Crookes Tube

An induction coil is used to produce a high-voltage discharge in a Crookes tube. A fluorescent screen permits the observation of the electron beam. A magnet may be used to deflect the beam. This apparatus produces x-rays and UV radiation.

Warning: High voltage! The electricity output by the wooden box is at least on the order of 10,000 V, with a peak current measured around 250 mA. There is exposed metal at the poles on the Crookes tube, so if you handle the base to reposition it or unplug something while it is energized, then you might create an arc and be shocked. To avoid this, always turn off the power supply before adjusting the tube position or circuit. To mitigate the damage, use only one hand to do so, so that you never create a circuit going across your heart.

Setup: The Crookes tube terminals may be unlabeled. The tube produces a beam with either polarity, but the phosphor screen is angled so that one one polarity is effective for viewing the beam. Once the apparatus is set up as shown in the picture, then turn on the power supply and slowly increase the voltage (top knob), just until you get a beam. Caution: If you keep increasing the voltage, you will produce an unnecessarily large amount of x-rays. Also, something starts vibrating at higher voltage that will probably shorten the life of the equipment.

Fun fact: the device in the wooden box was taken from a 1920s-era automobile and was originally used to produce high voltages for spark plugs.

Cabinets: 15, 21

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