



THE ROYAL ASTRONOMICAL SOCIETY OF CANADA
OBSERVER'S CALENDAR
































2008



JANUARY

Beautiful Blue

M78 is a bright reflection nebula that is part of the much larger Orion complex. As the brightest portion of a huge dust cloud, it doesn't "glow" like emission nebulae, but instead reflects and scatters blue wavelengths of light from nearby massive and hot young stars. This ghostly cloud is about 1600 light years away and almost 4 light years across.
Photo by Stuart Heggie

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
<p>The planets this month</p> <p><i>Mercury: very low in WSW in evening twilight, except early in month</i></p> <p><i>Venus: very low in SE in morning twilight</i></p> <p><i>Mars: in E after dark, sets in NW before dawn</i></p> <p><i>Jupiter: very low in SE in morning twilight, late in month</i></p> <p><i>Saturn: rises in ENE in mid-evening, in WSW in morning twilight</i></p>		 <p>Rise 40°N 50°N 1:08 1:27 Set 11:58 11:36</p> <p>1</p> <p><i>New Year's Day</i></p>	 <p>Rise 40°N 50°N 2:10 2:36 Set 12:22 11:53</p> <p>2</p> <p><i>Earth at perihelion (147,099,100 km) 7 pm</i></p>	 <p>Rise 40°N 50°N 3:11 3:47 Set 12:51 12:13</p> <p>3</p>	 <p>Rise 40°N 50°N 4:13 4:57 Set 13:25 12:40</p> <p>4</p> <p><i>Quadrantid meteors (ZHR=120) 2 am</i></p>	 <p>Rise 40°N 50°N 5:14 6:04 Set 14:07 13:16</p> <p>5</p> <p>Sunrise 7:22 7:58 Sunset 16:49 16:13</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
 <p>Rise 40°N 50°N 6:11 7:04 Set 14:57 14:04</p> <p>6</p>	 <p>Rise 40°N 50°N 7:02 7:53 Set 15:56 15:05</p> <p>7</p>	 <p>Rise 40°N 50°N 7:46 8:31 Set 17:00 16:16</p> <p>8</p> <p><i>New Moon 6:37</i></p> <p><i>John Dollard presented achromatic lens to Royal Society, 250 years ago</i></p>	 <p>Rise 40°N 50°N 8:23 9:00 Set 18:07 17:33</p> <p>9</p>	 <p>Rise 40°N 50°N 8:54 9:21 Set 19:16 18:51</p> <p>10</p> <p><i>Islamic New Year</i></p> <p><i>Eunomia at opposition (m=8.1)</i></p>	 <p>Rise 40°N 50°N 9:20 9:39 Set 20:24 20:09</p> <p>11</p>	 <p>Rise 40°N 50°N 9:44 9:54 Set 21:32 21:27</p> <p>12</p> <p>Sunrise 7:21 7:55 Sunset 16:55 16:22</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
 <p>Rise 40°N 50°N 10:08 10:08 Set 22:41 22:46</p> <p>13</p>	 <p>Rise 40°N 50°N 10:31 10:22 Set 23:51 --</p> <p>14</p>	 <p>Set 40°N 50°N -- 0:07 Rise 10:57 10:38</p> <p>15</p> <p><i>First Quarter 14:46</i></p>	 <p>Set 40°N 50°N 1:04 1:30 Rise 11:26 10:57</p> <p>16</p>	 <p>Set 40°N 50°N 2:20 2:57 Rise 12:03 11:23</p> <p>17</p>	 <p>Set 40°N 50°N 3:37 4:23 Rise 12:48 12:00</p> <p>18</p> <p><i>Moon 0.8° N of the Pleiades best in NW of N. America 2 am</i></p>	 <p>Set 40°N 50°N 4:50 5:42 Rise 13:45 12:52</p> <p>19</p> <p>Sunrise 7:18 7:50 Sunset 17:03 16:32</p> <p><i>Moon 0.7° N of Mars best in NE of N. America 6 pm</i></p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
 <p>Set 40°N 50°N 5:55 6:47 Rise 14:52 14:01</p> <p>20</p>	 <p>Set 40°N 50°N 6:48 7:34 Rise 16:06 15:22</p> <p>21</p> <p><i>Martin Luther King Jr. Day (USA)</i></p>	 <p>Set 40°N 50°N 7:30 8:07 Rise 17:22 16:48</p> <p>22</p> <p><i>Full Moon 8:35</i></p> <p><i>Mercury at greatest elongation E (19°)</i> <i>Neptune 0.3° to left of Mercury visible telescopically soon after sunset</i></p>	 <p>Set 40°N 50°N 8:04 8:31 Rise 18:35 18:11</p> <p>23</p>	 <p>Set 40°N 50°N 8:31 8:48 Rise 19:44 19:31</p> <p>24</p> <p><i>Crash of Kosmos 954 near Yellowstone was reported, 30 years ago</i></p> <p><i>Venus near M20 and M21 visible before sunrise, best in S of N. America</i></p>	 <p>Set 40°N 50°N 8:55 9:03 Rise 20:50 20:46</p> <p>25</p>	 <p>Set 40°N 50°N 9:17 9:16 Rise 21:53 21:59</p> <p>26</p> <p>Sunrise 7:14 7:42 Sunset 17:11 16:43</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
 <p>Set 40°N 50°N 9:38 9:28 Rise 22:55 23:10</p> <p>27</p>	 <p>Set 40°N 50°N 9:59 9:42 Rise 23:57 --</p> <p>28</p>	 <p>Rise 40°N 50°N -- 0:20 Set 10:23 9:57</p> <p>29</p>	 <p>Rise 40°N 50°N 0:59 1:31 Set 10:50 10:15</p> <p>30</p> <p><i>Last Quarter 0:03</i></p> <p><i>Andrew Common took first photograph of a nebula, M42, 125 years ago</i></p>	 <p>Rise 40°N 50°N 2:01 2:42 Set 11:22 10:39</p> <p>31</p> <p><i>Explorer 1 is first American satellite launched into orbit, 50 years ago</i></p> <p><i>Venus and Jupiter near M22 visible before sunrise, best in S of N. America</i></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. 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> <table border="1"> <tr> <td>DECEMBER</td> <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></td> <td></td> <td>1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>4</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>5</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>6</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>7</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> 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FEBRUARY

The Sun on Ice

Tiny hexagonal ice crystals in the atmosphere refract the Sun's rays, producing this spectacular halo on a cold winter day. The Sun is flanked by two brilliant parhelia (sun dogs), that are integral to the 22° halo arching over the Sun. A bright crescent on the halo directly above the Sun is Parry's arc, and passing horizontally through the Sun and both parhelia, is the parhelic arc.

