM	8:46 PM	Jupiter	Jupiter rises
9:19 PM	9:19 PM	Jup Sats	III.Sh.I	

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
14 Nov 2013	9:25 PM	9:25 PM	Jup Sats	II.Oc.R
	11:35 PM	11:35 PM	Jup Sats	IV.Tr.E
	11:43 PM	11:43 PM	Jup GRS	GRS Transit (CML=203)
15 Nov 2013	12:23 AM	12:23 AM	Jup Sats	III.Sh.E
	1:38 AM	1:38 AM	Jup Sats	III.Tr.I
	4:42 AM	4:42 AM	Moon	Moonset
	4:49 AM	4:49 AM	Jup Sats	III.Tr.E
	5:16 AM	5:16 AM	Twilight	Astronomical Twilight begins
	5:46 AM	5:46 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	6:45 AM	6:45 AM	Sun	Sunrise
	8:24 AM	8:24 AM	Iridium Flare	CHES:Iridium 83 Flares at mag.-8.0 (Azm 157 Alt 80)
	9:39 AM	9:39 AM	Jup GRS	GRS Transit (CML=203)
	11:08 AM	11:08 AM	Jupiter	Jupiter sets
	3:52 PM	3:52 PM	Moon	Moonrise
	4:59 PM	4:59 PM	Sun	Sunset
	5:59 PM	5:59 PM	Iridium Flare	CHES:Iridium 35 Flares at mag.-2.7 (Azm 179 Alt 36)
	5:59 PM	5:59 PM	Iridium Flare	CHES:Iridium 4 Flares at mag.-7.4 (Azm 180 Alt 36)
6:28 PM	6:28 PM	Twilight	Astronomical Twilight ends	
7:34 PM	7:34 PM	Jup GRS	GRS Transit (CML=203)	
8:42 PM	8:42 PM	Jupiter	Jupiter rises	
16 Nov 2013	5:17 AM	5:17 AM	Twilight	Astronomical Twilight begins
	5:30 AM	5:30 AM	Jup GRS	GRS Transit (CML=203)
	5:41 AM	5:41 AM	Moon	Moonset
	6:46 AM	6:46 AM	Sun	Sunrise
	11:04 AM	11:04 AM	Jupiter	Jupiter sets
	2:03 PM	2:03 PM	Iridium Flare	CHES:Iridium 76 Flares at mag.-5.8 (Azm 229 Alt 45)
	3:25 PM	3:25 PM	Jup GRS	GRS Transit (CML=203)
	4:30 PM	4:30 PM	Moon	Moonrise
	4:58 PM	4:58 PM	Sun	Sunset
	5:01 PM	5:01 PM	Iridium Flare	CHES:Iridium 55 Flares at mag.-4.6 (Azm 268 Alt 16)
6:27 PM	6:27 PM	Twilight	Astronomical Twilight ends	
8:38 PM	8:38 PM	Jupiter	Jupiter rises	
17 Nov 2013	1:21 AM	1:21 AM	Jup GRS	GRS Transit (CML=203)
	5:17 AM	5:17 AM	Twilight	Astronomical Twilight begins
	6:12 AM	6:12 AM	Jup Sats	I.Ec.D
	6:39 AM	6:39 AM	Moon	Moonset
	6:47 AM	6:47 AM	Sun	Sunrise
	11:00 AM	11:00 AM	Jupiter	Jupiter sets
	11:00 AM	11:00 AM	Diary	FULL MOON

