

Chemical interactions between Saturn's atmosphere and its rings

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Cassini's final phase of exploration

The Cassini spacecraft spent 13 years orbiting Saturn; as it ran low on fuel, the trajectory was changed to sample regions it had not yet visited. A series of orbits close to the rings was followed by a Grand Finale orbit, which took the spacecraft through the gap between Saturn and its rings before the spacecraft was destroyed when it entered the planet's upper atmosphere. Six papers in this issue report results from these final phases of the Cassini mission. Dougherty *et al.* measured the magnetic field close to Saturn, which implies a complex multilayer dynamo process inside the planet. Roussos *et al.* detected an additional radiation belt trapped within the rings, sustained by the radioactive decay of free neutrons. Lamy *et al.* present plasma measurements taken as Cassini flew through regions emitting kilometric radiation, connected to the planet's aurorae. Hsu *et al.* determined the composition of large, solid dust particles falling from the rings into the planet, whereas Mitchell *et al.* investigated the smaller dust nanograins and show how they interact with the planet's upper atmosphere. Finally, Waite *et al.* identified molecules in the infalling material and directly measured the composition of Saturn's atmosphere.

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