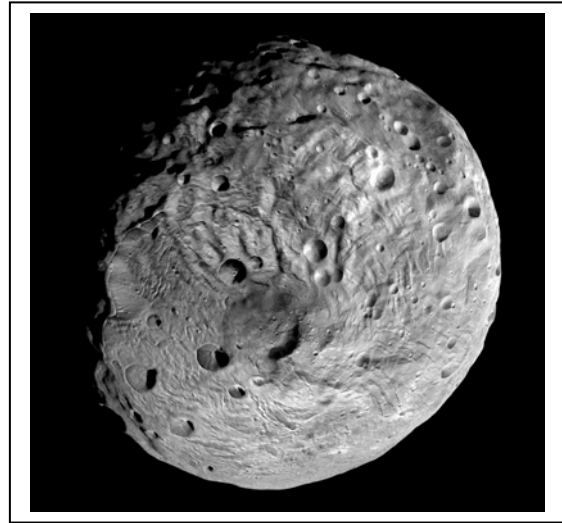# Comparing the Volume of Vesta and the Moon

On July 15, 2011 the NASA spacecraft Dawn completed a 2.8 billion kilometer journey taking four years, and went into orbit around the asteroid Vesta (photo on the right). Vesta is the second largest asteroid in the Asteroid Belt. Its diameter is 530 kilometers. The same year, amateur photographer Luc Viator took a photograph of the moon (left image: courtesy Luc Viator www.lucnix.be). The diameter of the moon is 1,730 kilometers.

Problem 1 - Assuming that it is shaped like a sphere, what is the volume of Vesta in cubic kilometers?

Problem 2 - About how many asteroids like Vesta could you fit inside our moon?

Answer Key

Problem 1 - Assuming that it is shaped like a sphere, what is the volume of Vesta in cubic kilometers?

Answer: The radius of Vesta is 530/2 = 265 km, so

$$V = \frac{4}{3}\pi R^3$$

V = 1.33 (3.14) (265)^3 = **77.7 million cubic kilometers**.

Problem 2 - About how many asteroids like Vesta could you fit inside our moon?

Answer: The diameter of the moon is (1730 km / 530 km) = 3.26 times the diameter of Vesta, so because they are both spheres, the volume of the moon will be (3.26)3 = 34.6 times the volume of Vesta. You could fit **about 35 Vesta's** inside the volume of the moon.