

Zhen Cao – Colloquium – September 26, 2024

Institute of High Energy Physics

Title - Cosmic-Ray Super-PeVatrons and Extreme Accelerators found by LHAASO

Abstract LHAASO has been operating smoothly since 2019 and making discovery of PeVatrons in the Milky Way. The first Cosmic Ray Super-PeVatron is found in the Cygnus region with 8 photons above 1 PeV pile-up in a so-called cosmic ray bubble of 10° . A couple of PWNe are found emitting photons up to 2 PeV. They pose challenges by manifesting so-called “Extreme Accelerators” in our galaxy. In future, we need to improve the spatial resolution to carry out deep investigations for the mechanism. Detection of Neutrinos from the PeVatrons will put in the last piece of the big puzzle lasted for a century.

Background Zhen Cao, the professor of the Institute of High Energy Physics (IHEP), Beijing. He graduated from Physics Department of Yunan University in 1982, then he was awarded the Ph. Doctoral degree at IHEP in 1994. He worked as postdoc researcher and associated professor in Univ. of Oregon and Utah Univ., US from 1994 to 2009. Since 2004, he has been taking the professor position in IHEP. He participated a couple of major cosmic ray experiments in the world. He has been leading a couple of experiments and playing a central role in proposing and implementation of the experiments. Since 2013, he has been the Chief Scientist and director of the project Large High Altitude Air Shower Observatory (LHAASO), Currently, he is the spokesperson of the international LHAASO Collaboration