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Gold Nanoparticles Assisted Photocurrent Enhancement in Hybrid Nanostructures Based Heterojunction Solar Cell Device[1] GEN LONG, MICHAEL BEATTIE, HUIZHONG XU, MOSTAFA SADOQI, Department of Physics, St John's University — In this presentation, we report a first hand study of plasmon enhanced photocurrent observed in hybrid nanostructures based heterojunction solar cell. The heterojunction solar cell was fabricated, using chemically synthesized narrow gap, IV-VI group semiconductor nanoparticles (PbS and PbSe), wide gap semiconductor ZnO nanowires, and gold nanoparticles, by spin-coating onto FTO glasses, in ambient conditions (25C, 1atm). The synthesized nanostructures were characterized by XRD, UV-VIS absorption, SEM, AFM, TEM, solar simulator, etc. Nanostructures of variant sizes were integrated in to the heterojunction devices to study the effects on photocurrent and solar cell performance. The architecture of film stack, i.e., the positions of Au nanoparticles and PbS, PbSe nanoparticles were also studied. We believe that introducing Au nanopartiles with proper size will lead to increase of photocurrent as well as solar cell devices.

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