



ЛАБОРАТОРИЯ  
ИНФОРМАЦИОННЫХ  
ТЕХНОЛОГИЙ

СЕМИНАР  
по ВЫЧИСЛИТЕЛЬНОЙ  
И ПРИКЛАДНОЙ  
МАТЕМАТИКЕ

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**Friday, July 27, 2018 at 11.00**

**Room 310**

**Prof. Akeo Misaki**

**(Saitama University, Japan)**

**THE DIVERSITIES OF COSMIC RAY PHENOMENA AT  
HIGH AND EXTREMELY HIGH ENERGIES AND  
RELIABLE ENERGY ESTIMATION OF THE  
PHENOMENA CONCERNED**

The speaker's talk deals with cosmic ray phenomena at high (over  $10^{10} - 10^{12}$  eV to  $10^{12} - 10^{15}$  eV) and extremely high (over  $10^{21}$  eV), such as high and extremely high energy neutrino physics phenomena, and extensive air showers. Concretely speaking, the range energy fluctuation of high energy muon which plays an important role in high and extremely high energy muon astrophysics physics over  $10^{12}$  eV to  $10^{15}$  eV is discussed. The diversity of the electromagnetic cascade showers at extremely high energies ( $10^{15}$  eV to  $10^{23}$  eV) is analyzed for the its application to extremely high energy electron neutrino astrophysics. The energy estimation of extensive air showers is considered, too. The importance of the exact treatment to the stochastic processes in cosmic ray phenomena at high and extremely high energies is strongly emphasized. Such exact treatments to stochastic processes in the cosmic ray phenomena have not been adopted due to time consuming, frequently, which may lead to unreliable conclusion. The speaker would explain the background for the collaboration with Drs. Olga Voskresenskaya and Hrach Torosyan in his seminar.