Royal Astronomical Society of Canada

Observer's Calendar

1995

JANUARY

The Pleiades Star Cluster, M45

This bright open cluster is a favourite naked-eye object. Most can see 6 or 7 stars with no optical aid, and some report seeing over ten. In this photo, we see the full extent of the surrounding nebulosity.
J. C. Mirtle

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
New Year's Day **1** *West* — *East* 3:56 am New Moon 5:56 am 7:50 am Moon rises 7:25 am 5:00 pm Moon sets 5:14 pm	**2** 8:32 am Moon rises 8:12 am 6:17 pm Moon sets 6:26 pm	**3** 9:06 am Moon rises 8:51 am 4 pm **Quadrantid meteors max** 6 pm 6 pm **Mars stationary** 8 pm 7:33 pm Moon sets 7:38 pm	**4** 9:35 am Moon rises 9:25 am 8:47 pm Moon sets 8:48 pm	**5** 10:00 am Moon rises 9:55 am 9:59 pm Moon sets 9:54 pm	**6** 10:24 am Moon rises 10:22 am 11:07 pm Moon sets 10:59 pm	**7** 8:02 am Sun rises 7:38 am 10:46 am Moon rises 10:49 am 4:11 pm Sun sets 4:35 pm -- Moon sets --
8 *West* — *East* 12:14 am Moon sets 12:01 am 8:46 am First Quarter 10:46 am 11:10 am Moon rises 11:17 am	**9** 1:19 am Moon sets 1:02 am 11:35 am Moon rises 11:45 am	**10** 2:22 am Moon sets 2:01 am 12:03 pm Moon rises 12:17 pm	**11** 3:22 am Moon sets 2:59 am 12:36 pm Moon rises 12:52 pm	**12** 4:20 am Moon sets 3:55 am 1:14 pm Moon rises 1:32 pm	**13** 5 am **Venus greatest elongation W. [47°]** 7 am 5:13 am Moon sets 4:47 am 1:59 pm Moon rises 2:17 pm	**14** 6:02 am Moon sets 5:36 am 7:58 am Sun rises 7:35 am 2:51 pm Moon rises 3:08 pm 4:21 pm Sun sets 4:43 pm
15 *West* — *East* 6:44 am Moon sets 6:20 am 3:49 pm Moon rises 4:04 pm	**16** 7:21 am Moon sets 7:00 am 1:26 pm Full Moon 3:26 pm 4:52 pm Moon rises 5:03 pm	**17** 7:53 am Moon sets 7:36 am 5:58 pm Moon rises 6:06 pm	**18** 8:21 am Moon sets 8:08 am 7:07 pm Moon rises 7:10 pm	**19** 1 am **Mercury greatest elongation E. [19°]** 3 am 8:46 am Moon sets 8:38 am 8:18 pm Moon rises 8:16 pm	**20** 9:11 am Moon sets 9:07 am 9:29 pm Moon rises 9:23 pm	**21** 2:43 am **In Ont. and east: 2 shadows on Jupiter** 4:43 am 7:51 am Sun rises 7:31 am 9:35 am Moon sets 9:35 am 4:32 pm Sun sets 4:52 pm 10:42 pm Moon rises 10:31 pm
22 *West* — *East* 10:01 am Moon sets 10:05 am 11:57 pm Moon rises 11:41 pm	**23** 4 am **Spica 0.6° S. of Moon Occultation** 6 am 10:29 am Moon sets 10:38 am 9:58 pm Last Quarter 11:58 pm -- Moon rises --	**24** 1:12 am Moon rises 12:51 am 11:02 am Moon sets 11:15 am	**25** 2:26 am Moon rises 2:02 am 11:42 am Moon sets 11:57 am	**26** 3:37 am Moon rises 3:10 am 12:30 pm Moon sets 12:48 pm	**27** 4:42 am Moon rises 4:14 am 5 am **Venus 0.2° S. of Moon** 7 am 1:29 pm Moon sets 1:46 pm	**28** 5:37 am Moon rises 5:12 am 5:46 am **Visible in west: 2 shadows on Jupiter** 7:46 am 7:43 am Sun rises 7:25 am 2:36 pm Moon sets 2:51 pm 4:44 pm Sun sets 5:02 pm
29 *West* — *East* 6:24 am Moon rises 6:01 am 3:50 pm Moon sets 4:01 pm	**30** 7:02 am Moon rises 6:44 am 3:48 pm New Moon 5:48 pm 5:06 pm Moon sets 5:13 pm	**31** 7:34 am Moon rises 7:21 am 6:21 pm Moon sets 6:24 pm		*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

FEBRUARY

M36 and M38

These two open clusters in Auriga are prominent in the winter sky. Below the larger one at the top, M38, is another open cluster, NGC 1907. Also, at the bottom centre and appearing almost stellar is NGC 1931, a small complex open cluster and nebula.
Rajiv Gupta

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12 *West* *East* 5:18 am Moon sets 4:56 am 2:38 pm Moon rises 2:51 pm	**13** 5:52 am Moon sets 5:34 am 3:44 pm Moon rises 3:53 pm	*Valentine's Day* **14** 6:22 am Moon sets 6:08 am 4:53 pm Moon rises 4:57 pm	**15** 5:15 am Full Moon 7:15 am 6:50 am Moon sets 6:39 am 6:04 pm Moon rises 6:04 pm	**16** 7:15 am Moon sets 7:09 am 7:16 pm Moon rises 7:12 pm	**17** 7:40 am Moon sets 7:39 am 8:30 pm Moon rises 8:21 pm	**18** 7:07 am Sun rises 6:57 am 8:06 am Moon sets 8:09 am 5:21 pm Sun sets 5:32 pm 9:45 pm Moon rises 9:31 pm
19 *West* *East* 8:34 am Moon sets 8:42 am 10 am **Spica 0.9° S. of Moon** 12 pm 11:01 pm Moon rises 10:42 pm	**20** 9:06 am Moon sets 9:17 am -- Moon rises 11:52 pm	**21** 12:15 am Moon rises -- 9:43 am Moon sets 9:58 am	**22** 1:27 am Moon rises 1:01 am 6:04 am Last Quarter 8:04 am 10:28 am Moon sets 10:45 am	**23** 2:32 am Moon rises 2:05 am 11:22 am Moon sets 11:39 am	**24** 3:30 am Moon rises 3:04 am 12:24 pm Moon sets 12:40 pm	**25** 4:18 am Moon rises 3:55 am 6:53 am Sun rises 6:45 am 1:33 pm Moon sets 1:46 pm 5:34 pm Sun sets 5:41 pm
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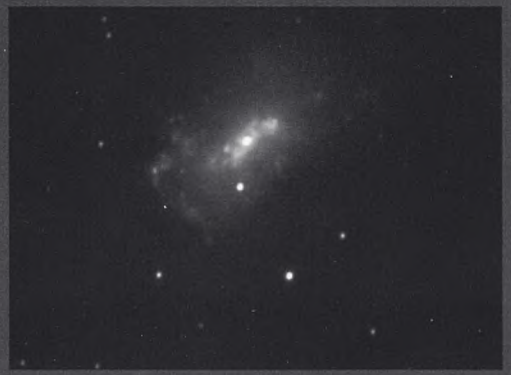

