Revolving Planets Lesson Plan

Overview: In this lesson, students learn about how planets revolve around the sun and play a game where students take on the roles of different planets, with one student being the sun and others being the planets that orbit the sun.

Grades: Preschool and K-3

Length of Lesson: 30-45 minutes

Related Video: "Here Comes the Sun" episode

Learning Goals:

After completing this lesson, students will be able to:

- Describe that the Earth revolves around the sun.
- Understand that all of the planets in the solar system revolve around the sun.
- Know that all eight planets revolve around the sun.
- Explain that the closer the planet is to the sun, the faster it orbits the sun.

Related Goals from the Space Racers™ Curriculum:

Key Facts about Space and Space Exploration:

Planets:

- There are eight planets in our solar system.
- Names of planets. (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.)
- Planets travel around the sun.
- Positions of planets relative to one another.

The Solar System:

- The solar system consists of the sun and everything that travels around it (i.e., all the planets, moons, comets, asteroids, dust, gas, etc.).

Materials:

- "Solar System Cards"
- a ball or object to represent the sun and another ball, globe or other object to represent the Earth.
  Tip: Take two balls. Tape the "Sun" image from the "Solar System Cards" to one ball and the "Earth" image to another ball.
- masking tape or sidewalk chalk
- tape (to tape paper signs to clothing)- optional

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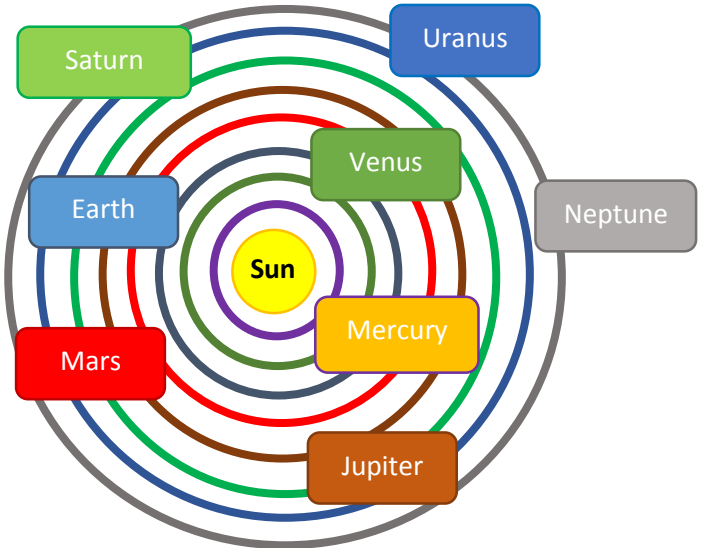
Prep:

- Print out one copy of each of the cards in the "Solar System Cards" handout, so that each image is on a separate sheet of paper.
- If taping the "Sun" and "Earth" cards to balls, as suggested in the tip in the Materials section, print out an extra copy of the "Sun" and "Earth" cards.
- Find an open area in your classroom, school or outside with enough space for students to re-enact the planets revolving around the sun.
- On the floor, using masking tape or, if outside, using sidewalk chalk, draw one circle (the sun) with 8 concentric circles surrounding it.
- Label each circle as follows, starting with the one closest to the sun and moving outwards: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. (See "Solar System Diagram" for an example.)



Solar System Diagram

Note: This diagram is not drawn to scale. It shows the order of the planets from the sun to Neptune, but does not aim to illustrate the distances between the planets.

