



THE ROYAL ASTRONOMICAL SOCIETY OF CANADA.
OBSERVER'S CALENDAR

2011





FEBRUARY

Ultraviolet Sculpture

Interstellar dust and gas are carved and lit up by intense radiation from hot, energetic young stars into weird and wonderful shapes. The brightest blue star just left of centre is S Mon. Above it is the strangely textured Fox Fur Nebula. To the right of S Mon is the Cone Nebula, a star-forming pillar of gas.

Photo by Kerry-Ann Lecky Hepburn and Stefano Cancelli

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p>Mercury: very low in SE in morning twilight, lost by mid-month</p> <p>Venus: low in SE in morning twilight</p> <p>Mars: not observable this month</p> <p>Jupiter: in SW in evening twilight sets in W near 8 pm</p> <p>Saturn: rises in E before midnight transits high in S overnight</p>		<p>40°N 50°N Rise 6:05 6:37 Set 16:11 15:41</p> <p>1</p>	<p>40°N 50°N Rise 6:38 7:03 Set 17:13 16:50 New Moon 21:31</p> <p>2</p>	<p>40°N 50°N Rise 7:07 7:24 Set 18:13 17:59</p> <p>3</p>	<p>40°N 50°N Rise 7:33 7:43 Set 19:12 19:05</p> <p>4</p>	<p>40°N 50°N Rise 7:57 8:00 Set 20:10 20:11</p> <p>5</p> <p>Sunrise 7:05 7:28 Sunset 17:24 17:01</p>
		<p>Moon 3° above Mercury at dawn visible in all of N. America increasingly harder beyond 45°N</p>		<p>Chinese New Year</p>	<p>Venus between clusters M20 and M21 visible in all of N. America 5 am</p>	<p>Alexander Herschel, noted for recording meteor paths, born 175 years ago</p> <p>Venus 1.5° left of star cluster M21 visible in all of N. America 5 am</p>
<p>40°N 50°N Rise 8:20 8:17 Set 21:08 21:16</p> <p>6</p>	<p>40°N 50°N Rise 8:44 8:33 Set 22:06 22:21</p> <p>7</p>	<p>40°N 50°N Rise 9:10 8:52 Set 23:05 23:27</p> <p>8</p>	<p>40°N 50°N Rise 9:38 9:13 Set -- --</p> <p>9</p>	<p>40°N 50°N Set 0:05 0:34 Rise 10:11 9:39</p> <p>10</p>	<p>40°N 50°N Set 1:05 1:41 Rise 10:49 10:12 First Quarter 2:18</p> <p>11</p>	<p>40°N 50°N Set 2:05 2:45 Rise 11:35 10:54</p> <p>12</p> <p>Sunrise 6:57 7:16 Sunset 17:32 17:13</p>
<p>Venus 2° left of star cluster M21 visible in all of N. America 5 am</p>			<p>Halley's Comet passed through perihelion 25 years ago</p>	<p>44 Nysa at opposition (m=8.9)</p>	<p>Venus 2.8° upper left of M22 visible in all of N. America Moon 1.7° S of Pleiades at dusk visible in all of N. America Lunar Straight Wall visible from all of N. America 6 pm</p>	<p>Venus 2.8° left of M22 visible in all of N. America 5 am</p>
<p>40°N 50°N Set 3:02 3:44 Rise 12:29 11:48</p> <p>13</p>	<p>40°N 50°N Set 3:56 4:36 Rise 13:32 12:53</p> <p>14</p>	<p>40°N 50°N Set 4:44 5:18 Rise 14:42 14:09</p> <p>15</p>	<p>40°N 50°N Set 5:26 5:53 Rise 15:56 15:31</p> <p>16</p>	<p>40°N 50°N Set 6:03 6:22 Rise 17:11 16:56</p> <p>17</p>	<p>40°N 50°N Set 6:37 6:47 Rise 18:28 18:22 Full Moon 3:36</p> <p>18</p>	<p>40°N 50°N Set 7:09 7:10 Rise 19:44 19:48</p> <p>19</p> <p>Sunrise 6:48 7:04 Sunset 17:40 17:25</p>
	<p>Valentine's Day Family Day (some prov.) Moon occults eta Geminorum N of graze Prince George-N Sask. 7 am</p>				<p>Today's full Moon is the Snow Moon</p>	<p>MIR Space Station launched 25 years ago</p>
<p>40°N 50°N Set 7:40 7:32 Rise 20:59 21:13</p> <p>20</p>	<p>40°N 50°N Set 8:13 7:56 Rise 22:14 22:37</p> <p>21</p>	<p>40°N 50°N Set 8:49 8:23 Rise 23:27 23:59</p> <p>22</p>	<p>40°N 50°N Set 9:29 8:56 Rise -- --</p> <p>23</p>	<p>40°N 50°N Rise 0:37 1:15 Set 10:15 9:35 Last Quarter 18:26</p> <p>24</p>	<p>40°N 50°N Rise 1:41 2:22 Set 11:06 10:24</p> <p>25</p>	<p>40°N 50°N Rise 2:37 3:19 Set 12:03 11:21</p> <p>26</p> <p>Sunrise 6:38 6:50 Sunset 17:48 17:37</p>
	<p>Presidents' Day (USA)</p>	<p>Zodiacal light readily visible from a dark site in W after evening twilight for next two weeks</p>				<p>Dominique Arago, optical scientist, born 225 years ago</p>
<p>40°N 50°N Rise 3:25 4:04 Set 13:03 12:25</p> <p>27</p>	<p>40°N 50°N Rise 4:06 4:39 Set 14:04 13:33</p> <p>28</p>					<p>Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.</p> <p>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time. Times for events involving planetary satellites refer to the start time. Detailed instructions on adjusting times for location are given in the back pages.</p> <p>Please see back pages for photo details and additional information about this Calendar.</p>
<p>Winter Star Party, Florida Keys www.scas.org/wsp.html (through Mar. 6)</p> <p>Moon near Venus in morning sky today and tomorrow</p>						<p>JANUARY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p> <p>MARCH S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p>


































MARCH

Gravity's Apron String

The Large Magellanic Cloud (LMC) is kept on the short leash of gravity by its massive master, the Milky Way. The LMC is an irregular dwarf galaxy and a satellite in orbit about our own, at a distance of 180,000 light-years. This close galactic neighbour is undergoing active star formation and is full of bright nebulae and sparkling new star clusters.

Photo by Jack Newton

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p>Mercury: low in W in evening twilight Venus: very low in SE in morning twilight Mars: not observable this month Jupiter: very low in W soon after sunset lost in twilight late this month Saturn: rises in E in mid-evening transits high in S after midnight</p>		<p> Rise 4:40 5:07 Set 15:05 14:41</p> <p>1</p>	<p> Rise 5:10 5:30 Set 16:06 15:49</p> <p>2</p>	<p> Rise 5:37 5:49 Set 17:05 16:55</p> <p>3</p>	<p> Rise 6:02 6:07 Set 18:03 18:01 New Moon 15:46</p> <p>4</p>	<p> Rise 6:25 6:24 Set 19:01 19:06</p> <p>5</p> <p>Sunrise 6:28 6:36 Sunset 17:56 17:48</p>
		<p><i>Moon near Venus in morning sky</i></p>				
<p> Rise 6:49 6:41 Set 19:58 20:11</p> <p>6</p>	<p> Rise 7:14 6:59 Set 20:57 21:16</p> <p>7</p>	<p> Rise 7:42 7:19 Set 21:56 22:23</p> <p>8</p>	<p> Rise 8:12 7:44 Set 22:55 23:28</p> <p>9</p>	<p> Rise 8:48 8:13 Set 23:54 --</p> <p>10</p>	<p> Set -- 0:33 Rise 9:30 8:51</p> <p>11</p>	<p> Set 0:51 1:32 Rise 10:20 9:38 First Quarter 18:45 Sunrise 6:17 6:21 Sunset 18:03 18:00</p> <p>12</p>
<p><i>Halley's Comet was first to be probed by spacecraft (Giotto), 25 years ago</i></p>			<p><i>7.4-mag star occulted by 72 Feronia from Texas to Oregon www.asteroidoccultation.com 10 pm</i></p>		<p><i>Urbain Le Verrier, co-discoverer of Neptune, born 200 years ago Lunar X near crater Werner visible in all of N. America 11 pm</i></p>	<p><i>3 Juno at opposition (m=8.8) Lunar Straight Wall visible in all of N. America 10 pm</i></p>
<p> Set 1:45 3:25 Rise 12:17 11:37</p> <p>13</p>	<p> Set 3:33 4:10 Rise 13:21 12:45</p> <p>14</p>	<p> Set 4:17 4:48 Rise 14:30 14:02</p> <p>15</p>	<p> Set 4:55 5:18 Rise 15:43 15:23</p> <p>16</p>	<p> Set 5:30 5:45 Rise 16:58 16:47</p> <p>17</p>	<p> Set 6:03 6:09 Rise 18:14 18:13</p> <p>18</p>	<p> Set 6:35 6:32 Rise 19:31 19:39 Full Moon 14:10 Sunrise 7:06 7:06 Sunset 19:11 19:11</p> <p>19</p> <p>RASC</p>
<p><i>Daylight Saving Time begins 2 am Moon occults mu Geminorum S of graze Manitoba-Cape Breton 7 pm</i></p>	<p><i>20 Massalia at opposition (m=8.8) Mercury 2.4° lower right of Jupiter visible in all of N. America at evening civil twilight</i></p>	<p><i>Mercury 2° right of Jupiter visible in all of N. America at evening civil twilight</i></p>	<p><i>Mercury 2.5° upper right of Jupiter visible in all of N. America at evening civil twilight</i></p>	<p><i>Arthur Covington, Canada's first radio astronomer, died 10 years ago</i></p>		<p><i>Largest full Moon of 2011 Today's full Moon is the Worm Moon</i></p>
<p> Set 7:08 6:56 Rise 20:48 21:06</p> <p>20</p>	<p> Set 7:43 7:22 Rise 22:05 22:32</p> <p>21</p>	<p> Set 8:23 7:53 Rise 23:19 23:54</p> <p>22</p>	<p> Set 9:08 8:32 Rise -- --</p> <p>23</p>	<p> Rise 0:27 1:08 Set 9:59 9:19</p> <p>24</p>	<p> Rise 1:29 2:10 Set 10:56 10:15</p> <p>25</p>	<p> Rise 2:21 3:00 Set 11:56 11:18 Last Quarter 8:07 Sunrise 6:54 6:50 Sunset 19:18 19:22</p> <p>26</p>
<p><i>Spring Equinox 7:21 pm</i></p>	<p><i>Zodiacal light readily visible from a dark site in W after evening twilight for next two weeks</i></p>	<p><i>Mercury at greatest elongation E (19°) best evening view in 2011</i></p>	<p><i>MIR Space Station was destroyed in controlled re-entry 10 years ago</i></p>			<p><i>Earth Hour (8-9 pm local) www.earthhour.org</i></p>
<p> Rise 3:05 3:40 Set 12:58 12:25</p> <p>27</p>	<p> Rise 3:42 4:10 Set 13:59 13:33</p> <p>28</p>	<p> Rise 4:13 4:35 Set 15:00 14:41</p> <p>29</p>	<p> Rise 4:41 4:55 Set 15:59 15:47</p> <p>30</p>	<p> Rise 5:06 5:14 Set 16:57 16:52</p> <p>31</p>		
				<p><i>Moon 6° above Venus at dawn visible in all of N. America</i></p>	<p><i>Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.</i></p> <p><i>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time. Times for events involving planetary satellites refer to the start time. Detailed instructions on adjusting times for location are given in the back pages.</i></p> <p><i>Please see back pages for photo details and additional information about this Calendar.</i></p>	<p>FEBRUARY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28</p> <p>APRIL S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30</p>




































MAY

Luminous Pinwheel

Sparkling with the red of abundant star-forming regions and the blue of countless hot, young, massive stars, is M101, an enormous face-on spiral galaxy in the constellation Ursa Major. At a distance of about 27 million light-years, it has a diameter of about 170,000 light-years – almost twice the breadth of the Milky Way!

