Now is best time to see Saturn's rings

skywatch

Raymond E. Bullock

THE MOON is at first quarter phase at 11:51 a.m. Aug. 20. The moon is one-quarter of its way around the earth, hence the name first-quarter.

The moon is approaching the star Antares (an TAR ees) that evening. Antares, the "rival of Mars," is a red giant star, many times larger than the sun. Antares rivals Mars in both brightness and color. It marks the "heart" of Scorpius the scorpion.

The moon has passed Antares on the evening of Aug. 21 and is approaching Saturn. On the following night the moon will be about 7 degrees below Saturn and sitting at the "spout" of the "teapot" that marks Sagittarius.

SATURN'S RING system is now tilted nearly 27 degrees from being edgewise, which is about the best they can appear in Saturn's 29 1¼ year orbit around the sun. From this point on, the angle of the tilt will decrease until the rings appear edge-on in 1995.

These next months will offer the *best viewing of Saturn's rings.* It's the best since 1973. We won't have it this good again until 2004.

Venus is at its greatest elongation (apparent distance) from the sun on the 21st. It is 46 degrees west (right) of the sun, as seen from the earth. A telescopic view of Venus will show it half-illuminated.

Mars is stationary Aug. 26. During the past several months, careful observers will have noticed it moving slowly from west to east, with respect to the background stars.

Mars is about to begin retrograde (backward) motion; during the next two months it will move from east to west.

Mars is not actually stopping dead in its orbit and going backward. "Retrograde motion" is an optical illusion. As the earth, moving faster in its orbit than Mars, comes around the sun, we pass Mars, making the slower moving planet appear to stop its forward movement and back up.

FULL MOON is at 6:56 a.m. on the 27th. "Half moon" might be a better name for it. Even though the moon is "fully lighted," it is at its halfway point in its orbit around the earth. It is opposite the sun, as seen from earth.

The full moon rises in the east as the sun sets in the west, and sets in the west as the sun rises in the east.

Because the moon is nearly exactly behind the earth, it will be passing through a portion of our planet's shadow. Such an event is called a lunar eclipse. If the moon went totally through the shadow, we would have a total eclipse.

Unfortunately, this is only a partial eclipse and, even more unfortunately, the eclipse is at its maximum 11 minutes after the moon has set (seen from the Detroit area).

If the orbit of the moon around the earth were exactly aligned with our equator, we would have a lunar (and solar) eclipse every month. But the moon's orbit is tilted 5 degrees.

Most of the time, the moon passes above or below the earth's shadow. It's only when the sun-earth-moon alignment is correct that an eclipse can occur.

THE ECLIPSE officially begins at 4:51 a.m. when the moon enters the dim penumbra, the outer edge of the earth's shadow. Because the penumbra is so faint, the shadow upon the moon will not be noticeable.

The most visible part of the eclipse begins at 6:08 a.m., when the moon begins to enter the umbra, the darkest part of the shadow. At maximum (7:05 a.m.), 30 percent of the top of the moon will be eclipsed, but the moon sets at 6:54 a.m.

In addition, morning twilight will have brightened the sky in advance of sunrise (6:53 a.m.) All in all, Michigan is not the most favorable location to observe this lunar eclipse. People living in the western states will be able to see the entire event, while those in the East will see even less.

ANOTHER opportunity to find Mars, by using the moon, occurs on Aug. 29. Mars is about 9 degrees below the moon at 11 p.m. Does Mars look any brighter to you than it did at the beginning of August?

Saturn has been going retrograde for the past four months. On Aug. 30, Saturn is stationary, and its illusion of drifting backward through the stars comes to an end. It will now resume its direct (also called "prograde") motion from west to east.

But remember: Saturn is a slowly moving planet, taking more than 29 years to complete one orbit around the sun. Saturn's motion, from night to night, is not easily perceptible.

By making careful observations, over the course of weeks, you will be able to notice its movement through the stars of Sagittarius.

An excellent aid for learning constellations and keeping up to date with the sky is the monthly "Sky Calendar." A one-year subscription is $6 and is available from Abrams Planetarium, Michigan State University, East Lansing, 48824.

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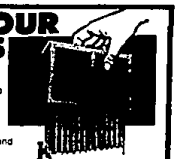

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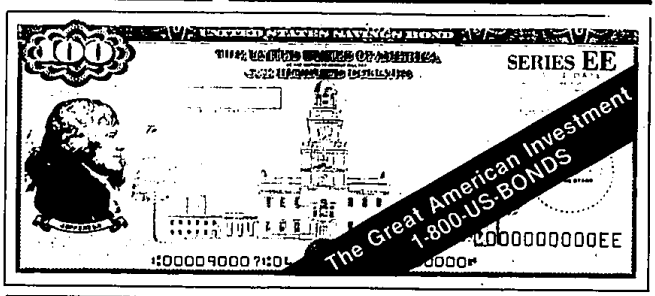

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WINNERS CIRCLE
BY LAURIE KIPP
MSL

Tickets for the Michigan Lottery's "Lotto" game went on sale August 14, 1984, with the first drawing conducted on August 25. The following talks about the evolution of the game during its first four years.

Q: How does the current Super Lotto game differ from the original Lotto game?

A: Players in the current game are challenged to match six, five or four numbers from a field of 44. In the original game, the field was comprised of 40 numbers.

Q: Why was the change made?

A: At one point, Lotto and Super Lotto were offered at the same time, but with different Jackpots. Besides confusion between the two games, Super Lotto consistently outsold Lotto, indicating a clear player preference for the Super Lotto game.

Q: How is the Super Lotto Jackpot determined?

A: Like other parimutuel games, Super Lotto prize pools are based on the amount played for each drawing. The 25 cents of every sales dollar assigned to the Jackpot prize pool forms an investment in which all the principal and interest combine to pay winners a much larger total over a 20-year period. Players who match five of the winning numbers share the second prize pools comprised of 8 cents of each dollar spent on tickets. The third prize pool, shared by all who match four numbers, is paid from 13 cents of each dollar.

Q: Is there a minimum Jackpot prize in the game?

A: Super Lotto has a minimum Jackpot of $1.5 million compared to $1 million in the original game. A "rollover" – when no one matches all six winning numbers – keeps the Jackpot growing until it is won.

Q: What have been the average Super Lotto Jackpot shares?

A: Through late July, 1988, the average Super Lotto Jackpot share was over $3.9 million.

Q: What was the largest Super Lotto Jackpot?

A: On January 20, 1988, a Jackpot of nearly $29 million was hit by five players, with each receiving nearly $5.8 million.

Q: What have been the average second and third prize shares in the Super Lotto game?

A. As of late July, 1988, the average Second Prize share was $2,515, while the average Third Prize share was about $90.

"Winners Circle" was created to answer the publics' inquiries about the Michigan Lottery. If you have a question you have not seen covered in these monthly columns, send it to: "Winners Circle," P.O. Box 30077, Lansing, MI 48909.

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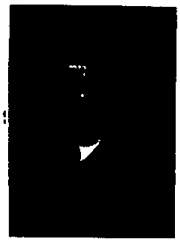

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