MARCH

Spring Galaxies

Springtime, and an astronomer's thoughts turn to ... galaxies.
A collection of CCD images. Left, going down: M100, NGC 2683, NGC 4449
Right, going down: M51, NGC 4631, NGC 4490
Centre: Perseus Cluster Abell 426, including NGC 1275
Jack Newton and Paul Boltwood (NGC 4449, Perseus Cluster)

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19 *West* 7:07 am 10:02 pm Moon sets Moon rises *East* 7:17 am 9:40 pm	**20** 7:44 am 7:15 pm 11:16 pm Moon sets **Spring Equinox** Moon rises 7:57 am 9:15 pm 10:51 pm	**21** 8:27 am -- Moon sets Moon rises 8:43 am 11:58 pm	**22** 12:25 am 9:19 am Moon rises Moon sets -- 9:36 am	**23** 1:25 am 10:19 am 1:10 pm Moon rises Moon sets Last Quarter 12:59 am 10:35 am 3:10 pm	**24** 2:16 am 11:25 am Moon rises Moon sets 1:52 am 11:39 am	**25** 2:58 am 5:52 am 10 am 12:36 pm 5 pm 6:21 pm Moon rises Sun rises **Mars stationary** Moon sets **Mercury 0.6° S of Saturn** Sun sets 2:37 am 5:55 am 12 pm 12:46 pm 7 pm 6:18 pm
26 *West* 3:33 am 1:48 pm Moon rises Moon sets *East* 3:17 am 1:54 pm	**27** 4:03 am 2:59 pm Moon rises Moon sets 3:51 am 3:01 pm	**28** 4:29 am 4:10 pm Moon rises Moon sets 4:22 am 4:08 pm	**29** 4:54 am 5:20 pm Moon rises Moon sets 4:51 am 5:13 pm	**30** 5:18 am 6:28 pm 7:09 pm Moon rises Moon sets New Moon 5:19 am 6:17 pm 9:09 pm	**31** 5:42 am 7:35 pm Moon rises Moon sets 5:47 am 7:20 pm	

APRIL

A Gibbous Moon

Note the dark Marias or Seas, Imbrium, Serinitatis, and Tranquillitatis at the top, and the rays emanating from several of the craters, including Tycho at the bottom.
Peter Schretlen

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Foucault and Fizeau take first photo of Sun 150 years ago **2** *West* *East* 2:00 am **Daylight Savings Time Begins** 2:00 am 7:37 am Moon rises 7:49 am 10:42 pm Moon sets 10:20 pm	**3** 8:09 am Moon rises 8:24 am 11:41 pm Moon sets 11:17 pm	**4** 8:47 am Moon rises 9:03 am -- Moon sets --	**5** 12:35 am Moon sets 12:10 am 9:29 am Moon rises 9:47 am	**6** 1:24 am Moon sets 12:59 am 10:18 am Moon rises 10:35 am	**7** 2:07 am Moon sets 1:44 am 11:12 am Moon rises 11:27 am 11:35 pm First Quarter --	**8** 2:45 am Moon sets 2:24 am 6:21 am Sun rises 6:29 am 12:12 pm Moon rises 12:24 pm 7:44 pm Sun sets 7:36 pm
9 *West* *East* 3:18 am Moon sets 3:00 am 1:16 pm Moon rises 1:24 pm	**10** -- **Visible in east:** 12:23 am **2 shadows on Jupiter** 3:47 am Moon sets 3:34 am 2:23 pm Moon rises 2:27 pm	**11** 4:15 am Moon sets 4:05 am 3:33 pm Moon rises 3:33 pm	**12** 4:40 am Moon sets 4:35 am 4:46 pm Moon rises 4:41 pm	**13** 5:06 am Moon sets 5:05 am 11 am **Venus 0.6° N. of Saturn** 1 pm 6:01 pm Moon rises 5:51 pm	*Good Friday* **14** 5:34 am Moon sets 5:37 am 7:19 pm Moon rises 7:04 pm	**15** 3 am **Spica 1.0° S. of Moon** 5 am **Occultation** 6:04 am Moon sets 6:12 am 6:06 am Sun rises 6:16 am 6:08 am Full Moon 8:08 am **Partial Lunar Eclipse** 7:55 pm Sun sets 7:45 pm 8:39 pm Moon rises 8:19 pm
Easter Sunday **16** *West* *East* 6:39 am Moon sets 6:51 am 9:57 pm Moon rises 9:33 pm	**17** 2:20 am **In Ont. and west:** 4:20 am **2 shadows on Jupiter** 7:21 am Moon sets 7:36 am 11:11 pm Moon rises 10:44 pm	**18** 8:11 am Moon sets 8:28 am -- Moon rises 11:50 pm	**19** 12:16 am Moon rises -- 9:10 am Moon sets 9:27 am	**20** 1:12 am Moon rises 12:47 am 10:16 am Moon sets 10:31 am	**21** 1:58 am Moon rises 1:36 am 11:27 am Moon sets 11:38 am 9:18 pm Last Quarter 11:18 pm	**22** 2:35 am Moon rises 2:18 am 5:51 am Sun rises 6:04 am 9 am **Lyrid meteors peak** 11 am 12:39 pm Moon sets 12:46 pm 8:07 pm Sun sets 7:54 pm
23 *West* *East* 3:07 am Moon rises 2:53 am 1:51 pm Moon sets 1:54 pm	**24** 3:34 am Moon rises 3:25 am 3:01 pm Moon sets 3:00 pm	**25** 3:59 am Moon rises 3:54 am 4:10 pm Moon sets 4:05 pm	**26** 4:22 am Moon rises 4:22 am 5:18 pm Moon sets 5:08 pm	**27** 4:46 am Moon rises 4:50 am 6:24 pm Moon sets 6:10 pm	**28** 5:11 am Moon rises 5:19 am 7:29 pm Moon sets 7:12 pm	**29** 5:38 am Sun rises 5:53 am 5:39 am Moon rises 5:49 am 11:36 am New Moon 1:36 pm **Annular Solar Eclipse** **visible in S. America** 8:18 pm Sun sets 8:03 pm 8:32 pm Moon sets 8:11 pm
30 *West* *East* 6:09 am Moon rises 6:23 am 9:32 pm Moon sets 9:09 pm						

MAY

M101

The delicate spiral structure of this low surface-brightness galaxy is difficult to detect visually, but is evident in this photo.
Part of a group of galaxies; NGC 5477 is above it in the photo.
J.C. Mirtle

