tometer could be kept at the required low temperature in a nonmagnetic Dewar flask, which could be brought to the warm measurement location.

While conventional SQUID magnetometers are routinely used to measure the change in magnetic flux density with similar sensitivity, the proposed implementation allows the full sensitivity of SQUID to be used to measure a small static magnetic flux density. Another implementation method involves flipping the pickup coil of a SQUID to measure the ambient static field. Although such a method had been used before, it involves cumbersome mechanical actuators to flip the coil at cryogenic temperatures and the wire of the coil can work harden and break after repeated flipping. Because of the absence of moving parts in the proposed magnetometer, reliability is improved.

This work was done by Peter Day, Talso Chui, and David Goodstein of Caltech for **NASA's Jet Propulsion Laboratory**. *Further information is contained in a TSP (see page 1). NPO-40748*

Wheel Electrometer System

John F. Kennedy Space Center, Florida

Two documents describe a prototype system of electrometers for measuring electrostatic fields and electrostatic responses of soils on Mars and the Moon. The electrodes of this electrometer are embedded in a wheel of an exploratory robotic vehicle, utilizing the wheel motion to bring the electrodes into proximity or contact with the soil. Each electrode resides in one of two types of sensor modules: electric-field (ELF) or triboelectric (TRIBO). In either type, what is measured is simply the electric charge induced on the electrode by exposure to the external distribution of electrostatic charge. In an ELF module, the electrode is bare and recessed radially from the wheel surface. The ELF sensor provides a measure of the charge on a small patch of undisturbed soil as the wheel rolls forward. In a TRIBO module, the electrode is only slightly recessed and covered with a polymeric insulator flush with the wheel surface. Through contact electrification, the insulator exchanges charge with the soil. There are five TRIBO sensors, each containing an insulator made of a different polymer. The charge data gathered by the five TRIBO sensors can be used to determine how the soil fits into a triboelectric series.

This work was done by Carlos I. Calle of **Kennedy Space Center**, *Martin G. Buehler of NASA's Jet Propulsion Laboratory, James G. Mantovani (an independent contractor), and Charles R. Buhler and Andrew Nowicki of Arctic Slope Research Corp. Further information is contained in a TSP (see page 1). KSC-12677*