Photo by Serge Theberge

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 <p>40°N 50°N Rise 4:49 4:31 Set 18:42 19:04</p> <p>1</p> <p>Mars 0.4° upper left of Jupiter visible in S of N. America Cres. Moon 8° left of Venus-Mercury shortly before sunrise</p>	 <p>40°N 50°N Rise 5:18 4:53 Set 19:41 20:10</p> <p>2</p> <p>International Astronomy Week (through May 8) Mars-Jupiter-Venus-Mercury group this week before sunrise visible in S of N. America</p>	 <p>40°N 50°N Rise 5:51 5:20 Set 20:41 21:16 New Moon 2:51</p> <p>3</p>	 <p>40°N 50°N Rise 6:29 5:54 Set 21:40 22:18</p> <p>4</p>	 <p>40°N 50°N Rise 7:14 6:35 Set 22:35 23:15</p> <p>5</p> <p>Alan Shepard was first American in space 50 years ago John Draper, noted for first astronomical photo of Moon, born 200 years ago</p>	 <p>40°N 50°N Rise 8:06 7:26 Set 23:26 --</p> <p>6</p> <p>η-Aquarid meteors (ZHR=60) 9 am</p>	 <p>40°N 50°N Set -- 0:04 Rise 9:05 8:27</p> <p>7</p> <p>Sunrise 5:53 5:27 Sunset 20:00 20:27</p> <p>International Astronomy Day www.rasc.ca/astroday www.astronleague.org/ai/astroday/astroday.html</p>																																																																																																			
 <p>40°N 50°N Set 0:11 0:45 Rise 10:08 9:35</p> <p>8</p> <p>Mother's Day Jupiter-Venus-Mercury compact group this week before sunrise visible in S of N. America</p>	 <p>40°N 50°N Set 0:51 1:19 Rise 11:14 10:49</p> <p>9</p>	 <p>40°N 50°N Set 1:26 1:47 Rise 12:23 12:05 First Quarter 16:33</p> <p>10</p> <p>Lunar X near crater Werner visible in N. America except Atlantic Canada and Alaska 1 am Lunar Straight Wall visible in all of N. America except Atlantic Canada 11 pm</p>	 <p>40°N 50°N Set 1:58 2:11 Rise 13:33 13:23</p> <p>11</p> <p>Jupiter-Venus-Mercury compact group Jupiter 0.5° upper left of Venus visible in S of N. America</p>	 <p>40°N 50°N Set 2:29 2:33 Rise 14:43 14:43</p> <p>12</p>	 <p>40°N 50°N Set 2:59 2:55 Rise 15:56 16:05</p> <p>13</p> <p>10 Hygiea at opposition (m=9.1)</p>	 <p>40°N 50°N Set 3:31 3:19 Rise 17:10 17:28</p> <p>14</p> <p>Sunrise 5:46 5:16 Sunset 20:07 20:38</p>																																																																																																			
 <p>40°N 50°N Set 4:06 3:45 Rise 18:25 18:52</p> <p>15</p> <p>Francis Baily discovered his Beads during solar eclipse 175 years ago Mars-Jupiter-Venus-Mercury group this week before sunrise visible in S of N. America</p>	 <p>40°N 50°N Set 4:46 4:16 Rise 19:40 20:14</p> <p>16</p>	 <p>40°N 50°N Set 5:32 4:56 Rise 20:51 21:30 Full Moon 7:09</p> <p>17</p> <p>Joseph Lockyer, pioneer of solar spectroscopy, born 175 years ago Today's full Moon is the Flower Moon</p>	 <p>40°N 50°N Set 6:25 5:45 Rise 21:54 22:35</p> <p>18</p>	 <p>40°N 50°N Set 7:25 6:45 Rise 22:48 23:27</p> <p>19</p>	 <p>40°N 50°N Set 8:29 7:52 Rise 23:34 --</p> <p>20</p>	 <p>40°N 50°N Rise -- 0:07 Set 9:35 9:03</p> <p>21</p> <p>Sunrise 5:40 5:07 Sunset 20:14 20:47</p> <p>Williamina Fleming, who classified over 10,000 stars, died 100 years ago Mars-Venus-Mercury group in 2° circle before sunrise visible in S of N. America</p>																																																																																																			
 <p>40°N 50°N Rise 0:11 0:38 Set 10:39 10:15</p> <p>22</p> <p>Mars-Venus-Mercury separate as Mercury brightens rapidly this week visible in far S of N. America</p>	 <p>40°N 50°N Rise 0:43 1:02 Set 11:41 11:24</p> <p>23</p> <p>Victoria Day (Canada)</p>	 <p>40°N 50°N Rise 1:11 1:23 Set 12:41 12:31 Last Quarter 14:52</p> <p>24</p>	 <p>40°N 50°N Rise 1:36 1:42 Set 13:39 13:37</p> <p>25</p> <p>RTMC Astronomy Expo, Big Bear, CA www.rtmcastronomyexpo.org (through May 29) Two shadows on Jupiter visible in SE of N. America and central Canada 5:32 am</p>	 <p>40°N 50°N Rise 2:01 1:59 Set 14:37 14:42</p> <p>26</p> <p>Curtiss Cross near crater Fra Mauro visible in E of N. America 2:50 am</p>	 <p>40°N 50°N Rise 2:25 2:17 Set 15:34 15:47</p> <p>27</p>	 <p>40°N 50°N Rise 2:51 2:35 Set 16:33 16:52</p> <p>28</p> <p>Sunrise 5:35 4:59 Sunset 20:20 20:56</p>																																																																																																			
 <p>40°N 50°N Rise 3:19 2:57 Set 17:32 17:58</p> <p>29</p> <p>Texas Star Party, Fort Davis, TX www.texasstarparty.org (through Jun. 5) Mercury-Venus-Mars-Jupiter spreading apart this week before sunrise visible in far S of N. America</p>	 <p>40°N 50°N Rise 3:50 3:22 Set 18:32 19:05</p> <p>30</p> <p>Memorial Day (USA)</p>	 <p>40°N 50°N Rise 4:27 3:53 Set 19:31 20:09</p> <p>31</p>	<p>The planets this month</p> <p>Mercury: very low in ENE in morning twilight</p> <p>Venus: very low in ENE in morning twilight</p> <p>Mars: very low in ENE in morning twilight</p> <p>Jupiter: rises near 4 am in ENE low in E in morning twilight</p> <p>Saturn: transits high in S in late evening sets in W around dawn</p>			<p>Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.</p> <p>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time.</p> <p>Times for events involving planetary satellites refer to the start time.</p> <p>Detailed instructions on adjusting times for location are given in the back pages.</p> <p>Please see back pages for photo details and additional information about this Calendar.</p>	<p>APRIL</p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td>1</td><td>2</td></tr> <tr><td></td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr> <tr><td></td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr> <tr><td></td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td></td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td></td><td>27</td><td>28</td><td>29</td><td>30</td><td></td><td></td></tr> </table> <p>JUNE</p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td></tr> <tr><td></td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td></td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr> <tr><td></td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td></tr> <tr><td></td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td></tr> <tr><td></td><td>28</td><td>29</td><td>30</td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S						1	2		3	4	5	6	7	8		9	10	11	12	13	14		15	16	17	18	19	20		21	22	23	24	25	26		27	28	29	30			S	M	T	W	T	F	S					1	2	3		4	5	6	7	8	9		10	11	12	13	14	15		16	17	18	19	20	21		22	23	24	25	26	27		28	29	30			
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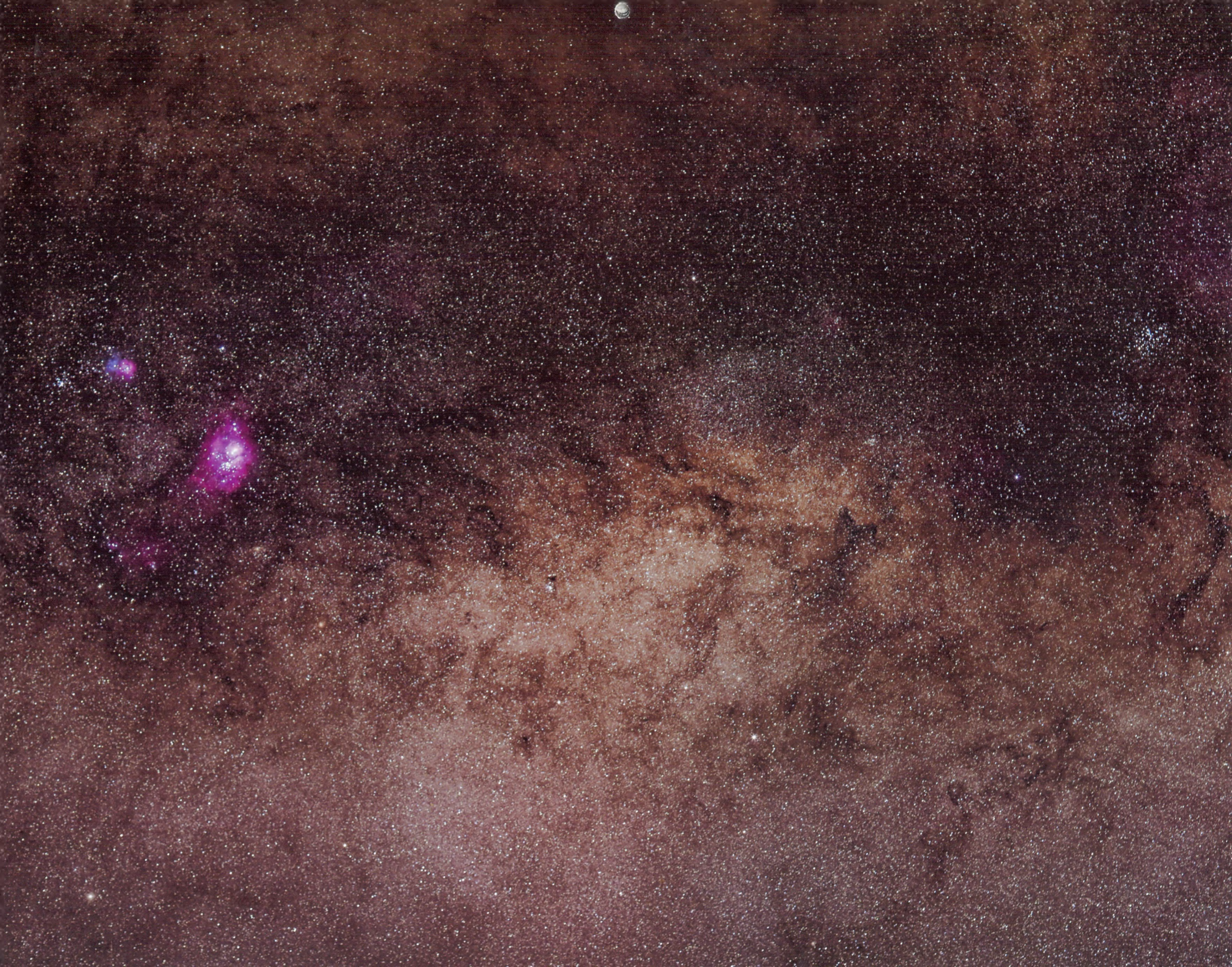
JUNE

