



*Royal Astronomical Society
of Canada*



*Observer's
Calendar
1997*



JANUARY

Cassiopeia's Milky Way

The Milky Way runs through the centre of the constellation's "W," which begins in the upper middle of the photo and extends to the right. The Double Cluster lies below the emission regions IC 1805 and 1848. In the west, NGC 7822 also invites the observer with an OIII filter, as does the more compact NGC 281 near alpha Cass.

Photo by Ian Fisher

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

The given times must be adjusted for location. Instructions are given in the back of the calendar.


Please see back pages for additional information on the photos and this calendar.

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				

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	

 *West* 11:30 *East* 11:31
Rise -- --
Set 3rd Quarter 20:45

1

 *Rise* 0:32 *Set* 0:22
Set 11:55 *Rise* 11:59

2

 *Rise* 1:38 *Set* 1:24
Set 12:22 *Rise* 12:30

3

 *Rise* 2:45 *Set* 2:27
Set 12:54 *Rise* 13:04


4

Sunrise 8:03 7:38
 Sunset 16:08 16:32

New Year's Day

Quadrantid meteors peak 5h


Wilhelm Beer born 200 years ago, 1st to map dark areas of Mars

 *Rise* 3:54 *Set* 3:32
Set 13:31 *Rise* 13:45


5

 *Rise* 5:02 *Set* 4:38
Set 14:17 *Rise* 14:32


6

 *Rise* 6:07 *Set* 5:41
Set 15:12 *Rise* 15:28


7

 *Rise* 7:06 *Set* 6:41
Set 16:18 *Rise* 16:32
New Moon 23:26


8

 *Rise* 7:57 *Set* 7:35
Set 17:31 *Rise* 17:42

9


 *Rise* 8:40 *Set* 8:23
Set 18:50 *Rise* 18:56

10

 *Rise* 9:17 *Set* 9:04
Set 20:09 *Rise* 20:11

11

Sunrise 7:59 7:37
 Sunset 16:17 16:40

 *Rise* 9:50 *Set* 9:41
Set 21:28 *Rise* 21:25


12

 *Rise* 10:19 *Set* 10:16
Set 22:45 *Rise* 22:38


13

 *Rise* 10:48 *Set* 10:48
Set 23:59 *Rise* 23:47


14

 *Rise* 11:16 *Set* 11:21
Set -- --
1st Quarter 15:02


15

 *Set* 1:10 *Rise* 0:55
Rise 11:46 *Set* 11:55

16

 *Set* 2:19 *Rise* 2:00
Rise 12:19 *Set* 12:31


17

 *Set* 3:24 *Rise* 3:02
Rise 12:56 *Set* 13:10


18

Sunrise 7:54 7:33
 Sunset 16:28 16:49


Saturn 2° S of Moon 23h

 *Set* 4:24 *Rise* 4:01
Rise 13:38 *Set* 13:53


19

 *Set* 5:19 *Rise* 4:55
Rise 14:25 *Set* 14:40


20

 *Set* 6:07 *Rise* 5:43
Rise 15:17 *Set* 15:31


21

 *Set* 6:49 *Rise* 6:27
Rise 16:13 *Set* 16:26


22

 *Set* 7:25 *Rise* 7:06
Rise 17:11 *Set* 17:22
Full Moon 10:11

23

 *Set* 7:56 *Rise* 7:40
Rise 18:12 *Set* 18:19


24

 *Set* 8:24 *Rise* 8:12
Rise 19:13 *Set* 19:17

25

Sunrise 7:46 7:27
 Sunset 16:39 16:58


Aldebaran 0.7° S of Moon Occultation 0h

 *Set* 8:49 *Rise* 8:40
Rise 20:15 *Set* 20:15


26

 *Set* 9:12 *Rise* 9:08
Rise 21:17 *Set* 21:13


27

 *Set* 9:36 *Rise* 9:35
Rise 22:20 *Set* 22:12


28

 *Set* 10:00 *Rise* 10:02
Rise 23:24 *Set* 23:12

29

 *Set* 10:25 *Rise* 10:31
Rise -- --

30

 *Rise* 0:29 *Set* 0:13
Set 10:54 *Rise* 11:03
3rd Quarter 14:40

31

Mars 3° N of Moon 17h



FEBRUARY

Orion's Sword

A Schmidt camera makes possible this extraordinary and deep image of Orion from the easternmost belt star (zeta) to M42 itself. The familiar Horsehead and NGC 2024 by zeta give way to soaring sheets of nebulosity which shoot beyond the belt star to the Orion Nebula and show how the entire region is bathed in luminosity.

Photo by John Mirtle

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<p>The given times must be adjusted for location. Instructions are given in the back of the calendar.</p> <p>Please see back pages for additional information on the photos and this calendar.</p>	<p>JANUARY</p> <p>S M T W T F S</p> <p>1 2 3 4</p> <p>5 6 7 8 9 10 11</p> <p>12 13 14 15 16 17 18</p> <p>19 20 21 22 23 24 25</p> <p>26 27 28 29 30 31</p>	<p>MARCH</p> <p>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>Rise 1:35 1:15 Set 11:27 11:39</p> <p>Sunrise 7:36 7:20 Sunset 16:52 17:08</p> <p>Venus 1.0° S of Neptune 5h</p>
	 <p>Rise 2:41 2:18 Set 12:07 12:21</p>	 <p>Rise 3:45 3:21 Set 12:56 13:11</p>	 <p>Rise 4:46 4:21 Set 13:54 14:09</p>	 <p>Rise 5:41 5:18 Set 15:02 15:15</p>	 <p>Rise 6:29 6:09 Set 16:18 16:27</p>	 <p>Rise 7:10 6:54 Set 17:39 17:43 New Moon 10:06</p>
 <p>Rise 8:18 8:12 Set 20:21 20:16</p>	 <p>Rise 8:49 8:47 Set 21:39 21:30</p>	 <p>Rise 9:18 9:21 Set 22:55 22:41</p>	 <p>Rise 9:49 9:56 Set -- 23:49</p>	 <p>Set 0:07 -- Rise 10:21 10:32</p>	 <p>Set 1:14 0:54 Rise 10:58 11:11 1st Quarter 3:57</p>	 <p>Set 2:17 1:54 Rise 11:38 11:53</p> <p>Sunrise 7:12 7:01 Sunset 17:17 17:28</p>
 <p>Set 3:14 2:50 Rise 12:23 12:39</p>	 <p>Set 4:04 3:41 Rise 13:13 13:28</p>	 <p>Set 4:48 4:26 Rise 14:07 14:21</p>	 <p>Set 5:26 5:06 Rise 15:05 15:16</p>	 <p>Set 5:58 5:42 Rise 16:04 16:12</p>	 <p>Set 6:27 6:14 Rise 17:05 17:10</p>	 <p>Set 6:53 6:44 Rise 18:07 18:08 Full Moon 5:27 Sunrise 6:59 6:50 Sunset 17:29 17:38</p>
<p>Jupiter 0.2° N of Uranus 2h</p>	<p>Saturn 1.8° S of Moon 11h</p>		<p>Venus 0.3° S of Jupiter 18h</p> <p>100-ton Sikhote-Alin meteorite, largest this century, 50 years ago</p> <p>Mercury 1.0° S of Jupiter 8h Mercury 0.9° S of Uranus 18h</p>	<p>Venus 0.2° S of Uranus 6h Mercury 1.4° S of Neptune 14h</p>	<p>Valentine's Day</p>	<p>Aldebaran 0.6° S of Moon 5h</p> <p>Ian Shelton discovers 1st "Canadian" supernova, 10 years ago</p>
 <p>Set 7:18 7:12 Rise 19:09 19:06</p>	 <p>Set 7:41 7:39 Rise 20:12 20:05</p>	 <p>Set 8:05 8:06 Rise 21:15 21:04</p>	 <p>Set 8:30 8:35 Rise 22:19 22:05</p>	 <p>Set 8:57 9:05 Rise 23:24 23:05</p>	 <p>Set 9:28 9:39 Rise -- --</p>	<p>John Glenn: 1st US manned orbital flight, 35 years ago</p>