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7  *West* / *East* 1:48 am Moon sets 1:33 am 12:06 pm Moon rises 12:13 pm 3:44 pm First Quarter 5:44 pm	**8**  2:15 am Moon sets 2:04 am 1:13 pm Moon rises 1:15 pm	**9**  2:41 am Moon sets 2:33 am 2:23 pm Moon rises 2:21 pm	**10**  3:06 am Moon sets 3:03 am 3:36 pm Moon rises 3:28 pm	**11**  3:32 am Moon sets 3:33 am 4:51 pm Moon rises 4:39 pm 8 pm **Mercury greatest elongation E. [22°]** 10 pm	**12**  4:00 am Moon sets 4:05 am 2 pm **Spica 1.0° S. of Moon** 4 pm 6:09 pm Moon rises 5:52 pm	**13**  4:32 am Moon sets 4:42 am 5:14 am Sun rises 5:34 am 7:29 pm Moon rises 7:07 pm 8:40 pm Sun sets 8:20 pm
Mother's Day **14**  *West* / *East* 5:10 am Moon sets 5:24 am 2:48 pm Full Moon 4:48 pm 8:47 pm Moon rises 8:21 pm	**15**  5:57 am Moon sets 6:13 am 9:59 pm Moon rises 9:32 pm	**16**  6:54 am Moon sets 7:10 am 11:01 pm Moon rises 10:35 pm	**17**  7:59 am Moon sets 8:15 am 11:53 pm Moon rises 11:30 pm	**18**  9:11 am Moon sets 9:24 am -- Moon rises --	**19**  12:35 am Moon rises 12:16 am 10:25 am Moon sets 10:34 am	**20**  1:09 am Moon rises 12:54 am 5:04 am Sun rises 5:26 am 11 am **Pluto at opposition** 1 pm 11:39 am Moon sets 11:44 am 8:50 pm Sun sets 8:27 pm
21  *West* / *East* 1:38 am Moon rises 1:28 am 5:36 am Last Quarter 7:36 am 12:52 pm Moon sets 12:52 pm	*Victoria Day* **22**  2 am **Earth passes through Saturn's ring plane** 4 am 2:04 am Moon rises 1:58 am 2:02 pm Moon sets 1:58 pm	**23**  2:28 am Moon rises 2:26 am 3:10 pm Moon sets 3:02 pm	**24**  1 am **Mars 1.1° N. of Regulus** 3 am 2:52 am Moon rises 2:54 am 4:16 pm Moon sets 4:04 pm	**25**  3:16 am Moon rises 3:22 am 5:21 pm Moon sets 5:05 pm	**26**  3:42 am Moon rises 3:52 am 6:24 pm Moon sets 6:05 pm	**27**  1 am **Venus 0.8° S. of Moon** 3 am 4:11 am Moon rises 4:24 am 4:56 am Sun rises 5:20 am 7:25 pm Moon sets 7:03 pm 8:59 pm Sun sets 8:35 pm
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APRIL

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30						

JUNE

S	M	T	W	T	F	S
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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

The Southern Milky Way

This wide-field piggyback camera photo shows us the Milky Way in Sagittarius and Scorpius in all its glory. The dark Dancing Horse, facing upward (turn your head to the left) is at the top centre; below and to the left is the Sagittarius Star Cloud. The bright patch above the Star Cloud is the Lagoon Nebula, the subject of next month's photo.
J.C. Mirtle

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11 *West* *East* 3:43 am Moon sets 3:58 am 7:33 pm Moon rises 7:07 pm	**12** 4:34 am Moon sets 4:51 am 8:42 pm Moon rises 8:15 pm 10:03 pm Full Moon --	**13** 5:36 am Moon sets 5:52 am 9:41 pm Moon rises 9:15 pm	*Messier discovers first short-period comet 225 years ago* **14** 6:46 am Moon sets 7:01 am 10:29 pm Moon rises 10:07 pm	**15** 8:02 am Moon sets 8:13 am 11:08 pm Moon rises 10:51 pm	**16** 9:20 am Moon sets 9:26 am 11:40 pm Moon rises 11:28 pm	**17** 4:45 am Sun rises 5:13 am 10:35 am Moon sets 10:37 am 9:17 pm Sun sets 8:49 pm -- Moon rises --
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25 *West* *East* 3:23 am Moon rises 3:40 am 7:11 pm Moon sets 6:46 pm 8 pm **Mercury 0.6° S. of Moon Occultation** 10 pm	**26** 4:06 am Moon rises 4:23 am 8:01 pm Moon sets 7:36 pm	**27** 4:54 am Moon rises 5:11 am 6:50 pm New Moon 8:50 pm 8:44 pm Moon sets 8:21 pm	**28** 5:48 am Moon rises 6:03 am 9:22 pm Moon sets 9:01 pm	*RASC General Assembly, Windsor (through July 3)* **29** 6:46 am Moon rises 6:59 am 10 am **Mercury greatest elongation W. [22°]** 12 pm 9:55 pm Moon sets 9:37 pm	**30** 7:48 am Moon rises 7:57 am 10:24 pm Moon sets 10:10 pm	

JULY

M8 and M20, the Lagoon and Trifid Nebulas

The Lagoon nebula is visible to the naked eye as a faint patch just above the 'spout' of Sagittarius. This medium-format exposure shows the extended fainter nebulosity and star fields in the region.
Rajiv Gupta