Sapphires and Diamond Dust

Messier 7, sometimes called "Ptolemy's Cluster," is a splendid open cluster of about 80 stars at a distance of 800-1000 light-years, in the direction of the heart of the Milky Way. At 220 million years of age, these young stars shine brilliantly against the thick star clouds of the galaxy. The cluster is moving toward us at 14 km/sec.

Photo by Debra and Peter Ceravolo

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p>Mercury: observed with difficulty early in month in morning twilight and at end of month in evening twilight</p> <p>Venus: very low in NE in morning twilight observed with difficulty at month end</p> <p>Mars: very low in NE in morning twilight</p> <p>Jupiter: rises before 3 am in NE in E in morning twilight</p> <p>Saturn: high in S early evening sets in W after midnight</p>	<p>Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.</p> <p>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time.</p> <p>Times for events involving planetary satellites refer to the start time. Detailed instructions on adjusting times for location are given in the back pages.</p> <p>Please see back pages for photo details and additional information about this Calendar.</p>	<p>MAY</p> <p>S M T W T F S</p> <p>1 2 3 4 5 6 7</p> <p>8 9 10 11 12 13 14</p> <p>15 16 17 18 19 20 21</p> <p>22 23 24 25 26 27 28</p> <p>29 30 31</p> <p>JULY</p> <p>S M T W T F S</p> <p>1 2</p> <p>3 4 5 6 7 8 9</p> <p>10 11 12 13 14 15 16</p> <p>17 18 19 20 21 22 23</p> <p>24 25 26 27 28 29 30</p> <p>31</p>	<p>40°N 50°N</p> <p>Rise 5:10 4:32</p> <p>Set 20:29 21:09</p> <p>New Moon 17:03</p> <p>1</p> <p>Mercury-Venus-Mars-Jupiter spreading this week before sunrise visible in far S of N. America</p> <p>Two shadows on Jupiter visible in W of N. America 7:26 am</p> <p>Partial Solar Eclipse visible N of line from Halifax to Churchill-Yellowknife-central Alaska. First eclipse of Saros 156</p>	<p>40°N 50°N</p> <p>Rise 6:01 5:20</p> <p>Set 21:22 22:01</p> <p>2</p>	<p>40°N 50°N</p> <p>Rise 6:58 6:19</p> <p>Set 22:09 22:45</p> <p>3</p>	<p>40°N 50°N</p> <p>Rise 8:01 7:26</p> <p>Set 22:51 23:21</p> <p>4</p> <p>Sunrise 5:32 4:54</p> <p>Sunset 20:25 21:03</p>
<p>40°N 50°N</p> <p>Rise 9:07 8:39</p> <p>Set 23:28 23:51</p> <p>5</p>	<p>40°N 50°N</p> <p>Rise 10:15 9:55</p> <p>Set -- --</p> <p>6</p> <p>John Winthrop saw first transit of Venus in North America, at St. John's, 250 years ago</p> <p>Mikhail Lomonosov inferred Venetian atmosphere during solar transit 250 years ago</p> <p>Johannes Muller, who prepared planetary tables for Columbus, born 575 years ago</p>	<p>40°N 50°N</p> <p>Set 0:01 0:16</p> <p>Rise 11:24 11:12</p> <p>7</p>	<p>40°N 50°N</p> <p>Set 0:32 0:39</p> <p>Rise 12:33 12:30</p> <p>First Quarter 22:11</p> <p>8</p>	<p>40°N 50°N</p> <p>Set 1:01 1:00</p> <p>Rise 13:43 13:49</p> <p>9</p>	<p>40°N 50°N</p> <p>Set 1:32 1:22</p> <p>Rise 14:55 15:09</p> <p>10</p>	<p>40°N 50°N</p> <p>Set 2:04 1:46</p> <p>Rise 16:07 16:30</p> <p>11</p> <p>Sunrise 5:31 4:51</p> <p>Sunset 20:29 21:09</p>
<p>40°N 50°N</p> <p>Set 2:40 2:15</p> <p>Rise 17:20 17:51</p> <p>12</p>	<p>40°N 50°N</p> <p>Set 3:23 2:49</p> <p>Rise 18:31 19:09</p> <p>13</p>	<p>40°N 50°N</p> <p>Set 4:12 3:33</p> <p>Rise 19:37 20:18</p> <p>14</p>	<p>40°N 50°N</p> <p>Set 5:08 4:27</p> <p>Rise 20:35 21:15</p> <p>Full Moon 16:14</p> <p>15</p>	<p>40°N 50°N</p> <p>Set 6:10 5:31</p> <p>Rise 21:25 22:01</p> <p>16</p>	<p>40°N 50°N</p> <p>Set 7:16 6:42</p> <p>Rise 22:06 22:36</p> <p>17</p>	<p>40°N 50°N</p> <p>Set 8:22 7:54</p> <p>Rise 22:41 23:04</p> <p>18</p> <p>Sunrise 5:31 4:50</p> <p>Sunset 20:31 21:12</p>
<p>40°N 50°N</p> <p>Set 9:26 9:06</p> <p>Rise 23:11 23:26</p> <p>19</p>	<p>40°N 50°N</p> <p>Set 10:27 10:15</p> <p>Rise 23:38 23:46</p> <p>20</p>	<p>40°N 50°N</p> <p>Set 11:27 11:22</p> <p>Rise -- --</p> <p>21</p> <p>Saturn stationary</p>	<p>40°N 50°N</p> <p>Rise 0:03 0:04</p> <p>Set 12:26 12:28</p> <p>22</p> <p>Total Lunar Eclipse visible in E hemisphere Today's full Moon is the Honey Moon</p>	<p>40°N 50°N</p> <p>Rise 0:27 0:22</p> <p>Set 13:24 13:33</p> <p>Last Quarter 7:48</p> <p>23</p>	<p>40°N 50°N</p> <p>Rise 0:52 0:40</p> <p>Set 14:22 14:38</p> <p>24</p>	<p>40°N 50°N</p> <p>Rise 1:19 1:00</p> <p>Set 15:20 15:44</p> <p>25</p> <p>Sunrise 5:32 4:52</p> <p>Sunset 20:33 21:13</p>
<p>Father's Day</p> <p>Two shadows on Jupiter visible in E of Atlantic Canada 1:25 am</p>	<p>40°N 50°N</p> <p>Rise 1:49 1:23</p> <p>Set 16:20 16:50</p> <p>26</p>	<p>40°N 50°N</p> <p>Rise 2:24 2:27</p> <p>Set 18:18 18:57</p> <p>27</p>	<p>40°N 50°N</p> <p>Rise 3:04 3:12</p> <p>Set 19:13 19:53</p> <p>28</p>	<p>40°N 50°N</p> <p>Rise 3:52 3:12</p> <p>Set 20:04 20:41</p> <p>29</p>	<p>40°N 50°N</p> <p>Rise 4:47 4:07</p> <p>Set 20:04 20:41</p> <p>30</p>	<p>Meteorite fall reportedly killed dog in Egypt 100 years ago</p> <p>Pluto at opposition (m=14.0)</p> <p>Cres. Moon between Mars and Pleiades visible in all of N. America 5 am</p>
<p>Two shadows on Jupiter visible in N. America except W and Arctic 4:03 am</p>	<p>40°N 50°N</p> <p>Rise 2:24 1:52</p> <p>Set 17:19 17:55</p> <p>27</p> <p>43 Ariadne at opposition (m=9.0)</p>	<p>Summer Solstice 1:16 pm</p>	<p>RASC General Assembly hosted by the Winnipeg Centre www.rasc.ca/ga2011 (through Jul. 3)</p> <p>Earth passed through tail of a comet 150 years ago</p>			



JULY

Delicate Filigree of Dust and Stars

Wispy tendrils of cold, dark dust curl among the thick star fields of the central Milky Way, reddening, dimming, or blocking the light from background stars. This region of our galaxy is packed with legions of stars, clusters, and emission nebulae, from the small pink and blue Trifid Nebula on the left to the clusters M6 and M7 on the right.

