

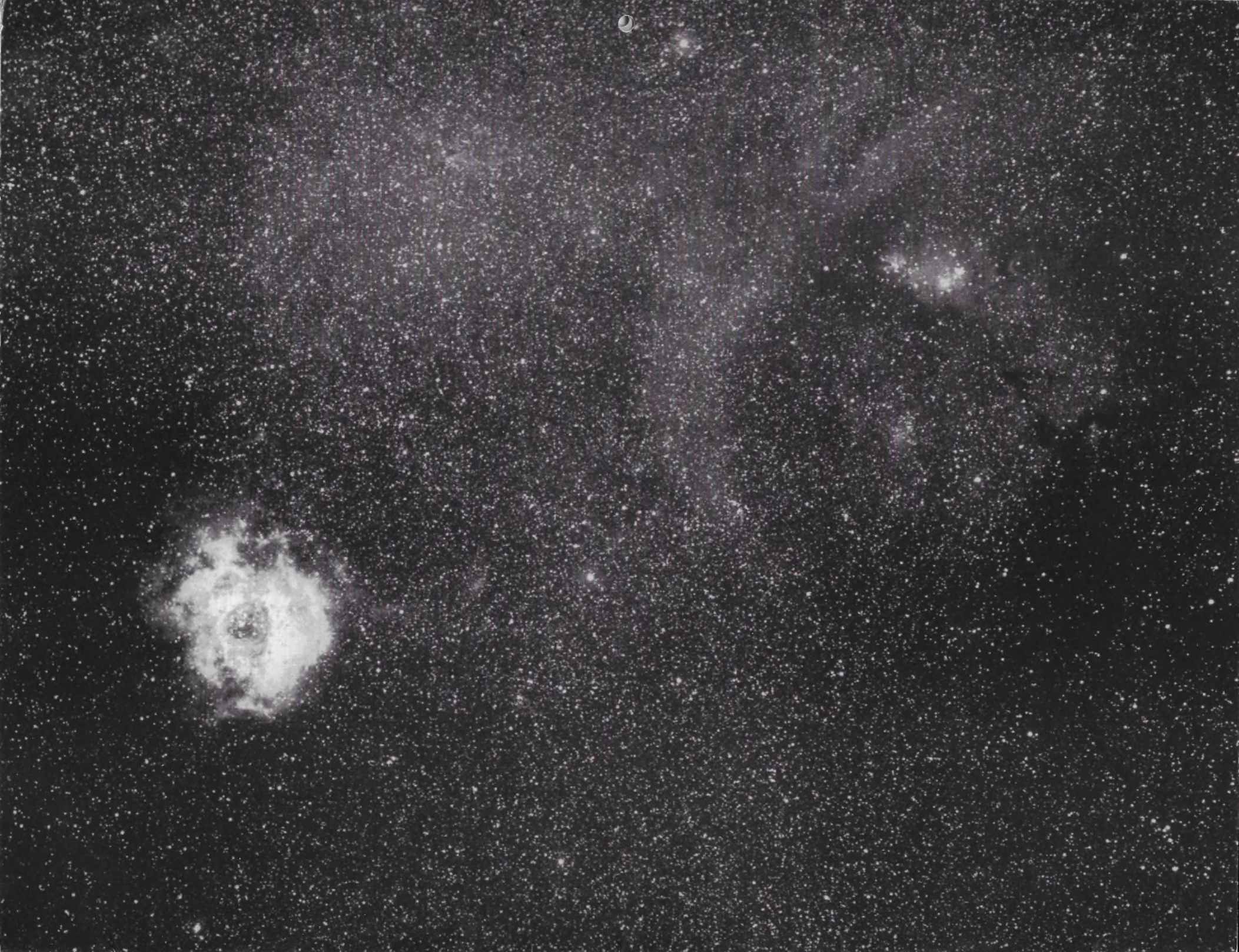


*Royal Astronomical Society
of Canada*



*Observer's
Calendar*
































1994



JANUARY

The Rosette and Cone Nebulas

An exposure with a Hydrogen-alpha filter on hypersensitized film shows extensive faint nebulosity. The field is about 10 degrees wide.
J. C. Mirtle

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>DECEMBER</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>FEBRUARY</p> <p>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</p>				<p><i>New Year's Day</i> 1</p>  <p>8:03 am Sun rises 7:38 am 9:45 am Moon sets 9:35 am 4:04 pm Sun sets 4:29 pm 9:08 pm Moon rises 9:07 pm</p>
<p>Lunik 1 First Moon probe 35 years ago</p> <p>2</p>  <p><i>West</i> 10:08 am Moon sets 10:25 pm <i>East</i> 10:04 am Moon rises 10:19 pm</p>	<p>3</p>  <p>10:32 am Moon sets 11:43 pm 11 am Quadrantid meteors peak Moon rises 11:31 pm</p>	<p>4</p>  <p>10:56 am Moon sets 5:00 pm Last Quarter Moon rises 11:01 am 7:00 pm</p>	<p>5</p>  <p>1:02 am Moon rises 11:23 am Moon sets 12:44 am 11:33 am</p>	<p>6</p>  <p>2:20 am Moon rises 11:54 am Moon sets 1:58 am 12:09 pm</p>	<p>7</p>  <p>3:37 am Moon rises 12:33 pm Moon sets 3:10 am 12:51 pm</p>	<p>8</p>  <p>4:48 am Moon rises 8:01 am 4:13 pm Moon sets 1:20 pm 4:36 pm Sun rises 7:38 am Sun sets 1:40 pm</p>
<p>9</p>  <p><i>West</i> 5:52 am Moon rises 2:17 pm <i>East</i> 5:22 am Moon sets 2:36 pm</p>	<p>10</p>  <p>6:45 am Moon rises 3:22 pm Moon sets 6:17 am 3:39 pm</p>	<p>11</p>  <p>7:27 am Moon rises 4:10 pm 4:32 pm New Moon Moon sets 7:03 am 4:46 pm</p>	<p>12</p>  <p>8:02 am Moon rises 5:44 pm Moon sets 7:42 am 5:53 pm</p>	<p>13</p>  <p>8:29 am Moon rises 6:55 pm Moon sets 8:15 am 7:00 pm</p>	<p>14</p>  <p>8:53 am Moon rises 8:04 pm Moon sets 8:43 am 8:05 pm</p>	<p>15</p>  <p>7:57 am Sun rises 9:14 am 9:12 pm Moon sets 4:23 pm 9:08 pm Sun rises 7:35 am 9:09 am Sun sets 4:45 pm 9:08 pm</p>
<p>16</p>  <p><i>West</i> 9:34 am Moon rises 7 pm <i>East</i> 9:33 am Moon sets 9 pm Venus in superior conjunction</p>	<p>17</p>  <p>9:54 am Moon rises 11:22 pm Moon sets 9:57 am 11:10 pm</p>	<p>18</p>  <p>10:14 am Moon rises -- Moon sets 10:22 am --</p>	<p>19</p>  <p>12:27 am Moon rises 10:37 am 1:27 pm Moon sets First Quarter 12:10 am 10:48 am 3:27 pm</p>	<p>20</p>  <p>1:31 am Moon rises 11:03 am Moon sets 1:10 am 11:18 am</p>	<p>21</p>  <p>2:34 am Moon rises 11:35 am Moon sets 2:09 am 11:53 am</p>	<p>22</p>  <p>3:35 am Moon rises 12:14 pm 4:34 pm Moon sets 7:50 am 12:33 pm Sun rises 3:08 am 7:30 am Sun sets 12:33 pm 4:54 pm</p>
<p>23</p>  <p><i>West</i> 4:33 am Moon sets 1:01 pm <i>East</i> 4:04 am Moon rises 1:21 pm</p>	<p>24</p>  <p>5:24 am Moon sets 1:57 pm Moon rises 4:56 am 2:16 pm</p>	<p>25</p>  <p>6:09 am Moon sets 3:03 pm Moon rises 5:44 am 3:18 pm</p>	<p>26</p>  <p>6:47 am Moon sets 4:15 pm Moon rises 6:26 am 4:26 pm</p>	<p>27</p>  <p>6:23 am Full Moon 7:19 am 5:32 pm Moon sets 8:23 am 7:03 am 5:38 pm</p>	<p>28</p>  <p>7:48 am Moon sets 6:50 pm Moon rises 7:36 am 6:51 pm</p>	<p>29</p>  <p>7:41 am Sun rises 8:13 am 8:10 pm Moon sets 4:46 pm 8:10 pm Sun rises 7:23 am 8:07 am Sun sets 5:04 pm 8:05 pm</p>
<p>30</p>  <p><i>West</i> 8:37 am Moon sets 9:30 pm <i>East</i> 8:36 am Moon rises 9:20 pm</p>	<p>31</p>  <p>9:02 am Moon sets 10:50 pm Moon rises 9:06 am 10:34 pm</p>					































FEBRUARY

M81 and M82

The CCD image at the bottom right shows the 1993 supernova in M81. This supernova is not visible in the older photograph on the left. Try to spot the missing star.

