Interesting Astronomical Events for 2018
By Mark Jones

Prairie State Park
June 11, 2017
References:

https://skysafariastronomy.com/
http://www.calsky.com/cs.cgi

RASC Handbook 2018

All Photos by Mark Jones
Unless noted
Sun Events 2018

Northern Limit Page and Lindbergh
Southern Limit Watson and Lindbergh
Red Lines are 72,100 ft long

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 3</td>
<td>1:00</td>
<td>Perihelion (distance to sun: 147 mKm)</td>
</tr>
<tr>
<td>Mar 20</td>
<td>10:15</td>
<td>March Equinox</td>
</tr>
<tr>
<td>Jun 21</td>
<td>4:07</td>
<td>Northern Solstice (declination: +23.434°)</td>
</tr>
<tr>
<td>Jul 6</td>
<td>11:00</td>
<td>Aphelion (distance to sun: 152 mKm)</td>
</tr>
<tr>
<td>Sep 22</td>
<td>19:54</td>
<td>Sep Equinox</td>
</tr>
<tr>
<td>Dec 21</td>
<td>17:23</td>
<td>Southern Solstice (declination: -23.435°)</td>
</tr>
</tbody>
</table>
Full Moon Events 2018

Smallest
Jun 27 – Second smallest of FM 2018
Jul 27 – Smallest of FM 2018 (29.41 arc-min)

Largest
Jan 1 – Largest FM of 2018 (33.16 arc-min)
Jan 31 – Second largest FM of 2018

Jan 1, 2018 - 3rd largest of the last 10 years. The biggest of the next 10 years. Former larger FM was Nov 14, 2016. Next larger FM is Nov 25, 2034
Other Moon Events 2018

Jan 2  - Northern most FM of 2018.

Jun 27 – Southern most FM of 2018.

Moon rise Sep 8, 2017
Arch from 17 miles away
Other Moon Events 2018

Lunar “X” (local start times + ~2 hours)

- Jan 23 23:42  Alt=1°
- Mar 24 00:57  Alt=10°
- May 23 01:02  Alt=17°
- July 20 00:14  Alt=6°
- Dec 14 17:24  Alt=41°

Local STL times
Favorable Dates in Yellow

Data provided by Cloudy Nights

**Other Moon Events 2018**

**Golden Handle on the Moon**

Sun rises on the Jura mountains, while Sinus Iridium is still in shadow

- **Jan 26** – 19:00 Alt=64°
- **Mar 27** – 2:30 Alt=22°
- **Apr 25** – 15:36 Alt=2°
- **Jul 22** – 22:36 Alt=18°
- **Sep 19** – 18:48 Alt=21°
- **Nov 17** – 19:54 Alt=44°

Start times. Event visible up to 7 hours

Data provided by CalSky

Photos by Werner Priller

Local STL times
Important Dates 2018

- Mar 11 – Daylight Saving Time Begins
- April 21 – Astronomy Day
- June 22-24 - MSRAL Springdale, AR
- Jul 11-14 – ALCON Minneapolis, MN
- Jul 26 – Mars Opposition
- Oct 13 – Astronomy Day
- Nov 4 – Daylight Saving Time Ends
2018 Meteor Showers

- January 3 Quadrantids; ZHR=40 (FM+1day)
- April 22 Lyrids; ZHR=20 (FQ)
- May 5 Eta Aquarids; ZHR=60 (FM+5days)
- July 28 Delta Aquarids; ZHR=20 (FM)
- Aug 12 Perseids; ZHR=60 (NM+2day)
- Oct 21 Orionids; ZHR=20 (FM-3days)
- Nov 17 Leonids; ZHR=20 (FQ+3days)
- Dec 14 Geminids; ZHR=120 (FQ-1day)

Yellow=Favorable Moon Conditions
Eclipses 2018

Jan 31 - Total Lunar Eclipse
  – Western N America

Feb 15 – Partial Solar Eclipse
  – not visible from US

Jul 13 - Partial Solar Eclipse
  – not visible from US

Jul 27 - Total Lunar Eclipse
  – not visible from US

Aug 11 - Partial Solar Eclipse
  – not visible from US

Yellow=Favorable Conditions
Planet Oppositions 2018

- Venus GEE – Aug 17 (24.5 arc-sec)
- Mars – July 27 (dia=24.3 arc-sec)
- Jupiter – May 9 (dia=45 arc-sec)
- Saturn – June 27 (dia=18.3 arc-sec, 25.6° ring tilt)
- Uranus – Oct 24 (dia=3.7 arc-sec)
- Neptune – Sep 7 (dia=2.32 arc-sec)

