

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
JANUARY	1	(Mon)	7:09	7:43	123	12:06	22S	16:30	237
	2	(Tue)	7:09	7:43	123	12:07	22S	16:31	237
	3	(Wed)	7:09	7:43	123	12:07	22S	16:32	238
	4	(Thu)	7:09	7:43	122	12:08	22S	16:33	238
	5	(Fri)	7:09	7:42	122	12:08	22S	16:34	238
	6	(Sat)	7:09	7:42	122	12:09	22S	16:35	238
	7	(Sun)	7:08	7:42	122	12:09	22S	16:36	238
	8	(Mon)	7:08	7:42	122	12:09	22S	16:37	238
	9	(Tue)	7:08	7:42	121	12:10	23S	16:39	239
	10	(Wed)	7:08	7:41	121	12:10	23S	16:40	239
	11	(Thu)	7:07	7:41	121	12:11	23S	16:41	239
	12	(Fri)	7:07	7:40	121	12:11	23S	16:42	239
	13	(Sat)	7:07	7:40	120	12:11	23S	16:43	240
	14	(Sun)	7:06	7:39	120	12:12	23S	16:45	240
	15	(Mon)	7:06	7:39	120	12:12	24S	16:46	240
	16	(Tue)	7:05	7:38	120	12:13	24S	16:47	240
	17	(Wed)	7:05	7:38	119	12:13	24S	16:48	241
	18	(Thu)	7:04	7:37	119	12:13	24S	16:50	241
	19	(Fri)	7:04	7:36	119	12:13	24S	16:51	241
	20	(Sat)	7:03	7:36	118	12:14	25S	16:52	242
	21	(Sun)	7:02	7:35	118	12:14	25S	16:54	242
	22	(Mon)	7:02	7:34	118	12:14	25S	16:55	242
	23	(Tue)	7:01	7:33	117	12:15	25S	16:57	243
	24	(Wed)	7:00	7:32	117	12:15	25S	16:58	243
	25	(Thu)	6:59	7:31	117	12:15	26S	16:59	244
	26	(Fri)	6:58	7:30	116	12:15	26S	17:01	244
	27	(Sat)	6:57	7:29	116	12:16	26S	17:02	244
	28	(Sun)	6:56	7:28	115	12:16	26S	17:04	245
	29	(Mon)	6:55	7:27	115	12:16	27S	17:05	245
	30	(Tue)	6:54	7:26	115	12:16	27S	17:06	245
	31	(Wed)	6:53	7:25	114	12:16	27S	17:08	246

The cold of January seems to be a paradox, because at this time the Earth is the closest to the Sun (perihelion). On January 3 we are "only" 147,100,000 km away from the Sun.

The year begins with the full Moon in Gemini, a third of the way up the sky in the east at 8pm. The long-past Summer Triangle is settling down in the northeast followed by the Great Square of Pegasus, high up in the southwest.

During the third week of the month, the Moon returns to the evening sky where we will find it low in the southwest. On the 27th, it returns to Gemini, but notice that it is not quite full. This is caused by the Earth's movement around the Sun. We need to wait another day for it to move a little further around the Earth.

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
17:04	16:27	61			6:53	299	Little Dipper "hangs" beneath Polaris (North Star), Moon at Perigee
17:05	17:34	62	0:13	64S	7:57	299	Full Moon
17:06	18:47	65	1:16	63S	8:52	296	Earth at Perihelion, (0:35 am) Night for Quadrantid Meteor Shower
17:07	20:01	70	2:17	60S	9:38	292	
17:08	21:13	76	3:14	57S	10:16	286	
17:09	22:24	83	4:07	52S	10:49	280	
17:10	23:31	90	4:56	48S	11:18	274	
17:11			5:43	43S	11:46	267	
17:12	0:36	96	6:29	39S	12:13	261	
17:13	1:39	102	7:14	34S	12:41	255	
17:14	2:40	108	7:58	31S	13:10	250	
17:15	3:40	112	8:44	28S	13:43	246	
17:16	4:38	116	9:30	26S	14:19	243	
17:18	5:32	118	10:17	24S	15:01	241	
17:19	6:24	119	11:05	24S	15:47	241	Moon at Apogee
17:20	7:10	119	11:53	24S	16:38	242	
17:21	7:52	117	12:41	26S	17:34	244	Pleadies Star Cluster on meridian at 8 pm, New Moon
17:23	8:29	114	13:28	28S	18:32	248	
17:24	9:02	110	14:14	31S	19:33	252	Sun enters Capricornus, 20:20
17:25	9:32	105	15:00	35S	20:35	258	Crescent Moon (14%) low in west (photo-op)
17:26	10:00	99	15:45	39S	21:38	264	
17:28	10:27	93	16:30	43S	22:43	270	Moon at Apogee
17:29	10:54	86	17:17	48S	23:49	277	
17:30	11:23	80	18:05	52S			Moon First Quarter
17:31	11:55	74	18:56	57S	0:57	284	
17:33	12:32	68	19:51	60S	2:08	289	
17:34	13:15	64	20:49	63S	3:19	294	
17:35	14:07	61	21:50	64S	4:29	298	Hyades Star Cluster on meridian at 8 pm
17:37	15:08	61	22:53	64S	5:35	299	
17:38	16:18	63	23:55	62S	6:34	298	Moon at Perigee
17:40	17:32	67			7:25	295	Full Moon

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
February	1	(Thu)	6:52	7:24	114	12:16	28S	17:09	246
	2	(Fri)	6:51	7:23	113	12:16	28S	17:11	247
In February the Great Square of Pegasus is standing on its SW corner and beginning to set in the west. It's not composed of bright stars, but its geometrical "purity" catches our eye.	3	(Sat)	6:50	7:21	113	12:17	28S	17:12	247
	4	(Sun)	6:49	7:20	113	12:17	28S	17:14	248
	5	(Mon)	6:48	7:19	112	12:17	29S	17:15	248
	6	(Tue)	6:47	7:18	112	12:17	29S	17:17	249
	7	(Wed)	6:45	7:16	111	12:17	29S	17:18	249
The month begins with the Moon approaching "first quarter". The shadow line created by the low Sun cuts vertically across the Moon and shows a wealth of detail in the vertical relief on the surface. Binoculars hint at the detail to be found, but a telescope will be better at showing the mountains and valleys.	8	(Thu)	6:44	7:15	111	12:17	30S	17:20	249
	9	(Fri)	6:43	7:13	110	12:17	30S	17:21	250
	10	(Sat)	6:41	7:12	110	12:17	30S	17:22	250
	11	(Sun)	6:40	7:11	109	12:17	31S	17:24	251
	12	(Mon)	6:39	7:09	109	12:17	31S	17:25	251
	13	(Tue)	6:37	7:08	108	12:17	31S	17:27	252
	14	(Wed)	6:36	7:06	108	12:17	32S	17:28	252
	15	(Thu)	6:34	7:05	107	12:17	32S	17:30	253
There aren't any bright stars in the western sky in the winter, but during the last half of the month, when the Moon is in the morning sky and if your sky is dark, you can still see the Milky Way arcing down to the horizon in the NW.	16	(Fri)	6:33	7:03	107	12:17	32S	17:31	253
	17	(Sat)	6:31	7:02	106	12:17	33S	17:33	254
	18	(Sun)	6:30	7:00	106	12:17	33S	17:34	254
	19	(Mon)	6:28	6:58	105	12:17	33S	17:35	255
	20	(Tue)	6:27	6:57	105	12:16	34S	17:37	255
	21	(Wed)	6:25	6:55	104	12:16	34S	17:38	256
	22	(Thu)	6:23	6:53	104	12:16	34S	17:40	256
	23	(Fri)	6:22	6:52	103	12:16	35S	17:41	257
	24	(Sat)	6:20	6:50	103	12:16	35S	17:43	258
	25	(Sun)	6:19	6:48	102	12:16	36S	17:44	258
	26	(Mon)	6:17	6:47	102	12:16	36S	17:45	259
	27	(Tue)	6:15	6:45	101	12:15	36S	17:47	259
	28	(Wed)	6:13	6:43	101	12:15	37S	17:48	260