Technical details on all photos may be found in the back of the calendar. Photo (left) by Rajiv Gupta, CCD images (right) by Paul Boltwood

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>		1 	2 	3 	4 	5 
			<p>West 9:29 am 9 pm</p> <p>Moon sets 11:48 pm</p> <p>Mercury 1.3° N. of Saturn</p> <p>East 9:37 am 11 pm</p>	<p>12:09 am 9:59 am</p> <p>Moon rises 10:12 am</p> <p>Moon sets</p>	<p>1:06 am 1:26 am 10:35 am</p> <p>Last Quarter Moon rises Moon sets</p> <p>3:06 am 1:01 am 10:51 am</p>	<p>2:38 am 11:18 am 2 pm</p> <p>Moon rises Moon sets</p> <p>Mercury greatest elongation E. [18°]</p> <p>2:10 am 11:37 am 4 pm</p>
6 	7 	8 	9 	10 	11 	12 
<p>West 4:39 am 1:11 pm</p> <p>Moon rises Moon sets</p> <p>East 4:10 am 1:29 pm</p>	<p>5:24 am 2:17 pm</p> <p>Moon rises Moon sets</p> <p>4:59 am 2:33 pm</p>	<p>6:01 am 3:27 pm</p> <p>Moon rises Moon sets</p> <p>5:40 am 3:39 pm</p>	<p>6:31 am 4:38 pm</p> <p>Moon rises Moon sets</p> <p>6:14 am 4:45 pm</p>	<p>6:56 am 7:30 am 5:47 pm</p> <p>Moon rises New Moon Moon sets</p> <p>6:44 am 9:30 am 5:50 pm</p>	<p>7:18 am 6:55 pm</p> <p>Moon rises Moon sets</p> <p>7:11 am 6:53 pm</p>	<p>7:18 am 7:39 am 8:02 pm</p> <p>Sun rises Moon rises Moon sets</p> <p>7:06 am 7:36 am 5:24 pm 7:55 pm</p>
13 	<i>Valentine's Day</i> 14 	Galileo born 430 years ago 15 	16 	17 	18 	19 
<p>West 7:59 am 9:07 pm</p> <p>Moon rises Moon sets</p> <p>East 8:00 am 8:57 pm</p>	<p>8:19 am 10:12 pm</p> <p>Moon rises Moon sets</p> <p>8:25 am 9:57 pm</p>	<p>8:41 am 11:16 pm</p> <p>Moon rises Moon sets</p> <p>8:51 am 10:57 pm</p>	<p>9:06 am --</p> <p>Moon rises Moon sets</p> <p>9:19 am 11:56 pm</p>	<p>12:19 am 9:35 am</p> <p>Moon sets Moon rises</p> <p>-- 9:51 am</p>	<p>1:20 am 10:10 am 10:47 am</p> <p>Moon sets Moon rises First Quarter</p> <p>12:54 am 10:29 am 12:47 pm</p>	<p>2:19 am 7:05 am 10:52 am 5:23 pm</p> <p>Moon sets Sun rises Moon rises Sun sets</p> <p>1:51 am 6:55 am 11:12 am 5:33 pm</p>
20 	21 	22 	23 	24 	25 	26 
<p>West 3:12 am 11:43 am</p> <p>Moon sets Moon rises</p> <p>East 2:44 am 12:03 pm</p>	<p>3:59 am 10 am 12:43 pm</p> <p>Moon sets Saturn in conjunction with Sun Moon rises</p> <p>3:33 am 12 pm 1:00 pm</p>	<p>4:40 am 1:51 pm</p> <p>Moon sets Moon rises</p> <p>4:17 am 2:05 pm</p>	<p>5:15 am 3:05 pm</p> <p>Moon sets Moon rises</p> <p>4:56 am 3:14 pm</p>	<p>5:46 am 4:23 pm</p> <p>Moon sets Moon rises</p> <p>5:31 am 4:27 pm</p>	<p>6:13 am 5:44 pm 6:15 pm</p> <p>Moon sets Moon rises Full Moon</p> <p>6:04 am 5:42 pm 8:15 pm</p>	<p>6:39 am 5:51 am 5:36 pm 7:06 pm</p> <p>Moon sets Sun rises Sun sets Moon rises</p> <p>6:35 am 6:43 am 5:43 pm 6:58 pm</p>
27 	28 				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	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>West 7:04 am 8:28 pm</p> <p>Moon sets Moon rises</p> <p>East 7:06 am 8:15 pm</p>	<p>7:31 am 9:51 pm</p> <p>Moon sets Moon rises</p> <p>7:38 am 9:32 pm</p>					



MARCH

M106 and companions






























The CCD inset of M106 shows its fine detail. Note also how the companions of M106 'point' toward it in the larger photograph. Photo by Rajiv Gupta, CCD image by Jack Newton

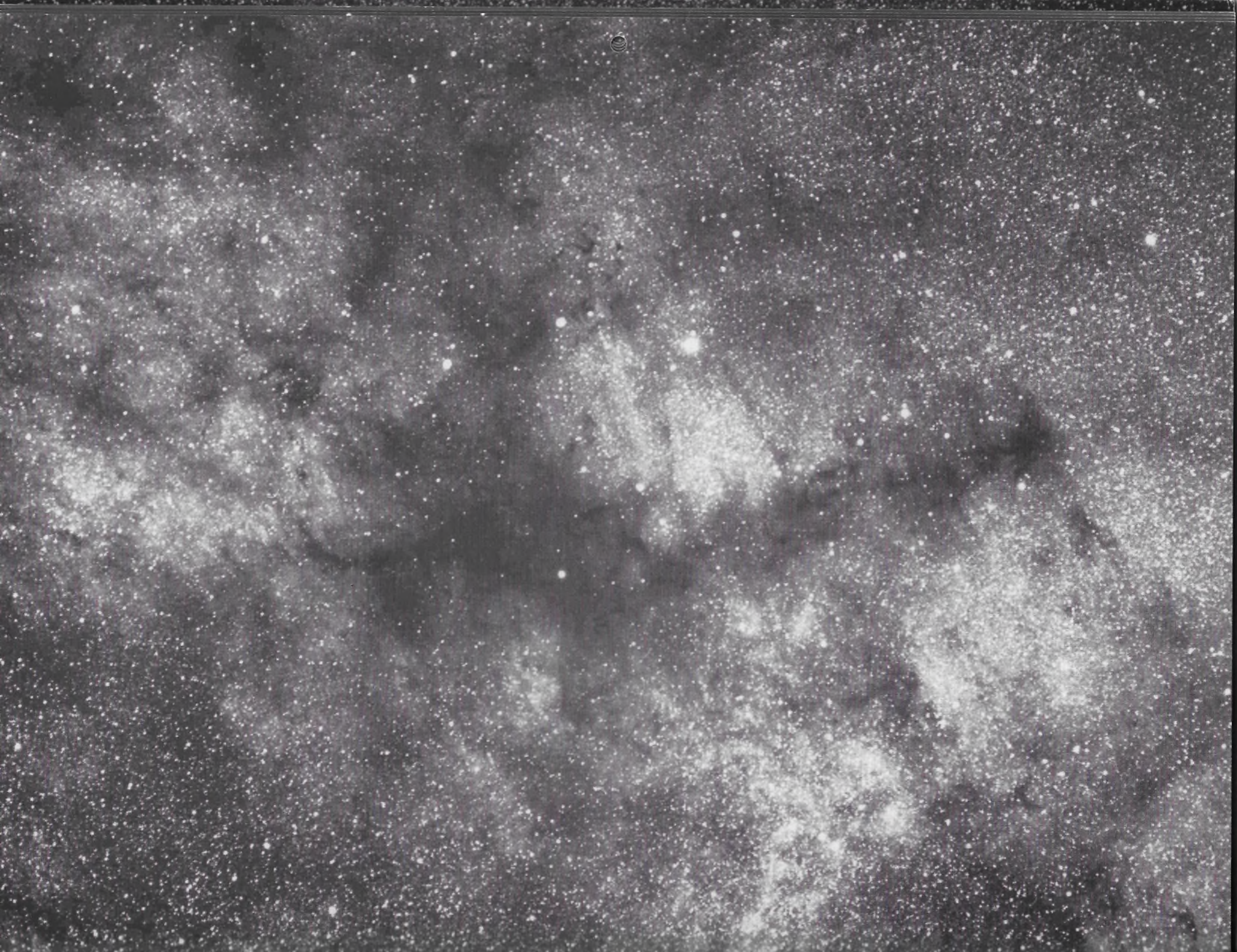
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY														
<p><i>The given times must be adjusted for location. Instructions are given in the back of the calendar.</i></p>		1 	2 	3 	4 	5 Voyager 1 discovers rings of Jupiter 15 years ago														
		West 8:01 am 11:11 pm	Moon sets Moon rises	East 8:12 am 10:48 pm	8:36 am --	Moon sets Moon rises	8:51 am --	12:27 am 9:18 am	Moon rises Moon sets	12:00 am 9:36 am	1:36 am 9:53 am 10:08 am	Moon rises Last Quarter Moon sets	1:07 am 11:53 am 10:28 am	2:34 am 6:36 am 11:06 am 5:48 pm	Moon rises Sun rises Moon sets Sun sets	2:06 am 6:31 am 11:25 am 5:53 pm				
6 	7 	8 	9 	10 	11 	12 														
West 3:23 am 12:10 pm	Moon rises Moon sets	East 2:56 am 12:27 pm	4:02 am 1:18 pm	Moon rises Moon sets	3:39 am 1:31 pm	4:33 am 2:27 pm	Moon rises Moon sets	4:15 am 2:36 pm	5:00 am 3:36 pm	Moon rises Moon sets	4:46 am 3:40 pm	5:23 am 4:43 pm	Moon rises Moon sets	5:14 am 4:43 pm	5:44 am 5:50 pm	Moon rises Moon sets	5:39 am 5:45 pm	12:05 am 6:04 am 6:21 am 6:00 pm 6:55 pm	New Moon Moon rises Sun rises Sun sets Moon sets	2:05 am 6:04 am 6:18 am 6:02 pm 6:46 pm
13 	Albert Einstein born 115 years ago	14 	15 	16 	17 	18 	19 													
West 6:25 am 8:00 pm	Moon rises Moon sets	East 6:29 am 7:47 pm	3 am 6:46 am 9:04 pm	Mars 0.4° N. of Saturn Moon rises Moon sets	5 am 6:54 am 8:47 pm	7:10 am 10:07 pm	Moon rises Moon sets	7:22 am 9:46 pm	7:38 am 11:09 pm	Moon rises Moon sets	7:52 am 10:44 pm	8:10 am --	Moon rises Moon sets	8:28 am 11:41 pm	12:08 am 8:49 am 7 pm	Moon sets Moon rises Mercury greatest elongation W. [28°]	-- 9:08 am 9 pm	1:02 am 6:05 am 9:35 am 6:11 pm	Moon sets Sun rises Moon rises Sun sets	12:34 am 6:05 am 9:55 am 6:11 pm
20 	21 	22 	23 	24 	25 	26 														
West 1:51 am 5:14 am 10:30 am 1:28 pm	Moon sets First Quarter Moon rises Spring Equinox	East 1:24 am 7:14 am 10:48 am 3:28 pm	2:33 am 11:33 am	Moon sets Moon rises	2:09 am 11:48 am	3:10 am 12:42 pm	Moon sets Moon rises	2:49 am 12:53 pm	3:42 am 1:56 pm	Moon sets Moon rises	3:25 am 2:02 pm	1 am 4:10 am 3:14 pm	Mercury 0.3° S. of Saturn Moon sets Moon rises	3 am 3:59 am 3:14 pm	4:37 am 4:34 pm	Moon sets Moon rises	4:30 am 4:30 pm	5:02 am 5:49 am 5:57 pm 6:23 pm	Moon sets Sun rises Moon rises Sun sets	5:01 am 5:52 am 5:47 pm 6:20 pm
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	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														
West 4:10 am 5:29 am 7:21 pm	Full Moon Moon sets Moon rises	East 6:10 am 5:33 am 7:05 pm	5:59 am 8:45 pm	Moon sets Moon rises	6:07 am 8:24 pm	6:33 am 10:07 pm	Moon sets Moon rises	6:46 am 9:41 pm	7:13 am 11:21 pm	Moon sets Moon rises	7:30 am 10:53 pm	8:02 am --	Moon sets Moon rises	8:21 am 11:57 pm						

