6th International Conference on New Frontiers in Physics (ICNFP2017)



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Type: Talk

Eighty Years of Research on Super-heavy Elements

Saturday 19 August 2017 11:50 (30 minutes)

Professor Walter Greiner, our friend and teacher, passed away in the age of eighty. During his lifetime, the search for elements beyond uranium started and elements up to the so far heaviest one with atomic number 118 were discovered. In this talk I will present a short history from early searches for 'trans-uraniums'up to the production and safe identification of shell-stabilized 'Super-Heavy Nuclei (SHN)'. The nuclear shell model reveals that these nuclei should be located in a region with closed shells for the protons at Z = 114, 120 or 126 and for the neutrons at N = 184. The outstanding aim of experimental investigations is the exploration of this region of spherical SHN. Systematic studies of heavy ion reactions for the synthesis of SHN revealed production cross-sections which reached values down to one picobarn and even below for the heaviest species. The systematics of measured cross-sections can be understood only on the basis of relatively high fission barriers as predicted for nuclei in and around the island of SHN. A key role in answering some of the open questions plays the synthesis of isotopes of element 120. Attempts aiming for synthesizing this element at the velocity filter SHIP will be reported.

Topic:

Memorial session for W. Greiner

Summary

Author:HOFMANN, Sigurd (GSI)Presenter:HOFMANN, Sigurd (GSI)Session Classification:W. Greiner Memorial Session

Track Classification: Walter Greiner Memorial session