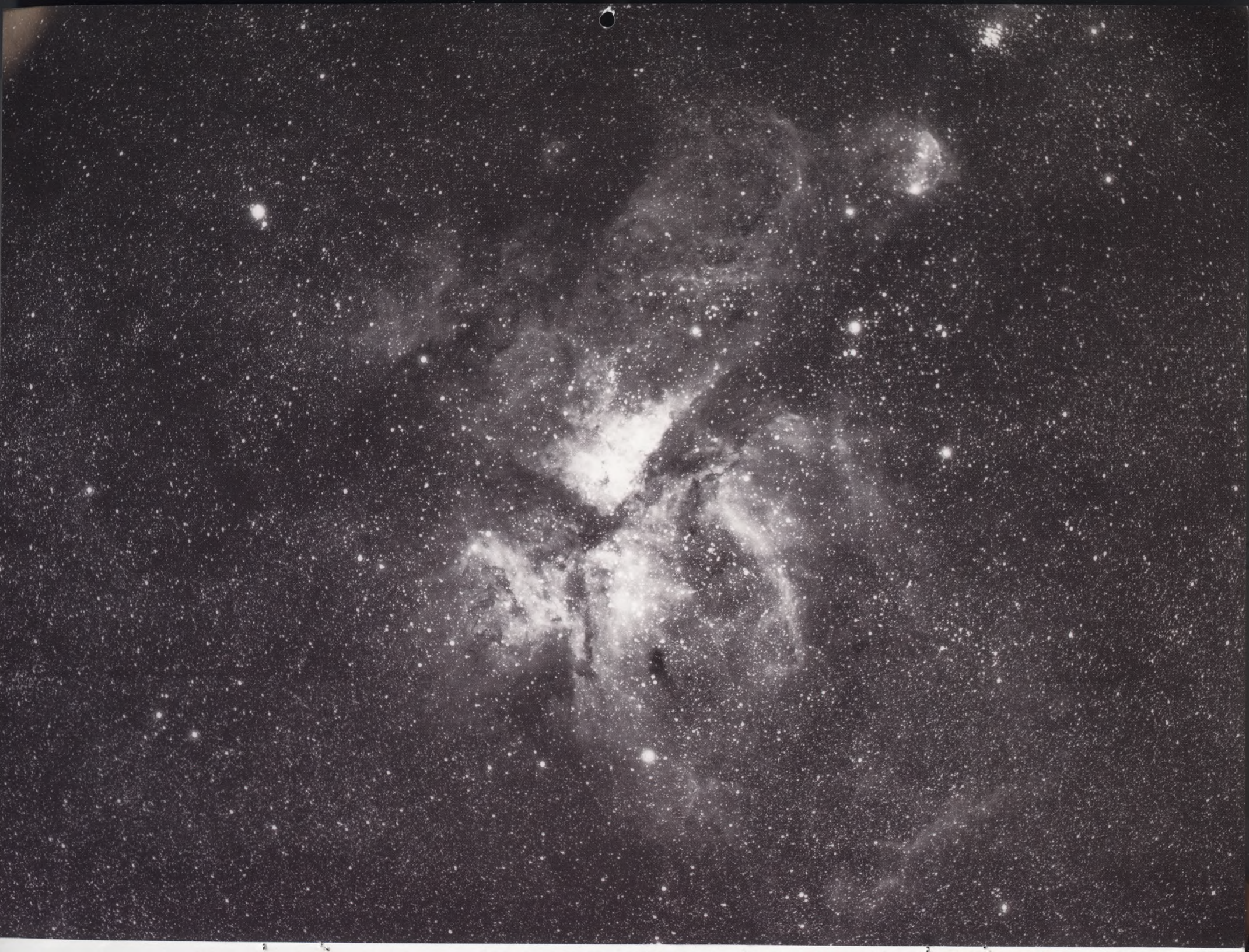
MARCH

The March of Comets

In March of 1996, Hyakutake 1996B most closely approached Earth, just as Hale-Bopp will do one year later. The top left portrait of 1996B shows the spike emanating from the nucleus. That comet's fluorescence and tail structure dominate the photos at top right and bottom left. The bottom right photo comes from April when our perspective changed to show both gas and dust tails to best advantage.

Photo credits (clockwise from bottom left): John Mirtle, Murray Paulson, Leo Enright, Murray Paulson