Lesson Activities:

Activity 1:

1. Tell your students that today you will be talking about the sun, Earth and the other planets in the solar system.
2. Ask students whether they think Earth always stays in the same place or whether it moves around each day. Explain that it moves very slowly each day.
3. Hold up the "Sun" and "Earth" balls.
4. Explain that the Earth goes around the sun. Ask students how long they think it might take the Earth to go all the way around the sun. Explain that it takes one whole year (365 days).
5. Show your students "The Solar System" image in the "Solar System Cards" handout. Explain that the solar system includes the sun and everything that travels around it. Explain that all the planets in the solar system revolve around the sun, all going in the same direction.
6. Ask your students to point out the sun and Earth.
7. Give one student the "Sun" card and another the "Earth" card. Tape the cards to the front of the students' shirts or ask them to hold them in front of them.
8. Ask "the sun" to stand on the corresponding circle on the ground and have "the Earth" stand on the third circle from the sun. Instruct the Earth to walk around the sun in a counterclockwise direction.
9. *Optional:* Point out the direction that a clock's hands go in. Explain that direction is called "clockwise." Explain that the Earth goes around the sun in the opposite direction – counterclockwise (like the hands of a clock going backwards).

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Activity 2:

1. Hand out the "Mercury" card to one other student. Show the students the "Solar System Card." Ask if Mercury is closer to the sun than the Earth or further away. (*Closer.)* Ask students to locate the circle on which Mercury should stand. (1st from the sun.)
2. Instruct the student with the Mercury card to stand on that circle. Instruct both students to walk around the sun, with Mercury going faster than Earth.
3. Give another student the Venus card and ask that student to stand on the Venus circle. Now have all three planets walk around the sun, with Mercury going the fastest, then Venus and then Earth.
4. Keep handing out the cards—Mars, Jupiter, Saturn, Uranus and Neptune. Show students the "Solar System" card and ask them to stand on their corresponding circles.
5. Ask the planets to start walking around the sun, all heading in the same direction (counterclockwise).
6. Explain that the planets closest to the sun move faster than the ones further away from the sun. Tell the students who are representing the planets to make sure they do not go faster than the people in the circles closer to the sun than them. (For example, Venus should go slower than Mercury, Earth should go slower than Venus, etc.)

Activity 3:

1. Explain that as the Earth revolves around the sun, it also spins around its own axis too.
2. Ask one volunteer to spin in place slowly in a counter clockwise direction (turning to the left and continuing all the way around in a full circle).
3. Ask students how long they think it takes the Earth to spin (rotate) around once. Explain that it takes one day.
4. Now ask for another volunteer to be the sun. Have "Earth" continue to spin around counterclockwise, while walking around the sun.
5. Explain that the sun also rotates in the counterclockwise direction, but rotates much slower than Earth. (Earth rotates once a day, while it takes the sun more than a month to have one complete rotation.)
6. Have the sun slowly spin on its axis, while Earth spins on its axis, as it walks counterclockwise around the sun.

Facts to share:

- Each planet spins around its own axis.
- An axis in an imaginary line that goes through the planet's center from top to bottom.
- When a planet spins around its own axis, that is called "**rotating**."
- When planets orbit or travel around the sun, that is called "**revolving**."
  The planets closest to the sun are much closer together than the planets that are further away from the sun. (View "Solar System Distances" (commons.wikimedia.org/wiki/File:Solar_system_distances.JPG) to explore the relative distances between the planets. To view the relative distances in real time, go to "Solar System Live" (www.fourmilab.ch/cgi-bin/Solar) and select show "images" and size "1000.")

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Activity 4 (optional):

1. View the Space Racers™ "Here Comes the Sun" episode.
2. Discuss the following facts presented in the show:
   - Each of the planets revolves around the sun.
   - All the planets also rotate (spin) on their own axes as they travel around the sun.
   - All the planets revolve around the sun in the same direction (counterclockwise)
   - All the planets except for Venus and Uranus also rotate in the same direction (counterclockwise). Venus and Uranus rotate in the reverse direction (clockwise).

