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ABSTRACT

Advancing Solar Absorbers with Femtosecond Lasers and Metamaterials for Photo-Thermal and Photo-Voltaic Applications

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This talk highlights two parallel technologies developed in my lab for solar energy harvesting. First, femtosecond lasers are utilized for material processing and functionalization, which enabled the creation of the so-called black and colored metals. Here, I will discuss the black and colored metals in a range of photo-thermal applications. Second, I will discuss our recent push in introducing a pure physics-based approach to enhance perovskite performance by utilizing metamaterials. This physics approach rivals the most advanced chemical engineering and provides a new pathway for enhancing perovskites' performance in photo-voltaic applications.

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[3] K.J. Lee, R. Wei, Y. Wang, J. Zhang, W. Kong, S.K. Chamoli, T. Huang, W. Yu, M. Elkabbash, and C. Guo, Nat. Photonics 17, 236 (2023).