Shaky rings help scientists measure Saturn’s days

A day on Saturn lasts for 10 hours, 33 minutes, and 38 seconds, according to a paper published in *The Astrophysical Journal* that used wobbles in Saturn’s rings to make the calculation. That’s several minutes shorter than older approximations of the gas giant’s day, but the new timetable lines up with some previous mathematical estimates.

It was hard for researchers to figure out how long a day was on Saturn for a few reasons. First, the planet has an incredibly thick and rotating atmosphere, which obscured the inner surface. That’s usually not a huge problem. When they can’t see how fast a planet’s surface is spinning, astronomers can generally measure movements in its magnetic field to figure out what’s going on inside. But Saturn’s magnetic field is perfectly lined up with its axis, making its rotation very difficult to measure. Other researchers got estimates that were *kind of* close — 10 hours, 39 minutes or 10 hours, 48 minutes — but weren’t quite right.

Then, one of the co-authors, Mark Marley, figured out that researchers could use Saturn’s most distinctive feature to their advantage. Saturn’s rings are made of solid bits of ice and rock. As they orbit the planet, Saturn’s gravity tugs on them slightly. Those small tugs created waves that were measured by NASA’s Cassini spacecraft, and helped researchers pin down the length of Saturn’s day.

“The researchers used waves in the rings to peer into Saturn’s interior, and out popped this long-sought, fundamental characteristic of the planet. And it’s a really solid result,” Cassini project scientist Linda Spilker said in a statement.

“The rings held the answer.”

If all this sounds familiar, you aren’t imagining things — this isn’t the first time researchers have announced a solution to this particular astronomical mystery. Writing in a *Nature* paper a few years ago, researchers took the planet’s gravitational field and its shape, and put the length of Saturn’s day at 10 hours, 32 minutes, and 44 seconds. (And, in fact, a version of *The Astrophysical Journal* paper made the rounds on the internet earlier last year.)

But it’s exciting that researchers finally have the length of days on the major bodies of the Solar System worked out. Kind of. Even something as simple as a day can have very different definitions. A solar day measures how long it takes for the Sun to return to the same point in the sky, while a sidereal day is the time it takes for a body to fully rotate on its axis.

Yes, a weekend day is always too short, and a day punctuated by the dreaded vibration of political news alerts is eternity, but those immutable laws of nature aside, there are still only 23 hours, 56 minutes in a day.

So the next time you hear someone sighing over the vagaries of time, and how *there just aren’t enough hours in a day*, here are some alternative day lengths for you to bring up and completely (and scientifically) derail the conversation.

Note: For simplicity’s sake, these are all sidereal days, and “day” refers to an Earth day. If you want to get weird, start reading up on Mercury and Venus’ solar days.

https://www.theverge.com/2019/1/18/18188429/rings-saturn-nasa-day-time-hours-duration