Wrap-up:

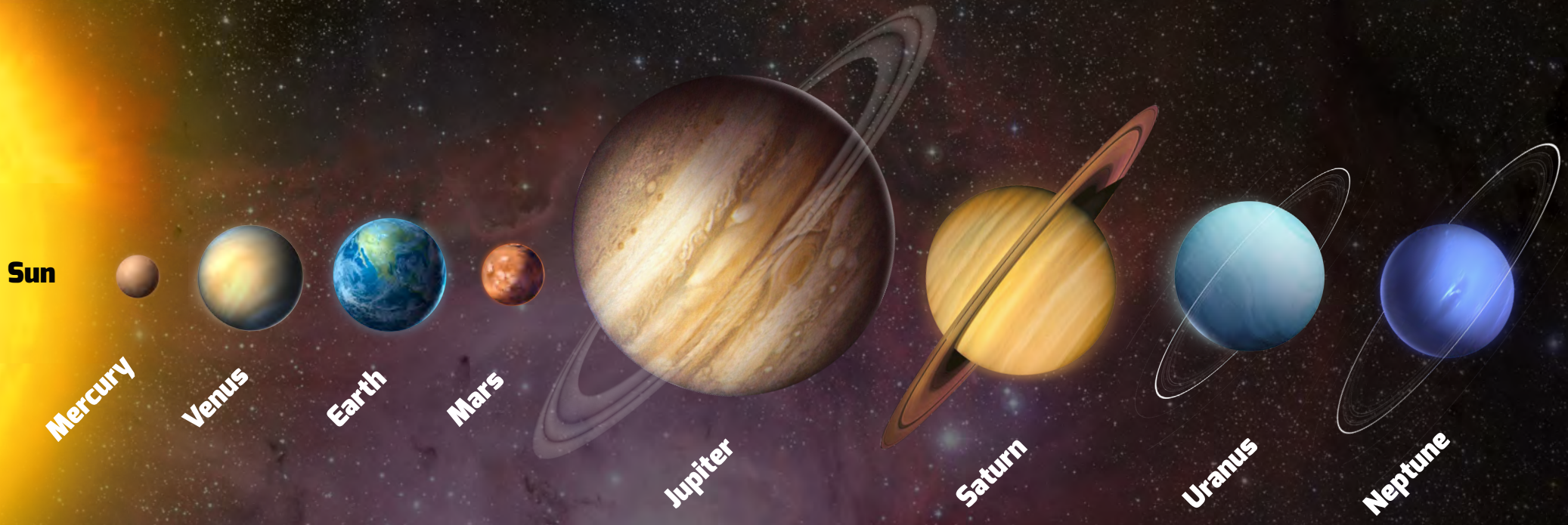
1. Lead a discussion to summarize what was covered in this lesson. Ask students to share one thing they learned from the lesson. Possible facts to include:
   - Earth moves around the sun.
   - It takes a whole year for Earth to go all the way around the sun.
   - All the other planets in the solar system also move around the sun
   - The planets that are closest to the sun travel around faster, the planets that are farther away travel around slower.
   - All the planets go around the sun in the same direction (counterclockwise).
   - In addition to moving (revolving) around the sun, the planets also spin (rotate).
   - The sun also spins (rotates) as it moves.

Solar System Cards

The images in this handout are designed to be used in the Space Racers "Planet Jumble" and "Revolving Planets" lessons.

Find more activities, games, and lesson plans at www.SpaceRacers.org.