• Yellow=Favorable Conditions

Images from Stellarium

Top to Bottom: Relative sizes of

Venus
Mars
Jupiter
Saturn
Uranus
Neptune
Venus 2018

• **Evening Star**
  Jan 8 - superior conjunction
  May 20th northmost declination, near M35
  Jun 14th latest setting time 11:02pm
  Aug 17 - Venus Greatest Elongation (45.9° East, in the evenings, brightness: -4.5 mag)

• **Evening and Morning Star!**
  Oct 26 – Inferior Conjunction (6° south of Sun. -4.3 mag, dia=61.3 arc-sec)
Small Body Oppositions 2018

Jan  31  Dwarf Planet Ceres (1) at opposition, mag 6.9 (2018)
Oct  29  Asteroid Pallas (2) at opposition, mag 8.2 (2017)
Nov  17  Asteroid Juno (3) at opposition, mag 7.4
Jun  19  Asteroid Vesta (4) at opposition, mag 5.3
Dec  28  Asteroid Hebe (6) at opposition, mag 8.4
Oct  30  Asteroid Iris (7) at opposition, mag 6.9 (2017)
Jan  2   Asteroid Flora (8) at opposition, mag 8.2 (2018)
Jan  16  Asteroid Metis (9) at opposition, mag 9.7
Sep  23  Asteroid Hygiea (10) at opposition, mag 10.1
Jul  12  Dwarf Planet Pluto (134340) at opposition, mag 14.2

Yellow=Favorable Conditions

Relative sizes

Moon 1000 km

Pluto
## Lunar/Aldebaran Conjunctions 2018

<table>
<thead>
<tr>
<th>Mon</th>
<th>Day</th>
<th>Time GMT</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>27</td>
<td>10:09</td>
<td>Aldebaran 0.7°S of Moon</td>
</tr>
<tr>
<td>Feb</td>
<td>23</td>
<td>17:07</td>
<td>Aldebaran 0.7°S of Moon</td>
</tr>
<tr>
<td><strong>Mar</strong></td>
<td>22</td>
<td><strong>22:33</strong></td>
<td><strong>Aldebaran 0.9°S of Moon</strong></td>
</tr>
<tr>
<td>Apr</td>
<td>19</td>
<td>4:45</td>
<td>Aldebaran 1.1°S of Moon</td>
</tr>
<tr>
<td><strong>Jul</strong></td>
<td>10</td>
<td><strong>9:30</strong></td>
<td><strong>Aldebaran 1.1°S of Moon</strong></td>
</tr>
<tr>
<td>Aug</td>
<td>6</td>
<td>18:35</td>
<td>Aldebaran 1.1°S of Moon</td>
</tr>
<tr>
<td>Sep</td>
<td>3</td>
<td>1:34</td>
<td>Aldebaran 1.2°S of Moon</td>
</tr>
<tr>
<td><strong>Sep</strong></td>
<td>30</td>
<td><strong>7:06</strong></td>
<td><strong>Aldebaran 1.4°S of Moon</strong></td>
</tr>
<tr>
<td>Oct</td>
<td>27</td>
<td>13:04</td>
<td>Aldebaran 1.6°S of Moon</td>
</tr>
<tr>
<td>Nov</td>
<td>23</td>
<td>21:11</td>
<td>Aldebaran 1.7°S of Moon</td>
</tr>
<tr>
<td><strong>Dec</strong></td>
<td>21</td>
<td><strong>7:31</strong></td>
<td><strong>Aldebaran 1.7°S of Moon</strong></td>
</tr>
</tbody>
</table>
January - March