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 <p>Rise 1:31 1:08</p> <p>Set 10:48 11:03</p> <p>3rd Quarter 4:38</p> <p>2</p>	 <p>Rise 2:32 2:07</p> <p>Set 11:40 11:55</p> <p>3</p>	 <p>Rise 3:27 3:03</p> <p>Set 12:41 12:55</p> <p>4</p>	 <p>Rise 4:17 3:55</p> <p>Set 13:51 14:01</p> <p>5</p>	 <p>Rise 5:01 4:42</p> <p>Set 15:07 15:14</p> <p>6</p>	 <p>Rise 5:39 5:25</p> <p>Set 16:27 16:29</p> <p>7</p>	 <p>Rise 6:13 6:04</p> <p>Set 17:48 17:46</p> <p>New Moon 20:14</p> <p>Sunrise 6:29 6:25</p> <p>Sunset 17:53 17:57</p> <p>8</p>
 <p>Rise 6:44 6:40</p> <p>Set 19:09 19:02</p> <p>9</p>	 <p>Rise 7:15 7:15</p> <p>Set 20:29 20:17</p> <p>10</p>	 <p>Rise 7:46 7:51</p> <p>Set 21:45 21:29</p> <p>11</p>	 <p>Rise 8:19 8:28</p> <p>Set 22:58 22:38</p> <p>12</p>	 <p>Rise 8:55 9:07</p> <p>Set -- 23:42</p> <p>13</p>	 <p>Set 0:05 --</p> <p>Rise 9:35 9:49</p> <p>14</p>	 <p>Set 1:05 0:42</p> <p>Rise 10:19 10:34</p> <p>1st Quarter 19:06</p> <p>Sunrise 6:13 6:12</p> <p>Sunset 18:05 18:06</p> <p>15</p>
<p>Nicholas Copernicus' 1st recorded observation, 500 years ago</p>	<p>Uranian rings discovered, 20 years ago</p> <p>Saturn 1.4° S of Moon 3h</p>			<p>V. Tereshkova born 60 years ago, 1st woman in space</p>	<p>Aldebaran 0.5° S of Moon 13h</p>	<p>Total Solar Eclipse (visible in N.E. Asia)</p>
 <p>Set 1:59 1:35</p> <p>Rise 11:08 11:23</p> <p>16</p>	 <p>Set 2:46 2:23</p> <p>Rise 12:01 12:16</p> <p>17</p>	 <p>Set 3:26 3:05</p> <p>Rise 12:58 13:10</p> <p>18</p>	 <p>Set 4:00 3:42</p> <p>Rise 13:57 14:06</p> <p>19</p>	 <p>Set 4:30 4:16</p> <p>Rise 14:57 15:03</p> <p>20</p>	 <p>Set 4:57 4:46</p> <p>Rise 15:58 16:01</p> <p>21</p>	 <p>Set 5:22 5:15</p> <p>Rise 17:01 16:59</p> <p>Sunrise 5:58 5:59</p> <p>Sunset 18:17 18:15</p> <p>22</p>
	<p>Mars at opposition 2h</p>			<p>Spring Equinox 7:55</p> <p>Mars closest approach 11h</p>		
 <p>Set 5:46 5:42</p> <p>Rise 18:03 17:58</p> <p>Full Moon 23:45</p> <p>23</p>	 <p>Set 6:10 6:10</p> <p>Rise 19:07 18:58</p> <p>24</p>	 <p>Set 6:34 6:38</p> <p>Rise 20:11 19:58</p> <p>25</p>	 <p>Set 7:01 7:08</p> <p>Rise 21:16 20:59</p> <p>26</p>	 <p>Set 7:31 7:41</p> <p>Rise 22:21 22:00</p> <p>27</p>	 <p>Set 8:05 8:18</p> <p>Rise 23:24 23:01</p> <p>28</p>	 <p>Set 8:46 9:00</p> <p>Rise -- --</p> <p>Sunrise 5:42 5:46</p> <p>Sunset 18:28 18:24</p> <p>29</p>
<p>Partial Lunar Eclipse</p>					<p>Good Friday</p>	
 <p>Rise 0:25 0:00</p> <p>Set 9:34 9:49</p> <p>30</p>	 <p>Rise 1:21 0:57</p> <p>Set 10:30 10:45</p> <p>3rd Quarter 14:38</p> <p>31</p>					
<p>Easter Sunday</p>	<p>Comet Hale-Bopp C/1995 O1 at perihelion 22h</p>					



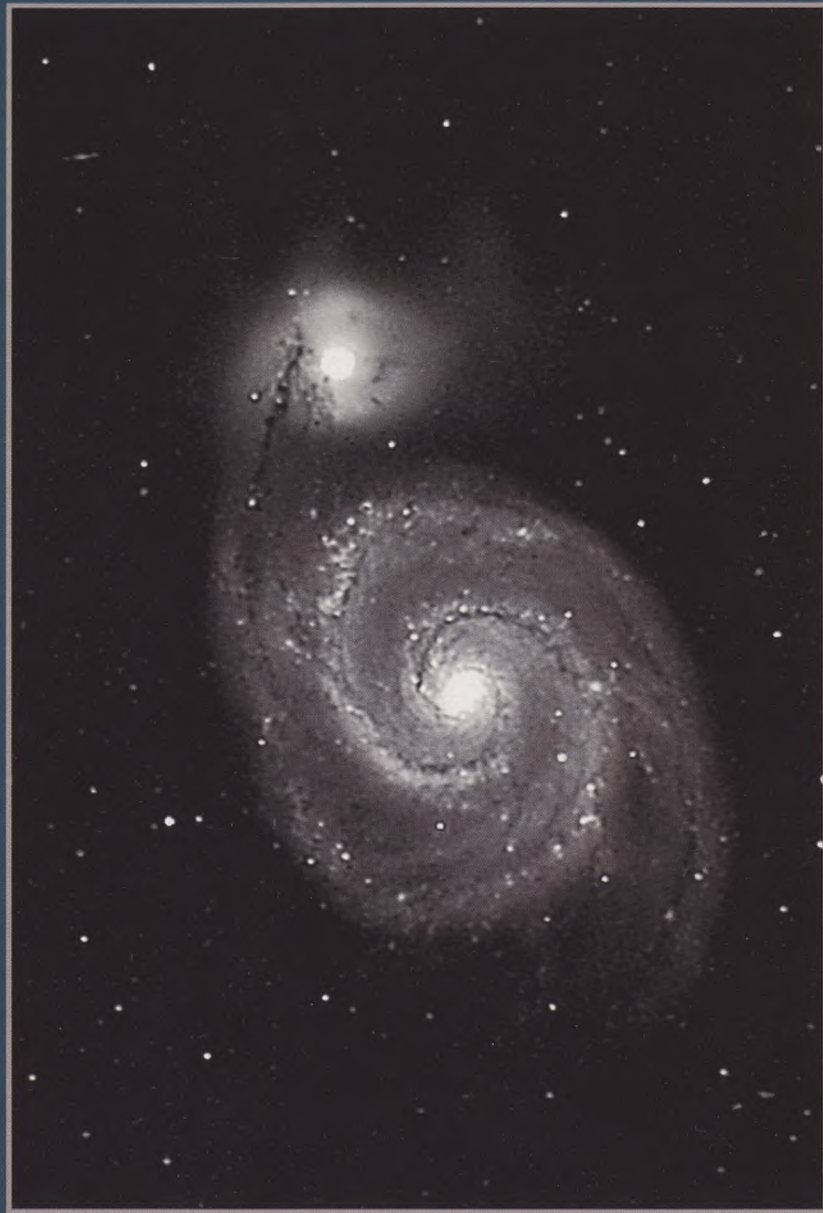
APRIL

The Great Keyhole Nebula (NGC 3372) in Carina

Resembling the Trifid, but on a much vaster scale, the southern hemisphere's Keyhole is named for the dark lanes that divide its sweeping emission clouds. Its intense luminosity is driven by Eta Carinae, its most mysterious and intriguing star, a gigantic variable that may be fated to end its life as a supernova.

Photo by Rajiv Gupta

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<p><i>Daylight Savings Time Begins 2h</i></p>				<p><i>Occultation Aldebaran 0.5° S of Moon (visible in W. of N. America) 23h</i></p>		<p><i>International Astronomy Day</i></p>																																																																																											
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M A Y

A Gallery of Spiral Galaxies

These detailed CCD images reveal intricate features of the "black eye" around the nucleus of M64 and dark lanes in M51's arms, including the extended "bridge" over the retreating companion, NGC 5195. The images also bring out sharp turns in the spiral arms of M51 and of IC 342, the large, faint face-on galaxy in Camelopardalis.

