October 2017 Astronomy Calendar by Dave Mitsky

Some information supplied and/or added by Tony Donnangelo

All times are Daylight Saving Time (-4 hrs. U.T.).

Events listed are based on a location of 40°N in the Eastern US and may not be visible in all areas.

Concerning moderate and minor meteor shower activity:
Do not have any high expectations. This general information is to account for why you might be seeing a few more than normal meteors during your observing session.

Lunar light rays may occur prior to or after the predicted time. Initial observations might have occurred after the ray's inception or continued after the observer's session. Rays may last a very short time or for many hours. Obtain further information; send reports (including non-occurrences and miss-calculations), photos, and observations of new rays to:
The Robinson Lunar Observatory: http://www.lunar-occultations.com/rlo/rlondx.htm.

10/1 Eta Cetids meteor shower (minor activity) peaks from the 1st through the 5th. Duration is from 9/20 through 11/2. Observing and history: http://meteorshowersonline.com/showers/eta_cetids.html
10/2 Lacroix G (sunrise) lunar light ray predicted to occur at 11:20:04 p.m.
10/3 Comet 240P/NEAT is at closest approach to Earth at 1.877 A.U.
10/3 Binary Asteroid (90) Antiope is at closest approach to Earth at 1.836 A.U.
10/4 Christen Longomontanus' 455th birthday (1562).
10/4 London Space Week held through the 5th in London, United Kingdom.
10/4 World Space Week.
10/4 October Cygnids meteor shower (minor activity) peaks from the 4th through the 9th. Duration is from 9/22 through 10/11. Observing and history: http://meteorshowersonline.com/showers/october_cygnids.html
10/5 Venus passes 0.2° from Mars.
10/5 Robert Goddard's 135th birthday (1882).
10/5 October Cetids meteor shower (minor activity) peaks on 5/6. Duration is from 9/8 to 10/30. Observing and history: http://meteorshowersonline.com/showers/october_cetids.html
10/6 Comet 124P/Mrkos is at opposition at 3.915 A.U.
10/6 Nevil Maskelyne's 285th birthday (1732).
10/6 Delta Aurigids meteor shower (minor activity) peaks from the 6th through the 15th. Duration is from 9/22 through 10/23. Observing and history: http://meteorshowersonline.com/showers/delta_aurigids.html
10/7 Comet P/2016 P1 (PANSTARRS) is at opposition at 3.049 A.U.
10/7 Space Day 2017 being held in Worcester, United Kingdom.
10/7 Donald Machholz's 65th birthday (1952).
10/7 Franz Suess' 150th birthday (1867).
10/7 Lame (sunset) lunar light ray predicted to occur at 4:19:29 a.m.
10/7 Endymion (sunset) lunar light ray predicted to occur at 8:54:28 p.m. Moonrise 8:16 p.m.
10/8 Autumn Arietids meteor shower (minor activity) peaks on 8/9. Duration is from 9/7 to 10/27. Observing and history: http://meteorshowersonline.com/showers/autumn_arietids.html
10/9 Draconids meteor shower (minor activity) peaks on 9/10. Duration is from the 6th to 10th. Observing and history: http://meteorshowersonline.com/showers/draconids.html
10/10 Comet 89P/Russell is at opposition at 2.018 A.U.
10/11 Comet 237P/LINEAR is at opposition at 2.247 A.U.
10/11 Maurolycus (sunset) lunar light ray predicted to occur at 3:00:07 a.m.
10/12 Comet C/2015 T2 (PANSTARRS) is at closest approach to Earth at 6.193 A.U.
10/12 Northern Piscids meteor shower (minor activity) peaks on 12/13. Duration is from the 5th through the 16th. Observing and history: http://meteorshowersonline.com/showers/piscids.html

