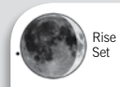
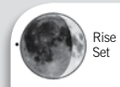
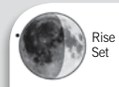
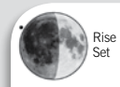
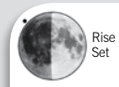
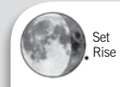
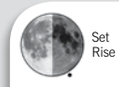
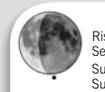
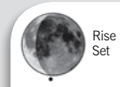
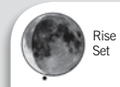
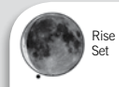
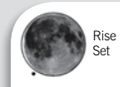
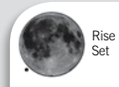
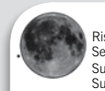
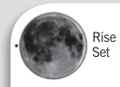
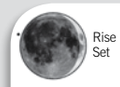
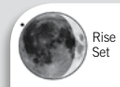
THE ROYAL ASTRONOMICAL
SOCIETY OF CANADA

2017

OBSERVER'S CALENDAR

JANUARY

CRESCENT NEBULA Ghostly in appearance looking almost like an ear visually, the crescent is a nebula being fuelled by its central Wolf-Rayet type star, WR136. Its outer layers are travelling out on the stellar wind as it consumes fuel at an extraordinary rate. | IMAGE BY STUART HEGGIE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
 Rise 9:28 9:49 Set 20:19 20:00 **1**	 Rise 10:05 10:20 Set 21:21 21:08 **2**	 Rise 10:40 10:49 Set 22:25 22:18 **3**	 Rise 11:13 11:16 Set 23:30 23:30 **4**	 Rise 11:47 11:44 Set — — **5**	 Set 0:36 0:43 Rise 12:23 12:13 **6**	 Set 1:44 1:58 Rise 13:01 12:44 Sunrise 7:22 7:57 Sunset 16:51 16:16 **7**
NEW YEAR'S DAY Neptune 0.5º lower right of Mars this evening	Venus-crescent Moon-Mars form a line in evening twilight	Quadrantid meteors (ZHR=120) best seen in predawn hours today 9:00 am	Earth at perihelion (147,100,998 km)	First Quarter 14:47 Lunar Straight Wall this evening in W of N. America Lunar X near crater Werner visible in extreme W of N. America 1:00 am *First successful photograph of an aurora was taken 125 years ago*	Lunar Straight Wall this evening	7
 Set 2:53 3:14 Rise 13:44 13:21 **8**	 Set 4:03 4:29 Rise 14:32 14:05 **9**	 Set 5:10 5:40 Rise 15:27 14:57 **10**	 Set 6:13 6:44 Rise 16:27 15:57 **11**	 Set 7:10 7:39 Rise 17:32 17:04 **12**	 Set 8:00 8:25 Rise 18:38 18:14 **13**	 Set 8:44 9:03 Rise 19:43 19:26 Sunrise 7:21 7:53 Sunset 16:58 16:26 **14**
Follow Arcturus unaided into daylight this week *Galileo Galilei died 375 years ago* *Stephen Hawking was born 75 years ago*	*Heber D. Curtis, known for scale of Universe studies, died 75 years ago*			Full Moon 6:34 Venus at greatest elongation (47º E) this evening Today's full Moon is the Tom-Cod Moon	Neptune 1.2º lower left of Venus this evening	Moon 1º S of Regulus this evening *Edmund Halley, who discovered that some comets are periodic, died 275 years ago*
 Set 9:22 9:36 Rise 20:47 20:36 **15**	 Set 9:56 10:04 Rise 21:49 21:44 **16**	 Set 10:27 10:29 Rise 22:48 22:49 **17**	 Set 10:57 10:53 Rise 23:46 23:53 **18**	 Set 11:27 11:18 Rise — — **19**	 Rise 0:43 0:55 Set 11:58 11:43 **20**	 Rise 1:38 1:57 Set 12:31 12:11 Sunrise 7:17 7:47 Sunset 17:06 16:36 **21**
	MARTIN LUTHER KING JR. DAY (USA)	4 Vesta at opposition (m=6.2)		Last Quarter 17:14 Mercury at greatest elongation (24º W) this morning. Poor apparition (m=–0.0) Moon 2º N of Jupiter early this morning Spica-Jupiter-Moon form a line this morning	Jupiter 3.4º N of Spica this morning	Lunar Curtiss X visible in E of N. America 4:00 am *John Couch Adams, discoverer of Neptune independently of Le Verrier, died 125 years ago*
 Rise 2:34 2:57 Set 13:06 12:42 **22**	 Rise 3:28 3:55 Set 13:46 13:18 **23**	 Rise 4:21 4:51 Set 14:29 13:59 **24**	 Rise 5:12 5:43 Set 15:18 14:47 **25**	 Rise 6:01 6:31 Set 16:12 15:42 **26**	 Rise 6:46 7:13 Set 17:09 16:43 **27**	 Rise 7:27 7:50 Set 18:10 17:49 Sunrise 7:12 7:39 Sunset 17:15 16:48 **28**
Roberta Bondar was first Canadian woman in space 25 years ago		Moon 4º N of Saturn this morning		Magellan *began mapping Venus 25 years ago*	New Moon 19:07 4 Vesta unaided next few nights, a challenge (m=6.3)	**CHINESE NEW YEAR (ROOSTER)** New Moon – Gegenschein visible from a very dark site – highest in S at midnight Young crescent Moon, 21 hours after new in E, 25 hours after new in W, soon after sunset
 Rise 8:06 8:23 Set 19:13 18:58 **29**	 Rise 8:42 8:53 Set 20:17 20:08 **30**	 Rise 9:16 9:22 Set 21:23 21:20 **31**				
		Venus-crescent Moon-Mars within 5º in evening twilight				

THE PLANETS THIS MONTH

Mercury	very low in ESE in morning twilight late in month, with difficulty
Venus	low in SW in evening twilight, sets near 9 pm
Mars	low in SW in evening twilight, sets after 9 pm
Jupiter	rises in E near midnight, high in S near dawn
Saturn	very low in SE in morning twilight

DEC	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

FEB	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				

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FEBRUARY

THE CYGNUS WALL Located at the southern extent of NGC 7000 (North America Nebula) is the Cygnus Wall. Structure in the wall is shaped by the hot, young, blue stars in this star-forming region that is 1,500 ly away. | IMAGE BY RON BRECHER

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

THE PLANETS THIS MONTH

Mercury	very low in ESE in morning twilight early in month, lost after mid-month
Venus	low in SW in evening twilight, sets near 9 pm
Mars	low in SW in evening twilight, sets near 9 pm
Jupiter	rises after 11 pm in E, transits high in S near 4 am
Saturn	rises in ESE near 4 am, in SSE near dawn

1 (WED)
Rise 40°N 9:50 50°N 9:49
Set 22:29 22:33

2 (THU)
Rise 40°N 10:25 50°N 10:17
Set 23:36 23:47
Ceres 0.5° S of Moon this evening
Moon occults Ceres visible N of central Baffin Island-Fort Smith NT-Prince Rupert BC this evening

3 (FRI)
Rise 40°N 11:02 50°N 10:47
Set — —
First Quarter 23:19

4 (SAT)
Set 40°N 0:43 50°N 1:01
Rise 11:42 11:21
Sunrise 7:05 7:29
Sunset 17:23 17:00
Lunar Straight Wall this evening

5 (SUN)
Set 40°N 1:50 50°N 2:14
Rise 12:26 12:01
Moon 1.5° E of Aldebaran this evening

6 (MON)
Set 40°N 2:57 50°N 3:25
Rise 13:17 12:48
Jupiter stationary

7 (TUE)
Set 40°N 3:59 50°N 4:30
Rise 14:13 13:42

8 (WED)
Set 40°N 4:57 50°N 5:27
Rise 15:14 14:44

9 (THU)
Set 40°N 5:49 50°N 6:16
Rise 16:18 15:52
Existence of 2 divisions in Saturn's A ring was proven 100 years ago

10 (FRI)
Set 40°N 6:35 50°N 6:58
Rise 17:23 17:03
Full Moon 19:33
Penumbral lunar eclipse, visible in E of N. America, at moonrise in W N. America
Today's full Moon is the Snow Blinding Moon

11 (SAT)
Set 40°N 7:16 50°N 7:33
Rise 18:28 18:13
Sunrise 6:58 7:17
Sunset 17:31 17:12
Moon 3° E of Regulus this morning

12 (SUN)
Set 40°N 7:52 50°N 8:03
Rise 19:31 19:23

13 (MON)
Set 40°N 8:25 50°N 8:30
Rise 20:33 20:31
FAMILY DAY (BC)
Zodiacal Light readily visible from a dark site in W after evening twilight for the next 2 weeks

14 (TUE)
Set 40°N 8:56 50°N 8:55
Rise 21:32 21:36
VALENTINE'S DAY

15 (WED)
Set 40°N 9:27 50°N 9:19
Rise 22:30 22:40
Moon 6° E of Jupiter

16 (THU)
Set 40°N 9:57 50°N 9:45
Rise 23:27 23:43

17 (FRI)
Set 40°N 10:29 50°N 10:12
Rise — —
Venus at greatest illuminated extent (m=–4.8) this evening

18 (SAT)
Rise 40°N 0:23 50°N 0:44
Set 11:04 10:41
Sunrise 6:49 7:05
Sunset 17:40 17:24
Last Quarter 14:33
14 Irene at opposition (m=9.1)

19 (SUN)
Rise 40°N 1:18 50°N 1:43
Set 11:41 11:15

20 (MON)
Rise 40°N 2:11 50°N 2:40
Set 12:23 11:53
CIVIC HOLIDAY (AB, ON, SK, NS, PE, MB)
PRESIDENTS' DAY (USA)
Winter Star Party, Florida Keys, www.scasorg/winter-star-party (through Feb 26)
15 Eunomia at opposition (m=9.2)