Photos by Jack Newton

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The given times must be adjusted for location. Instructions are given in the back of the calendar.</p> <p>Please see back pages for additional information on the photos and this calendar.</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	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		 Rise Set West 3:09 14:01 East 2:56 14:04 1	 Rise Set 3:41 15:18 3:32 15:16 2	 Rise Set 4:10 16:36 4:06 16:28 3 Sunrise 5:29 5:46 Sunset 20:25 20:08
	 Rise Set West 4:39 17:53 East 4:40 17:41 4 Saturn 0.8° S of Moon Occultation 11h η-Aquarid meteors peak 16h	 Rise Set 5:10 19:09 5:15 18:53 5	 Rise Set 5:43 20:23 5:51 20:03 New Moon 16:46 6	 Rise Set 6:19 21:32 6:31 21:09 7	 Rise Set 7:01 22:35 7:15 22:11 8 Occultation Aldebaran 0.6° S of Moon (visible in E. of N. America) 9h	 Rise Set 7:47 23:31 8:03 23:07 9
 Set Rise 0:19 9:35 -- 9:49 11 Mother's Day	 Set Rise 0:59 10:34 0:39 10:45 12	 Set Rise 1:33 11:34 1:16 11:43 13	 Set Rise 2:03 12:35 1:49 12:41 1st Quarter 6:55 14	 Set Rise 2:29 13:37 2:19 13:39 15	 Set Rise 2:54 14:39 2:47 14:37 16 Mars 2° N of Moon 11h	 Set Rise 3:17 15:42 3:14 15:36 17 Sunrise 5:07 5:29 Sunset 20:47 20:25
 Set Rise 3:41 16:46 3:41 16:36 18	 Set Rise 4:06 17:52 4:10 17:38 19 Victoria Day	 Set Rise 4:33 18:58 4:41 18:40 20	 Set Rise 5:04 20:05 5:15 19:44 21 First observation with 40-inch Yerkes refractor, 100 years ago	 Set Rise 5:41 21:10 5:54 20:46 Full Moon 5:13 22 Mercury Greatest Elongation W (25°)	 Set Rise 6:25 22:12 6:40 21:47 23	 Set Rise 7:17 23:07 7:32 22:43 24 Sunrise 4:58 5:22 Sunset 20:56 20:32
 Set Rise 8:17 23:56 8:31 23:34 25 Pluto at opposition 5h	 Set Rise 9:24 -- 9:36 -- 26	 Rise Set 0:37 10:36 0:19 10:44 27	 Rise Set 1:13 11:50 0:59 11:54 28	 Rise Set 1:45 13:06 1:35 13:05 3rd Quarter 3:51 29	 Rise Set 2:14 14:21 2:09 14:16 30	 Rise Set 2:43 15:37 2:42 15:27 31 Sunrise 4:52 5:17 Sunset 21:04 20:39 Saturn 0.5° S of Moon 22h





JULY

The Lagoon Nebula (M8) and Region

The bright Lagoon, which is a naked-eye object, is here contrasted with faint blue reflection and red emission nebulae (IC 1274, 1275, 4685) that seem to be its associates. Note the dark band of matter that envelopes them all and includes B91 at the upper left but just misses the globular cluster NGC 6544 at the bottom.

Photo by Rajiv Gupta

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The given times must be adjusted for location. Instructions are given in the back of the calendar.</p> <p>Please see back pages for additional information on the photos and this calendar.</p>		<p>☉ Rise 2:53 3:06 Set 18:10 17:47</p> <p>1</p> <p><i>Canada Day</i> Jocelyn Bell discovers 1st pulsar, 30 years ago</p>	<p>☉ Rise 3:34 3:48 Set 19:11 18:46</p> <p>2</p> <p>Aldebaran 0.6° S of Moon 0h</p>	<p>☉ Rise 4:20 4:35 Set 20:05 19:41</p> <p>3</p>	<p>☉ Rise 5:11 5:27 Set 20:52 20:29 New Moon 14:40</p> <p>4</p>	<p>☉ Rise 6:08 6:22 Set 21:32 21:12</p> <p>5</p> <p>Sunrise 4:53 5:20 Sunset 21:16 20:49</p>
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<p>☉ Rise 0:22 0:30 Set 14:54 14:35</p> <p>27</p>	<p>☉ Rise 0:56 1:07 Set 16:02 15:40</p> <p>28</p> <p>S. δ-Aquarid meteors peak 12h</p>	<p>☉ Rise 1:34 1:48 Set 17:04 16:40</p> <p>29</p> <p>Aldebaran 0.4° S of Moon 6h α-Capricornid meteors peak 13h Uranus at opposition 14h</p>	<p>☉ Rise 2:18 2:33 Set 18:00 17:36</p> <p>30</p>	<p>☉ Rise 3:07 3:22 Set 18:49 18:26</p> <p>31</p>	<p>JUNE</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</p>	<p>AUGUST</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>



AUGUST

Van Gogh's Ear (NGC 6888)

More commonly known as the Crescent Nebula, this shock wave from a Wolf-Rayet star seems to apotheosize the great painter's missing ear. An OIII filter works best visually, and photography brings out other swirling nebulosities in this area of Cygnus.

Photo by John Mirtle

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
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<p>☉ Rise 5:59 6:08 Set 20:38 20:23 New Moon 4:14</p> <p>3</p>	<p>☉ Rise 7:00 7:07 Set 21:06 20:54</p> <p>4</p>	<p>☉ Rise 8:02 8:05 Set 21:31 21:23</p> <p>5</p>	<p>☉ Rise 9:04 9:03 Set 21:54 21:50</p> <p>6</p>	<p>☉ Rise 10:06 10:01 Set 22:17 22:17</p> <p>7</p>	<p>☉ Rise 11:08 10:59 Set 22:41 22:44</p> <p>8</p>	<p>☉ Rise 12:10 11:58 Set 23:06 23:12</p> <p>Sunrise 5:38 5:55 Sunset 20:32 20:15</p> <p>9</p>
<p>Mercury Greatest Elongation E (27°)</p>	<p>Civic Holiday</p>	<p>Mercury 1.0° S of Moon 14h</p>	<p>Venus 1.6° N of Moon 4h</p>	<p>Starfest, Mount Forest, Ont. (through August 10)</p>		<p>Jupiter at opposition 9h</p>
<p>☾ Rise 13:14 12:58 Set 23:34 23:44</p> <p>10</p>	<p>☾ Rise 14:18 13:58 Set -- -- 1st Quarter 8:42</p> <p>11</p>	<p>☾ Set 0:07 0:19 Rise 15:22 14:59</p> <p>12</p>	<p>☾ Set 0:46 1:00 Rise 16:24 15:59</p> <p>13</p>	<p>☾ Set 1:33 1:48 Rise 17:22 16:58</p> <p>14</p>	<p>☾ Set 2:29 2:44 Rise 18:16 17:52</p> <p>15</p>	<p>☾ Set 3:35 3:48 Rise 19:03 18:42</p> <p>Sunrise 5:49 6:03 Sunset 20:18 20:05</p> <p>16</p>
		<p>Otto Struve born 100 years ago, discoverer of interstellar hydrogen</p> <p>N. δ-Aquarid meteors peak 3h Perseid meteors peak 13h</p>				
<p>☾ Set 4:49 4:58 Rise 19:43 19:27</p> <p>17</p>	<p>☾ Set 6:08 6:13 Rise 20:19 20:08 Full Moon 6:55</p> <p>18</p>	<p>☾ Set 7:29 7:29 Rise 20:52 20:45</p> <p>19</p>	<p>☾ Set 8:51 8:46 Rise 21:22 21:20</p> <p>20</p>	<p>☾ Set 10:10 10:01 Rise 21:53 21:55</p> <p>21</p>	<p>☾ Set 11:28 11:14 Rise 22:24 22:30</p> <p>22</p>	<p>☾ Set 12:42 12:24 Rise 22:58 23:08</p> <p>Sunrise 6:00 6:11 Sunset 20:04 19:53</p> <p>23</p>
<p>2 Shadows on Jupiter 0:43</p>			<p>Voyager 2 launched, 20 years ago</p>	<p>Saturn 0.008° N of Moon 21h</p>		
<p>☾ Set 13:52 13:31 Rise 23:35 23:48 3rd Quarter 22:23</p> <p>24</p>	<p>☾ Set 14:57 14:34 Rise -- --</p> <p>25</p>	<p>☾ Rise 0:17 0:32 Set 15:55 15:31</p> <p>26</p>	<p>☾ Rise 1:04 1:20 Set 16:47 16:23</p> <p>27</p>	<p>☾ Rise 1:57 2:11 Set 17:31 17:09</p> <p>28</p>	<p>☾ Rise 2:53 3:06 Set 18:08 17:49</p> <p>29</p>	<p>☾ Rise 3:52 4:02 Set 18:41 18:25</p> <p>Sunrise 6:11 6:20 Sunset 19:49 19:40</p> <p>30</p>
	<p>Aldebaran 0.3° S of Moon 12h</p>		<p>Mount Kobau Star Party, B.C. (through August 31)</p>		<p>Nova East, Fundy Nat. Park (through September 1)</p>	
<p>☉ Rise 4:53 5:00 Set 19:09 18:57</p> <p>31</p>						
<p>α-Aurigid meteors peak 5h</p>						