Photo by Stuart Heggie

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p><i>Mercury: very low in ESE in morning twilight in second half of month</i></p> <p><i>Venus: very low in SE in morning twilight</i></p> <p><i>Mars: high in SE after dark, sets in NW near 4 am</i></p> <p><i>Jupiter: very low in SE in morning twilight</i></p> <p><i>Saturn: rises in ENE in evening twilight, low in W at dawn</i></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. 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>JANUARY S M T W T F S</p> <p>1 2 3 4 5</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 31</p> <p>MARCH 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 3:02 3:51</p> <p>Set 12:01 11:11</p> <p>1</p> <p>Venus 0.6° N of Jupiter visible before sunrise, best in S of N. America</p> <p>Cr. Moon near Antares and M4 visible in morning sky</p>	<p>40°N 50°N</p> <p>Rise 4:01 4:54</p> <p>Set 12:47 11:54</p> <p>2</p> <p>Sunrise 7:08 7:33</p> <p>Sunset 17:20 16:55</p>
<p>40°N 50°N</p> <p>Rise 4:54 5:47</p> <p>Set 13:42 12:50</p> <p>3</p>	<p>40°N 50°N</p> <p>Rise 5:41 6:30</p> <p>Set 14:45 13:58</p> <p>4</p> <p>Winter Star Party, Florida Keys</p> <p>www.scas.org/wsp.htm (through Feb. 10)</p>	<p>40°N 50°N</p> <p>Rise 6:21 7:01</p> <p>Set 15:52 15:13</p> <p>5</p>	<p>40°N 50°N</p> <p>Rise 6:54 7:26</p> <p>Set 17:02 16:33</p> <p>New Moon 22:44</p> <p>6</p> <p>Hebe at opposition (m=8.8)</p> <p>Annular Solar Eclipse visible in parts of Antarctica</p>	<p>40°N 50°N</p> <p>Rise 7:23 7:45</p> <p>Set 18:11 17:53</p> <p>7</p> <p>Chinese New Year</p>	<p>40°N 50°N</p> <p>Rise 7:48 8:01</p> <p>Set 19:21 19:13</p> <p>8</p>	<p>40°N 50°N</p> <p>Rise 8:12 8:15</p> <p>Set 20:31 20:33</p> <p>9</p> <p>Sunrise 7:01 7:22</p> <p>Sunset 17:28 17:07</p>
<p>40°N 50°N</p> <p>Rise 8:36 8:29</p> <p>Set 21:42 21:54</p> <p>10</p>	<p>40°N 50°N</p> <p>Rise 9:01 8:45</p> <p>Set 22:55 23:18</p> <p>11</p>	<p>40°N 50°N</p> <p>Rise 9:29 9:03</p> <p>Set -- --</p> <p>12</p>	<p>40°N 50°N</p> <p>Set 0:10 0:44</p> <p>Rise 10:03 9:27</p> <p>First Quarter 22:33</p> <p>13</p>	<p>40°N 50°N</p> <p>Set 1:26 2:10</p> <p>Rise 10:44 9:59</p> <p>14</p> <p>Valentine's Day</p>	<p>40°N 50°N</p> <p>Set 2:39 3:30</p> <p>Rise 11:36 10:44</p> <p>15</p>	<p>40°N 50°N</p> <p>Set 3:45 4:38</p> <p>Rise 12:38 11:45</p> <p>16</p> <p>Sunrise 6:52 7:10</p> <p>Sunset 17:36 17:19</p> <p>Gerard Kuiper discovered Miranda, 5th satellite of Uranus, 60 years ago</p> <p>Moon 1.0° N of Mars</p> <p>best in W of N. America 4 am</p>
<p>40°N 50°N</p> <p>Set 4:41 5:30</p> <p>Rise 13:48 13:00</p> <p>17</p>	<p>40°N 50°N</p> <p>Set 5:26 6:07</p> <p>Rise 15:01 14:23</p> <p>18</p> <p>Presidents' Day (USA)</p>	<p>40°N 50°N</p> <p>Set 6:02 6:33</p> <p>Rise 16:14 15:46</p> <p>19</p>	<p>40°N 50°N</p> <p>Set 6:31 6:53</p> <p>Rise 17:24 17:06</p> <p>Full Moon 22:30</p> <p>20</p> <p>Total Lunar Eclipse visible in all of N. America, best in E</p>	<p>40°N 50°N</p> <p>Set 6:56 7:08</p> <p>Rise 18:32 18:24</p> <p>21</p>	<p>40°N 50°N</p> <p>Set 7:19 7:22</p> <p>Rise 19:36 19:38</p> <p>22</p>	<p>40°N 50°N</p> <p>Set 7:40 7:35</p> <p>Rise 20:40 20:50</p> <p>23</p> <p>Sunrise 6:43 6:56</p> <p>Sunset 17:45 17:31</p> <p>Zodiacal Light readily visible in W after evening twilight for next two weeks</p>
<p>40°N 50°N</p> <p>Set 8:02 7:48</p> <p>Rise 21:42 22:02</p> <p>24</p> <p>Saturn at opposition (m=0.2)</p>	<p>40°N 50°N</p> <p>Set 8:25 8:02</p> <p>Rise 22:45 23:13</p> <p>25</p>	<p>40°N 50°N</p> <p>Set 8:50 8:19</p> <p>Rise 23:47 --</p> <p>26</p> <p>Mercury 1.2° N of Venus visible in morning twilight, best in S of N. America</p>	<p>40°N 50°N</p> <p>Set -- 0:25</p> <p>Rise 9:20 8:40</p> <p>27</p>	<p>40°N 50°N</p> <p>Rise 0:49 1:35</p> <p>Set 9:56 9:08</p> <p>Last Quarter 21:18</p> <p>28</p>	<p>40°N 50°N</p> <p>Rise 1:49 2:40</p> <p>Set 10:39 9:46</p> <p>29</p>	


































MARCH

Backbone of the Sky

The glories of the southern Milky Way draw the eye along a grand sweep of glittering stars, obscuring dust, and glowing clouds of interstellar gas. Almost unnoticed under the grandeur of our home galaxy are the two small satellite galaxies, the Large and Small Magellanic Clouds, playing hide-and-seek among the foreground trees.