The Solar System



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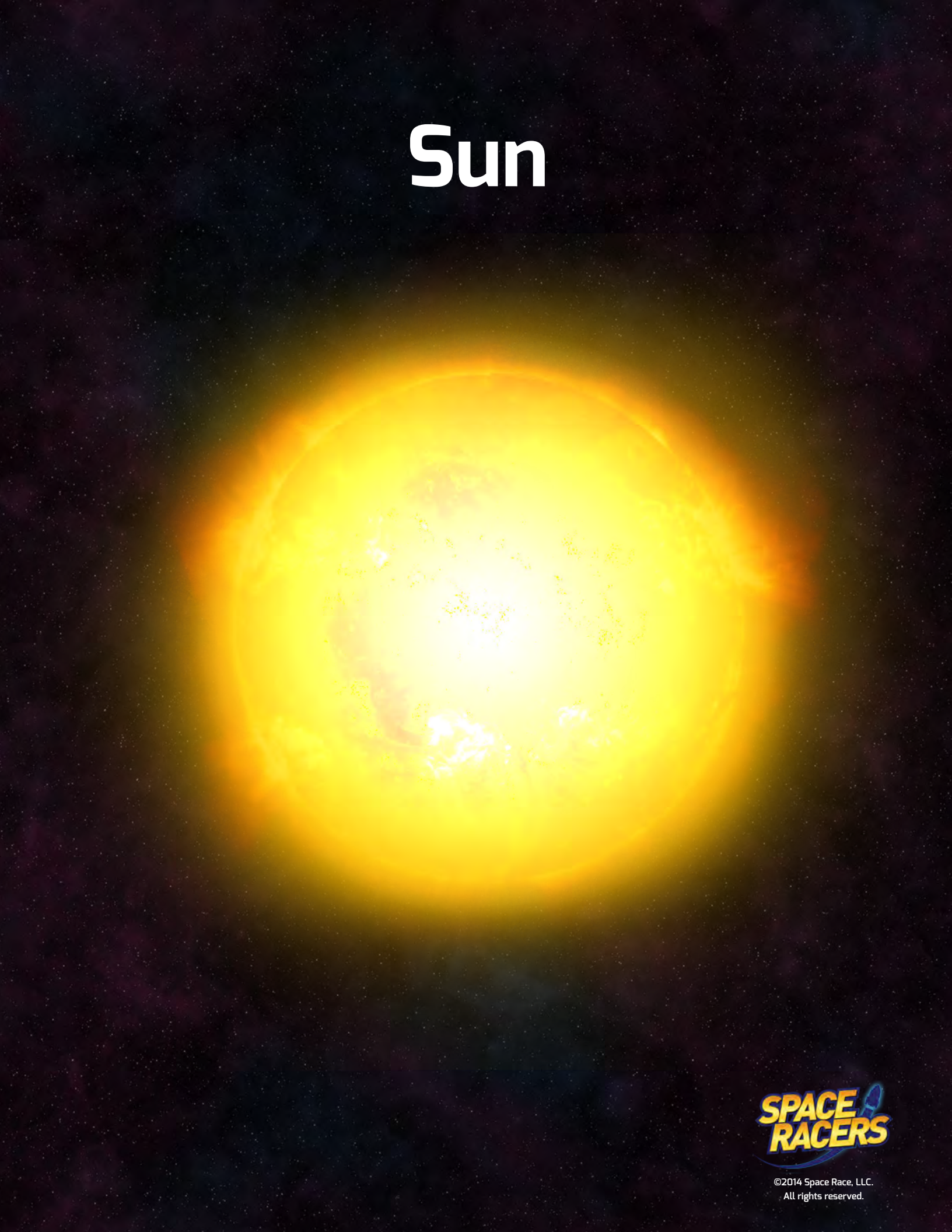
Sun



