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IAPME Seminar

Development and Application of Large Area Nanometer Precision Diffraction Grating

21 January 2026

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Venue: N23-6009
Time: 10:00 - 11:00
Hosted by: Prof. Songnan QU

Abstract

Large area high-precision diffraction grating is widely used in spectral analysis, laser, displacement measurement, optical communication and other fields. It is an indispensable core component of inertial confinement nuclear fusion device, large astronomical observation equipment, synchrotron radiation light source and other important national scientific projects. The modulation of light field by micro-scale groove precision and distribution determines the diffraction efficiency and wave front of grating macroscopic characteristics. Based on the development trend of large-area high-precision gratings, the report analyzes the effect of grating diffraction efficiency and wave front on groove parameters, and introduces the key technologies that the team has conquered in the production of meter-scale nano-precision gratings. The echelle grating with the largest area 400mm×500mm in the world and the 650mm×1700mm domestic largest monomer non-jointing holographic grating have been developed. The gratings developed by the team have been applied in the national strategic high-tech fields such as large optical system and high-end lithography machine industry, which provides the core device support for China's high-tech strategic deployment.

Biography

Prof. Wenhao LI is a Professor at the CIOMP, is the winners of the Youth Science Fund (Class A) of NSFC and the chief scientist of Key Research and Development Program of the Ministry of Science and Technology. He has achieved a series of original results in the research of high-precision grating displacement measurement technology and the theory and technology of large-area high-precision grating manufacturing. He has published over 100 papers in top journals such as Light: Science & Applications and has been granted over 50 patents, including 5 US patents. He has led over 20 projects including the Key Project from NSFC and the Key Research and Development Program from Ministry of Science and Technology. As the first author, he has won multiple honors including the First Prize for Technological Invention of the China Instrument and Control Society and the First Prize for Scientific and Technological Progress of Jilin Province.