

## **The F-ring: Target no 2**

All of the targets are fascinating, but as only one has to be chosen in the end, I strongly believe that the Cassini spacecraft should point its cameras at the most active of all Saturn's rings – the F-ring. This is because there is so much to be discovered about the F-ring, for example 'Is F-ring the flattest of all rings?' or 'Is it the thinnest?' and much more. I will mainly focus on F-ring's shape, composition and the objects that strike through it.

The F ring, which stands alone beyond the thick clump of Saturn's main rings, has long puzzled scientists. It was in 1979 that the Pioneer 11 probe discovered the planet's F ring — the third most distant of the seven — and straightaway scientists knew there was something special about it. The ring is very flat, and this is presumably because the countless numbers of icy bodies of different sizes that make up the ring must all have nearly the same velocity. The thin ring is few hundred kilometres across, and it is like 'a sheep shepherded by a pair of dogs', pair of moons — Prometheus traveling along on the inside edge and Pandora on the outside. The 'strong force of the dogs', the gravity of the small satellites keep the boundaries of the F-ring sharp, but also gives rise to elaborate eddies and swirls within the ice and rubble that makes up the ring material. This gives the ring what appear to be kinks and knots and even something resembling braids.

These moons cause perturbations to the ring, but the F-ring also suffers from another anomaly in the form of "jets". These jets can extend for hundreds of kilometres and are caused by objects colliding with the ring, such as the moonlet S2004/S6.

One particular micro-jet stretched 50 km before collapsing back in towards F-ring.

The 'criminal', the culprit that caused this jet is thought to be a small moonlet, around one kilometre across, which collided with the ring at a velocity of one metre per second. This low velocity indicates that the moonlet was a local object on a similar orbit to the F-ring, since if it had come from elsewhere it would have been moving at a greater velocity.

Before it was unknown how the jets were created, but now there is some evidence that these jets survive and punch through the ring. Saturn's rings are very spectacular as they are constantly changing and evolving, and it this is especially true for Saturn's dazzling F-ring, as sometimes it can even change on a timescale of hours. The F-ring has got many more surprises in store for us, which are ought to be looked at.

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**SCIENTIST FOR A DAY**

Astronomers think that F-ring could be the one and only place in universe where collisions on a huge scale happen daily. By pointing cameras many mysteries can be unravelled and the F-ring may turn out to be more strange, fascinating and dynamic than we have previously thought.