The Pocket Planetarium ★

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Astronomical Information Newsletter of the Rio Tinto Alcan Planetarium

The Starry Sky — Spring 2016

This Star Map is Accurate on...

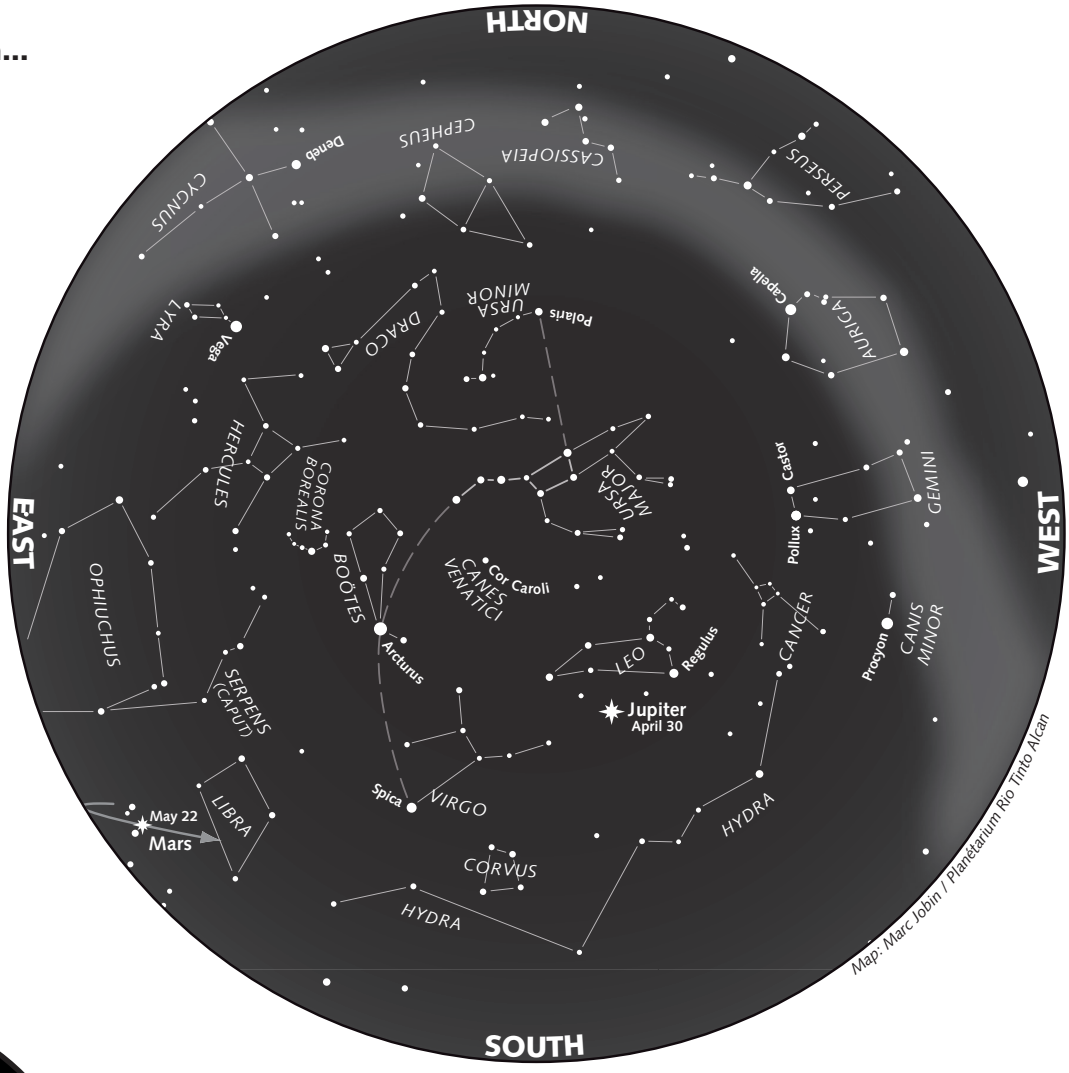
(Eastern Daylight Time)

March 21 at 1 a.m.
April 6 at midnight
April 21 at 11 p.m.
May 6 at 10 p.m.
May 21 at 9 p.m.

How to Use this Map

The map represents the night sky as it appears at the indicated times, and remains usable several hours before and after.

