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Nanowires filled with nanoparticles: application to solar cells SUMAN DHAYAL, GOPAL SAPKOTA, USHA PHILIPOSE, YURI ROSTOVT-SEV, Univ of North Texas, DR. USHA PHILIPOSE GROUP COLLABORATION — Gold nanoparticles have interesting properties of nano-antennas that focus the radiation field in relatively small, much smaller than the wavelength of radiation, regions. Optical and electronic properties of nanowires experiencing huge field enhancement can be modified due to these plasmonic interactions. We have developed generalized Mie theory to demonstrate the effect of enhancement of electric field near gold nanoparticles and study the novel optical and electronic properties of these new structures: nanotubes with the pores filled with metal nanoparticles and nanowires with metal naoparticles as inclusions on their surface. In the talk, we discuss the applications of such novel nanoscale hybrid metal/semiconductor composites in applications such as sensitive sensors and efficient photovoltaics.

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