Tidal Forces Encyclopedia Article

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Contents

Tidal Forces Encyclopedia Article.....1

Contents.....2

Tidal Forces.....3

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Tidal forces are responsible for the ocean tides we observe on Earth. One of the earliest problems considered by physicists was why Earth has two high tides per day. **Galileo** was unable to understand or explain this, but Isaac Newton eventually solved the problem using his theory of gravitation. The solution to the problem is that high tides are caused by the differences between the gravitational forces on Earth's water applied by Earth, the **Moon**, and the **Sun**. The water closest to the Moon is pulled toward the Moon, and Earth is also pulled toward the Moon, away from the water furthest from the Moon. This leads to an oval-shaped distribution of water around the earth, rather than a uniform spherical shape, with the thickest parts of the oval along the line between Earth and the Moon. Because Earth is rotating, a point on its surface crosses the line between Earth and the Moon twice a day, where the height of the water is at its maximum. The Sun also exerts tidal forces which are approximately half as large as those due to the Moon. This is the reason for the high and low tides that we observe.