

## ASTRONOMY

### Hold on to your space helmet and take a ride in Saturn's rings

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For astronomers, nothing beats showing someone the planet Saturn for the first time in a telescope. For sheer Wow! value, it's unsurpassed.

Despite first impressions, Saturn's rings aren't solid objects. They're made of billions of chunks of ice, each in its own orbit. They race around Saturn at 15 miles per second, bumper to bumper, but like the finest NASCAR drivers, barely jostling each other.

Let's imagine that we could go for a ride-along.

In the thick of the traffic, we're surrounded by a swarm of icebergs. The biggest are the size of your house; the smallest you can hold in your hand. We're deep in the shadows of the giant bergs as they gently bump and scrape against each other.

Let's catch hold of a boulder-sized berg and, careful not to get crushed between colliding chunks, climb toward the light. It's not far — less than a mile — before we can stick our heads out into clear space.

Floating, feet above the rings, the view is jaw-dropping. The flat, ice-white surface of the rings stretches away from us at least 20,000 miles in any direction. Half of the planet Saturn forms a towering dome rising over the rings, higher than five Earths stacked atop one another.

No human has been to this spot. But a human-made camera on the Cassini spacecraft, orbiting Saturn since July 2004, is watching this ever-changing panorama.

Gradually, the rings are grinding themselves into dust. With nothing to replenish them, the rings we see today would last for only a few million years — short by astronomical terms — before sinking into Saturn's thick atmosphere.

Ring experts are beginning to understand how Saturn's rings are continually restocked by the small, icy moons that also circle the planet.

Occasionally these moons collide and shatter each other, creating a shower of icy particles.

But Saturn's E ring, the most distant and most tenuous, is like an ice fog — the accumulated spray from ice geysers on the moon Enceladus. Cassini's instruments show that the ice from the geysers is the same as that in the E ring. Cassini caught Enceladus red-handed!

The subtle gravitational pull from Saturn's moons slowly sculpts intricate grooves and ripples into the rings. Over time, a few hundred-trillion tons of ice and rock, using the weakest force in nature, have created some of the most stunning artistry in our solar system.

The latest images from Cassini are on the Jet Propulsion Laboratory's Internet site, <http://saturn.jpl.nasa.gov>.

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