Photo by Alan Dyer































SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p><i>Mercury:</i> very low in ESE in morning twilight in first week of month</p> <p><i>Venus:</i> very low in ESE in morning twilight, early in month</p> <p><i>Mars:</i> high in SW after dark, sets in NW by 4 am</p> <p><i>Jupiter:</i> rises in ESE about 3 hours before sunrise, very low in SE at dawn</p> <p><i>Saturn:</i> in ESE after dark, very low in W at 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. 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>FEBRUARY S M T W T F S</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</p> <p>APRIL 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> ^{40°N 50°N} Rise 2:44 3:38 Set 11:30 10:36</p> <p>Sunrise 6:33 6:42 Sunset 17:52 17:43</p> <p>1</p>
<p> ^{40°N 50°N} Rise 3:33 4:24 Set 12:28 11:38</p> <p>2</p>	<p> ^{40°N 50°N} Rise 4:16 5:00 Set 13:33 12:50</p> <p>3</p>	<p> ^{40°N 50°N} Rise 4:51 5:27 Set 14:41 14:08</p> <p>4</p>	<p> ^{40°N 50°N} Rise 5:22 5:49 Set 15:51 15:28</p> <p>5</p>	<p> ^{40°N 50°N} Rise 5:49 6:06 Set 17:02 16:49</p> <p>6</p>	<p> ^{40°N 50°N} Rise 6:14 6:21 Set 18:13 18:11 New Moon 12:14</p> <p>7</p>	<p> ^{40°N 50°N} Rise 6:38 6:36 Set 19:26 19:34</p> <p>Sunrise 6:22 6:28 Sunset 18:00 17:55</p> <p>8</p>
	<p>Mercury at greatest elongation W (27°)</p>		<p>Cr. Moon near Venus and Mercury visible in morning twilight, best in W of N. America</p>	<p>Neptune 0.6° to left of Venus visible in morning twilight</p>	<p>L. Kohoutek discovered most over-advertised comet in history, 35 years ago</p>	
<p> ^{40°N 50°N} Rise 8:03 7:51 Set 21:40 21:59</p> <p>9</p>	<p> ^{40°N 50°N} Rise 8:31 8:09 Set 22:57 23:27</p> <p>10</p>	<p> ^{40°N 50°N} Rise 9:04 8:31 Set -- --</p> <p>11</p>	<p> ^{40°N 50°N} Set 0:14 0:55 Rise 9:44 9:01</p> <p>12</p>	<p> ^{40°N 50°N} Set 1:30 2:19 Rise 10:32 9:42</p> <p>13</p>	<p> ^{40°N 50°N} Set 2:39 3:32 Rise 11:31 10:38 First Quarter 6:46</p> <p>14</p>	<p> ^{40°N 50°N} Set 3:38 4:28 Rise 12:38 11:49</p> <p>Sunrise 7:11 7:13 Sunset 19:07 19:06</p> <p>15</p>
<p>Daylight Saving Time begins 2 am</p>	<p>Mars 1.7° N of M35</p>				<p>Moon 1.2° N of Mars 11 pm</p>	
<p> ^{40°N 50°N} Set 4:25 5:09 Rise 13:50 13:08</p> <p>16</p>	<p> ^{40°N 50°N} Set 5:03 5:37 Rise 15:01 14:30</p> <p>17</p>	<p> ^{40°N 50°N} Set 5:34 5:59 Rise 16:11 15:49</p> <p>18</p>	<p> ^{40°N 50°N} Set 6:00 6:15 Rise 17:18 17:06</p> <p>19</p>	<p> ^{40°N 50°N} Set 6:22 6:29 Rise 18:23 18:20</p> <p>20</p>	<p> ^{40°N 50°N} Set 6:44 6:42 Rise 19:26 19:33 Full Moon 14:40</p> <p>21</p>	<p> ^{40°N 50°N} Set 7:05 6:55 Rise 20:28 20:44</p> <p>Sunrise 7:00 6:57 Sunset 19:15 19:17</p> <p>22</p>
			<p>Moon 1.1° SW of Regulus best in W of N. America 3 am</p>	<p>Spring Equinox 1:49 am</p>	<p>Good Friday</p>	
<p> ^{40°N 50°N} Set 7:27 7:08 Rise 21:31 21:56</p> <p>23</p>	<p> ^{40°N 50°N} Set 7:52 7:24 Rise 22:34 23:08</p> <p>24</p>	<p> ^{40°N 50°N} Set 8:20 7:44 Rise 23:36 --</p> <p>25</p>	<p> ^{40°N 50°N} Rise -- 0:19 Set 8:53 8:09</p> <p>26</p>	<p> ^{40°N 50°N} Rise 0:37 1:26 Set 9:33 8:43</p> <p>27</p>	<p> ^{40°N 50°N} Rise 1:34 2:27 Set 10:21 9:28</p> <p>28</p>	<p> ^{40°N 50°N} Rise 2:25 3:17 Set 11:15 10:24 Last Quarter 17:47 Sunrise 6:48 6:42 Sunset 19:22 19:28</p> <p>29</p>
<p>Easter Sunday</p> <p>Mercury 1.0° S of Venus visible with difficulty in morning twilight only in S of N. America</p>	<p>Zodiacal Light readily visible in W after evening twilight for next two weeks</p>			<p>Moon 1.1° S of Antares best in W of N. America 5 am</p>		
<p> ^{40°N 50°N} Rise 3:10 3:57 Set 12:17 11:31</p> <p>30</p>	<p> ^{40°N 50°N} Rise 3:47 4:27 Set 13:22 12:44</p> <p>31</p>					



APRIL

Ghostly Glow in the Night

Three galaxies (M65, M66, and NGC 3628) glow in the lonely, black depths of space. Known as the Leo Triplet, these huge collections of billions of stars lie relatively nearby at a distance of about 35 to 39 million light-years. The light collected to make this image left its source at least 35 million years ago, so we are seeing the galaxies as they were in the past.
Photo by Stuart Heggie

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p>Mercury: very low in WNW in evening twilight in last few days of month</p> <p>Venus: not easily observed</p> <p>Mars: high in WSW after dark, sets in NW near 2:30 am</p> <p>Jupiter: rises in ESE near 2:30 am, low in SE at dawn</p> <p>Saturn: high in S after dark, sets in WNW about 2 hours before sunrise</p>		 <p>40°N 50°N Rise 4:20 4:50 Set 14:30 14:02</p> <p>1</p>	 <p>40°N 50°N Rise 4:48 5:09 Set 15:39 15:21</p> <p>2</p>	 <p>40°N 50°N Rise 5:13 5:25 Set 16:50 16:42</p> <p>3</p>	 <p>40°N 50°N Rise 5:38 5:40 Set 18:02 18:04</p> <p>4</p>	 <p>40°N 50°N Rise 6:03 5:56 Set 19:16 19:30 New Moon 23:55 Sunrise 6:37 6:27 Sunset 19:29 19:39</p> <p>5</p>
 <p>40°N 50°N Rise 6:30 6:13 Set 20:34 20:58</p> <p>6</p>	 <p>40°N 50°N Rise 7:01 6:33 Set 21:53 22:30</p> <p>7</p>	 <p>40°N 50°N Rise 7:39 7:01 Set 23:13 23:59</p> <p>8</p>	 <p>40°N 50°N Rise 8:26 7:39 Set -- --</p> <p>9</p>	 <p>40°N 50°N Set 0:27 1:19 Rise 9:23 8:31</p> <p>10</p>	 <p>40°N 50°N Set 1:31 2:23 Rise 10:30 9:39</p> <p>11</p>	 <p>40°N 50°N Set 2:23 3:09 Rise 11:41 10:57 First Quarter 14:32 Sunrise 6:26 6:12 Sunset 19:36 19:50</p> <p>12</p>
		<p>Moon occults the Pleiades 11 pm</p>	<p>Iris at opposition (m=9.2)</p>			<p>Moon 0.5° N of Mars best in W of N. America 3 am</p>
 <p>40°N 50°N Set 3:04 3:41 Rise 12:53 12:19</p> <p>13</p>	 <p>40°N 50°N Set 3:37 4:04 Rise 14:03 13:39</p> <p>14</p>	 <p>40°N 50°N Set 4:04 4:22 Rise 15:10 14:55</p> <p>15</p>	 <p>40°N 50°N Set 4:27 4:37 Rise 16:14 16:09</p> <p>16</p>	 <p>40°N 50°N Set 4:49 4:50 Rise 17:17 17:21</p> <p>17</p>	 <p>40°N 50°N Set 5:10 5:02 Rise 18:19 18:31</p> <p>18</p>	 <p>40°N 50°N Set 5:32 5:16 Rise 19:21 19:42 Sunrise 6:16 5:58 Sunset 19:43 20:01</p> <p>19</p>
		<p>George Alcock discovered Nova Vulpeculae with binoculars, 40 years ago</p>				
 <p>40°N 50°N Set 5:55 5:31 Rise 20:23 20:54 Full Moon 6:25</p> <p>20</p>	 <p>40°N 50°N Set 6:22 5:49 Rise 21:26 22:05</p> <p>21</p>	 <p>40°N 50°N Set 6:54 6:13 Rise 22:27 23:14</p> <p>22</p>	 <p>40°N 50°N Set 7:31 6:43 Rise 23:25 --</p> <p>23</p>	 <p>40°N 50°N Rise -- 0:17 Set 8:16 7:24</p> <p>24</p>	 <p>40°N 50°N Rise 0:19 1:11 Set 9:08 8:16</p> <p>25</p>	 <p>40°N 50°N Rise 1:05 1:54 Set 10:06 9:18 Sunrise 6:06 5:45 Sunset 19:50 20:12</p> <p>26</p>
<p>First Day of Passover</p>		<p>Lyrid meteors (ZHR=20) 12 am</p>				<p>Arno Penzias, co-discoverer of Cosmic Microwave Background radiation, born 75 years ago</p>
 <p>40°N 50°N Rise 1:44 2:27 Set 11:09 10:28</p> <p>27</p>	 <p>40°N 50°N Rise 2:18 2:52 Set 12:14 11:42 Last Quarter 10:12</p> <p>28</p>	 <p>40°N 50°N Rise 2:47 3:12 Set 13:21 12:59</p> <p>29</p>	 <p>40°N 50°N Rise 3:13 3:29 Set 14:28 14:16</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. 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>Rolf Meier discovered first comet from Canada, 30 years ago</p> <p>Melpomene at opposition (m=10.1)</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> <p>MAY 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>



