東北大学　宇宙創成物理学国際共同大学院プログラム

GP-PU (Graduate Program on Physics for the Universe）Seminar セミナー

"Alpha-clustering and discrete point-group symmetries in nuclei: How to assess the role of alpha-clustering in Carbon-12”

by Lorenzo Fortunato

(Padova University, Italy)

Time and Date : 16:00 - 18:00, Wed May 29th 2019

Venue : Room 745, Science Complex B (H-03)

Abstract:

Clustering in light nuclei and the existence of nuclear molecular states is a very important phenomenon, that is linked with several branches of physics: nuclear forces and nuclear structure, molecular physics, symmetries and group theory. In this lecture, aimed at B.Sc. and Ph.D. students, I will recall the basic phenomenological facts and models related to alpha-clustering and molecular structures and I will introduce the basic mathematical tools to deal with discrete point-groups in quantum mechanical systems. Building on this knowledge, we will discuss how the scattering of polarized gamma rays on 12C can be used to identify with certainty the geometric shape of a cluster structure through the comparison of measurements of the depolarization ratio with a list of possible theoretical scenarios. All the possible outcomes have been calculated and collected in a table (PRC 99, 031302(R) (2019)) that will be explained.

Contact : Yusuke Tanimura (E-mail: tanimura@nucl.phys.tohoku.ac.jp)