**Hybrid Laser Precision Engineering of Transparent Hard Materials**

*Xiamen University, China*

**Hong Minghui**

**Email: elehmh@xmu.edu.cn**

 Laser is a mature and versatile tool with great flexibility and applicability for precision engineering of a wide range of materials. Past decades have witnessed its rapid development and extensive applications ranging from scientific research to industrial manufacturing. Transparent hard materials remain a few major technical challenges for conventional laser processing techniques due to their high hardness, great brittleness, and low optical absorption. A variety of hybrid laser processing technologies, such as laser-induced plasma-assisted ablation (LIPAA), laser-induced backside wet etching (LIBWE), and etching assisted laser micromachining, have been developed to overcome these barriers by introducing additional medium assistance or combining different process steps. In this talk, the principles and characteristics of these hybrid technologies will be reviewed. How these technologies are used to precisely process transparent hard materials, and their recent advancements are introduced. These hybrid technologies show remarkable benefits in terms of efficiency, accuracy, and quality in the fabrication of microstructures and functional devices on the surface of or inside the transparent hard substrates, thus enabling widespread applications in the fields of microelectronics, biomedicine, photonics, and microfluidics. A summary and outlook of hybrid laser technologies are also highlighted.

**Short Bio:**

Prof. Hong Minghui is the **Tan Kah Kee** Chair Professor, Xiamen University, China and specializes in laser microprocessing & nanofabrication.