

Eratta: Time accuracy is 0.3% (worst), escape velocity should be 133,026 mph

Amateur astronomer weighs planet Jupiter

World Series on giant planet would take three times more muscle.

BY DAN SWANSON
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An amateur astronomy project led by Eugene Lanning of Nebraska City determined the weight of the planet Jupiter within 0.2 percent of the figure established by NASA.

Lanning and other members of the American Association of Amateur Astronomers tracked four of Jupiter's 35 moons. Lanning collected data on the distance between Jupiter and the moons and

the time between peak movements of the moons. He then used the gravitational constant of the universe and Keplers Law to determine the weight of the gas planet.

Based on Lanning's data, the weight of Jupiter was determined at nearly 4.18 billion-billion-billion pounds, about 317 times more than the entire Earth weighs.

If the World Series were played on Jupiter, a 5 ounce baseball would weigh over 12 ounces. If the ball were hit by a bat, Jupiter's gravity would yank it from the air within a third of the distance the ball might have traveled on Earth. For the ball to escape Jupiter's gravity, Lanning surmised, it would have to travel about 48

miles per second, or about 172,000 miles per hour.

"You wouldn't have all the home runs," he said. "The major leaguers would really be earning their pay."

The Jupiter Project was able to achieve a .03 percent accuracy on measuring the time between the movements of the moons, Io, Europa, Ganymede and Callisto.

"I was ecstatic. You can't have many errors and still end up with that level of accuracy," he said.

During the project, Lanning read a report in "Sky and Telescope" that said two of the moons would pass over each other, so that instead of seeing all four, earth observers could only see

three.

Lanning applied the model he developed for the Jupiter Project to predict the time the event would occur. He came within three minutes of the time listed in the report.

"It was an unexpected benefit," he said. "If you're batting 1000, you must be doing something right somewhere down the line."

Lanning said he learned a lot from the project. "To me, it was great fun and I got to help others processing the mathematics," he said.

Dan Swanson is a reporter for the News-Press and may be reached at dswanson@newspress.com.