**Link:** <https://solar-power-tech.com/e-posters/dsc_eposter_07/>

**Abstract**

A simple synthesis route is opted to obtain a multishaped silver(Ag) NPs. These obtained Ag nanoparticles are exhibiting their extinction cross section from 300nm to 1100nm by tuning its plasmonics band, covers the visible and IR regime of solar spectrum. The outstanding optical and electronic properties of the multishaped AgNPs enhance the current density by (i) harnessing photons as an antenna, (ii) assisting the sensitizer harvesting more photons, (iii) serving as carrier separators (iv) reducing recombination and offering less charge transfer resistance and, (V) boosted the open circuit voltage. Out of all the multishaped Ag nanoparticles, the one having the combination of uniform spheres, triangles with rods served optimally to harvest more photons by overlapping its surface plasmon resonance band with an absorption maxima of the investigated sensitizer and extending its help to absorbing photons in the window region of the sensitizer by its plasmonic cooperation effect. The experimental results found for the benefits of the plasmonic effect were supported with numerical simulations on the shape and size of the AgNPs. The maximum photovoltaic conversion efficiency of 7.64% is obtained for DSSC using the plasmonic NPs in which boosting in the efficiency was 45% compare to the reference non plasmonic DSSC device giving an efficiency 5.28%.