









Astronomical Events 2021

for Owen Sound ON 44.57°N, 80.94°W





from astropixels.com

(planetary aphelia/perihelia and lunar nodes deleted)





See glossary at end for definitions of astronomical terms

Date 2021	GMT (hh:mm)	Event (Subtract 5 hr for local EST, 4 hr for local EDT)
January		
01	07:05	Beehive 2.3°S of Moon
02	14:00	Earth at Perihelion: 0.98325 AU
02	21:58	Regulus 4.7°S of Moon
03	15:00	Quadrantid Meteor Shower 120/hr peak at 3 pm EST Moon 80% waning
06	09:37	 LQ Moon rises 00:22 EST at Owen Sound ON
09	15:39	Moon at Perigee: 367 390 km
10	02:08	Antares 5.6°S of Moon
10	05:00	Mercury 1.6°S of Saturn
11	18:00	Mercury 1.4°S of Jupiter
11	20:12	Venus 1.5°N of Moon
13	05:00	 NM 08:36 EST at Owen Sound ON
14	08:15	Mercury 2.3°N of Moon
20	21:02	 FQ Moon 11:47 EST at Owen Sound ON
21	05:37	Mars 5.1°N of Moon
21	13:11	Moon at Apogee: 404 361 km
24	02:00	Mercury at Greatest Elongation 18.6°E magnitude -0.5, diameter= 7"
24	02:00	Saturn in Conjunction with Sun
24	04:39	Aldebaran 4.7°S of Moon
27	15:46	Pollux 3.8°N of Moon
28	14:50	Beehive 2.3°S of Moon
28	19:16	 FM rises 17:17 EST at Owen Sound ON
29	01:00	Jupiter in Conjunction with Sun
30	04:56	Regulus 4.6°S of Moon
February		
03	19:33	Moon at Perigee: 370 127 km
04	17:37	 LQ Moon rises 00:43 EST at Owen Sound ON
06	08:33	Antares 5.5°S of Moon
08	14:00	Mercury at Inferior Conjunction
11	19:06	 NM rises 05:17 EST at Owen Sound ON
15	14:00	Mercury 3.8°N of Jupiter
18	10:22	Moon at Apogee: 404 467 km
18	22:47	Mars 3.7°N of Moon
19	18:47	 FQ Moon rises 10:59 EST at Owen Sound ON
20	13:15	Aldebaran 5.0°S of Moon
23	08:00	Mercury 4.0°N of Saturn
24	01:10	Pollux 3.7°N of Moon
25	00:16	Beehive 2.4°S of Moon
26	14:04	Regulus 4.6°S of Moon
27	08:17	 FM rises 18:39 EST at Owen Sound ON




March

02 05:19 Moon at Perigee: 365 422 km
03 23:36 **Mars 2.6°S of Pleiades**
05 05:00 **Mercury 0.3°N of Jupiter**
05 13:58 Antares 5.2°S of Moon
06 01:30  LQ Moon rises 01:06 EST Mar 5 at Owen Sound ON
06 11:00 **Mercury at Greatest Elongation 27.3°W** magnitude 0.13, diameter= 7"
09 23:02 Saturn 3.7°N of Moon
10 15:35 Jupiter 4.0°N of Moon
11 00:00 Neptune in Conjunction with Sun
11 01:02 Mercury 3.7°N of Moon
13 10:21  **NM** rises 07:12 EST at Owen Sound ON
14 02:00 **Daylight Saving Time starts (set clocks ahead 1 hr)**
18 05:04 Moon at Apogee: 405 253 km
19 17:48 **Mars 1.9°N of Moon**
19 21:13 Aldebaran 5.2°S of Moon
20 09:37 **Vernal Equinox (05:37 EDT)**
20 19:15 Mars 6.9°N of Aldebaran
21 14:40  FQ Moon rises 11:45 EDT at Owen Sound ON
23 10:26 Pollux 3.5°N of Moon
24 09:58 Beehive 2.6°S of Moon
26 00:17 Regulus 4.7°S of Moon
26 06 :00 Venus at Superior Conjunction
28 18:48  FM rises 19:48 EDT at Owen Sound ON
29 15:52 Spica 6.5°S of Moon
30 06:12 Moon at Perigee: 360 311 km