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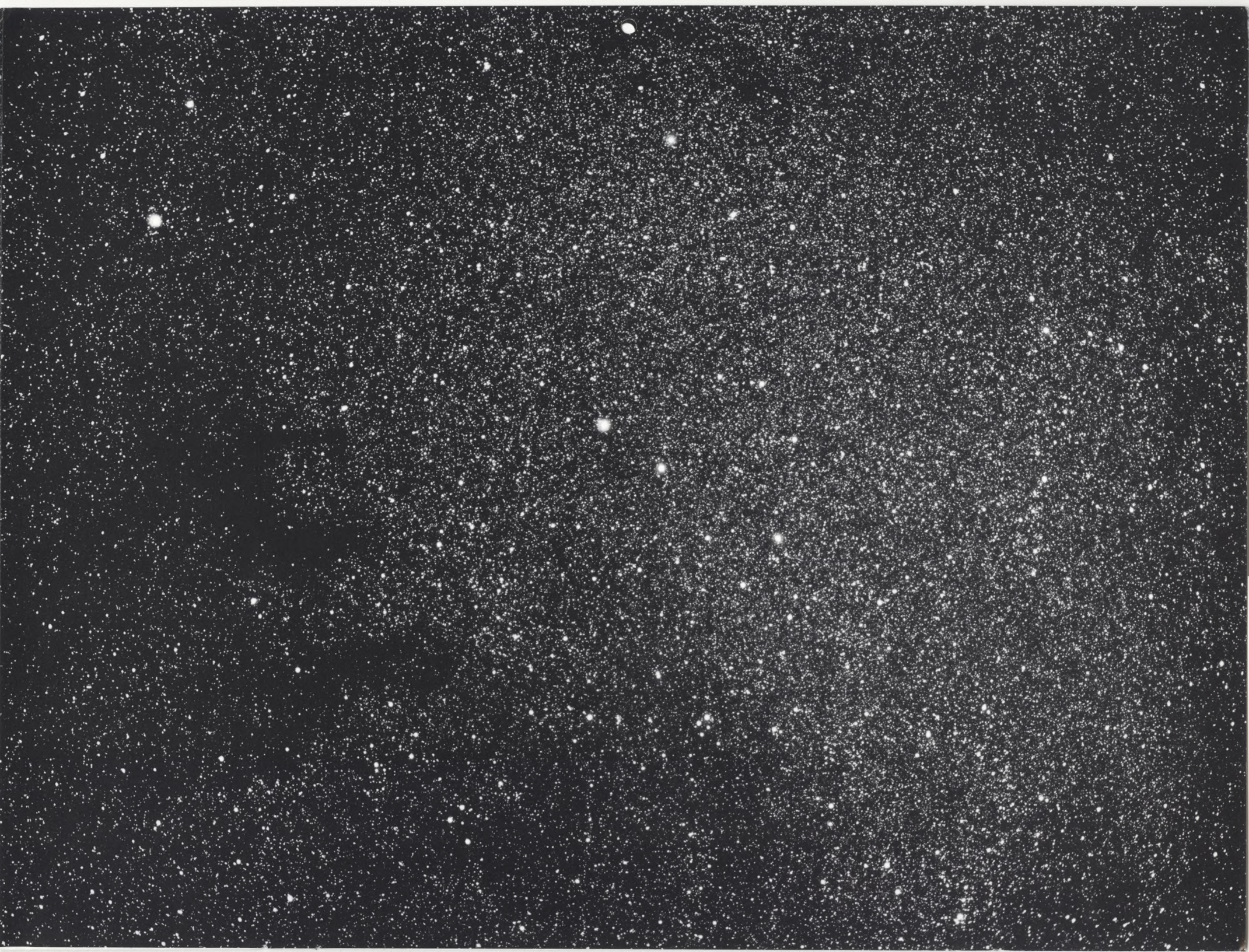
The given times must be adjusted for location. Instructions are given in the back of the calendar. *Please see back pages for additional information on the photos and this calendar.*	JUNE S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	AUGUST S M T W T F 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				*Canada Day* **1** 4:50 am Sun rises 5:17 am 8:52 am Moon rises 8:57 am 9:18 pm Sun sets 8:50 pm 10:50 pm Moon sets 10:40 pm
2 *West* *East* 9:58 am Moon rises 9:59 am 11:15 pm Moon sets 11:08 pm	**3** 11:05 am Moon rises 11:02 am 11:39 pm Moon sets 11:36 pm	**4** 12:15 pm Moon rises 12:07 pm -- Moon sets --	**5** 12:03 am Moon sets 12:05 am 1:26 pm Moon rises 1:14 pm 2:02 pm First Quarter 4:02 pm	**6** 12:30 am Moon sets 12:36 am 2:40 pm Moon rises 2:22 pm	**7** 1:00 am Moon sets 1:10 am 3:55 pm Moon rises 3:33 pm	**8** 1:37 am Moon sets 1:50 am 4:55 am Sun rises 5:21 am 5:09 pm Moon rises 4:44 pm 9:14 pm Sun sets 8:48 pm
Astronomer George Darwin, son of Charles, born, 150 years ago **9** *West* *East* 2:21 am Moon sets 2:37 am 6:20 pm Moon rises 5:53 pm	**10** 3:16 am Moon sets 3:32 am 7:23 pm Moon rises 6:57 pm	**11** 4:21 am Moon sets 4:36 am 8:17 pm Moon rises 7:53 pm	**12** 4:49 am Full Moon 6:49 am 5:34 am Moon sets 5:47 am 9:01 pm Moon rises 8:42 pm	**13** 6:52 am Moon sets 7:00 am 9:38 pm Moon rises 9:23 pm	**14** 8:10 am Moon sets 8:14 am 10:09 pm Moon rises 9:59 pm	**15** 5:03 am Sun rises 5:27 am 9:27 am Moon sets 9:26 am 9:09 pm Sun sets 8:44 pm 10:36 pm Moon rises 10:31 pm
16 *West* *East* 10:41 am Moon sets 10:36 am 11 pm **Neptune at opposition** -- 11:01 pm Moon rises 11:00 pm	**17** 11:52 am Moon sets 11:42 am 11:26 pm Moon rises 11:29 pm	**18** 1:00 pm Moon sets 12:47 pm 11:51 pm Moon rises 11:59 pm	**19** 5:10 am Last Quarter 7:10 am 2:06 pm Moon sets 1:49 pm -- Moon rises --	**20** 12:19 am Moon rises 12:29 am 3:09 pm Moon sets 2:49 pm	**21** 12:49 am Moon rises 1:03 am 12 pm **Uranus at opposition** 2 pm 4:09 pm Moon sets 3:46 pm	**22** 1:24 am Moon rises 1:40 am 5:11 am Sun rises 5:34 am 5:05 pm Moon sets 4:40 pm 9:01 pm Sun sets 8:38 pm
23 *West* *East* 2:04 am Moon rises 2:21 am 5:57 pm Moon sets 5:31 pm	**24** 2:50 am Moon rises 3:07 am 6:42 pm Moon sets 6:18 pm	**25** 3:42 am Moon rises 3:57 am 7:23 pm Moon sets 7:00 pm	**26** 4:39 am Moon rises 4:52 am 7:58 pm Moon sets 7:38 pm	**27** 5:40 am Moon rises 5:50 am 9:13 am New Moon 11:13 am 8:28 pm Moon sets 8:13 pm	**28** 6:44 am Moon rises 6:50 am 8:56 pm Moon sets 8:44 pm 11 pm **S Aquarid meteors peak** --	**29** 5:21 am Sun rises 5:42 am 7:49 am Moon rises 7:52 am 8:51 pm Sun sets 8:31 pm 9:21 pm Moon sets 9:13 pm
30 *West* *East* 8:57 am Moon rises 8:55 am 9:45 pm Moon sets 9:42 pm	**31** 10:06 am Moon rises 10:00 am 10:10 pm Moon sets 10:10 pm					



AUGUST

Barnard's E

The upper 'C' part of this dark nebula is more apparent than the lower. The rich star field to the right of the nebula lies within a few degrees of the bright star Altair, and can be seen by the naked eye. Altair is about 2 degrees to the left of this 4-degree-wide field.
Rajiv Gupta