10/13 Royal Astronomical Society ordinary meeting being held in London, United Kingdom.
10/14 Comet C/2017 O1 (ASASSN) is at perihelion at 1.499 A.U.
10/14 Comet 263P/Gibbs is at closest approach to Earth at 2.070 A.U.
10/15 Comet 9P/Tempel is at opposition at 2.591 A.U.
10/15 Abenezra P (sunrise) lunar light ray predicted to occur at 1:21:58. Moonrise 12:41 a.m.
10/16 Comet C/2015 T2 (PANSTARRS) is at opposition at 6.196 A.U.
10/17 Comet 47P/Ashbrook-Jackson is at opposition at 1.925 A.U.
10/17 Comet 65P/Gunn is at perihelion at 2.910 A.U.
10/17 Dwarf Planet 136199 Eris is at opposition at 95.195 A.U.
10/18 50th Anniversary (1967) of Venera 4 Venus landing.
10/18 Mercury passes 1.0° from Jupiter.
10/18 Comet C/2017 O1 (ASASSN) is at closest approach to Earth at 0.720 A.U.
10/18 Pascual Jordan's 115th birthday (1902).
10/18 120th Anniversary (1897) of the Delhi meteorite fall in India.
10/18 Carl Kiess' 130th birthday (1887).
10/19 50th Anniversary (1967) of Mariner 5 Venus flyby.
10/18 Epsilon Geminids meteor shower (minor activity) peaks on 18/19. Duration is from the 10th through the 27th. Observing and history: http://meteorshowersonline.com/showers/epsilon_geminids.html
10/19 Uranus is at opposition.
10/19 Comet C/2015 V1 (PANSTARRS) is at opposition at 3.308 A.U.
10/20 Comet 228P/LINEAR is at opposition at 3.438 A.U.
10/20 Stargazing Lecture: Cosmic Fireworks being held in Pasadena, California.
10/20 Christopher Wren's 385th birthday (1632).
10/21 NASA Langley Research Center open house being held in Hampton, Virginia.
10/21 Comet 159P/LONEOS is at opposition at 2.844 A.U.
10/21 Comet 258P/PANSTARRS is at opposition at 3.803 A.U.
10/21 Yerkes Observatory's 120th birthday (1897).
10/21 Orionids meteor shower (major activity) peaks at 9:00 a.m. Duration is from 15th to 29th. Observing and history: http://meteorshowersonline.com/orionids.html
10/23 Comet 96P/Machholz is at closest approach to Earth at 0.879 A.U.
10/23 Comet C/2017 C2 (PANSTARRS) is at closest approach to Earth at 2.999 A.U.
10/24 Comet 53P/Van Biesbroeck is at opposition at 3.531 A.U.
10/24 Comet C/2016 U1 (NEOWISE) is at opposition at 3.658 A.U.
10/25 Henry Russell's 140th birthday (1877).
10/26 Comet 159P/LONEOS is at closest approach to Earth at 2.840 A.U.
10/26 Apollo Asteroid 2017 QV34 near-Earth flyby at 0.083 A.U.
10/27 Curtius (sunrise) lunar light ray predicted to occur at 9:52:36 p.m.
10/28 Comet 96P/Machholz is at perihelion at 0.124 A.U.
10/28 Renart (sunrise) lunar light ray predicted to occur at 9:19:10 p.m.
10/28 Bonpland (sunrise) lunar light ray predicted to occur at 9:43:09 p.m.
10/29 European Summer Time ends. Set clock back 1 Hour (European Union).
10/29 La Condamine (sunrise) lunar light ray predicted to occur at 7:25:53 p.m.Sunset 6:07 p.m.
10/31 Comet P/2016 G1 (PANSTARRS) is at closest approach to Earth at 1.492 A.U.
10/31 Comet 123P/West-Hartley is at opposition at 2.739 A.U.

For location (40°16'N 76°45'W) Hummelstown, PA, USA:
October 1:

	Mercury	Venus	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Right ascension	$12^h\ 15^m\ 6.6^s$	$11^h\ 4^m\ 43.0^s$	$11^h\ 12^m\ 41.7^s$	$13^h\ 45^m\ 18.9^s$	$17^h\ 25^m\ 41.9^s$	$1^h\ 41^m\ 1.5^s$	$22^h\ 54^m\ 39.8^s$	$19^h\ 11^m\ 43.4^s$
Declination	0° 10' 17"	7° 19' 0"	6° 20' 59"	-9° 46' 19"	-22° 8' 8"	9° 50' 8"	-7° 58' 7"	-21° 47' 49"
Range (AU)	1.355	1.500	2.550	6.379	10.305	18.959	29.050	33.266
Elongation from Sun	5.6°	24.4°	22.2°	19.2°	73.3°	161.8°	153.1°	97.8°
Brightness	-1.3	-3.8	1.8	-1.5	0.5	5.7	7.8	14.2
Equatorial Diameter	4.97"	11.13"	3.67"	30.90"	16.13"	3.72"	2.35"	0.10"
Phase Angle	15.3°	35.1°	13.1°	3.5°	5.5°	0.9°	0.9°	1.7°
Constellation	Virgo	Leo	Leo	Virgo	Ophiuchus	Pisces	Aquarius	Sagittarius
Meridian transit	12:37	11:28	11:36	14:09	17:49	02:07	23:17	19:35
Rises	06:35	05:02	05:15	08:44	13:11	19:31	17:46	14:55
Sets	18:39	17:53	17:58	19:35	22:28	08:40	04:53	00:19
Altitude	-24.2°	-30.0°	-29.6°	-14.0°	14.8°	14.8°	30.8°	25.6°
Azimuth	292.6°	312.9°	310.4°	269.0°	222.7°	89.6°	135.8°	199.1°
% illumination	97.7	90.7	99.6	98.7	99.8	100	100	100