Hold the map up to the sky in front of you and turn it so the direction you are facing appears at the bottom. Lines identify the constellations. The light-coloured area outlines the Milky Way.



Map: Marc Jobin / Planétarium Rio Tinto Alcan

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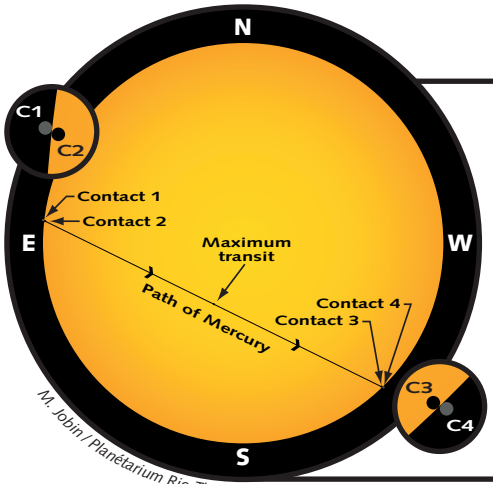

M. Jobin / Planétarium Rio Tinto Alcan, from F. Espenak / EclipseWise.com

Transit of Mercury

On May 9, Mercury will pass directly in front of our star, the Sun. For the first time since 1960, this rare event (13 per century on average) will be visible in its entirety from Quebec, and under promising circumstances.

From Montreal, the first two contacts—the moment Mercury's disk touches the edge of the Sun, and the moment it appears completely silhouetted in front of the Sun—will occur at precisely 7:13:27 and 7:16:39 A.M. (EDT). At that time, the Sun will be about 16 degrees above the eastern horizon.

Mercury's progress across the solar disk can be followed throughout the morning and early afternoon. At mid-transit, at 10:57:46, the tiny planet will appear two thirds of the way between the Sun's edge and its centre, and the Sun will be 53 degrees up in the southeast. As with its ingress, Mercury's egress will take place gradually, from 2:38:07 to 2:41:18 P.M., which marks the end of the event. At this point, the Sun will be about 54 degrees above the southwest horizon.

Mercury is smaller and farther away than Venus, which makes it harder to spot against the solar surface. To safely observe the tiny black dot, barely 12 arc seconds in diameter, it is necessary to use an optical instrument with sufficient magnification, **that's equipped with a specialized solar filter** (the same type used to observe sunspots).

Let's hope that the weather cooperates: During the last transit of Mercury, on November 8, 2006, clouds got in the way.

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The Sky This Spring

Mars, Saturn and Jupiter occupy the evenings this spring.

And tiny Mercury will bring some additional interest to our observations!

Spotlight on the Red Planet

An orange-coloured object can be seen shining brightly near the head of Scorpius: It's the planet **Mars.** Mars reaches opposition on May 22, which is the best time to observe it—a situation that arises about every 26 months. This is when the Red Planet is closest to us: As a result, it appears large enough for a small telescope to reveal surface details. The prime window for observing Mars remains open from April 24 to July 12, during which time the planet's apparent diameter surpasses 15". Its apparent size reaches a maximum of 18.6" on May 30, a few days after opposition. That's when the distance between Earth and Mars is at a minimum: The Red Planet will then be "just" 75 million kilometers away! From April 30 to June 28, Mars will surpass the brightness of Sirius (magnitude –1.43) and will be at its brightest (magnitude –2.06) around opposition.

This Martian opposition occurs while the planet is in a southerly part of the ecliptic (declination –21°) so it never rises much above the horizon. Regrettably, this situation will hamper telescopic observations from the Northern Hemisphere; but despite these circumstances, Mars will remain spectacular to the naked eye! Compare its colour with that of the nearby star, Antares, whose name actually means "rival of Mars". Starting on April 17, the Red Planet begins its retrograde loop: As the weeks pass it will trace a large figure "S" through the constellations of Ophiuchus, Scorpius and Libra.

As spring begins, Mars appears in the southeast around 1:00 A.M., but by the end of April it rises somewhat earlier, around 11:00 P.M. When it reaches opposition at the end of May, the Red Planet will emerge in the south-eastern twilight at sunset and culminate around 1:00 in the morning, slightly more than 20 degrees above the southern horizon.