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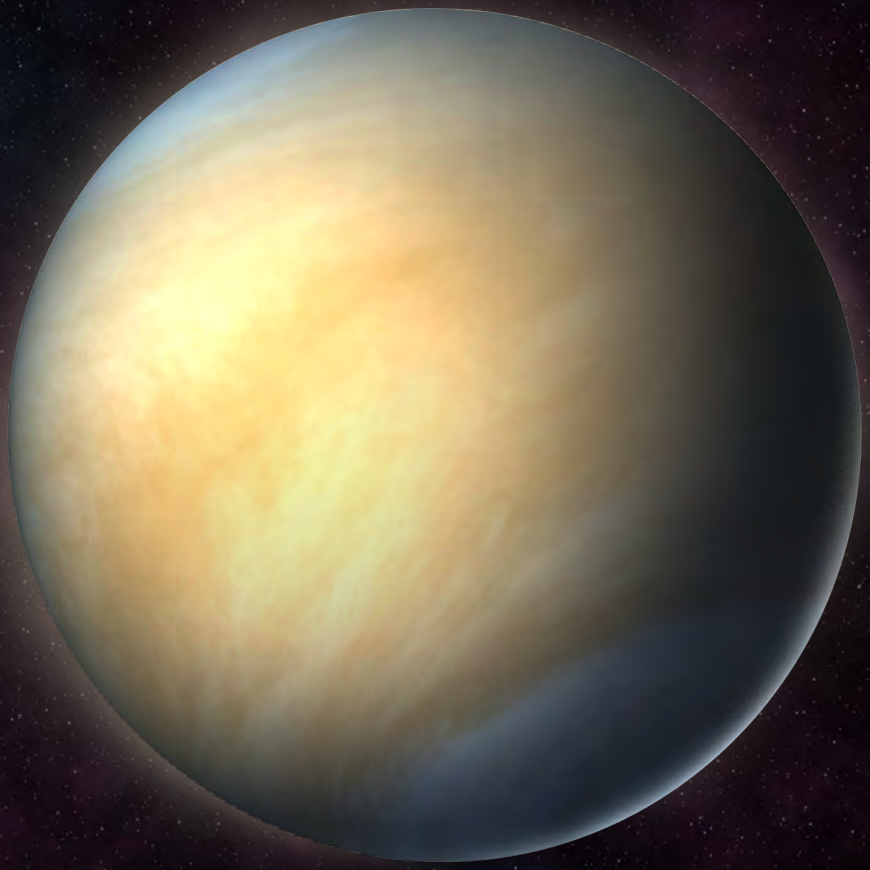
Mercury