April

01 20:49 Antares 4.9°S of Moon
04 10:02  LQ Moon rises 15:24 EDT at Owen Sound ON
06 08:34 Saturn 4.0°N of Moon
07 07:15 Jupiter 4.4°N of Moon
12 02:31  **NM** rises 06:58 EDT Apr 11 at Owen Sound ON
14 17:47 Moon at Apogee: 406 120 km
16 04:07 Aldebaran 5.4°S of Moon
17 12:09 **Mars 0.1°N of Moon: Occultation (Daytime event, below local horizon)**
19 02:00 Mercury at Superior Conjunction
19 18:18 Pollux 3.2°N of Moon
20 06:59  FQ Moon rises 12:25 EDT at Owen Sound ON
20 18:25 Beehive 2.8°S of Moon
22 09:48 Regulus 4.9°S of Moon
22 12:00 **Lyrid Meteor Shower** 20/hr peak at noon EST Moon 73% waxing
26 02:43 Spica 6.5°S of Moon
27 01:00 Mercury at Perihelion
27 03:31  FM rises 19:59 EDT Apr 26 at Owen Sound ON
27 15:24 Moon at Perigee: 357 379 km
29 06:07 Antares 4.8°S of Moon
30 21:00 Uranus in Conjunction with Sun






May

03 17:02 Saturn 4.2°N of Moon
03 19:50  LQ Moon rises 02:57 EDT at Owen Sound ON
04 03:03 **Mercury 2.1°S of Pleiades**
04 21:00 Jupiter 4.6°N of Moon
06 02:00 **Eta-Aquarid Meteors** 60/hr peak at 22:00 EDT May 5 Moon 28% waning
11 19:00  **NM** rises 6:06 am EDT at Owen Sound ON
11 21:54 Moon at Apogee: 406 512 km
13 17:59 Mercury 2.1°N of Moon
16 04:47 **Mars 1.5°S of Moon**
17 00:39 Pollux 3.1°N of Moon
17 06:00 **Mercury at Greatest Elongation 22.0°E**
18 01:08 Beehive 2.9°S of Moon
19 17:28 Regulus 5.0°S of Moon
19 19:13  FQ Moon rises 12:29 EDT at Owen Sound ON
23 13:07 Spica 6.5°S of Moon
26 01:52 Moon at Perigee: 357 310 km
26 11:14  FM rises 21:36 EDT at Owen Sound ON
26 11:19 **Total Lunar Eclipse; mag=1.009** (NOT visible from E. Canada -go West!)
26 16:55 Antares 4.8°S of Moon
29 03:00 **Mercury 0.4°S of Venus**
31 01:22 Saturn 4.2°N of Moon
31 11:41 Mars 5.2°S of Pollux





June

01 08:57 Jupiter 4.6°N of Moon
02 07:24  LQ Moon rises 14:29 EDT at Owen Sound ON
08 02:27 Moon at Apogee: 406 230 km
10 10:42 **Annular Solar Eclipse; mag=0.943** Last half vis. here at sunrise 05:40 EDT
10 10:53  **NM** rises 05:38 EDT at Owen Sound ON
11 01:00 Mercury at Inferior Conjunction
12 06:44 **Venus 1.5°S of Moon**
13 06:19 Pollux 3.1°N of Moon
13 19:52 **Mars 2.8°S of Moon**
14 06:47 **Beehive 2.9°S of Moon**
15 23:28 Regulus 5.0°S of Moon
18 03:54  FQ Moon rises 12:40 EDT Jun 17 at Owen Sound ON
21 03:32 **Summer Solstice (23:32 EDT)**
21 15:57 Venus 5.1°S of Pollux
22 20:36 Mercury 1.8°N of Aldebaran
23 03:26 Antares 4.8°S of Moon
23 05:21 **Mars 0.3°S of Beehive (Mars passes through M44 Jun 21-24)**
23 09:58 Moon at Perigee: 359 960 km
24 18:40  FM rises 21:38 EDT at Owen Sound ON
27 09:30 Saturn 4.0°N of Moon
28 18:38 Jupiter 4.5°N of Moon

July

- 01 21:11  LQ Moon rises 01:16 EDT at Owen Sound ON
- 03 02:45 Venus 0.1°N of Beehive**
- 04 20:00 Mercury at Greatest Elongation 21.6°W** magnitude = 0.5, diameter = 8"
- 05 14:48 Moon at Apogee: 405 342 km
- 05 23:00 Earth at Aphelion: 1.01673 AU
- 06 22:52 Aldebaran 5.5°S of Moon
- 08 04:38 Mercury 3.7°S of Moon
- 10 01:17  NM rises 05:04 EDT Nov 9 at Owen Sound ON**
- 12 09:10 Venus 3.3°S of Moon
- 12 10:10 Mars 3.8°S of Moon
- 13 05:02 Regulus 4.9°S of Moon
- 17 04:01 Spica 6.4°S of Moon
- 17 10:11  FQ Moon rises 14:09 EDT at Owen Sound ON
- 20 12:06 Antares 4.7°S of Moon
- 21 10:30 Moon at Perigee: 364520 km
- 21 21:21 Venus 1.0°N of Regulus
- 24 02:37  FM rises 21:15 EDT Jul 23 at Owen Sound ON
- 24 16:42 Saturn 3.8°N of Moon
- 26 01:17 Jupiter 4.2°N of Moon
- 29 03:00 Delta-Aquarid Meteors 20/hr peak at 23:00 EDT Jul 28 Moon 72% waning
- 29 14:09 Mars 0.6°N of Regulus
- 31 13:16  LQ Moon rises 12:19 EDT at Owen Sound ON