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.*		**1** *West* 11:16 am Moon rises 10:36 pm Moon sets *East* 11:05 am 10:40 pm	**2** 12:27 pm Moon rises 11:04 pm Moon sets 12:12 pm 11:12 pm	**3** 1:40 pm Moon rises 9:16 pm First Quarter 11:37 pm Moon sets 1:21 pm 11:16 pm 11:49 pm	**4** 2:53 pm Moon rises -- Moon sets 2:29 pm --	**5** 12:17 am Moon sets 5:31 am Sun rises 4:03 pm Moon rises 8:40 pm Sun sets 12:31 am 5:49 am 3:37 pm 8:22 pm
6 *West* 1:05 am Moon sets 5:08 pm Moon rises *East* 1:21 am 4:41 pm	*Civic Holiday* **7** 2:03 am Moon sets 6:04 pm Moon rises 2:19 am 5:39 pm	**8** 3:11 am Moon sets 6:52 pm Moon rises 3:25 am 6:31 pm	**9** 4:25 am Moon sets 10 am **Mercury 1.1° N. of Regulus** 7:32 pm Moon rises 4:36 am 12 pm 7:15 pm	*Comet West discovered 20 years ago* **10** 5:43 am Moon sets 12:16 pm Full Moon 3 pm **Earth passes through Saturn's ring plane** 8:06 pm Moon rises 5:49 am 2:16 pm 5 pm 7:54 pm	**11** 7:00 am Moon sets 8:36 pm Moon rises 7:02 am 8:28 pm	**12** 5:42 am Sun rises 8:17 am Moon sets 2 pm **N Aquarid meteors peak** 8:27 pm Sun sets 9:02 pm Moon rises 5:58 am 8:14 am 4 pm 8:12 pm 8:59 pm
13 *West* 12 am **Perseid meteors peak** 9:30 am Moon sets 9:28 pm Moon rises *East* 2 am 9:23 am 9:29 pm	**14** 10:41 am Moon sets 9:54 pm Moon rises 10:30 am 9:59 pm	**15** 11:50 am Moon sets 10:21 pm Moon rises 11:34 am 10:30 pm	**16** 12:55 pm Moon sets 10:51 pm Moon rises 12:36 pm 11:03 pm	**17** 1:57 pm Moon sets 9:04 pm Last Quarter 11:24 pm Moon rises 1:36 pm 11:04 pm 11:39 pm	**18** 2:56 pm Moon sets -- Moon rises 2:32 pm --	**19** 12:02 am Moon rises 5:53 am Sun rises 3:49 pm Moon sets 8:14 pm Sun sets 12:19 am 6:06 am 3:24 pm 8:00 pm
20 *West* 12:46 am Moon rises 4:37 pm Moon sets 6 pm **Venus in superior conjunction** *East* 1:03 am 4:13 pm 8 pm	**21** 1:35 am Moon rises 5:20 pm Moon sets 1:51 am 4:57 pm	**22** 2:30 am Moon rises 5:57 pm Moon sets 2:44 am 5:36 pm	*Mount Kobau Star Party, B.C. (through Aug. 27)* **23** 3:29 am Moon rises 6:30 pm Moon sets 3:41 am 6:12 pm	**24** 4:32 am Moon rises 6:59 pm Moon sets 4:40 am 6:45 pm	*Starfest, Mount Forest, Ont. (through Aug. 27)* *Nova East, Fundy Ntl. Park (through Aug. 27)* **25** 5:38 am Moon rises 7:25 pm Moon sets 10:31 pm New Moon 5:42 am 7:16 pm --	**26** 6:04 am Sun rises 6:46 am Moon rises 7:50 pm Moon sets 7:59 pm Sun sets 6:14 am 6:46 am 7:45 pm 7:49 pm
Voyager 2 at Saturn 15 years ago **27** *West* 7:55 am Moon rises 8:15 pm Moon sets *East* 7:50 am 8:14 pm	**28** 9:06 am Moon rises 8:41 pm Moon sets 8:57 am 8:44 pm	**29** 10:18 am Moon rises 9:09 pm Moon sets 10 pm **Mars 0.2° N. of Moon** 10:04 am 9:16 pm --	**30** 11:30 am Moon rises 9:41 pm Moon sets 11:12 am 9:51 pm	**31** 12:43 pm Moon rises 4 pm **α-Aurigid meteors peak** 10:18 pm Moon sets 12:21 pm 6 pm 10:32 pm	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	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

SEPTEMBER

NGC 6946 and NGC 6939

The galaxy NGC 6946, lying on the border of Cygnus and Cepheus, and the open cluster are within a degree of each other, and will both fit in the view of most amateur telescopes. Galaxies in this star- and nebula-rich part of the sky are unusual.
Rajiv Gupta

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.*	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	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			**1** 1:53 pm Moon rises 1:28 pm 11:03 pm Moon sets 11:18 pm	**2** 3:03 am First Quarter 5:03 am 6:15 am Sun rises 6:23 am 2:58 pm Moon rises 2:32 pm 7:44 pm Sun sets 7:36 pm 11:56 pm Moon sets --
3 *West* *East* -- Moon sets 12:12 am 3:56 pm Moon rises 3:31 pm	*Labour Day* **4** 12:58 am Moon sets 1:13 am 4:46 pm Moon rises 4:23 pm	**5** 2:07 am Moon sets 2:20 am 5:28 pm Moon rises 5:09 pm	**6** 3:21 am Moon sets 3:30 am 6:03 pm Moon rises 5:49 pm	**7** 4:37 am Moon sets 4:41 am 6:34 pm Moon rises 6:24 pm	**8** 5:53 am Moon sets 5:53 am 7:02 pm Moon rises 6:57 pm 9:37 pm Full Moon 11:37 pm 10 pm **Mercury greatest elongation E. [27°]** --	**9** 6:25 am Sun rises 6:31 am 7:07 am Moon sets 7:02 am 7:28 pm Sun sets 7:23 pm 7:29 pm Moon rises 7:28 pm
10 *West* *East* 8:20 am Moon sets 8:11 am 7:55 pm Moon rises 7:58 pm	**11** 9:30 am Moon sets 9:17 am 8:22 pm Moon rises 8:29 pm	**12** 10:38 am Moon sets 10:21 am 8:51 pm Moon rises 9:01 pm	**13** 11:43 am Moon sets 11:22 am 9:23 pm Moon rises 9:37 pm	**14** 9 am **Saturn at opposition** 11 am 12:43 pm Moon sets 12:20 pm 10:00 pm Moon rises 10:15 pm	**15** 1:39 pm Moon sets 1:15 pm 10:41 pm Moon rises 10:58 pm	**16** 6:36 am Sun rises 6:39 am 2:30 pm Moon sets 2:05 pm 3:09 pm Last Quarter 5:09 pm 7:12 pm Sun sets 7:10 pm 11:28 pm Moon rises 11:44 pm
17 *West* *East* 3:14 pm Moon sets 2:51 pm -- Moon rises --	**18** 12:20 am Moon rises 12:35 am 3:54 pm Moon sets 3:32 pm	**19** 1:17 am Moon rises 1:30 am 4:28 pm Moon sets 4:09 pm	**20** 2:19 am Moon rises 2:28 am 4:58 pm Moon sets 4:44 pm	**21** 3:23 am Moon rises 3:29 am 5:26 pm Moon sets 5:15 pm	**22** 4:30 am Moon rises 4:31 am 5:52 pm Moon sets 5:45 pm	**23** 5:39 am Moon rises 5:36 am 6:13 am **Fall Equinox** 8:13 am 6:47 am Sun rises 6:48 am 6:18 pm Moon sets 6:15 pm 6:57 pm Sun sets 6:56 pm
24 *West* *East* 6:50 am Moon rises 6:43 am 10:55 am New Moon 12:55 pm 6:44 pm Moon sets 6:45 pm	**25** 8:03 am Moon rises 7:51 am 7:11 pm Moon sets 7:17 pm	**26** 9:17 am Moon rises 9:00 am 7:43 pm Moon sets 7:52 pm	**27** 10:31 am Moon rises 10:10 am 8:19 pm Moon sets 8:31 pm	**28** 11:43 am Moon rises 11:19 am 9:02 pm Moon sets 9:17 pm	**29** 12:51 pm Moon rises 12:25 pm 9:53 pm Moon sets 10:09 pm	**30** 6:58 am Sun rises 6:56 am 1:51 pm Moon rises 1:26 pm 6:41 pm Sun sets 6:43 pm 10:52 pm Moon sets 11:07 pm