Photo by Alan Dyer

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY																																																																													
<p>The planets this month</p> <p>Mercury: very low in WNW in evening twilight</p> <p>Venus: not easily observed</p> <p>Mars: in ENE in morning twilight</p> <p>Jupiter: rises near midnight in NE high in SE in morning twilight</p> <p>Saturn: in SSW in evening twilight sets in W around midnight</p>	<p>Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.</p> <p>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time.</p> <p>Times for events involving planetary satellites refer to the start time</p> <p>Detailed instructions on adjusting times for location are given in the back pages.</p> <p>Please see back pages for photo details and additional information about this Calendar.</p>	<p>JUNE</p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr> <tr><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td></tr> <tr><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td></tr> <tr><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td></td><td></td></tr> </table> <p>AUGUST</p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td></tr> <tr><td>28</td><td>29</td><td>30</td><td>31</td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			S	M	T	W	T	F	S		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						<p>40°N 50°N Rise 5:48 5:12 Set 20:49 21:21 New Moon 4:54</p> <p>1</p> <p>Canada Day Stargazing Manitoulin www.gordonspark.com (through Jul. 4)</p> <p>Partial Solar Eclipse visible in Antarctica, India side</p>	<p>40°N 50°N Rise 6:55 6:25 Set 21:28 21:54</p> <p>2</p> <p>Sunrise 5:35 4:56 Sunset 20:33 21:12</p>
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<p>40°N 50°N Rise 8:04 7:41 Set 22:03 22:21</p> <p>3</p>	<p>40°N 50°N Rise 9:14 9:00 Set 22:35 22:45</p> <p>4</p> <p>Independence Day (USA)</p> <p>21 Lutetia at opposition (m=9.4) Earth at aphelion (152,102,200 km) 11 am Mercury 2.9° lower right of Beehive Cluster (M44) just after sunset</p>	<p>40°N 50°N Rise 10:25 10:19 Set 23:05 23:07</p> <p>5</p> <p>Mercury 1° lower right of Beehive Cluster (M44) just after sunset</p>	<p>40°N 50°N Rise 11:35 11:38 Set 23:35 23:28</p> <p>6</p> <p>Mercury in Beehive Cluster (M44) just after sunset</p>	<p>40°N 50°N Rise 12:46 12:57 Set -- 23:52</p> <p>7</p> <p>Mercury 1.6° upper left of Beehive Cluster (M44) just after sunset Lunar X near crater Werner visible in N. America except Atlantic Canada and W 11 pm</p>	<p>40°N 50°N Set 0:07 -- Rise 13:57 14:17 First Quarter 2:29</p> <p>8</p> <p>Lunar Straight Wall visible in all of N. America except Atlantic Canada 11 pm</p>	<p>40°N 50°N Set 0:41 0:18 Rise 15:08 15:37</p> <p>9</p> <p>Sunrise 5:39 5:01 Sunset 20:31 21:09</p>																																																																													
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<p>40°N 50°N Rise 0:21 -- Set 15:06 15:40</p> <p>24</p> <p>Curtiss Cross near crater Fra Mauro visible in E of N. America but not SE 12:46 am Spot Jupiter unaided after sunrise 7° to right of the Moon</p>	<p>40°N 50°N Rise 0:58 0:24 Set 16:05 16:43</p> <p>25</p> <p>532 Herculina at opposition (m=9.8) Mercury 2.8° below Regulus just after sunset</p>	<p>40°N 50°N Rise 1:42 1:03 Set 17:01 17:41</p> <p>26</p> <p>Mercury 2.9° below Regulus just after sunset</p>	<p>40°N 50°N Rise 2:34 1:53 Set 17:54 18:33</p> <p>27</p> <p>Cres. Moon approaches Mars visible in all of N. America 5 am 9 Metis at opposition (m=9.6) Mercury 3° lower left of Regulus just after sunset</p>	<p>40°N 50°N Rise 3:32 2:54 Set 18:41 19:16</p> <p>28</p> <p>Stellafane Convention, Springfield, VT www.stellafane.org (through Jul. 31)</p>	<p>40°N 50°N Rise 4:37 4:04 Set 19:24 19:52</p> <p>29</p> <p>2 Pallas at opposition (m=9.5) S-Aquarid meteors (ZHR=20) 11 am</p>	<p>40°N 50°N Rise 5:47 5:20 Set 20:02 20:22 New Moon 14:40 Sunrise 5:56 5:26 Sunset 20:16 20:46</p> <p>30</p> <p>Star-B-Q, Eccles Ranch, AB calgary.rasc.ca (through Jul. 31)</p>																																																																													
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AUGUST

Celestial Harbour

The famous Lagoon Nebula, M8, is one of the galaxy's most magnificent star-forming regions. Glittering hot blue stars push back the cloud that gave them birth, carving caverns and ridges into the hydrogen, energizing it to glow garishly pink. Dense dark knots give promise of more new stars to come.

Photo by Paul Mortfield and Stefano Cancelli

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p><i>Mercury: observed with difficulty early in month in evening twilight and but easy at month end in morning</i></p> <p><i>Venus: not observable this month</i></p> <p><i>Mars: in E in morning twilight</i></p> <p><i>Jupiter: rises before 11 pm in NE transits near sunrise</i></p> <p><i>Saturn: in WSW after dark sets in W in mid-evening</i></p>	<p>Rise 40°N 50°N 8:10 8:01 Set 21:07 21:12</p> <p>1</p> <p><i>Civic Holiday (Canada)</i> <i>First day of Ramadan</i> <i>Dawn mission arrives at Vesta dawn.jpl.nasa.gov/mission</i> <i>Caroline Herschel discovered first of 8 comets 225 years ago</i></p>	<p>Rise 40°N 50°N 9:22 9:22 Set 21:38 21:34</p> <p>2</p>	<p>Rise 40°N 50°N 10:35 10:44 Set 22:10 21:57</p> <p>3</p>	<p>Rise 40°N 50°N 11:47 12:05 Set 22:44 22:23</p> <p>4</p>	<p>Rise 40°N 50°N 12:59 13:25 Set 23:21 22:53</p> <p>5</p> <p><i>Manitoulin Star Party</i> <i>www.gordonspark.com (through Aug. 8)</i></p> <p><i>Mars 1.0° right of star cluster M35 before dawn</i> <i>4 Vesta at opposition (m=5.6)</i></p>	<p>Rise 40°N 50°N 14:10 14:43 Set -- 23:29 <i>First Quarter 7:08</i> <i>Sunrise 6:03 5:36</i> <i>Sunset 20:08 20:35</i></p> <p>6</p> <p><i>Mars 0.5° lower right of star cluster M35 before dawn</i></p>
<p>Set 40°N 50°N 0:04 -- Rise 15:17 15:55</p> <p>7</p> <p><i>Mars 0.6° below star cluster M35 before dawn</i> <i>Lunar Straight Wall visible in all of N. America</i> 9 pm</p>	<p>Set 40°N 50°N 0:54 0:14 Rise 16:18 16:59</p> <p>8</p> <p><i>Mars 1.2° lower left of star cluster M35 before dawn</i></p>	<p>Set 40°N 50°N 1:49 1:09 Rise 17:12 17:51</p> <p>9</p> <p><i>Moon occults pi Sagittarii visible in N. America except W</i> 9 pm</p>	<p>Set 40°N 50°N 2:50 2:12 Rise 17:59 18:33</p> <p>10</p>	<p>Set 40°N 50°N 3:54 3:21 Rise 18:38 19:06</p> <p>11</p>	<p>Set 40°N 50°N 4:58 4:31 Rise 19:11 19:33</p> <p>12</p> <p><i>349 Dembowska at opposition (m=9.7)</i></p>	<p>Set 40°N 50°N 6:01 5:42 Rise 19:41 19:55 <i>Full Moon 14:57</i> <i>Sunrise 6:09 5:46</i> <i>Sunset 20:00 20:22</i></p> <p>13</p> <p><i>Perseid meteors (ZHR=90) 2 am</i> <i>Today's full Moon is the Sturgeon Moon</i></p>
<p>Set 40°N 50°N 7:02 6:51 Rise 20:08 20:15</p> <p>14</p>	<p>Set 40°N 50°N 8:02 7:59 Rise 20:33 20:33</p> <p>15</p>	<p>Set 40°N 50°N 9:01 9:05 Rise 20:58 20:51</p> <p>16</p> <p><i>Mercury at inferior conjunction</i></p>	<p>Set 40°N 50°N 9:59 10:10 Rise 21:24 21:10</p> <p>17</p>	<p>Set 40°N 50°N 10:57 11:15 Rise 21:51 21:31</p> <p>18</p>	<p>Set 40°N 50°N 11:56 12:20 Rise 22:21 21:55</p> <p>19</p>	<p>Set 40°N 50°N 12:54 13:25 Rise 22:56 22:23</p> <p><i>Sunrise 6:16 5:57</i> <i>Sunset 19:50 20:09</i></p> <p>20</p> <p><i>Sunshine Coast 6th Annual Star Party</i> <i>Porpoise Provincial Park, BC</i> <i>www.coastastronomy.ca (through Aug 21)</i> <i>Fred Hoyle, known for steady state theory of universe, died 10 years ago</i></p>
<p>Set 40°N 50°N 13:52 14:28 Rise 23:36 22:59 <i>Last Quarter 17:54</i></p> <p>21</p>	<p>Set 40°N 50°N 14:48 15:27 Rise -- 23:44</p> <p>22</p> <p><i>Neptune at opposition (m=7.8)</i></p>	<p>Rise 40°N 50°N 0:23 -- Set 15:42 16:21</p> <p>23</p>	<p>Rise 40°N 50°N 1:17 0:38 Set 16:31 17:08</p> <p>24</p>	<p>Rise 40°N 50°N 2:18 1:42 Set 17:16 17:47</p> <p>25</p> <p><i>Starfest, Mount Forest, ON</i> <i>www.nyaa.ca (through Aug. 28)</i> <i>Saskatchewan Summer Star Party</i> <i>homepage.usask.ca/~ges125/rasc/starparty.html (through Aug. 28)</i> <i>Moon 2.8° right of Mars visible in all of N. America</i> 6 am</p>	<p>Rise 40°N 50°N 3:25 2:55 Set 17:55 18:20</p> <p>26</p> <p><i>Nova East, Smileys Provincial Park, NS</i> <i>halifax.rasc.ca/ne (through Aug. 28)</i></p>	<p>Rise 40°N 50°N 4:35 4:13 Set 18:31 18:48</p> <p><i>Sunrise 6:23 6:07</i> <i>Sunset 19:40 19:55</i></p> <p>27</p>
<p>Rise 40°N 50°N 5:48 5:34 Set 19:05 19:13 <i>New Moon 23:04</i></p> <p>28</p>	<p>Rise 40°N 50°N 7:01 6:57 Set 19:37 19:37</p> <p>29</p>	<p>Rise 40°N 50°N 8:16 8:20 Set 20:09 20:00</p> <p>30</p> <p><i>Jupiter stationary</i></p>	<p>Rise 40°N 50°N 9:30 9:44 Set 20:43 20:26</p> <p>31</p>	<p><i>Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.</i></p> <p><i>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time.</i></p> <p><i>Times for events involving planetary satellites refer to the start time.</i></p> <p><i>Detailed instructions on adjusting times for location are given in the back pages.</i></p> <p><i>Please see back pages for photo details and additional information about this Calendar.</i></p>		<p>JULY S M T W T F S</p> <p>1 2</p> <p>3 4 5 6 7 8 9</p> <p>10 11 12 13 14 15 16</p> <p>17 18 19 20 21 22 23</p> <p>24 25 26 27 28 29 30</p> <p>31</p> <p>SEPTEMBER S M T W T F S</p> <p>1 2 3</p> <p>4 5 6 7 8 9 10</p> <p>11 12 13 14 15 16 17</p> <p>18 19 20 21 22 23 24</p> <p>25 26 27 28 29 30</p>



SEPTEMBER

Shadow Play

Earth is spherical, as evidenced by the curved edges of its round shadow. This multiple exposure records the Moon's right-to-left orbital motion through Earth's shadow cast into space. The orange central image is mid-eclipse. The bracketing of the camera exposure time shows partial eclipse phases, not lunar phases.