APRIL

The Virgo Cluster

This photograph, taken on medium-format film, shows seven Messier galaxies (including M87 at the centre bottom) and dozens of fainter ones in over three degrees of sky.
Rajiv Gupta
































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>MARCH</p> <p>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>MAY</p> <p>S M T W T F S</p> <p>1 2 3 4 5 6 7</p> <p>8 9 10 11 12 13 14</p> <p>15 16 17 18 19 20 21</p> <p>22 23 24 25 26 27 28</p> <p>29 30 31</p>			<p>Good Friday</p> <p>1</p>  <p>12:26 am 8:59 am</p> <p>Moon rises Moon sets</p> <p>-- 9:18 am</p>	<p>2</p>  <p>1:19 am 5:34 am 10:03 am 6:34 pm 7:55 pm</p> <p>Moon rises Sun rises Moon sets Sun sets Last Quarter</p> <p>12:52 am 5:39 am 10:20 am 6:29 pm 9:55 pm</p>
	<p><i>Easter Sunday</i></p> <p>3</p>  <p>West 2:00 am Daylight Savings Time Begins 3:01 am 12:11 pm 8 pm</p> <p>East 2:00 am 1:38 am 12:24 pm 10 pm</p> <p>Mercury 1.5° S. of Mars</p>	<p>4</p>  <p>3:36 am 1:20 pm</p> <p>Moon rises Moon sets</p>	<p>5</p>  <p>4:04 am 2:28 pm</p> <p>Moon rises Moon sets</p>	<p>6</p>  <p>4:28 am 3:35 pm</p> <p>Moon rises Moon sets</p>	<p>7</p>  <p>4:49 am 4:41 pm</p> <p>Moon rises Moon sets</p>	<p>8</p>  <p>5:10 am 5:46 pm</p> <p>Moon rises Moon sets</p>
<p>10</p>  <p>West 5:51 am 6:17 pm 7:55 pm</p> <p>Moon rises New Moon Moon sets</p>	<p>11</p>  <p>6:15 am 8:58 pm</p> <p>Moon rises Moon sets</p>	<p>12</p>  <p>6:41 am 5 pm 10:00 pm</p> <p>Moon rises Venus 1.0° S. of Moon Moon sets</p> <p>6:55 am 7 pm 9:37 pm</p>	<p>13</p>  <p>7:12 am 11:00 pm</p> <p>Moon rises Moon sets</p>	<p>14</p>  <p>7:49 am 11:56 pm</p> <p>Moon rises Moon sets</p>	<p>15</p>  <p>8:32 am --</p> <p>Moon rises Moon sets</p>	<p><i>Astronomy Day</i></p> <p>16</p>  <p>12:46 am 6:03 am 9:23 am 7:57 pm</p> <p>Moon rises Sun rises Moon rises Sun sets</p> <p>12:19 am 6:14 am 9:42 am 7:47 pm</p>
<p>17</p>  <p>West 1:30 am 10:22 am</p> <p>Moon sets Moon rises</p>	<p>18</p>  <p>2:07 am 11:26 am 8:34 pm</p> <p>Moon sets Moon rises First Quarter</p> <p>1:45 am 11:39 am 10:34 pm</p>	<p>19</p>  <p>2:40 am 12:36 pm</p> <p>Moon sets Moon rises</p> <p>2:22 am 12:44 pm</p>	<p>20</p>  <p>3:09 am 1:50 pm</p> <p>Moon sets Moon rises</p> <p>2:55 am 1:53 pm</p>	<p>21</p>  <p>3:35 am 3:06 pm</p> <p>Moon sets Moon rises</p> <p>3:26 am 3:04 pm</p>	<p>22</p>  <p>4:01 am 8 am 4:26 pm</p> <p>Moon sets Lyrid meteors peak Moon rises</p> <p>3:57 am 10 am 4:18 pm</p>	<p>23</p>  <p>4:26 am 5:49 am 5:48 pm 8:09 pm</p> <p>Moon sets Sun rises Moon rises Sun sets</p> <p>4:27 am 6:02 am 5:35 pm 7:55 pm</p>
<p>24</p>  <p>West 4:54 am 7:12 pm</p> <p>Moon sets Moon rises</p>	<p>25</p>  <p>5:26 am 1:45 pm 8:36 pm</p> <p>Moon sets Full Moon Moon rises</p> <p>5:36 am 3:45 pm 8:12 pm</p>	<p>26</p>  <p>6:04 am 9:56 pm</p> <p>Moon sets Moon rises</p> <p>6:18 am 9:29 pm</p>	<p>27</p>  <p>6:50 am 11:08 pm</p> <p>Moon sets Moon rises</p> <p>7:07 am 10:39 pm</p>	<p>28</p>  <p>7:45 am --</p> <p>Moon sets Moon rises</p> <p>8:03 am 11:41 pm</p>	<p>29</p>  <p>12:08 am 8:48 am</p> <p>Moon rises Moon sets</p> <p>-- 9:06 am</p>	<p>30</p>  <p>12:57 am 3 am 5:35 am 9:57 am 8:20 pm</p> <p>Moon rises Jupiter at opposition Sun rises Moon sets Sun sets</p> <p>12:32 am 5 am 5:51 am 10:12 am 8:04 pm</p>