MAY

Diamonds in a Blanket

The Cocoon Nebula in Cygnus swaddles the open star cluster IC 5146 in a blanket of glowing pink hydrogen. The nebula and its cargo of newly formed stars (about 100,000 years old) lie about 4000 light-years away from the Sun. This nebular complex is spectacular with pink emission, blue reflection, and dark nebula (B 168) components.

Photo by Serge Theberge

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, except late in month</p> <p>Venus: not easily observed</p> <p>Mars: in W after dark, sets in WNW near 1:30 am</p> <p>Jupiter: rises in ESE soon after midnight, low in SSE at dawn</p> <p>Saturn: in WSW after dark, sets in WNW by 3 am</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. 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 S M T W T F S</p> <p>1 2 3 4 5</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>JUNE 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</p>		 <p>Rise 40°N 50°N 3:37 3:44</p> <p>Set 15:38 15:35</p> <p>1</p>	 <p>Rise 40°N 50°N 4:01 3:59</p> <p>Set 16:49 16:57</p> <p>2</p>	 <p>Rise 40°N 50°N 4:27 4:15</p> <p>Set 18:05 18:24</p> <p>3</p> <p>Sunrise 5:57 5:32</p> <p>Sunset 19:57 20:23</p>
 <p>Rise 40°N 50°N 4:56 4:34</p> <p>Set 19:24 19:54</p> <p>4</p>	 <p>Rise 40°N 50°N 5:31 4:58</p> <p>Set 20:45 21:27</p> <p>New Moon 8:18</p> <p>5</p>	 <p>Rise 40°N 50°N 6:15 5:31</p> <p>Set 22:05 22:54</p> <p>6</p>	 <p>Rise 40°N 50°N 7:09 6:19</p> <p>Set 23:16 --</p> <p>7</p>	 <p>Set 40°N 50°N -- 0:08</p> <p>Rise 8:14 7:23</p> <p>8</p>	 <p>Set 40°N 50°N 0:15 1:03</p> <p>Rise 9:27 8:40</p> <p>9</p>	 <p>Set 40°N 50°N 1:02 1:41</p> <p>Rise 10:41 10:04</p> <p>10</p> <p>Sunrise 5:49 5:21</p> <p>Sunset 20:04 20:33</p>
	<p>International Astronomy Week (through May 11)</p> <p>η-Aquarid meteors (ZHR=60) 2 pm</p>	<p>Young Cr. Moon 2° N of Mercury visible in evening twilight, best in E of N. America</p>			<p>Mercury 2° to left of the Pleiades visible with difficulty in evening twilight, best in S of N. America</p>	<p>Saturn stationary, 2.2° E of Regulus</p>
 <p>Set 40°N 50°N 1:38 2:08</p> <p>Rise 11:54 11:27</p> <p>First Quarter 23:47</p> <p>11</p>	 <p>Set 40°N 50°N 2:07 2:28</p> <p>Rise 13:03 12:45</p> <p>12</p>	 <p>Set 40°N 50°N 2:32 2:44</p> <p>Rise 14:08 14:00</p> <p>13</p>	 <p>Set 40°N 50°N 2:54 2:57</p> <p>Rise 15:11 15:12</p> <p>14</p>	 <p>Set 40°N 50°N 3:15 3:10</p> <p>Rise 16:12 16:22</p> <p>15</p>	 <p>Set 40°N 50°N 3:37 3:23</p> <p>Rise 17:14 17:33</p> <p>16</p>	 <p>Set 40°N 50°N 4:00 3:38</p> <p>Rise 18:16 18:43</p> <p>17</p> <p>Sunrise 5:43 5:11</p> <p>Sunset 20:11 20:43</p>
<p>Mother's Day</p>			<p>Mercury at greatest elongation E (22°) best evening view in 2008, best observed during the previous week</p>			<p>International Astronomy Day</p> <p>www.rasc.ca/astroday</p> <p>www.astroleague.org/ai/astroday/astroday.html</p>
 <p>Set 40°N 50°N 4:26 3:55</p> <p>Rise 19:18 19:54</p> <p>18</p>	 <p>Set 40°N 50°N 4:55 4:17</p> <p>Rise 20:19 21:04</p> <p>Full Moon 22:11</p> <p>19</p>	 <p>Set 40°N 50°N 5:31 4:45</p> <p>Rise 21:19 22:09</p> <p>20</p>	 <p>Set 40°N 50°N 6:13 5:23</p> <p>Rise 22:13 23:05</p> <p>21</p>	 <p>Set 40°N 50°N 7:03 6:11</p> <p>Rise 23:02 23:52</p> <p>22</p>	 <p>Set 40°N 50°N 8:00 7:11</p> <p>Rise 23:43 --</p> <p>23</p>	 <p>Rise 40°N 50°N -- 0:27</p> <p>Set 9:01 8:18</p> <p>24</p> <p>Sunrise 5:37 5:03</p> <p>Sunset 20:17 20:52</p>
	<p>Victoria Day (Canada)</p>		<p>Mars within Beehive Cluster visible after dark, today through May 23</p>		<p>RMTC Astronomy Expo, Big Bear, CA</p> <p>www.rtmcastronomyexpo.org (through May 26)</p>	
 <p>Rise 40°N 50°N 0:18 0:55</p> <p>Set 10:04 9:30</p> <p>25</p>	 <p>Rise 40°N 50°N 0:48 1:16</p> <p>Set 11:09 10:44</p> <p>26</p>	 <p>Rise 40°N 50°N 1:14 1:33</p> <p>Set 12:15 11:59</p> <p>Last Quarter 22:57</p> <p>27</p>	 <p>Rise 40°N 50°N 1:38 1:49</p> <p>Set 13:21 13:15</p> <p>28</p>	 <p>Rise 40°N 50°N 2:02 2:03</p> <p>Set 14:29 14:33</p> <p>29</p>	 <p>Rise 40°N 50°N 2:26 2:18</p> <p>Set 15:40 15:54</p> <p>30</p>	 <p>Rise 40°N 50°N 2:52 2:35</p> <p>Set 16:56 17:20</p> <p>31</p> <p>Sunrise 5:33 4:56</p> <p>Sunset 20:22 21:00</p>
	<p>Memorial Day (USA)</p>					





JULY

Swimming in Stars

Floating serenely in a sea of stars, the Swan Nebula, also called M17, the Omega, or Horseshoe Nebula, is a stellar nursery in the southern Milky Way. The hot and energetic new stars born of, and hidden within, the nebula, irradiate its gas with intense ultra-violet light. The excited gas then glows red and shines away its excess energy, producing a visually stunning target for even small telescopes.