OCTOBER

NGC 7822 and Ced 214

This faint glowing hydrogen in Cepheus is recorded only with a long exposure through a red filter. The open cluster NGC 7762 is near the bright star at the right of the photo.
Rajiv Gupta

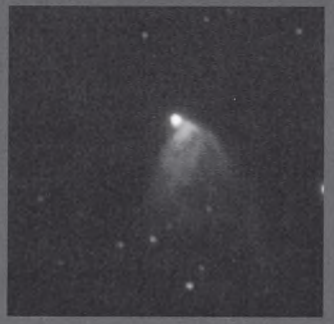
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 *West* — *East* 8:36 am First Quarter 10:36 am 2:43 pm Moon rises 2:19 pm 11:58 pm Moon sets --	**2** -- Moon sets 12:11 am 3:27 pm Moon rises 3:06 pm	**3** 1:09 am Moon sets 1:19 am 4:03 pm Moon rises 3:47 pm	**4** 2:23 am Moon sets 2:28 am 4:35 pm Moon rises 4:23 pm	**5** 3:36 am Moon sets 3:38 am 5:03 pm Moon rises 4:56 pm	**6** 4:50 am Moon sets 4:46 am 5:30 pm Moon rises 5:27 pm	**7** 6:01 am Moon sets 5:54 am 7:10 am Sun rises 7:05 am 5:56 pm Moon rises 5:57 pm 6:25 pm Sun sets 6:30 pm
8 *West* — *East* 7:12 am Moon sets 7:00 am 9:52 am Full Moon 11:52 am 6:22 pm Moon rises 6:27 pm	*Thanksgiving Day* **9** 8:21 am Moon sets 8:05 am 6:50 pm Moon rises 6:59 pm	**10** 9:27 am Moon sets 9:08 am 7:21 pm Moon rises 7:33 pm	**11** 10:30 am Moon sets 10:08 am 7:56 pm Moon rises 8:11 pm	**12** 11:28 am Moon sets 11:04 am 8:36 pm Moon rises 8:52 pm	**13** 12:21 pm Moon sets 11:57 am 9:21 pm Moon rises 9:37 pm	**14** 7:21 am Sun rises 7:14 am 1:08 pm Moon sets 12:44 pm 6:10 pm Sun sets 6:18 pm 10:11 pm Moon rises 10:27 pm
15 *West* — *East* 1:50 pm Moon sets 1:27 pm 11:06 pm Moon rises 11:20 pm	**16** 10:26 am Last Quarter 12:26 pm 2:26 pm Moon sets 2:06 pm -- Moon rises --	**17** 12:05 am Moon rises 12:16 am 2:57 pm Moon sets 2:41 pm	**18** 1:07 am Moon rises 1:14 am 3:26 pm Moon sets 3:13 pm	**19** 2:12 am Moon rises 2:15 am 3:52 pm Moon sets 3:43 pm	**20** 3:19 am Moon rises 3:18 am 8 am **Mercury greatest elongation W. [18°]** 4:17 pm Moon sets 4:13 pm	**21** 4:29 am Moon rises 4:23 am 7:33 am Sun rises 7:23 am 4:43 pm Moon sets 4:43 pm 5:56 pm Sun sets 6:06 pm
22 *West* — *East* 5:41 am Moon rises 5:31 am 6 am **Orionid meteors peak** 8 am 5:10 pm Moon sets 5:14 pm	**23** 6:56 am Moon rises 6:41 am 5:40 pm Moon sets 5:48 pm 10:36 pm New Moon -- **Total Solar Eclipse visible in S.E. Asia**	**24** 8:12 am Moon rises 7:52 am 6:15 pm Moon sets 6:26 pm	**25** 9:27 am Moon rises 9:04 am 6:56 pm Moon sets 7:11 pm	**26** 10:39 am Moon rises 10:13 am 7:46 pm Moon sets 8:02 pm	**27** 11:44 am Moon rises 11:18 am 8:44 pm Moon sets 9:00 pm	**28** 7:45 am Sun rises 7:32 am 12:40 pm Moon rises 12:15 pm 5:42 pm Sun sets 5:55 pm 9:50 pm Moon sets 10:04 pm
29 *West* — *East* 2:00 am **Daylight Savings Time Ends** 2:00 am 12:27 pm Moon rises 12:05 pm 10:00 pm Moon sets 10:11 pm	**30** 1:06 pm Moon rises 12:48 pm 2:17 pm First Quarter 4:17 pm 11:13 pm Moon sets 11:20 pm	*Halloween* **31** 1:38 pm Moon rises 1:25 pm -- Moon sets --		*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.*	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	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

NOVEMBER

NGC 891

Trailing off to the bottom right from this faint edge-on galaxy in Andromeda is a string of even fainter ones, including NGC 898 at the right. The two in the middle are not in the NGC catalogue.
James Thomas Himer