21 (TUE)
Rise 40°N 3:03 50°N 3:33
Set 13:09 12:38
9 Metis at opposition (m=9.0)

22 (WED)
Rise 40°N 3:52 50°N 4:23
Set 14:00 13:30

23 (THU)
Rise 40°N 4:39 50°N 5:07
Set 14:56 14:28

24 (FRI)
Rise 40°N 5:22 50°N 5:47
Set 15:56 15:32
Jupiter 4° N of Spica this morning
Canadian Ian Shelton discovered SN1987a 30 years ago

25 (SAT)
Rise 40°N 6:02 50°N 6:22
Set 16:59 16:41
Sunrise 6:39 6:51
Sunset 17:48 17:36

26 (SUN)
Rise 40°N 6:40 50°N 6:54
Set 18:04 17:52
New Moon 9:59
Annular solar eclipse visible Chile-Argentina-Atlantic Ocean-Angola
Nicolas Camille Flammarion, researcher of double stars, was born, 175 years ago
Radio emission was first detected from the Sun 75 years ago

27 (MON)
Rise 40°N 7:16 50°N 7:23
Set 19:10 19:06
Uranus 0.9° lower left of Mars this evening

28 (TUE)
Rise 40°N 7:51 50°N 7:52
Set 20:18 20:20

JAN	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				

MAR	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	

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MARCH

ORANGE MOON Total eclipses of the Moon are easily viewed over a wide area of the Earth. In September 2015, as the Moon passed through the shadow of the Earth, many across Canada had the chance to see this amazing view. | IMAGE BY STAN RUNGE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

THE PLANETS THIS MONTH

Mercury	very low in WNW in evening twilight, late this month with difficulty
Venus	very low in W in evening twilight, lost after twilight mid-month
Mars	very low in W in evening twilight, sets after dusk
Jupiter	rises after 9 pm in E, transits high in S near 3 am
Saturn	rises in ESE after 3 am, in SSE near dawn

FEB	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				

APR	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						

1 — *40°N 50°N*
Rise 8:26 8:20
Set 21:26 21:36
Moon 4° left of Mars early this evening

2 — *40°N 50°N*
Rise 9:03 8:50
Set 22:35 22:51
Venus stationary

3 — *40°N 50°N*
Rise 9:42 9:23
Set 23:43 —
29 Amphitrite at opposition (m=9.1)

4 — *40°N 50°N*
Set — 0:05
Rise 10:25 10:01
Sunrise 6:29 6:37
Sunset 17:55 17:48
Moon occults Aldebaran south of graze line Vancouver-Fargo-Toronto-Rhode Island this evening
Moon 0.2° E of Aldebaran this evening

5 — *40°N 50°N*
Set 0:50 1:17
Rise 11:13 10:45
First Quarter 6:32
Spot Capella unaided before sunset this week

6 — *40°N 50°N*
Set 1:53 2:23
Rise 12:06 11:36
Lunar Straight Wall this evening
Valentina Tereshkova, first woman in space, born 80 years ago

7 — *40°N 50°N*
Set 2:51 3:21
Rise 13:04 12:35
Sir John Herschel, son of William Herschel, born 225 years ago

8 — *40°N 50°N*
Set 3:44 4:12
Rise 14:06 13:39
41 Daphne at opposition (m=9.6)

9 — *40°N 50°N*
Set 4:31 4:55
Rise 15:09 14:47

10 — *40°N 50°N*
Set 5:12 5:31
Rise 16:13 15:56
Moon 2.5° lower left of Regulus
Occultation of star unexpectedly reveals rings of Uranus 40 years ago

11 — *40°N 50°N*
Set 5:49 6:02
Rise 17:16 17:05
Sunrise 6:18 6:22
Sunset 18:03 17:59

12 — *40°N 50°N*
Set 7:23 7:30
Rise 19:18 19:13
Full Moon 10:54
Daylight Saving Time begins 2:00 am
Today's full Moon is the Maple Sugar Moon

13 — *40°N 50°N*
Set 7:54 7:56
Rise 20:18 20:20

14 — *40°N 50°N*
Set 8:25 8:21
Rise 21:17 21:25
Moon 4° lower left of Jupiter

15 — *40°N 50°N*
Set 8:56 8:46
Rise 22:15 22:29
Zodiacal Light readily visible from a dark site in W after evening twilight for the next 2 weeks

16 — *40°N 50°N*
Set 9:28 9:12
Rise 23:12 23:31

17 — *40°N 50°N*
Set 10:01 9:40
Rise — —

18 — *40°N 50°N*
Rise 0:08 0:31
Set 10:37 10:12
Sunrise 7:06 7:07
Sunset 19:10 19:10

19 — *40°N 50°N*
Rise 1:02 1:29
Set 11:17 10:48

20 — *40°N 50°N*
Rise 1:54 2:24
Set 12:01 11:30
Last Quarter 11:58
BAHÁ'Í NEW YEAR
(begins at sunset on previous evening)
ST. PATRICK'S DAY (NL)
Moon 2.5° N of Saturn early this morning
Spring equinox 6:29 am

21 — *40°N 50°N*
Rise 2:44 3:14
Set 12:49 12:18
Lunar Curtiss X visible in W of N. America 8:00 am

22 — *40°N 50°N*
Rise 3:31 4:00
Set 13:42 13:13

23 — *40°N 50°N*
Rise 4:15 4:41
Set 14:39 14:14

24 — *40°N 50°N*
Rise 4:56 5:18
Set 15:40 15:19

25 — *40°N 50°N*
Rise 5:34 5:51
Set 16:44 16:29
Sunrise 6:55 6:52
Sunset 19:17 19:21
Earth Hour (8:30–9:30 pm local) www.earthhour.org
Venus in inferior conjunction at 8° N of Sun, possible to see in both morning and evening within a few days of today

26 — *40°N 50°N*
Rise 6:11 6:21
Set 17:51 17:43

27 — *40°N 50°N*
Rise 6:46 6:50
Set 18:59 18:58
New Moon 22:57

28 — *40°N 50°N*
Rise 7:22 7:19
Set 20:09 20:15
Young crescent Moon, 20 hours after new in E, 24 hours after new in W, soon after sunset

29 — *40°N 50°N*
Rise 7:59 7:49
Set 21:20 21:33

30 — *40°N 50°N*
Rise 8:38 8:22
Set 22:31 22:51

31 — *40°N 50°N*
Rise 9:21 8:59
Set 23:40 —

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APRIL

SPIRAL GALAXY NGC 300 is a showpiece of the southern sky and a must-see for astronomers venturing Down Under. The Type SA galaxy is part of the local group at a distance of 6 Mly in the direction of Sculptor, with an apparent size of about 2/3rds of the full Moon. | IMAGE BY DEBRA CERAVOLO & DANIEL VERSCHATSE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

THE PLANETS THIS MONTH

Mercury	very low in WNW in evening twilight, early this month with difficulty, lost by mid-month
Venus	very low in E in morning twilight, with difficulty
Mars	very low in W in evening twilight, lost after mid-month
Jupiter	in SE after dark, transits near 1 am
Saturn	rises in ESE after 1 am, in S near 5 am

1 (Saturday)

	40°N	50°N
Rise	7:23	7:28
Set	19:17	19:10
Sunrise	6:44	6:36
Sunset	19:25	19:32

Mercury at greatest elongation (19° E) this evening (m=0.0). Best evening apparition of the year

2 (Sunday)

	40°N	50°N
Rise	8:20	8:30
Set	19:47	19:35

Follow Vega unaided into daylight this week

Spot Sirius unaided before sunset this week

3 (Monday)

	40°N	50°N
Rise	9:16	9:31
Set	20:19	20:02

First Quarter 14:40

Lunar X near crater Werner visible in Atlantic Canada 6:00 pm

Ernst Wilhelm Tempel discovered first of 12 comets 150 years ago

4 (Tuesday)

	40°N	50°N
Rise	10:11	10:32
Set	20:54	20:32

Lunar Straight Wall this evening

5 (Wednesday)

	40°N	50°N
Rise	11:06	11:30
Set	21:31	21:05

6 (Thursday)

	40°N	50°N
Rise	11:59	12:27
Set	22:13	21:44

Moon 1.2° S of Regulus late this evening

Saturn stationary

7 (Friday)

	40°N	50°N
Rise	12:50	13:20
Set	22:59	22:29

Jupiter at opposition (m=–2.5)

8 (Saturday)

	40°N	50°N
Rise	13:40	14:09
Set	23:50	23:20
Sunrise	6:33	6:21
Sunset	19:32	19:43

9 (Sunday)

	40°N	50°N
Rise	14:26	14:54
Set	—	—

10 (Monday)

	40°N	50°N
Set	0:45	0:18
Rise	15:10	15:34

Moon 2.5° E of Jupiter this evening

11 (Tuesday)

	40°N	50°N
Set	1:45	1:22
Rise	15:50	16:10

Full Moon 2:08

FIRST DAY OF PASSOVER (begins at sunset on the previous evening)

Today's full Moon is the Birds Lay Eggs Moon

12 (Wednesday)

	40°N	50°N
Set	2:49	2:31
Rise	16:29	16:43

Venus stationary

13 (Thursday)

	40°N	50°N
Set	3:56	3:45
Rise	17:07	17:14

14 (Friday)

	40°N	50°N
Set	5:05	5:01
Rise	17:44	17:45

GOOD FRIDAY

15 (Saturday)

	40°N	50°N
Set	6:17	6:20
Rise	18:22	18:16
Sunrise	6:22	6:07
Sunset	19:39	19:54

16 (Sunday)