Photo by Leslie Marczi

SUNDAY

MONDAY
































TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY																																																																																																																																																																																																																																
<p>The planets this month</p> <p><i>Mercury: very low in ENE in morning twilight in first half of month</i></p> <p><i>Venus: slowly emerges in evening twilight in WNW, very late in month</i></p> <p><i>Mars: very low in W in evening twilight</i></p> <p><i>Jupiter: low in SSE after dark, sets in WSW in morning twilight</i></p> <p><i>Saturn: very low in W in evening twilight, except late in month</i></p>		 <p>Rise 3:31 2:41 Set 19:38 20:29</p> <p>40°N 50°N</p> <p>1</p> <p>Canada Day</p> <p>Mercury at greatest elongation W (22°) located about 7.5° S of the Moon</p>	 <p>Rise 4:37 3:46 Set 20:38 21:25</p> <p>40°N 50°N</p> <p>New Moon 22:19</p> <p>2</p>	 <p>Rise 5:53 5:07 Set 21:26 22:04</p> <p>40°N 50°N</p> <p>3</p>	 <p>Rise 7:11 6:35 Set 22:03 22:32</p> <p>40°N 50°N</p> <p>4</p> <p>Independence Day (USA)</p> <p>Gateway to the Universe Star Party Munro Park near Powassan, ON www.gatewaytotheuniverse.org (through Jul. 6)</p> <p>Earth at aphelion (152,104,200 km) 4 am</p>	 <p>Rise 8:27 8:02 Set 22:34 22:52</p> <p>40°N 50°N</p> <p>5</p> <p>Sunrise 5:37 4:58 Sunset 20:32 21:11</p>																																																																																																																																																																																																																																
 <p>Rise 9:40 9:25 Set 22:59 23:08</p> <p>40°N 50°N</p> <p>6</p>	 <p>Rise 10:48 10:43 Set 23:22 23:23</p> <p>40°N 50°N</p> <p>7</p>	 <p>Rise 11:53 11:58 Set 23:44 23:36</p> <p>40°N 50°N</p> <p>8</p>	 <p>Rise 12:57 13:10 Set -- 23:50</p> <p>40°N 50°N</p> <p>9</p>	 <p>Set 0:07 -- Rise 13:59 14:22</p> <p>40°N 50°N</p> <p>First Quarter 0:35</p> <p>10</p>	 <p>Set 0:31 0:06 Rise 15:02 15:33</p> <p>40°N 50°N</p> <p>11</p>	 <p>Set 0:58 0:25 Rise 16:04 16:44</p> <p>40°N 50°N</p> <p>12</p> <p>Sunrise 5:42 5:05 Sunset 20:29 21:06</p>																																																																																																																																																																																																																																
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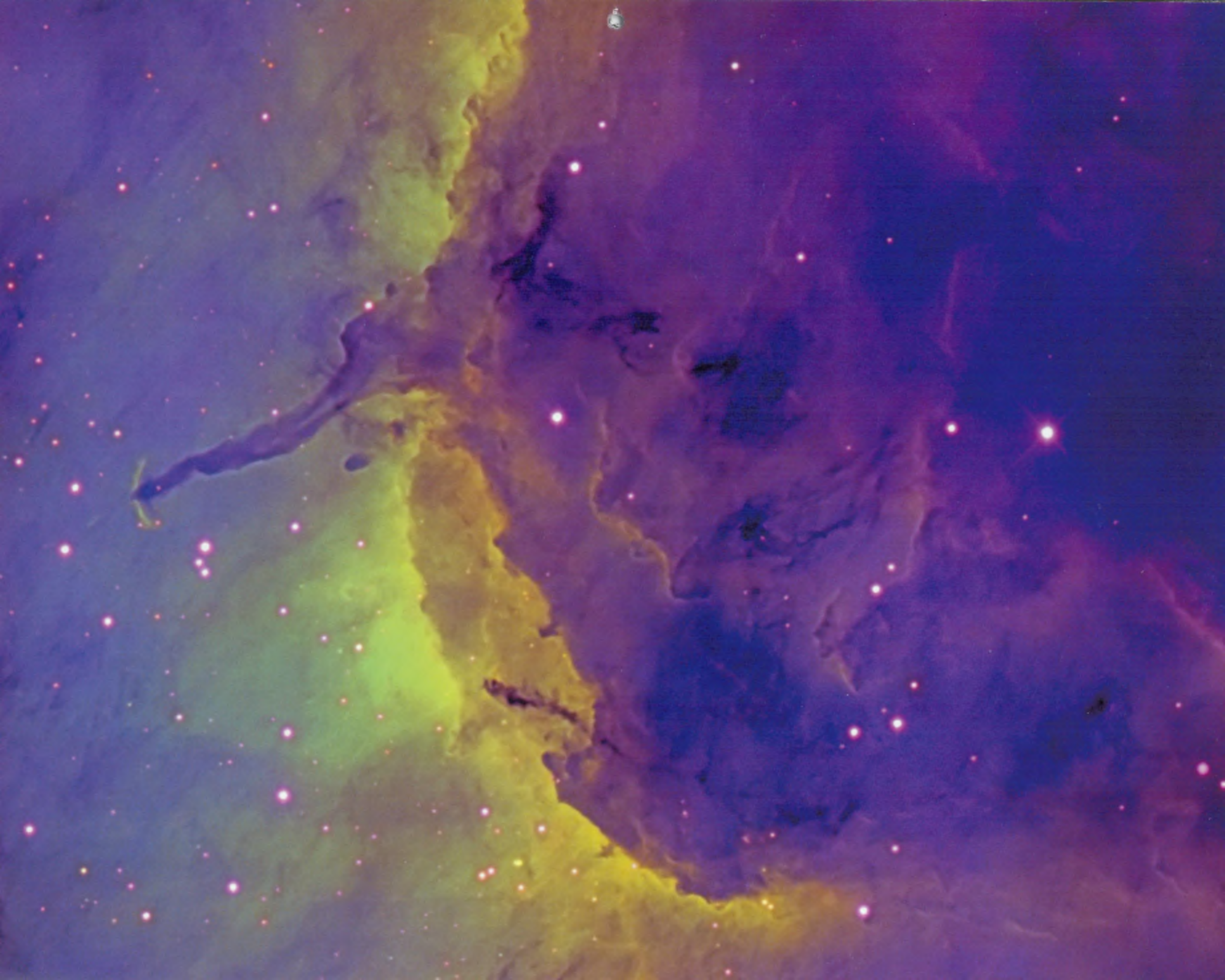
SEPTEMBER

Stellar Cataclysm Creates Cosmic Lace

Faint filaments of tortured gas float between the better-known, and more easily observed, east and west portions of the Veil Nebula in Cygnus. Called Pickering's Wedge, or Pickering's Triangular Wisp, these twisted shreds of glowing hydrogen were piled up by the shockwave from a supernova blast that occurred some 5000 years ago.

