**Aluminum-Based Multiscale 3D Lithography: Concept and Applications**

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Complex structures are ubiquitous in biological systems. Over millions of years, biological systems have evolved optimized functions based on their unit cells' beneficial size and material effects that contribute to favorable mechanical and physical properties. Inspired by these biological systems, many trial-and-error reverse-engineering and computational methods have been utilized to mimic these structures for various applications, such as light management, flexible sensing, wetting control, adhesion, and electrocatalysis. One most challenging is manufacturing man-made systems with controllable features spanning multiple length scales, particularly down to the nanoscale, which seriously impacts the system’s collective properties. In this talk, I will introduce a new concept of aluminum-based 3Dlithography (AL-3Dlitho) enabled by the aluminum surface work hardening phenomenon. Combining AL-3Dlitho with different deposition methods, various high-precise homogeneous and heterogeneous multiscale materials across at least 108 length scales could be designed and fabricated. Finally, I will talk about plasmonic metasurface-based optoelectronics and biosensors by fully utilizing the customized multiscale structures on different length scales.

**Short Bio:**

**Liaoyong Wen** received his PhD degree in Applied Physics from the Technical University of Ilmenau, Germany. He joined Westlake University, China, as an assistant professor in 2019. He has won the China National Scholarship for Outstanding Self-Financed International Students, IEEE Best Oral Paper Award, Vebleo Fellow, etc. He has published more than 40 SCI-indexed papers in top international journals, such as Nature Nanotechnology, Advanced Materials, ACS Nano, Nano Letters, Advanced Science, Energy & Environmental Science, etc. He is also a co-founder of Westlake Micro-Nano-Tech Co., Ltd.