Photo by Leslie Mardzi

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p>Mercury: low in ESE in morning twilight difficult after mid-month</p> <p>Venus: at month end it is very low in W in evening twilight sets shortly after</p> <p>Mars: rises near 1 am in NE high in ESE at dawn</p> <p>Jupiter: rises before 9 pm in NE in S near 3 am</p> <p>Saturn: very low in W in evening twilight sets shortly after dark</p>	<p>Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.</p> <p>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time. Times for events involving planetary satellites refer to the start time. Detailed instructions on adjusting times for location are given in the back pages.</p> <p>Please see back pages for photo details and additional information about this Calendar.</p>	<p>AUGUST S M T W T F S</p> <p>1 2 3 4 5 6</p> <p>7 8 9 10 11 12 13</p> <p>14 15 16 17 18 19 20</p> <p>21 22 23 24 25 26 27</p> <p>28 29 30 31</p> <p>OCTOBER S M T W T F S</p> <p>1</p> <p>2 3 4 5 6 7 8</p> <p>9 10 11 12 13 14 15</p> <p>16 17 18 19 20 21 22</p> <p>23 24 25 26 27 28 29</p> <p>30 31</p>		<p>40°N 50°N</p> <p>Rise 10:45 11:08</p> <p>Set 21:21 20:56</p> <p>1</p>	<p>40°N 50°N</p> <p>Rise 11:58 12:29</p> <p>Set 22:03 21:31</p> <p>2</p>	<p>40°N 50°N</p> <p>Rise 13:08 13:45</p> <p>Set 22:52 22:14</p> <p>3</p> <p>Sunrise 6:29 6:18</p> <p>Sunset 19:29 19:40</p> <p>Mercury at greatest elongation W (18°) best morning view in 2011</p> <p>Moon occults delta Scorpii S of graze W Texas-Pennsylvania 10 pm</p>
<p>40°N 50°N</p> <p>Rise 14:12 14:52</p> <p>Set 23:46 23:06</p> <p>First Quarter 13:39</p> <p>4</p>	<p>40°N 50°N</p> <p>Rise 15:09 15:48</p> <p>Set -- --</p> <p>5</p>	<p>40°N 50°N</p> <p>Set 0:45 0:06</p> <p>Rise 15:57 16:33</p> <p>6</p>	<p>40°N 50°N</p> <p>Set 1:47 1:13</p> <p>Rise 16:38 17:08</p> <p>7</p>	<p>40°N 50°N</p> <p>Set 2:50 2:22</p> <p>Rise 17:13 17:37</p> <p>8</p>	<p>40°N 50°N</p> <p>Set 3:53 3:32</p> <p>Rise 17:44 18:00</p> <p>9</p>	<p>40°N 50°N</p> <p>Set 4:54 4:40</p> <p>Rise 18:11 18:21</p> <p>10</p> <p>Sunrise 6:36 6:28</p> <p>Sunset 19:17 19:25</p>
<p>Lunar X near crater Werner visible in N. America except W and N 9 pm</p>	<p>Labour Day</p> <p>Lunar Straight Wall visible in all of N. America 9 pm</p>	<p>Moon occults Xi2 Sagittarii S of graze S Texas-PEI 11 pm</p>	<p>Mercury 2.8° above Regulus at dawn</p>	<p>Mercury 1.5° above Regulus at dawn</p>	<p>Mercury 0.7° left of Regulus at dawn</p>	<p>Mercury 1.9° lower left of Regulus at dawn</p>
<p>40°N 50°N</p> <p>Set 5:54 5:47</p> <p>Rise 18:37 18:39</p> <p>11</p>	<p>40°N 50°N</p> <p>Set 6:53 6:53</p> <p>Rise 19:02 18:58</p> <p>Full Moon 5:27</p> <p>12</p>	<p>40°N 50°N</p> <p>Set 7:51 7:59</p> <p>Rise 19:27 19:16</p> <p>13</p>	<p>40°N 50°N</p> <p>Set 8:49 9:04</p> <p>Rise 19:54 19:37</p> <p>14</p>	<p>40°N 50°N</p> <p>Set 9:47 10:09</p> <p>Rise 20:23 19:59</p> <p>15</p>	<p>40°N 50°N</p> <p>Set 10:45 11:13</p> <p>Rise 20:56 20:26</p> <p>16</p>	<p>40°N 50°N</p> <p>Set 11:42 12:16</p> <p>Rise 21:34 20:59</p> <p>17</p> <p>Sunrise 6:43 6:38</p> <p>Sunset 19:06 19:10</p>
	<p>Today's full Moon is the Harvest Moon</p>				<p>1 Ceres at opposition (m=7.6)</p>	<p>Follow Capella unaided into daylight best for a few days near the 17th</p>
<p>40°N 50°N</p> <p>Set 12:39 13:16</p> <p>Rise 22:18 21:39</p> <p>18</p>	<p>40°N 50°N</p> <p>Set 13:32 14:11</p> <p>Rise 23:08 22:29</p> <p>19</p>	<p>40°N 50°N</p> <p>Set 14:22 15:00</p> <p>Rise -- 23:27</p> <p>Last Quarter 9:39</p> <p>20</p>	<p>40°N 50°N</p> <p>Rise 0:04 --</p> <p>Set 15:07 15:41</p> <p>21</p>	<p>40°N 50°N</p> <p>Rise 1:06 0:34</p> <p>Set 15:48 16:16</p> <p>22</p>	<p>40°N 50°N</p> <p>Rise 2:13 1:47</p> <p>Set 16:25 16:45</p> <p>23</p>	<p>40°N 50°N</p> <p>Rise 3:23 3:05</p> <p>Set 16:59 17:12</p> <p>24</p> <p>Sunrise 6:49 6:49</p> <p>Sunset 18:54 18:54</p>
		<p>Curtiss Cross near crater Fra Mauro visible in E of N. America but not SE 11:49 pm</p>			<p>Annual Algonquin Adventure Algonquin Park, ON www.toronto.rasc.ca (through Sep. 25)</p> <p>Fall Equinox 5:05 am</p>	<p>Alberta Star Party, Starland, AB calgary.rasc.ca (through Sep. 25)</p>
<p>40°N 50°N</p> <p>Rise 4:35 4:26</p> <p>Set 17:32 17:36</p> <p>25</p>	<p>40°N 50°N</p> <p>Rise 5:49 5:49</p> <p>Set 18:04 18:00</p> <p>26</p>	<p>40°N 50°N</p> <p>Rise 7:04 7:14</p> <p>Set 18:38 18:25</p> <p>New Moon 7:09</p> <p>27</p>	<p>40°N 50°N</p> <p>Rise 8:21 8:39</p> <p>Set 19:16 18:54</p> <p>28</p>	<p>40°N 50°N</p> <p>Rise 9:37 10:04</p> <p>Set 19:57 19:28</p> <p>29</p>	<p>40°N 50°N</p> <p>Rise 10:51 11:26</p> <p>Set 20:45 20:09</p> <p>30</p>	
<p>Uranus at opposition (m=5.7)</p>	<p>Zodiacal light readily visible from a dark site in E before morning twilight for next two weeks</p>	<p>Northern Prairie Star Party, near Tofield, AB edmontonrasc.com/nps.html (through Oct 2)</p> <p>Saturn 2.6° to upper left of Venus just after sunset for S of N. America</p>	<p>Mars 1.9° upper right of Beehive Cluster (M44) before dawn</p> <p>Saturn 1.6° above Venus, Moon far left just after sunset for S of N. America</p>	<p>Rosh Hashanah Begins</p> <p>Mars 1.3° upper right of Beehive Cluster (M44) before dawn</p> <p>Saturn 1.2° to upper right of Venus just after sunset for S of N. America</p>	<p>Mars 0.7° upper right of Beehive Cluster (M44) before dawn</p> <p>Saturn 1.7° to right of Venus just after sunset for S of N. America</p>	



OCTOBER

Twisted Into Shape

The glowing coil of the Helix Nebula, some 700 light-years away, is the second nearest planetary nebula to the Sun. The colourful shells of gas are the outer layers of a dying star, whose super-hot white-dwarf core appears as a bright white dot floating in the centre of the nebula. We see this twisting tunnel of gas end-on, making it appear round.

