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Harvesting energy from the sun—photovoltaic panel apparatus
DAVID RICCIO, WALTER SCHIER, Department of Physics and Applied Physics, University of Massachusetts Lowell, Lowell, MA 01854 — Two 11 cm x 18 cm photovoltaic panels are mounted on a modified ballistic pendulum apparatus that was retired from service in our labs. Its heavy base with pivoted arm provides a stable mount with angle adjustment. Residential PV panel installations group the panels both in series and in parallel, extract maximum power from these groupings, and deal with varying intensity due to changing light conditions. Measurements in the undergraduate lab with a bare light bulb simultaneously provide characteristic graphs of current vs voltage, power vs voltage, load resistance vs voltage for PV panels singly, in series, or in parallel. Also intensity dependence on angle and on distance to the light source are studied in the lab. A custom junction box with a variable load resistor connects the PV panels to PASCO's interface box with voltage and current leads. PASCO's Data Studio is used to record and analyze the graphs.

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