Photo by Paul Mortfield and Stef Cancelli

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p>Mercury: not easily observed</p> <p>Venus: very low in WSW after sunset</p> <p>Mars: not easily observed</p> <p>Jupiter: low in S after dark, sets in WSW soon after midnight</p> <p>Saturn: very low in E in morning twilight, late in month</p>	<p> Rise 40°N 50°N 8:23 8:29 Set 20:11 20:02</p> <p>1</p> <p>Labour Day</p> <p>First day of Ramadan</p> <p>Comet Morehouse was discovered by Daniel Morehouse, 100 years ago</p>	<p> Rise 40°N 50°N 9:29 9:44 Set 20:34 20:16</p> <p>2</p> <p>Northern Prairie Starfest, near Tofield, AB edmontonrasc.com/nps.html (through Sep. 7)</p>	<p> Rise 40°N 50°N 10:34 10:58 Set 21:00 20:33</p> <p>3</p> <p>Saturn in conjunction with the Sun</p>	<p> Rise 40°N 50°N 11:38 12:11 Set 21:29 20:53</p> <p>4</p>	<p> Rise 40°N 50°N 12:41 13:23 Set 22:02 21:19</p> <p>5</p>	<p> Rise 40°N 50°N 13:42 14:30 Set 22:42 21:53</p> <p>6</p> <p>Sunrise 6:33 6:23 Sunset 19:23 19:32</p>
<p> Rise 40°N 50°N 14:39 15:31 Set 23:29 22:37 First Quarter 10:04</p> <p>7</p> <p>Moon 1.1° S of Antares best in W of N. America 12 am Two shadows on Jupiter visible in E of N. America 8:13 pm</p>	<p> Rise 40°N 50°N 15:30 16:21 Set -- 23:32</p> <p>8</p>	<p> Set 40°N 50°N 0:23 -- Rise 16:14 17:01</p> <p>9</p>	<p> Set 40°N 50°N 1:23 0:37 Rise 16:52 17:32</p> <p>10</p>	<p> Set 40°N 50°N 2:26 1:49 Rise 17:24 17:55</p> <p>11</p> <p>Mercury at greatest elongation E (27°) not easily observed Venus 0.3° N of Mars visible soon after sunset, best in S of N. America (look for Mercury to south)</p>	<p> Set 40°N 50°N 3:32 3:03 Rise 17:52 18:14</p> <p>12</p> <p>Charles Messier discovered a nebula and began his catalogue, 250 years ago</p> <p>Uranus at opposition (m=5.7) Moon occults Neptune, visible in parts of E of N. America 10 pm</p>	<p> Set 40°N 50°N 4:39 4:20 Rise 18:17 18:31</p> <p>13</p> <p>Sunrise 6:39 6:34 Sunset 19:11 19:17</p>
<p> Set 40°N 50°N 5:46 5:36 Rise 18:41 18:45</p> <p>14</p>	<p> Set 40°N 50°N 6:54 6:54 Rise 19:05 19:00 Full Moon 5:13</p> <p>15</p> <p>Today's Full Moon is the Harvest Moon</p>	<p> Set 40°N 50°N 8:04 8:14 Rise 19:30 19:16</p> <p>16</p>	<p> Set 40°N 50°N 9:16 9:37 Rise 19:59 19:35</p> <p>17</p>	<p> Set 40°N 50°N 10:31 11:02 Rise 20:32 19:58</p> <p>18</p>	<p> Set 40°N 50°N 11:46 12:28 Rise 21:14 20:30</p> <p>19</p> <p>Moon occults the Pleiades best in NE of N. America 10 pm</p>	<p> Set 40°N 50°N 13:00 13:49 Rise 22:04 21:15</p> <p>20</p> <p>Sunrise 6:46 6:44 Sunset 19:00 19:01</p>
<p> Set 40°N 50°N 14:07 14:59 Rise 23:05 22:14</p> <p>21</p>	<p> Set 40°N 50°N 15:05 15:53 Rise -- 23:28 Last Quarter 1:04</p> <p>22</p> <p>Fall Equinox 11:45 am</p>	<p> Rise 40°N 50°N 0:15 -- Set 15:52 16:32</p> <p>23</p>	<p> Rise 40°N 50°N 1:28 0:49 Set 16:29 17:01</p> <p>24</p>	<p> Rise 40°N 50°N 2:41 2:13 Set 17:00 17:22</p> <p>25</p> <p>Alberta Star Party, Caroline, AB calgary.rasc.ca (through Sep. 28)</p>	<p> Rise 40°N 50°N 3:52 3:34 Set 17:27 17:39</p> <p>26</p> <p>Annual Algonquin Adventure Algonquin Park, ON www.toronto.rasc.ca (through Sep. 28)</p> <p>Cr. Moon 1.8° to right of Regulus best in W of N. America 8 am</p>	<p> Rise 40°N 50°N 5:01 4:53 Set 17:50 17:54</p> <p>27</p> <p>Sunrise 6:53 6:55 Sunset 18:48 18:46</p> <p>Comet Donati was first to be photographed, by William Usherwood, 150 years ago</p>
<p> Rise 40°N 50°N 6:08 6:09 Set 18:13 18:08</p> <p>28</p> <p>Zodiacal Light readily visible in E before morning twilight for next two weeks</p>	<p> Rise 40°N 50°N 7:13 7:24 Set 18:37 18:22 New Moon 4:12</p> <p>29</p>	<p> Rise 40°N 50°N 8:18 8:38 Set 19:01 18:38</p> <p>30</p> <p>Rosh Hashanah</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. 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 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>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>



OCTOBER

Caught in the Act

This colourful image of a region in Cygnus' Pelican Nebula, taken in the light of Silicon II, H-alpha, and Oxygen III, shows the Herbig-Haro object HH 555 at the end of the long narrow gas pillar extending down and to the left. Herbig-Haro objects are formed by outflows from proto-stars. They are not part of initial star-forming processes but they point the way to proto-stellar objects.
 Photo by Stef Cancelli and Paul Mortfield