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
17:41	18:47	73	0:55	59S	8:08	290	
17:42	20:01	80	1:51	55S	8:45	283	
17:44	21:12	86	2:44	50S	9:17	277	
17:45	22:20	93	3:34	45S	9:46	270	
17:46	23:26	100	4:22	41S	10:14	264	
17:48			5:08	36S	10:42	258	
17:49	0:29	106	5:54	32S	11:12	252	Moon 3rd Quarter
17:51	1:31	111	6:40	29S	11:44	248	
17:52	2:30	115	7:26	26S	12:19	244	Star Capella overhead at 8 pm
17:53	3:26	118	8:13	25S	12:58	242	
17:55	4:18	119	9:01	24S	13:43	241	Moon at Apogee
17:56	5:07	119	9:49	24S	14:32	241	
17:57	5:50	118	10:37	25S	15:26	243	
17:59	6:29	115	11:24	27S	16:24	246	Orion on meridian at 8 pm
18:00	7:04	111	12:11	30S	17:25	251	New Moon
18:02	7:35	106	12:57	33S	18:27	256	Sun enters Aquarius, 6:34
18:03	8:04	101	13:43	37S	19:31	262	
18:04	8:31	95	14:29	42S	20:36	269	Crescent(10%) Moon low in west (photo-op)
18:06	8:59	88	15:15	46S	21:42	275	
18:07	9:27	82	16:03	51S	22:49	282	
18:08	9:57	76	16:52	55S	23:57	288	
18:10	10:31	70	17:44	59S			
18:11	11:11	65	18:39	62S	1:07	293	Moon First Quarter
18:12	11:57	62	19:37	64S	2:15	297	
18:14	12:52	61	20:37	64S	3:21	299	
18:15	13:56	62	21:37	63S	4:21	299	
18:17	15:06	65	22:37	61S	5:13	297	Moon at Perigee
18:18	16:19	70	23:34	57S	5:59	292	

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
March	1	(Thu)	6:12	6:41	100	12:15	37S	17:50	260
<p>Turing towards the south shows the "Winter Oval" of bright stars – centred on Orion. It's centre-stage at 8pm. The star Sirius is bright because it's close to use. Other stars are much farther and intrinsically brighter. The upper left star of Orion (Betelgeuse) is about 650 light-years away but is 800X more luminous than Sirius.</p>	2	(Fri)	6:10	6:40	99	12:15	37S	17:51	261
	3	(Sat)	6:08	6:38	99	12:15	38S	17:52	261
	4	(Sun)	6:07	6:36	98	12:14	38S	17:54	262
	5	(Mon)	6:05	6:34	98	12:14	39S	17:55	262
	6	(Tue)	6:03	6:32	97	12:14	39S	17:56	263
	7	(Wed)	6:01	6:31	97	12:14	39S	17:58	264
	8	(Thu)	5:59	6:29	96	12:14	40S	17:59	264
	9	(Fri)	5:58	6:27	96	12:13	40S	18:00	265
	10	(Sat)	6:56	7:25	95	13:13	41S	19:02	265
	11	(Sun)	6:54	7:23	94	13:13	41S	19:03	266
<p>If you are like most of us, set your clocks forward one hour on the night of March 10, or the morning of March 11. Daylight Saving time may brighten your evening commute, but it also means we have to say up later to see the stars.</p>	12	(Mon)	6:52	7:21	94	13:13	41S	19:04	266
	13	(Tue)	6:50	7:20	93	13:12	42S	19:06	267
	14	(Wed)	6:48	7:18	93	13:12	42S	19:07	267
	15	(Thu)	6:46	7:16	92	13:12	43S	19:08	268
	16	(Fri)	6:45	7:14	92	13:11	43S	19:10	269
<p>The spring equinox is when the Sun appears to cross the celestial equator from the southern celestial hemisphere into the northern hemisphere. This happens at 12:15 EDT. The Sun remains in our sky progressively longer each day - melting the snow and thawing the ice.</p>	17	(Sat)	6:43	7:12	91	13:11	43S	19:11	269
	18	(Sun)	6:41	7:10	91	13:11	44S	19:12	270
	19	(Mon)	6:39	7:08	90	13:11	44S	19:14	270
	20	(Tue)	6:37	7:06	89	13:10	45S	19:15	271
	21	(Wed)	6:35	7:04	89	13:10	45S	19:16	271
	22	(Thu)	6:33	7:03	88	13:10	45S	19:18	272
	23	(Fri)	6:31	7:01	88	13:09	46S	19:19	273
	24	(Sat)	6:29	6:59	87	13:09	46S	19:20	273
	25	(Sun)	6:27	6:57	87	13:09	46S	19:22	274
	26	(Mon)	6:25	6:55	86	13:08	47S	19:23	274
	27	(Tue)	6:23	6:53	85	13:08	47S	19:24	275
	28	(Wed)	6:21	6:51	85	13:08	48S	19:25	275
	29	(Thu)	6:20	6:49	84	13:08	48S	19:27	276
	30	(Fri)	6:18	6:47	84	13:07	48S	19:28	276
	31	(Sat)	6:16	6:45	83	13:07	49S	19:29	277

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
18:19	17:34	76			6:38	287	
18:21	18:47	83	0:29	53S	7:12	280	Full Moon
18:22	19:58	90	1:20	48S	7:43	273	
18:23	21:07	97	2:10	43S	8:12	267	Star Sirius on meridian at about 8 pm
18:25	22:13	103	2:58	38S	8:41	260	
18:26	23:17	109	3:46	34S	9:10	254	
18:27			4:32	30S	9:42	249	
18:29	0:18	113	5:20	27S	10:16	245	
18:30	1:17	117	6:07	25S	10:54	242	Moon Last Quarter
19:31	2:11	119	6:55	24S	11:37	241	
19:33	4:01	119	8:43	24S	13:24	241	Daylight Saving begins at 2 am, Moon at Apogee
19:34	4:47	119	9:30	24S	14:17	242	Sun enters Pices, 08:00
19:35	5:27	116	10:18	26S	15:13	245	
19:37	6:03	113	11:05	29S	16:13	249	
19:38	6:36	108	11:52	32S	17:15	254	
19:39	7:05	103	12:38	36S	18:19	260	
19:41	7:34	97	13:25	40S	19:25	266	New Moon
19:42	8:01	90	14:11	45S	20:32	273	Moon at Apogee
19:43	8:29	84	14:59	50S	21:40	280	7% illuminated crescent Moon in west at 8 pm
19:45	8:59	77	15:49	54S	22:49	286	Spring Equinox at 12:15
19:46	9:32	71	16:41	58S	23:59	292	
19:47	10:10	66	17:35	61S			
19:49	10:54	63	18:32	64S	1:08	296	
19:50	11:46	61	19:30	64S	2:14	299	First Quarter Moon
19:51	12:45	61	20:29	64S	3:15	299	
19:53	13:51	63	21:27	62S	4:08	298	Moon at Perigee
19:54	15:01	68	22:23	59S	4:55	294	
19:55	16:13	73	23:17	55S	5:35	289	
19:57	17:26	80	6:09	283			
19:58	18:37	87	0:09	50S	6:41	277	
19:59	19:46	94	0:59	45S	7:10	270	Full Moon