MAY

The Pipe Nebula

Extensive dark nebulosity sitting in front of a rich star field in southern Ophiuchus is visible in this 'piggyback' exposure.
J. C. Mirtle

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY																																																																																					
<p>1</p>  <p>West 1:35 am 11:08 am</p> <p>Moon rises Moon sets</p> <p>East 1:15 am 11:19 am</p>	<p>2</p>  <p>2:06 am 8:32 am 12:18 pm</p> <p>Moon rises Last Quarter Moon sets</p> <p>1:50 am 10:32 am 12:25 pm</p>	<p>3</p>  <p>2:32 am 1:27 pm</p> <p>Moon rises Moon sets</p> <p>2:21 am 1:29 pm</p>	<p>4</p>  <p>2:55 am 12 pm 2:33 pm</p> <p>Moon rises Aquarid meteors peak Moon sets</p> <p>2:48 am 2 pm 2:31 pm</p>	<p>5</p>  <p>3:16 am 3:39 pm</p> <p>Moon rises Moon sets</p> <p>3:13 am 3:32 pm</p>	<p>6</p>  <p>3:36 am 4:43 pm</p> <p>Moon rises Moon sets</p> <p>3:37 am 4:32 pm</p>	<p>7</p>  <p>3:57 am 5:23 am 5:47 pm 8:31 pm</p> <p>Moon rises Sun rises Moon sets Sun sets</p> <p>4:02 am 5:41 am 5:32 pm 8:13 pm</p>																																																																																					
<p><i>Mother's Day</i></p> <p>8</p>  <p>West 4:19 am 6:50 pm</p> <p>Moon rises Moon sets</p> <p>East 4:28 am 6:32 pm</p>	<p>9</p>  <p>4:45 am 7:53 pm</p> <p>Moon rises Moon sets</p> <p>4:57 am 7:31 pm</p>	<p>10</p>  <p>5:14 am 11:07 am 8:54 pm</p> <p>Moon rises New Moon Moon sets</p> <p>5:30 am 1:07 pm 8:28 pm</p> <p>Annular Solar Eclipse</p>	<p>11</p>  <p>5:49 am 9:51 pm</p> <p>Moon rises Moon sets</p> <p>6:07 am 9:24 pm</p>	<p>12</p>  <p>6:30 am 10:43 pm</p> <p>Moon rises Moon sets</p> <p>6:49 am 10:16 pm</p>	<p>13</p>  <p>7:19 am 11:29 pm</p> <p>Moon rises Moon sets</p> <p>7:38 am 11:03 pm</p>	<p>14</p>  <p>5:12 am 8:15 am 8:42 pm</p> <p>Sun rises Moon rises Sun sets Moon sets</p> <p>5:32 am 8:32 am 8:21 pm 11:45 pm</p>																																																																																					
<p>15</p>  <p>West 12:08 am 9:18 am</p> <p>Moon sets Moon rises</p> <p>East -- 9:32 am</p>	<p>16</p>  <p>12:42 am 10:25 am</p> <p>Moon sets Moon rises</p> <p>12:23 am 10:35 am</p>	<p>17</p>  <p>1:11 am 11:35 am 2 pm</p> <p>Moon sets Moon rises Pluto at opposition</p> <p>12:56 am 11:41 am 4 pm</p>	<p>18</p>  <p>1:38 am 6:50 am 12:48 pm</p> <p>Moon sets First Quarter Moon rises</p> <p>1:27 am 8:50 am 12:49 pm</p>	<p>19</p>  <p>2:02 am 2:04 pm</p> <p>Moon sets Moon rises</p> <p>1:57 am 1:59 pm</p>	<p>20</p>  <p>2:27 am 3:22 pm</p> <p>Moon sets Moon rises</p> <p>2:26 am 3:12 pm</p>	<p>21</p>  <p>2:52 am 5:02 am 4:42 pm 8:52 pm</p> <p>Moon sets Sun rises Moon rises Sun sets</p> <p>2:56 am 5:25 am 4:27 pm 8:29 pm</p>																																																																																					
<p>22</p>  <p>West 3:21 am 6:05 pm</p> <p>Moon sets Moon rises</p> <p>East 3:29 am 5:43 pm</p>	<p><i>Victoria Day</i></p> <p>23</p>  <p>3:55 am 7:26 pm</p> <p>Moon sets Moon rises</p> <p>4:07 am 7:00 pm</p>	<p>24</p>  <p>4:36 am 8:43 pm 9:39 pm</p> <p>Moon sets Moon rises Full Moon</p> <p>4:52 am 8:14 pm 11:39 pm</p> <p>Partial Lunar Eclipse</p>	<p>25</p>  <p>5:26 am 9:51 pm</p> <p>Moon sets Moon rises</p> <p>5:45 am 9:22 pm</p>	<p>26</p>  <p>6:27 am 10:46 pm</p> <p>Moon sets Moon rises</p> <p>6:45 am 10:20 pm</p>	<p>27</p>  <p>7:35 am 11:31 pm</p> <p>Moon sets Moon rises</p> <p>7:51 am 11:08 pm</p>	<p>28</p>  <p>4:55 am 8:48 am 9:01 pm</p> <p>Sun rises Moon sets Sun sets Moon rises</p> <p>5:19 am 9:00 am 8:36 pm 11:48 pm</p>																																																																																					
<p>29</p>  <p>West 12:06 am 10:01 am</p> <p>Moon rises Moon sets</p> <p>East -- 10:09 am</p>	<p>30</p>  <p>12:35 am 1 am 11:12 am</p> <p>Moon rises Mercury greatest elongation E. [23°] Moon sets</p> <p>12:21 am 3 am 11:16 am</p>	<p>31</p>  <p>12:59 am 12:21 pm 10:02 pm</p> <p>Moon rises Moon sets Last Quarter</p> <p>12:50 am 12:21 pm --</p>	<p>The given times must be adjusted for location. Instructions are given in the back of the calendar.</p>		<p>APRIL</p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td>1</td><td>2</td></tr> <tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr> <tr><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> </table>	S	M	T	W	T	F	S						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	<p>JUNE</p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr> <tr><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td></tr> <tr><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td></tr> <tr><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
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JULY

M24 and M17

This medium-format photo shows the star cloud M24 and the 'Swan' nebula M17 (the swan appears upside down). Note the pockets of dark nebulosity in the upper regions of M24.
Rajiv Gupta
































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>JUNE</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</p>	<p>AUGUST</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>Canada Day</p> <p>1</p> <p>RASC General Assembly, St. John's</p> <p>2:29 pm -- Moon sets Moon rises</p> <p>2:13 pm --</p>	<p>RASC G.A.</p> <p>2</p> <p>12:52 am Moon rises 1:02 am</p> <p>4:50 am Sun rises 5:18 am</p> <p>3:33 pm Moon sets 3:13 pm</p> <p>9:17 pm Sun sets 8:50 pm</p>
<p>RASC G.A.</p> <p>3</p> <p>West 1:18 am Moon rises 4:35 pm</p> <p>East 1:32 am Moon sets 4:12 pm</p>	<p>4</p> <p>1:49 am Moon rises 5:35 pm</p> <p>Mars 0.3° N. of Moon</p> <p>2:05 am Moon sets 5:09 pm</p>	<p>5</p> <p>2:25 am Moon rises 6:31 pm</p> <p>2:44 am Moon sets 6:04 pm</p>	<p>6</p> <p>3:09 am Moon rises 7:23 pm</p> <p>3:28 am Moon sets 6:55 pm</p>	<p>7</p> <p>4:01 am Moon rises 8:08 pm</p> <p>4:19 am Moon sets 7:42 pm</p>	<p>8</p> <p>5:00 am Moon rises 8:46 pm</p> <p>New Moon</p> <p>5:16 am Moon sets 8:24 pm</p>	<p>9</p> <p>4:56 am Sun rises 6:06 am</p> <p>Sun rises Moon sets 6:18 am</p> <p>5:22 am Sun sets 9:01 pm</p>
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<p>17</p> <p>West 12:28 am Moon sets 8 am</p> <p>Mercury greatest elongation W. [21°]</p> <p>12:42 am Moon rises 10 am</p>	<p>18</p> <p>1:08 am Moon sets 5:14 pm</p> <p>1:25 am Moon rises 4:46 pm</p>	<p>19</p> <p>1:57 am Moon sets 6:18 pm</p> <p>2:15 am Moon rises 5:50 pm</p>	<p>Apollo 11 First men on Moon 25 years ago</p> <p>20</p> <p>2:55 am Moon sets 7:12 pm</p> <p>3:13 am Moon rises 6:46 pm</p>	<p>21</p> <p>4:02 am Moon sets 7:57 pm</p> <p>4:18 am Moon rises 7:34 pm</p>	<p>22</p> <p>5:14 am Moon sets 8:32 pm</p> <p>Full Moon</p> <p>5:27 am Moon rises 8:14 pm</p>	<p>23</p> <p>5:13 am Sun rises 6:28 am</p> <p>Sun rises Moon sets 6:36 am</p> <p>8:59 pm Sun sets 9:02 pm</p> <p>8:43 pm Moon rises</p>
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<p>31</p> <p>West -- Moon rises 3:23 pm</p> <p>East 12:05 am Moon sets 2:58 pm</p>						