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
17 Nov 2013	11:17 AM	11:17 AM	Jup GRS	GRS Transit (CML=203)
	11:28 AM	11:28 AM	Meteor Shower	Leonids (Temple-Tut) meteor peak (zhr=12)
	4:57 PM	4:57 PM	Sun	Sunset
	5:12 PM	5:12 PM	Moon	Moonrise
	6:27 PM	6:27 PM	Twilight	Astronomical Twilight ends
	8:34 PM	8:34 PM	Jupiter	Jupiter rises
	9:12 PM	9:12 PM	Jup GRS	GRS Transit (CML=203)
	11:07 PM	11:07 PM	Lunar Occult	Moon occults 5.9 mag. double star 593(r)
18 Nov 2013	2:35 AM	2:35 AM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	3:25 AM	3:25 AM	Jup Sats	I.Sh.I
	4:00 AM	4:00 AM	Diary	Mercury greatest elong W(19)
	4:27 AM	4:27 AM	Jup Sats	I.Tr.I
	5:18 AM	5:18 AM	Twilight	Astronomical Twilight begins
	5:39 AM	5:39 AM	Jup Sats	I.Sh.E
	5:52 AM	5:52 AM	Jup Sats	II.Ec.D
	6:13 AM	6:13 AM	Iridium Flare	CHES:Iridium 6 Flares at mag. 0.8 (Azm 342 Alt 60)
	6:48 AM	6:48 AM	Sun	Sunrise
	7:08 AM	7:08 AM	Jup GRS	GRS Transit (CML=203)
	7:34 AM	7:34 AM	Moon	Moonset
	10:56 AM	10:56 AM	Jupiter	Jupiter sets
	3:00 PM	3:00 PM	Diary	Aldebaran 2.7S of Moon
	4:40 PM	4:40 PM	Iridium Flare	CHES:Iridium 32 Flares at mag.-5.4 (Azm 265 Alt 20)
	4:57 PM	4:57 PM	Sun	Sunset
	5:04 PM	5:04 PM	Jup GRS	GRS Transit (CML=203)
	5:48 PM	5:48 PM	Iridium Flare	CHES:Iridium 36 Flares at mag.-2.6 (Azm 187 Alt 34)
	5:50 PM	5:50 PM	Iridium Flare	CHES:Iridium 34 Flares at mag. 1.7 (Azm 190 Alt 33)
	5:58 PM	5:58 PM	Moon	Moonrise
	6:00 PM	6:00 PM	Meetings	NAS Regular Meeting at Chesapeake Public Library Major Hillard branch
6:26 PM	6:26 PM	Twilight	Astronomical Twilight ends	
8:30 PM	8:30 PM	Jupiter	Jupiter rises	
9:54 PM	9:54 PM	Lunar Occult	Moon occults 5.1 mag. star 730(R) 97 Tau	
19 Nov 2013	12:41 AM	12:41 AM	Jup Sats	IEc.D
	2:59 AM	2:59 AM	Jup GRS	GRS Transit (CML=203)
	4:00 AM	4:00 AM	Jup Sats	IOc.R
	5:19 AM	5:19 AM	Twilight	Astronomical Twilight begins
	6:06 AM	6:06 AM	Iridium Flare	CHES:Iridium 96 Flares at mag. 1.3 (Azm 351 Alt 62)
	6:49 AM	6:49 AM	Sun	Sunrise
	8:26 AM	8:26 AM	Moon	Moonset
	10:52 AM	10:52 AM	Jupiter	Jupiter sets
12:55 PM	12:55 PM	Jup GRS	GRS Transit (CML=203)	

