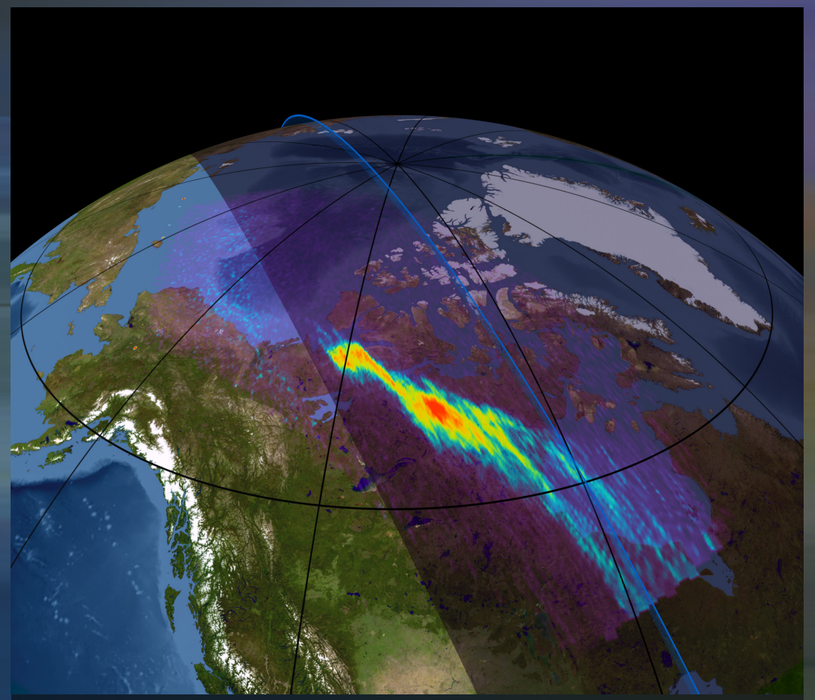
National Aeronautics and Space Administration

SOLAR SYSTEM

The Earth's local neighborhood is our Solar System, with the Sun at its center and the planets, asteroids, and comets in orbit around it. Chandra is providing new insight and uncovering new mysteries about objects of all sizes throughout our Solar System.

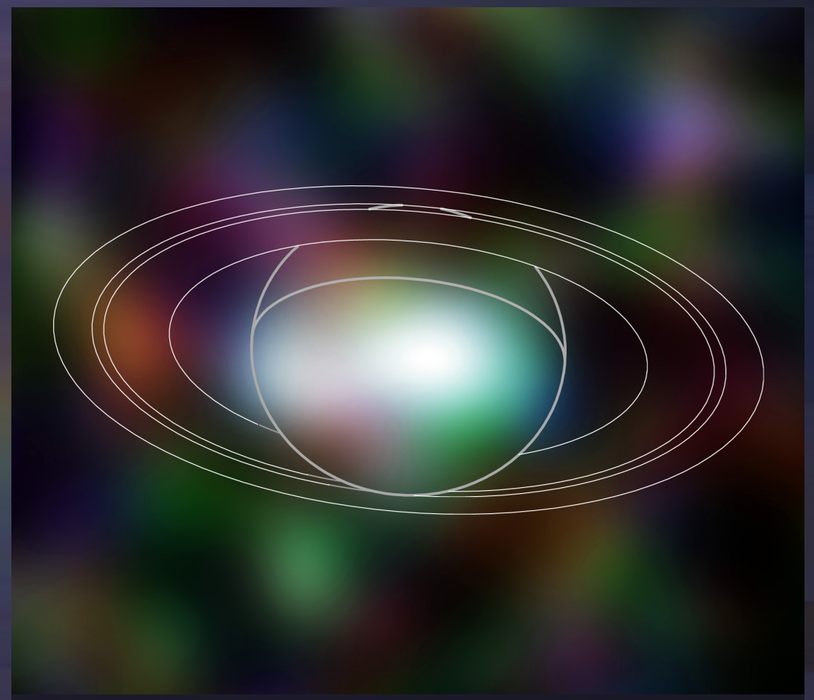


Auroras on Earth originate from storms on our Sun that eject clouds of energetic charged particles into space. Ultimately, these particles collide with atoms high in the Earth's atmosphere and this produces X-rays. Chandra made an unusual observation pointing back at the Earth to get these data.

NASA/MSFC/CXC/A.Bhardwaj & R.Elsner, et al.; Earth model: NASA/GSFC/L.Perkins & G.Shirah

Jupiter also has auroras near the poles of the planet that give off X-rays. Scientists think Jovian auroras are caused by the interaction of sulfur and oxygen atoms in the outer regions of the planet's magnetic field with particles flowing away from the Sun.

X-ray: NASA/CXC/SwRI/R.Gladstone et al.; Optical: NASA/ESA/Hubble Heritage (AURA/STScI)



Unlike the Earth and Jupiter, the X-rays that Chandra has detected from Saturn are concentrated near the planet's equator but are not from its famous rings. This is a surprising result since existing theories cannot easily explain the intensity or distribution of Saturn's X-rays that Chandra observed.

X-ray: NASA/U. Hamburg/J.Ness et al