	40°N	50°N
Set	7:30	7:41
Rise	19:03	18:49

EASTER SUNDAY

17 (Monday)

	40°N	50°N
Set	8:44	9:01
Rise	19:46	19:26

18 (Tuesday)

	40°N	50°N
Set	9:56	10:19
Rise	20:34	20:09

19 (Wednesday)

	40°N	50°N
Set	11:05	11:33
Rise	21:26	20:57

Last Quarter 5:57

12 Victoria at opposition (m=9.8)

20 (Thursday)

	40°N	50°N
Set	12:08	12:38
Rise	22:23	21:53

Surveyor 3 (USA) soft landed on Moon 50 years ago

21 (Friday)

	40°N	50°N
Set	13:04	13:34
Rise	23:22	22:53

22 (Saturday)

	40°N	50°N
Set	13:54	14:20
Rise	—	23:57
Sunrise	6:12	5:53
Sunset	19:46	20:05

Lyrid meteors (ZHR=18) 12 pm, best seen in predawn hours today

23 (Sunday)

	40°N	50°N
Rise	0:23	—
Set	14:37	14:59

24 (Monday)

	40°N	50°N
Rise	1:23	1:03
Set	15:15	15:32

ST. GEORGE'S DAY (NL)

International Astronomy Week (Spring) (through April 30)

25 (Tuesday)

	40°N	50°N
Rise	2:23	2:08
Set	15:49	16:01

26 (Wednesday)

	40°N	50°N
Rise	3:22	3:13
Set	16:20	16:26

New Moon 8:16

27 (Thursday)

	40°N	50°N
Rise	4:20	4:17
Set	16:50	16:51

28 (Friday)

	40°N	50°N
Rise	5:17	5:20
Set	17:20	17:14

29 (Saturday)

	40°N	50°N
Rise	6:13	6:22
Set	17:49	17:39
Sunrise	6:02	5:40
Sunset	19:53	20:16

International Astronomy Day (Spring) www.astroleague.org/al/astroday/astrodayform.html

30 (Sunday)

	40°N	50°N
Rise	7:10	7:23
Set	18:21	18:05

Venus at greatest illuminated extent (m=–4.7) this morning

MAR

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	

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			

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MAY

GLOBULARS Globular Clusters are spherical collections of stars that are tightly bound by gravity.They come in many sizes and densities as seen in this collage, but most of our galaxy's globulars are visible in amateur telescopes. Clockwise from upper left is M13 (magnitude 5.8, size 20′), M10 (magnitude 6.4, size 20′), M71 (magnitude 6.1, size 7.2′) and M80 (magnitude 7.8, size 10′). Which is your favourite in the eyepiece? | IMAGE BY STUART HEGGIE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock. Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time. Times for events involving planetary satellites refer to the start time. Detailed instructions on adjusting times for location are given in the back pages. *Please see back pages for photo details and additional information about this Calendar.*	**1** 40°N 50°N Set 0:37 1:08 Rise 10:51 10:21	**2** 40°N 50°N Set 1:29 1:56 Rise 11:54 11:28 First Quarter 22:47	**3** 40°N 50°N Set 2:14 2:37 Rise 12:58 12:37 Moon 5° lower right of Regulus and approaching this evening	**4** 40°N 50°N Set 2:52 3:10 Rise 14:01 13:45 Lunar Straight Wall this evening	**5** 40°N 50°N Set 3:27 3:39 Rise 15:02 14:53 Eta Aquariid meteors (ZHR=40) 10:00 pm	**6** 40°N 50°N Set 3:59 4:05 Rise 16:02 15:59 Sunrise 5:54 5:28 Sunset 20:00 20:27
7 40°N 50°N Set 4:29 4:29 Rise 17:00 17:04 Moon 2° left of Jupiter and separating this evening *David Fabricius, discoverer of first variable star, died 400 years ago*	**8** 40°N 50°N Set 4:59 4:53 Rise 17:58 18:08	**9** 40°N 50°N Set 5:29 5:17 Rise 18:56 19:11	**10** 40°N 50°N Set 6:01 5:43 Rise 19:52 20:13 Full Moon 17:42 Today's full Moon is the Frog Croaking Moon	**11** 40°N 50°N Set 6:34 6:12 Rise 20:48 21:13 Two shadows on Jupiter visible in E of N. America 10:00 pm	**12** 40°N 50°N Set 7:11 6:45 Rise 21:42 22:11	**13** 40°N 50°N Set 7:52 7:22 Rise 22:33 23:05 Sunrise 5:47 5:17 Sunset 20:07 20:37 Moon 3.5° left of Saturn and separating this evening
14 40°N 50°N Set 8:36 8:05 Rise 23:22 23:54 **MOTHER'S DAY**	**15** 40°N 50°N Set 9:25 8:54 Rise — —	**16** 40°N 50°N Rise 0:07 0:37 Set 10:17 9:48	**17** 40°N 50°N Rise 0:49 1:16 Set 11:13 10:48 Mercury at greatest elongation (26° W) this morning. Poor apparition (m=0.5)	**18** 40°N 50°N Rise 1:28 1:50 Set 12:12 11:51 Last Quarter 20:33 Two shadows on Jupiter visible in E of N. America 11:54 pm	**19** 40°N 50°N Rise 2:04 2:21 Set 13:13 12:59	**20** 40°N 50°N Rise 2:38 2:49 Set 14:17 14:09 Sunrise 5:41 5:07 Sunset 20:13 20:47
21 40°N 50°N Rise 3:12 3:16 Set 15:23 15:22 Texas Star Party, Fort Davis, Texas www.texasstarparty.org (through May 28)	**22** 40°N 50°N Rise 3:46 3:44 Set 16:31 16:38 **VICTORIA DAY (CANADA)** Moon 3° lower right of Venus early this morning, best from SW of USA	**23** 40°N 50°N Rise 4:22 4:13 Set 17:43 17:56 Venus-Moon-Mercury form a line in morning twilight from S of USA, difficult	**24** 40°N 50°N Rise 5:02 4:46 Set 18:56 19:16	**25** 40°N 50°N Rise 5:46 5:23 Set 20:09 20:35 New Moon 15:44 RTMC Astronomy Expo, Big Bear, CA www.rtmcastronomyexpo.org (through May 29) Closest Lunar Perigee of the year ~357209 km 9:24 pm	**26** 40°N 50°N Rise 6:36 6:08 Set 21:19 21:49 Two shadows on Jupiter visible in all of N. America 1:48 am	**27** 40°N 50°N Rise 7:33 7:02 Set 22:24 22:55 Sunrise 5:36 5:00 Sunset 20:19 20:55 **FIRST DAY OF RAMADAN (begins at sunset on the previous evening)** Two shadows on Jupiter visible in Newfoundland 8:17 pm
28 40°N 50°N Rise 8:35 8:04 Set 23:21 23:51	**29** 40°N 50°N Rise 9:40 9:12 Set — — **MEMORIAL DAY (USA)**	**30** 40°N 50°N Set 0:10 0:36 Rise 10:46 10:22	**31** 40°N 50°N Set 0:53 1:13 Rise 11:51 11:33 Moon 5° left of Regulus and separating this evening			

THE PLANETS THIS MONTH

Mercury	not observable this month
Venus	very low in E, observed with difficulty at end of month
Mars	very low in W in evening twilight, with difficulty
Jupiter	in SE after dark, transits near 11 pm, sets in W near 4 am
Saturn	rises in ESE after 11 pm, transits in S near 4 am

APR	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						

JUN	S	M	T	W	T	F	S
					1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	

JUNE

NLC In the earliest hour of 2014 August 9, eerie electric-blue noctilucent clouds shine above Frame Lake and the Prince of Wales Northern Heritage Centre in Yellowknife, Northwest Territories. Noctilucent clouds are the Earth's highest clouds located in the mesosphere at altitudes of 76 to 85 km. | IMAGE BY STEPHEN BEDINGFIELD

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

THE PLANETS THIS MONTH

Mercury	not observable this month
Venus	very low in E in morning twilight
Mars	very low in W in evening twilight, lost after mid-month
Jupiter	in SW after dark, sets in W near 2 am
Saturn	rises in ESE at dusk, transits in S near 1 am

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			

JUL	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					

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1 — *40°N 50°N*
Set 1:30 1:44
Rise 12:54 12:43
First Quarter 8:42

Watch for noctilucent clouds in N sky during twilight this month. Best N of 50° latitude

2 — *40°N 50°N*
Set 2:03 2:11
Rise 13:55 13:50

Kouchibouquac Spring Star Fest, Kouchibouquac N.P., NB www.nb.rasc.ca/ (through Jun 4)

Lunar Straight Wall this evening

Two shadows on Jupiter visible in W of N. America 3:43 am

3 — *40°N 50°N*
Set 2:34 2:35
Rise 14:55 14:56
Sunrise 5:33 4:55
Sunset 20:24 21:03

Two shadows on Jupiter visible in E of N. America 10:22 pm

Venus at greatest elongation (46° W) this morning

Moon 1.3° above Jupiter this evening

4 — *40°N 50°N*
Set 3:03 2:59
Rise 15:53 16:00

5 — *40°N 50°N*
Set 3:33 3:23
Rise 16:50 17:03

6 — *40°N 50°N*
Set 4:03 3:48
Rise 17:47 18:05

7 — *40°N 50°N*
Set 4:36 4:15
Rise 18:42 19:06

8 — *40°N 50°N*
Set 5:11 4:46
Rise 19:37 20:05

9 — *40°N 50°N*
Set 5:50 5:21
Rise 20:30 21:01
Full Moon 9:10

Moon 2.5° left of Saturn and separating

Today's full Moon is the Trees Fully Leaved Moon

10 — *40°N 50°N*
Set 6:33 6:02
Rise 21:20 21:52
Sunrise 5:31 4:51
Sunset 20:28 21:08

