

Date:	Tuesday, 27 November 2018
Time:	15:00 – 16:20
Speaker:	Yannis SEMERTZIDIS
Institution:	Center for Axion and Precision Physics Research, The Institute for Basic Science (IBS)

Title:

A comprehensive approach to axion research

Abstract:

CAPP, the Center for Axion and Precision Physics Research, of the Institute for Basic Science (IBS) of the Republic of Korea was established five years ago completely from scratch, to make a decisive contribution in answering the following questions: 1. Do axions exist? and 2. Are they part of the dark matter in our galaxy? The IBS/CAPP approach was to take immediate advantage of currently mature technology and develop what's needed by collaborating with the world's experts in the specific areas that needed development. Five years later, we have a state-of-the-art laboratory, capable of launching seven axion dark matter experiments in parallel. Currently we have three state of the art axion dark matter experiments using conventional superconductors and HEMT amplifiers reaching all the way to the theoretically motivated sensitivities. In parallel, we are procuring a high-temperature-superconducting (HTS) magnet with 25T/100mm bore aperture from BNL and an LTS magnet based on Nb3Sn superconductor of 12T/320mm aperture from Oxford. In parallel, we are working to implement low-noise RF-amplifiers, and when combined with the rest of our systems we expect to reach all the way down to DFSZ sensitivity very fast for 0.7GHz to 10 GHz in the first phase and second phase. We also expect to reach all the way to 20GHz in the next phase by employing our home-developed high efficiency, high-frequency axion multi-cavity system. Our axion dark matter search program is complemented by several additional efforts looking into higher and lower frequencies, which I will also describe.

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