AUGUST

The Eagle Nebula

In this relatively short exposure we see detail in the heart of the bright nebula M16, yet also can detect the faint outer wisps.
J. C. Mirtle

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>Civic Holiday</i></p> <p>1</p>  <p>West 4:20 pm</p> <p>East 3:54 pm</p>	<p>2</p>  <p>1:04 am 5:14 pm</p> <p>Moon rises Moon sets</p>	<p>3</p>  <p>1:52 am 6:01 pm</p> <p>Moon rises Moon sets</p>	<p>4</p>  <p>2:48 am 6:43 pm</p> <p>Moon rises Moon sets</p>	<p><i>Starfest, Mount Forest, Ont. (through Aug. 7)</i></p> <p>5</p>  <p>3:51 am 7:19 pm</p> <p>Moon rises Moon sets</p>	<p>6</p>  <p>4:59 am 5:33 am 7:50 pm 8:38 pm</p> <p>Moon rises Sun rises Moon sets Sun sets</p> <p>5:09 am 5:51 am 7:34 pm 8:20 pm</p>
<p>7</p>  <p>West 2:45 am 6:12 am 8:18 pm</p> <p>East 4:45 am 6:17 am 8:07 pm</p>	<p>8</p>  <p>7:26 am 8:43 pm</p> <p>Moon rises Moon sets</p>	<p>9</p>  <p>8:42 am 9:08 pm</p> <p>Moon rises Moon sets</p>	<p><i>Mount Kobau Star Party, B.C. (through Aug. 14)</i></p> <p>10</p>  <p>9:59 am 9:33 pm</p> <p>Moon rises Moon sets</p>	<p>11</p>  <p>11:17 am 10:01 pm</p> <p>Moon rises Moon sets</p>	<p>12</p>  <p>5 am 12:35 pm 10:32 pm</p> <p>Perseid meteors peak</p> <p>7 am 12:15 pm 10:44 pm</p>	<p>13</p>  <p>5:44 am 1:51 pm 8:25 pm 11:09 pm 11:57 pm</p> <p>Sun rises Moon rises Sun sets Moon sets First Quarter</p> <p>5:59 am 1:27 pm 8:10 pm 11:25 pm</p>
<p>14</p>  <p>West 3:04 pm 11:54 pm</p> <p>East 2:36 pm</p>	<p>15</p>  <p>4:09 pm</p> <p>Moon sets Moon rises</p>	<p>16</p>  <p>12:48 am 5:06 pm</p> <p>Moon sets Moon rises</p>	<p>17</p>  <p>1:50 am 5:53 pm</p> <p>Moon sets Moon rises</p>	<p>18</p>  <p>2:59 am 6:31 pm</p> <p>Moon sets Moon rises</p>	<p>19</p>  <p>4:10 am 7:02 pm</p> <p>Moon sets Moon rises</p>	<p>20</p>  <p>5:23 am 5:55 am 7:29 pm 8:11 pm</p> <p>Moon sets Sun rises Moon rises Sun sets</p> <p>5:28 am 6:07 am 7:18 pm 7:58 pm</p>
<p>21</p>  <p>West 12:47 am 6:34 am 7:53 pm</p> <p>East 2:47 am 6:35 am 7:47 pm</p>	<p>22</p>  <p>7:44 am 8:15 pm</p> <p>Moon sets Moon rises</p>	<p>23</p>  <p>8:52 am 8:37 pm</p> <p>Moon sets Moon rises</p>	<p>24</p>  <p>9:59 am 5 pm 9:00 pm</p> <p>Moon sets Venus greatest elongation E. [46°] Moon rises</p> <p>9:47 am 7 pm 9:06 pm</p>	<p>25</p>  <p>11:04 am 9:24 pm</p> <p>Moon sets Moon rises</p>	<p>26</p>  <p>12:08 pm 9:52 pm</p> <p>Moon sets Moon rises</p>	<p>27</p>  <p>6:06 am 1:09 pm 7:56 pm 10:23 pm</p> <p>Sun rises Moon sets Sun sets Moon rises</p> <p>6:16 am 12:46 pm 7:46 pm 10:39 pm</p>
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SEPTEMBER

The region surrounding Gamma Cygnus

Almost 4 degrees of sky surrounding the central star in Cygnus is shown in this medium-format exposure. An exposure time of three hours was required because of the dark red filter used.

Rajiv Gupta

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY																																																																																											
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<p>11</p>  <p>West 2:02 pm 10:45 pm</p> <p>East 1:34 pm 11:03 pm</p>	<p>12</p>  <p>5:34 am 3:01 pm 11:45 pm</p> <p>First Quarter Moon rises Moon sets</p> <p>7:34 am 2:34 pm --</p>	<p>13</p>  <p>-- 3:50 pm</p> <p>Moon sets Moon rises</p> <p>12:02 am 3:25 pm</p>	<p>14</p>  <p>12:50 am 4:31 pm</p> <p>Moon sets Moon rises</p> <p>1:05 am 4:09 pm</p>	<p>15</p>  <p>2:00 am 5:04 pm</p> <p>Moon sets Moon rises</p> <p>2:11 am 4:47 pm</p>	<p>16</p>  <p>3:11 am 5:32 pm</p> <p>Moon sets Moon rises</p> <p>3:18 am 5:20 pm</p>	<p>17</p>  <p>4:21 am 6:38 am 5:57 pm 7:10 pm</p> <p>Moon sets Sun rises Moon rises Sun sets</p> <p>4:24 am 6:41 am 5:49 pm 7:07 pm</p>																																																																																											
<p>Jean Foucault born 175 years ago</p> <p>18</p>  <p>West 5:30 am 6:19 pm</p> <p>East 5:29 am 6:16 pm</p>	<p>19</p>  <p>6:38 am 2:00 pm 6:41 pm</p> <p>Moon sets Full Moon Moon rises</p> <p>6:32 am 4:00 pm 6:42 pm</p>	<p>20</p>  <p>7:45 am 7:04 pm</p> <p>Moon sets Moon rises</p> <p>7:35 am 7:09 pm</p>	<p>21</p>  <p>7 am 8:50 am 7:28 pm</p> <p>Mercury 0.1° S. of Spica</p> <p>9 am 8:36 am 7:36 pm</p>	<p>22</p>  <p>9:55 am 7:54 pm</p> <p>Moon sets Moon rises</p> <p>9:36 am 8:06 pm</p>	<p>23</p>  <p>12:19 am 10:57 am 8:24 pm</p> <p>Fall Equinox Moon sets Moon rises</p> <p>2:19 am 10:35 am 8:39 pm</p>	<p>24</p>  <p>6:49 am 11:57 am 6:54 pm 8:59 pm</p> <p>Sun rises Moon sets Sun sets Moon rises</p> <p>6:49 am 11:32 am 6:54 pm 9:16 pm</p>																																																																																											
<p>25</p>  <p>West 12:53 pm 9:40 pm</p> <p>East 12:27 pm 9:58 pm</p>	<p>26</p>  <p>10 am 10:28 pm</p> <p>Mercury greatest elongation E. [26°]</p> <p>12 pm 1:44 pm 10:46 pm</p> <p>Moon sets Moon rises</p> <p>1:18 pm 10:46 pm</p>	<p>27</p>  <p>2:29 pm 6:23 pm 11:22 pm</p> <p>Moon sets Last Quarter Moon rises</p> <p>2:04 pm 8:23 pm 11:39 pm</p>	<p>28</p>  <p>3:09 pm 4 pm --</p> <p>Moon sets Venus greatest brilliancy Moon rises</p> <p>2:46 pm 6 pm --</p>	<p>29</p>  <p>12:24 am 3:44 pm</p> <p>Moon rises Moon sets</p> <p>12:37 am 3:25 pm</p>	<p>30</p>  <p>1:30 am 4:14 pm</p> <p>Moon rises Moon sets</p> <p>1:40 am 3:59 pm</p>																																																																																												


































