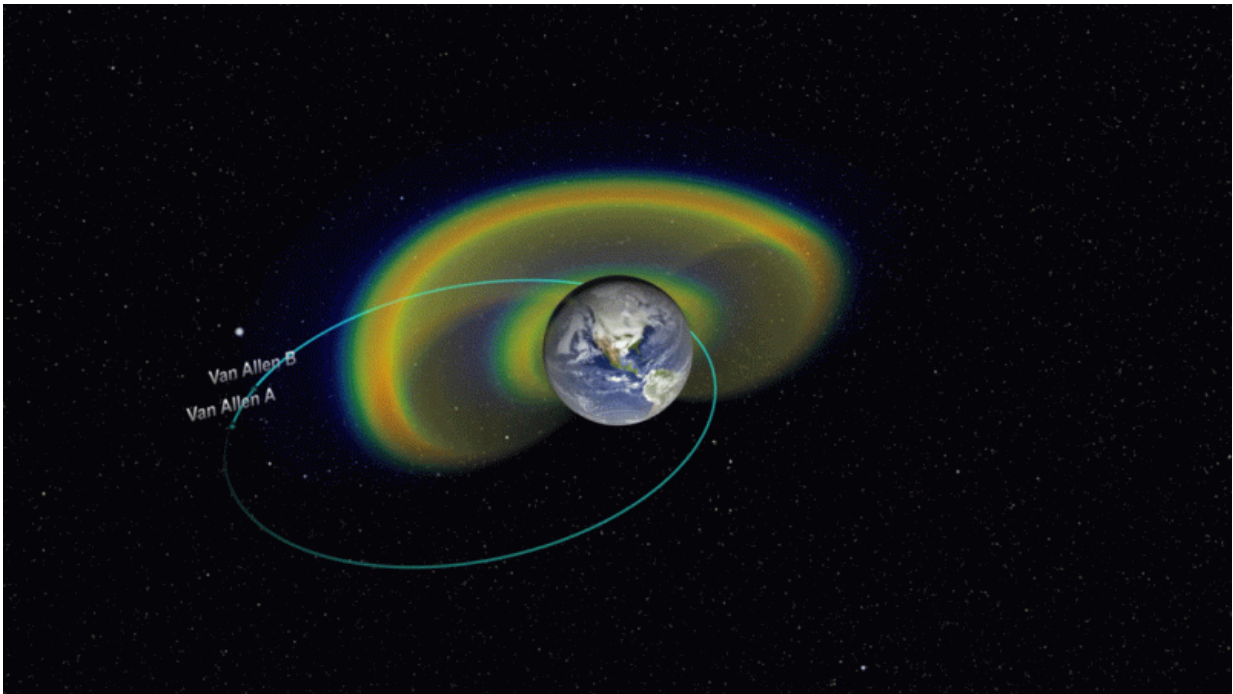


# NASA's Van Allen probes survive extreme radiation five years on

September 4 2017

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The spacecrafts' orbit can be seen in this cutaway view of the Van Allen Belts.  
Credit: NASA's Goddard Space Flight Center

Most satellites, not designed to withstand high levels of particle radiation, wouldn't last a day in the Van Allen Radiation belts. Trapped by Earth's magnetic field into two giant belts around the planet, high-energy particles in the region can batter the spacecraft and even interfere with onboard electronics. But NASA's Van Allen Probes have been

traveling through this hazardous area since Aug. 30 2012 – they are now celebrating their fifth year in space studying this dynamic region.

The Van Allen Probes mission is the second of NASA's Living with a Star missions, which is tasked with understand our near-Earth environment. The two identical spacecraft, built with radiation-hardened components, study how high-energy particles are accelerated and lost from the belts. This information helps scientists understand and predict space weather, which, in addition to creating shimmering auroras, can disrupt power grids and GPS communications.

"During its first five years, the Van Allen Probes have made enormously significant contributions to our understanding of radiation belt physics, including truly exceptional discoveries," said Shri Kanekal, Van Allen Probes deputy mission scientist at NASA's Goddard Space Flight Center in Greenbelt, Maryland.

he Van Allen Probes mission has provided invaluable information about the very shape of the belts, discovering a third radiation belt that can appear during certain circumstances, and used uniquely capable instruments to unveil [inner radiation belt](#) features that were all but invisible to previous sensors. The mission has also extended beyond the practical considerations of the hazards of Earth's space environment: Observations have found process that generate intense [particle radiation](#) inside the belts also occur across the universe, making the region a unique natural laboratory for developing our understanding of the particle energization processes.



The two Van Allen Probes work as a team, following one behind the other to uniquely observe changes in the belts. Credit: NASA's Goddard Space Flight Center/JHUAPL

In celebration of the Van Allen Probes' fifth year in space, here are five facts about the spacecraft.

- 14+ gigabits – amount of data are downloaded daily from each spacecraft
- 2,000 miles per hour – spacecrafts' cruising speed
- 164 feet – length of the longest instruments aboard the spacecraft
- 3.8 square yards – size of solar panels used to power the instruments
- 9 hours – time each [spacecraft](#) takes to encircle Earth

Originally tasked with a two-year [mission](#), the Van Allen Probes

continue to make new discoveries five years on, continuing to solve scientific puzzles about the dynamic belt region around Earth.

Provided by NASA's Goddard Space Flight Center

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