November 1:

	Mercury	Venus	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Right ascension	$15^h\ 20^m\ 31.9^s$	$13^h\ 23^m\ 3.5^s$	$12^h\ 22^m\ 42.2^s$	$14^h\ 10^m\ 10.5^s$	$17^h\ 35^m\ 42.7^s$	$1^h\ 36^m\ 26.5^s$	$22^h\ 52^m\ 35.6^s$	$19^h\ 12^m\ 56.0^s$
Declination	-19° 52' 44"	-7° 8' 9"	-1° 13' 1"	-12° 3' 6"	-22° 19' 44"	9° 24' 2"	-8° 10' 22"	-21° 49' 8"
Range (AU)	1.358	1.609	2.405	6.430	10.731	18.941	29.399	33.792
Elongation from Sun	14.3°	16.9°	33.0°	4.3°	45.7°	167.1°	122.7°	68.2°
Brightness	-0.4	-3.8	1.8	-1.5	0.5	5.7	7.9	14.3
Equatorial Diameter	4.96"	10.37"	3.89"	30.66"	15.49"	3.72"	2.32"	0.10"
Phase Angle	31.8°	23.6°	19.0°	0.8°	4.0°	0.6°	1.6°	1.6°
Constellation	Libra	Virgo	Virgo	Virgo	Ophiuchus	Pisces	Aquarius	Sagittarius
Meridian transit	13:46	11:48	10:46	12:33	15:58	00:01	21:14	17:35
Rises	08:58	06:13	04:51	07:15	11:20	17:26	15:42	12:55
Sets	18:34	17:22	16:41	17:50	20:36	06:32	02:49	22:14
Altitude	-59.7°	-56.7°	-47.6°	-60.8°	-36.7°	59.1°	28.7°	-18.1°
Azimuth	304.5°	5.7°	27.6°	342.5°	270.6°	179.6°	227.4°	256.3°
% illumination	92.5	95.8	97.3	100.0	99.9	100	100	100

Comet information for: October 19, 2017 (New Moon).

	Constellation	Rises	Transits	Sets
240P/NEAT	Sculpter	7:44 p.m.	11:18 p.m.	2:53 a.m.
24P Schaumasse	Leo	2:35 a.m.	9:34 a.m.	4:32 p.m.
62P/Tsuchinshan 1	Leo	1:45 a.m.	8:45 a.m.	3:45 p.m.
355P/2017 M2 (LINEAR-NEAT)	Cetus	7:33 p.m.	1:56 a.m.	8:20 a.m.
C/2016 M1 (PanSTARRS)	Hercules	9:01 a.m.	4:32 p.m.	12:02 a.m.
C/2015 ER61 (PanSTARRS)	Taurus	7:33 p.m.	2:51 a.m.	10:09 a.m.
71P/Clark	Sagittarius	3:19 p.m.	7:15 p.m.	11:11 p.m.
65P/Gunn	Ophiuchus	12:11 p.m.	4:30 p.m.	8:50 p.m.
C/2015 O1 (PannSTARRS)	Hercules	8:11 a.m.	3:21 p.m.	10:32 p.m.
C/2015 VL62 (Lemmon-Yeung-PannSTARRS)	Sagittarius	1:18 p.m.	6:32 p.m.	11:47 p.m.
29P/Schwassmann-Wachman 1	Aquarius	3:13 p.m.	8:20 p.m.	1:38 a.m.
217P/(LINEAR)	Cancer	12:38 a.m.	7:15 a.m.	1:52 p.m.
213P/Van Ness	Sagittarius	2:09 p.m.	7:10 p.m.	12:11 a.m.
C/2016 R2 (PannSTARRS)	Orion	10:51 p.m.	4:51 a.m.	10:51 a.m.
C/2016 N4 (MASTER)	Draco	circumpolar	7:39 p.m.	
C/2017 O1 (ASSASSN)	Camelopardalis	circumpolar	4:02 a.m.	