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
April	1	(Sun)	6:14	6:44	83	13:07	49S	19:31	278
<p>With Daylight Saving Time, it does not get dark until after 8pm. So in our table of nightly events, we use 10pm as the time of observations – during our evening walk before heading to bed. The bright Moon lights our way at the beginning of the month but by mid-month the moon will have migrated to the east into the morning sky leaving the evening dark for stargazing.</p> <p>Orion is slowing leaning down to the western horizon and Leo is high in the sky to the south. Binoculars may show the "Beehive" star cluster about 20-degrees to the right of the head of Leo (the backward looking "?"), which is high up above the southern horizon.</p>	2	(Mon)	6:12	6:42	82	13:06	50S	19:32	278
	3	(Tue)	6:10	6:40	82	13:06	50S	19:33	279
	4	(Wed)	6:08	6:38	81	13:06	50S	19:34	279
	5	(Thu)	6:06	6:36	81	13:06	51S	19:36	280
	6	(Fri)	6:04	6:34	80	13:05	51S	19:37	280
	7	(Sat)	6:02	6:32	79	13:05	51S	19:38	281
	8	(Sun)	6:00	6:31	79	13:05	52S	19:40	281
	9	(Mon)	5:58	6:29	78	13:04	52S	19:41	282
	10	(Tue)	5:56	6:27	78	13:04	53S	19:42	282
	11	(Wed)	5:55	6:25	77	13:04	53S	19:44	283
	12	(Thu)	5:53	6:23	77	13:04	53S	19:45	284
	13	(Fri)	5:51	6:21	76	13:03	54S	19:46	284
	14	(Sat)	5:49	6:20	76	13:03	54S	19:47	285
	15	(Sun)	5:47	6:18	75	13:03	54S	19:49	285
	16	(Mon)	5:45	6:16	75	13:03	55S	19:50	286
	17	(Tue)	5:43	6:14	74	13:02	55S	19:51	286
	18	(Wed)	5:42	6:13	74	13:02	55S	19:53	287
	19	(Thu)	5:40	6:11	73	13:02	56S	19:54	287
	20	(Fri)	5:38	6:09	73	13:02	56S	19:55	288
	21	(Sat)	5:36	6:08	72	13:02	57S	19:56	288
	22	(Sun)	5:34	6:06	72	13:01	57S	19:58	289
	23	(Mon)	5:33	6:04	71	13:01	57S	19:59	289
	24	(Tue)	5:31	6:03	71	13:01	58S	20:00	290
	25	(Wed)	5:29	6:01	70	13:01	58S	20:01	290
	26	(Thu)	5:27	5:59	70	13:01	58S	20:03	291
	27	(Fri)	5:26	5:58	69	13:00	58S	20:04	291
	28	(Sat)	5:24	5:56	69	13:00	59S	20:05	292
	29	(Sun)	5:22	5:55	68	13:00	59S	20:07	292
	30	(Mon)	5:20	5:53	68	13:00	59S	20:08	292

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
20:01	20:54	100	1:47	40S	7:38	263	
20:02	22:00	106	2:35	36S	8:07	257	
20:03	23:04	112	3:23	32S	8:38	251	
20:05	4:11	28S	9:11	247			
20:06	0:05	116	4:59	26S	9:48	243	
20:07	1:02	118	5:47	24S	10:29	241	
20:09	1:55	120	6:35	23S	11:15	240	
20:10	2:42	119	7:23	24S	12:06	241	Moon at Apogee, Last Quarter Moon
20:11	3:24	118	8:11	25S	13:01	243	Star Regulus, of Leo, on meridian at 8 pm
20:13	4:02	115	8:58	27S	13:59	247	
20:14	4:35	111	9:44	30S	15:00	251	
20:15	5:06	106	10:31	34S	16:03	257	
20:17	5:34	100	11:17	38S	17:08	263	
20:18	6:02	93	12:04	43S	18:15	270	Big Dipper above Polaris over head at 10 pm
20:20	6:30	86	12:52	48S	19:24	277	New Moon
20:21	6:59	80	13:42	53S	20:35	284	
20:22	7:31	73	14:34	57S	21:47	290	
20:24	8:08	68	15:29	61S	22:59	295	Sun enters Aries, 19:40, Crescent Moon (11%) low west in Hyades (photo-op)
20:25	8:50	63	16:26	63S			
20:27	9:40	61	17:25	64S	0:08	298	Moon at Perigee
20:28	10:38	60	18:24	64S	1:11	300	
20:29	11:42	62	19:22	63S	2:07	299	Night for Lyrid Meteor Shower
20:31	12:51	66	20:18	60S	2:55	296	
20:32	14:01	71	21:12	56S	3:36	291	
20:34	15:12	77	22:03	52S	4:11	286	
20:35	16:22	84	22:52	47S	4:43	279	
20:36	17:31	91	23:40	42S	5:11	273	
20:38	18:39	98	5:39	266			
20:39	19:45	104	0:27	37S	6:07	259	
20:41	20:50	110	1:15	33S	6:37	253	Jupiter 5-deg to right of Moon in east at 22:00

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
May	1	(Tue)	5:19	5:52	67	13:00	60S	20:09	293
That bright star-like object in the SE at the beginning of the month is not a star – it's Jupiter – 12X the diameter of Earth, but over 650 million km away. It's a small system of celestial objects, and four of them can be seen with binoculars. If you can carefully hold your binoculars steady, you may be able to see then clustered close to the planet.	2	(Wed)	5:17	5:50	67	13:00	60S	20:10	293
	3	(Thu)	5:16	5:49	66	13:00	60S	20:12	294
Our neck did not evolve for us to continually look the sky. As we get older, looking up becomes a bit painful. If you would like a comfortable view of the Big Dipper, lie on your back – it's overhead at the top of the sky.	4	(Fri)	5:14	5:47	66	13:00	61S	20:13	294
	5	(Sat)	5:12	5:46	66	12:59	61S	20:14	295
	6	(Sun)	5:11	5:44	65	12:59	61S	20:15	295
	7	(Mon)	5:09	5:43	65	12:59	61S	20:17	295
	8	(Tue)	5:08	5:42	64	12:59	62S	20:18	296
	9	(Wed)	5:06	5:40	64	12:59	62S	20:19	296
	10	(Thu)	5:05	5:39	64	12:59	62S	20:20	297
	11	(Fri)	5:04	5:38	63	12:59	63S	20:21	297
	12	(Sat)	5:02	5:36	63	12:59	63S	20:23	297
	13	(Sun)	5:01	5:35	62	12:59	63S	20:24	298
	14	(Mon)	5:00	5:34	62	12:59	63S	20:25	298
	15	(Tue)	4:58	5:33	62	12:59	63S	20:26	299
	16	(Wed)	4:57	5:32	61	12:59	64S	20:27	299
	17	(Thu)	4:56	5:31	61	12:59	64S	20:29	299
	18	(Fri)	4:55	5:29	61	12:59	64S	20:30	300
	19	(Sat)	4:53	5:28	60	12:59	64S	20:31	300
	20	(Sun)	4:52	5:27	60	12:59	65S	20:32	300
	21	(Mon)	4:51	5:26	60	12:59	65S	20:33	301
	22	(Tue)	4:50	5:25	59	12:59	65S	20:34	301
	23	(Wed)	4:49	5:25	59	13:00	65S	20:35	301
	24	(Thu)	4:48	5:24	59	13:00	65S	20:36	301
	25	(Fri)	4:47	5:23	58	13:00	66S	20:37	302
	26	(Sat)	4:46	5:22	58	13:00	66S	20:38	302
	27	(Sun)	4:45	5:21	58	13:00	66S	20:39	302
	28	(Mon)	4:44	5:21	58	13:00	66S	20:40	303
	29	(Tue)	4:43	5:20	57	13:00	66S	20:41	303
	30	(Wed)	4:43	5:19	57	13:00	66S	20:42	303
	31	(Thu)	4:42	5:19	57	13:00	67S	20:43	303