August

- 01 14:00 Mercury at Superior Conjunction
- 02 05:00 Saturn at Opposition** magnitude 0.35, diameter= 18"
- 02 07:35 Moon at Apogee: 404 412 km
- 03 06:18 Aldebaran 5.7°S of Moon
- 06 19:42 Pollux 3.1°N of Moon
- 08 13:50  NM rises 05:59 EDT at Owen Sound ON
- 11 07:00 Venus 4.3°S of Moon
- 12 19:00 Perseid Meteor Shower** 90/hr peak at 14:00 EST Moon 20% waxing
- 13 09:31 Spica 6.1°S of Moon
- 15 15:20  FQ Moon rises 14:32 EDT at Owen Sound ON
- 16 18:34 Antares 4.5°S of Moon
- 17 09:23 Moon at Perigee: 369127 km
- 19 03:00 Mercury 0.1°S of Mars**
- 19 23:00 Jupiter at Opposition** magnitude -2.67, diameter= 46"
- 20 22:19 Saturn 3.7°N of Moon
- 22 04:52 Jupiter 4.0°N of Moon
- 22 12:02  FM rises 20:55 EDT at Owen Sound ON
- 30 02:22 Moon at Apogee: 404 100 km
- 30 07:13  LQ Moon rises 12:07 EDT at Owen Sound ON





September

03	04:04	Pollux 3.0°N of Moon
04	04:07	Beehive 2.9°S of Moon
05	14:32	Venus 1.4°N of Spica
07	00:52	● NM rises 06:04 EDT at Owen Sound ON
09	16:01	Spica 5.9°S of Moon
10	02:09	Venus 4.1°S of Moon
11	10:05	Moon at Perigee: 368 464 km
12	23:59	Antares 4.2°S of Moon
13	20:39	● FQ Moon rises 14:56 EDT at Owen Sound ON
14	04:00	Mercury at Greatest Elongation 26.8°E magnitude 0.19, diameter= 7"
14	08:00	Neptune at Opposition magnitude 7.8, diameter= 2.4"
17	02:37	Saturn 3.8°N of Moon
18	06:50	Jupiter 4.0°N of Moon
20	23:55	● FM rises 19:44 EDT at Owen Sound ON
21	02:00	Mercury 1.2°S of Spica
22	19:21	Autumnal Equinox (15:21 EDT)
26	21:44	Moon at Apogee: 404 641 km
29	01:57	● LQ Moon rises 23:27 EDT Sep 28 at Owen Sound ON
30	12:44	Pollux 2.8°N of Moon





October

01	13:07	Beehive 3.1°S of Moon
03	05:12	Regulus 4.9°S of Moon
06	11:05	● NM rises 07:26 EDT at Owen Sound ON
08	04:00	Mars in Conjunction with Sun
08	17:28	Moon at Perigee: 363 388 km
09	16:00	Mercury at Inferior Conjunction
09	18:36	Venus 2.9°S of Moon
10	06:27	Antares 4.0°S of Moon
13	03:25	● FQ Moon rises 15:01 EDT Oct 12 at Owen Sound ON
14	07:12	Saturn 3.9°N of Moon
15	09:58	Jupiter 4.1°N of Moon
16	13:24	Venus 1.4°N of Antares
20	14:57	● FM rises 18:48 EDT at Owen Sound ON
21	11:00	Orionid Meteor Shower 20/hr peak at 08:00 EST Moon Full
24	15:30	Moon at Apogee: 405 616 km
25	05:00	Mercury at Greatest Elongation 18.4°W magnitude -0.57, diameter= 6.8"
27	20:40	Pollux 2.6°N of Moon
28	20:05	● LQ Moon rises 12:12 EDT Oct 29 at Owen Sound ON
28	21:32	Beehive 3.3°S of Moon
29	22:00	Venus at Greatest Elongation 47.0°E magnitude -4.4, diameter= 25"
30	14:33	Regulus 5.1°S of Moon

