

中央大學物理學系

Department of Physics, National Central University



Colloquium

Laboratory Data Acquisition and Management in the Era of AI & Python Programing Tutorial

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Date: 2025/09/23 (Tue)

Venue: S4-625

Time: 14:00-16:00

Abstract :

In the era of artificial intelligence, laboratory data has become more than a byproduct of experiments—it is now a cornerstone of reproducibility, collaboration, and discovery. This talk explores the opportunities and challenges in modern laboratory data acquisition and management, highlighting the growing importance of metadata standards and FAIR principles. We will demonstrate how Python, with its flexible object-oriented programming capabilities, provides an effective foundation for experiment workflow automation, instrument control, and data analysis. An illustrative case study on quantum optics tomography showcases the synergy between experimental data and machine learning. Finally, we will look forward to the future of research data infrastructures, where autonomous laboratories, standardized ecosystems, and AI-ready databases pave the way toward human–AI collaborative science.