

KEK WNSC Seminar



Speaker: Prof. Andrei Andreyev
(University of York)

**Title: Nuclear Fission in the 21st Century:
A Review of Experimental Advances and Phenomenology**

*The seminar will be given in *English*

Date: From 13:30 on September 28, 2022

Place: Hybrid of RIBF bldg. R201 & Zoom (Meeting ID: 846 9141 6579 Passcode: 217527)

Abstract

In the last two decades, through technological, experimental and theoretical advances, the situation in experimental fission studies has changed dramatically. With the use of advanced production and detection techniques much more detailed and precise information can now be obtained for the traditional regions of fission research. Crucially, *new regions of nuclei* have become routinely accessible for fission studies, by means of *radioactive ion beams*.

The talk will briefly introduce classical concepts of fission, followed by examples of recent developments in fission techniques, in particular the resurgence of multinucleon-transfer induced fission reactions with light and heavy ions, the emerging use of inverse-kinematic approaches, both at Coulomb and relativistic energies, and of fission studies with radioactive beams [1].

The emphasis on the fission-fragment mass and charge distributions will be made for *low-energy fission*. Such studies have become possible due to the development of several complementary experimental studies, including the β -delayed fission with laser-ionized mass-separated radioactive beams at ISOLDE(CERN) [2].

The unprecedented high-quality data for fission of heavy actinides, completely identified in Z and A , by means of reactions in inverse kinematics at FRS(GSI), SAMURAI(RIKEN, Japan), and VAMOS(GANIL, France) will be also reviewed. These experiments explored an extended range of heavy elements, covering both asymmetric, symmetric and transitional fission regions.

The talk will conclude with the discussion of the new experimental fission facilities which are presently being brought into operation, along with promising 'next-generation' fission approaches, which might become available within the next decade [1].

[1] A.N. Andreyev, K. Nishio, K.-H. Schmidt, Reports on Progress in Physics, 81,1 (2018)

[2] A.N. Andreyev et al, Physical Review Letters, 105, 252502 (2010)

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