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.*	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	**1** *West* 12:26 am 2:07 pm Moon sets Moon rises *East* 12:29 am 1:58 pm	**2** 1:38 am 2:33 pm Moon sets Moon rises 1:37 am 2:29 pm	**3** 2:49 am 6 am **S. Taurid meteors peak** 8 am 2:59 pm Moon sets Moon rises 2:43 am 2:59 pm	**4** 3:59 am 6:57 am 3:24 pm 4:30 pm Moon sets Sun rises Moon rises Sun sets 3:49 am 6:42 am 3:28 pm 4:45 pm
5 *West* 5:07 am 3:51 pm Moon sets Moon rises *East* 4:53 am 3:59 pm	**6** 6:14 am 4:21 pm Moon sets Moon rises 5:56 am 4:32 pm	*Caroline Herschel discovers Encke's Comet 200 years ago* **7** 12:20 am 7:17 am 4:54 pm Full Moon Moon sets Moon rises 2:20 am 6:56 am 5:08 pm	**8** 8:18 am 5:32 pm Moon sets Moon rises 7:54 am 5:47 pm	**9** 9:13 am 6:15 pm Moon sets Moon rises 8:49 am 6:31 pm	**10** 10:03 am 7:03 pm Moon sets Moon rises 9:39 am 7:19 pm	*Remembrance Day* **11** 7:09 am 10:47 am 4:18 pm 7:56 pm Sun rises Moon sets Sun sets Moon rises 6:52 am 10:24 am 4:36 pm 8:10 pm
12 *West* 11:25 am 8:53 pm Moon sets Moon rises *East* 11:04 am 9:05 pm	**13** 5 am **N. Taurid meteors peak** 7 am 11:58 am 9:53 pm Moon sets Moon rises 11:40 am 10:02 pm	**14** 12:27 pm 10:56 pm Moon sets Moon rises 12:12 pm 11:01 pm	**15** 4:40 am 12:53 pm -- Last Quarter Moon sets Moon rises 6:40 am 12:43 pm --	**16** 12:00 am 1 am **Mars 1.2° S. of Jupiter** 3 am 1:18 pm Moon rises Moon sets 12:02 am 1:12 pm	**17** 1:07 am 1:43 pm 8 pm **Leonid meteors peak** 10 pm Moon rises Moon sets 1:04 am 1:40 pm	**18** 2:17 am 7:21 am 2:09 pm 4:09 pm Moon rises Sun rises Moon sets Sun sets 2:09 am 7:01 am 2:10 pm 4:29 pm
19 *West* 3:29 am 5 am **Venus 1.3° S. of Jupiter** 7 am 2:36 pm Moon rises Moon sets *East* 3:17 am 2:42 pm	**20** 4:44 am 3:08 pm Moon rises Moon sets 4:27 am 3:18 pm	**21** 6:01 am 3:46 pm Moon rises Moon sets 5:39 am 3:59 pm	**22** 7:16 am 8:43 am 3 pm **Venus 0.2° S. of Mars** 5 pm 4:32 pm Moon rises New Moon Moon sets 6:51 am 10:43 am 4:48 pm	**23** 8:27 am 5:28 pm Moon rises Moon sets 8:01 am 5:44 pm	**24** 9:30 am 6:33 pm Moon rises Moon sets 9:04 am 6:48 pm	**25** 7:32 am 10:22 am 4:02 pm 7:45 pm Sun rises Moon rises Sun sets Moon sets 7:10 am 9:59 am 4:23 pm 7:57 pm
26 *West* 11:06 am 9:00 pm Moon rises Moon sets *East* 10:46 am 9:08 pm	**27** 11:41 am 10:15 pm Moon rises Moon sets 11:27 am 10:19 pm	**28** 12:12 pm 11:28 pm 11:29 pm Moon rises First Quarter Moon sets 12:02 pm -- 11:29 pm	**29** 12:39 pm -- Moon rises Moon sets 12:33 pm --	**30** 12:40 am 1:04 pm Moon sets Moon rises 12:36 am 1:03 pm		



DECEMBER

A Collection of CCD Images

Clockwise from top left: Horsehead Nebula, Eskimo Nebula (NGC 2392) NGC 6543, M43, NGC 2158, M76, Hubble's Variable Nebula (NGC 2261), M78, Centre: Trapezium and M42
Paul Boltwood (Horsehead Nebula, NGC 6543, NGC 2158) and Jack Newton

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.*	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			**1** 1:50 am Moon sets 1:41 am 1:29 pm Moon rises 1:32 pm	**2** 2:58 am Moon sets 2:45 am 7:42 am Sun rises 7:19 am 1:55 pm Moon rises 2:02 pm 3:56 pm Sun sets 4:20 pm
3 *West* *East* 4:04 am Moon sets 3:48 am 2:23 pm Moon rises 2:33 pm	**4** 5:08 am Moon sets 4:49 am 2:55 pm Moon rises 3:08 pm	**5** 6:10 am Moon sets 5:47 am 3:30 pm Moon rises 3:45 pm	**6** 7:07 am Moon sets 6:43 am 4:11 pm Moon rises 4:27 pm 6:27 pm Full Moon 8:27 pm	**7** 7:59 am Moon sets 7:34 am 4:57 pm Moon rises 5:13 pm	**8** 8:45 am Moon sets 8:21 am 5:48 pm Moon rises 6:04 pm	**9** 7:51 am Sun rises 7:26 am 9:25 am Moon sets 9:03 am 3:54 pm Sun sets 4:18 pm 6:44 pm Moon rises 6:57 pm
10 *West* *East* 10:00 am Moon sets 9:41 am 7:43 pm Moon rises 7:53 pm	**11** 10:30 am Moon sets 10:14 am 8:44 pm Moon rises 8:51 pm	**12** 10:57 am Moon sets 10:45 am 9:47 pm Moon rises 9:50 pm	**13** 11:22 am Moon sets 11:14 am 10:52 pm Moon rises 10:51 pm	**14** 10 am **Geminid meteors peak** 12 pm 11:46 am Moon sets 11:42 am 10:31 pm Last Quarter -- 11:58 pm Moon rises 11:53 pm	**15** 12:10 pm Moon sets 12:10 pm -- Moon rises --	**16** 1:07 am Moon rises 12:57 am 7:57 am Sun rises 7:32 am 12:36 pm Moon sets 12:39 pm 3:54 pm Sun sets 4:19 pm
17 *West* *East* 2:18 am Moon rises 2:04 am 1:05 pm Moon sets 1:12 pm	**18** 3:32 am Moon rises 3:13 am 1:38 pm Moon sets 1:49 pm	**19** 4:47 am Moon rises 4:24 am 2:18 pm Moon sets 2:32 pm	**20** 6:01 am Moon rises 5:35 am 3:08 pm Moon sets 3:24 pm	**21** 7:09 am Moon rises 6:42 am 4:09 pm Moon sets 4:24 pm 7:22 pm New Moon 9:22 pm	**22** 1:17 am **Winter Solstice** 3:17 am 8:09 am Moon rises 7:44 am 5:19 pm Moon sets 5:32 pm	**23** 1 am **Ursid meteors peak** 3 am 2 am **Mercury 1.1° S. of Mars** 4 am 8:02 am Sun rises 7:36 am 8:58 am Moon rises 8:37 am 3:57 pm Sun sets 4:22 pm 6:35 pm Moon sets 6:45 pm
24 *West* *East* 9:39 am Moon rises 9:22 am 7:54 pm Moon sets 8:00 pm	*Christmas Day* **25** 10:13 am Moon rises 10:01 am 9:11 pm Moon sets 9:13 pm	**26** 10:43 am Moon rises 10:35 am 10:26 pm Moon sets 10:23 pm	**27** 11:10 am Moon rises 11:07 am 11:39 pm Moon sets 11:31 pm	**28** 11:35 am Moon rises 11:36 am 12:06 pm First Quarter 2:06 pm -- Moon sets --	**29** 12:48 am Moon sets 12:37 am 12:01 pm Moon rises 12:06 pm	**30** 1:56 am Moon sets 1:41 am 8:03 am Sun rises 7:38 am 12:28 pm Moon rises 12:37 pm 4:02 pm Sun sets 4:27 pm
31 *West* *East* 3:01 am Moon sets 2:42 am 12:58 pm Moon rises 1:10 pm						