M56  Sep 30, 2017
Ballwin MO
### Jan–Mar 2018 Conjunctions

<table>
<thead>
<tr>
<th>Mon</th>
<th>Day</th>
<th>Time GMT</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>3</td>
<td>19:50</td>
<td>Beehive 2.3°N of Moon</td>
</tr>
<tr>
<td>Jan</td>
<td>5</td>
<td>7:24</td>
<td>Regulus 0.9°S of Moon</td>
</tr>
<tr>
<td>Jan</td>
<td>13</td>
<td>8</td>
<td>Mercury 0.7° of Saturn</td>
</tr>
<tr>
<td>Jan</td>
<td>27</td>
<td>10:09</td>
<td>Aldebaran 0.7°S of Moon</td>
</tr>
<tr>
<td>Jan</td>
<td>31</td>
<td>7:19</td>
<td>Beehive 2.3°N of Moon</td>
</tr>
<tr>
<td>Feb</td>
<td>1</td>
<td>18:24</td>
<td>Regulus 0.9°S of Moon</td>
</tr>
<tr>
<td>Feb</td>
<td>11</td>
<td>14:46</td>
<td>Saturn 2.5°S of Moon</td>
</tr>
<tr>
<td>Feb</td>
<td>23</td>
<td>17:07</td>
<td>Aldebaran 0.7°S of Moon</td>
</tr>
<tr>
<td>Feb</td>
<td>27</td>
<td>17:28</td>
<td>Beehive 2.3°N of Moon</td>
</tr>
<tr>
<td>Mar</td>
<td>1</td>
<td>5:09</td>
<td>Regulus 0.9°S of Moon</td>
</tr>
<tr>
<td><strong>Mar</strong></td>
<td><strong>4</strong></td>
<td><strong>6</strong></td>
<td><strong>Mercury 1.1° of Venus</strong></td>
</tr>
<tr>
<td>Mar</td>
<td>11</td>
<td>2:37</td>
<td>Saturn 2.2°S of Moon</td>
</tr>
<tr>
<td>Mar</td>
<td>19</td>
<td>8</td>
<td>Mercury 3.8° of Venus</td>
</tr>
<tr>
<td><strong>Mar</strong></td>
<td><strong>22</strong></td>
<td><strong>22:33</strong></td>
<td><strong>Aldebaran 0.9°S of Moon</strong></td>
</tr>
<tr>
<td>Mar</td>
<td>27</td>
<td>0:52</td>
<td>Beehive 2.2°N of Moon</td>
</tr>
<tr>
<td>Mar</td>
<td>28</td>
<td>13:38</td>
<td>Regulus 1.0°S of Moon</td>
</tr>
</tbody>
</table>
- Jan 7, 2018
- Jupiter/Mars Conjunction
- 5:00am
- AZ=134 deg
- EL=21 deg
- Separation = 0.2 deg!

- Jupiter’s moons are “doubled up” on each side

- Jupiter mag= -1.8
- Mars mag= +1.4
- Jan 27, 2018
- Moon Occults Star
- Name: 75 Tauri
- Mag=4.96
- Occult Begins: 2:24am
- Occult Ends: after Moonset
- AZ=286 deg
- EL=6 deg

- Very near horizon
Full Moon Events 2018

Smallest
Jun 27 – Second smallest of FM 2018
Jul 27 – Smallest of FM 2018 (29.41 arc-min)

Largest
Jan 1 – Largest FM of 2018 (33.16 arc-min)
Jan 31 – Second largest FM of 2018

Jan 1, 2018 - 3rd largest of the last 10 years. The biggest of the next 10 years. Former larger FM was Nov 14, 2016. Next larger FM is Nov 25, 2034
Jan 31 - Total Lunar Eclipse

Partial Begins: 5:49am
   AZ=280 deg
   EL 14 deg

Totality Begins: 6:52am
   AZ=289 deg
   EL=2.5 deg

Moon Sets: 7:07am
   AZ=291 deg

Sunrise: 7:08am

Very near horizon

Moon south of M44 in Cancer

Images from Sky Safari
• Feb 9, 2018
• Moon/Mars/Vesta Conjunction
• 5:00am
• AZ=143 deg
• EL=21 deg
• Mars mag=+1.1
• Vesta mag=+7.6
• Mar 3, 2018
• Venus/Mercury Conjunction
• 6:00pm
• AZ=263 deg
• EL=3 deg
• Separation = 1.4 deg
• Venus mag= -3.9
• Mercury mag= -1.2
• Very near horizon
- Mar 28, 2018
- Venus/Uranus Conjunction
- 8:00pm
- AZ=275 deg
- EL=8 deg
- Separation = 0.07 deg!!

