

Physics & Astronomy Colloquium

Presents



Nicolas Schunck

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Nuclear Data and Theory Group

Thursday, February 4, 2021
4:10 pm via Zoom

*Meet the speaker at 3:30 pm, join us in welcoming
the speaker and for an informal chat!*

“Theory of Nuclear Fission ”

Nuclear fission - the process by which heavy atomic nuclei split into two or more fragments - was discovered more than 80 years ago. Technological applications of it, for instance to produce energy, have been around for decades. Yet, our understanding of this phenomenon remains very empirical and fragmentary: although we have very sophisticated models of fission that are well calibrated on existing experimental data, we lack a truly predictive theory capable of, e.g., simulating the fission of very short-lived radioactive isotopes made during nucleosynthesis. How does fission emerge from nuclear forces between protons and neutrons and from the laws of quantum mechanics? How accurately can we predict the characteristics of this process? Beyond making progress in fundamental nuclear science, answering these questions is essential to better understand how heavy elements are formed in the cosmos or the stability of superheavy elements. This talk will give an overview of modern theoretical approaches fission, where fully quantum-mechanical methods are combined with high-performance computing and, more recently, machine learning techniques to provide a consistent and increasingly realistic description of this phenomenon.

Host: Dr. Michael Forbes

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