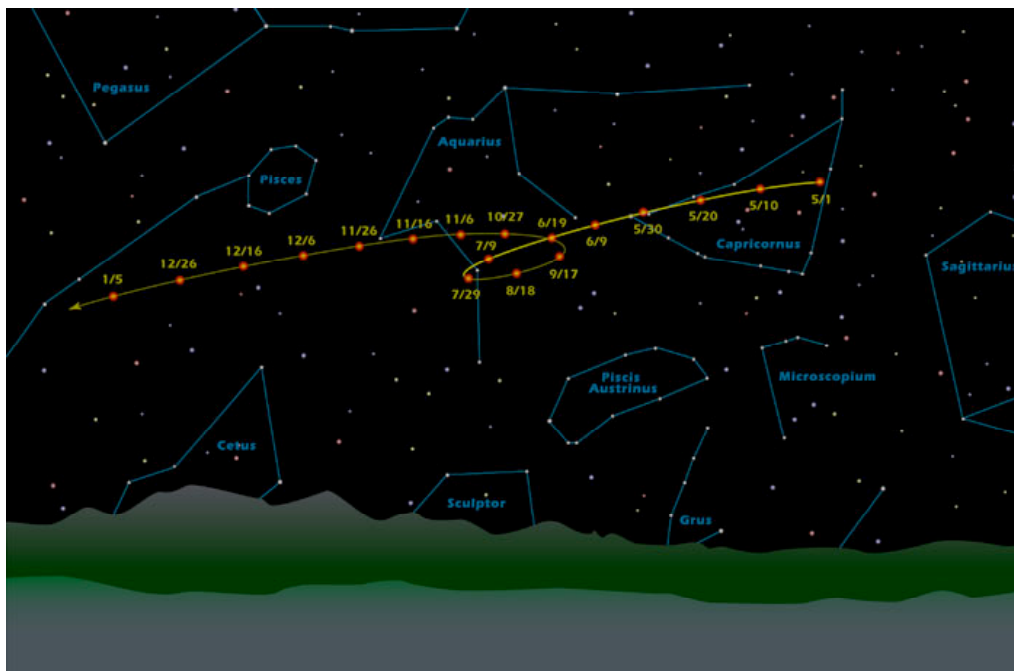


Mars Retrograde

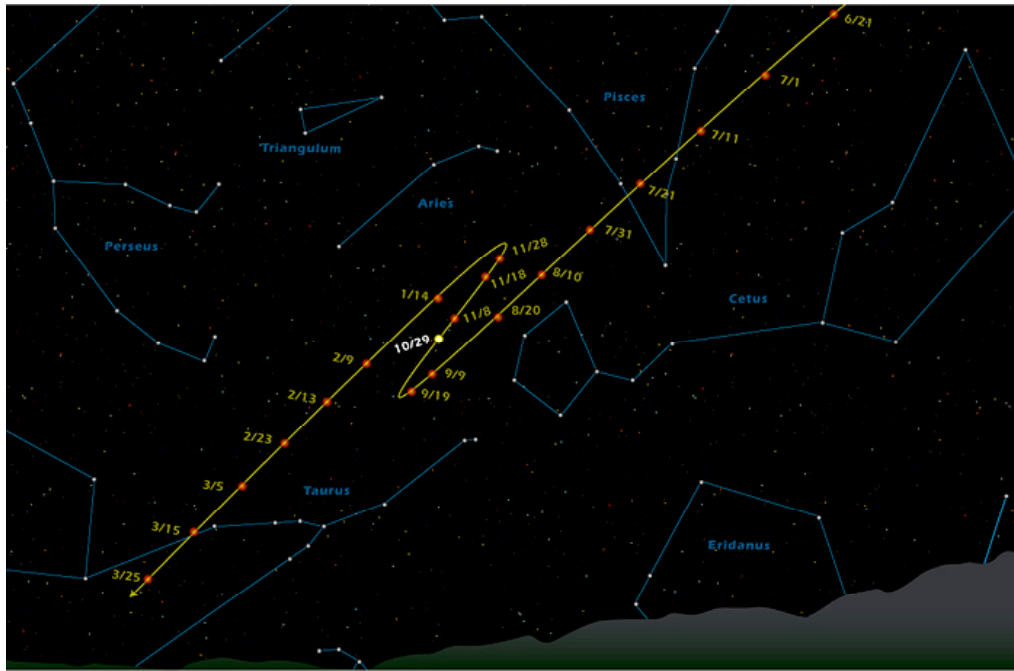
If you were to look up in the eastern sky at the same time each night and note where Mars appears to be compared to the constellations of stars, you would find the planet a little farther east with each viewing. That is, Mars appears to move from west to east from one night to the next.

But every two years or so, there are a couple of months when Mars' position from night to night seems to change direction and move east to west. This strange behavior was very puzzling to early skywatchers. Did the planet really stop, back up, change its mind, and then continue to move forward? Did it have some weird, mystical meaning?



Mars' 2003 Retrograde

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Mars' 2005 Retrograde

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Today we know what's going on. It's an illusion, caused by the ways that Earth and Mars orbit the sun.

The two planets are like race cars on an oval track. Earth has the inside lane and moves faster than Mars -- so much faster, in fact, that it makes two laps around the course in about as much time as it takes Mars to go around once. That's why, this fall, we will be celebrating the first full Martian year that NASA's Mars Exploration Rovers Spirit and Opportunity have spent on the red planet, even though they landed nearly two Earth years ago.

About every 26 months, Earth comes up from behind and overtakes Mars. While we're passing by the red planet this year, it will look to us as though Mars is

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moving up and down. Then, as we move farther along our curved orbit and see the planet from a different angle, the illusion will disappear and we will once again see Mars move in a straight line.

This apparent erratic movement is called "retrograde motion." The illusion also happens with Jupiter and the other planets that orbit farther from the sun.

Just to make things a little more odd, the orbits that Earth and Mars follow don't quite lie in the same plane. It's as if the two planets were on separate tracks that are a little tilted with respect to each other. This causes another strange illusion.

Suppose you were to draw a dot on a sky map each night to show where Mars appears as it moves forward, goes through retrograde, and then resumes its forward motion. Connect the dots, and you'll draw either a loop or an open zigzag. The pattern depends on where Earth and Mars happen to be in their tilted racetrack orbits.

This year's Martian retrograde runs from October 1 to December 9, and forms an open zigzag. Even though 2003 saw the closest approach in 60,000 years, this fall Mars will appear higher in our sky and brighter than two years ago. This is due to the tilt of the planets and the corresponding seasons. In 2003, the closest approach occurred in August - Earth's summer. The red planet was lower in Earth's sky (closer to the horizon) and, therefore, our view of it was dulled a bit by our own thick atmosphere. This year, closest approach will occur at the end of October - Earth's fall. With Mars higher in our night sky (without any atmospheric interference), it will appear clearer and crisper to sky watchers.