

Saturn's radio emissions and bright auroras are linked

February 17 2005

Just as the static on an AM radio grows louder with the approach of a summer lightning storm, strong radio emissions accompany bright auroral spots -- similar to Earth's northern lights -- on the planet Saturn, according to a research paper published in the Thursday, Feb. 17 issue of the journal Nature.

The Cassini spacecraft is the first to explore the Saturn system of rings and moons from orbit. Cassini entered orbit on Jun. 30, 2004 and immediately began sending back intriguing images and data. According to William Kurth, research scientist in the University of Iowa College of Liberal Arts and Sciences Department of Physics and Astronomy, the data collected in early 2004, indicated that Saturn's strong radio emissions grow stronger when the solar wind blows harder.

"We had expected that this might be the case, based on our understanding of auroral radio signals from Earth's auroras, but this is the first time we've been able to compare Saturn's radio emissions with detailed images of the aurora," Kurth says. "This is important to our on-going Cassini studies because this association allows us to have some idea of what the aurora are doing throughout the mission from our continuous radio observations."

Co-author Don Gurnett, Cassini Radio and Plasma Wave Science (RPWS) instrument principal investigator, says the finding means that radio emissions from Saturn's aurora are very similar to radio emissions from the Earth's aurora.

Kurth says that one of Cassini's objectives is to understand how the magnetic field around Saturn, called its magnetosphere, responds to the influence of the solar wind, a hot gas composed of electrons and ions that originates at the Sun and blows past the planets at speeds around one million miles per hour.

Two related papers published by other researchers in Thursday's issue of Nature show that, like a flaming log in a campfire, Saturn's aurora become brighter and more expansive when the solar wind blows harder. However, the distribution of auroras on Saturn differs from those on Earth.

Other discoveries made by UI researchers using the RPWS instrument have included finding that lightning on Saturn is roughly one million times stronger than lightning on Earth; observing that Cassini impacted dust particles as it traversed Saturn's rings; and learning that Saturn's radio rotation rate varies.

The radio sounds of Saturn's rotation -- resembling a heartbeat -- and other sounds of space can be heard by visiting [www-pw.physics.uiowa.edu/space-audio](http://www.pw.physics.uiowa.edu/space-audio) .

Citation: Saturn's radio emissions and bright auroras are linked (2005, February 17) retrieved 25 April 2024 from <https://phys.org/news/2005-02-saturns-radio-emissions-bright-auroras.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.