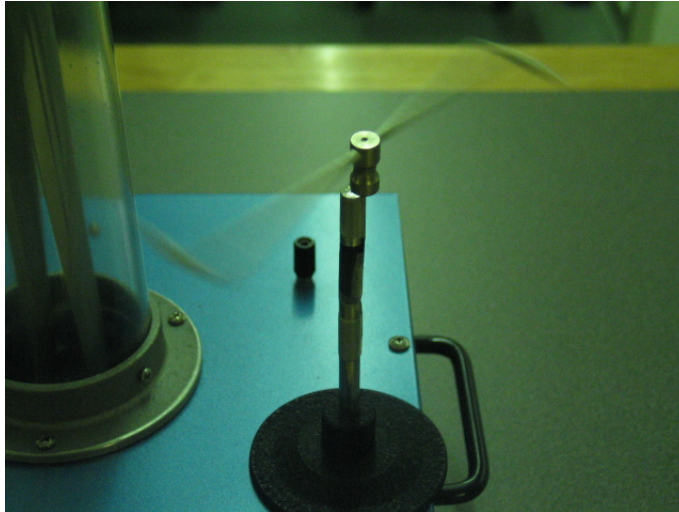


Van de Graaff Design and Spin Electroscope (VdG)



Purpose: To show that sharp points can be used to generate “electric fields” intense enough to ionize air, and how this fact is used in Van de Graaff generators.

Location: room 146, shelf L1 (spin electroscope shelf L3)

Connect the grounding wand to the base of the Van de Graaff generator. Set the spin electroscope on the base of the Van de Graaff, or hold it next to the dome. Turn unit on. At first the rotor becomes polarized and aligns with the electric field from the belt. As the charge on the dome builds up, the vane should start to spin.

The sharp points on the rotor tips serve to create extremely intense electric fields, which ionize nearby air molecules. As electrons (or + ions) are pulled into the tips, the positively charged molecules (or negatively charged electrons) are repelled at high speed, creating a torque on the vane.

This principle is used in the design of Van de Graaff generators as described at:

http://www.splung.com/content/sid/3/page/electrostatic_machines .

A copy of the explanation and accompanying diagram are provided below.