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**Intermediate- band solar cells: future prospects and challenges<sup>1</sup>**

ANTONIO MARTI, Instituto de Energia Solar - Universidad Politecnica de Madrid

The intermediate band solar cell is a novel type of solar cell with the potential of exceeding the limiting efficiency of single gap solar cells. Its principle of operation relies on the existence of a material characterized by an electronic band (intermediate band) located within the semiconductor bandgap. This intermediate band allows the absorption of two below-band gap energy photons to produce one electron-hole pair and is engineered to prevent introducing non-radiative recombination mechanisms in the cell. This basic principle of operation has been recently experimentally demonstrated in devices employing InAs/GaAs quantum dots. In this system, the intermediate band arises from the energy states associated to the confinement of the electrons in the dots. The challenges for the future are: a) to produce devices in which the intermediate band effect is enhanced, b) to identify and synthesize other intermediate band material systems, maybe different from the ones based on quantum dots and c) to produce high efficiency devices that allow the production of photovoltaic electricity at competitive costs.

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