November

- 02 01:18 Mercury 3.7°N of Spica
03 18:40 **Mercury 1.2°S of Moon: Occultation (Daytime event, Young Moon)**
04 21:15  NM rises 07:36 EDT at Owen Sound ON
05 00:00 **Uranus at Opposition** magnitude 5.64, diameter= 3.8"
05 12:00 **S Taurid Meteor Shower** 10/hr peak at 08:00 EDT Moon 1% (New)
05 22:23 Moon at Perigee: 358 845 km
06 15:29 Antares 3.9°S of Moon
07 2:00 am **Daylight Saving Time ends (set clocks back 1 hr)**
08 05:21 **Venus 1.1°S of Moon: Occultation (Daytime event, below local horizon)**
10 14:27 Saturn 4.1°N of Moon
11 12:46  FQ Moon rises 02:06 EST at Owen Sound ON
11 17:13 Jupiter 4.4°N of Moon
12 11:00 **N Taurid Meteor Shower** 15/hr peak at 06:00 EST Moon 60% waning
17 18:00 **Leonid Meteor Shower** 20/hr peak at 13:00 EST Moon Full
19 08:58  FM rises 5:05 pm EST at Owen Sound ON
19 09:03 **Partial (almost total) Lunar Eclipse; mag=0.974 (Entire event vis. Canada)**
1st umbral contact 02:19 EST, mid-ecl=04:04, last contact 05:47 EST
21 02:14 Moon at Apogee: 406 276 km
24 03:22 Pollux 2.5°N of Moon
25 04:32 Beehive 3.3°S of Moon
26 22:27 Regulus 5.2°S of Moon
27 12:28  LQ Moon rises 12:23 EST Nov 28 at Owen Sound ON
29 05:00 Mercury at Superior Conjunction
30 22:04 Spica 5.9°S of Moon

December

- 04 07:33 **Total Solar Eclipse; mag=1.037 (visible in Antarctica only)**
04 07:43  NM rises 08:12 EST at Owen Sound ON
04 10:01 Moon at Perigee: 356 794 km
07 00:48 **Venus 1.9°N of Moon**
08 01:52 Saturn 4.2°N of Moon
09 06:07 Jupiter 4.5°N of Moon
11 01:36  FQ Moon rises 13:22 EST Dec 10 at Owen Sound ON
14 07:00 **Geminid Meteor Shower** 120/hr peak at 2 am EST Moon 80% waxing
18 02:16 Moon at Apogee: 406 322 km
19 04:36  FM rises 16:15 EST Nov 18 at Owen Sound ON
21 09:20 Pollux 2.6°N of Moon
21 15:59 **Winter Solstice (10:59 EST)**
22 10:28 Beehive 3.3°S of Moon
22 15:00 **Ursid Meteor Shower** 10/hr peak at 13:00 EST Moon 88% waning
24 04:40 Regulus 5.1°S of Moon
27 02:24  LQ Moon rises 12:30 EST at Owen Sound ON
27 09:15 Mars 4.4°N of Antares
28 06:58 Spica 5.8°S of Moon
29 05:00 Mercury 4.2°S of Venus
31 13:54 Antares 3.9°S of Moon
31 20:13 **Mars 1.0°N of Moon: Occultation (Daytime event, below local horizon)**

Astronomical Definitions

- AU (Astronomical Unit) - equivalent to 149 597 870 7 km or $1.495\,978\,707 \times 10^{11}$ m
- EST / EDT - Eastern Standard Time / Daylight Saving Time (for Eastern Time Zone) subtract 5 hours from Greenwich Mean Time (or 4 hours during EDT)
- GMT - Greenwich Mean Time - equal to Coordinated Universal Time (UTC) Greenwich UK
- Perihelion - the instant when a planet is closest to the Sun
- Aphelion - the instant when a planet is furthest from the Sun
- Perigee - the instant when the Moon is closest to Earth
- Apogee - the instant when the Moon is furthest from Earth
- Inferior Conjunction - the instant when a planet passes between Earth and the Sun (Mercury or Venus)
- Superior Conjunction - the instant when a planet passes on the opposite side of the Sun from Earth (Mercury or Venus)
- Greatest Elongation - elongation is the apparent angle between a planet and the Sun as seen from Earth; during eastern elongation (E), the planet appears as an evening star and farthest from Sun to the east; during western elongation (W), the planet appears as a morning star farthest from Sun to the west
- Opposition - the instant when a planet appears opposite the Sun as seen from Earth
- Conjunction - the instant when a planet appears closest the Sun as seen from Earth
- Occultation - the Moon occults or eclipses a star or planet
- Solstice - the point in time when the Sun appears directly overhead at the Tropic of Capricorn (winter, southern or September solstice) or Tropic of Cancer (summer, northern or June solstice)
- Equinox - the point in time when the Sun appears directly overhead at the Equator. There are two: the autumnal or fall equinox around Sep 21 -Sun appearing to sink southwards (lower in the sky) and spring or vernal equinox around Mar 21 -Sun appearing to travel north (higher in the sky)
- Ascending Node - the point where a planet crosses from the southern to northern portion of its orbit
- Descending Node - the point where a planet crosses from the northern to the southern portion of its orbit