- Venus mag= -3.9
- Uranus mag= +5.9
April - June

M13  Sep 30, 2017
Ballwin MO
# Apr–Jun 2018 Conjunctions

<table>
<thead>
<tr>
<th>Mon</th>
<th>Day</th>
<th>Time GMT</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr</td>
<td>7</td>
<td>12:50</td>
<td>Saturn 1.9°S of Moon</td>
</tr>
<tr>
<td>Apr</td>
<td>19</td>
<td>4:45</td>
<td>Aldebaran 1.1°S of Moon</td>
</tr>
<tr>
<td>Apr</td>
<td>23</td>
<td>6:17</td>
<td>Beehive 1.9°N of Moon</td>
</tr>
<tr>
<td>Apr</td>
<td>24</td>
<td>16:47</td>
<td>Venus 3.4°S of Pleiades</td>
</tr>
<tr>
<td>Apr</td>
<td>24</td>
<td>19:39</td>
<td>Regulus 1.2°S of Moon</td>
</tr>
<tr>
<td>May</td>
<td>2</td>
<td>13:29</td>
<td>Venus 6.3°N of Aldebaran</td>
</tr>
<tr>
<td>May</td>
<td>4</td>
<td>20:31</td>
<td>Saturn 1.7°S of Moon</td>
</tr>
<tr>
<td>May</td>
<td>13</td>
<td>17:21</td>
<td>Mercury 2.4°N of Moon</td>
</tr>
<tr>
<td>May</td>
<td>20</td>
<td>11:57</td>
<td>Beehive 1.7°N of Moon</td>
</tr>
<tr>
<td>May</td>
<td>22</td>
<td>0:53</td>
<td>Regulus 1.4°S of Moon</td>
</tr>
<tr>
<td>Jun</td>
<td>1</td>
<td>1:20</td>
<td>Saturn 1.6°S of Moon</td>
</tr>
<tr>
<td>Jun</td>
<td>8</td>
<td>3:37</td>
<td>Venus 4.6°S of Pollux</td>
</tr>
<tr>
<td>Jun</td>
<td>16</td>
<td>13:13</td>
<td>Venus 2.3°N of Moon</td>
</tr>
<tr>
<td>Jun</td>
<td>16</td>
<td>19:38</td>
<td>Beehive 1.5°N of Moon</td>
</tr>
<tr>
<td>Jun</td>
<td>18</td>
<td>7:25</td>
<td>Regulus 1.7°S of Moon</td>
</tr>
<tr>
<td>Jun</td>
<td>20</td>
<td>2:21</td>
<td>Venus 0.4°N of Beehive</td>
</tr>
<tr>
<td>Jun</td>
<td>24</td>
<td>21:37</td>
<td>Mercury 4.7°S of Pollux</td>
</tr>
<tr>
<td>Jun</td>
<td>28</td>
<td>3:59</td>
<td>Saturn 1.8°S of Moon</td>
</tr>
</tbody>
</table>
• Apr 3, 2018
• Mars/Saturn/M22 Conjunction
• 5:24am
• AZ=157 deg
• EL=24 deg
• Separation = 1.3 deg
• Mars mag= +0.2
• Saturn mag= +0.5
• M22 Cluster mag=5.1
• Apr 7, 2018
• Mars/Saturn/Moon Conjunction
• 4:24am
• AZ=147 deg
• EL=10 deg
• Separation = 1.2 deg

• Mars mag= +0.2
• Saturn mag=+0.5
• Apr 18, 2018
• Moon Occults Stars
• Name: 55 & 63 Tauri
• Mag=6.9 & 5.6
• Occult Begins: 5:55pm
• Occult Ends: 7:09pm
• AZ=260 deg
• EL=38 deg
- Apr 24, 2018
- Moon/Regulus Conjunction
- 2:24am
- AZ=227 deg
- EL=8 deg
- Separation = 1.2 deg
- Regulus= +1.4
- Apr 24, 2018
- Venus/Pleiades Conjunction
- 8:00pm
- AZ=282 deg
- EL=21 deg
- Venus mag= -3.9
- Apr 27, 2018
- Venus between Pleiades and Hyades
- 8:00pm
- AZ=279 deg
- EL=22 deg
- Venus mag= -3.9
- May 4, 2018
- Moon Occults Double Star
- Name: Polis
- Constellation: Mu Sagitari
- Mag=3.83 & 10.48
- Sep= 16.9 arc-sec
- Occult Begins: 3:09am
- Occult Ends: 4:27am
- AZ=186 deg
- EL=30 deg
Jupiter 2018

- May 9 – Opposition (Libra)
  - 4.40AU
  - 36.6 light-minutes
  - -2.52 mag

Images from Sky Safari
May 9 – Opposition (Libra)
  – Dia = 44.8 arc-sec
  – Feb 2017 Aphelion
  – Jan 2023 Perihelion

Moons apparent size at Opposition
  – Io: 1.1 arc-sec
  – Europa: 1.0 arc-sec
  – Ganymede: 1.7 arc-sec
  – Callisto: 1.5 arc-sec

Jupiter to scale with moons
Saturn 2018

- May 2017 – Summer begins on N. Hemisphere
- April 2018 – Aphelion
- 2017 rings tilted to maximum possible
- 2018 rings tilted 26.6 degrees

The Saturn views were simulated with a computer program written by Tom Ruen. (Created here for public domain)
Venus 2018

