The study of space science was established in 1958 when University of Iowa physics Prof. James Van Allen and a team of researchers developed the science instrument on the 1st successful U.S. spacecraft, Explorer 1. Measurements from that Iowa Explorer 1 instrument led to the discovery of Earth’s radiation belts, later named the Van Allen Belts. After the discovery of the radiation belts, Prof. Van Allen continued his involvement in space exploration for more than 45 years through mission conception, instrument development, and scientific interpretation. As a result of his pioneering efforts in advancing the exploration of space, Van Allen is known as the “father of space science.”

Throughout his career Prof. Van Allen involved students in every step of planning, development, and data analysis, which laid the groundwork for the next generation of scientists and engineers. Many of those former students entered careers that provided opportunities to make significant impacts and achievements in education, science, and engineering.

Select University of Iowa Major Science Achievements in Space Science

- Development of the science instrument on the 1st successful U.S. spacecraft, Explorer 1, launched in 1958
- Discovery of Earth’s radiation belts
- Design and fabrication of science instruments for 69 space exploration projects, including 9 complete spacecraft, more projects than any other university
- First observations by spacecraft at 7 of 8 planets
- Discovery of radiation belts at Jupiter, Saturn, Uranus, and Neptune
- First evidence of lightning at Jupiter
- First in situ observations by spacecraft of a comet and an asteroid
- Detection of the particles responsible for Earth’s aurora
- Observations by most distant spacecraft from Earth
- Closest spacecraft observations of the Sun
- Development of first objects (spacecraft) manipulated and recovered by a space shuttle robotic arm
- Development of first subsurface radar sounder to explore Mars
- First measurements of plasma waves at the heliospheric termination shock
- Discovery of a magnetosphere at Jupiter’s moon, Ganymede
- Discovery of radio emissions generated near the heliopause
- First measurements in interstellar space

The University of Iowa Department of Physics and Astronomy is internationally recognized as a leader in space science as the result of the development of spaceflight instruments flown on 69 space exploration missions, including Earth-orbiting and planetary spacecraft to Venus, Mars, Jupiter, Saturn, Uranus, Neptune, and interstellar space. To date, analysis of data collected by these instruments has led to the completion of more than 80 Ph.D. theses in space physics, and has contributed an important segment of the world’s knowledge and understanding of energetic particles, plasmas, and radio waves throughout the solar system.

Images courtesy of NASA, ESA, and the University of Iowa