Contribution ID: **86** Type: **not specified**

The 157th HENPIC seminar by Dr. Chunjian Zhang, Stony Brook Uni. Jan. 20, 2022, Thursday, 10:30am (Beijing time)

Talk title: Imaging the shape of nuclei at high-energy colliders: towards a new type of nuclear phenomenology

Abstract:Nuclear deformation is a ubiquitous phenomenon for most atomic nuclei, reflecting collective motion induced by interaction between valance nucleons and shell structure. Recent progress in hydrodynamic modeling together with the wealth of precision collective flow data, however allow us to not only perform quantitative extractions of the transport properties of the QGP, but very importantly start to strongly constrain the initial state of the colliding nuclei. In this talk, I will show the precision measurements of bulk observables, such as flow coefficients, mean transverse momentum fluctuations, and their Pearson correlation coefficients. The use of which can be used to infer the
shape of the colliding nuclei, and thus obtain quantitative information about their
structure in the experiments. I will also discuss the comparison of such data with the state-of-the-art model calculations, and show that it permits us to clearly identify the nuclear deformations. These results demonstrate high-energy colliders as a new experimental test to image the structure of atomic nuclei.

About the speaker: Chunjian Zhang is a postdoctoral researcher at Stony Brook University. He received his Ph.D from Shanghai Institute of Applied Physics (SINAP) in 2019.12. Currently, his research works focus on the experimental and phenomenological study of correlations and fluctuations in relativistic heavy-ion collisions.