

## **SPACE MAGNETOMETRY: FROM THE EARTH INTO SPACE**

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The development of rocket technology made magnetic field measurements above the Earth's atmosphere possible. Measurements in space also depended on the availability of instrumentation capable of surviving the launch and space environments and the duration of the measurements was greatly extended by the development of solar cells to provide power. By good fortune and as a result of having just graduated with a university degree in physics, I became involved in some of the earliest experiments to study the magnetic fields in space. How little we knew and how much to discover! Experience gained on sub-orbital rocket flights led to magnetometers on many of the early spacecraft. While NASA was just getting under way, the USAF Space Technology Laboratories, where I worked initially, launched Explorer 6 into the magnetosphere where it detected the field of the ring current and established the existence of the magnetotail. Pioneer 5 became the first deep space probe and provided the first observations of the interplanetary magnetic field. As the NASA programs took over, I moved to JPL, the designated center for missions to other planets and participated in Mariners 2 and 5 to Venus and Mariner 4 to Mars. I also pursued other opportunities on missions managed by Goddard Space Flight Center (Orbiting Geophysical Observatories 1-6, International Sun- Earth Explorer 3/ International Cometary Explorer) and Ames Research Center (Pioneer 10 to Jupiter and Pioneer 11 to Jupiter and Saturn). Every history, no matter how long and widespread it may become, has a beginning. This talk will describe these early magnetospheric and planetary missions, their magnetic field instrumentation and their principal scientific achievements.

Early space missions, space-flight magnetometers, scientific achievements

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