Jupiter with only one satellite visible in E of N. America 10:57 pm

Jupiter stationary

11 — *40°N 50°N*
Set 7:21 6:49
Rise 22:07 22:38

12 — *40°N 50°N*
Set 8:12 7:42
Rise 22:50 23:18

13 — *40°N 50°N*
Set 9:07 8:40
Rise 23:29 23:53

14 — *40°N 50°N*
Set 10:04 9:42
Rise — —

15 — *40°N 50°N*
Rise 0:06 0:25
Set 11:04 10:47

Saturn at opposition (m=0.0)

16 — *40°N 50°N*
Rise 0:40 0:53
Set 12:05 11:54

17 — *40°N 50°N*
Rise 1:13 1:20
Set 13:08 13:04
Sunrise 5:31 4:50
Sunset 20:31 21:12
Last Quarter 7:33

6 Hebe at opposition (m=9.2)

18 — *40°N 50°N*
Rise 1:45 1:46
Set 14:14 14:16

FATHER'S DAY

Jupiter with only one satellite visible in W of N. America 1:18 am

19 — *40°N 50°N*
Rise 2:19 2:13
Set 15:21 15:31

Two shadows on Jupiter visible in Atlantic Canada 10:05 pm

20 — *40°N 50°N*
Rise 2:55 2:43
Set 16:31 16:48

Moon 6° right of Venus early this morning, best from W of N. America

21 — *40°N 50°N*
Rise 3:36 3:16
Set 17:43 18:07

NATIONAL ABORIGINAL DAY (NT)

Summer solstice 12:24 am

22 — *40°N 50°N*
Rise 4:22 3:56
Set 18:55 19:23

23 — *40°N 50°N*
Rise 5:14 4:44
Set 20:03 20:34
New Moon 22:31

40 Harmonia at opposition (m=9.3)

24 — *40°N 50°N*
Rise 6:14 5:42
Set 21:05 21:36
Sunrise 5:32 4:52
Sunset 20:33 21:13

LA FÊTE NATIONALE (QC)

25 — *40°N 50°N*
Rise 7:19 6:48
Set 22:00 22:28

26 — *40°N 50°N*
Rise 8:27 8:00
Set 22:47 23:10

DISCOVERY DAY (NL)

27 — *40°N 50°N*
Rise 9:34 9:14
Set 23:28 23:45

Moon 1° left of Regulus and separating this evening after twilight, best in E of N. America

28 — *40°N 50°N*
Rise 10:41 10:26
Set — —

29 — *40°N 50°N*
Set 0:04 0:14
Rise 11:44 11:37

10 Hygiea at opposition (m=9.1)

30 — *40°N 50°N*
Set 0:36 0:40
Rise 12:46 12:44
First Quarter 20:51

RASC General Assembly hosted by the Ottawa Centre www.rasc.ca/ga2017 (through July 3)

JULY

AQSARNIIT (INUKTITUT FOR AURORA BOREALIS) The Northern Lights themselves can present in many forms and often are a strange sight! Dancing and shimmering, they are an unforgettable experience for anyone who has seen them. With solar maximum now behind us, we will see less of the displays in the coming years. | IMAGE BY COLIN CHATFIELD

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

THE PLANETS THIS MONTH

Mercury	very low in WNW in evening twilight, early this month with extreme difficulty, lost by mid-month
Venus	very low in E in morning twilight
Mars	not observable this month
Jupiter	low in SW during twilight, sets in W near midnight
Saturn	in S at dusk, low in SW near dawn

1 (SATURDAY)

	40°N	50°N
Set	1:06	1:05
Rise	13:45	13:50
Sunrise	5:35	4:56
Sunset	20:33	21:12

CANADA DAY

Jocelyn Bell discovered first pulsar 50 years ago–was overlooked for Nobel Prize

2 (SUNDAY)

	40°N	50°N
Set	1:36	1:28
Rise	14:43	14:54

Watch for noctilucent clouds in N sky during twilight this month, Best N of 50° latitude

3 Juno at opposition (m=9.8)

Lunar Straight Wall this evening

3 (MONDAY)

	40°N	50°N
Set	2:06	1:53
Rise	15:40	15:57

Earth at aphelion (152,092,504 km) 4:11 pm

4 (TUESDAY)

	40°N	50°N
Set	2:38	2:19
Rise	16:36	16:58

INDEPENDENCE DAY (USA)

Sojourner rover was deployed, proving that Mars roving was possible, 20 years ago

5 (WEDNESDAY)

	40°N	50°N
Set	3:12	2:49
Rise	17:31	17:58

6 (THURSDAY)

	40°N	50°N
Set	3:50	3:22
Rise	18:25	18:55

Moon 2.5° above Saturn

7 (FRIDAY)

	40°N	50°N
Set	4:31	4:01
Rise	19:16	19:48

8 (SATURDAY)

	40°N	50°N
Set	5:17	4:46
Rise	20:05	20:36
Sunrise	5:39	5:01
Sunset	20:31	21:09

9 (SUNDAY)

	40°N	50°N
Set	6:08	5:36
Rise	20:49	21:19

Full Moon 0:07

NUNAVUT DAY

Spot Arcturus unaided before sunset this week

Today's full Moon is the Birds Shed Feathers Moon

10 (MONDAY)

	40°N	50°N
Set	7:02	6:33
Rise	21:30	21:56

Pluto at opposition (m=14.2)

11 (TUESDAY)

	40°N	50°N
Set	7:59	7:34
Rise	22:08	22:29

12 (WEDNESDAY)

	40°N	50°N
Set	8:58	8:39
Rise	22:43	22:58

13 (THURSDAY)

	40°N	50°N
Set	9:58	9:45
Rise	23:16	23:25

14 (FRIDAY)

	40°N	50°N
Set	11:00	10:54
Rise	23:48	23:51

Venus 3° upper left of Aldebaran this morning, best in E of NA

15 (SATURDAY)

	40°N	50°N
Set	12:04	12:04
Rise	—	—
Sunrise	5:44	5:08
Sunset	20:28	21:03

16 (SUNDAY)

	40°N	50°N
Rise	0:20	0:17
Set	13:09	13:16

Last Quarter 15:26

17 (MONDAY)

	40°N	50°N
Rise	0:54	0:44
Set	14:16	14:30

Lunar Curtiss X visible in W of N. America 6:00 am

18 (TUESDAY)

	40°N	50°N
Rise	1:32	1:15
Set	15:24	15:45

Gene Shoemaker, Chair of Near-Earth Object Search Committee, died 20 years ago

19 (WEDNESDAY)

	40°N	50°N
Rise	2:13	1:51
Set	16:34	17:00

George Ritchey discovered one of best distance indicators of spiral nebulae 100 years ago

20 (THURSDAY)

	40°N	50°N
Rise	3:01	2:33
Set	17:42	18:12

Stellafane Convention, Springfield, VT (through Jul 23)

Moon 3° lower right of Venus this morning

21 (FRIDAY)

	40°N	50°N
Rise	3:56	3:25
Set	18:47	19:18

22 (SATURDAY)

	40°N	50°N
Rise	4:57	4:26
Set	19:45	20:15
Sunrise	5:50	5:17
Sunset	20:23	20:56

Mount Kobau Star Party, Osoyoos, BC (through Jul 30)

23 (SUNDAY)

	40°N	50°N
Rise	6:03	5:35
Set	20:36	21:02

New Moon 5:46

24 (MONDAY)

	40°N	50°N
Rise	7:12	6:48
Set	21:21	21:41

Moon-Mercury-Regulus within 6° this evening, best from S of USA

25 (TUESDAY)

	40°N	50°N
Rise	8:21	8:03
Set	22:00	22:13

Mercury 1° lower left of Regulus, best from S of USA

26 (WEDNESDAY)

	40°N	50°N
Rise	9:27	9:16
Set	22:34	22:42

Mars in conjunction with Sun

27 (THURSDAY)

	40°N	50°N
Rise	10:31	10:27
Set	23:06	23:07

28 (FRIDAY)

	40°N	50°N
Rise	11:33	11:35
Set	23:37	23:32

Mataquac COW, Mactaquac P.P., NB www.nb.rasc.ca/ (through Jul 30)

Butterpot Star Party, St. John's, NL www.stjohnsrasc.ca/ (through Jul 29)

Moon 2.5° above Jupiter and separating this evening

29 (SATURDAY)

	40°N	50°N
Rise	12:33	12:41
Set	—	23:57
Sunrise	5:56	5:26
Sunset	20:16	20:46

30 (SUNDAY)

	40°N	50°N
Set	0:08	—
Rise	13:31	13:46

First Quarter 11:23

Mercury at greatest elongation (27° E) this evening (m=0.3)

31 (MONDAY)

	40°N	50°N
Set	0:39	0:22
Rise	14:28	14:48

Lunar Straight Wall this evening

JUN

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	

AUG

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		

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AUGUST

TOTALITY This August, North America will witness its first total solar eclipse in decades to cross the continent from coast to coast! Many thousands of amateur astronomers and public will travel to place themselves within the path of the shadow to witness one of the greatest marvels nature provides! Where will you be? | IMAGE BY ALAN DYER

SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY

THE PLANETS THIS MONTH

Mercury	not observable this month
Venus	low in E in morning twilight
Mars	not observable this month
Jupiter	very low in W soon after sunset, sets soon after dusk
Saturn	in SSW at dusk, sets in WSW near 1 am

1 — 40ºN 50ºN — Set 1:12 0:51 — Rise 15:24 15:49

2 — 40ºN 50ºN — Set 1:49 1:22 — Rise 16:18 16:47
Moon 4º above Saturn this evening