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
20:42	21:52	114	2:02	29S	7:08	248	
20:43	22:52	118	2:50	27S	7:43	244	
20:45	23:47	120	3:39	24S	8:23	241	
20:46			4:28	23S	9:07	240	
20:47	0:37	120	5:16	23S	9:56	240	Moon at Apogee
20:49	1:21	119	6:04	24S	10:49	242	Night for Eta Aquarids Meteor Shower
20:50	2:01	117	6:51	26S	11:46	245	Last Quarter Moon
20:52	2:35	113	7:37	29S	12:45	249	
20:53	3:06	108	8:23	32S	13:47	254	Jupiter rises at sunset, and sets at sunrise
20:54	3:35	103	9:08	36S	14:50	260	
20:56	4:02	96	9:54	41S	15:56	267	
20:57	4:29	90	10:41	45S	17:04	274	
20:58	4:57	83	11:30	50S	18:14	281	
21:00	5:28	76	12:22	55S	19:27	287	Sun enters Taurus, 09:00
21:01	6:03	70	13:16	59S	20:40	293	New Moon
21:02	6:43	65	14:14	62S	21:53	297	
21:03	7:31	61	15:14	64S	23:01	300	Cres. Moon-Venus low in west (photo-op). Moon at Perigee
21:05	8:28	60	16:16	65S			
21:06	9:32	61	17:16	64S	0:02	300	
21:07	10:41	64	18:14	61S	0:55	297	
21:08	11:52	69	19:09	58S	1:38	293	
21:10	13:03	75	20:01	53S	2:15	288	First Quarter Moon
21:11	14:13	81	20:50	49S	2:48	282	
21:12	15:21	88	21:38	44S	3:16	275	
21:13	16:28	95	22:24	39S	3:44	268	
21:14	17:34	102	23:10	35S	4:11	262	
21:15	18:39	108	23:57	31S	4:39	255	Jupiter 4-deg to right of Moon in SE at 22:00
21:16	19:42	113			5:09	250	Cassiopea ("W") under Polaris on the horizon
21:18	20:43	117	0:45	27S	5:42	245	Full Moon
21:19	21:40	119	1:33	25S	6:19	242	
21:20	22:32	120	2:21	24S	7:01	240	

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
June	1	(Fri)	4:41	5:18	57	13:01	67S	20:44	303
Venus and Jupiter are the brightest planets in this month's evening sky. Together they easily shine through the light pollution. In the third week, they re	2	(Sat)	4:41	5:17	56	13:01	67S	20:45	304
	3	(Sun)	4:40	5:17	56	13:01	67S	20:45	304
	4	(Mon)	4:39	5:16	56	13:01	67S	20:46	304
joined by the Moon, and low in the east is Saturn. Drawing an imaginary line from Venus past the Moon and Jupiter and on to Saturn shows the path of the ecliptic - the plane of our solar system.	5	(Tue)	4:39	5:16	56	13:01	67S	20:47	304
	6	(Wed)	4:38	5:16	56	13:01	67S	20:48	304
	7	(Thu)	4:38	5:15	56	13:02	67S	20:48	305
Consider the ecliptic when looking at the sky. It differs from the plane of our galaxy, it's not related to our horizon-based orientation of our night sky, and it is not related to our astronomical coordinate system. All these are based on completely different astronomical structures and cultural history.	8	(Fri)	4:38	5:15	55	13:02	67S	20:49	305
	9	(Sat)	4:37	5:15	55	13:02	68S	20:50	305
	10	(Sun)	4:37	5:14	55	13:02	68S	20:50	305
The nights are short in June. We have to wait until after 10 pm before the sky is dark enough to see the less prominent celestial objects. This increases to 11 pm for those in Canada's west and after 11:30 pm for those in Edmonton, but in Whitehorse, it barely reaches civil twilight in June.	11	(Mon)	4:37	5:14	55	13:02	68S	20:51	305
	12	(Tue)	4:36	5:14	55	13:03	68S	20:51	305
	13	(Wed)	4:36	5:14	55	13:03	68S	20:52	305
	14	(Thu)	4:36	5:14	55	13:03	68S	20:52	305
	15	(Fri)	4:36	5:14	55	13:03	68S	20:53	305
	16	(Sat)	4:36	5:14	55	13:03	68S	20:53	305
	17	(Sun)	4:36	5:14	55	13:04	68S	20:54	305
	18	(Mon)	4:36	5:14	55	13:04	68S	20:54	306
	19	(Tue)	4:36	5:14	54	13:04	68S	20:54	306
	20	(Wed)	4:36	5:14	54	13:04	68S	20:55	306
	21	(Thu)	4:36	5:14	54	13:05	68S	20:55	306
	22	(Fri)	4:37	5:15	54	13:05	68S	20:55	306
	23	(Sat)	4:37	5:15	54	13:05	68S	20:55	306
	24	(Sun)	4:37	5:15	54	13:05	68S	20:55	305
	25	(Mon)	4:38	5:15	55	13:05	68S	20:55	305
	26	(Tue)	4:38	5:16	55	13:06	68S	20:55	305
	27	(Wed)	4:38	5:16	55	13:06	68S	20:55	305
	28	(Thu)	4:39	5:17	55	13:06	68S	20:55	305
	29	(Fri)	4:39	5:17	55	13:06	68S	20:55	305
	30	(Sat)	4:40	5:18	55	13:06	68S	20:55	305

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
21:21	23:19	120	3:10	23S	7:48	240	
21:22	0:00	118	3:58	24S	8:40	241	Moon at Apogee
21:22			4:46	25S	9:36	243	
21:23	0:36	115	5:32	27S	10:34	247	
21:24	1:08	110	6:18	30S	11:34	252	
21:25	1:37	105	7:02	34S	12:36	257	Little Dipper standing on handle above Polaris at 10 pm
21:26	2:04	99	7:47	38S	13:39	264	
21:27	2:30	93	8:32	43S	14:44	270	
21:27	2:57	86	9:19	48S	15:52	277	
21:28	3:25	80	10:08	53S	17:02	284	
21:29	3:57	73	11:01	57S	18:15	290	Star Arcturus on meridian at 10 pm
21:29	4:34	67	11:57	61S	19:29	296	
21:30	5:19	63	12:57	64S	20:42	299	New Moon
21:30	6:12	60	13:59	65S	21:48	300	Moon at Perigee
21:31	7:14	60	15:02	64S	22:47	299	
21:31	8:24	62	16:04	63S	23:36	295	Cres. Moon joins Venus in western evening sky
21:32	9:37	67	17:02	59S			
21:32	10:51	72	17:57	55S	0:16	290	Jupiter on meridian at 10 pm - low in south.
21:32	12:03	79	18:48	50S	0:51	284	
21:33	13:13	86	19:36	46S	1:21	277	
21:33	14:21	93	20:23	41S	1:49	270	Solstice at 06:07, Sun enters Gemini 15:30
21:33	15:27	100	21:09	36S	2:16	264	
21:33	16:31	106	21:55	32S	2:43	258	
21:33	17:34	111	22:42	29S	3:12	252	
21:33	18:35	115	23:29	26S	3:44	247	
21:33	19:33	119			4:19	243	
21:33	20:27	120	0:17	24S	4:59	241	
21:33	21:16	120	1:06	23S	5:44	240	Full Moon
21:33	21:59	119	1:54	23S	6:34	240	Moon at Apogee
21:33	22:37	116	2:42	24S	7:28	242	

