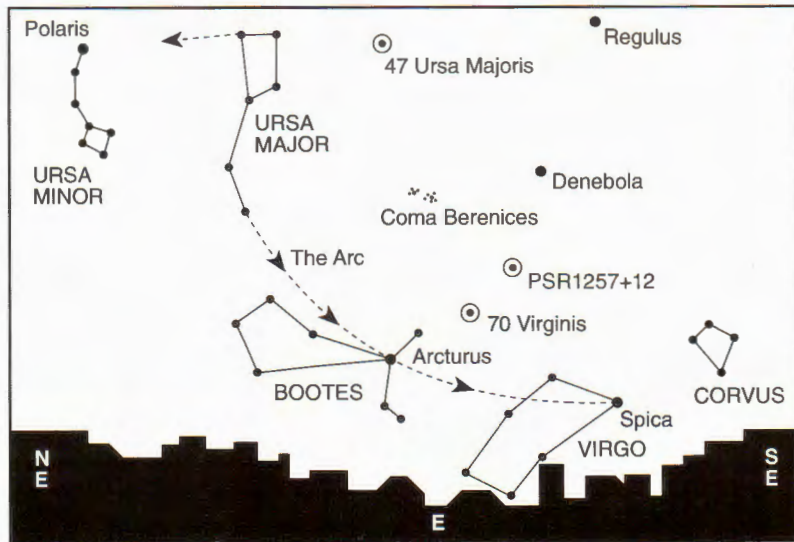


Singing with the stars



LOOKING EAST AT 9:00 P.M. ON MAY 15, 1996.

During Spring in the northern hemisphere, the seven bright stars that form the Big Dipper are easily seen high over the northern horizon. Located at the headquarters of the Great Bear (Ursa Major), this asterism (group of stars) has long been used as a celestial guide by travelers. During the American Civil War, slaves memorized a song called "Follow the Drinking Gourd" that helped them locate the stars that would point their way to freedom. By tracing a path across the night sky in the direction indicated by the two "pointer stars" in the dipper's handle, Polaris, the North Star can easily be found.

On spring evenings when the Big Dipper stars are high over the horizon, you can use the following mnemonic device as your own celestial guide: "Follow the arc to Arcturus and then speed to Spica." This saying helps guide a stargazer's eyes along the arc-shaped handle of the Big Dipper to the reddish star Arcturus in Boötes the Herdsman, and then on to Spica in Virgo the Maiden.

While you're in this region of the

sky, you can also investigate some newly discovered neighboring solar systems.

Scientists now believe that two sunlike stars in this region have at least one orbiting satellite each, and that a nearby pulsar could have up to three satellites. Just below the bowl of the Big Dipper lies 47 Ursa Majoris, a star with an orbiting object estimated to have two to three times the mass of Jupiter and a revolution rate of 1103 Earth days. Near the northern boundaries of Virgo, an object orbiting around 70 Virginis is estimated to have six to seven times the mass of Jupiter and a revolution rate of 117 Earth days. Although the objects themselves are too far away to be seen, the suns around which they orbit are visible to the naked eye.

A third solar system you should direct your attention to is also within the boundaries of Virgo. Unlike the other two solar systems, the objects in this system orbit a pulsar, PSR 1257+12. According to theory, a pulsar is a small, extremely dense, and rapidly rotating stellar object that is thought to be the remnants of

a supernova explosion. (A supernova is an extremely bright variable star that suddenly increases in brightness up to a billion times.) PSR 1257+12 gets its name from its celestial coordinates, 12 hours 57 minutes right ascension and 12 degrees north declination. This pulsar is one of at least 20 known pulsars in our galaxy and has an estimated diameter of 16 kilometers, and a mass that is one to two times that of our Sun.

Pulsars earn their name from the radio waves they emit, which we receive in regular pulses. Pulsars emit radio waves as a narrow beam, much like the beam of light emitted from a lighthouse. Just as direct light from a lighthouse sweeps past a point regularly, so does the beam of radio waves emitted from a pulsar. PSR 1257+12 emits radio waves that reach the Earth with at an interval of 6.2 milliseconds. Because we receive pulsed radio waves from a pulsar as a result of its rotation, we know a pulsar's pulse interval coincides with its period of rotation. This means that PSR 1257+12 rotates every 6.2 milliseconds!

Lunar eclipse lookout

April will feature two eclipses, a total lunar eclipse during the evening of April 3 followed by a partial solar eclipse on April 17. The solar eclipse will only be visible to inhabitants of the southern hemisphere, but North Americans on the eastern seaboard will be able to view the lunar eclipse. (Unfortunately, the lunar eclipse will be over before moonrise for people in the western United States.) See Table 1 for best viewing times.

Evening planets

Mercury: Low over the west-northwestern horizon, sets about 45 minutes after sunset during April.

Venus: Over the southwestern horizon, sets about three hours after sunset during April and May.

Special calendar events

Daylight saving time in the United States begins on Sunday, April 7. Remember to "spring forward" by setting your clocks and watches forward one hour.

Easter Day is also on Sunday, April 7, as this is the first Sunday after the full moon that occurs on or after the calendar-based date for the March equinox, March 21.

Moon phases

April

Full Moon - April 3

Third Quarter - April 9

New Moon - April 17

First Quarter - April 25

May

Full Moon - May 3

Third Quarter - May 10

New Moon - May 17

First Quarter - May 25

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TABLE 1. Eclipse observation times

(Evening, April 3, through morning, April 4)



	Washington, D.C.	Kansas City, Missouri	Los Angeles, California
Sunset	18:34	18:44	18:16
Moonrise	18:29	18:43	18:18
Moonset	05:32	05:44	05:23
Eclipse starts	17:24	16:24	14:24
Totality starts	18:30	17:30	15:30
Mid-eclipse (totality)	19:13	18:13	16:13
Totality ends	19:55	18:55	16:55
Eclipse ends	21:01	20:01	18:01

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