Venus



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Earth

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Mars

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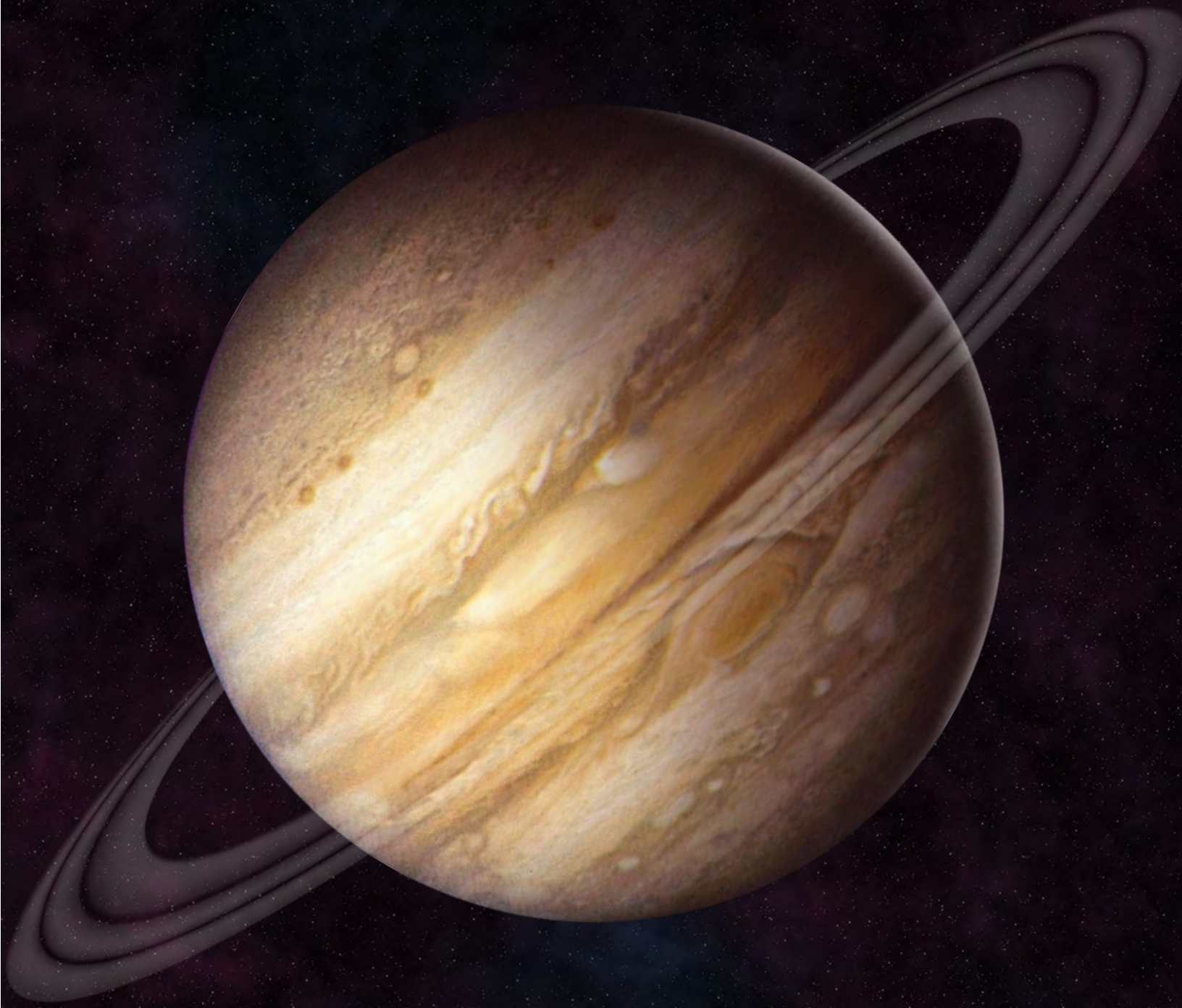
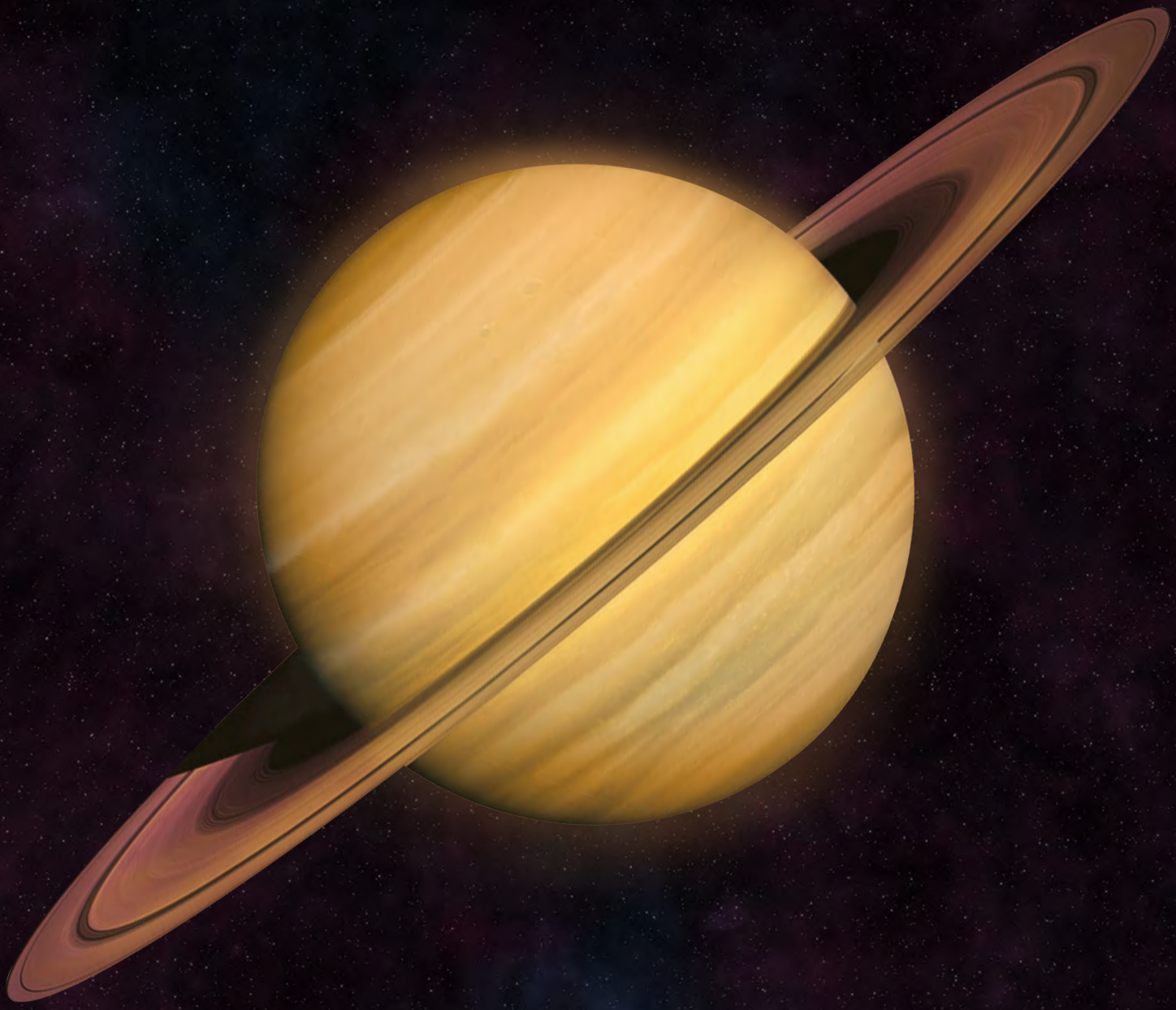
Jupiter