3 — 40ºN 50ºN — Set 2:29 1:59 — Rise 17:10 17:41

4 — 40ºN 50ºN — Set 3:13 2:41 — Rise 18:00 18:31
Phoenix *Mars Lander was launched to Mars 10 years ago*

5 — 40ºN 50ºN — Set 4:02 3:30 — Rise 18:46 19:16 — Sunrise 6:03 5:36 — Sunset 20:09 20:35

6 — 40ºN 50ºN — Set 4:55 4:25 — Rise 19:29 19:56

7 — 40ºN 50ºN — Set 5:51 5:25 — Rise 20:08 20:31
Full Moon 14:11
CIVIC HOLIDAY (AB, BC, MB, NB, NS, NT, NU, ON, PE, SK)
Partial lunar eclipse, visible E hemisphere, NOT visible from N. America
Today's full Moon is the Ripening Moon

8 — 40ºN 50ºN — Set 6:50 6:29 — Rise 20:44 21:02

9 — 40ºN 50ºN — Set 7:51 7:36 — Rise 21:18 21:30

10 — 40ºN 50ºN — Set 8:54 8:45 — Rise 21:51 21:56

11 — 40ºN 50ºN — Set 9:57 9:55 — Rise 22:24 22:22
Mt Carleton Star Party, Mt Carleton P.P., NB www.nb.rasc.ca/ (through Aug 13)

12 — 40ºN 50ºN — Set 11:02 11:06 — Rise 22:57 22:49 — Sunrise 6:09 5:46 — Sunset 20:00 20:23
Perseid meteors (ZHR=150) 4 pm, best seen in predawn hours today or tomorrow

13 — 40ºN 50ºN — Set 12:07 12:19 — Rise 23:32 23:18

14 — 40ºN 50ºN — Set 13:14 13:33 — Rise — 23:51
Last Quarter 21:15

15 — 40ºN 50ºN — Rise 0:11 — — Set 14:22 14:46

16 — 40ºN 50ºN — Rise 0:55 0:29 — Set 15:28 15:57
Moon 0.5º below Aldebaran this morning, best in E of N. America

17 — 40ºN 50ºN — Rise 1:45 1:16 — Set 16:33 17:04

18 — 40ºN 50ºN — Rise 2:42 2:11 — Set 17:32 18:03

19 — 40ºN 50ºN — Rise 3:45 3:15 — Set 18:25 18:53 — Sunrise 6:16 5:56 — Sunset 19:51 20:10
Moon 4º below Venus this morning

20 — 40ºN 50ºN — Rise 4:51 4:25 — Set 19:12 19:35

21 — 40ºN 50ºN — Rise 5:59 5:39 — Set 19:53 20:10
New Moon 14:30
DISCOVERY DAY (YT)
Total solar eclipse visible across U.S.

22 — 40ºN 50ºN — Rise 7:07 6:53 — Set 20:30 20:41

23 — 40ºN 50ºN — Rise 8:13 8:06 — Set 21:04 21:08
Saskatchewan Summer Star Party, Cypress Hills I-P.P., SK (through Aug 27)

24 — 40ºN 50ºN — Rise 9:17 9:16 — Set 21:35 21:33

25 — 40ºN 50ºN — Rise 10:19 10:25 — Set 22:07 21:58
Saturn stationary
Moon 5º upper left of Jupiter early this evening

26 — 40ºN 50ºN — Rise 11:19 11:31 — Set 22:38 22:24 — Sunrise 6:23 6:07 — Sunset 19:40 19:56

27 — 40ºN 50ºN — Rise 12:17 12:35 — Set 23:11 22:51

28 — 40ºN 50ºN — Rise 13:14 13:37 — Set 23:46 23:22

29 — 40ºN 50ºN — Rise 14:09 14:36 — Set — 23:56
First Quarter 4:13
22 Florence at opposition (m=8.8)
Moon 7º right of Saturn and approaching this evening

30 — 40ºN 50ºN — Set 0:25 — — Rise 15:02 15:33
Lunar Straight Wall this evening
Moon 6º left of Saturn and separating this evening

31 — 40ºN 50ºN — Set 1:07 0:36 — Rise 15:53 16:24

JUL	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					

SEP	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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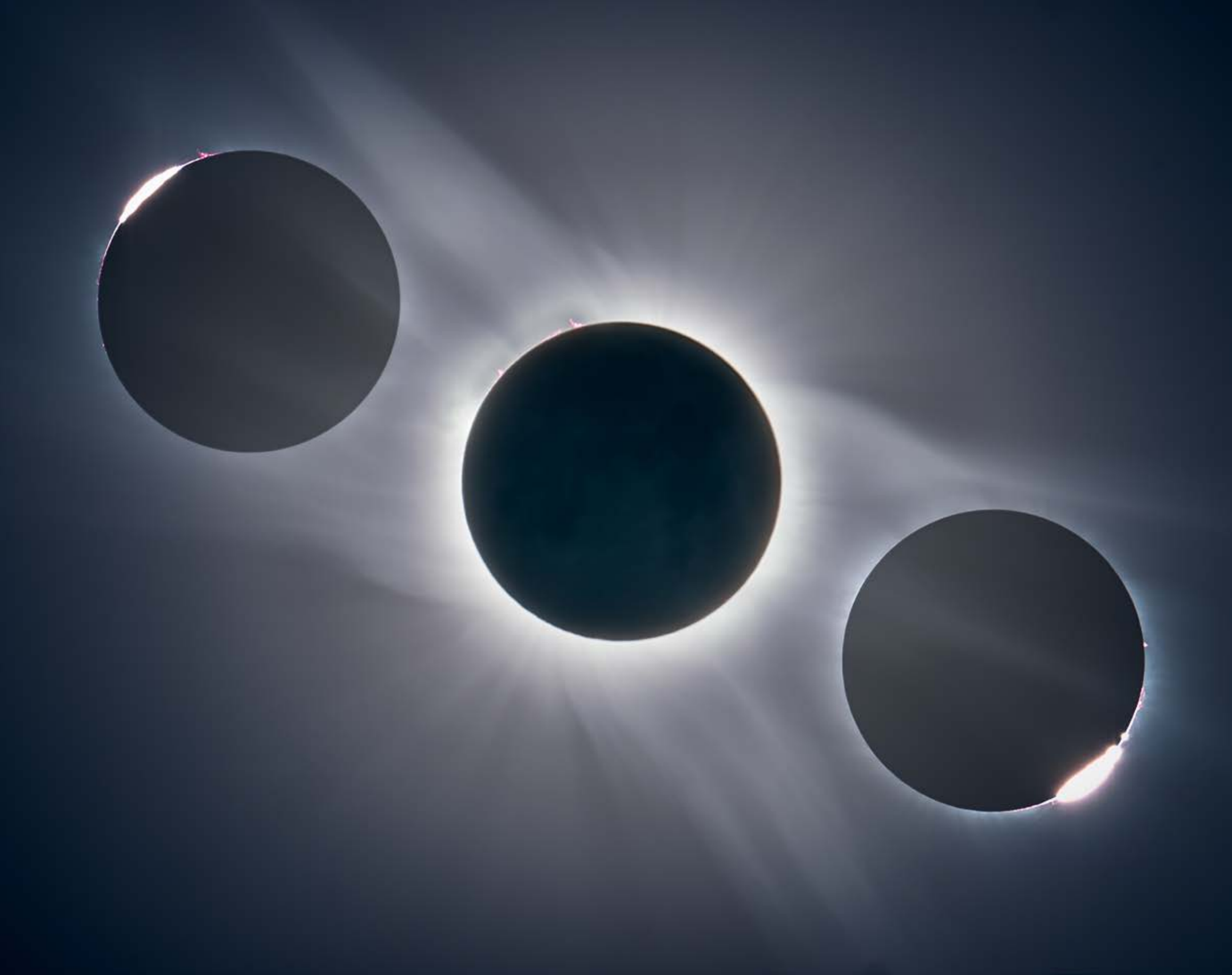

SEPTEMBER

THE PRANCING HORSE The region around the Pipe Nebula (B78), the main part of the naked-eye formation of dark nebulae, is called the Dark Horse. In photos it breaks up into patches of dark nebulosity, including the tiny Snake Nebula (B72) at centre in Ophiuchus. No less than two dozen of E.E. Barnard's Dark Nebulae are in this image! | IMAGE BY ALAN DYER.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

THE PLANETS THIS MONTH

Mercury	very low in E in morning twilight near mid-month, with difficulty
Venus	low in E in morning twilight
Mars	very low in E during twilight, late this month
Jupiter	very low in W soon after sunset, lost in twilight mid-month
Saturn	low in SSW at dusk, sets in WSW near 11 pm

AUG	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		

OCT	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				

Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.

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1 — FRIDAY

	40°N	50°N
Set	1:54	1:22
Rise	16:40	17:11

Venus 0.8° right of M44 early this morning

2 — SATURDAY

	40°N	50°N
Set	2:45	2:15
Rise	17:24	17:53
Sunrise	6:29	6:17
Sunset	19:29	19:41

3 — SUNDAY

	40°N	50°N
Set	3:40	3:13
Rise	18:05	18:30

Mercury, Mars, and Regulus within 3° this week,difficult in morning twilight

4 — MONDAY

	40°N	50°N
Set	4:39	4:16
Rise	18:43	19:02

LABOUR DAY

5 — TUESDAY

	40°N	50°N
Set	5:40	5:22
Rise	19:18	19:32

Neptune at opposition (m=7.8)

6 — WEDNESDAY

	40°N	50°N
Set	6:43	6:32
Rise	19:52	19:59

Full Moon 3:03

89 Julia at opposition (m=9.0)

Moon 1.5° below Neptune

Today's full Moon is the Moose Calling Moon

7 — THURSDAY

	40°N	50°N
Set	7:47	7:43
Rise	20:25	20:26

8 — FRIDAY

	40°N	50°N
Set	8:53	8:55
Rise	20:58	20:53

9 — SATURDAY

	40°N	50°N
Set	9:59	10:09
Rise	21:33	21:21
Sunrise	6:36	6:28
Sunset	19:18	19:26

10 — SUNDAY

	40°N	50°N
Set	11:07	11:23
Rise	22:12	21:53

11 — MONDAY

	40°N	50°N
Set	12:14	12:37
Rise	22:54	22:29

Surveyor 5 made first soil analysis of another planetary body, the Moon, 50 years ago

12 — TUESDAY

	40°N	50°N
Set	13:21	13:49
Rise	23:41	23:12

Mercury at greatest elongation (18° W) this morning (m=–0.4). Best morning apparition of the year. Mars 2.7° east.