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
July	1	(Sun)	4:41	5:18	55	13:07	68S	20:55	305
The ecliptic is still evident throughout July. This helped us ponder the historical backgrounds on which astronomy is based. There is also the amateur astronomy perspective.	2	(Mon)	4:41	5:19	55	13:07	68S	20:55	305
	3	(Tue)	4:42	5:19	55	13:07	68S	20:54	305
	4	(Wed)	4:43	5:20	55	13:07	67S	20:54	305
The basic truth about astronomy is that when it's warm, the planets are low in the sky, and blurred by our turbulent atmosphere. This makes observing at high magnification with telescopes very difficult. In the winter the ecliptic is high in the sky. The planets are less blurred, but it's bitterly cold.	5	(Thu)	4:43	5:21	55	13:07	67S	20:54	304
	6	(Fri)	4:44	5:21	56	13:08	67S	20:53	304
	7	(Sat)	4:45	5:22	56	13:08	67S	20:53	304
Although it's summer, the Summer Triangle needs more time to reach our meridian. It's not there until about 2 am. So for most of the night we get to watch one of the most sparsely populated areas of sky - east of Leo. However if we had telescopes for eyes we would see a different view. There is a cascade of very faint wonders from the handle of the Big Dipper, east of Leo and into the south to the right of Jupiter: the Great Coma-Virgo Galaxy field. Check out this area on the Internet during a cloudy evening.	8	(Sun)	4:46	5:23	56	13:08	67S	20:53	304
	9	(Mon)	4:47	5:24	56	13:08	67S	20:52	304
	10	(Tue)	4:47	5:24	56	13:08	67S	20:52	304
	11	(Wed)	4:48	5:25	57	13:08	67S	20:51	303
	12	(Thu)	4:49	5:26	57	13:08	67S	20:50	303
	13	(Fri)	4:50	5:27	57	13:09	66S	20:50	303
	14	(Sat)	4:51	5:28	57	13:09	66S	20:49	303
	15	(Sun)	4:52	5:29	57	13:09	66S	20:48	302
	16	(Mon)	4:53	5:30	58	13:09	66S	20:48	302
	17	(Tue)	4:54	5:31	58	13:09	66S	20:47	302
	18	(Wed)	4:56	5:32	58	13:09	66S	20:46	302
	19	(Thu)	4:57	5:33	59	13:09	65S	20:45	301
	20	(Fri)	4:58	5:34	59	13:09	65S	20:44	301
	21	(Sat)	4:59	5:35	59	13:09	65S	20:43	301
	22	(Sun)	5:00	5:36	59	13:09	65S	20:42	300
	23	(Mon)	5:01	5:37	60	13:09	65S	20:41	300
	24	(Tue)	5:02	5:38	60	13:09	64S	20:40	300
	25	(Wed)	5:04	5:39	60	13:09	64S	20:39	299
	26	(Thu)	5:05	5:40	61	13:09	64S	20:38	299
	27	(Fri)	5:06	5:41	61	13:09	64S	20:37	299
	28	(Sat)	5:07	5:42	61	13:09	64S	20:36	298
	29	(Sun)	5:09	5:43	62	13:09	63S	20:35	298
	30	(Mon)	5:10	5:44	62	13:09	63S	20:33	298
	31	(Tue)	5:11	5:46	63	13:09	63S	20:32	297

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
21:32	23:11	112	3:29	26S	8:25	245	
21:32	23:40	107	4:15	29S	9:25	250	
21:32			4:59	33S	10:25	255	
21:31	0:07	102	5:43	37S	11:27	261	
21:31	0:33	96	6:27	41S	12:30	267	
21:31	0:59	89	7:12	46S	13:35	274	Earth at aphelion (12:47), Last Quarter Moon
21:30	1:25	83	7:58	50S	14:42	281	
21:30	1:55	76	8:48	55S	15:52	287	
21:29	2:28	70	9:41	59S	17:04	293	
21:28	3:07	65	10:38	62S	18:17	297	
21:28	3:55	61	11:39	64S	19:26	300	
21:27	4:53	60	12:42	65S	20:30	300	Mercury farthest from the Sun in evening sky. Mars rises at sunset, and sets at sunrise
21:26	6:00	61	13:45	64S	21:25	297	Moon at Perigee
21:25	7:13	64	14:47	61S	22:11	293	Star Antares on meridian, low in sky at 10 pm
21:25	8:30	70	15:45	57S	22:49	287	
21:24	9:45	76	16:40	53S	23:22	280	
21:23	10:59	83	17:31	48S	23:52	273	
21:22	12:09	90	18:20	42S			
21:21	13:17	97	19:07	38S	0:20	266	First Quarter Moon
21:20	14:23	104	19:53	33S	0:47	260	Sun enters Cancer, 07:06
21:19	15:27	109	20:40	30S	1:16	254	
21:18	16:29	114	21:27	27S	1:46	248	
21:16	17:27	118	22:15	24S	2:20	244	
21:15	18:23	120	23:03	23S	2:58	241	
21:14	19:13	120	23:51	23S	3:41	240	
21:13	19:58	120			4:30	240	
21:12	20:38	117	0:39	24S	5:22	241	Mars 6-deg south of full Moon in SE at 10 pm, Moon at Apogee
21:10	21:13	114	1:26	26S	6:19	244	Night for Delta Aquarid meteor shower
21:09	21:44	109	2:13	28S	7:18	248	
21:08	22:12	104	2:58	31S	8:18	253	
21:06	22:38	98	3:42	35S	9:19	259	

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
August	1	(Wed)	5:13	5:47	63	13:09	63S	20:31	297
<p>For the first two weeks the Moon will be the morning sky. The evening sky will be dark and the "Summer Triangle" and the Summer Milky Way will be well placed for viewing during our late evening walks. Low in the south the "Tea Pot" asterism is as high as it's going to get. If your observing site is dark enough you will also see the Milky Way extending above the horizon. The "steam" that appears to rise from Tea Pot's spout has several fine visual targets for those with binoculars.</p>	2	(Thu)	5:14	5:48	63	13:09	62S	20:30	296
	3	(Fri)	5:15	5:49	64	13:09	62S	20:28	296
	4	(Sat)	5:16	5:50	64	13:09	62S	20:27	296
	5	(Sun)	5:18	5:51	64	13:09	61S	20:25	295
	6	(Mon)	5:19	5:53	65	13:09	61S	20:24	295
	7	(Tue)	5:20	5:54	65	13:09	61S	20:23	294
	8	(Wed)	5:22	5:55	66	13:08	61S	20:21	294
	9	(Thu)	5:23	5:56	66	13:08	60S	20:20	294
	10	(Fri)	5:24	5:57	67	13:08	60S	20:18	293
	11	(Sat)	5:26	5:59	67	13:08	60S	20:17	293
	12	(Sun)	5:27	6:00	67	13:08	59S	20:15	292
	13	(Mon)	5:28	6:01	68	13:08	59S	20:14	292
	<p>Between Cassiopeia (the "W") and Perseus is the point from which the Perseid meteors will appear to radiate. Sadly, this year the bright Moon will interfere, but you may catch a few bright ones throughout the night.</p>	14	(Tue)	5:30	6:02	68	13:07	59S	20:12
15		(Wed)	5:31	6:03	69	13:07	59S	20:10	291
16		(Thu)	5:32	6:05	69	13:07	58S	20:09	290
17		(Fri)	5:34	6:06	70	13:07	58S	20:07	290
18		(Sat)	5:35	6:07	70	13:07	58S	20:05	289
19		(Sun)	5:36	6:08	71	13:06	57S	20:04	289
20		(Mon)	5:38	6:09	71	13:06	57S	20:02	289
21		(Tue)	5:39	6:11	72	13:06	57S	20:00	288
22		(Wed)	5:40	6:12	72	13:06	56S	19:59	288
23		(Thu)	5:42	6:13	73	13:05	56S	19:57	287
24		(Fri)	5:43	6:14	73	13:05	56S	19:55	287
25		(Sat)	5:44	6:15	74	13:05	55S	19:53	286
26		(Sun)	5:46	6:17	74	13:05	55S	19:52	286
27		(Mon)	5:47	6:18	75	13:04	55S	19:50	285
28		(Tue)	5:48	6:19	75	13:04	54S	19:48	285
29		(Wed)	5:49	6:20	76	13:04	54S	19:46	284
30		(Thu)	5:51	6:22	76	13:03	54S	19:44	283
31		(Fri)	5:52	6:23	77	13:03	53S	19:43	283