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
19 Nov 2013	1:45 PM	1:45 PM	Iridium Flare	CHES:Iridium 22 Flares at mag.-6.5 (Azm 225 Alt 48)
	4:56 PM	4:56 PM	Sun	Sunset
	5:44 PM	5:44 PM	Iridium Flare	CHES:Iridium 5 Flares at mag.-5.8 (Azm 188 Alt 34)
	6:26 PM	6:26 PM	Twilight	Astronomical Twilight ends
	6:46 PM	6:46 PM	Moon	Moonrise
	8:25 PM	8:25 PM	Jupiter	Jupiter rises
	9:53 PM	9:53 PM	Jup Sats	I.Sh.I
	10:50 PM	10:50 PM	Jup GRS	GRS Transit (CML=203)
	10:53 PM	10:53 PM	Jup Sats	I.Tr.I
20 Nov 2013	12:08 AM	12:08 AM	Jup Sats	I.Sh.E
	12:43 AM	12:43 AM	Jup Sats	II.Sh.I
	1:08 AM	1:08 AM	Jup Sats	I.Tr.E
	2:46 AM	2:46 AM	Jup Sats	II.Tr.I
	3:23 AM	3:23 AM	Jup Sats	II.Sh.E
	5:20 AM	5:20 AM	Twilight	Astronomical Twilight begins
	5:28 AM	5:28 AM	Jup Sats	II.Tr.E
	6:00 AM	6:00 AM	Iridium Flare	CHES:Iridium 19 Flares at mag.-3.0 (Azm 345 Alt 57)
	6:50 AM	6:50 AM	Sun	Sunrise
	8:46 AM	8:46 AM	Jup GRS	GRS Transit (CML=203)
	9:13 AM	9:13 AM	Moon	Moonset
	10:48 AM	10:48 AM	Jupiter	Jupiter sets
	4:56 PM	4:56 PM	Sun	Sunset
	5:38 PM	5:38 PM	Iridium Flare	CHES:Iridium 8 Flares at mag.-2.0 (Azm 189 Alt 34)
	5:47 PM	5:47 PM	Iridium Flare	CHES:Iridium 96 Flares at mag.-2.8 (Azm 190 Alt 32)
	6:25 PM	6:25 PM	Twilight	Astronomical Twilight ends
	6:42 PM	6:42 PM	Jup GRS	GRS Transit (CML=203)
7:36 PM	7:36 PM	Moon	Moonrise	
8:21 PM	8:21 PM	Jupiter	Jupiter rises	
10:26 PM	10:26 PM	Jup Sats	I.Oc.R	
11:24 PM	11:24 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)	
21 Nov 2013	4:37 AM	4:37 AM	Jup GRS	GRS Transit (CML=203)
	5:21 AM	5:21 AM	Twilight	Astronomical Twilight begins
	5:54 AM	5:54 AM	Iridium Flare	CHES:Iridium 97 Flares at mag.-0.7 (Azm 349 Alt 57)
	6:51 AM	6:51 AM	Sun	Sunrise
	9:56 AM	9:56 AM	Moon	Moonset
	10:44 AM	10:44 AM	Jupiter	Jupiter sets
	11:01 AM	11:01 AM	Iridium Flare	CHES:Iridium 72 Flares at mag.-5.1 (Azm 160 Alt 60)
	2:33 PM	2:33 PM	Jup GRS	GRS Transit (CML=203)
4:55 PM	4:55 PM	Sun	Sunset	
6:25 PM	6:25 PM	Twilight	Astronomical Twilight ends	

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
21 Nov 2013	8:17 PM	8:17 PM	Jupiter	Jupiter rises
	8:29 PM	8:29 PM	Moon	Moonrise
	11:00 PM	11:00 PM	Diary	Jupiter 5.0N of Moon
	11:47 PM	11:47 PM	Jup Sats	II.Oc.R
22 Nov 2013	12:28 AM	12:28 AM	Jup GRS	GRS Transit (CML=203)
	1:17 AM	1:17 AM	Jup Sats	III.Sh.I
	4:22 AM	4:22 AM	Jup Sats	III.Sh.E
	5:11 AM	5:11 AM	Jup Sats	III.Tr.I
	5:22 AM	5:22 AM	Twilight	Astronomical Twilight begins
	5:48 AM	5:48 AM	Iridium Flare	CHES:Iridium 51 Flares at mag. 1.7 (Azm 352 Alt 56)
	5:48 AM	5:48 AM	Iridium Flare	CHES:Iridium 7 Flares at mag. 1.0 (Azm 351 Alt 55)
	6:00 AM	6:00 AM	Diary	Moon at apogee
	6:52 AM	6:52 AM	Sun	Sunrise
	10:24 AM	10:24 AM	Jup GRS	GRS Transit (CML=203)
	10:36 AM	10:36 AM	Moon	Moonset
	10:40 AM	10:40 AM	Jupiter	Jupiter sets
	4:55 PM	4:55 PM	Sun	Sunset
	6:25 PM	6:25 PM	Twilight	Astronomical Twilight ends
	8:13 PM	8:13 PM	Jupiter	Jupiter rises
8:20 PM	8:20 PM	Jup GRS	GRS Transit (CML=203)	
9:23 PM	9:23 PM	Moon	Moonrise	
23 Nov 2013	2:05 AM	2:05 AM	Jup Sats	IV.Oc.D
	5:23 AM	5:23 AM	Twilight	Astronomical Twilight begins
	5:44 AM	5:44 AM	Jup Sats	IV.Oc.R
	6:15 AM	6:15 AM	Jup GRS	GRS Transit (CML=203)
	6:53 AM	6:53 AM	Sun	Sunrise
	10:35 AM	10:35 AM	Jupiter	Jupiter sets
	11:12 AM	11:12 AM	Moon	Moonset
	4:11 PM	4:11 PM	Jup GRS	GRS Transit (CML=203)
	4:54 PM	4:54 PM	Sun	Sunset
	5:29 PM	5:29 PM	Iridium Flare	CHES:Iridium 51 Flares at mag.-0.7 (Azm 197 Alt 31)
	5:29 PM	5:29 PM	Iridium Flare	CHES:Iridium 7 Flares at mag. 0.2 (Azm 198 Alt 30)
	6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends
8:09 PM	8:09 PM	Jupiter	Jupiter rises	
8:13 PM	8:13 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)	
10:17 PM	10:17 PM	Moon	Moonrise	
24 Nov 2013	2:06 AM	2:06 AM	Jup GRS	GRS Transit (CML=203)
	3:46 AM	3:46 AM	Lunar Occult	Moon occults 5.2 mag. double star ZC1359(R) Kappa Cnc
	5:23 AM	5:23 AM	Twilight	Astronomical Twilight begins

