Geomagnetism is the study of Earth’s magnetic environment, and the geomagnetsosphere is the region of space surrounding Earth in which Earth’s magnetic field dominates the interactions of charged particles – electrons and ions. Although Earth’s field may dominate, the geomagnetsosphere is heavily influenced by the Sun and solar wind, resulting in space weather. Space weather affects human activity not only on the ground but in the air and in space. And, it is fun to study and can be done so inexpensively.

This presentation first briefly describes Earth’s magnetic field by comparing it to a simple magnetic dipole. Of great interest is exactly how Earth’s internal magnetic field is generated. Nobody knows for sure, but a brief discussion is provided of the most commonly accepted idea. Next, the geomagnetsosphere is described and how it is shaped in space by the solar wind. Any discussion of magnetic fields includes magnitude and time scales. In nature these show a huge range and are briefly reviewed. Also of great interest and reviewed are geomagnetic disturbances and radio propagation effects including geomagnetic storms, aurora radio reflections, polar cap absorption and other space weather effects. Some geomagnetic measurements at Anchorage, Alaska produced by the SAM-III magnetometer are shown. Individuals can build their own geomagnetic observatory using the SAM-III magnetometer, which is described in some detail.

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