- **Evening Star**
  May 20th northmost declination, near M35
  Jun 14th latest setting time 11:02pm

Images from Sky Safari
Venus 2018

• **Evening Star**
  Jun 14\(^{th}\) latest setting time 11:02pm

Images from Sky Safari

Venus Jul 31 2015 8:49pm Set Time
Small Body Oppositions 2018

Jan  31  Dwarf Planet Ceres (1) at opposition, mag 6.9 (2018)
Oct  29  Asteroid Pallas (2) at opposition, mag 8.2 (2017)
Nov  17  Asteroid Juno (3) at opposition, mag 7.4
Jun  19  Asteroid Vesta (4) at opposition, mag 5.3
Dec  28  Asteroid Hebe (6) at opposition, mag 8.4
Oct  30  Asteroid Iris (7) at opposition, mag 6.9 (2017)
Jan   2  Asteroid Flora (8) at opposition, mag 8.2 (2018)
Jan  16  Asteroid Metis (9) at opposition, mag 9.7
Sep  23  Asteroid Hygiea (10) at opposition, mag 10.1
Jul  12  Dwarf Planet Pluto (134340) at opposition, mag 14.2

Relative sizes

Moon 1000 km

1  2  3  4  5  6  7  8  9  10

Pluto
Full Moon Events 2018

Smallest
Jun 27 – Second smallest of FM 2018
Jul 27 – Smallest of FM 2018 (29.41 arc-min)

Largest
Jan 1 – Largest FM of 2018 (33.16 arc-min)
Jan 31 – Second largest FM of 2018

Jan 1, 2018 - 3rd largest of the last 10 years. The biggest of the next 10 years. Former larger FM was Nov 14, 2016. Next larger FM is Nov 25, 2034

Canon DSLR    FL=300mm
Other Moon Events 2018

Jan 2 - Northern most FM of 2018.

Jun 27 – Southern most FM of 2018.

Moon rise Sep 8, 2017
Arch from 17 miles away
• Jun 27 – Opposition
  – Sagittarius
  – 9.048AU
  – 75 light-minutes
  – 0.0 mag

**Full Moon next to Saturn**
**Separation = 1.8 deg**
• Jun 27 – Opposition
• Saturn – dia. 18.4 arc-sec
• Rings - 42 arc-sec
• Titan – dia. 0.8 arc-sec

Relative apparent size of Titan compared to Saturn and Cassini Division
- Jun 28, 2018
- Moon/Saturn Conjunction
- 1:00am
- AZ=179 deg
- EL=28 deg
- Separation = 1.8 deg
- Saturn= +0.0
- M22 to south
- M25 to north
July - September

M31  Sep 30, 2017
Ballwin MO
<table>
<thead>
<tr>
<th>Mon</th>
<th>Day</th>
<th>Time GMT</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul</td>
<td>4</td>
<td>5:39</td>
<td>Mercury 0.6°S of Beehive</td>
</tr>
<tr>
<td>Jul</td>
<td>9</td>
<td>23:34</td>
<td>Venus 0.9°N of Regulus</td>
</tr>
<tr>
<td>Jul</td>
<td>10</td>
<td>9:30</td>
<td><strong>Aldebaran 1.1°S of Moon</strong></td>
</tr>
<tr>
<td>Jul</td>
<td>14</td>
<td>22:04</td>
<td>Mercury 2.2°S of Moon</td>
</tr>
<tr>
<td>Jul</td>
<td>15</td>
<td>16:14</td>
<td>Regulus 1.7°S of Moon</td>
</tr>
<tr>
<td>Jul</td>
<td>16</td>
<td>3:31</td>
<td><strong>Venus 1.6°S of Moon</strong></td>
</tr>
<tr>
<td>Jul</td>
<td>24</td>
<td>16:49</td>
<td>Mercury 1.2°S of Regulus</td>
</tr>
<tr>
<td>Jul</td>
<td>25</td>
<td>6:10</td>
<td>Saturn 2.0°S of Moon</td>
</tr>
<tr>
<td>Aug</td>
<td>6</td>
<td>18:35</td>
<td><strong>Aldebaran 1.1°S of Moon</strong></td>
</tr>
<tr>
<td>Aug</td>
<td>21</td>
<td>2:09</td>
<td>Mercury 4.8°S of Beehive</td>
</tr>
<tr>
<td>Aug</td>
<td>21</td>
<td>9:55</td>
<td>Saturn 2.1°S of Moon</td>
</tr>
<tr>
<td>Sep</td>
<td>1</td>
<td>4:45</td>
<td><strong>Venus 1.0°S of Spica</strong></td>
</tr>
<tr>
<td>Sep</td>
<td>3</td>
<td>1:34</td>
<td><strong>Aldebaran 1.2°S of Moon</strong></td>
</tr>
<tr>
<td>Sep</td>
<td>7</td>
<td>2:13</td>
<td><strong>Beehive 1.4°N of Moon</strong></td>
</tr>
<tr>
<td>Sep</td>
<td>17</td>
<td>16:46</td>
<td>Saturn 2.1°S of Moon</td>
</tr>
<tr>
<td>Sep</td>
<td>30</td>
<td>7:06</td>
<td><strong>Aldebaran 1.4°S of Moon</strong></td>
</tr>
</tbody>
</table>
• Jul 1, 2018
• Moon Occults Star
• Near-graze
• Name: Deneb Algiedi
• Constellation: Delta Cap
• Mag=2.84
• Occult Begins: 11:08pm
• Occult Ends: 11:12pm
• AZ=110 deg
• EL=<1 deg
• Very near horizon
- Jul 4, 2018
- Saturn Occults Star
- Name: TYC 6277-00323-1
- Constellation: Sagittarius
- Mag=9.7
- Ring Occult Begins: 11:09pm
- Cassini Occult: 11:32pm
- Ball Occult: 12:10am
- Ball Occult Ends: 1:15am
- Ring Occult Ends: 1:38am
- AZ=182 deg
- EL=28 deg