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

The planets this month				SEPTMBER S M T W T F S		40°N 50°N		1		40°N 50°N		2		40°N 50°N		3		40°N 50°N		4	
Mercury: very low in ESE in morning twilight in second half of month Venus: very low in SW in evening twilight Mars: not easily observed Jupiter: low in SSW after dark, sets in WSW in late evening Saturn: rises in E near 4 am, low in ESE in morning twilight		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. Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time. Detailed instructions on adjusting times for location are given in the back pages. Please see back pages for photo details and additional information about this Calendar.		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		Rise 9:23 9:52 Set 19:29 18:57				Rise 10:27 11:05 Set 20:01 19:21				Rise 11:29 12:14 Set 20:38 19:52				Rise 12:28 13:18 Set 21:22 20:32 Sunrise 7:00 7:05 Sunset 18:37 18:31			
				NOVEMBER S M T W T F S				NASA established by Act of U.S. Congress, 50 years ago		Hans Lippershey applied for a telescope patent, 400 years ago											
40°N 50°N Rise 13:21 14:13 Set 22:13 21:22		40°N 50°N Rise 14:08 14:56 Set 23:10 22:23		40°N 50°N Rise 14:48 15:30 Set -- 23:31 First Quarter 5:04		40°N 50°N Set 0:11 -- Rise 15:22 15:57		40°N 50°N Set 1:15 0:43 Rise 15:51 16:17		40°N 50°N Set 2:20 1:57 Rise 16:17 16:35		40°N 50°N Set 3:26 3:13 Rise 16:42 16:50 Sunrise 7:07 7:16 Sunset 18:26 18:16									
				Draconid meteors 9 pm				Yom Kippur				H.W.M. Olbers, known for Olbers' Paradox, born 250 years ago									
40°N 50°N Set 4:34 4:29 Rise 17:06 17:05		40°N 50°N Set 5:43 5:48 Rise 17:31 17:21		40°N 50°N Set 6:55 7:11 Rise 17:58 17:38 Full Moon 16:02		40°N 50°N Set 8:10 8:37 Rise 18:30 18:01		40°N 50°N Set 9:28 10:05 Rise 19:10 18:30		40°N 50°N Set 10:45 11:31 Rise 19:59 19:11		40°N 50°N Set 11:57 12:48 Rise 20:58 20:07 Sunrise 7:14 7:27 Sunset 18:15 18:02									
		Thanksgiving Day (Canada) Columbus Day (USA) British Interplanetary Society was founded, 75 years ago		Today's Full Moon is the Hunter's Moon						Moon occults the Pleiades best in W of N. America 7 am		Donati's Comet almost collided with Venus, 150 years ago									
40°N 50°N Set 13:00 13:49 Rise 22:06 21:18		40°N 50°N Set 13:50 14:33 Rise 23:19 22:38		40°N 50°N Set 14:30 15:04 Rise -- -- Last Quarter 7:55		40°N 50°N Rise 0:32 0:01 Set 15:03 15:27		40°N 50°N Rise 1:44 1:23 Set 15:30 15:45		40°N 50°N Rise 2:52 2:41 Set 15:55 16:01		40°N 50°N Rise 3:58 3:56 Set 16:17 16:15 Sunrise 7:22 7:39 Sunset 18:06 17:48									
				Orionid meteors (ZHR=20) 12 am		Mercury at greatest elongation W (18°) best morning view in 2008, best observed during the next week															
40°N 50°N Rise 5:02 5:10 Set 16:40 16:29		40°N 50°N Rise 6:06 6:23 Set 17:04 16:45		40°N 50°N Rise 7:10 7:36 Set 17:30 17:02 New Moon 19:14		40°N 50°N Rise 8:14 8:49 Set 18:01 17:24		40°N 50°N Rise 9:17 10:00 Set 18:36 17:52		40°N 50°N Rise 10:18 11:06 Set 19:18 18:29											
		Zodiacal Light readily visible in E before morning twilight for next two weeks				Oldest person was launched into space, John Glenn, age 77, 10 years ago Vesta at opposition (m=6.3)		Sun, Moon, and five planets were within a 30-degree arc, 525 years ago		Halloween											


















DECEMBER

Celestial Masterpiece

"Begin with many a blazing star, Stood the great giant Algebar, Orion, hunter of the beast! His sword hung gleaming by his side..." - Henry Wadsworth Longfellow. M42, the Great Orion Nebula, is the brightest, most spectacular nebula for northerners. About 1600 light-years distant, it is visible to the unaided eye and stunning even in small telescopes. It was first photographed in 1880 by Henry Draper. Photo by Pierre Tremblay

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The planets this month</p> <p>Mercury: very low in SW in evening twilight, late in month</p> <p>Venus: low in SW in evening twilight</p> <p>Mars: not easily observed</p> <p>Jupiter: very low in SW in evening twilight, sets in WSW less than 2 hours after sunset</p> <p>Saturn: rises in E before midnight, high in S before dawn</p>	 <p>Rise 40°N 50°N 10:19 10:59</p> <p>Set 19:53 19:15</p> <p>1</p> <p><i>Cr. Moon near Venus and Jupiter visible soon after sunset best in E of N. America</i></p>	 <p>Rise 40°N 50°N 10:51 11:23</p> <p>Set 20:55 20:26</p> <p>2</p>	 <p>Rise 40°N 50°N 11:18 11:42</p> <p>Set 21:57 21:37</p> <p>3</p> <p><i>First Jupiter flyby, by Pioneer 10, 35 years ago</i></p>	 <p>Rise 40°N 50°N 11:43 11:58</p> <p>Set 23:00 22:48</p> <p>4</p> <p><i>Pallas at opposition (m=7.4)</i></p>	 <p>Rise 40°N 50°N 12:06 12:13</p> <p>Set -- --</p> <p>First Quarter 16:26</p> <p>5</p> <p><i>Mars in conjunction with the Sun</i></p>	 <p>Set 40°N 50°N 0:04 0:01</p> <p>Rise 12:29 12:27</p> <p>6</p> <p>Sunrise 7:08 7:44 Sunset 16:35 15:59</p>
 <p>Set 40°N 50°N 1:09 1:16</p> <p>Rise 12:53 12:42</p> <p>7</p>	 <p>Set 40°N 50°N 2:18 2:34</p> <p>Rise 13:20 13:00</p> <p>8</p>	 <p>Set 40°N 50°N 3:31 3:58</p> <p>Rise 13:52 13:22</p> <p>9</p>	 <p>Set 40°N 50°N 4:48 5:25</p> <p>Rise 14:32 13:52</p> <p>10</p>	 <p>Set 40°N 50°N 6:07 6:52</p> <p>Rise 15:22 14:35</p> <p>11</p> <p><i>Moon occults the Pleiades 4 am</i></p>	 <p>Set 40°N 50°N 7:21 8:11</p> <p>Rise 16:26 15:35</p> <p>Full Moon 11:37</p> <p>12</p> <p><i>Largest Full Moon of 2008 Closest Lunar Perigee of 2008</i></p>	 <p>Set 40°N 50°N 8:26 9:14</p> <p>Rise 17:39 16:53</p> <p>13</p> <p>Sunrise 7:14 7:51 Sunset 16:35 15:58</p> <p><i>Geminid meteors (ZHR=120) 6 pm</i></p>
 <p>Set 40°N 50°N 9:19 9:59</p> <p>Rise 18:58 18:20</p> <p>14</p>	 <p>Set 40°N 50°N 10:00 10:31</p> <p>Rise 20:16 19:48</p> <p>15</p>	 <p>Set 40°N 50°N 10:33 10:54</p> <p>Rise 21:30 21:13</p> <p>16</p>	 <p>Set 40°N 50°N 11:01 11:13</p> <p>Rise 22:41 22:33</p> <p>17</p>	 <p>Set 40°N 50°N 11:26 11:28</p> <p>Rise 23:47 23:49</p> <p>18</p>	 <p>Set 40°N 50°N 11:49 11:43</p> <p>Rise -- --</p> <p>Last Quarter 5:29</p> <p>19</p> <p><i>Farthest Lunar Apogee of 2008</i></p>	 <p>Rise 40°N 50°N 0:52 1:03</p> <p>Set 12:12 11:58</p> <p>20</p> <p>Sunrise 7:18 7:56 Sunset 16:38 16:00</p>
 <p>Rise 40°N 50°N 1:56 2:16</p> <p>Set 12:37 12:14</p> <p>21</p> <p><i>First manned lunar mission, Apollo 8, 40 years ago</i></p> <p>Winter Solstice 7:04 am</p>	 <p>Rise 40°N 50°N 2:59 3:28</p> <p>Set 13:05 12:33</p> <p>22</p> <p><i>Ursid meteors (ZHR=10) 3 am</i></p>	 <p>Rise 40°N 50°N 4:01 4:39</p> <p>Set 13:36 12:57</p> <p>23</p>	 <p>Rise 40°N 50°N 5:03 5:47</p> <p>Set 14:14 13:28</p> <p>24</p>	 <p>Rise 40°N 50°N 6:01 6:50</p> <p>Set 14:58 14:09</p> <p>25</p> <p><i>Christmas Day</i></p> <p><i>Johann Palitsch recovered Comet Halley on first predicted return, 250 years ago</i></p>	 <p>Rise 40°N 50°N 6:54 7:44</p> <p>Set 15:49 14:59</p> <p>26</p> <p><i>Boxing Day (Canada)</i></p>	 <p>Rise 40°N 50°N 7:40 8:28</p> <p>Set 16:46 15:59</p> <p>New Moon 7:22</p> <p>Sunrise 7:21 7:58 Sunset 16:42 16:05</p> <p>27</p>
 <p>Rise 40°N 50°N 8:20 9:01</p> <p>Set 17:46 17:06</p> <p>28</p>	 <p>Rise 40°N 50°N 8:53 9:27</p> <p>Set 18:48 18:16</p> <p>29</p>	 <p>Rise 40°N 50°N 9:22 9:48</p> <p>Set 19:50 19:27</p> <p>30</p>	 <p>Rise 40°N 50°N 9:47 10:05</p> <p>Set 20:52 20:38</p> <p>31</p> <p><i>Caroline Herschel was injured while helping her brother, William, observe, 225 years ago</i></p> <p><i>Mercury 1.3° to left of Jupiter visible soon after sunset</i></p>	<p>NOVEMBER S M T W T F S</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</p> <p>JANUARY 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 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. 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>		