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
24 Nov 2013	6:54 AM	6:54 AM	Sun	Sunrise
	10:31 AM	10:31 AM	Jupiter	Jupiter sets
	11:45 AM	11:45 AM	Moon	Moonset
	12:02 PM	12:02 PM	Jup GRS	GRS Transit (CML=203)
	3:45 PM	3:45 PM	Iridium Flare	CHES:Iridium 60 Flares at mag.-4.7 (Azm 255 Alt 31)
	4:54 PM	4:54 PM	Sun	Sunset
	5:23 PM	5:23 PM	Iridium Flare	CHES:Iridium 37 Flares at mag.-6.7 (Azm 198 Alt 31)
	6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends
	8:04 PM	8:04 PM	Jupiter	Jupiter rises
9:58 PM	9:58 PM	Jup GRS	GRS Transit (CML=203)	
11:12 PM	11:12 PM	Moon	Moonrise	
25 Nov 2013	5:18 AM	5:18 AM	Jup Sats	I.Sh.I
	5:24 AM	5:24 AM	Twilight	Astronomical Twilight begins
	6:13 AM	6:13 AM	Jup Sats	I.Tr.I
	6:55 AM	6:55 AM	Sun	Sunrise
	7:53 AM	7:53 AM	Jup GRS	GRS Transit (CML=203)
	8:00 AM	8:00 AM	Diary	Regulus 5.3N of Moon
	10:27 AM	10:27 AM	Jupiter	Jupiter sets
	12:17 PM	12:17 PM	Moon	Moonset
	3:00 PM	3:00 PM	Diary	LAST QUARTER
	4:53 PM	4:53 PM	Sun	Sunset
	5:49 PM	5:49 PM	Jup GRS	GRS Transit (CML=203)
	6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends
	6:52 PM	6:52 PM	Iridium Flare	CHES:Iridium 16 Flares at mag. 1.2 (Azm 155 Alt 27)
6:53 PM	6:53 PM	Iridium Flare	CHES:Iridium 56 Flares at mag.-3.2 (Azm 157 Alt 29)	
8:00 PM	8:00 PM	Jupiter	Jupiter rises	
8:00 PM	8:00 PM	Diary	Mercury 0.3S of Saturn	
10:12 PM	10:12 PM	Jup Sats	III.Oc.R	
26 Nov 2013	12:08 AM	12:08 AM	Moon	Moonrise
	2:35 AM	2:35 AM	Jup Sats	I.Ec.D
	3:44 AM	3:44 AM	Jup GRS	GRS Transit (CML=203)
	5:25 AM	5:25 AM	Twilight	Astronomical Twilight begins
	5:33 AM	5:33 AM	Iridium Flare	CHES:Iridium 96 Flares at mag. 1.7 (Azm 347 Alt 51)
	5:47 AM	5:47 AM	Jup Sats	I.Oc.R
	6:18 AM	6:18 AM	Lunar Occult	Moon grazes 6.3 mag. double star ZC1566(Gr)
	6:31 AM	6:31 AM	Lunar Occult	Moon occults 6.3 mag. double star ZC1566(r)
	6:56 AM	6:56 AM	Sun	Sunrise
	10:23 AM	10:23 AM	Jupiter	Jupiter sets
	12:48 PM	12:48 PM	Moon	Moonset
1:40 PM	1:40 PM	Jup GRS	GRS Transit (CML=203)	

