



千葉大学大学院理学研究院附属

ハドロン宇宙国際研究センター

International Center for Hadron Astrophysics

ICEHAP Online Seminar

Date **May 27 Wednesday 10:00~12:00**

Location **Online via Zoom (The meeting url will be informed by mail.)**

By **Dr. Lluís Martí Magro (ICRR, University of Tokyo)**

Title

『The gadolinium revolution for Super-Kamiokande』

Abstract

While Super-Kamiokande (SK) can reconstruct charged particle tracks over a wide energy range, the detection efficiency of neutrons is very low. Neutron tagging in water Cherenkov detectors is challenging since a neutron capture produces a single 2.2 MeV gamma. To efficiently detect neutrons GADZOOKS! was proposed: dissolve a gadolinium (Gd) salt. The cross-section for thermal neutron capture on Gd is about 5 orders of magnitude larger than on hydrogen and yields an 8 MeV gamma cascade, which is much easier to detect. The addition of a Gd salt had potential effects that had to be evaluated. EGADS, a dedicated R&D facility at the Kamioka Observatory was built to demonstrate the feasibility of this technique. EGADS showed very good results and thus, in June 2015 the SK-Gd project was approved. Since then the most ambitious upgrade preparations at SK started: new caverns to build a complete new water system and an extensive refurbishment of the detector have been the most prominent landmarks. In this seminar I will report about the most important steps in this project, its by-products (EGADS as a stand-alone supernova detector) and its broad implications: basically in all SK analyses but also its application in other detectors. Finally I will give an outlook for SK-Gd.