Photo by Debra and Peter Cenavolo

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

The planets this month		Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.		SEPTEMBER S M T W T F S								40°N 50°N		1											
<p>Mercury: at month end it is very low in SW in bright evening twilight</p> <p>Venus: very low in SW in bright evening twilight, sets shortly after</p> <p>Mars: rises near midnight in NE high in SE at dawn</p> <p>Jupiter: rises near 7 pm in NE transits near 1 am, sets in NW near sunrise</p> <p>Saturn: not observable this month</p>		<p>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time. Times for events involving planetary satellites refer to the start time. Detailed instructions on adjusting times for location are given in the back pages.</p> <p>Please see back pages for photo details and additional information about this Calendar.</p>		<p>4 5 6 7 8 9 10</p> <p>11 12 13 14 15 16 17</p> <p>18 19 20 21 22 23 24</p> <p>25 26 27 28 29 30</p>								<p>Rise 12:00 12:39</p> <p>Set 21:39 21:00</p> <p>Sunrise 6:56 7:00</p> <p>Sunset 18:43 18:39</p>		<p>Fall Astronomy Day</p> <p>Isaac Roberts photographed structure of Andromeda Nebula 125 years ago</p> <p>Mars in Beehive Cluster (M44) before dawn</p>											
<p>40°N 50°N</p> <p>Rise 13:01 13:41</p> <p>Set 22:38 21:59</p>		<p>40°N 50°N</p> <p>Rise 13:54 14:30</p> <p>Set 23:41 23:05</p> <p>First Quarter 23:15</p>		<p>40°N 50°N</p> <p>Rise 14:38 15:09</p> <p>Set -- --</p>		<p>40°N 50°N</p> <p>Set 0:44 0:14</p> <p>Rise 15:15 15:40</p>		<p>40°N 50°N</p> <p>Set 1:47 1:24</p> <p>Rise 15:46 16:05</p>		<p>40°N 50°N</p> <p>Set 2:48 2:32</p> <p>Rise 16:15 16:26</p>		<p>40°N 50°N</p> <p>Set 3:48 3:39</p> <p>Rise 16:41 16:45</p> <p>Sunrise 7:03 7:10</p> <p>Sunset 18:32 18:24</p>		<p>Johann Palisa discovered Earth-grazing asteroid, Albert, 100 years ago</p> <p>Mars 1.1° lower left of Beehive Cluster (M44) before dawn</p>		<p>Mars 1.7° lower left of Beehive Cluster (M44) before dawn</p> <p>27 Euterpe at opposition (m=9.3)</p>									
<p>Mars 0.5° below Beehive Cluster (M44) before dawn</p>		<p>Mars 1.1° lower left of Beehive Cluster (M44) before dawn</p>		<p>Mars 1.7° lower left of Beehive Cluster (M44) before dawn</p> <p>27 Euterpe at opposition (m=9.3)</p>		<p>Lunar Straight Wall visible in all of N. America 8 pm</p>		<p>Follow Sirius unaided into daylight best for a few days near the 6th</p>		<p>Yom Kippur</p>		<p>40°N 50°N</p> <p>Set 4:46 4:45</p> <p>Rise 17:06 17:04</p>		<p>40°N 50°N</p> <p>Set 5:44 5:50</p> <p>Rise 17:31 17:23</p>		<p>40°N 50°N</p> <p>Set 6:42 6:55</p> <p>Rise 17:58 17:42</p> <p>Full Moon 22:06</p>		<p>40°N 50°N</p> <p>Set 7:40 7:59</p> <p>Rise 18:26 18:05</p>		<p>40°N 50°N</p> <p>Set 8:38 9:04</p> <p>Rise 18:58 18:30</p>		<p>40°N 50°N</p> <p>Set 9:36 10:07</p> <p>Rise 19:34 19:01</p>		<p>40°N 50°N</p> <p>Set 10:32 11:08</p> <p>Rise 20:16 19:39</p> <p>Sunrise 7:10 7:21</p> <p>Sunset 18:21 18:09</p>	
<p>40°N 50°N</p> <p>Set 12:16 12:04</p> <p>Rise 21:03 20:25</p>		<p>40°N 50°N</p> <p>Set 12:17 12:54</p> <p>Rise 21:57 21:19</p>		<p>40°N 50°N</p> <p>Set 13:02 13:37</p> <p>Rise 22:55 22:22</p>		<p>40°N 50°N</p> <p>Set 13:44 14:13</p> <p>Rise 23:58 23:30</p> <p>Last Quarter 23:30</p>		<p>40°N 50°N</p> <p>Set 14:21 14:44</p> <p>Rise -- --</p>		<p>40°N 50°N</p> <p>Rise 1:04 0:43</p> <p>Set 14:55 15:11</p>		<p>40°N 50°N</p> <p>Set 2:13 2:00</p> <p>Rise 15:27 15:35</p> <p>Sunrise 7:18 7:33</p> <p>Sunset 18:11 17:55</p>		<p>Galileo made his first recorded observations of sunspots 400 years ago</p> <p>Orionid meteors (ZHR=20) 6 pm</p>											
<p>40°N 50°N</p> <p>Rise 3:23 3:19</p> <p>Set 15:59 15:59</p>		<p>40°N 50°N</p> <p>Rise 4:36 4:41</p> <p>Set 16:31 16:23</p>		<p>40°N 50°N</p> <p>Rise 5:51 6:05</p> <p>Set 17:07 16:50</p>		<p>40°N 50°N</p> <p>Rise 7:08 7:31</p> <p>Set 17:46 17:21</p> <p>New Moon 15:56</p>		<p>40°N 50°N</p> <p>Rise 8:25 8:55</p> <p>Set 18:32 18:00</p>		<p>40°N 50°N</p> <p>Rise 9:39 10:15</p> <p>Set 19:25 18:47</p>		<p>40°N 50°N</p> <p>Rise 10:46 11:25</p> <p>Set 20:24 19:45</p> <p>Sunrise 7:25 7:44</p> <p>Sunset 18:02 17:42</p>		<p>230 Athamantis at opposition (m=9.9)</p>		<p>Two shadows on Jupiter visible in W of N. America except SW 10:22 am</p>		<p>Zodiacal light readily visible from a dark site in E before morning twilight for next two weeks</p>		<p>Jupiter at opposition (m=-2.9)</p>		<p>Gaspra was first asteroid visited by a spacecraft (Galileo) 20 years ago</p>			
<p>40°N 50°N</p> <p>Rise 11:44 12:22</p> <p>Set 21:28 20:51</p>		<p>40°N 50°N</p> <p>Rise 12:33 13:06</p> <p>Set 22:33 22:01</p>												<p>Hallowe'en</p> <p>Radio telescope was commissioned at Parkes, New South Wales, 50 years ago</p>											

































NOVEMBER

Radiant and Shiny

The Universe is but the Thing of Things, The things but balls all going round in rings
Some of them mighty huge, some mighty tiny, All of them radiant and mighty shiny. – Robert Frost
Our spinning Earth creates shiny star trails, here slashed by radiant Perseid meteors.

Photo by Jennifer West

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p>Mercury: very low in SW in bright evening twilight, difficult at month end</p> <p>Venus: very low in SW in evening twilight, sets before dark</p> <p>Mars: rises near midnight in NE transits high in S at dawn</p> <p>Jupiter: in SE after dark transits in S near 11 pm sets in NW near 5 am</p> <p>Saturn: very low in ESE in morning twilight</p>		<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 13:13 13:40 Set 23:38 23:13</p> <p>1</p> <p>Archbishop of Capua urged Copernicus to publish heliocentric theory 475 years ago</p> <p>Mercury 2.0° below Venus all week during the day in all of N. America and at dusk in S of N. America</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 13:47 14:08 Set -- -- First Quarter 12:38</p> <p>2</p> <p>Lunar X near crater Werner visible in N. America except Atlantic Canada 11 pm</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 0:41 0:23 Rise 14:17 14:31</p> <p>3</p> <p>Lunar Straight Wall visible in all of N. America 11 pm</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 1:41 1:31 Rise 14:44 14:51</p> <p>4</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 2:40 2:37 Rise 15:10 15:10</p> <p>5</p> <p>Sunrise 7:33 7:56 Sunset 17:53 17:31</p> <p>29 Amphitrite at opposition (m=8.7) tomorrow S Taurid meteors (ZHR=10) 7 pm</p>
<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 2:38 2:42 Rise 14:35 14:28</p> <p>6</p> <p>Daylight Saving Time ends 2 am Mercury 1.9° below Venus all week during the day in all of N. America and at dusk in S of N. America</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 3:36 3:46 Rise 15:01 14:48</p> <p>7</p> <p>Mars passes N of Regulus this week best after midnight</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 4:33 4:51 Rise 15:29 15:09</p> <p>8</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 5:31 5:55 Rise 16:00 15:34</p> <p>9</p> <p>Mars 1.3° N of Regulus best after midnight</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 6:29 6:59 Rise 16:35 16:03 Full Moon 15:16</p> <p>10</p> <p>Mercury 1.9° below Venus Antares 1.9° below Mercury during the day in all of N. America and at dusk in S of N. America Today's full Moon is the Beaver Moon</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 7:27 8:01 Rise 17:15 16:39</p> <p>11</p> <p>Remembrance Day (Canada) Veterans Day (USA) 68 Leto at opposition (m=9.6)</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 8:22 8:59 Rise 18:01 17:23</p> <p>12</p> <p>Sunrise 6:41 7:08 Sunset 16:46 16:20</p> <p>Canadarm was first carried into space on shuttle Columbia 30 years ago 40 Harmonia at opposition (m=9.4) N Taurid meteors (ZHR=15) 5 pm</p>
<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 9:13 9:52 Rise 18:35 18:15</p> <p>13</p> <p>30 Urania at opposition (m=9.6) Mercury 2.5° below right of Venus all week after sunset, tougher above 45°N</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 10:01 10:36 Rise 19:50 19:15</p> <p>14</p> <p>Mercury at greatest elongation E (23°) Mars separating from Regulus this week best after midnight</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 10:43 11:14 Rise 20:51 20:21</p> <p>15</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 11:21 11:46 Rise 21:54 21:31</p> <p>16</p> <p>Leonid meteors (ZHR=15) 11 pm</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 11:55 12:13 Rise 23:00 22:44</p> <p>17</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Set 12:26 12:37 Rise -- -- Last Quarter 10:09</p> <p>18</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 0:07 0:00 Set 12:57 13:00</p> <p>19</p> <p>Sunrise 6:49 7:19 Sunset 16:41 16:11</p> <p>Curtiss Cross near crater Fra Mauro visible in E of N. America 1:13 am</p>
<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 1:16 1:17 Set 13:28 13:23</p> <p>20</p> <p>Mercury below right of Venus all week after sunset, separating and fading</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 2:27 2:37 Set 14:00 13:48</p> <p>21</p> <p>115 Thyra at opposition (m=9.6)</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 3:41 3:59 Set 14:37 14:16</p> <p>22</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 4:56 5:22 Set 15:18 14:50</p> <p>23</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 6:11 6:44 Set 16:07 15:32</p> <p>24</p> <p>Thanksgiving Day (USA) Partial Solar Eclipse visible in Antarctica, Tasmania, and South Africa</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 7:22 8:00 Set 17:04 16:25 New Moon 1:10</p> <p>25</p> <p>Venus 1.9° lower right of Lagoon Neb. (M8) at dusk</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 8:26 9:05 Set 18:07 17:28</p> <p>26</p> <p>Sunrise 6:57 7:29 Sunset 16:37 16:05</p> <p>Venus 0.7° below Lagoon Neb. (M8) at dusk Cres. Moon between Venus and Mercury visible in all of N. America 6 pm</p>
<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 9:21 9:57 Set 19:13 18:39</p> <p>27</p> <p>Islamic New Year Venus 0.7° left of Lagoon Nebula (M8) at dusk Moon occults Xi2 Sagittarii visible from W Alaska-Haida Gwaii 9 pm</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 10:07 10:37 Set 20:21 19:53</p> <p>28</p> <p>15 Eunomia at opposition (m=7.9)</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 10:45 11:08 Set 21:27 21:06</p> <p>29</p>	<p> $40^{\circ}\text{N } 50^{\circ}\text{N}$ Rise 11:17 11:34 Set 22:30 22:17</p> <p>30</p>	<p>Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.</p> <p>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time. Times for events involving planetary satellites refer to the start time. Detailed instructions on adjusting times for location are given in the back pages.</p>		<p>OCTOBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p> <p>DECEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p>



DECEMBER

Bursting with Stars

The spiral Sculptor Galaxy, NGC 253, belongs to one of the nearest galaxy clusters to our own Local Group. At about ten million light-years away in the southern sky, it is bright enough to see with a good pair of binoculars. It is a starburst galaxy with dense dust clouds and a high rate of star formation.