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
21:05	23:03	92	4:25	40S	10:22	265	
21:03	23:29	85	5:09	44S	11:25	272	
21:02	23:56	79	5:54	49S	12:30	278	
21:00			6:41	53S	13:37	285	Last Quarter Moon
20:59	0:26	73	7:31	57S	14:45	291	
20:57	1:01	67	8:24	61S	15:56	296	
20:56	1:44	63	9:21	64S	17:05	299	
20:54	2:35	60	10:22	65S	18:10	300	
20:53	3:36	60	11:24	65S	19:09	299	
20:51	4:46	62	12:27	63S	20:00	295	Sun enters Leo, 10 pm, Saturn on meridian at 10 pm - low in south
20:49	6:02	67	13:27	59S	20:42	290	
20:48	7:19	73	14:25	55S	21:19	284	Maximum night for Perseid meteor shower
20:46	8:36	80	15:19	50S	21:51	276	Sagittarius on meridian and highest in southern sky at 10 pm
20:44	9:50	87	16:11	45S	22:20	269	Pegasus well placed in eastern sky at 10 pm
20:43	11:01	95	17:00	40S	22:48	262	
20:41	12:10	101	17:48	35S	23:17	256	
20:39	13:16	108	18:35	31S	23:47	250	
20:37	14:20	113	19:23	28S			First Quarter Moon
20:36	15:21	117	20:11	25S	0:21	246	
20:34	16:17	119	20:59	24S	0:57	242	
20:32	17:10	120	21:48	23S	1:39	240	
20:30	17:56	120	22:36	23S	2:25	240	
20:28	18:38	118	23:23	25S	3:17	241	Moon at Apogee
20:26	19:14	115			4:12	243	
20:25	19:46	111	0:10	27S	5:11	247	
20:23	20:15	105	0:55	30S	6:11	251	Mercury appears farthest from the Sun in our morning sky.
20:21	20:42	100	1:40	34S	7:12	257	
20:19	21:07	93	2:24	38S	8:15	263	
20:17	21:33	87	3:08	43S	9:18	270	
20:15	21:59	81	3:53	47S	10:22	276	
20:13	22:28	74	4:38	52S	11:28	283	

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
September	1	(Sat)	5:53	6:24	77	13:03	53S	19:41	282
The Milky Way arcs from the southwest, up overhead and down to the horizon in the northeast. Along the way it passes through the summer Triangle, Cepheus, Cassiopeia and Perseus. They host rich star fields and clusters that are visible with your binoculars.	2	(Sun)	5:55	6:25	78	13:02	52S	19:39	282
	3	(Mon)	5:56	6:26	78	13:02	52S	19:37	281
	4	(Tue)	5:57	6:28	79	13:02	52S	19:35	281
	5	(Wed)	5:59	6:29	79	13:01	51S	19:33	280
	6	(Thu)	6:00	6:30	80	13:01	51S	19:31	280
	7	(Fri)	6:01	6:31	80	13:01	51S	19:30	279
	8	(Sat)	6:02	6:32	81	13:00	50S	19:28	279
Remember in February we were saying good-bye to Pegasus? Well now it's returning over the eastern horizon. We have orbited around the Sun and it is now coming into view again.	9	(Sun)	6:04	6:34	82	13:00	50S	19:26	278
	10	(Mon)	6:05	6:35	82	13:00	49S	19:24	278
	11	(Tue)	6:06	6:36	83	12:59	49S	19:22	277
	12	(Wed)	6:07	6:37	83	12:59	49S	19:20	277
	13	(Thu)	6:09	6:39	84	12:59	48S	19:18	276
When looking at the Milky Way we are looking along the plane of our Galaxy. But in the direction of Pegasus, we are looking through the disk of the Galaxy out into inter-galactic space. You will see a line of faint Milky Way stars arcing to the left from the NE corner of the Great Square. Follow this line out one star. Centre it in your binoculars and look "up" about 1/2 the field of your binoculars. You may see a "faint fuzzy". This is the Andromeda Galaxy - about twice the size of our own galaxy but 2½-million light years away.	14	(Fri)	6:10	6:40	84	12:58	48S	19:16	275
	15	(Sat)	6:11	6:41	85	12:58	48S	19:14	275
	16	(Sun)	6:12	6:42	85	12:58	47S	19:12	274
	17	(Mon)	6:14	6:43	86	12:57	47S	19:10	274
	18	(Tue)	6:15	6:45	86	12:57	46S	19:08	273
	19	(Wed)	6:16	6:46	87	12:57	46S	19:06	273
	20	(Thu)	6:17	6:47	88	12:56	46S	19:05	272
	21	(Fri)	6:19	6:48	88	12:56	45S	19:03	272
	22	(Sat)	6:20	6:49	89	12:55	45S	19:01	271
	23	(Sun)	6:21	6:51	89	12:55	44S	18:59	270
	24	(Mon)	6:22	6:52	90	12:55	44S	18:57	270
	25	(Tue)	6:24	6:53	90	12:54	44S	18:55	269
	26	(Wed)	6:25	6:54	91	12:54	43S	18:53	269
	27	(Thu)	6:26	6:56	91	12:54	43S	18:51	268
	28	(Fri)	6:27	6:57	92	12:53	43S	18:49	268
	29	(Sat)	6:29	6:58	93	12:53	42S	18:47	267
	30	(Sun)	6:30	6:59	93	12:53	42S	18:45	267

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
20:11	23:01	69	5:26	56S	12:35	289	
20:09	23:39	64	6:17	60S	13:44	294	Last Quarter Moon
20:07			7:11	63S	14:51	298	
20:05	0:25	61	8:09	65S	15:56	300	Summer Triangle on meridian at 10 pm - high in sky
20:04	1:20	60	9:08	65S	16:56	300	
20:02	2:24	61	10:09	64S	17:49	297	
20:00	3:35	64	11:09	61S	18:34	293	Moon at Perigee
19:58	4:51	69	12:08	57S	19:12	287	
19:56	6:08	76	13:03	52S	19:46	280	Mars on meridian at 10 pm - low in south, New Moon
19:54	7:25	83	13:57	47S	20:17	273	
19:52	8:39	91	14:48	42S	20:46	265	
19:50	9:51	98	15:38	37S	21:15	258	
19:48	11:00	105	16:27	32S	21:46	252	
19:46	12:07	111	17:16	29S	22:18	247	
19:44	13:10	115	18:04	26S	22:54	243	
19:42	14:09	119	18:53	24S	23:34	240	Sun enters Virgo, 21:00
19:40	15:04	120	19:42	23S			Gibbous Moon 4 degrees east of Saturn
19:38	15:53	121	20:31	23S	0:20	239	
19:36	16:36	119	21:19	24S	1:09	240	Moon at Apogee
19:34	17:14	116	22:06	26S	2:04	242	
19:32	17:48	112	22:51	29S	3:01	245	
19:30	18:18	107	23:37	33S	4:01	250	Equinox at 21:54
19:28	18:45	102			5:03	255	
19:26	19:11	96	0:21	37S	6:05	261	Full Moon
19:24	19:36	89	1:05	41S	7:09	268	
19:22	20:03	82	1:50	46S	8:14	274	
19:21	20:31	76	2:36	51S	9:20	281	
19:19	21:02	70	3:24	55S	10:28	287	
19:17	21:38	65	4:14	59S	11:36	293	
19:15	22:21	61	5:07	62S	12:44	297	

