



中国科学院理论物理研究所  
Institute of Theoretical Physics, Chinese Academy of Sciences

ITP/CAS - Landau ITP  
Joint Online Colloquium

# The Unification from Spin Dynamics

**Yue-Liang Wu**

Institute of Theoretical Physics  
Chinese Academy of Sciences



## Abstract

This talk will present how the principles of spin dynamics serve as the foundation for unifying quantum mechanics with general relativity. This unification gives rise to a Gravitational Quantum Field Theory (GQFT), which predicts new gravitational wave polarizations associated with spin phenomena, and a General Theory of the Standard Model (GSM), offering a unified framework for particle physics and cosmology. Furthermore, its extension into hyper-spin dynamics allows for the development of a Hyperunified Field Theory (HUFT), a single framework encompassing all fundamental interactions and elementary particles. Such a theory is crucial for understanding the nature of spacetime and gravity and for addressing profound mysteries of the universe, including dark matter, dark energy, and inflation. Ultimately, we expect gravitational wave astronomy to provide a powerful new probe into the gravitational universe.

## Biography

Prof. Yue-Liang Wu, theoretical physicist, the member of Chinese Academy of Sciences (CAS), TWAS and International Eurasian Academy of Sciences. Served as the director of International Centre for Theoretical Physics Asia-Pacific (ICTP-AP, UNESCO), the academic vice-president of the University of Chinese Academy of Sciences (UCAS), and the chief scientist of the Taiji Program in Space for Gravitational Wave Detection in China. Graduated from Nanjing University in 1982, received Ph.D. at the Institute of Theoretical Physics (ITP) at CAS in 1987, joined the Dortmund University and Mainz University in Germany and the Carnegie-Mellon University and Ohio-State University in USA from 1987 to 1996, and worked at the Institute of Theoretical Physics at CAS since 1996.

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