

## Preface

The International Workshop on “Energy Budget in the High Energy Universe” was held February 22-24, 2006 at Institute of Cosmic Ray Research, Kashiwa campus of the University of Tokyo. This workshop is the fourth in the series of international workshops of the 21th Century COE program “Quantum Extreme Systems and Their Symmetries” of the University of Tokyo (for a detailed description of the project, visit, [http://bilbo.phys.s.u-tokyo.ac.jp/coe21/index\\_e.htm](http://bilbo.phys.s.u-tokyo.ac.jp/coe21/index_e.htm)).

Aim of the Workshop was to discuss of our understanding in the non-thermal, high energy Universe. The existence of materials with very high specific energies, much exceeding the local virial temperature, is best represented by cosmic rays, of which the origin has long been a mystery. Recent astrophysical observations in X-ray, gamma-ray, neutrino and high energy cosmic ray experiments, in conjunction with theoretical studies, have been revealing various new aspects of the High Energy Universe, including promising candidates for the cosmic-ray acceleration sites. However, each approach has its own advantage and limitations in proving the whole view of the issue. Joint efforts by experimentalists and theorists in various related fields are essential in our deeper understanding of the issue. In this Workshop, we discussed to what extent we understand the fluxes, the spectra and the maximum energies of the cosmic radiation produced in various astrophysical sites.

This proceedings includes about 30 reviews by distinguished researchers and 21 contributed papers by active researchers. We hope this proceedings is useful for scientists in this field, and contributes further understanding of the High Energy Universe.

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