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Nuclear Physics under the low-energy, high intensity frontier

Content

Nuclear physics stands at the forefront of scientific exploration, invigorated by cutting-edge developments in few- and many-body methodologies, field-theoretical frameworks, and state-of-the art experimental techniques. These advancements have propelled the discipline into an era of maturity, enabling it to venture boldly into uncharted territories. One particularly thrilling frontier lies in the study of systems where particles interact with relatively low energy yet extraordinarily high-intensity fields. In such environments, multi-particle processes rival or even surpass traditional one-to-one interactions, opening the door to groundbreaking discoveries. These investigations can be conducted through highly time-compressed sources, such as particle beams generated by high-power laser-matter interactions.
In this talk I focus on a new scheme, where high-power laser systems are exploited as a driver to generate energetic gamma-ray photons. Together with additional low-energy photons provided by a second, less intense laser, a multi-photon absorption scheme enables a very attainable manipulation of nuclear transitions including isomer pumping and depletion.

Primary author: YANG, Chieh-Jen

Presenter: YANG, Chieh-Jen

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