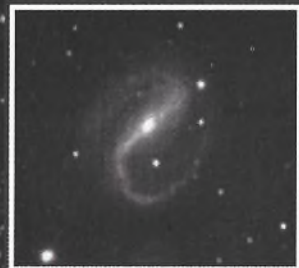
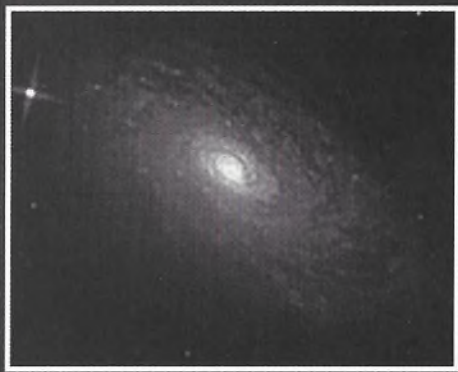
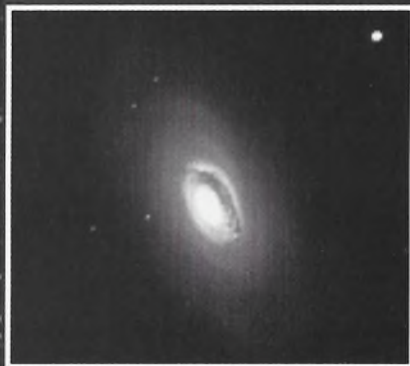
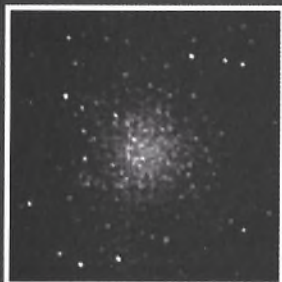
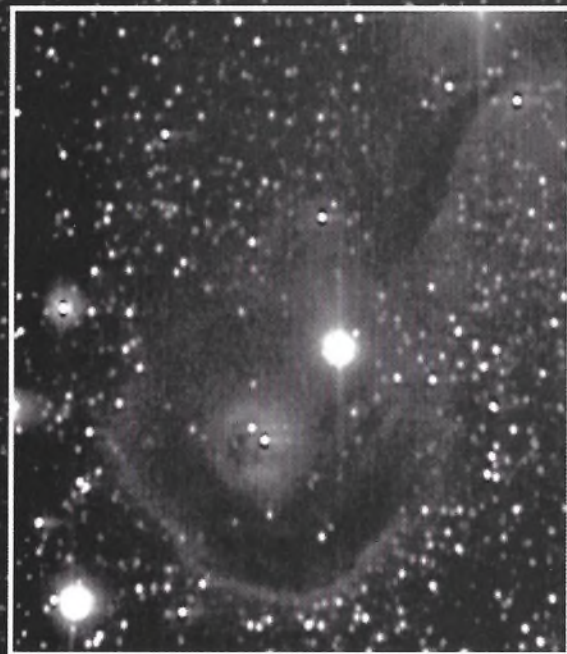
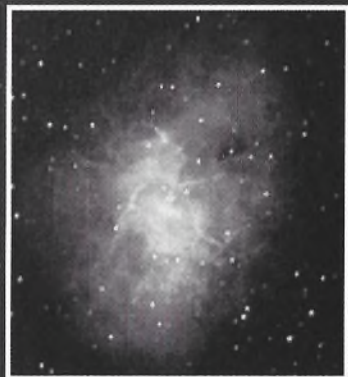
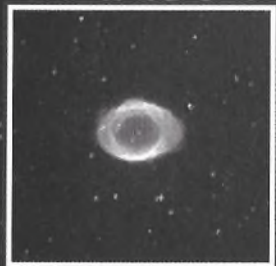
OCTOBER

NGC 7331 and Stephan's Quintet

The photograph shows the bright galaxy NGC 7331 at the top, and the faint members of Stephan's Quintet at the bottom. A more detailed look at the quintet is provided by the CCD inset.

Photo by J. C. Mirtle, CCD image by Paul Boltwood































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>SEPTEMBER</p> <p>S M T W T F S</p> <p> 1 2 3</p> <p>4 5 6 7 8 9 10</p> <p>11 12 13 14 15 16 17</p> <p>18 19 20 21 22 23 24</p> <p>25 26 27 28 29 30</p>	<p>NOVEMBER</p> <p>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>1</p>  <p>2:41 am Moon rises 7:00 am Sun rises 4:42 pm Moon sets 6:38 pm Sun sets</p> <p>2:46 am 6:58 am 4:32 pm 6:41 pm</p>
<p>2</p>  <p>West 3:55 am Moon rises 5:09 pm</p> <p>East 3:55 am Moon sets 5:03 pm</p>	<p>3</p>  <p>5:12 am Moon rises 5:35 pm Moon sets</p> <p>5:07 am 5:34 pm</p>	<p>4</p>  <p>6:32 am Moon rises 6:02 pm Moon sets 9:55 pm New Moon</p> <p>6:22 am 6:06 pm 11:55 pm</p>	<p>Mark Garneau First Canadian astronaut 10 years ago</p> <p>5</p>  <p>7:54 am Moon rises 6:32 pm Moon sets</p> <p>7:38 am 6:41 pm</p>	<p>6</p>  <p>9:15 am Moon rises 7:08 pm Moon sets</p> <p>8:54 am 7:20 pm</p>	<p><i>Nova East, Fundy Ntl. Park (through Oct. 10)</i></p> <p>7</p>  <p>6 am Jupiter 0.7°N. of Moon 10:35 am Moon rises 7:49 pm Moon sets</p> <p>8 am 10:10 am 8:05 pm</p>	<p>8</p>  <p>7:12 am Sun rises 11:49 am Moon rises 6:22 pm Moon sets 8:39 pm Moon sets</p> <p>7:07 am 11:21 am 6:28 pm 8:57 pm</p>
<p>9</p>  <p>West 12:53 pm Moon rises 9:38 pm</p> <p>East 12:26 pm Moon sets 9:55 pm</p>	<p><i>Thanksgiving Day</i></p> <p>10</p>  <p>1:47 pm Moon rises 10:43 pm Moon sets</p> <p>1:21 pm 10:58 pm</p>	<p>11</p>  <p>1:17 pm First Quarter 2:31 pm Moon rises 11:52 pm Moon sets</p> <p>3:17 pm 2:08 pm --</p>	<p>12</p>  <p>-- 3:06 pm Moon rises</p> <p>12:04 am 2:48 pm</p>	<p>13</p>  <p>1:03 am Moon rises 3:36 pm Moon sets</p> <p>1:11 am 3:22 pm</p>	<p>14</p>  <p>2:13 am Moon rises 4:01 pm Moon sets</p> <p>2:17 am 3:52 pm</p>	<p>15</p>  <p>3:21 am Moon rises 7:23 am Moon sets 4:24 pm Moon rises 6:07 pm Sun sets</p> <p>3:21 am 7:16 am 4:19 pm 6:15 pm</p>
<p>16</p>  <p>West 4:29 am Moon sets 4:46 pm</p> <p>East 4:24 am Moon rises 4:46 pm</p>	<p>17</p>  <p>5:35 am Moon sets 5:08 pm Moon rises</p> <p>5:26 am 5:12 pm</p>	<p>18</p>  <p>6:40 am Moon sets 5:31 pm Moon rises</p> <p>6:27 am 5:39 pm</p>	<p>19</p>  <p>6:18 am Full Moon 7:44 am Moon sets 5:57 pm Moon rises</p> <p>8:18 am 7:27 am 6:08 pm</p>	<p>20</p>  <p>8:47 am Moon sets 6:26 pm Moon rises</p> <p>8:27 am 6:39 pm</p>	<p>21</p>  <p>9:48 am Moon sets 10 am Orionid meteors peak 6:59 pm Moon rises</p> <p>9:24 am 12 pm 7:15 pm</p>	<p>22</p>  <p>7:35 am Sun rises 10:45 am Moon sets 5:53 pm Sun sets 7:38 pm Moon rises</p> <p>7:25 am 10:20 am 6:04 pm 7:55 pm</p>
<p>23</p>  <p>West 11:38 am Moon sets 8:23 pm</p> <p>East 11:12 am Moon rises 8:41 pm</p>	<p>24</p>  <p>12:25 pm Moon sets 9:14 pm Moon rises</p> <p>12:00 pm 9:31 pm</p>	<p>25</p>  <p>1:06 pm Moon sets 10:12 pm Moon rises</p> <p>12:43 pm 10:27 pm</p>	<p>26</p>  <p>1:42 pm Moon sets 11:15 pm Moon rises</p> <p>1:22 pm 11:26 pm</p>	<p>27</p>  <p>10:44 am Last Quarter 2:13 pm Moon sets -- Moon rises</p> <p>12:44 pm 1:57 pm --</p>	<p>28</p>  <p>12:22 am Moon rises 2:41 pm Moon sets</p> <p>12:29 am 2:29 pm</p>	<p>29</p>  <p>1:32 am Moon rises 7:47 am Sun rises 3:07 pm Moon sets 5:40 pm Sun sets</p> <p>1:35 am 7:34 am 2:59 pm 5:53 pm</p>
<p>30</p>  <p>West 1:46 am Moon sets 2:00 am</p> <p>East 1:43 am Moon rises 2:00 am</p> <p>2:33 pm Daylight Savings Time Ends Moon sets 2:29 pm</p>	<p><i>Halloween</i></p> <p>31</p>  <p>3:02 am Moon rises 2:59 pm Moon sets</p> <p>2:55 am 3:00 pm</p>					