Moon occults Aldebaran south of graze line Juneau-Yellowknife near dawn and after sunrise north of graze from Corpus Christi-central Florida

Mars Global Surveyor *began orbiting Mars to track weather patterns 20 years ago*

13 — WEDNESDAY

	40°N	50°N
Set	14:25	14:56
Rise	—	—

Last Quarter 2:25

14 — THURSDAY

	40°N	50°N
Rise	0:35	0:04
Set	15:25	15:56

Lunar Curtiss X visible in all of N. America except NE 5:00 am

15 — FRIDAY

	40°N	50°N
Rise	1:34	1:03
Set	16:19	16:48

Fundy Park Stargaze, Fundy N.P., NB www.nb.rasc.ca/ (through Sep 17)

16 — SATURDAY

	40°N	50°N
Rise	2:38	2:10
Set	17:07	17:32
Sunrise	6:42	6:38
Sunset	19:07	19:11

Mercury 0.3° above Mars in morning twilight

17 — SUNDAY

	40°N	50°N
Rise	3:44	3:20
Set	17:49	18:08

Zodiacal Light readily visible from a dark site in E before morning twilight for the next two weeks

Try to spot Uranus (m=5.7) unaided this week

Follow Capella unaided into daylight this week

18 — MONDAY

	40°N	50°N
Rise	4:50	4:33
Set	18:27	18:40

Mercury, Mars, Moon, Regulus, and Venus form straight line in morning twilight

19 — TUESDAY

	40°N	50°N
Rise	5:56	5:46
Set	19:01	19:08

Northern Prairie Star Party, AB edmontonrasc.com/northern-prairie-star-party (through Sep 24)

Old crescent Moon, 20 hours before new in E, 16 hours before new in W, a difficult challenge just before sunrise

20 — WEDNESDAY

	40°N	50°N
Rise	7:01	6:57
Set	19:33	19:34

New Moon 1:30

Venus 0.5° left of Regulus in morning twilight

21 — THURSDAY

	40°N	50°N
Rise	8:03	8:06
Set	20:04	19:59

ROSH HASHANAH BEGINS (begins at sunset the previous evening)

Spruce Woods Star Party, Spruce Woods P.P., MB winnipeg.rasc.ca/spruce-woods-star-party (through Sep 23)

22 — FRIDAY

	40°N	50°N
Rise	9:05	9:14
Set	20:36	20:24

ISLAMIC NEW YEAR (begins at sunset the previous evening)

Kouchibouquac Fall Star Gaze, Kouchibouquac N.P., NB www.nb.rasc.ca/ (through Sep 24)

Fall equinox 4:02 pm

23 — SATURDAY

	40°N	50°N
Rise	10:04	10:20
Set	21:08	20:51
Sunrise	6:49	6:49
Sunset	18:55	18:55

24 — SUNDAY

	40°N	50°N
Rise	11:03	11:24
Set	21:43	21:20

25 — MONDAY

	40°N	50°N
Rise	11:59	12:25
Set	22:20	21:53

26 — TUESDAY

	40°N	50°N
Rise	12:53	13:23
Set	23:01	22:31

Moon 2.5° above Saturn this evening

27 — WEDNESDAY

	40°N	50°N
Rise	13:45	14:17
Set	23:46	23:14

First Quarter 22:54

28 — THURSDAY

	40°N	50°N
Rise	14:34	15:05
Set	—	—

Lunar Straight Wall this evening

29 — FRIDAY

	40°N	50°N
Set	0:35	0:03
Rise	15:19	15:49

YOM KIPPUR (begins at sunset the previous evening)

30 — SATURDAY

	40°N	50°N
Set	1:28	0:58
Rise	16:00	16:27
Sunrise	6:56	6:59
Sunset	18:43	18:40

OCTOBER

CELESTIAL PAIR Messier 35 is one of the finest open clusters in the northern sky, covering an area almost the size of the full Moon and at a distance of only 2,800 ly. A treat under dark skies is the pairing with the more distant cluster NGC 2158, 11,000 ly, giving the view an almost three-dimensional feel when viewed through a telescope. | IMAGE BY RON BRECHER

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 *40°N 50°N* Set 2:24 1:59 Rise 16:39 17:01 704 Interamnia at opposition (m=9.9) Follow Sirius unaided into daylight this week	**2** *40°N 50°N* Set 3:24 3:04 Rise 17:15 17:31	**3** *40°N 50°N* Set 4:26 4:12 Rise 17:49 18:00	**4** *40°N 50°N* Set 5:31 5:23 Rise 18:23 18:26 *USSR launched* Sputnik 1, *first artificial satellite, 60 years ago*	**5** *40°N 50°N* Set 6:37 6:36 Rise 18:56 18:53 Full Moon 14:40 Venus 0.2° upper left of Mars in morning twilight Today's full Moon is the Animal Fattening Moon *K. Tomita recovered four known comets in one night 50 years ago*	**6** *40°N 50°N* Set 7:45 7:51 Rise 19:31 19:21	**7** *40°N 50°N* Set 8:54 9:08 Rise 20:09 19:52 Sunrise 7:03 7:10 Sunset 18:32 18:25
8 *40°N 50°N* Set 10:04 10:25 Rise 20:51 20:28 Spot Vega unaided before sunset this week	**9** *40°N 50°N* Set 11:13 11:40 Rise 21:38 21:10 **COLUMBUS DAY (USA)** **THANKSGIVING DAY (CANADA)**	**10** *40°N 50°N* Set 12:19 12:50 Rise 22:30 21:59 S Taurid meteors (ZHR=5)	**11** *40°N 50°N* Set 13:21 13:53 Rise 23:28 22:56	**12** *40°N 50°N* Set 14:17 14:47 Rise — — Last Quarter 8:25 *Edward E. Barnard made first photographic discovery of a comet 125 years ago*	**13** *40°N 50°N* Rise 0:30 0:01 Set 15:06 15:33 Try to spot Uranus (m=5.7) unaided this weekend	**14** *40°N 50°N* Rise 1:35 1:09 Set 15:49 16:10 Sunrise 7:10 7:21 Sunset 18:22 18:10
15 *40°N 50°N* Rise 2:40 2:20 Set 16:27 16:42 Moon 0.1° below Regulus early this morning Moon occults Regulus south of graze line-central Oregon-Fargo-Wawa-Gaspé before dawn Cassini-Huygens Mission *was launched to study Saturn and Titan 20 years ago*	**16** *40°N 50°N* Rise 3:45 3:32 Set 17:01 17:11 Zodiacal Light readily visible from a dark site in E before morning twilight for the next two weeks	**17** *40°N 50°N* Rise 4:48 4:42 Set 17:33 17:36 Moon 1° left of Mars early this morning Moon, Mars, Venus within 7° in morning twilight, best from western N. America	**18** *40°N 50°N* Rise 5:51 5:51 Set 18:04 18:01 *Venus's atmosphere was sampled for first time, by USSR's* Venera 4, *50 years ago*	**19** *40°N 50°N* Rise 6:52 6:59 Set 18:35 18:25 New Moon 15:12 Uranus at opposition (m=5.7)	**20** *40°N 50°N* Rise 7:52 8:06 Set 19:07 18:51	**21** *40°N 50°N* Rise 8:51 9:11 Set 19:40 19:19 Sunrise 7:17 7:32 Sunset 18:11 17:56 Orionid meteors (ZHR=15) 8 am, best seen in predawn hours today
22 *40°N 50°N* Rise 9:49 10:14 Set 20:16 19:50 Pioneer 12 *burned up in Venus' atmosphere ending 14 years in orbit 25 years ago*	**23** *40°N 50°N* Rise 10:45 11:13 Set 20:56 20:26	**24** *40°N 50°N* Rise 11:38 12:09 Set 21:39 21:07	**25** *40°N 50°N* Rise 12:28 13:00 Set 22:26 21:54	**26** *40°N 50°N* Rise 13:14 13:45 Set 23:17 22:46 Jupiter in conjunction with Sun	**27** *40°N 50°N* Rise 13:56 14:25 Set — 23:44 First Quarter 18:22	**28** *40°N 50°N* Set 0:11 — Rise 14:35 15:00 Sunrise 7:25 7:44 Sunset 18:02 17:43 2 Pallas at opposition (m=8.2) Lunar Straight Wall this evening
29 *40°N 50°N* Set 1:09 0:46 Rise 15:12 15:31 7 Iris at opposition (m=6.8)	**30** *40°N 50°N* Set 2:09 1:51 Rise 15:46 15:59	**31** *40°N 50°N* Set 3:11 3:00 Rise 16:19 16:26 **HALLOWE'EN** The Vatican absolved all heresy charges against Galileo 25 years ago *William Parsons, builder of 72" reflector at Birr Castle, died 150 years ago*				

THE PLANETS THIS MONTH

Mercury	not observable this month
Venus	very low in E in morning twilight
Mars	very low in E in morning twilight
Jupiter	not observable this month
Saturn	very low in SW after sunset, lost in twilight late this month