SEPTEMBER

M33

The spiral structure of the Pinwheel Galaxy in Triangulum is evident in this detailed portrait, which also shows a variety of HII regions such as NGC 604 at the 2 o'clock position from the nucleus. Although a large object of a degree in diameter, its low surface brightness challenges the naked eye under darkest skies.

Photo by John Mirtle

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<p>The given times must be adjusted for location. Instructions are given in the back of the calendar.</p> <p>Please see back pages for additional information on the photos and this calendar.</p>	<p>West East Rise 5:54 5:58 Set 19:35 19:26 New Moon 19:51</p> <p>1</p> <p>Labour Day</p>	<p>Rise 6:56 6:56 Set 19:59 19:54</p> <p>2</p>	<p>Rise 7:57 7:54 Set 20:22 20:20</p> <p>3</p>	<p>Rise 8:59 8:52 Set 20:45 20:47</p> <p>4</p>	<p>Rise 10:02 9:51 Set 21:10 21:15</p> <p>5</p> <p>Voyager 1 launched, 20 years ago</p>	<p>Rise 11:04 10:49 Set 21:37 21:45</p> <p>6</p> <p>Sunrise 6:22 6:28 Sunset 19:34 19:28</p> <p>Venus 1.9° N of Spica 0h</p>
<p>West East Rise 12:07 11:49 Set 22:07 22:19</p> <p>7</p>	<p>Rise 13:10 12:48 Set 22:43 22:57</p> <p>8</p>	<p>Rise 14:11 13:47 Set 23:25 23:40 1st Quarter 21:31</p> <p>9</p>	<p>Rise 15:09 14:45 Set -- --</p> <p>10</p>	<p>Set 0:16 0:31 Rise 16:03 15:39</p> <p>11</p>	<p>Set 1:15 1:29 Rise 16:52 16:30</p> <p>12</p>	<p>Set 2:23 2:34 Rise 17:35 17:16</p> <p>13</p> <p>Sunrise 6:32 6:36 Sunset 19:18 19:14</p>
<p>Set 3:38 3:45 Rise 18:12 17:58</p> <p>14</p>	<p>Set 4:58 5:00 Rise 18:47 18:37</p> <p>15</p>	<p>Set 6:19 6:17 Rise 19:18 19:14 Full Moon 14:50</p> <p>16</p>	<p>Set 7:41 7:34 Rise 19:49 19:50</p> <p>17</p>	<p>Set 9:03 8:51 Rise 20:21 20:26</p> <p>18</p>	<p>Set 10:21 10:05 Rise 20:55 21:04</p> <p>19</p>	<p>Set 11:36 11:16 Rise 21:32 21:44</p> <p>20</p> <p>Sunrise 6:43 6:45 Sunset 19:02 19:01</p>
<p>Set 12:45 12:23 Rise 22:14 22:28</p> <p>21</p> <p>Aldebaran 0.3° S of Moon 19h</p>	<p>Set 13:48 13:24 Rise 23:00 23:16</p> <p>22</p> <p>Fall Equinox 18:56</p>	<p>Set 14:43 14:19 Rise 23:52 -- 9:35 3rd Quarter</p> <p>23</p> <p>Mercury Greatest Elongation W (18°)</p>	<p>Rise -- 0:07 Set 15:30 15:07</p> <p>24</p>	<p>Rise 0:47 1:01 Set 16:09 15:49</p> <p>25</p> <p>Saturn 0.2° S of Moon 5h</p>	<p>Rise 1:45 1:57 Set 16:43 16:26</p> <p>26</p>	<p>Rise 2:45 2:54 Set 17:13 16:59</p> <p>27</p> <p>Sunrise 6:54 6:53 Sunset 18:46 18:48</p>
<p>West East Rise 3:47 3:52 Set 17:39 17:29</p> <p>28</p> <p>Alouette 1, 1st Canadian satellite, launched 35 years ago</p>	<p>Rise 4:48 4:50 Set 18:04 17:57</p> <p>29</p>	<p>Rise 5:50 5:48 Set 18:27 18:24</p> <p>30</p>			<p>AUGUST</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>OCTOBER</p> <p>S M T W T F S</p> <p>1 2 3 4</p> <p>5 6 7 8 9 10 11</p> <p>12 13 14 15 16 17 18</p> <p>19 20 21 22 23 24 25</p> <p>26 27 28 29 30 31</p>



OCTOBER

The Northern Milky Way around Deneb and Gamma Cygni
 Just below a star cloud in eastern Cygnus, the North American Nebula (NGC 7000) stands out as a showpiece. To the astrophotographer, however, it is only the most concentrated instance of hydrogen-alpha emissions which circulate throughout the area in subtle and then unexpectedly bright pools and arcs.
 Photo by Giovanni Andreis