NOVEMBER

A Collection of CCD Images

Clockwise from top left:
 M57 (the Ring Nebula); NGC 2371; M1 (the Crab Nebula); vdB 142
 Galaxies NGC 520 (an interacting pair); NGC 7479; NGC 7814; M63
 Globular clusters M3 and NGC 2419, the farthest galactic globular
 Centre: M64 (the 'Blackeye' galaxy)
 Paul Boltwood (NGC 2371, vdB 142, M3, NGC 2419) and 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>		1 	2 	3 	4 	5 
			<p>5:44 am Moon rises 5:25 am 9 am S. Taurid meteors peak 11 am 4 pm Venus in inferior conjunction 6 pm</p> <p>4:00 pm Moon sets 4:10 pm</p>	<p>6:35 am New Moon 8:35 am Total Solar Eclipse 7:06 am Moon rises 6:43 am 4:39 pm Moon sets 4:53 pm</p>		<p>6:59 am Sun rises 6:44 am 9:37 am Moon rises 9:09 am 4:27 pm Sun sets 4:43 pm 6 pm Mercury greatest elongation W. [19°] 8 pm</p> <p>6:23 pm Moon sets 6:40 pm</p>
6 	7 	8 	9 	10 	11 <i>Remembrance Day</i> 	12 
<p>West 10:38 am Moon rises 7:28 pm East 10:11 am Moon sets 7:44 pm</p>	<p>11:27 am Moon rises 8:39 pm Moon sets 11:03 am Moon sets 8:52 pm</p>	<p>12:06 pm Moon rises 9:51 pm Moon sets 11:47 am Moon sets 10:00 pm</p>	<p>12:39 pm Moon rises 11:03 pm Moon sets 11:14 pm First Quarter</p> <p>12:23 pm Moon sets 11:08 pm</p>	<p>1:06 pm Moon rises -- Moon sets 12:55 pm --</p>	<p>12:13 am Moon sets 1:29 pm Moon rises 12:14 am 1:23 pm</p>	<p>1:20 am Moon sets 1:17 am 7:11 am Sun rises 6:53 pm 1:52 pm Moon rises 1:50 pm 4:17 pm Sun sets 4:34 pm</p>
13 	14 	15 	16 	17 	18 	19 
<p>West 2:27 am Moon sets 2:14 pm East 2:19 am Moon rises 2:16 pm</p>	<p>3:32 am Moon sets 2:36 pm Moon rises 3:20 am Moon rises 2:42 pm</p>	<p>4:36 am Moon sets 3:01 pm Moon rises 4:20 am Moon rises 3:10 pm</p>	<p>5:39 am Moon sets 3:28 pm Moon rises 5:20 am Moon rises 3:41 pm</p>	<p>6:40 am Moon sets 1 pm Jupiter in conjunction with Sun 4 pm Leonid meteors peak 6 pm 4:00 pm Moon rises Full Moon 4:15 pm 11:57 pm Penumbral Eclipse</p>	<p>7:39 am Moon sets 4:36 pm Moon rises 7:14 am 4:54 pm</p>	<p>7:23 am Sun rises 7:03 am 8:34 am Moon sets 8:07 am 4:07 pm Sun sets 4:28 pm 5:20 pm Moon rises 5:38 pm</p>
20 	21 	22 	23 	24 	25 	26 
<p>West 9:23 am Moon sets 6:09 pm East 8:57 am Moon rises 6:27 pm</p>	<p>10:06 am Moon sets 7:05 pm Moon rises 9:42 am Moon rises 7:20 pm</p>	<p>10:43 am Moon sets 8:06 pm Moon rises 10:22 am Moon rises 8:18 pm</p>	<p>11:16 am Moon sets 9:10 pm Moon rises 10:58 am Moon rises 9:19 pm</p>	<p>11:44 am Moon sets 10:18 pm Moon rises 11:30 am Moon rises 10:22 pm</p>	<p>12:10 pm Moon sets 11:28 pm Moon rises 12:00 pm 11:27 pm</p>	<p>12:04 am Last Quarter 2:04 am 7:34 am Sun rises 7:12 am 12:34 pm Moon sets 12:29 pm 4:00 pm Sun sets 4:22 pm -- Moon rises --</p>
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		DECEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
<p>West 12:40 am Moon rises 12:59 pm East 12:35 am Moon sets 12:58 pm</p>	<p>1:55 am Moon rises 1:45 am Moon sets 1:29 pm</p>	<p>3:13 am Moon rises 2:58 am Moon sets 2:02 pm</p>	<p>4:33 am Moon rises 2:29 pm Moon sets 4:13 am 2:41 pm</p>			



DECEMBER

M35, IC443, and NGC 2174/5

This red exposure shows regions of nebulosity near the well-known open cluster M35 (top).
J. C. Mirtle

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>NOVEMBER</p> <p>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>JANUARY</p> <p>S M T W T F S</p> <p>1 2 3 4 5 6 7</p> <p>8 9 10 11 12 13 14</p> <p>15 16 17 18 19 20 21</p> <p>22 23 24 25 26 27 28</p> <p>29 30 31</p>			<p>1</p> 	<p>2</p> 	<p>3</p> 
	<p>4</p> 	<p>5</p> 	<p>6</p> 	<p>7</p> 	<p>8</p> 	<p>9</p> 	<p>10</p> 
<p><i>West</i> 9:15 am 6:15 pm</p> <p><i>East</i> 8:50 am 6:30 pm</p>	<p>10:01 am 7:29 pm</p> <p>Moon rises Moon sets</p>	<p>10:38 am 8:44 pm</p> <p>Moon rises Moon sets</p>	<p>11:08 am 9:58 pm</p> <p>Moon rises Moon sets</p>	<p>11:34 am 11:08 pm</p> <p>Moon rises Moon sets</p>	<p>7:10 am 4:02 pm 4:54 pm</p> <p>Moon rises Moon sets New Moon</p>	<p>7:44 am 8:18 am 3:56 pm 5:04 pm</p> <p>Sun rises Moon rises Sun sets Moon sets</p>	
<p><i>West</i> 1:22 am 12:42 pm</p> <p><i>East</i> 1:12 am 12:46 pm</p>	<p>2:27 am 1:05 pm</p> <p>Moon sets Moon rises</p>	<p>3:30 am 1:31 pm</p> <p>Moon sets Moon rises</p>	<p>4 am 4:32 am 2:01 pm</p> <p>Geminid meteors peak Moon sets Moon rises</p>	<p>5:32 am 2:36 pm</p> <p>Moon sets Moon rises</p>	<p>6 am 11:57 am 2:06 pm</p> <p>Venus greatest brilliancy Moon rises First Quarter Moon sets</p>	<p>12:16 am 7:52 am 12:19 pm 3:54 pm</p> <p>Moon sets Sun rises Moon rises Sun sets</p>	
<p><i>West</i> 11:20 am 12:00 pm</p> <p><i>East</i> 11:30 am 2:06 pm</p>	<p>12:53 am 11:55 am</p> <p>Moon rises Moon sets</p>	<p>2:10 am 12:25 pm</p> <p>Moon rises Moon sets</p>	<p>3:27 am 1:02 pm</p> <p>Moon rises Moon sets</p>	<p>4:43 am 1:47 pm 5 pm</p> <p>Moon rises Moon sets Jupiter 1.1° S. of Moon</p>	<p>6:28 am 11:57 am 2:06 pm</p> <p>Moon sets Moon rises</p>	<p>7:20 am 7:58 am 3:54 pm 4:04 pm 7:17 pm</p> <p>Moon sets Sun rises Sun sets Moon rises Full Moon</p>	
<p><i>Christmas Day</i></p> <p>25</p> 	<p>26</p> 	<p>27</p> 	<p>28</p> 	<p>29</p> 	<p>30</p> 	<p>31</p> 	
<p>11:20 am 12:00 pm</p> <p>Moon sets Last Quarter Moon rises</p>	<p>8:45 am 5:58 pm</p> <p>Moon sets Moon rises</p>	<p>9:19 am 7:02 pm</p> <p>Moon sets Moon rises</p>	<p>9:49 am 7:23 pm 8:08 pm</p> <p>Moon sets Moon rises Winter Solstice</p>	<p>10 am 10:16 am 9:17 pm</p> <p>Ursid meteors peak Moon sets Moon rises</p>	<p>10:40 am 10:27 pm</p> <p>Moon sets Moon rises</p>	<p>8:02 am 11:04 am 3:57 pm 11:39 pm</p> <p>Sun rises Moon sets Sun sets Moon rises</p>	
<p>6:58 am 8:03 am 3:47 pm 4:03 pm</p> <p>Moon rises Sun rises Moon sets Sun sets</p>	<p>6:54 am 7:33 am 4:20 pm 4:22 pm 9:17 pm</p> <p>Moon sets Sun rises Sun sets Moon rises</p>	<p>7:36 am 11:01 am 4:23 pm 11:31 pm</p> <p>Moon sets Sun rises Sun sets Moon rises</p>	<p>6:30 am 7:38 am 4:03 pm 4:28 pm</p> <p>Moon rises Sun rises Moon sets Sun sets</p>				

The Royal Astronomical Society of Canada Observer's Calendar

How to use this Calendar

Astronomical data is given in the daily boxes. Every day, a pictorial representation of the Moon's phase at 9:00 p.m. EST (10:00 p.m. EDT) of that day is given, as are Moon rising and setting times for that day. The size of the Moon on the calendar varies from day to day reflecting the change in the apparent size of the Moon in the sky as the Moon in its elliptical orbit moves closer to or further from the Earth. On some days, there is no moonrise or moonset - this means that this event occurs the next day.