SEP	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

NOV	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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NOVEMBER

GRAND VIEW Physics abound in this view of Grand Geyser in Yellowstone National Park as it adds its steam to the summer Milky Way, while the Moon provides illumination of the foreground and is the source of the moonbow. A lone meteor slices through sky, adding to the dynamics of the scene. | IMAGE BY JENNIFER WEST

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

THE PLANETS THIS MONTH

Mercury	very low in SW in evening twilight near end of month, with difficulty
Venus	very low in E in morning twilight, lost after mid-month
Mars	very low in ESE during twilight
Jupiter	very low in E with difficulty after mid month
Saturn	not observable this month

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	40°N	50°N
Set	4:16	4:12
Rise	16:52	16:52

1

Hooker 100" reflector was first used 100 years ago

	40°N	50°N
Set	5:23	5:26
Rise	17:26	17:19

2

	40°N	50°N
Set	6:32	6:43
Rise	18:03	17:49

3

44 Nysa at opposition (m=9.6)

	40°N	50°N
Set	7:43	8:01
Rise	18:43	18:23
Sunrise	7:33	7:55
Sunset	17:54	17:31

4

Full Moon 1:23

Today's full Moon is the Rivers Freezing Moon

	40°N	50°N
Set	7:55	8:20
Rise	18:29	18:03

5

Daylight Saving Time ends 2:00 am

Moon occults Aldebaran in N. America except W this evening

	40°N	50°N
Set	9:06	9:36
Rise	19:21	18:50

6

	40°N	50°N
Set	10:13	10:45
Rise	20:19	19:46

7

	40°N	50°N
Set	11:13	11:44
Rise	21:21	20:50

8

	40°N	50°N
Set	12:05	12:34
Rise	22:27	21:59

9

	40°N	50°N
Set	12:50	13:14
Rise	23:33	23:11

10

Last Quarter 15:36

	40°N	50°N
Set	13:30	13:48
Rise	—	—
Sunrise	6:41	7:07
Sunset	16:47	16:21

11

REMEMBRANCE DAY (CANADA)

VETERANS DAY (USA)

Daylight lunar graze of Regulus Anchorage-Kamloops-Memphis-Savannah this morning

	40°N	50°N
Rise	0:38	0:22
Set	14:05	14:16

12

Lunar Curtiss X visible in W of N. America 7 am

N Taurid meteors (ZHR=5)

	40°N	50°N
Rise	1:41	1:32
Set	14:37	14:42

13

Venus 0.3° left of Jupiter in morning twilight

	40°N	50°N
Rise	2:43	2:41
Set	15:07	15:06

14

	40°N	50°N
Rise	3:44	3:49
Set	15:37	15:30

15

	40°N	50°N
Rise	4:44	4:55
Set	16:08	15:54

16

Jean le Rond d'Alembert, known for celestial mechanics, was born 300 years ago

	40°N	50°N
Rise	5:43	6:00
Set	16:40	16:21

17

Leonid meteors (ZHR=15) 9 am, best seen in predawn hours today

Old crescent Moon, 25 hours before new in E, 21 hours before new in W, just before sunrise

	40°N	50°N
Rise	6:41	7:03
Set	17:15	16:50
Sunrise	6:49	7:18
Sunset	16:41	16:12

18

New Moon 6:42

	40°N	50°N
Rise	7:37	8:05
Set	17:52	17:24

19

	40°N	50°N
Rise	8:32	9:02
Set	18:34	18:02

20

	40°N	50°N
Rise	9:23	9:56
Set	19:20	18:47

21

	40°N	50°N
Rise	10:11	10:43
Set	20:09	19:37

22

	40°N	50°N
Rise	10:54	11:25
Set	21:02	20:32

23

THANKSGIVING DAY (USA)

Mercury at greatest elongation (22° E) this evening (m=–0.4)

	40°N	50°N
Rise	11:34	12:01
Set	21:57	21:32

24

	40°N	50°N
Rise	12:11	12:33
Set	22:55	22:35
Sunrise	6:57	7:29
Sunset	16:37	16:05

25

Lunar X near crater Werner visible in E of N. America 6:00 pm

	40°N	50°N
Rise	12:45	13:01
Set	23:55	23:40

26

First Quarter 12:03

Lunar Straight Wall this evening

	40°N	50°N
Rise	13:17	13:27
Set	—	—

27

	40°N	50°N
Set	0:56	0:49
Rise	13:49	13:53

28

	40°N	50°N
Set	2:01	2:00
Rise	14:21	14:18

29

Australia launched its first satellite, Wresat 1, 50 years ago

	40°N	50°N
Set	3:07	3:14
Rise	14:55	14:46

30

OCT	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				

DEC	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

RADIANT Each December, the Earth passes through a stream of debris in space left behind by 3200 Phaethon, making this one of only two meteor showers not originating from a comet, the other being the Quadrantids in January. In this image the many meteors point back to a common point in the sky known as the radiant. | IMAGE BY MALCOLM PARK

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

THE PLANETS THIS MONTH

Mercury	very low in ESE in morning twilight, late this month
Venus	not observable this month
Mars	rises in E near 4 am, low in SE near dawn
Jupiter	very low in E in morning twilight
Saturn	not observable this month

1 — *40°N 50°N*
Set 4:17 4:31
Rise 15:33 15:16

349 Dembowska at opposition (m=9.6)

2 — *40°N 50°N*
Set 5:29 5:50
Rise 16:16 15:52
Sunrise 7:04 7:39
Sunset 16:35 16:00

3 — *40°N 50°N*
Set 6:41 7:09
Rise 17:05 16:36

Full Moon 10:47

Moon occults Aldebaran north of line Nevada-Saskatoon-Churchill before dawn

Today's full Moon is the Great Moon

4 — *40°N 50°N*
Set 7:52 8:24
Rise 18:02 17:29

5 — *40°N 50°N*
Set 8:58 9:31
Rise 19:05 18:32

6 — *40°N 50°N*
Set 9:57 10:28
Rise 20:12 19:42

7 — *40°N 50°N*
Set 10:47 11:13
Rise 21:20 20:56

8 — *40°N 50°N*
Set 11:30 11:51
Rise 22:28 22:10

9 — *40°N 50°N*
Set 12:07 12:21
Rise 23:33 23:22
Sunrise 7:11 7:47
Sunset 16:35 15:58

10 — *40°N 50°N*
Set 12:41 12:48
Rise — —

Last Quarter 2:51

11 — *40°N 50°N*
Rise 0:37 0:32
Set 13:12 13:13

12 — *40°N 50°N*
Rise 1:38 1:40
Set 13:41 13:36

Joseph von Fraunhofer ground his best achromatic lens 200 years ago

13 — *40°N 50°N*
Rise 2:38 2:46
Set 14:11 14:00

Moon 5° above Mars in morning twilight

14 — *40°N 50°N*
Rise 3:36 3:51
Set 14:42 14:25

Moon 4° above Jupiter in morning twilight

Moon, Mars, and Jupiter within 10° in morning twilight

Geminid meteors (ZHR=120) best seen in predawn hours today 1:00 am

15 — *40°N 50°N*
Rise 4:34 4:55
Set 15:16 14:53

16 — *40°N 50°N*
Rise 5:31 5:57
Set 15:52 15:25
Sunrise 7:16 7:53
Sunset 16:36 15:59

17 — *40°N 50°N*
Rise 6:26 6:56
Set 16:32 16:01

20 Massalia at opposition (m=8.4)

Old crescent Moon, 19 hours before new in E, 15 hours before new in W, a challenge just before sunrise

18 — *40°N 50°N*
Rise 7:19 7:51
Set 17:16 16:43

New Moon 1:30

Furthest Lunar Apogee of the year ~406604 km 8:28 pm

New Moon-Gegenschein visible from a very dark site-highest in S at midnight

19 — *40°N 50°N*
Rise 8:08 8:41
Set 18:04 17:31

20 — *40°N 50°N*
Rise 8:53 9:25
Set 18:56 18:25

21 — *40°N 50°N*
Rise 9:35 10:03
Set 19:50 19:23

Winter solstice 11:28 am

Saturn in conjunction with Sun

22 — *40°N 50°N*
Rise 10:12 10:36
Set 20:47 20:24

Ursid meteors (ZHR=10) best seen in predawn hours today 10:00 am

23 — *40°N 50°N*
Rise 10:46 11:05
Set 21:45 21:28
Sunrise 7:20 7:57
Sunset 16:39 16:02

24 — *40°N 50°N*
Rise 11:19 11:32
Set 22:45 22:34

25 — *40°N 50°N*
Rise 11:49 11:56
Set 23:46 23:42

CHRISTMAS DAY

Jupiter with only one satellite visible in W of N. America 7:33 am

Sir Isaac Newton was born 375 years ago

26 — *40°N 50°N*
Rise 12:20 12:21
Set — —

First Quarter 4:20

BOXING DAY (CANADA)

Lunar Straight Wall this evening

27 — *40°N 50°N*
Set 0:49 0:52
Rise 12:52 12:46

28 — *40°N 50°N*
Set 1:55 2:05
Rise 13:26 13:13

29 — *40°N 50°N*
Set 3:03 3:20
Rise 14:05 13:45

30 — *40°N 50°N*
Set 4:14 4:38
Rise 14:49 14:23
Sunrise 7:22 7:59
Sunset 16:44 16:07

Moon occults Aldebaran for all N. America except S of graze line central Florida this evening. Daylight for W coast U.S.

31 — *40°N 50°N*
Set 5:25 5:55
Rise 15:41 15:10

NEW YEAR'S EVE

NOV

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		

JAN

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			

Times in the upper half of the daily boxes are in the 24-hour clock; times in the lower half are given in the 12-hour clock.

Eastern time is used, except for rise and set events and changes to/from Daylight Saving Time, which are given in local time.