Saturn



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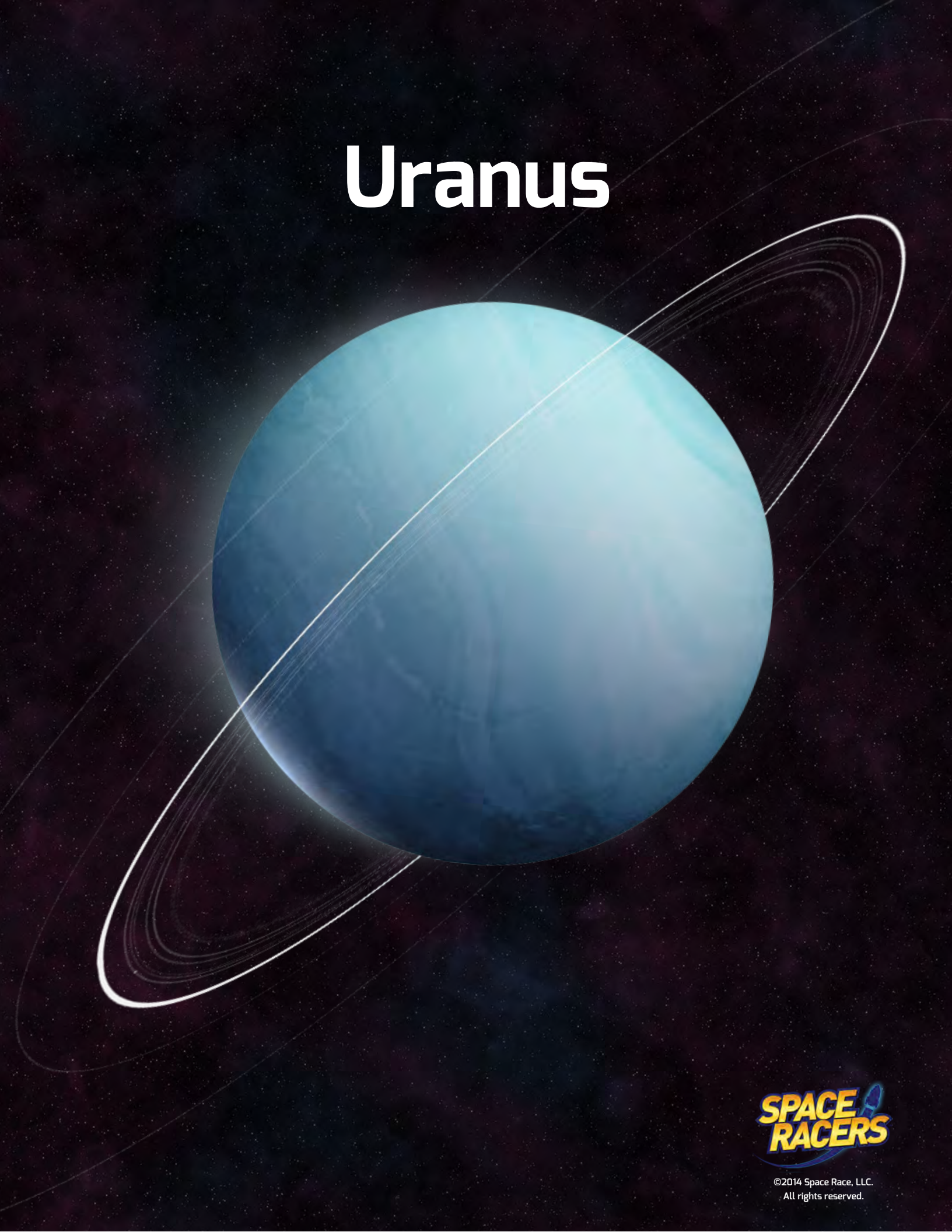
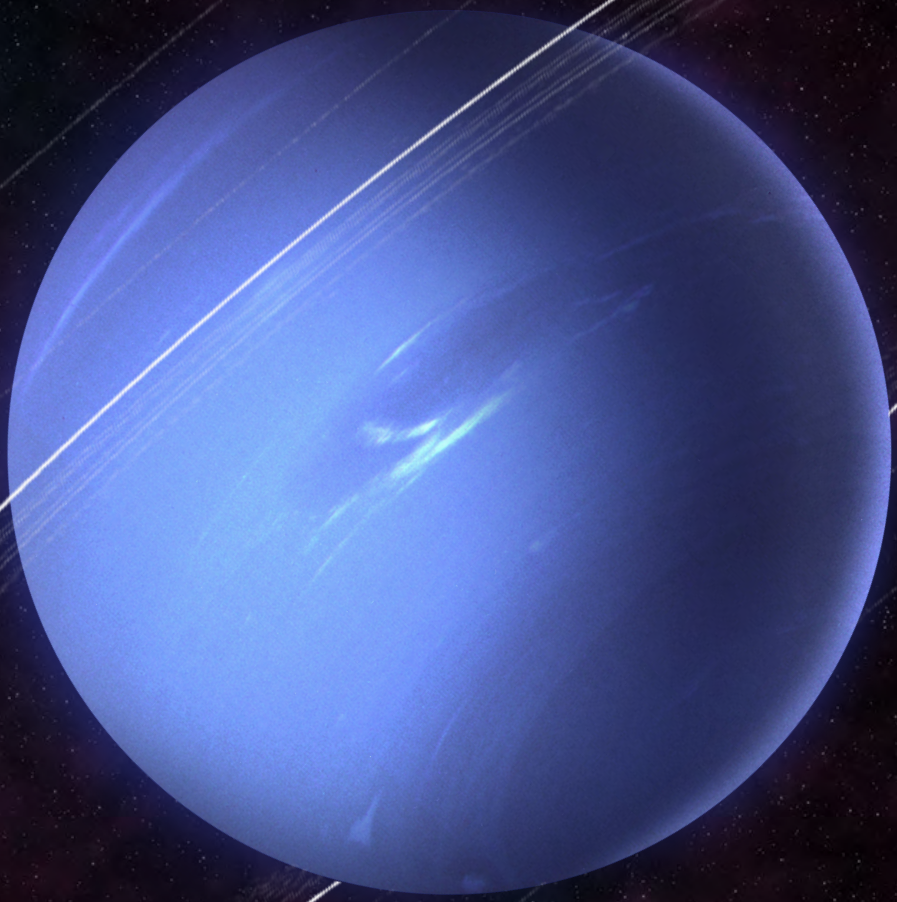
Uranus



Neptune



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