Photo by Stefano Cancelli and Paul Mortfield

SUNDAY

MONDAY
































TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p>Mercury: low in SE in morning twilight by mid-month</p> <p>Venus: in SW in evening twilight sets in W before 7 pm</p> <p>Mars: rises in ESE near 11 pm transits in S near 5 am</p> <p>Jupiter: high in SE after dark transits in S near 8 pm sets in NW after midnight</p> <p>Saturn: in SE in morning twilight and SSE near sunrise</p>	<p>Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.</p> <p>Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time. Times for events involving planetary satellites refer to the start time. Detailed instructions on adjusting times for location are given in the back pages.</p> <p>Please see back pages for photo details and additional information about this Calendar.</p>	<p>NOVEMBER S M T W T F S</p> <p>6 7 8 9 10 11 12</p> <p>13 14 15 16 17 18 19</p> <p>20 21 22 23 24 25 26</p> <p>27 28 29 30</p> <p>JANUARY S M T W T F S</p> <p>1 2 3 4 5 6 7</p> <p>8 9 10 11 12 13 14</p> <p>15 16 17 18 19 20 21</p> <p>22 23 24 25 26 27 28</p> <p>29 30 31</p>		<p> Rise 11:46 11:55 Set 23:31 23:25</p> <p>40°N 50°N</p> <p>1</p>	<p> Rise 12:12 12:15 Set -- -- First Quarter 4:52</p> <p>40°N 50°N</p> <p>2</p>	<p> Set 0:30 0:31 Rise 12:38 12:33</p> <p>40°N 50°N</p> <p>3</p> <p>Sunrise 7:04 7:39 Sunset 16:35 16:00</p>
<p> Set 1:28 1:36 Rise 13:04 12:53</p> <p>40°N 50°N</p> <p>4</p>	<p> Set 2:25 2:40 Rise 13:31 13:13</p> <p>40°N 50°N</p> <p>5</p>	<p> Set 3:23 3:45 Rise 14:00 13:37</p> <p>40°N 50°N</p> <p>6</p>	<p> Set 4:21 4:49 Rise 14:34 14:04</p> <p>40°N 50°N</p> <p>7</p>	<p> Set 5:19 5:52 Rise 15:12 14:38</p> <p>40°N 50°N</p> <p>8</p>	<p> Set 6:15 6:52 Rise 15:57 15:19</p> <p>40°N 50°N</p> <p>9</p>	<p> Set 7:09 7:47 Rise 16:47 16:09 Full Moon 9:36 Sunrise 7:11 7:47 Sunset 16:35 15:58</p> <p>40°N 50°N</p> <p>10</p>
<p>Mercury at inferior conjunction</p> <p> Set 7:58 8:35 Rise 17:43 17:07</p> <p>40°N 50°N</p> <p>11</p>	<p> Set 8:43 9:16 Rise 18:44 18:12</p> <p>40°N 50°N</p> <p>12</p>	<p> Set 9:22 9:49 Rise 19:47 19:22</p> <p>40°N 50°N</p> <p>13</p>	<p> Set 9:57 10:18 Rise 20:53 20:35</p> <p>40°N 50°N</p> <p>14</p>	<p> Set 10:30 10:43 Rise 21:59 21:49</p> <p>40°N 50°N</p> <p>15</p>	<p> Set 11:00 11:06 Rise 23:06 23:04</p> <p>40°N 50°N</p> <p>16</p>	<p> Set -- -- Rise -- -- Last Quarter 19:48 Sunrise 7:16 7:53 Sunset 16:36 15:59</p> <p>40°N 50°N</p> <p>17</p>
<p> Rise 0:14 0:20 Set 12:00 11:51</p> <p>40°N 50°N</p> <p>18</p>	<p> Rise 1:24 1:39 Set 12:34 12:16</p> <p>40°N 50°N</p> <p>19</p>	<p> Rise 2:36 2:59 Set 13:11 12:46</p> <p>40°N 50°N</p> <p>20</p>	<p> Rise 3:48 4:19 Set 13:55 13:23</p> <p>40°N 50°N</p> <p>21</p>	<p> Rise 4:59 5:36 Set 14:46 14:09</p> <p>40°N 50°N</p> <p>22</p>	<p> Rise 6:06 6:45 Set 15:45 15:06</p> <p>40°N 50°N</p> <p>23</p>	<p> Rise 7:06 7:43 Set 16:50 16:13 New Moon 13:06 Sunrise 7:20 7:57 Sunset 16:39 16:02</p> <p>40°N 50°N</p> <p>24</p>
<p> Rise 7:56 8:29 Set 17:58 17:27</p> <p>40°N 50°N</p> <p>25</p>	<p> Rise 8:39 9:05 Set 19:06 18:42</p> <p>40°N 50°N</p> <p>26</p>	<p> Rise 9:14 9:34 Set 20:12 19:55</p> <p>40°N 50°N</p> <p>27</p>	<p> Rise 9:45 9:58 Set 21:16 21:06</p> <p>40°N 50°N</p> <p>28</p>	<p> Rise 10:13 10:19 Set 22:17 22:15</p> <p>40°N 50°N</p> <p>29</p>	<p> Rise 10:40 10:38 Set 23:16 23:21</p> <p>40°N 50°N</p> <p>30</p>	<p> Rise 11:06 10:57 Set -- --</p> <p>40°N 50°N</p> <p>31</p> <p>Sunrise 7:22 7:59 Sunset 16:44 16:07</p>
<p>Christmas Day</p>	<p>Boxing Day (Canada)</p> <p>Jupiter stationary</p>	<p>Two shadows on Jupiter visible in N. America</p> <p>10:51 pm</p>	<p>Geminid meteors (ZHR=120) 1 pm</p>	<p>Grote Reber, a father of radio astronomy, born 100 years ago</p> <p>1st photographic asteroid discovery, 323 Brucia, by Wolf 120 years ago</p> <p>Winter Solstice 12:30 am</p> <p>Moon occults delta Scorpii W of line San Fran-N Saskatchewan after 15 UT</p> <p>Ursid meteors (ZHR=10) 9 pm</p> <p>Mercury at greatest elongation W (22°)</p>	<p>Venus 1.0° below globular cl. M22 at dusk</p> <p>Venus 1.0° left of globular cl. M22 at dusk</p> <p>Lunar Straight Wall visible in all of N. America 6 pm</p> <p>Total Lunar Eclipse visible in N. America except E 7 am</p> <p>This full Moon is the Long Night's Moon</p> <p>7.2 mag star occulted by 1404 Ajax from SW BC to N Alberta</p> <p>www.asteroidoccultation.com 10 pm</p> <p>Jean-Louis Pons, discoverer of 37 comets, born 250 years ago</p> <p>22 Kalliope at opposition (m=10.0)</p>	

The Royal Astronomical Society of Canada Observer's Calendar

How to Use this Calendar

A graphical representation of the Moon's appearance in the late evening is given in each daily box. In addition to the varying phase, the depicted size of the Moon varies, reflecting the change in the apparent size of the Moon in the sky as it moves closer to or farther from Earth. The depicted face of the Moon also changes slightly to reflect lunar libration, the rocking motion of the Moon, which means that over time approximately 59% of the lunar surface can be seen from Earth. A small dot of size proportional to the amount of libration appears near the lunar limb that is librated. These daily lunar graphics were prepared using images provided by Roger Fell.

Daily Moon and weekly Sun rise and set times, and the times of Moon phases, are shown in the top portion of the boxes. If no Moon rise or set time is given, this event occurs the next day.

A summary of the naked-eye visibility and position of the planets is given each month. Descriptions are for approximate latitude 45° and unless otherwise stated apply to midmonth; rise and set times at the beginning or end of the month may vary by an hour or more from those given. Times and compass directions may also differ somewhat from the given ones at other latitudes.

Special astronomical events are given at the bottom of the daily boxes. Events observable in some part of Canada or the continental United States are listed. Days on which particularly interesting phenomena or events occur are highlighted with light-green shading. Detailed information on all events, including their visibility from particular locations, may be determined by consulting the Observer's Handbook, which is published annually by the RASC.

Adjustments for Actual Location

When it is in effect, times are adjusted for Daylight Saving Time. Moon phases and special events are given in Eastern time. The user's local time for events other than Moon and Sun rise and set may be determined by converting the given time to the user's time zone (e.g. Pacific time is Eastern time minus 3 hours). For occultations, a further adjustment of an hour or more may be needed for any particular geographical location because of parallax effects. Parallax also means that actual angular separations for events involving the Moon may vary by close to 1° from those given. Also, the Moon's rapid movement of approximately 0.5° per hour means that separations may be considerably larger at a time that is even a few hours away from the given time.

Two sets of rise and set times are given to accommodate North American observers in midnorthern latitudes. Times are displayed for locations 40°N latitude and 75°W longitude and for 50°N, 75°W. The actual times for a given location must be calculated using the tables at the right.

The tables give (longitude) corrections in minutes to the tabulated rise and set times for selected Canadian and U.S. cities. In the column labeled **Correction**, an entry such as 50°N + 25 means add 25 minutes to the displayed 50°N time. This computed time is an approximation. In the column labeled **Accuracy**, the approximate maximum error in minutes for Moon rise and set using this method is indicated. The error for Sun rise and set is less. These errors can be substantially reduced by interpolating according to latitude, as explained in the following section.

Note that the rise and set times calculated using the above method will be local times. It is not necessary to adjust them for time zone.

Canadian Locations

City	Correction	Accuracy	Latitude
Calgary	50°N + 36	15	51
Charlottetown	40°N + 12	20	46
Edmonton	50°N + 34	25	54
Halifax	40°N + 14	25	45
Hamilton	40°N + 20	15	43
Kingston	40°N + 6	20	44
Kitchener	40°N + 22	15	43
London	40°N + 25	15	43
Moncton	40°N + 19	20	46
Montreal	50°N - 6	20	46
Niagara	40°N + 16	15	43
Kelowna	50°N - 3	10	50
Ottawa	50°N + 3	20	45
Prince George	50°N + 11	25	54
Quebec	50°N - 15	15	47
Regina	50°N + 58 ⁽¹⁾	10	50
St. John's	50°N + 1	20	48
Sarnia	40°N + 30	15	43
Saskatoon	50°N + 67 ⁽¹⁾	15	52
Thunder Bay	50°N + 57	10	48
Toronto	40°N + 18	20	44
Vancouver	50°N + 12	15	49
Victoria	50°N + 13	20	49
Windsor	40°N + 32	15	42
Winnipeg	50°N + 29	5	50

U.S. Locations

City	Correction	Accuracy	Latitude
Atlanta	40°N + 37	30	34
Boston	40°N - 16	10	42
Chicago	40°N - 10	15	42
Cincinnati	40°N + 38	10	39
Denver	40°N + 0	10	40
Flagstaff	40°N + 27 ⁽¹⁾	30	35
Kansas City	40°N + 18	10	39
Los Angeles	40°N - 7	35	34
Minneapolis	40°N + 13	25	45
New York	40°N - 4	5	41
San Francisco	40°N + 10	20	38
Seattle	50°N + 9	20	48
Tucson	40°N + 24 ⁽¹⁾	40	32
Washington	40°N + 8	5	39

⁽¹⁾ Subtract 60 minutes in the summer.

Other Locations, and Improving Accuracy

For locations not listed in the tables to the left, the user should calculate a correction factor. This amount is +4 minutes for each degree that the user's location is west of the central meridian of the user's time zone or -4 minutes for each degree that it is east. This correction factor should be added to the displayed 50°N or 40°N time for the location whose latitude is nearest that of the user's site. The accuracy in minutes for Moon rise and set can be calculated by multiplying the difference between the user's latitude and 50°N/40°N respectively by 4.5, and then adding 0.2 times the difference between the user's longitude and 75°W.

