500th ASRC Seminar

Date: 13:30 - 15:00, 1st February

Location: Meeting room 302, ASRC Building

Speaker: Prof. Shan-Gui Zhou
(Institute of Theoretical Physics,Chinese Academy of Science)

Title: Theoretical study of structure and synthesis mechanism of superheavy nuclei

I will first mention briefly recent progresses made by us towards a better understanding of the structure and the synthesis mechanism of superheavy nuclei. Then I will focus on the multi-dimensional potential energy surfaces of heavy and superheavy nuclei from covariant density functional theories (CDFT). With newly developed multi-dimensional constraint CDFTs, we are able to explore the importance of various shape degrees of freedom simultaneously along the fission path. For example, we found that aside from the octupole deformation, the triaxiality also plays an important role upon the second fission barriers: Both the outer and the inner barriers are lowered by the triaxial deformation compared with axially symmetric results. With many important shape degrees of freedom included in these CDFTs, one may predict more accurately the ground state and saddle point properties for superheavy nuclei.

[1] Bing-Nan Lu, En-Guang Zhao, and Shan-Gui Zhou, Phys. Rev. C84 (2011) 014328
[2] Bing-Nan Lu, En-Guang Zhao, and Shan-Gui Zhou, Phys. Rev. C85 (2012) 011301(R)
[3] Jie Zhao, Bing-Nan Lu, En-Guang Zhao, and Shan-Gui Zhou, Phys. Rev. C86 (2012) 05730

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