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Perspectives on New Physics Discoveries at Multi-Terawatt Laser Facilities

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Venue: S4-625

Time: 14:00-15:00

Abstract:

It has been nearly 40 years since the invention of chirped pulse amplification (CPA), a technique that serves as the foundation for ultrahigh-intensity laser systems. Over the decades, CPA-enabled terawatt-level laser facilities have driven significant advancements in high-field physics and myriad applications, ranging from plasma-based particle accelerators and advanced radiation sources to efforts toward controlled nuclear fusion. With the advent of petawatt-class laser systems, we can now explore extreme physical conditions with unprecedented peak intensities. While petawatt lasers offer unmatched peak intensities for probing extreme regimes, terawatt systems remain indispensable for their accessibility, precision, and versatility across a broad spectrum of experiments. In this talk, I will share insights from my personal experience in high-field laser-plasma interaction research on the opportunities and challenges that lie ahead. I will discuss the role of advanced diagnostics, the interplay between theoretical modeling and experimental approaches, and the collaborative efforts required to realize the full potential of multi-terawatt laser facilities for groundbreaking discoveries in physics.