



EXPLORING THE UNIVERSE

Static Electricity

Try this!



Experiment with the model *electroscope*—an instrument used to detect electrical charge. First, rub the foam tray on the wool felt for about ten seconds to charge it up. Then, wave the tray next to the wire on top of the electroscope without touching the tray to the wire. What do you notice about the foil shapes inside?



Follow the “Build an Electroscope” instructions to construct your own tool!

Now try this! Charge up the foam tray again and hold it close to (but not touching) the wire on your own tool. Keep experimenting! What happens if you use your own shirt to develop a charge? Can you get a stronger charge by rubbing the foam on the carpet? What happens if you rub the tray for a longer or shorter time?

Special tools can help detect invisible forces on Earth and in space.

Engineers and scientists invent and build tools to answer specific questions. You might be familiar with different tools that measure or detect different things. For example, a scale measures weight and a thermometer measures temperature. The electroscope you made in this activity detects if an object is electrically charged or not.

By rubbing the foam tray on the wool, you created an *electrostatic charge* (static electricity), and the wire and foil in your electroscope moved in response. A build-up of static electricity causes many events we witness on Earth, including lightning storms, getting a shock from a doorknob in the winter, or your hair standing on end after you go down a slide!



Massive lightning storms on Earth, viewed from the International Space Station.



An electrostatic discharge point on the Sojourner Mars rover's antenna.

Some NASA scientists study how static electricity behaves—here on Earth, in space, and on other worlds.

For example, scientists have theorized that the earliest stage of planet formation is tiny particles, pulled close together by gravity, attracting each other due to static electricity.

Static electricity is also important as we explore other worlds. Another reason we measure and monitor electrical charge is because a build-up of static electricity, and an uncontrolled discharge, could zap critical electronics. For example, the dry, dusty soil on the Moon and Mars is so insulating that the wheels of a rover moving over the surface can develop a static charge—kind of like dragging your feet across carpet. Engineers have designed special features to ensure that any electrostatic build-up is safely discharged.