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
26 Nov 2013	4:53 PM	4:53 PM	Sun	Sunset
	5:00 PM	5:00 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends
	6:47 PM	6:47 PM	Iridium Flare	CHES:Iridium 84 Flares at mag.-0.2 (AzM 158 Alt 28)
	7:56 PM	7:56 PM	Jupiter	Jupiter rises
	11:36 PM	11:36 PM	Jup GRS	GRS Transit (CML=203)
	11:47 PM	11:47 PM	Jup Sats	I.Sh.I
27 Nov 2013	12:40 AM	12:40 AM	Jup Sats	I.Tr.I
	1:06 AM	1:06 AM	Moon	Moonrise
	2:01 AM	2:01 AM	Jup Sats	I.Sh.E
	2:55 AM	2:55 AM	Jup Sats	I.Tr.E
	3:08 AM	3:08 AM	Lunar Occult	Moon occults 7.1 mag. star SAO138220(r)
	3:20 AM	3:20 AM	Jup Sats	II.Sh.I
	3:43 AM	3:43 AM	Lunar Occult	Moon occults 7.0 mag. star SAO138233(r)
	5:08 AM	5:08 AM	Jup Sats	II.Tr.I
	5:26 AM	5:26 AM	Twilight	Astronomical Twilight begins
	5:28 AM	5:28 AM	Iridium Flare	CHES:Iridium 19 Flares at mag. 1.0 (AzM 341 Alt 44)
	6:00 AM	6:00 AM	Jup Sats	II.Sh.E
	6:57 AM	6:57 AM	Sun	Sunrise
	7:00 AM	7:00 AM	Diary	Mars 5.3N of Moon
	9:23 AM	9:23 AM	Iridium Flare	CHES:Iridium 80 Flares at mag.-7.5 (AzM 171 Alt 65)
	9:31 AM	9:31 AM	Jup GRS	GRS Transit (CML=203)
	10:19 AM	10:19 AM	Jupiter	Jupiter sets
	12:48 PM	12:48 PM	Iridium Flare	CHES:Iridium 23 Flares at mag.-6.6 (AzM 207 Alt 57)
1:20 PM	1:20 PM	Moon	Moonsset	
4:53 PM	4:53 PM	Sun	Sunset	
6:24 PM	6:24 PM	Twilight	Astronomical Twilight ends	
7:27 PM	7:27 PM	Jup GRS	GRS Transit (CML=203)	
7:52 PM	7:52 PM	Jupiter	Jupiter rises	
9:03 PM	9:03 PM	Jup Sats	I.Ec.D	
28 Nov 2013	12:00 AM	12:00 AM	Public Holiday	Thanksgiving Day holiday
	12:13 AM	12:13 AM	Jup Sats	I.Oc.R
	2:05 AM	2:05 AM	Moon	Moonrise
	5:22 AM	5:22 AM	Jup GRS	GRS Transit (CML=203)
	5:22 AM	5:22 AM	Iridium Flare	CHES:Iridium 97 Flares at mag.-5.5 (AzM 344 Alt 44)
	5:27 AM	5:27 AM	Twilight	Astronomical Twilight begins
	6:58 AM	6:58 AM	Sun	Sunrise
	9:17 AM	9:17 AM	Iridium Flare	CHES:Iridium 81 Flares at mag.-7.6 (AzM 172 Alt 67)
	10:15 AM	10:15 AM	Jupiter	Jupiter sets
	1:54 PM	1:54 PM	Moon	Moonsset

