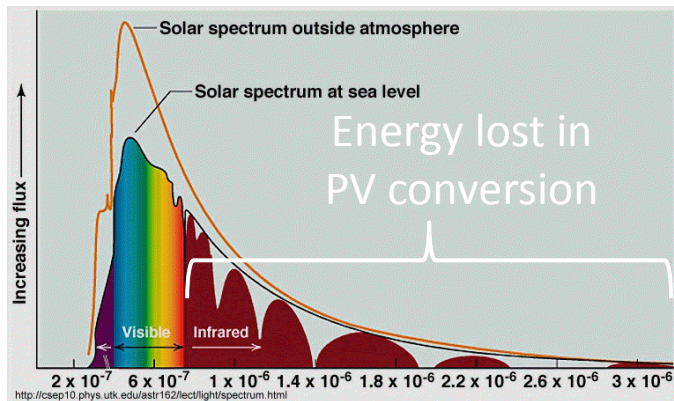


Semiconductor nanowires for energy harvesting applications

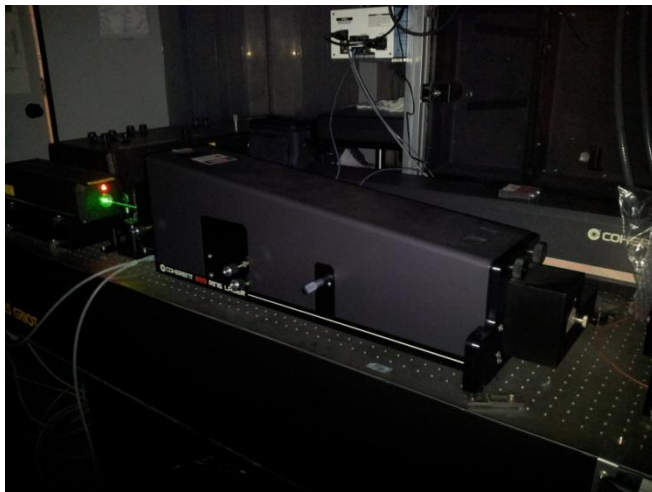


Solar spectrum at the Sea level (AM1)

Most of the energy arriving from the Sun (IR) is lost. The idea of energy harvesting is to take profit of this unused energy and transform it into electricity which can be stored in a battery or supercapacitor or directly to supply electricity to a running electronic device. Heat can be transformed into electricity through the Seebeck effect. Actually, the efficiency of a thermoelectric device is related to the Seebeck coefficient, and the electrical and thermal conductivities, which give the figure of merit.

It has been proved some years ago that the efficiency of a thermoelectric device increases by decreasing the dimensionality of the materials due to the drastic changes produced in the DOS. Actually, semiconductor nanowires has been shown as the most promising nanostructures for the fabrication of thermoelectric devices.

The student will study different semiconductor nanowires and analyze their structural and physical properties using several techniques available in our group. He/she will finally ends with a working thermoelectric device.



Pumping of a variable λ Ti-Sapphire ring laser with a Verdi (532 nm laser)