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
October	1	(Mon)	6:31	7:01	94	12:52	41S	18:43	266
<p>With the Summer Triangle in the west and Pegasus in the east, we can "interpolate" between the easy constellations to find the less prominent ones. Using a simple star map, step from one recognized group of stars to the next. In this way you will step across the sky and learn your way around the celestial sphere.</p> <p>At 10 pm low in the south is Mars. It's in the SW of the relatively dim constellation of Capricornus. Its faint stars resemble a blunt arrowhead pointing down to the horizon. Try to remember Mars' location with respect to the nearby stars. Drawing a sketch may help, then set it aside until next month.</p>	2	(Tue)	6:32	7:02	94	12:52	41S	18:42	266
	3	(Wed)	6:34	7:03	95	12:52	41S	18:40	265
	4	(Thu)	6:35	7:04	95	12:52	40S	18:38	264
	5	(Fri)	6:36	7:06	96	12:51	40S	18:36	264
	6	(Sat)	6:37	7:07	96	12:51	39S	18:34	263
	7	(Sun)	6:39	7:08	97	12:51	39S	18:32	263
	8	(Mon)	6:40	7:10	98	12:50	39S	18:30	262
	9	(Tue)	6:41	7:11	98	12:50	38S	18:29	262
	10	(Wed)	6:42	7:12	99	12:50	38S	18:27	261
	11	(Thu)	6:44	7:13	99	12:50	38S	18:25	261
	12	(Fri)	6:45	7:15	100	12:49	37S	18:23	260
	13	(Sat)	6:46	7:16	100	12:49	37S	18:21	260
	14	(Sun)	6:48	7:17	101	12:49	36S	18:20	259
	15	(Mon)	6:49	7:19	101	12:49	36S	18:18	258
	16	(Tue)	6:50	7:20	102	12:48	36S	18:16	258
	17	(Wed)	6:51	7:21	102	12:48	35S	18:14	257
	18	(Thu)	6:53	7:23	103	12:48	35S	18:13	257
	19	(Fri)	6:54	7:24	103	12:48	35S	18:11	256
	20	(Sat)	6:55	7:25	104	12:48	34S	18:09	256
	21	(Sun)	6:57	7:27	104	12:47	34S	18:07	255
	22	(Mon)	6:58	7:28	105	12:47	33S	18:06	255
	23	(Tue)	6:59	7:29	105	12:47	33S	18:04	254
	24	(Wed)	7:00	7:31	106	12:47	33S	18:03	254
	25	(Thu)	7:02	7:32	106	12:47	32S	18:01	253
	26	(Fri)	7:03	7:33	107	12:47	32S	17:59	253
	27	(Sat)	7:04	7:35	107	12:47	32S	17:58	252
	28	(Sun)	7:06	7:36	108	12:47	31S	17:56	252
	29	(Mon)	7:07	7:38	108	12:46	31S	17:55	251
	30	(Tue)	7:08	7:39	109	12:46	31S	17:53	251
	31	(Wed)	7:10	7:40	109	12:46	30S	17:52	250

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
19:13	23:12	60	6:03	64S	13:50	300	
19:11			7:01	65S	14:50	301	Last Quarter Moon
19:09	0:12	60	7:59	65S	15:43	299	
19:07	1:18	62	8:58	63S	16:29	295	
19:05	2:31	67	9:55	59S	17:09	290	Moon at Perigee
19:04	3:45	73	10:50	55S	17:43	283	
19:02	5:00	80	11:43	50S	18:14	276	
19:00	6:15	87	12:35	44S	18:44	269	
18:58	7:28	95	13:25	39S	19:12	262	New Moon
18:56	8:39	102	14:15	34S	19:42	255	
18:55	9:48	109	15:05	30S	20:14	249	
18:53	10:55	114	15:54	27S	20:49	244	
18:51	11:58	118	16:44	24S	21:28	241	
18:49	12:55	120	17:34	23S	22:11	239	
18:48	13:48	121	18:24	23S	23:00	239	
18:46	14:34	120	19:12	23S	23:53	240	First Quarter Moon
18:44	15:14	118	20:00	25S			Moon at Apogee, Big Dipper under Polaris on horizon at 10 pm
18:42	15:48	114	20:46	28S	0:50	243	
18:41	16:19	110	21:31	31S	1:49	247	
18:39	16:47	104	22:15	35S	2:49	252	
18:38	17:13	98	23:00	39S	3:52	258	Night for Orionid Meteor Shower
18:36	17:39	92	23:45	44S	4:55	265	
18:34	18:04	85			6:01	272	
18:33	18:32	78	0:31	49S	7:07	279	Full Moon
18:31	19:02	72	1:18	54S	8:16	285	
18:30	19:37	66	2:09	58S	9:26	291	
18:28	20:18	62	3:02	62S	10:36	296	
18:27	21:07	60	3:58	64S	11:44	300	
18:25	22:04	59	4:56	65S	12:47	301	
18:24	23:09	61	5:55	65S	13:42	300	Last Quarter Moon
18:23			6:53	64S	14:30	297	Sun enters Libra, 10:00, Moon at Perigee

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
November	1	(Thu)	7:11	7:42	110	12:46	30S	17:50	250
	2	(Fri)	7:12	7:43	110	12:46	30S	17:49	249
Daylight Saving Time is over and we can begin our observing earlier in the evening. Remember Mars last month? Now look at it – it's now in the NE side of the Capricornus. True to its label as a planet – it is a "wandering star". As a personal project, continue to follow it, week-by-week.	3	(Sat)	6:14	6:45	111	11:46	29S	16:48	249
	4	(Sun)	6:15	6:46	111	11:46	29S	16:46	249
	5	(Mon)	6:16	6:47	112	11:46	29S	16:45	248
	6	(Tue)	6:17	6:49	112	11:46	29S	16:43	248
	7	(Wed)	6:19	6:50	113	11:46	28S	16:42	247
	8	(Thu)	6:20	6:52	113	11:46	28S	16:41	247
	9	(Fri)	6:21	6:53	113	11:47	28S	16:40	246
	10	(Sat)	6:23	6:54	114	11:47	27S	16:38	246
If lying on your back was uncomfortable when viewing the Big Dipper, you can now see it by standing up and looking north. It's low just above the northern horizon. But don't give up on lying down. In the early evening the Great Square of Pegasus is high in the south. Try again for the Great Andromeda Galaxy. Remember the line of faint stars from the NE corner - one star out, then look north. Scan the area with binoculars when under dark sky. You may sweep it up as an elongated patch of faint light that will extend across the field of view.	11	(Sun)	6:24	6:56	114	11:47	27S	16:37	246
	12	(Mon)	6:25	6:57	115	11:47	27S	16:36	245
	13	(Tue)	6:27	6:59	115	11:47	27S	16:35	245
	14	(Wed)	6:28	7:00	116	11:47	26S	16:34	244
	15	(Thu)	6:29	7:01	116	11:47	26S	16:33	244
	16	(Fri)	6:31	7:03	116	11:48	26S	16:32	244
	17	(Sat)	6:32	7:04	117	11:48	26S	16:31	243
	18	(Sun)	6:33	7:05	117	11:48	25S	16:30	243
	19	(Mon)	6:34	7:07	117	11:48	25S	16:29	242
	20	(Tue)	6:36	7:08	118	11:48	25S	16:28	242
	21	(Wed)	6:37	7:09	118	11:49	25S	16:27	242
	22	(Thu)	6:38	7:11	118	11:49	24S	16:27	241
	23	(Fri)	6:39	7:12	119	11:49	24S	16:26	241
	24	(Sat)	6:40	7:13	119	11:49	24S	16:25	241
	25	(Sun)	6:42	7:15	119	11:50	24S	16:24	241
	26	(Mon)	6:43	7:16	120	11:50	24S	16:24	240
	27	(Tue)	6:44	7:17	120	11:50	23S	16:23	240
	28	(Wed)	6:45	7:18	120	11:51	23S	16:23	240
	29	(Thu)	6:46	7:19	120	11:51	23S	16:22	239
	30	(Fri)	6:47	7:21	121	11:51	23S	16:22	239