Images from Sky Safari
• Jul 10, 2018
• Moon/Aldebaran Conjunction
• Mag=6.9 & 5.6
• 3:30am
• AZ=68 deg
• EL=1 deg
• Separation = < 10 arc-min
• Aldebaran mag= +0.99

• Very near horizon
• Jul 15, 2018
• Moon/Venus Conjunction
• 9:06pm
• AZ=269 deg
• EL=16 deg
• Separation = 1.6 deg
• Venus mag= -4.1
Mars 2018

- July 26 - Opposition 24.7 arc-sec (Left)
- July 31 – Closest to Earth (Right)
- Sep 16 Perihelion

Images from Sky Safari
Mars Oppositions
1999-2003
Mars 2018

- July 26 – Opposition
- Full Moon nearby
- Mars on meridian
- Mars mag= -2.8
- Dia = 24.3 arc-sec
- Distance 3.2 light-minutes

Images from Sky Safari
## Mars Oppositions

<table>
<thead>
<tr>
<th>Date</th>
<th>Mars Distance in Millions of Miles</th>
<th>Diameter in arc-seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 23 1924</td>
<td>34.86</td>
<td>25.1</td>
</tr>
<tr>
<td>Sep 10 1956</td>
<td>35.42</td>
<td>24.7</td>
</tr>
<tr>
<td>Aug 10 1971</td>
<td>35.15</td>
<td>24.9</td>
</tr>
<tr>
<td>Sep 28 1988</td>
<td>37.03</td>
<td>23.7</td>
</tr>
<tr>
<td>Aug 28 2003</td>
<td>34.85</td>
<td>25.1</td>
</tr>
<tr>
<td>Jul 26 2018</td>
<td>36.10</td>
<td>24.3</td>
</tr>
<tr>
<td>Oct 13 2020</td>
<td>39.13</td>
<td>22.4</td>
</tr>
<tr>
<td>Dec 7 2022</td>
<td>51.27</td>
<td>17.1</td>
</tr>
<tr>
<td>Jan 15 2025</td>
<td>60.13</td>
<td>14.6</td>
</tr>
<tr>
<td>Feb 19 2027</td>
<td>63.39</td>
<td>13.8</td>
</tr>
<tr>
<td>Mar 25 2029</td>
<td>60.69</td>
<td>14.4</td>
</tr>
<tr>
<td>May 4 2031</td>
<td>52.28</td>
<td>16.8</td>
</tr>
<tr>
<td>June 27 2033</td>
<td>40.02</td>
<td>21.9</td>
</tr>
<tr>
<td>Sep 15 2035</td>
<td>35.66</td>
<td>24.6</td>
</tr>
</tbody>
</table>

- **Next minimum distance of Oct 2020**
- **Next time this close 2035**
Mars 2018

- May – Oct 2018
- ~ 4 months to repeat central meridian

Images from Sky Safari
Full Moon Events 2018

Smallest
Jun 27 – Second smallest of FM 2018
Jul 27 – Smallest of FM 2018 (29.41 arc-min)