Improvement in accuracy may be obtained for many sites by interpolating or extrapolating the 50°N and 40°N times depending on the user's latitude. For example, the latitude of Ottawa is approximately midway between 50°N and 40°N. An observer in Ottawa can improve accuracy to better than 5 minutes by averaging the given 50°N and 40°N times and then adding the correction factor for Ottawa, which is 3 minutes. Western observers may gain additional accuracy by adding about 10% of the difference between the listed time and the next day's time.

The Royal Astronomical Society of Canada

Since it was founded in 1890, the RASC has filled a special role in both amateur and professional astronomy. Today, it has over 4000 members worldwide who share a passion for the night sky and make contributions to astronomy in many ways.

The RASC has a long tradition of high-quality, volunteer-produced publications. The Observer's Handbook has been published since 1907 and is recognized worldwide as the leading handbook of its type. The Journal, also published since 1907, contains articles of interest to amateur astronomers. The Beginner's Observing Guide is an introduction to the night sky for the novice observer, the Observer's Calendar is a forum for astrophotography by amateur astronomers, and Skyways (available in French as "Explorons l'Astronomie") is a astronomy teacher's guide.

For information on joining the Society, or to order an RASC publication, visit www.rasc.ca or contact the national office at:

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 Canada
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 Email: nationaloffice@rasc.ca

The Photos and the Calendar

Details on the photos are given below and to the right. Monthly grids were mostly generated using custom software written in the Fortran and PostScript programming languages and kindly provided to the editor by **Dr. Rajiv Gupta**. Some minor modifications to this software were made by the editor. Additional software written by both editors was also used.

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Cover/August (Celestial Harbour): A colour composite image made from 6.5 hours of total exposure time through an Astrodon luminance and RGB filters on an Apogee U16 CCD camera using an RCOS 16-inch f/8.9 telescope; processed with CCDAP, MaxIm DL, and Photoshop CS3 software; taken on 2009 September 15 from the Sierra Remote Observatories, California (Paul Mortfield and Stefano Cancelli).



January (Fires of Creation): A false-colour composite image made from a total exposure time of 12.9 hours in Astrodon H-alpha, SII, and OIII filters on an SBIG ST-10XME CCD camera using a Takahashi FS-152 f/8 telescope; processed with MaxIm DL, FITS Liberator, ImagesPlus, and Photoshop CS3; taken on 2008 December 10 and 2009 January 25 from Orangeville, Ontario (Serge Theberge).

February (Ultraviolet Sculpture): A composite image made from a two-panel mosaic (7.5 hours) in an H-alpha filter on an SBIG ST-10XME CCD camera using a Takahashi FS-102 f/6 telescope and a two-panel mosaic in RGB (5.4 hours each) filters on an QHY-8 CCD camera using a AstroTech 8-inch RC telescope from within the Golden Horseshoe area of Ontario (Kerry-Ann Lecky Hepburn and Stefano Cancelli).

March (Gravity's Apron String): A composite image made from one 5-minute exposure on a modified Cold Canon EOS 40D DSLR camera using a Borg 101-mm telescope at f/4 combined with a 10-minute exposure using a Takahashi 180ED f2.8 telescope; processed with MaxIm DL, ImagesPlus, and Photoshop CS3; taken on 2010 February 4 from Gisborne, New Zealand (Jack Newton).

April (The Stuff of Southern-Sky Dreams): A composite image made from a stack of 5 x 3-minute exposures at ISO 800 and 2 x 3-minute exposures (with Kenko Softon filter) on a modified Canon 5D MkII DSLR camera using a Canon L-Series 135-mm lens set at f/2.8; taken on 2010 March 18 from the Atacama Lodge, Chile (Alan Dyer).

May (Luminous Pinwheel): A composite image made from a total exposure time of about 15 hours in Astrodon luminance and RGB filters on an SBIG ST-10XME CCD camera using a Takahashi FS-152 f/8 telescope; processed with MaxIm DL, FITS Liberator, ImagesPlus, and Photoshop CS3; taken on 2009 March 20, 23, and 24 from Orangeville, Ontario (Serge Theberge).

June (Sapphires and Diamond Dust): A composite image made from 1.9 hours of total exposure time through Astrodon LRGB filters on an Apogee U16M CCD camera using a Ceravolo 300 Astrograph working at f/4.9; processed with MaxIm DL, Registar, and Photoshop CS2 software; taken in August 2009 from the Atacama Desert, Chile (Debra and Peter Ceravolo).

July (Delicate Filigree of Dust and Stars): A composite image made from a stack of 5 x 4-minute exposures at ISO 800 on a filter-modified Canon 5D MkII DSLR camera using a Canon L-Series 135-mm lens set at f/2.8; taken on 2010 March 18 from the Atacama Lodge, Chile (Alan Dyer).

September (Shadow Play): A composite image made with a Canon EOS 40D DSLR camera using a Takahashi Sky 90 II f/5.6 telescope; partial-eclipse exposures were 1/1500 second at ISO 320; total-eclipse exposure was 2 seconds at ISO 200; processed with ImagesPlus and Photoshop CS2 software; taken on 2008 February 20/21 from the Niagara Centre Observatory in Wellandport, Ontario (Leslie Marczy).

October (Twisted into Shape): A composite image made from 10.5 hours of total exposure time through Astrodon LRGB, H-alpha, and OIII filters on an Apogee U16M CCD camera using a Ceravolo 300 Astrograph working at f/4.9; processed with MaxIm DL, Registar, and Photoshop CS2 software; taken in August 2009 from the Atacama Desert, Chile (Debra and Peter Ceravolo).

November (Radiant and Shiny): A composite image made from 179 20-second exposures on a Canon 20Da DSLR camera using a Canon 15-mm f2.8 lens; processed with ImageJ and Photoshop CS3 software; taken between 3 a.m. and 4 a.m. on 2009 August 12 from Mantario Lake, Whiteshell Provincial Park, Manitoba (Jennifer West).

December (Bursting with Stars): A composite image made from 9 hours of total exposure time through an Astrodon luminance and RGB filters on an Apogee U16 CCD camera using an RCOS 16-inch f/8.9 telescope; processed with CCDAP, CCDStack, MaxIm DL, and Photoshop CS3 software; taken on 2008 October 8 from the Sierra Remote Observatories, California (Stefano Cancelli and Paul Mortfield).

2011

January	February	March
S M T W T F S	S M T W T F S	S M T W T F S
2 3 4 5 6 7 8	1 2 3 4 5	1 2 3 4 5
9 10 11 12 13 14 15	6 7 8 9 10 11 12	6 7 8 9 10 11 12
16 17 18 19 20 21 22	13 14 15 16 17 18 19	13 14 15 16 17 18 19
23 24 25 26 27 28 29	20 21 22 23 24 25 26	20 21 22 23 24 25 26
30 31	27 28	27 28 29 30 31
April	May	June
S M T W T F S	S M T W T F S	S M T W T F S
3 4 5 6 7 8 9	1 2 3 4 5 6 7	1 2 3 4
10 11 12 13 14 15 16	8 9 10 11 12 13 14	5 6 7 8 9 10 11
17 18 19 20 21 22 23	15 16 17 18 19 20 21	12 13 14 15 16 17 18
24 25 26 27 28 29 30	22 23 24 25 26 27 28	19 20 21 22 23 24 25
	29 30 31	26 27 28 29 30
July	August	September
S M T W T F S	S M T W T F S	S M T W T F S
3 4 5 6 7 8 9	1 2 3 4 5 6 7	1 2 3
10 11 12 13 14 15 16	7 8 9 10 11 12 13	4 5 6 7 8 9 10
17 18 19 20 21 22 23	14 15 16 17 18 19 20	11 12 13 14 15 16 17
24 25 26 27 28 29 30	21 22 23 24 25 26 27	18 19 20 21 22 23 24
31	28 29 30 31	25 26 27 28 29 30
October	November	December
S M T W T F S	S M T W T F S	S M T W T F S
2 3 4 5 6 7 8	1 2 3 4 5	1 2 3
9 10 11 12 13 14 15	6 7 8 9 10 11 12	4 5 6 7 8 9 10
16 17 18 19 20 21 22	13 14 15 16 17 18 19	11 12 13 14 15 16 17
23 24 25 26 27 28 29	20 21 22 23 24 25 26	18 19 20 21 22 23 24
30 31	27 28 29 30	25 26 27 28 29 30 31

2012

January	February	March
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4	1 2 3
8 9 10 11 12 13 14	5 6 7 8 9 10 11	4 5 6 7 8 9 10
15 16 17 18 19 20 21	12 13 14 15 16 17 18	11 12 13 14 15 16 17
22 23 24 25 26 27 28	19 20 21 22 23 24 25	18 19 20 21 22 23 24
29 30 31	26 27 28 29	25 26 27 28 29 30 31
April	May	June
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4 5	1 2
8 9 10 11 12 13 14	6 7 8 9 10 11 12	3 4 5 6 7 8 9
15 16 17 18 19 20 21	13 14 15 16 17 18 19	10 11 12 13 14 15 16
22 23 24 25 26 27 28	20 21 22 23 24 25 26	17 18 19 20 21 22 23
29 30	27 28 29 30 31	24 25 26 27 28 29 30
July	August	September
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4	1
8 9 10 11 12 13 14	5 6 7 8 9 10 11	2 3 4 5 6 7 8
15 16 17 18 19 20 21	12 13 14 15 16 17 18	9 10 11 12 13 14 15
22 23 24 25 26 27 28	19 20 21 22 23 24 25	16 17 18 19 20 21 22
29 30 31	26 27 28 29 30 31	23 24 25 26 27 28 29 30
October	November	December
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6	1 2 3	1
7 8 9 10 11 12 13	4 5 6 7 8 9 10	2 3 4 5 6 7 8
14 15 16 17 18 19 20	11 12 13 14 15 16 17	9 10 11 12 13 14 15
21 22 23 24 25 26 27	18 19 20 21 22 23 24	16 17 18 19 20 21 22
28 29 30 31	25 26 27 28 29 30	23 24 25 26 27 28 29 30 31

New Moon dates are displayed in **bold**.



All photos in this unique Calendar were taken by members of the Royal Astronomical Society of Canada (RASC) who are amateur astronomers. It was produced by volunteer members of the Royal Astronomical Society of Canada.

This Calendar includes comprehensive listings of astronomical data such as lunar and planetary conjunctions, Sun and Moon rise and set times, eclipses, meteor showers, and Moon phases.

er of o	3 Juno at opposition (m=8.8) Lunar Straight Wall visible in all of N. America		11 pm	10 pm
N 09 13	18	 Set 40°N 50°N 6:35 6:32 Rise 19:31 19:39 Full Moon 14:10 Sunrise 7:06 7:06 Sunset 19:11 19:11	19	
<i>Largest full Moon of 2011 Today's full Moon is the Worm Moon</i>				

Edited by
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ISBN 978-0-9813292-4-6



\$16.95 Can. / U.S.