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
18:21	0:19	65	7:49	61S	15:10	292	
18:20	1:31	70	8:44	57S	15:45	286	
17:18	2:44	77	9:36	52S	16:16	279	
17:17	2:57	84	9:26	47S	15:44	272	Daylight Saving Time ends at 2 am
17:16	4:09	92	10:16	42S	16:12	265	
17:15	5:20	99	11:05	36S	16:40	258	Mercury appears farthest from the Sun in our evening sky.
17:13	6:29	106	11:54	32S	17:10	251	New Moon
17:12	7:37	112	12:44	28S	17:44	246	
17:11	8:43	116	13:34	25S	18:21	242	
17:10	9:44	120	14:25	23S	19:03	240	
17:09	10:39	121	15:15	22S	19:50	239	
17:08	11:29	121	16:04	23S	20:41	239	
17:07	12:11	119	16:53	24S	21:37	242	
17:06	12:48	116	17:39	26S	22:35	245	Moon at Apogee
17:05	13:20	112	18:25	29S	23:35	250	First Quarter Moon
17:04	13:49	107	19:09	33S			Great Square of Pegasus on meridian at 8 pm
17:03	14:15	101	19:53	37S	0:36	255	
17:02	14:40	95	20:37	42S	1:39	262	
17:01	15:05	88	21:22	46S	2:43	268	
17:01	15:32	81	22:08	51S	3:48	275	
17:00	16:00	75	22:58	56S	4:57	282	
16:59	16:33	69	23:51	60S	6:07	289	
16:59	17:12	64			7:19	295	Sun enters Scopius at 12 (noon), Full Moon
16:58	17:59	60	0:47	63S	8:30	299	
16:57	18:55	59	1:46	65S	9:38	301	
16:57	19:59	60	2:47	66S	10:38	301	Moon at Perigee
16:56	21:09	63	3:47	64S	11:30	298	
16:56	22:22	68	4:46	62S	12:13	294	
16:55	23:35	74	5:41	58S	12:49	288	Sun enters Ophiuchus, 23:00
16:55			6:33	54S	13:21	282	Last Quarter Moon

	Date	Day	Begin Civil Twilight	Sunrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Sunset Time (h:m)	AZ (°)
December	1	(Sat)	6:49	7:22	121	11:52	23S	16:21	239
	2	(Sun)	6:50	7:23	121	11:52	23S	16:21	239
See how far Mars has moved? Two weeks into December it's lapped by the Moon. Then in the third week it leaves Capricornus behind and moves into the constellation of Pisces.	3	(Mon)	6:51	7:24	121	11:53	22S	16:21	239
	4	(Tue)	6:52	7:25	122	11:53	22S	16:20	238
	5	(Wed)	6:53	7:26	122	11:53	22S	16:20	238
	6	(Thu)	6:54	7:27	122	11:54	22S	16:20	238
	7	(Fri)	6:55	7:28	122	11:54	22S	16:20	238
Winter is approaching, and yet we can still see the Summer Triangle but its disappearing fast below the NW horizon. In the east the winter constellations are rising – and most famous of all is Orion. These bright stars always chill my bones because I know the cold is on the way.	8	(Sat)	6:56	7:29	122	11:55	22S	16:20	238
	9	(Sun)	6:57	7:30	123	11:55	22S	16:20	237
	10	(Mon)	6:57	7:31	123	11:56	22S	16:20	237
	11	(Tue)	6:58	7:32	123	11:56	22S	16:20	237
	12	(Wed)	6:59	7:33	123	11:56	22S	16:20	237
	13	(Thu)	7:00	7:34	123	11:57	21S	16:20	237
	14	(Fri)	7:01	7:35	123	11:57	21S	16:20	237
	15	(Sat)	7:01	7:36	123	11:58	21S	16:20	237
	16	(Sun)	7:02	7:36	123	11:58	21S	16:20	237
	17	(Mon)	7:03	7:37	123	11:59	21S	16:21	237
	18	(Tue)	7:03	7:38	123	11:59	21S	16:21	237
	19	(Wed)	7:04	7:38	123	12:00	21S	16:21	237
	20	(Thu)	7:05	7:39	123	12:00	21S	16:22	237
	21	(Fri)	7:05	7:39	123	12:01	21S	16:22	236
	22	(Sat)	7:06	7:40	124	12:01	21S	16:23	237
	23	(Sun)	7:06	7:40	123	12:02	21S	16:23	237
	24	(Mon)	7:07	7:41	123	12:02	21S	16:24	237
	25	(Tue)	7:07	7:41	123	12:03	21S	16:24	237
	26	(Wed)	7:07	7:41	123	12:03	21S	16:25	237
	27	(Thu)	7:08	7:42	123	12:04	21S	16:26	237
	28	(Fri)	7:08	7:42	123	12:04	21S	16:27	237
	29	(Sat)	7:08	7:42	123	12:05	21S	16:27	237
	30	(Sun)	7:08	7:42	123	12:05	21S	16:28	237
	31	(Mon)	7:08	7:43	123	12:06	22S	16:29	237

Civil Twilight Ends (h:m)	Moonrise Time (h:m)	AZ (°)	Transit Time (h:m)	ALT (°)	Moonset Time (h:m)	AZ (°)	NOTABLE EVENTS
16:55	0:47	82	7:24	49S	13:49	275	
16:54	1:57	89	8:12	43S	14:16	267	
16:54	3:07	96	9:00	38S	14:43	260	
16:54	4:16	103	9:48	34S	15:11	254	
16:54	5:23	110	10:36	29S	15:42	248	
16:54	6:29	115	11:26	26S	16:17	244	Mars and Neptune in SW only 20 arc minutes apart at 22:00 (binoculars or telescope)
16:54	7:32	119	12:16	24S	16:56	240	Orion climbs above eastern horizon, New Moon
16:53	8:30	121	13:06	22S	17:41	239	
16:53	9:22	122	13:56	22S	18:31	239	
16:53	10:08	121	14:46	23S	19:26	240	
16:54	10:48	118	15:33	25S	20:23	243	
16:54	11:21	114	16:19	28S	21:22	248	Moon at Apogee
16:54	11:51	110	17:03	31S	22:22	253	
16:54	12:18	104	17:47	35S	23:23	259	Night for Geminid Meteor Shower, Mars 4-deg. North of Moon
16:54	12:43	98	18:30	39S			Mercury farthest from Sun in morning sky. First Quarter Moon
16:54	13:07	92	19:13	44S	0:25	265	
16:55	13:32	85	19:58	49S	1:29	272	Summer Triangle settling down in west during the evening
16:55	13:58	78	20:45	54S	2:35	279	Sun enters Sagittarius, 07:00
16:56	14:28	72	21:36	58S	3:43	285	Uranus 5-deg north of Moon at 02:00 (bino.)
16:56	15:04	66	22:30	62S	4:54	292	
16:56	15:47	62	23:29	64S	6:07	297	Winter Solstice at 17:23, Full moon
16:57	16:39	59			7:18	300	Full Moon in southern Gemini at 22:00 pm
16:57	17:41	59	0:30	66S	8:24	301	
16:58	18:51	61	1:33	65S	9:21	300	Moon at Perigee
16:59	20:06	66	2:35	63S	10:10	296	Little Dipper Hangs from Polaris at 8 pm
16:59	21:22	72	3:34	60S	10:50	291	
17:00	22:36	79	4:29	55S	11:24	284	
17:01	23:48	87	5:21	50S	11:54	277	
17:01			6:11	45S	12:22	270	Last Quarter Moon
17:02	0:59	94	6:59	40S	12:48	263	
17:03	2:07	101	7:46	35S	13:16	256	