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	*West*+13	19
Vancouver	Pacific	49.2	*West*+12	13
Calgary	Mountain	51.1	*West*+36	2
Edmonton	Mountain	53.6	*West*+34	15
Saskatoon	Central	52.1	*West*+67[3]	5
Regina	Central	50.5	*West*+58[3]	3
Winnipeg	Central	49.9	*West*+29	7
Thunder Bay	Eastern	48.4	*West*+57	16
Sarnia	Eastern	42.9	*East*+30	12
Windsor	Eastern	42.3	*East*+32	15
London	Eastern	43.0	*East*+25	12
Kitchener	Eastern	43.4	*East*+22	10
Hamilton	Eastern	43.2	*East*+20	11
Toronto	Eastern	43.7	*East*+18	7
Niagara	Eastern	43.1	*East*+16	11
Kingston	Eastern	44.2	*East*+6	4
Ottawa	Eastern	45.4	*East*+3	3
Montreal	Eastern	45.5	*East*−6	3
Quebec	Eastern	46.8	*East*−15	9
Halifax	Atlantic	44.6	*East*+14	6
St John's	Nfld	47.5	*East*+1	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 *West* and *East* times depending on the observer's latitude. For example, the latitude of Thunder Bay is approximately midway between those of the standard *West* and *East* sites. An observer in Thunder Bay can improve his or her 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

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. It 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 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.

About this Calendar

This Calendar is intended to serve as an observing aid for amateur astronomers, and to provide a forum for Canadian astrophotography. The photos were all taken by members of the RASC, using personal equipment.

Production of the calendar was computer assisted. The monthly grids with data were generated using a Fortran computer program which calls Pascal subroutines and outputs PostScript code.

Photos were scanned using a flatbed scanner and in some cases enhanced using commercial software. Roughly 75 megabytes of image data were sent by modem to be output directly as halftone film.

All Canadian astrophotographers are encouraged to submit photos for consideration in future issues of the Calendar. Photos should be sent to:

RASC, Vancouver Centre
Attn: Calendar
1100 Chestnut Street
Vancouver, BC, V6J 3J9.

List of Contributors

The Photographers:

Paul Boltwood photographs from his observatory near Ottawa, where he uses advanced digital techniques to produce his images.

Rajiv Gupta, from Vancouver, has been developing a homemade medium-format camera to do wide-field photography.

Jim Himer, a new contributor this year from Calgary, uses a large 14-inch telescope for high-power photography.

John Mirtle, from Calgary, uses a variety of instruments, and is currently working on Schmidt-camera photography.

Jack Newton observes from his home near Victoria, and is currently developing a remote observatory in Florida.

Peter Schretlen, a youth member from Calgary, is also a new contributor, and is assisted by his father Mark.

Also contributing were:
David Chapman (historical anniversaries)
Patrick Kelly (Jupiter double shadows)

Produced by Rajiv Gupta.

Exposure details

Unless otherwise indicated, film photos were taken on gas-hypersensitized Kodak Technical Pan film.

The images by Paul Boltwood were taken using a homemade CCD camera with an array of 576 by 384 pixels, and those by Jack Newton were taken using an SBIG ST-6 CCD camera. These cameras are more sensitive than film, but are smaller, hence the CCD images in this calendar are relatively small.

- **Cover** *The Veil Nebula* 140-minute exposure, 5-inch f/6 Astro-Physics refractor, H-α filter, Rajiv Gupta.
- **January** 60 minutes, 8-inch f/6 reflector.
- **February** 30 minutes, 5-inch f/6 refractor with a homemade camera which uses 120-size film. Film is curved to compensate for field curvature.
- **March**
  Jack Newton: 25-inch f/5 reflector. Colour photos, obtained by taking 3 separate red, green, and blue exposures of 6-10 minutes, converted to black-and-white for this Calendar.
  Paul Boltwood: 7-inch f/9 Astro-Physics refractor working at f/18. Several short exposures combined digitally to produce the final images; total exposure times 28 minutes for NGC 4449 and 4 hours for the Perseus Cluster.
- **April** Eyepiece projection at f/28 with a focal length of 3080 mm, 1/8-second exposure. Unhypered Technical Pan.
- **May** 70 minutes, 8-inch f/6 reflector.
- **June** 30 minutes, 28-mm lens at f/4, taken from the North Rim of the Grand Canyon.
- **July** 95 minutes, 5-inch f/6 refractor, on 120-size film using a red filter.
- **August, September** 60 minutes, 5-inch f/6 refractor, on 120-size film.
- **October** 210 minutes, 5-inch f/6 refractor, on 120-size film using a H-α filter.
- **November** 90 minutes, Celestron C14 at f/7.
- **December**
  Paul Boltwood: 7-inch refractor. Total exposure times respectively of 90, 52, and 20 minutes at f/18, f/54, f/18.
  Jack Newton: 25-inch f/5 reflector; see March.

1995

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
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

March

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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	***30***	31	

April

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16	17	18	19	20	21	22
23	24	25	26	27	28	***29***
30						

May

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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	***29***	30	31			

June

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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	***27***	28	29	30	

July

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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	***27***	28	29
30	31					

August

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13	14	15	16	17	18	19
20	21	22	23	24	25	***26***
27	28	29	30	31		

September

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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

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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

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			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

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					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						

1996

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

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					1	2
3	4	5	6	7	8	9
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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	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

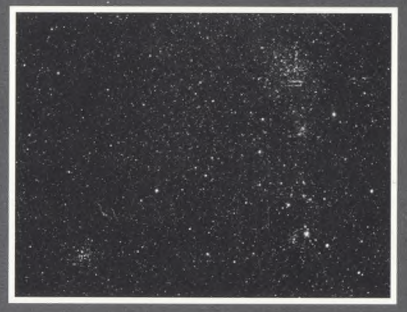
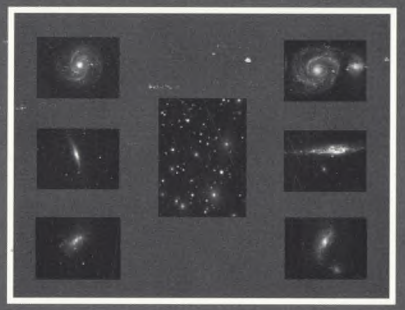
November

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

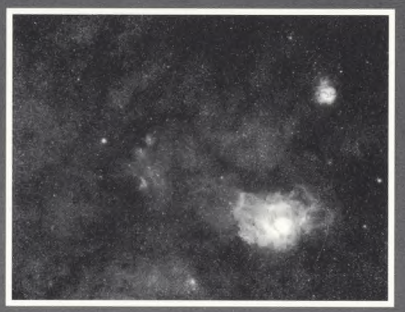
December

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				

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








Photographs by members of the RASC