

The Telescope Array Project

T. Aoki¹, Y. Arai², K. Arisaka³, J. Beltz⁴, J. Boyer⁵, Z. Cao⁶, M. Chikawa⁷, R.W. Clay⁸, D. Cline³, B. Dawson⁸, B.D. Dieterle⁹, J.O. Dimmock¹⁰, M. Fukushima¹, K. Hashimoto¹¹, N. Hayashida¹, L.W. Hillman¹⁰, K. Honda¹¹, N. Inoue¹², F. Ishikawa¹, C. Jui⁶, S. Kabe², F. Kajino¹³, F. Kakimoto¹⁴, S. Kawakami¹⁵, N. Kawasumi¹¹, B.D. Kieda⁶, B. Knapp⁵, D.J. Lamb¹⁰, E.C. Loh⁶, E. Mannel⁵, G. Martin⁹, J.A.J. Matthews⁹, J.N. Matthews⁶, H. Ohoka¹, S. Ogio¹⁴, S. Riley⁹, M. Sakata¹³, M. Sasaki¹, M. Sasano¹, M. Seman⁵, M. Shaevitz⁵, W. Slater³, P. Sokolsky⁶, W. Springer⁶, T. Suwada², Y. Takahashi¹⁰, M. Takeda¹, Y. Tanaka¹⁶, M. Teshima¹, T. Tessier⁹, R. Torii¹, A. Tripathi³, T. Vinogradova³, N. Wild⁸, L. Wiencke⁶, Y. Yamamoto¹³, S. Yoshida¹,

¹*Institute for Cosmic Ray Research, University of Tokyo, Tokyo 188-8502, Japan*

²*KEK, High Energy Accelerator Organization, Tsukuba 305-0801, Japan*

³*University of California at Los Angeles, Los Angeles, California 90095, USA*

⁴*Montana State University, Bozeman MT 59717, USA*

⁵*Columbia University, Navis Laboratories, Irvington, New York 10533, USA*

⁶*University of Utah, Salt Lake City, Utah 84112, USA*

⁷*Kinki University, Osaka 577-8502, Japan*

⁸*University of Adelaide, Adelaide, South Australia 5005, Australia*

⁹*University of New Mexico, Albuquerque, New Mexico 871331, USA*

¹⁰*University of Alabama in Huntsville, Alabama 35899, USA*

¹¹*Yamanashi University, Kofu 400-8511, Japan*

¹²*Saitama University, Urawa 338-8570, Japan*

¹³*Konan University, Kobe 658-8501, Japan*

¹⁴*Tokyo Institute of Technology, Tokyo 152-8551, Japan*

¹⁵*Osaka City University, Osaka 558-8585, Japan*

¹⁶*Nagasaki Institute of Applied Science, Nagasaki, Japan*

Abstract

The Telescope Array Project is proposed for the study of the highest energy cosmic rays by Japan-US-Australia collaboration. Recently, AGASA and Fly's Eye experiments show the clear evidence for the breaking of GZK(Greisen, Zatsepin and Kuzumin) cutoff, existence of cosmic rays above GZK cutoff, and post the puzzle for their origin. In order to solve this puzzle, and explore much higher energy region, we require not only higher statistics of data but also the capability of identification of primary cosmic ray composition. Especially the identification of gamma rays and neutrino will become essential above GZK energy in order to discriminate several models. The Telescope Array is a huge array of air fluorescence detectors covering $80,000\text{km}^2\text{sr}$ area and the target volume of 3×10^{11} tons. Here we will report the concept of the telescope array and its design.