News from the Japanese candidate site for the ILC in Iwate, Tohoku

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THE KITAKAMI TIMES

Iwate, the International Linear Collider, and You

A warm welcome for Dr. Suzuki at Iwate Prefectural University

Dr. Atsuto Suzuki, president of Iwate Prefectural University, wins the 2016 Breakthrough Prize in Fundamental Physics

Translated and compiled by Amanda Wayama and Anna Thomas. Original press release: Iwate Prefectural University

At an awards ceremony held in NASA's Ames Research Center in San Francisco on November 8th local time, the Breakthrough Prize in Fundamental Physics was jointly awarded to representatives of five teams for the fundamental discovery and exploration of neutrino oscillations, "revealing a new frontier beyond, and possibly far beyond, the standard model of particle physics." The prize is awarded by the Breakthrough Foundation in the United States, which gives annual awards to researchers who have made great strides in the field of fundamental physics, life sciences and mathematics.

Along with team leaders including recent Nobel Prize in Physics winner Dr. Takaaki Kajita, president of Iwate Prefectural University, Dr. Atsuto Suzuki accepted the award as leader of the KamLAND collaboration (a liquid scintillator/neutrino detector) at Tohoku University. This is the first time a Japanese person has won the Prize in Fundamental Physics since it was established in 2012.

Discovering antineutrino oscillations

Dr. Suzuki and the KamLAND team measured antineutrinos from nuclear power reactors and from within the earth. This resulted in successful detection of anti-neutrino oscillations and the discovery that anti-neutrinos have mass, and solving from the behavior of anti-neutrino oscillations the 30 year old riddle of the solar neutrino problem. The experiment further succeeded in the first detection of geoneutrinos, creating a new research field of neutrino geophysics: examining the internal energy and structure of the earth with neutrinos.

From Dr. Suzuki's acceptance remarks

"Taking advantage of this good opportunity, I sincerely thank Masatoshi Koshiba, the 2002 Nobel Laureate in Physics. His invitation to join the Kamiokande group at the University of Tokyo in 1982 empowered my research activity. I was able to invest lots of effort in developing the 20-inch photomultiplier, in improving the neutrino detection sensitivity for Kamiokande, and in designing/constructing the Kamiokande and Super-Kamiokande detectors. All these experiences led me to propose and promote a new neutrino experiment, called KamLAND, which was optimized for detecting anti-neutrinos, replacing the Kamiokande detector.

"I gratefully acknowledge my colleagues at Kamiokande, Super-Kamiokande, and KamLAND for encouraging me to chase neutrinos. I also would like to thank local residents for supporting and hosting us through three generations of neutrino projects at Kamioka. In addition to the prize winners, the collaboration would like to acknowledge the contribution of Stuart Freedman who passed away before the Breakthrough Prize was awarded."

From the November 10, 2015 edition of Iwate Nippo

"The Breakthrough Prize was awarded because the 5 teams showed that neutrinos possess a finite mass. It further confirms the Higgs boson's place in the Standard Model and points to the existence of a unified theory of elementary particles. If the International Linear Collider (ILC) is built, we will be able carry out precise investigations into this unified theory, and discover the workings of the birth of the universe before the Big Bang."

An award for the work of many

This year's physics prize was shared between the KamLAND collaboration, the Super Kamiokande collaboration led by the University of Tokyo Institute for Cosmic Ray Research, Canada's Sudbury Neutrino Observatory (SNO), China's Daya Bay experiment, and the K2k/T2K long baseline neutrino oscillation experiment led by KEK.

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The universe is in your hands, Dr. Suzuki. Congratulations!