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 40° 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 labelled **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 labelled **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 4,000 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 an 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:

136 Dupont Street
 Toronto ON M5R 1V2
 Canada
 888-924-7272 (toll free in Canada) or 416-924-7973

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 used in the creation of this calendar was written by the editor.

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Cover/December (Celestial Masterpiece): Composite image made from 190 minutes of total exposure time (52 minutes in a luminance filter, and 36 minutes in each of red, green, and blue filters) on an SBIG STL-11000 CCD camera using a Takahashi TOA-150 refracting telescope; taken on January 5 and February 6, 2007, remotely using "Global Rent-a-Scope" located in Cloudcroft, New Mexico (Pierre Tremblay).



January (Beautiful Blue): Composite image made from three hours of total exposure time (90 minutes in a luminance filter, and 30 minutes in each of red, green, and blue filters) on an SBIG ST-10XME CCD camera using a Takahashi 106-mm F5.0 fluorite refracting telescope; processed using CCDSoft5, MaxIm DL, and Photoshop CS2 software; taken on March 11/12, 2007 from Flesherton, Ontario (Stuart Heggie).



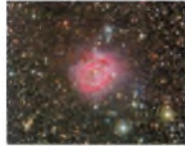
February (The Sun on Ice): Image taken with Nikon D70 DSLR camera using a 18 to 70-mm ED Zoom lens set at 18 mm; taken on January 18, 2005 from Shelburne, Ontario; air temperature was -24° C (Stuart Heggie).



March (Backbone of the Sky): Image made from 3 x 6-minute exposures on a Hutech-modified Canon 5D DSLR camera (set at ISO 400) using a 15-mm fish-eye lens at f/4; taken on April 17, 2007 from Coonabarabran, NSW, Australia (Alan Dyer).



April (Ghostly Glow in the Night): Composite image made from 190 minutes of total exposure time (115 minutes in a luminance filter, 35 minutes in a red filter, and 20 minutes in each of green and blue filters) on an SBIG ST-10XME CCD camera using a Takahashi 106-mm F5.0 fluorite refracting telescope; processed using CCDSoft5, MaxIm DL, and Photoshop CS2 software; taken on January 18/19, 2007 from Flesherton, Ontario (Stuart Heggie).



May (Diamonds in a Blanket): Composite image made from three hours of total exposure time (one hour in each of red, green, and blue filters) on an SBIG ST-10XME CCD camera using a Vixen R200SS/Paracorr - 8-inch f/4.6 Newtonian telescope; calibrated with MaxIm DL, and combined with Photoshop CS software packages; taken on August 6, 2005 from Carr Observatory, Thornbury, Ontario (Serge Théberge).



June (Glittering Galactic Fossils): Composite image made from three hours of total exposure time (12 x 5-minute sub-exposures in each of red, green, and blue filters) on an SBIG ST-10XME CCD camera using a Takahashi FS-152 apochromatic refractor on a Takahashi N.J.P. Temma2/GOTO mount, with Astrodon RGB filters; calibrated and combined with MaxIm DL, DDP with ImagesPlus, and final processing with Photoshop CS2 software packages; taken in September 2006 from a remote observatory located at Robosky, near Orangeville, Ontario (Serge Théberge).



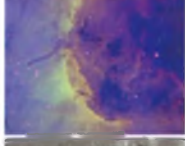
July (Swimming in Stars): Image made from one hour of total exposure time in four-minute increments on a Hutech-modified Canon 300D DSLR camera (set at ISO 1600) using an Astro-Physics 130-mm refracting telescope; taken on July 2, 2006 from Manitoulin Island, Ontario (Leslie Marczzi).



August (An Embarrassment of Riches): Image made from 40 minutes of total exposure time in 8-minute increments on a Hutech-modified Canon 5D DSLR camera (set at ISO 400) using a Borg 77-mm astrographic refractor at f/4.3; taken on April 18, 2007 from Coonabarabran, NSW, Australia (Alan Dyer).



September (Stellar Cataclysm Creates Cosmic Lace): Composite image made from six hours of total exposure time (three hours through a Hydrogen-Alpha filter (656 nm) and one hour each through red, green, and blue filters) on an SBIG ST-10XME CCD camera using an RCOS 16-inch f/6.8 Ritchey-Chretien telescope; taken over several nights in July 2006 from Toronto, Ontario (Paul Mortfield and Stef Cancelli).



October (Caught in the Act): Composite image made from six hours of total exposure time (one hour in SII (673 nm), four hours in H-alpha (656 nm), and one hour in OIII (500 nm) - all filters were Astrodon 6 nm bandpass) on an SBIG ST-10XME CCD camera using an RCOS 16-inch f/6.8 Ritchey-Chretien telescope; combined in Photoshop using the "Hubble" palette, which mapped red=SII, green=H-alpha, blue=OIII; taken over several nights in August 2006 from Toronto, Ontario (Paul Mortfield and Stef Cancelli).



November (Otherworldly View): Image made from 385 stacked frames chosen from a stream of 1000 available frames from a Lumenera Infinity 2-2 camera, with True Technology R/IR filter and a 2.5x Powermate Barlow, using a Starmaster 18-inch driven Dobsonian reflecting telescope; Registax 4 software, using 35 points of alignment, was used; taken on March 7, 2006 from Ottawa, Ontario (Mike Wirths).

2008

January	February	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	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	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
April	May	June
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 31	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
July	August	September
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	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	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
October	November	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	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 31

2009



January	February	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	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	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
April	May	June
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 31	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
July	August	September
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	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	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
October	November	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	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 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 using readily available telescopes and cameras. 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.

Total Solar Eclipse <i>visible in parts of arctic Canada, Greenland, Russia, Mongolia, and China</i>		Mount www
	40°N 50°N Rise 13:52 14:29 Set 23:29 22:51 First Quarter 16:20	8 
<i>The Dam Star Party, Fredericton, NB www.nb.rasc.ca (through Aug. 10)</i>		
<i>Pioneer 13 was first American spacecraft to land on Venus, 30 years ago</i>		

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