



**International Center  
for Hadron Astrophysics**  
ICEHAP CHIBA UNIVERSITY

## ICEHAP セミナー

**Date** 日時 4月4日（金） 14:00～16:00

**Place** 場所 [ICEHAP オフィス \(工学系総合研究棟 1 内 6 階 609-1 号室\)](#)

**By** 講演者 **Ellis Owen** 氏 (理化学研究所、基礎科学特別研究員)

**Title** タイトル

### 『From Galaxies to Cosmological Structures: The Multi-Scale Influence of Cosmic Rays』

**Abstract** 概要

Cosmic rays interact with astrophysical systems over a broad range of scales. They go hand-in-hand with violent, energetic astrophysical environments, and are an active agent able to regulate the evolution and physical conditions of galactic and circumgalactic ecosystems. Depending on their energy, cosmic rays can also escape from their galactic environments of origin, and propagate into larger-scale cosmological structures. In this talk, I will discuss the impacts of cosmic rays retained in galaxies. I will show they can deposit energy and momentum to alter the initial conditions of star-formation, modify the circulation of baryons around galaxies, and have the potential to regulate long-term galaxy evolution. I will highlight some of the astrophysical consequences of contained hadronic and leptonic cosmic rays in and around galaxies, and how their influence can be probed using signatures including X-rays, gamma-rays and neutrinos. I will also discuss what happens to the cosmic rays that escape from galaxies, including their interactions with the magnetized large-scale structures of our Universe, and the fate of distant high-energy cosmic rays that do not reach us on Earth.