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The given times must be adjusted for location. Instructions are given in the back of the calendar.</p> <p>Please see back pages for additional information on the photos and this calendar.</p>	<p>SEPTEMBER</p> <p>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</p>	<p>NOVEMBER</p> <p>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</p>	<p>West East</p> <p>Rise 6:52 6:46</p> <p>Set 18:50 18:51</p> <p>New Moon</p> <p>1</p>	<p>Rise 7:54 7:44</p> <p>Set 19:14 19:19</p> <p>2</p>	<p>Rise 8:57 8:43</p> <p>Set 19:40 19:48</p> <p>3</p>	<p>Rise 10:00 9:43</p> <p>Set 20:10 20:20</p> <p>4</p> <p>Sunrise 7:06 7:02</p> <p>Sunset 18:31 18:35</p>
<p>West East</p> <p>Rise 11:03 10:42</p> <p>Set 20:43 20:56</p> <p>5</p>	<p>Rise 12:04 11:41</p> <p>Set 21:22 21:37</p> <p>6</p>	<p>Rise 13:03 12:38</p> <p>Set 22:09 22:25</p> <p>7</p>	<p>Rise 13:57 13:33</p> <p>Set 23:04 23:19</p> <p>8</p>	<p>Rise 14:46 14:23</p> <p>Set -- --</p> <p>1st Quarter 8:22</p> <p>9</p>	<p>Set 0:06 0:19</p> <p>Rise 15:29 15:09</p> <p>10</p>	<p>Set 1:16 1:25</p> <p>Rise 16:08 15:51</p> <p>11</p> <p>Sunrise 7:17 7:11</p> <p>Sunset 18:15 18:22</p>
<p>West East</p> <p>Set 2:31 2:36</p> <p>Rise 16:42 16:30</p> <p>12</p>	<p>Set 3:49 3:50</p> <p>Rise 17:14 17:07</p> <p>13</p>	<p>Set 5:10 5:05</p> <p>Rise 17:45 17:42</p> <p>14</p>	<p>Set 6:31 6:21</p> <p>Rise 18:16 18:18</p> <p>Full Moon 23:46</p> <p>15</p>	<p>Set 7:52 7:37</p> <p>Rise 18:48 18:55</p> <p>16</p>	<p>Set 9:10 8:52</p> <p>Rise 19:25 19:35</p> <p>17</p>	<p>Set 10:25 10:03</p> <p>Rise 20:05 20:18</p> <p>18</p> <p>Sunrise 7:29 7:20</p> <p>Sunset 18:01 18:10</p>
<p>West East</p> <p>Set 11:33 11:09</p> <p>Rise 20:51 21:06</p> <p>19</p>	<p>Set 12:33 12:09</p> <p>Rise 21:42 21:57</p> <p>20</p>	<p>Set 13:25 13:02</p> <p>Rise 22:37 22:52</p> <p>21</p>	<p>Set 14:09 13:47</p> <p>Rise 23:36 23:48</p> <p>22</p>	<p>Set 14:45 14:27</p> <p>Rise -- --</p> <p>3rd Quarter 0:48</p> <p>23</p>	<p>Rise 0:36 0:46</p> <p>Set 15:16 15:01</p> <p>24</p>	<p>Rise 1:37 1:44</p> <p>Set 15:44 15:32</p> <p>25</p> <p>Sunrise 7:41 7:29</p> <p>Sunset 17:47 17:58</p>
<p>Occultation Aldebaran 0.3° S of Moon (visible central N. America) 4h</p> <p>West East</p> <p>Rise 1:39 1:42</p> <p>Set 15:08 15:01</p> <p>26</p>	<p>Rise 2:41 2:40</p> <p>Set 15:32 15:28</p> <p>27</p>	<p>Rise 3:43 3:38</p> <p>Set 15:55 15:54</p> <p>28</p>	<p>Rise 4:45 4:37</p> <p>Set 16:18 16:22</p> <p>29</p>	<p>Rise 5:48 5:36</p> <p>Set 16:44 16:50</p> <p>30</p>	<p>Rise 6:52 6:36</p> <p>Set 17:12 17:22</p> <p>New Moon 5:01</p> <p>31</p>	<p>Daylight Savings Time Ends 2h</p> <p>Venus 2° S of Mars 17h</p>
<p>Daylight Savings Time Ends 2h</p> <p>Venus 2° S of Mars 17h</p>		<p>Orionid meteors peak 19h</p>	<p>Saturn 0.4° S of Moon 13h</p>	<p>Venus 1.7° N of Antares 17h</p>	<p>Saturn at opposition 23h</p>	<p>Halloween</p>



NOVEMBER

The Pleiades Cluster, M45

To the observer who has clean optics and a transparent sky, the reflection nebulosity appears as a grey fog. The Pleiades have meant good luck to many cultures. M45 is called Subaru by the Japanese, who hope this asterism will shine beneficently on their new Subaru Observatory in Mauna Kea.

Photo by Peter Ceravolo

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p><i>The given times must be adjusted for location. Instructions are given in the back of the calendar.</i></p> <p><i>Please see back pages for additional information on the photos and this calendar.</i></p>	<p>OCTOBER</p> <p>S M T W T F S</p> <p>1 2 3 4</p> <p>5 6 7 8 9 10 11</p> <p>12 13 14 15 16 17 18</p> <p>19 20 21 22 23 24 25</p> <p>26 27 28 29 30 31</p>	<p>DECEMBER</p> <p>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> Rise 7:56 7:36 Set 17:44 17:56 1</p> <p>Sunrise 6:53 6:39 Sunset 16:34 16:48</p> <p><i>Asteroid Chiron discovered, 20 years ago</i></p>
<p> Rise <i>West East</i> Set 18:22 18:36 2</p>	<p> Rise 9:59 9:34 Set 19:06 19:22 3</p>	<p> Rise 10:55 10:30 Set 19:58 20:13 4</p>	<p> Rise 11:45 11:21 Set 20:57 21:11 5</p>	<p> Rise 12:29 12:08 Set 22:03 22:14 6</p>	<p> Rise 13:08 12:50 Set 23:14 23:21 7 <i>1st Quarter 16:43</i></p>	<p> Rise 13:42 13:29 Set -- -- 8</p> <p>Sunrise 7:05 6:48 Sunset 16:22 16:39</p>
<p><i>S. Taurid meteors peak 18h</i></p>	<p><i>2 Shadows on Jupiter (visible N. America except W.) 19:38</i></p>			<p><i>Venus Greatest Elongation E (47°)</i></p>		
<p> Set <i>West East</i> Rise 14:14 14:05 9</p>	<p> Set 1:46 1:44 Rise 14:43 14:39 10</p>	<p> Set 3:04 2:57 Rise 15:13 15:13 11</p>	<p> Set 4:23 4:11 Rise 15:43 15:48 12</p>	<p> Set 5:42 5:26 Rise 16:17 16:25 13</p>	<p> Set 6:59 6:38 Rise 16:55 17:07 14 <i>Full Moon 9:12</i></p>	<p> Set 8:11 7:48 Rise 17:38 17:52 15</p> <p>Sunrise 7:17 6:58 Sunset 16:12 16:31</p>
	<p><i>3 Shadows on Jupiter (visible N. America except E.) 21:34</i></p>	<p><i>Remembrance Day</i></p>	<p><i>N. Taurid meteors peak 18h</i></p>	<p><i>Mercury 2° N of Antares 22h</i></p>		<p><i>Aldebaran 0.5° S of Moon 14h</i></p>
<p> Set <i>West East</i> Rise 18:27 18:43 16</p>	<p> Set 10:15 9:50 Rise 19:22 19:37 17</p>	<p> Set 11:03 10:41 Rise 20:21 20:34 18</p>	<p> Set 11:44 11:24 Rise 21:22 21:33 19</p>	<p> Set 12:18 12:01 Rise 22:24 22:32 20</p>	<p> Set 12:47 12:34 Rise 23:27 23:31 21 <i>3rd Quarter 18:58</i></p>	<p> Set 13:13 13:03 Rise -- -- 22</p> <p>Sunrise 7:28 7:07 Sunset 16:04 16:25</p>
	<p><i>Leonid meteors peak 14h</i></p>					
<p> Rise <i>West East</i> Set 13:37 13:31 23</p>	<p> Rise 1:31 1:28 Set 13:59 13:57 24</p>	<p> Rise 2:33 2:26 Set 14:22 14:24 25</p>	<p> Rise 3:36 3:25 Set 14:47 14:52 26</p>	<p> Rise 4:40 4:25 Set 15:13 15:22 27</p>	<p> Rise 5:44 5:26 Set 15:44 15:55 28</p>	<p> Rise 6:48 6:27 Set 16:19 16:33 29 <i>New Moon 21:14</i> Sunrise 7:39 7:16 Sunset 15:58 16:21</p>
					<p><i>Mercury Greatest Elongation E (22°)</i></p>	
<p> Rise <i>West East</i> Set 17:02 17:17 30</p>						



DECEMBER

Another Eagle Nebula (IC 2177)

In addition to the more widely known Eagle Nebula in Serpens, there is this much larger object that straddles the Canis Major/Monoceros border and features a bright "head" (vdB93) just above right centre, a long "S"-shaped wing defined by a dark lane on its leading edge, and open clusters (NGC 2335, 2343) at the top of the field.