Times for events involving planetary satellites refer to the start time.

Detailed instructions on adjusting times for location are given in the back pages.

Please see back pages for photo details and additional information about this Calendar.

How to Use this Calendar

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

This years moon names are those of the Mi'kmaq, a First Nations band, indigenous to Canada's Atlantic Provinces and the Gaspé Peninsula of Quebec.

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

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

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

Adjustments for Actual Location

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

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

The tables give (longitude) corrections in minutes to the tabulated rise and set times for selected Canadian and U.S. cities. In the column labelled **Correction**, an entry such as 50°N + 25 means add 25 minutes to the displayed 50°N time. This computed time is an approximation. In the column labelled **Accuracy**, the approximate maximum error in minutes for Moon rise and set using this method is indicated. The error for Sun rise and set is less. These errors can be substantially reduced by interpolating according to latitude, as explained in the following section. Note that the rise and set times calculated using the above method will be local times. It is not necessary to adjust them for time zone.

Other Locations, and Improving Accuracy

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

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

Canadian Locations

City	Correction	Accuracy	Latitude
Calgary	50°N + 36	15	51
Charlottetown	40°N + 12	20	46
Edmonton	50°N + 34	25	54
Halifax	40°N + 14	25	45
Hamilton	40°N + 20	15	43
Kelowna	50°N − 3	10	50
Kingston	40°N + 6	20	44
Kitchener	40°N + 22	15	43
London	40°N + 25	15	43
Moncton	40°N + 19	20	46
Montréal	50°N − 6	20	46
Niagara	40°N + 16	15	43
Ottawa	50°N + 3	20	45
Prince George	50°N + 11	25	54
Québec	50°N − 15	15	47
Regina	50°N + 58*	10	50
St. John's	50°N + 1	20	48
Sarnia	40°N + 30	15	43
Saskatoon	50°N + 67*	15	52
Thunder Bay	50°N + 57	10	48
Toronto	40°N + 18	20	44
Vancouver	50°N + 12	15	49
Victoria	50°N + 13	20	49
Whitehorse	50°N + 60	60	61
Windsor	40°N + 32	15	42
Winnipeg	50°N + 29	5	50

U.S. Locations

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

**Subtract 60 minutes in the summer.*

2017

JAN	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				

FEB	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				

MAR	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	

APR	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			

JUN	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	

JUL	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					

AUG	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		

SEP	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

OCT	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				

NOV	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		

DEC	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						

2018

JAN	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			

FEB	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			

MAR	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

APR	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		

JUN	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

JUL	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				

AUG	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	

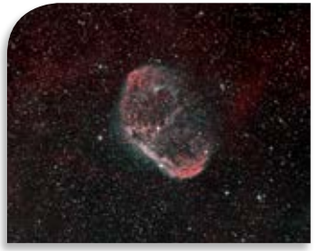
SEP	S	M	T	W	T	F	S
							1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30						

OCT	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			

NOV	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	

DEC	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 (UT) are displayed in **blue**.



January *(Crescent Nebula)*
A composite image made from exposures totalling 16 × 15 min OIII and 33 x 15 min Hα, for a total exposure of 12.25 hours. Image was taken using an Apogee U16M camera with a PlaneWave CDK12.5 on a Paramount ME. Processed with Maxim-DL and Photo Shop CS6. Image taken August 2013 by Stuart Heggie from Flesherton, Ontario.

February *(The Cygnus Wall)*
A composite image made from exposures totalling 13 × 15-min R, 11 × 15-min G, 11 × 15-min B, and 9 × 30-min Hα, for a total exposure of 13.25 hours. Image was taken using a SBIG STL-11000M camera with Baader RGB filters and a 10″ ASA astrograph at *f*/6.8 on a Paramount MX. Calibration and processing with PixInsight. Images were taken from Guelph, Ontario, by Ron Brecher.

March *(Orange Moon)*
A single 8-sec image at ISO 400 with a Canon T1i, Astrotech 8″ *f*/4 Newtonian with a Celestron coma corrector on a Losmandy GM8 mount tracking at lunar rate. Image by Stan Runge from Teulon, Manitoba.

April *(Spiral Galaxy)*
A composite image made from 2 hours each of L, R, G, B, and Hα, and for a total exposure of 10 hours! Image was taken with a TEC 500RC 20″ *f*/9 and a FLI Proline PL 16803 CCD from the Hacienda Los Andes, Chile, in December 2015. Image acquisition by Debra Ceravolo and Daniel Verschatse, and processing by Debra Ceravolo.

May *(Globulars)*
All images are composites made from exposures as follows: M13 LRGB, 5 min × 5, 7, 8, and 8; M10 RGB, 10 min × 6, 6, and 6; M71 RGB, 10 min × 5, 5, and 5, and M80 RGB, 10 min × 5, 5, and 5. Images were all taken using a Apogee U16M with Astrodon Gen II LRGB filters on a 12.5″ Planewave CDK on a Paramount ME guided with a SBIG ST-402ME. Calibration with Maxim DL, combines and colour processing with PixInsight and Photoshop CC. Images were taken from Lucknow, Ontario, by Stuart Heggie.

June *(NLC)*
A single image exposed for 1 second at ISO 400 with a Canon 5D MKIII and a 24-mm, *f*/1.4 lens at *f*/2.0. Image was taken from Yellowknife, Northwest Territories, 2014 August 9. Image by Stephen Bedingfield.

July *(Aqsarniit)*
A single image exposed for 20 secs at ISO 1600 with a Canon 7D MKII and Tokina 11-16-mm lens at 11 mm, *f*/2.8 with mirror lock up and white balance 3200K. Image was taken a few kilometres east of Saskatoon, Saskatchewan, 2015 November 9. Image by Colin Chatfield.

August *(Totality)*
A composite image from 7 frames of a range of exposures from1/800th to 0.8 second with a Canon 20Da through a 66-mm Williams Optics *f*/6 APO refractor on an alt-az tripod with no tracking. Images were manually aligned in Photoshop. Images were taken from desert location south of Turbuq, Libya. Image by Alan Dyer.

September *(The Prancing Horse)*
A composite image from 5 × 3-min frames captured with a modified Canon 5D Mark II, 135-mm *f*/2.8 telephoto lens at ISO 1600. Image was taken at Four Bar Cottages near the Arizona Sky Village, Portal, Arizona. Image by Alan Dyer.

October *(Celestial Pair)*
A composite image made from exposures totalling 6 × 3-min R, 5 × 3-min G, 6 × 3-min B, for a total exposure of 51 mins. Image was taken using a SBIG STL-11000M camera with Baader RGB filters and a 10″ ASA astrograph at *f*/3.6 on an MI-250 mount. Guiding and calibration with Maxim-DL and processing with PixInsight. Images were taken from Guelph, Ontario, 2012 January 21. Image by Ron Brecher.

November *(Grand View)*
A composite image from 6 × 40-sec frames captured with a Canon Rebel Xs, 15-mm *f*/2.8 lens at *f*/2.8 and ISO 800. Frames were processed and combined using Image J and Adobe Photoshop. Image was taken at Grand Geyser, Yellowstone National Park, USA. Image by Jennifer West.

December *(Radiant)*
A composite image from 50 × 25-sec frames selected from over 1400 captured with a Nikon D3S, 14-24-mm *f*/2.8 lens at 14 mm *f*/2.8 and ISO 4000. Frames were processed and combined using Adobe Photoshop CC. Image was taken near Gila, New Mexico, 2015 December 13/14. Image by Malcolm Park.

Most of the data appearing in the monthly grids was generated using custom software written by Dave Lane, Alister Ling, and Larry McNish. The Moon images were created using custom software written by Alister Ling.

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The Royal Astronomical Society of Canada

Since it was founded in 1868, the RASC has filled a special role in both amateur and professional astronomy. Today, it has over 5000 members worldwide who share a passion for the night sky and make contributions to astronomy in many ways.

The RASC has a long tradition of high-quality, volunteer-produced publications. The *Observer's Handbook* has been published since 1907 and is recognized worldwide as the leading handbook of its type. The *Journal*, also published since 1907, contains articles of interest to amateur astronomers. The *Observer's Calendar* is a forum for astro photography by amateur astronomers, and *Skyways* (available in French as "*Explorons l'Astronomie*") is an astronomy teacher's guide. The RASC now owns and publishes *SkyNews*, Canada's only adult science magazine.

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

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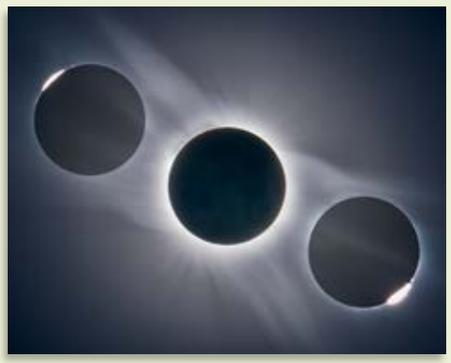



Set Rise — 40°N 5:31 18:23 — 50°N 5:23 18:26 — **4**

USSR launched Sputnik 1*, first artificial satellite, 60 years ago*

Set Rise — 40°N 6:37 18:56 — 50°N 6:36 18:53 — **5**

Full Moon 14:40

Venus 0.2° upper left of Mars in morning twilight

Today's full Moon is the Animal Fattening Moon

K. Tomita recovered four known comets in one night 50 years ago

Set Rise — 40°N 13:21 23:28 — 50°N 13:53 22:56 — **11**

Set Rise — 40°N — 14:17 — 50°N — 14:47 — **12**

Last Quarter 8:25

Edward E. Barnard made first photographic discovery of a comet 125 years ago

The Royal Astronomical Society of Canada

Observer's Calendar 2017

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

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

Editor
Paul Gray

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