Advancing Energy and Sustainability through Laser- and Non-Laser-based Material Functionalization

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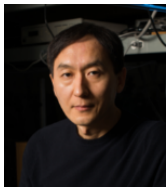
I will discuss two parallel technologies developed in my lab and their applications. First, femtosecond lasers are utilized for material processing and functionalization, which enabled the creation of the so-called black and colored metals, as well as superhydrophobic and superhydrophilic surfaces in my lab. A range of applications will be discussed, particularly in renewable energy and sustainability. Second, I will introduce our recent research without the use of lasers. This includes introducing a new category of optical coatings to the century-old technology and enhancing perovskite performance through purely physics-based methods, which rivals the most advanced chemical engineering techniques.



Short Bio:

Chunlei Guo is a professor in the Institute of Optics at University of Rochester in the US. His work at Rochester led to the discoveries of a range of highly functionalized materials, which promise a broad range of technological applications. He is a Fellow for American Physical Society and Optica. He is an Editor for Light: Sci. & Appl. and served as the Editor-in-Chief for CRC Handbook of Laser Technology and Applications (2nd Edition).