Photo by Rajiv Gupta

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>The given times must be adjusted for location. Instructions are given in the back of the calendar.</p> <p>Please see back pages for additional information on the photos and this calendar.</p>	 Rise 8:50 Set 17:52 West 8:25 East 18:08 1	 Rise 9:44 Set 18:50 9:19 19:04 2	 Rise 10:31 Set 19:54 10:08 20:07 3	 Rise 11:11 Set 21:04 10:52 21:13 4	 Rise 11:47 Set 22:17 11:32 22:22 5	 Rise 12:18 Set 23:32 12:08 23:32 6 Sunrise 7:48 7:24 Sunset 15:54 16:19
 Rise 12:47 Set 1st Quarter 12:41 -- 1:09 7	 Set 0:48 Rise 13:15 0:43 13:14 8	 Set 2:04 Rise 13:44 1:55 13:47 9	 Set 3:21 Rise 14:15 3:07 14:22 10	 Set 4:36 Rise 14:49 4:18 15:00 11	 Set 5:50 Rise 15:28 5:28 15:42 12	 Set 6:59 Rise 16:14 Full Moon 21:37 16:29 21:37 Sunrise 7:55 7:30 Sunset 15:53 16:19
Apollo 17 launched 25 years ago, last lunar landing mission		Saturn 0.2° S of Moon 1h		Venus Greatest Brilliancy 17h	Aldebaran 0.5° S of Moon Occultation 23h	Geminid meteors peak 23h
 Set 8:01 Rise 17:06 7:36 17:22 14	 Set 8:54 Rise 18:03 8:30 18:18 15	 Set 9:39 Rise 19:05 9:17 19:17 16	 Set 10:17 Rise 20:08 9:58 20:17 17	 Set 10:49 Rise 21:11 10:34 21:17 18	 Set 11:16 Rise 22:14 11:05 22:16 19	 Set 11:41 Rise 23:16 11:33 23:15 20 Sunrise 8:00 7:35 Sunset 15:55 16:21
	Mars 1.6° S of Neptune 13h					
 Set 12:04 Rise 3rd Quarter 12:00 -- 16:43 21	 Rise 0:19 Set 12:27 0:13 12:26 22	 Rise 1:21 Set 12:50 1:12 12:53 23	 Rise 2:24 Set 13:15 2:11 13:22 24	 Rise 3:28 Set 13:43 3:11 13:53 25	 Rise 4:32 Set 14:16 4:12 14:29 26	 Rise 5:36 Set 14:55 5:13 15:10 27 Sunrise 8:03 7:38 Sunset 16:00 16:25
Winter Solstice 14:07	Venus 1.1° N of Mars Ursid meteors peak 5h 15h			Christmas Day	Mars 0.6° S of Uranus 14h	Mercury 2° S of Moon 21h
 Rise 6:38 Set 15:42 6:13 15:58 28	 Rise 7:35 Set 16:37 New Moon 7:10 16:53 11:56 29	 Rise 8:27 Set 17:41 8:03 17:54 30	 Rise 9:11 Set 18:51 8:51 19:01 31		NOVEMBER 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	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
			Venus 1.3° S of Moon 7h			

The Royal Astronomical Society of Canada Observer's Calendar

How to Use this Calendar

A pictorial representation of the Moon's phase at midday is given in each daily box. The size of the Moon in the Calendar varies from day to day reflecting the change in the apparent size of the Moon in the sky as it moves closer to or further from the Earth. The distance between the left edge of the Moon and the left border of the box can be used as an aid in discerning the size of the Moon.

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. Special astronomical events, such as eclipses, meteor showers, occultations, interesting planetary events, and equinoxes and solstices, are given at the bottom of the boxes.

The Calendar lists events observable in some part of Canada. Days on which particularly interesting phenomena occur are highlighted with a coloured date. Detailed information on all events, including their visibility from particular locations, may be determined by consulting the *RASC Observer's Handbook*.

Adjusting Times for Actual Location

All times are given in the 24-hour clock and are adjusted for Daylight Savings Time. Moon phases are given in Eastern time, and special events in Central 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 (eg. Pacific time is Central time minus 2 hours).

Two sets of rise and set times are given to accommodate observers across Canada. The *West* times displayed are computed for location 51° N latitude and 105° W longitude. The *East* times are for 45° N, 75° W. The actual times for a given location must be calculated using the table above.

The table gives a correction in minutes to the tabulated rise and set times for each RASC centre. In the column labelled **Correction**, an entry such as *East + 25* means add 25 minutes to the displayed *East* time. This computed time is an approximation. In the column labelled **Accuracy**, the maximum error in minutes for Moon rise and set using this method is indicated. The error for Sun rise and set is less.

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

Location	Correction	Accuracy	Latitude
Victoria	<i>West + 13</i>	19	47.8
Vancouver	<i>West + 12</i>	13	49.2
Okanagan	<i>West - 2</i>	9	49.7
Calgary	<i>West + 36</i>	2	51.1
Edmonton	<i>West + 34</i>	15	53.6
Saskatoon	<i>West + 67</i> ⁽¹⁾	5	52.1
Regina	<i>West + 58</i> ⁽¹⁾	3	50.5
Winnipeg	<i>West + 29</i>	7	49.9
Thunder Bay	<i>West + 57</i>	16	48.4
Windsor	<i>East + 32</i>	15	42.3
Sarnia	<i>East + 30</i>	12	42.9
London	<i>East + 25</i>	12	43.0
Kitchener	<i>East + 22</i>	10	43.4
Hamilton	<i>East + 20</i>	11	43.2
Toronto	<i>East + 18</i>	7	43.7
Niagara	<i>East + 16</i>	11	43.1
Kingston	<i>East + 6</i>	4	44.2
Ottawa	<i>East + 3</i>	3	45.4
Montreal	<i>East - 6</i>	3	45.5
Quebec	<i>East - 15</i>	9	46.8
Halifax	<i>East + 14</i>	6	44.6
St. John's	<i>East + 1</i>	17	47.5

⁽¹⁾ Subtract 60 min. from these computed times in the summer.

For other locations, 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. A table with values for various locations can be found in the *RASC Observer's Handbook*. This correction factor should be added to the displayed *West* or *East* time corresponding to the closest of these two locations to the user's site. The accuracy in minutes for Moon rise and set can be calculated by multiplying the difference in latitude between the user's location and that of the *West* or *East* site used by 5 and adding 0.2 times the difference in longitude.

