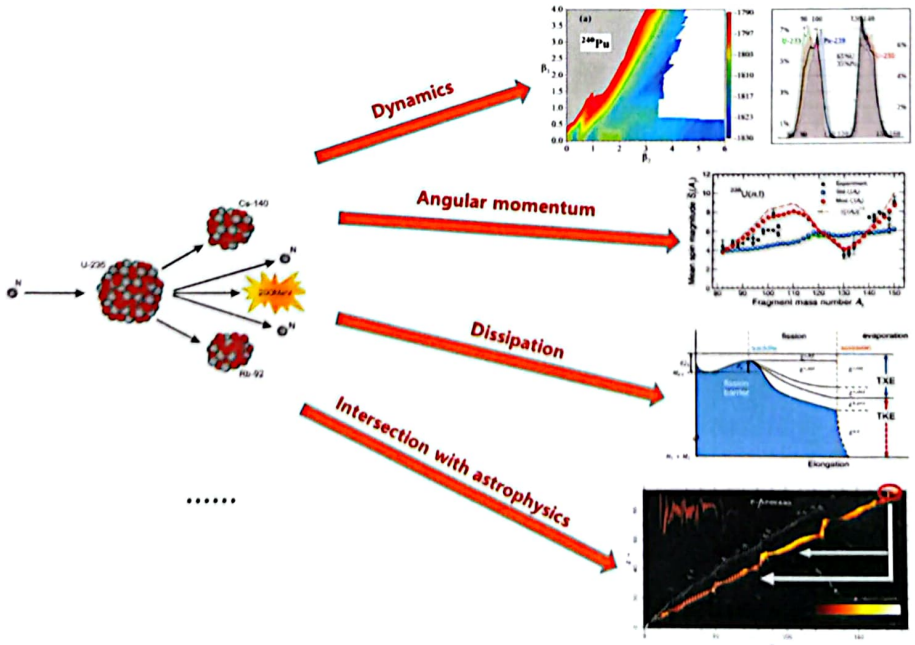
Workshop on Fission Dynamics

May 11th–15th, 2026 | Chongqing, China

The Workshop on Fission Dynamics will be held in Chongqing, China, from May 11th to 15th, 2026. This meeting is hosted by Chongqing University, Peking University, Southwest University, and the Chongqing Physical Society, with support from the National Natural Science Foundation of China's Theoretical Physics Special Fund "Southwest Center for Theoretical Physics" project. The workshop aims to bring together leading experts and young researchers in the field of nuclear fission to discuss recent advancements in theoretical and experimental studies, explore new methodologies, and foster collaborations on key challenges in fission dynamics.

Scientific Background

The process of nuclear fission, in which a heavy atomic nucleus splits into two or more fragments while releasing a significant amount of energy, was first discovered in 1938. This landmark finding not only revolutionized our understanding of nuclear physics but also led to major technological advances, particularly in energy production and nuclear applications. Over the past eight decades, extensive experimental and theoretical efforts have been devoted to understanding the fundamental mechanisms of fission, its applications, and its implications for nuclear stability, element formation in astrophysics, and energy production.



From a physical perspective, nuclear fission is a complex process governed by a delicate interplay of macroscopic and microscopic forces. The nucleus, a self-bound mesoscopic quantum system, undergoes large-amplitude collective motion as it deforms towards scission. This process is influenced by nuclear interactions, shell effects, and pairing correlations, that determine the energy landscape of fission pathways. Fission fragment distributions, neutron multiplicities, total kinetic energy distributions, and angular momenta are key observables that encode essential information about the underlying nuclear structure and dynamics.

Significant advancements have been reported in both experimental and theoretical studies of nuclear fission in recent years:

Experimental Progress: High-precision experiments using advanced detection techniques and next-generation accelerators have provided unprecedented data on fission fragment properties, neutron emission spectra, and time-dependent fission observables. The development of sophisticated fission chambers, ion traps, and coincidence measurements has enabled a more detailed characterization of fission processes across different isotopes and excitation energies.

Theoretical Developments: The refinement of Macroscopic-Microscopic model, density functional theory (DFT), scission point model, and Langevin model has greatly improved our ability to describe the entire fission process from initial excitation to final fragment distribution. Recent studies have also incorporated machine learning techniques to enhance predictive capabilities and reduce computational costs.

Challenges and Open Questions: Despite these advances, many fundamental questions remain unresolved. The integration of microscopic and macroscopic approaches to provide a unified fission framework is still an ongoing challenge. The role of quantum correlations, the impact of dynamical pairing effects, and the prediction of fission yields with high accuracy require further investigation. Additionally, implications of fission for nuclear astrophysics, particularly in r-process nucleosynthesis, necessitate a deeper understanding of fission fragment distributions under extreme conditions.

Given these developments and challenges, this workshop aims to bring together leading experts in nuclear fission research to discuss recent progress, identify key open questions, and explore future directions in both experimental and theoretical approaches. By fostering collaboration between experimentalists and theorists, we seek to refine our understanding of nuclear fission and its broader implications for fundamental and applied nuclear physics.

Workshop Objectives

1. Review recent advances in experimental and theoretical approaches.
2. Assess the current limitations of existing experimental techniques and theoretical models.
3. Identify new computational strategies and their role in enhancing predictive accuracy.
4. Foster collaboration between experimentalists and theorists to improve data integration and model validation.
5. Explore emerging applications and their implications for future research.

We invite researchers with both experimental and theoretical backgrounds to participate in this workshop.

Registration: Attendance is primarily by invitation.

Fees: There is no registration fee for the workshop.

Accommodation: Accommodation will be arranged at the workshop venue, Chongqing Chaotianmen Voco Hotel. Participants are responsible for their own accommodation expenses.

We look forward to an engaging and productive discussion!

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