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If solar energy is to become a practical alternative to fossil fuels, we must have e cient ways to convert photons into electricity, fuel, and heat. To this end, direct solar energy conversion to storable fuels o ers a promising route toward less reliance on fossil fuels. e development of a successful solar-fuel-generation technology would require the invention of new photoactive materials that accomplish the combined tasks of light harvesting, charge separation, and compartmentalized chemical transformations. One of the most critical issues is the development of a suitable semiconductor photoanode with high e ciency and long-term durability in aqueous environments. In addition, the lack of e ective oxidation and reduction catalysts is among the most serious obstacles preventing the development of an e cient and scalable arti cial fuel generator In this regard, nanoscience can make a di erence. is talk will cover the assembly and development of new semiconductor nanoarchitectures as well as interface control for the purpose of solar energy conversion in general and direct solar-to-chemical energy conversion in particular.

Biography

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