Mars and neighbouring Saturn, which shines a few degrees to its left, are frequented by the Moon several times this spring. The waning gibbous moon appears near Mars on the morning of March 28; it forms a triangle together with the two planets on the morning of March 29 and again during the night of April 24 to 25. The full moon will create another outstanding triangle with Mars and Saturn on the night of May 21 to 22. And finally, the waxing gibbous moon passes next to Mars during the night of June 16 to 17, forming another triangle with the two planets on the night of June 17 to 18.

Saturn at opposition

On June 3, **Saturn** is the next planet to arrive at opposition, just a few days after its neighbour, Mars. From March 25 to August 13, Saturn undergoes its retrograde loop in Ophiuchus, a few degrees to the upper left of Antares, near the head of Scorpius. As with the Red Planet, during this opposition Saturn occupies a region of sky that remains close to the horizon. But the north face of the planet's rings is currently tilted a bit more than 26 degrees toward Earth, open almost to the maximum; so despite its low position Saturn still offers a dramatic view through telescopes. The ringed planet appears progressively earlier as spring advances. At the start of the season, it rises around 1:00 A.M.; by mid-April it rises before midnight; at the beginning of June, Saturn rises in the southeast at twilight and culminates in the south around 1:00 A.M. The planet will remain visible during the evening throughout summer till fall.

Apart from Saturn's encounters with Mars (see preceding section), the gibbous moon also appears near the ringed planet: 4 degrees to the left of it on the night of May 22 to 23, and 3 degrees above it during the night of June 18 to 19.

Jupiter shines in the evening

Jupiter was at opposition early in March and is the first planet to appear in the evening twilight. It shines beneath the main asterism of Leo and is currently retrograding (moving westward, to the right, with respect to the background stars). On May 9, the giant planet resumes its eastward movement and heads toward Virgo. Aside from the Moon, Jupiter is currently the brightest object visible in the evening sky: to identify it with certainty, the waxing gibbous moon will pass less than 3 degrees below Jupiter on the nights of March 21 to 22, April 17 to 18, and May 14 to 15. Throughout this period, Jupiter is highest in the sky around nightfall. Take advantage of the planet's altitude to observe it with a telescope: Its four Galilean moons and atmospheric cloud bands are always fascinating.

An excellent apparition of Mercury

Mercury offers its best apparition of the year in the evening, during the first three weeks of April. To find the tiny planet, scan the west-northwest horizon at twilight, about thirty minutes after sunset. Mercury is brightest at the beginning of April, but highest in the sky around mid-month. **On the evening of April 8,** a lunar crescent will appear 7 degrees to the left of the planet: Enjoy this celestial pairing 45 minutes after the Sun sets. Beginning April 18, Mercury plunges sunward once again, and its brightness rapidly fades over the following evenings; after the 22nd, it becomes lost in the glare of twilight. **On May 9,** Mercury is at inferior conjunction between the Earth and Sun: On this occasion, the alignment will be nearly perfect and **the tiny planet will pass directly in front of the solar disk**—a rare event. (See boxed text on previous page.)

Venus heads behind the Sun

Shining as the Morning Star since last September, **Venus** is approaching the Sun and becoming harder to see in the glow of dawn, above the east-southeast horizon: in April, it becomes completely lost in the solar glare. The dazzling planet is behind the Sun (superior conjunction) on June 6, and will gradually reappear in the evening sky in July.

Clear skies!

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Adaptation: **Louie Bernstein**

Phases of the Moon

(Eastern Daylight Time)

First quarter	Full moon
March 15 at 13:03	March 23 at 8:01
April 13 at 23:59	April 22 at 1:24
May 13 at 13:02	May 21 at 17:14
June 12 at 4:10	June 20 at 7:02
Last quarter	**New moon**
March 31 at 11:17	April 7 at 7:24
April 29 at 23:29	May 6 at 15:30
May 29 at 8:12	June 4 at 23:00
June 27 at 14:19	July 4 at 7:01

Seasonal Milestones

The **spring equinox** occurs on March 20 at 00:30 Eastern Daylight Time, and the **summer solstice** will take place on June 20 at 6:34 P.M. Spring 2016 will last exactly 92 days 18 hours 4 minutes.

The Pocket Planetarium *is a seasonal information newsletter published by the Rio Tinto Alcan Planetarium, 4801, avenue Pierre-De Coubertin, Montréal (Québec) H1V 3V4*
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