

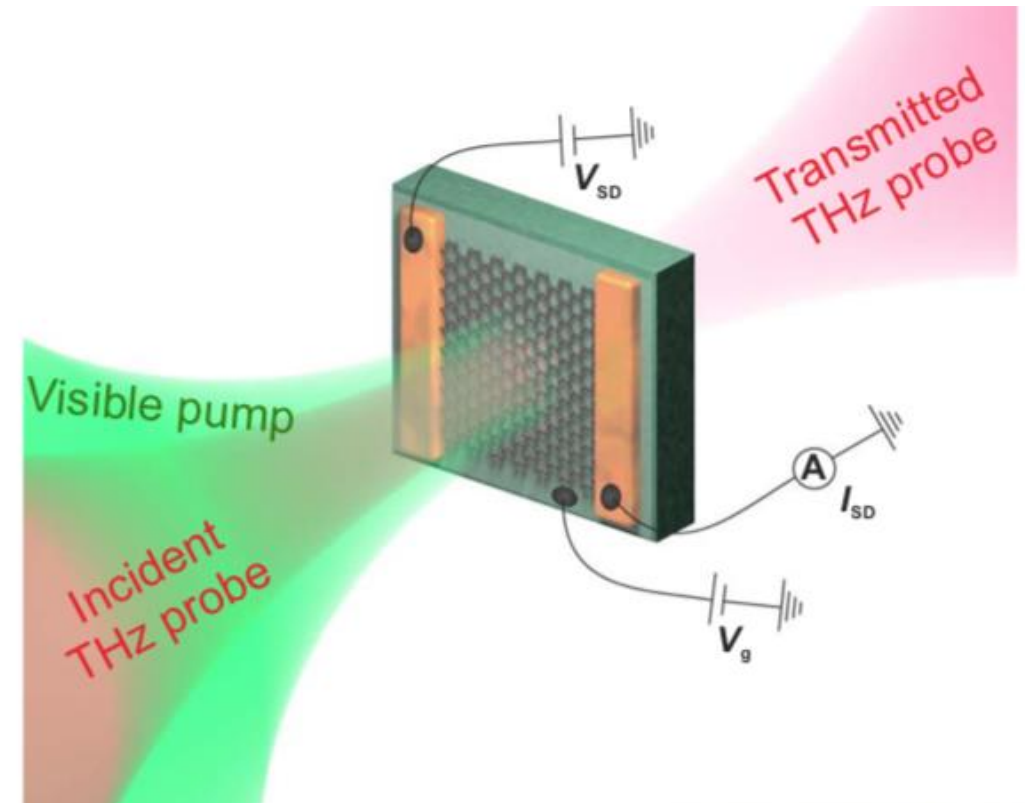
Two electrons for the price of one photon: *The solar cell wet dream*

Carrier multiplication:

the process in which the absorption of a single, high-energy photon results in the generation of two or more electron–hole pairs. The excess energy of the initially excited electron is used to excite a second electron over the bandgap, rather than being converted into heat through sequential phonon emission.

Ultrafast time-domain terahertz time-domain spectroscopy (THz TDS):

technique for directly determining the number of photogenerated electron–hole pairs per absorbed photon, η , for various photon energies from the ultraviolet to the infrared, picoseconds after photo excitation.



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Procedure:

1. Perform THz TDS measurements upon excitation of various photon energies and fluence
2. Analyze the transmittance of THz pulses, obtain the frequency-resolved complex photoconductivity
3. Estimate the degree of carrier multiplication

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