The times of sunrise and sunset are given once a week. These times can be interpolated for other days. A few special events, such as equinoxes, solstices, change between standard and daylight savings time, eclipses, meteor shower maxima, and planetary events are also given.

To accommodate observers across Canada, two sets of times are given for all events. For events *other than* moonrise, moonset, sunrise, or sunset, the given times can easily be adjusted. The given times are the Mountain (for times labeled 'West') and Eastern (for times labeled 'East') time zone times for these events. The local time for such an event may be found by simply converting the given times to the local time zone. For example, observers in the Pacific time zone should subtract one hour from the tabulated *West* time.

Adjusting Rising and Setting Times for Actual Location

Rising and setting times are considerably more dependent on location. The *West* times displayed are computed for location 51 degrees North latitude and 105 degrees West longitude, and the *East* times for 45 degrees North, 75 degrees West. At the right is a table giving, for each RASC centre, a correction in minutes to the tabulated rising and setting times corresponding to the given location. The accuracy in minutes achieved for moonrise and moonset using this correction is also indicated; the accuracy for sunrise and sunset is somewhat better. An entry such as "*East+25*" means add 25 minutes to the tabulated *East* time.

Please note that the times calculated using this method *will be local times*. It is *not* necessary to adjust them for time zone. The column marked zone gives the appropriate time zone, but is for reference only.

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

(1) This gives a correction factor in minutes that accounts for the distance of the given site east or west from the central meridian of the appropriate time zone.

(2) This gives an upper bound in minutes on the error that results from the difference in the latitude and longitude of the given site from the standard *West* or *East* location.

(3) Subtract 60 minutes in the summer.

For other locations, an observer should calculate the correction factor for his or her site. This amount is +4 minutes for each degree west of the central meridian of the time zone or -4 minutes for each degree east. A table with values for various locations can also be found in the RASC Observer's Handbook. This correction factor should be added to the tabulated times for the closest standard location. The accuracy in minutes can be calculated by multiplying the difference in latitude between the actual and standard sites by 5 and adding .2 times the difference in longitude.

Further improvement in accuracy may be obtained for some sites by interpolating or extrapolating the western and eastern times depending on the observer's latitude. For example, the latitude of Thunder Bay is approximately midway between those of the standard western and eastern sites. An observer in Thunder Bay can improve his or her accuracy to 3 minutes by averaging the given western and eastern times and then adding the correction factor for Thunder Bay, which is 57 minutes.

The Royal Astronomical Society of Canada

Have you ever sat outside on a clear dark night and just gazed with awe at the thousands and thousands of stars in the sky overhead? If you have, and you want to recapture some of that feeling, then consider getting involved in astronomy and joining the ranks of the Royal Astronomical Society of Canada.

The RASC is open to anyone interested in astronomy. It doesn't require any special skills, education, or equipment to join. The only thing it does require is your desire to learn more about the stars and other celestial objects.

Since it was founded in 1903, the RASC has filled a special role in astronomy. Its amateur and professional astronomers have made significant observational contributions to astronomical research. We also take pride in the role we play in educating the general public about astronomy. Today the RASC consists of over 3000 members, most of whom are attached to one of the 22 RASC 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. The *Observer's Handbook* lists the astronomical events of the year and other astronomical data, and is indispensable to amateur and professional astronomers alike.

The RASC *Journal* is published six times per year and contains original research papers and items of an historical, biographical or educational nature of interest to the international astronomical community. The RASC *Bulletin* is the members' own place to exchange ideas and observations from across Canada.

An Invitation for Membership in the Royal Astronomical Society of Canada

Any serious user of this calendar would benefit from membership in the Society. An applicant may affiliate with one of the 22 Centres across Canada, located in the cities in the table to the left. Contact the National Office at

136 Dupont Street
Toronto, Ontario, M5R 1V2
(416)-924-7973

for the addresses of any of the Centres.

Photographic Data and Technical Details

The photos in this calendar were taken by members of the RASC, mostly with amateur equipment. Both photographic film and CCD (charge-coupled device) cameras were used. To avoid confusion, images obtained using CCD cameras will be referred to explicitly as 'CCD images.'

The photographs (by Rajiv Gupta and J. C. Mirtle) were taken using gas-hypersensitized Kodak Technical Pan film. The film was hypered using homemade equipment in many cases.

Images by Paul Boltwood were taken with a homemade CCD camera having an array of 576 by 384 pixels. Multiple (often as many as one-hundred) exposures were digitally combined; the exposure times given below are the total times.

The Jupiter images by Terence Dickinson and Alan Dyer were taken using a Photometrics CCD camera.

Images by Jack Newton were obtained using an SBIG ST-6 CCD camera. Separate red, green, and blue exposures were combined to produce colour images which were then converted to grayscale by computer. The given exposure times are the averages of the times for the three exposures.

Most of the CCD images were processed to bring out maximum detail using the software package 'Hidden Image.' This package uses an iterative procedure known as *maximum entropy deconvolution* to enhance detail, often with dramatic results. This same procedure is used on Hubble Space Telescope images.

Because of the relatively small number of pixels in all of the above CCD cameras, the CCD images appearing in this calendar are small, compared with the photographic images.

Exposure details:

- **Cover** *The North America Nebula* 5-inch f/6 Astro-Physics refractor, 100-minute exposure with a Deep Sky filter, Rajiv Gupta.
- **January** 180-mm f/2.8 lens, 60-minute piggyback exposure with a Hydrogen- α filter.
- **February** Photo of M81 and M82: 5-inch f/6 refractor, 30-minute exposure. CCD image of M82: 7-inch Astro-Physics refractor working at f/36, 80-minute exposure. CCD image of M81: 7-inch refractor working at f/18, 15-minute exposure.
- **March** Photograph of M106 and companions: 5-inch f/6 refractor, 60-minute exposure. CCD image of M106: 25-inch f/5 Newtonian reflector, 10 minute exposure.
- **April** 5-inch f/6 refractor, 70-minute exposure on 120-size film with a homemade medium-format camera. The camera bends the film to compensate for field curvature. Negatives measure 48 by 58 mm.
- **May** 135-mm lens at f/3.5, 25-minute piggyback exposure taken from Coral Pink Sand Dunes in Utah.
- **June** 24-inch Helen Sawyer Hogg Telescope at the University of Toronto Southern Observatory in Chile; telescope working at f/35. First two exposures taken with a blue filter, the last with a green one. Exposures taken at 05:03, 05:41, and 06:57 UT on 01/04/1993.
- **July** 5-inch f/6 refractor, 45-minute exposure on 120-size film.

- **August** 8-inch f/6 Newtonian reflector, 30-minute exposure.
- **September** 5-inch f/6 refractor, Hydrogen- α filter, 120-size film.
- **October** Photograph: 8-inch f/6 Newtonian reflector, 60-minute exposure. CCD image: 7-inch refractor, 22-minute exposure.
- **November**
Images by Paul Boltwood obtained with a 7-inch refractor; exposure times 14 minutes for NGC 2371; 42 minutes for vdB 142; 12 minutes for M3; and 3 minutes for NGC 2419. Note that the exposure of M3 was taken at f/36 and as such only shows the core.
Images by Jack Newton obtained with a 25-inch f/5 Newtonian reflector and exposure times of 6 to 10 minutes.
- **December** 180-mm f/2.8 lens, 45-minute piggyback exposure with a Hydrogen- α filter.

Notes on this Calendar

Production of the calendar was computer assisted. No mechanical typesetting was done; computer diskettes with the necessary image and monthly layout information in camera-ready form were delivered to the printers.

A Fortran computer program was developed for the production of this calendar. This program automatically outputs PostScript files which produce the monthly grids with data.

Film photos were scanned and converted into digital form, and then processed with contrast adjustments. These adjustments and all photo layouts were done using the public-domain Unix software packages 'xv' and 'imtools.'

This calendar was produced by Rajiv Gupta of the Royal Astronomical Society of Canada, Vancouver Centre. Gratitude is expressed to: the photo contributors; David Chapman for providing the historical anniversaries; and Doug George for processing and sending the Jupiter images.

1995																																							
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New Moon dates are displayed in bold-italic.

