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Abstract for an Invited Paper
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Conversion of solar into chemical energy on plasmonic metal nanostructures

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We will show that composite photo-catalysts combing plasmonic metallic nanoparticles of noble metals and semiconductor nanostructures exhibit improved photo-chemical activity compared to conventional photo-catalytic materials [1,2]. We will also show that plasmonic silver nanoparticles, optically excited with low intensity visible light, exhibit direct photo-catalytic activity in a number of oxidation reactions. We will discuss underlying mechanisms associated with these phenomena and predictive models that can capture the outcome of chemical transformations on these materials [2-4]. We propose that this new family of plasmonic metal photo-catalysts could prove useful for many heterogeneous catalytic processes that cannot be activated using conventional thermal processes on metals or photo-catalytic processes on semiconductors. I will show an example of such a process [5].

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[5] M. Andiappan, J. Zhang, S. Linic, **Science,** 339, 1590, 2013