Further improvement in accuracy may be obtained for some sites by interpolating or extrapolating the *West* and *East* times depending on the user's latitude. Latitudes of all RASC Centres are given in the table. For example, the latitude of Thunder Bay is approximately midway between those of the *West* and *East* sites. An observer in Thunder Bay can improve accuracy to 3 minutes by averaging the given *West* and *East* times and then adding the correction factor for Thunder Bay, which is 57 minutes.

The Royal Astronomical Society of Canada

Since it was founded in 1890, the RASC has filled a special role in astronomy. Its amateur and professional astronomers have made significant observational contributions to astronomical research. The RASC also takes pride in the role it plays in educating the general public about astronomy. Today the RASC consists of over 3000 members, most of whom are attached to one of its 23 Centres across Canada.

National Publications

The *RASC Observer's Handbook* has been published since 1908 and is recognized world-wide as the leading handbook of its type. It lists the astronomical events of the year and other astronomical data, and is indispensable to amateur and professional astronomers alike. The *Beginner's Observing Guide* is an introduction to the night sky for the novice observer.

The RASC also publishes a bi-monthly journal which contains articles of interest to amateur astronomers. These include survey articles, original research papers, and items of an historical, biographical or educational nature.

An Invitation for Membership in the Royal Astronomical Society of Canada

Anyone with an interest in astronomy would benefit from membership in the Society. An applicant may affiliate with one of the 23 Centres across Canada, located in the cities shown in the table above. For the addresses of any of the Centres, information on joining the Society, or to order an RASC publication, please contact the National Office at:

136 Dupont Street
Toronto, Ontario, M5R 1V2
(416)-924-7973
Email: rasc@astro.utoronto.ca
Web: <http://mnbsun.stmarys.ca/rasc/nat/rasc.html>

Production of the Calendar was computer assisted. The monthly grids with data were automatically generated using a Fortran computer program. Photos were scanned using a flatbed scanner and in some cases enhanced using commercial software.

A variety of equipment was used for the photos in this Calendar, with details given at the right.

Eight contributors from six RASC Centres provided photographs:

- Giovanni Andreis (Vancouver)
- Peter Ceravolo (Ottawa)
- Leo Enright (Kingston)
- Ian Fisher (Vancouver)
- Rajiv Gupta (Vancouver)
- John Mirtle (Calgary)
- Jack Newton (Victoria)
- Murray Paulson (Edmonton)

Also contributing were:

- Diane Brooks (anniversaries)
- David Chapman (anniversaries)
- Lee Johnson (captions)
- Patrick Kelly (Jupiter shadow events)

The Calendar was edited and produced by Rajiv Gupta. Photo submissions for future editions and any comments should be sent marked to his attention to:

RASC Vancouver Centre
1100 Chestnut Street
Vancouver, BC, V6J 3J9

Front Cover

The North America Nebula
This colour image was obtained by digitally combining 150-minute red and 50-minute yellow exposures on medium-format, gas-hypered Kodak Technical Pan black-and-white film, taken by Rajiv Gupta using a 5-inch f/6 refractor. Image registration and manipulation was accomplished using a package of C-programs written by David Hare.



January: *Cassiopeia's Milky Way.* 9-minute exposure on Kodak Ektachrome EPH 1600 film, piggyback with a 50-mm lens at f/2.8.



February: *Orion's Sword.* 40-minute exposure on gas-hypered Kodak Technical Pan film with a Wratten 92 red filter using an 8-inch f/1.5 Schmidt camera.



March: *The March of Comets.* Clockwise from bottom left: 10-minute exposure on gas-hypered Kodak Technical Pan film, piggyback with a 50-mm f/2.8 lens, March 24, 1996; 1-minute exposure on Kodak Gold 400 using a 94-mm f/6.6 Brandon refractor, March 25, 1996; 10-minute exposure on Kodak Ektachrome EPH 1600, piggyback with a 135-mm f/2.5 lens, March 24, 1996; 5-minute exposure on Kodak Gold 400, piggyback with a 135-mm f/3.5 lens, April 13, 1996.



April: *The Great Keyhole Nebula (NGC 3372) in Carina.* 65-minute exposure on gas-hypered medium-format Kodak Technical Pan film using a 5-inch f/6 refractor.



May: *A Gallery of Spiral Galaxies.* M51: 10-minute exposure on Meade Pictor 1616XT CCD camera using a 25-inch f/5 reflector; IC 342: 5, 20, and 2 20-minute red, green, and blue exposures combined to form colour image, other details as above; M64: Details as above.



June: *Scorpius.* 12-minute exposure on Kodak Ektachrome EPH 1600, piggyback with a 50-mm f/2.8 lens, taken from 4304-metre summit of Mauna Kea.



July: *The Lagoon Nebula (M8) and Region.* 110, 70, and 55-minute red, dark-yellow, and light-yellow exposures on gas-hypered medium-format Kodak Technical Pan film using a 5-inch f/6 refractor; black & white photos digitally combined to produce colour image. (See also details for Front Cover photo.)



August: *Van Gogh's Ear (NGC 6888).* 45-minute exposure on Kodak Royal Gold 400 with a Deep-Sky filter using an 8-inch f/6 Newtonian reflector.



September: *M33.* 120-minute exposure on gas-hypered Kodak Technical Pan film using an 8-inch f/6 Newtonian reflector with an ST4 autoguider.



October: *The Northern Milky Way around Deneb and Gamma Cygni.* 10-minute exposure on Kodak Ektachrome EPH 1600, piggyback with a 105-mm f/4 lens.



November: *The Pleiades Cluster.* 60-minute exposure on Fuji Super G 800 Plus film using a HD 145C f/4.5 Maksutov-Newtonian with an ST4 autoguider.



December: *Another Eagle Nebula (IC 2177).* Details as for July.

1997

January

S	M	T	W	T	F	S
				1	2	3
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	

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	

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					

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	

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

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	

July

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

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						

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	

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

November

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						

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

1998

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

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	29

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

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	

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						

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	

July

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

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						

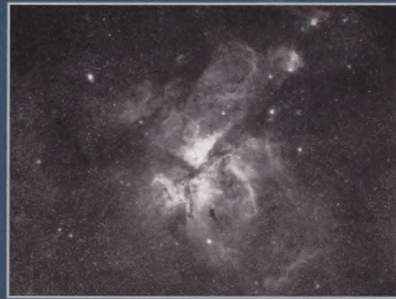
September

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	

October

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15		

This unique calendar was created by members of the Royal Astronomical Society of Canada. All photographs were taken by amateur astronomers using ordinary camera lenses and small telescopes.







The images represent the wide spectrum of deep-sky objects being observed and photographed by amateur astronomers. An informative caption accompanies every photograph.



The Calendar is designed with the observer in mind. It contains comprehensive astronomical data such as daily Moon rise and set times, eclipses, and meteor showers.



	Rise	West	East	4		Rise
	Set	4:39	4:40		Set	
		West	East			
		17:53	17:41			
Saturn 0.8° S of Moon			11h			
Occultation						
η-Aquarid meteors peak			16h			
	Set	West	East	11		Set
	Rise	0:19	--		Rise	
		West	East			
		9:35	9:49			