Largest
Jan 1 – Largest FM of 2018 (33.16 arc-min)
Jan 31 – Second largest FM of 2018

Jan 1, 2018 - 3rd largest of the last 10 years. The biggest of the next 10 years. Former larger FM was Nov 14, 2016. Next larger FM is Nov 25, 2034
Planet Oppositions 2018

- **Venus GEE** – Aug 17 (24.5 arc-sec)
- Mars – July 27 (dia=24.3 arc-sec)
- Jupiter – May 9 (dia=45 arc-sec)
- Saturn – June 27 (dia=18.3 arc-sec, 25.6° ring)
- Uranus – Oct 24 (dia=3.7 arc-sec)
- Neptune – Sep 7 (dia=2.32 arc-sec)

Images from Stellarium

Top to Bottom: Relative sizes of

Venus, Mars, Jupiter, Saturn, Uranus, Neptune
Images from Sky Safari

- Sep 21, 2018
- Moon Occults Star
- Name: Deneb Algiedi
- Constellation: Delta Cap
- Mag=2.84
- Occult Begins: 5:50pm
- Occult Ends: 6:43pm
- AZ=121 deg
- EL=11 deg
<table>
<thead>
<tr>
<th>Mon</th>
<th>Day</th>
<th>Time GMT</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct</td>
<td>4</td>
<td>9:51</td>
<td>Beehive 1.3°N of Moon</td>
</tr>
<tr>
<td>Oct</td>
<td>5</td>
<td>21:58</td>
<td>Regulus 1.8°S of Moon</td>
</tr>
<tr>
<td>Oct</td>
<td>16</td>
<td>3</td>
<td>Mercury 6.2° of Venus</td>
</tr>
<tr>
<td>Oct</td>
<td>18</td>
<td>13:01</td>
<td>Mars 1.9°S of Moon</td>
</tr>
<tr>
<td>Oct</td>
<td>27</td>
<td>13:04</td>
<td>Aldebaran 1.6°S of Moon</td>
</tr>
<tr>
<td>Oct</td>
<td>29</td>
<td>6</td>
<td>Mercury 3.1° of Jupiter</td>
</tr>
<tr>
<td>Oct</td>
<td>31</td>
<td>15:24</td>
<td>Beehive 1.0°N of Moon</td>
</tr>
<tr>
<td>Nov</td>
<td>2</td>
<td>4:16</td>
<td>Regulus 2.1°S of Moon</td>
</tr>
<tr>
<td>Nov</td>
<td>9</td>
<td>4:58</td>
<td>Mercury 1.8°N of Antares</td>
</tr>
<tr>
<td>Nov</td>
<td>11</td>
<td>15:46</td>
<td>Saturn 1.4°S of Moon</td>
</tr>
<tr>
<td>Nov</td>
<td>14</td>
<td>23:14</td>
<td>Venus 0.2°S of Spica</td>
</tr>
<tr>
<td>Nov</td>
<td>16</td>
<td>4:16</td>
<td><strong>Mars 1.0°N of Moon</strong>: Occn.</td>
</tr>
<tr>
<td>Nov</td>
<td>23</td>
<td>21:11</td>
<td>Aldebaran 1.7°S of Moon</td>
</tr>
<tr>
<td>Nov</td>
<td>27</td>
<td>20:57</td>
<td>Beehive 0.8°N of Moon</td>
</tr>
<tr>
<td>Nov</td>
<td>29</td>
<td>9:27</td>
<td>Regulus 2.3°S of Moon</td>
</tr>
<tr>
<td>Dec</td>
<td>5</td>
<td>21:06</td>
<td>Mercury 1.9°S of Moon</td>
</tr>
<tr>
<td>Dec</td>
<td>9</td>
<td>5:30</td>
<td>Saturn 1.1°S of Moon**: Occn.</td>
</tr>
<tr>
<td>Dec</td>
<td>21</td>
<td>7:31</td>
<td>Aldebaran 1.7°S of Moon</td>
</tr>
<tr>
<td>Dec</td>
<td>21</td>
<td>20</td>
<td>Mercury 0.8° of Jupiter</td>
</tr>
<tr>
<td>Dec</td>
<td>22</td>
<td>8:05</td>
<td>Mercury 5.8°N of Antares</td>
</tr>
<tr>
<td>Dec</td>
<td>22</td>
<td>15:03</td>
<td>Jupiter 5.1°N of Antares</td>
</tr>
<tr>
<td>Dec</td>
<td>25</td>
<td>4:52</td>
<td>Beehive 0.6°N of Moon</td>
</tr>
<tr>
<td>Dec</td>
<td>26</td>
<td>16:06</td>
<td>Regulus 2.5°S of Moon</td>
</tr>
</tbody>
</table>
• Oct 4, 2018
• Moon Occults Star
• Asellus Australis
• Name: Delta Cancri
• Mag=3.93 & 12.2
• Occult Begins: 5:41am
• Occult Ends: 6:54am
• AZ=102 deg
• EL=43 deg
• M44 1.2 deg to north
• Oct 4, 2018
• Moon Conjunction Hyades Cluster
• Constellation: Cancer
• 3:50am
• AZ=83 deg
• EL=22 deg
• Separation = 1.2 deg
- Oct 14, 2018
- Moon/Saturn/M8 Conjunction
- Constellation: Sagittarius
- 9:44pm
- AZ=234 deg
- EL=5 deg
- Separation = 1.8 deg
- Saturn mag= +0.5
- M8 mag= +6.0
- Very near horizon