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
28 Nov 2013	3:18 PM	3:18 PM	Jup GRS	GRS Transit (CML=203)
	4:53 PM	4:53 PM	Sun	Sunset
	5:08 PM	5:08 PM	Iridium Flare	CHES:Iridium 36 Flares at mag.-6.3 (AzM 206 Alt 27)
	5:08 PM	5:08 PM	Iridium Flare	CHES:Iridium 19 Flares at mag.-6.5 (AzM 206 Alt 27)
	6:23 PM	6:23 PM	Twilight	Astronomical Twilight ends
	6:44 PM	6:44 PM	Iridium Flare	CHES:Iridium 50 Flares at mag. 1.3 (AzM 167 Alt 31)
	7:48 PM	7:48 PM	Jupiter	Jupiter rises
	8:30 PM	8:30 PM	Jup Sats	I.Sh.E
	9:21 PM	9:21 PM	Jup Sats	I.Tr.E
	9:42 PM	9:42 PM	Jup Sats	II.Ec.D
29 Nov 2013	1:13 AM	1:13 AM	Jup GRS	GRS Transit (CML=203)
	2:06 AM	2:06 AM	Jup Sats	II.Oc.R
	3:07 AM	3:07 AM	Moon	Moonrise
	3:54 AM	3:54 AM	Lunar Occult	Moon occults 6.3 mag. star ZC1887(R)
	5:15 AM	5:15 AM	Jup Sats	III.Sh.I
	5:15 AM	5:15 AM	Iridium Flare	CHES:Iridium 51 Flares at mag.-1.4 (AzM 346 Alt 43)
	5:16 AM	5:16 AM	Iridium Flare	CHES:Iridium 7 Flares at mag.-3.0 (AzM 345 Alt 42)
	5:28 AM	5:28 AM	Twilight	Astronomical Twilight begins
	6:59 AM	6:59 AM	Sun	Sunrise
	10:11 AM	10:11 AM	Jupiter	Jupiter sets
	11:09 AM	11:09 AM	Jup GRS	GRS Transit (CML=203)
	12:35 PM	12:35 PM	Iridium Flare	CHES:Iridium 20 Flares at mag.-6.9 (AzM 202 Alt 58)
	12:48 PM	12:48 PM	Lunar Occult	Moon occults 1.0 mag. double star ZC1925(D) Alpha Vir Spica
	1:00 PM	1:00 PM	Diary	Spica 0.9S of Moon Occn
	1:51 PM	1:51 PM	Algol Minima	Algol at mag. +3.4 minimum (+/-5 hours)
	2:30 PM	2:30 PM	Moon	Moonset
	4:52 PM	4:52 PM	Sun	Sunset
	6:23 PM	6:23 PM	Twilight	Astronomical Twilight ends
	6:38 PM	6:38 PM	Iridium Flare	CHES:Iridium 53 Flares at mag.-4.5 (AzM 166 Alt 30)
	7:00 PM	7:00 PM	Meetings	NAS Observing Session (Gates Co., NC)
	7:43 PM	7:43 PM	Jupiter	Jupiter rises
	9:05 PM	9:05 PM	Jup GRS	GRS Transit (CML=203)
30 Nov 2013	4:12 AM	4:12 AM	Moon	Moonrise
	5:10 AM	5:10 AM	Iridium Flare	CHES:Iridium 37 Flares at mag. 0.0 (AzM 346 Alt 41)
	5:28 AM	5:28 AM	Twilight	Astronomical Twilight begins
	7:00 AM	7:00 AM	Sun	Sunrise
	7:00 AM	7:00 AM	Jup GRS	GRS Transit (CML=203)
	10:06 AM	10:06 AM	Jupiter	Jupiter sets
	3:11 PM	3:11 PM	Moon	Moonset
	4:52 PM	4:52 PM	Sun	Sunset

Norfolk Astronomical Society Astronomical Calendar

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

Calendar

	Start	End	Category	Description
30	4:56 PM	4:56 PM	Jup GRS	GRS Transit (CML=203)
<small>Nov 2013</small>	6:23 PM	6:23 PM	Twilight	Astronomical Twilight ends
	6:32 PM	6:32 PM	Iridium Flare	CHES:Iridium 54 Flares at mag.-0.1 (AzM 165 Alt 30)
	7:39 PM	7:39 PM	Jupiter	Jupiter rises
	9:01 PM	9:01 PM	Jup Sats	II.Tr.E