For location (40°16’N 76°45’W) Hummelstown, PA, USA:
October 1:

Event	Time	Altitude	Azimuth
Minimum altitude:	00:57	-53.0°	0°
Astronomical twilight begins:	05:33	-18.0°	79°
Nautical twilight begins:	06:05	-12.0°	84°
Civil twilight begins:	06:37	-6.0°	89°
Sunrise:	07:04	-0.8°	94°
Maximum altitude:	12:56	46.3°	180°
Sunset:	18:49	-0.8°	266°
Civil twilight ends:	19:16	-6.0°	270°
Nautical twilight ends:	19:47	-12.0°	276°
Astronomical twilight ends:	20:19	-18.0°	281°

November 1:

Event	Time	Altitude	Azimuth
Minimum altitude:	00:51	-64.2°	0°
Astronomical twilight begins:	06:05	-18.0°	94°
Nautical twilight begins:	06:37	-12.0°	99°
Civil twilight begins:	07:09	-6.0°	104°
Sunrise:	07:37	-0.8°	109°
Maximum altitude:	12:50	35.1°	180°
Sunset:	18:04	-0.8°	251°
Civil twilight ends:	18:32	-6.0°	256°
Nautical twilight ends:	19:04	-12.0°	261°
Astronomical twilight ends:	19:36	-18.0°	266°

The objects listed below are located between 22:00 and 24:00 hours of right ascension:

Eighty-five binary and multiple stars for October: Struve 2973, Struve 2985, Struve 2992, Struve 3004, Struve 3028, Otto Struve 501, Struve 3034, Otto Struve 513, Struve 3050 (Andromeda); 29 Aquarii, 41 Aquarii, 51 Aquarii, 53 Aquarii, Zeta Aquarii, Struve 2913, Struve 2935, Tau-1 Aquarii, Struve 2944, Struve 2988, Psi-1 Aquarii, 94 Aquarii, 96 Aquarii, h3184, Omega-2 Aquarii, 107 Aquarii (Aquarius); Otto Struve 485, Struve 3037, 6 Cassiopeiae, Otto Struve 512, Sigma Cassiopeiae (Cassiopeia); Xi Cepheii, Struve 2883, Struve 2893, Struve 2903, Krueger 60, Delta Cephei, Struve 2923, Otto Struve 482, Struve 2947, Struve 2948, Struve 2950, Struve 2984, Omicron Cephei, Otto Struve 502 (Cepheus); Otto Struve 459, h1735, Struve 2876, Otto Struve 465, Struve 2886, Struve 2894, h1756, Struve 2902, Struve 2906, 8 Lacertae, Otto Struve 475, 13 Lacertae, h1828, 16 Lacertae (Lacerta); Struve 2857, Struve 2877, 34 Pegasi, Struve 2908, Xi Pegasi, Struve 2958, Struve 2978, 57 Pegasi, Struve 2991, h1859, Struve 3007, Struve 3021, Otto Struve 504, Struve 3044 (Pegasus); Struve 3009, Struve 3019, Struve 3033 (Pisces); Eta Piscis Austrini, Beta Piscis Austrini, Dunlop 241, h5356, Gamma Piscis Austrini, Delta Piscis Austrini, h5371 (Piscis Austrinus); h5417, Delta Sculptoris, h5429 (Sculptor)

Seventy-five deep-sky objects for October: NGC 7640, NGC 7662, NGC 7686 (Andromeda); NGC 7180, NGC 7183, NGC 7184, NGC 7293, NGC 7392, NGC 7585, NGC 7606, NGC 7721, NGC 7723, NGC 7727 (Aquarius); Cz43, K12, M52, NGC 7635, NGC 7788, NGC 7789, NGC 7790, St12 (Cassiopeia); B171, B173-4, IC 1454, IC 1470, K10, Mrk50, NGC 7235, NGC 7261, NGC 7354, NGC 7380, NGC 7419, NGC 7510 (Cepheus); IC 1434, IC 5217, NGC 7209, NGC 7223, NGC 7243, NGC 7245 (Lacerta); NGC 7177, NGC 7217, NGC 7320 (the brightest galaxy in Stephan’s Quintet), NGC 7331, NGC 7332, NGC 7339, NGC 7448, NGC 7454, NGC 7479, NGC 7619 (the brightest member of Pegasus I), NGC 7626, NGC 7678, NGC 7742, NGC 7769 (Pegasus); NGC 7541, NGC 7562, NGC 7611 (Pisces); IC 5156, IC 5269, IC 5271, NGC 7172, NGC 7173, NGC 7174, NGC 7176, NGC 7201, NGC 7203, NGC 7214, NGC 7221, NGC 7229, NGC 7314, NGC 7361 (Piscis Austrinus); NGC 7507, NGC 7513, NGC 7713, NGC 7755, NGC 7793 (Sculptor)

Top ten binocular deep-sky objects for October: M52, NGC 7209, NGC 7235, NGC 7243, NGC 7293, NGC 7510, NGC 7686, NGC 7789, NGC 7790, St12

Top ten deep-sky objects for October: K12, M52, NGC 7209, NGC 7293, NGC 7331, NGC 7332, NGC 7339, NGC 7640, NGC 7662, NGC 7789

Challenge deep-sky object for October: Jones 1 (PK104-29.1) (Pegasus)