Images from Sky Safari
Mars/Antares/Saturn/Moon Conjunction
Sep 27, 2014
Venus 2018

- **Evening to Morning Star!**
  - Oct 26 - Venus Conjunction (inferior)
  - Separation = 6° south of Sun.
  - Mag= -4.3
  - Dia = 61.3 arc-sec

Images from Sky Safari
Uranus/Neptune 2018

- **Uranus**
  - Oct 24 – Opposition (Pisces)
    - 18.9AU
    - 156 light-minutes
    - +5.7mag
    - 3.7 arc-sec

- **Neptune**
  - Sep 7 – Opposition (Aquarius)
    - 28.9AU
    - 240 light-minutes
    - +7.8mag
    - 2.32 arc-sec

Position of Uranus’ and Neptune’s moons at opposition

Images from Sky Safari
- Nov 15, 2018
- Moon/Mars Conjunction
- 11:40pm
- AZ=251 deg
- EL=1 deg
- Separation = 1.0 deg
- Mars mag = -0.3
- Very near horizon
Small Body Oppositions 2018

Jan 31  Dwarf Planet Ceres (1) at opposition, mag 6.9 (2018)
Oct 29  Asteroid Pallas (2) at opposition, mag 8.2 (2017)
Nov 17  Asteroid Juno (3) at opposition, mag 7.4
Jun 19  Asteroid Vesta (4) at opposition, mag 5.3
Dec 28  Asteroid Hebe (6) at opposition, mag 8.4
Oct 30  Asteroid Iris (7) at opposition, mag 6.9 (2017)
Jan  2  Asteroid Flora (8) at opposition, mag 8.2 (2018)
Jan 16  Asteroid Metis (9) at opposition, mag 9.7
Sep 23  Asteroid Hygiea (10) at opposition, mag 10.1
Jul 12  Dwarf Planet Pluto (134340) at opposition, mag 14.2
Asteroid Juno (3) at opposition, Nov 17 2018
mag: 7.5
dist=155 mKm
dia=0.3 arc-sec
Constellation: Eridanus

Yellow=Favorable Conditions

Images from Sky Safari
• Dec 6, 2018
• Mars/Neptune Conjunction
• 10:40pm
• AZ=252 deg
• EL=9 deg
• Separation = 0.04 deg!!

• Mars mag= +0.1
• Neptune mag=+7.9
• Dec 21, 2018
• Venus Occults Star
• HR 5518, Mag=6.32
• Constellation: Libra
• Occult Begins: 5:52am
• Occult Ends: 6:07am
• AZ=131 deg
• EL=23.5 deg

Images from Sky Safari
<table>
<thead>
<tr>
<th>Month</th>
<th>Date</th>
<th>Dark Sky Party (sunset)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar</td>
<td>10</td>
<td>6:10pm</td>
</tr>
<tr>
<td>Apr</td>
<td>14</td>
<td>7:43pm</td>
</tr>
<tr>
<td>May</td>
<td>12</td>
<td>8:11pm</td>
</tr>
<tr>
<td>Jun</td>
<td>16</td>
<td>8:27pm</td>
</tr>
<tr>
<td>Jul</td>
<td>14</td>
<td>8:28pm</td>
</tr>
<tr>
<td>Aug</td>
<td>11</td>
<td>8:03pm</td>
</tr>
<tr>
<td>Sep</td>
<td>8</td>
<td>7:24pm</td>
</tr>
<tr>
<td>Oct</td>
<td>6</td>
<td>6:39pm</td>
</tr>
<tr>
<td>Nov</td>
<td>3</td>
<td>6:02pm</td>
</tr>
</tbody>
</table>