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[International Participation] NTU Team Joined the ARA Observatory Program
[International Cooperation] NTU Team Joined the ARA Observatory Program (Chinese Version)

NTU Spotlight (Issue 182) National Taiwan University has just set another world record: the outstanding scientific breakthrough of Professor Pisin CHEN's great experiment in the Antarctica. The press conference, physically held in the Antarctic detection site, was also held at the NTU planetarium, jointly organized with the Leung Center for Cosmology and Particle Astrophysics on December 12.

At the press conference, Professor Pisin CHEN introduced the ARA Observatory via satellite. In order to be able to go to the Antarctica, Professor CHEN has gone through thirty entries of health check-up to make sure that he can survive the -40 °C environment there. Moreover, Professor CHEN drew an R.O.C. national flag himself a day before the press conference to show the audience in Taiwan the waving national flag high on the Geographic South Pole, and it is also where people are celebrating the 100th anniversary of reaching the peak in history. This scientific project marks a significant breakthrough in the research area of Taiwan’s astrophysics. Also, it makes a beautiful coincidence with the 100th anniversary of both human's reaching the Antarctic peak and the birth of R.O.C. Thus, it means a lot to National Taiwan University to have the opportunity of joining this ARA Observatory.

ARA (Askaryan Radio Array) Observatory is an international project jointly organized among the United Sates, Europe, Japan, and Taiwan. It is expected that ARA Observatory will constitute a super-sized square kilometer radio array with a hundred billion US dollars. This will be the greatest neutrino observatory in size. The term, ARA, is originated from the ancient Greek and Latin name of the Altar in the Antarctica. The telescope of this neutrino observatory is constituted of 37 antenna stations buried at 3000 meters altitude in the deep ice field in the Antarctica. The telescope can detect an area about a hundred square meters, receiving the message from the ultra high energy GZK cosmic neutrino under the thick ice field. With the support from National Science Council and Leung Center for Cosmology and Particle Astrophysics of National Taiwan University, the team from Taiwan will offer 10 ARA antenna stations, over one forth in total, and conduct the development of the antenna. This thus made Taiwan an important role in this international scientific project. Professor Pisin CHEN, also Chairman of Leung Center for Cosmology and Particle Astrophysics, is therefore entitled to be the international spokesman to talk in the press conference.

ARA Observatory will establish the first antenna station on the peak of the Antarctica soon, and it is expected that there will be 37 antenna arrays constituted in the next four years. This super-sized telescope will definitely help the scientists a lot solve the deepest myths, such as the cosmic ray, the direct detection of the dark matter and the origin of the universe. Also, this super-sized telescope can provide the interaction data of the high-energy particles as well. What the scientists of the ARA Observatory project are doing now will provide the world a better energy particle accelerating device whose core power can reach the performance of ten times higher than the LHC (Large Hadron Collider) of CERN (European Organization for Nuclear Research, originally stood in French “Conseil Européen pour la Recherche Nucléaire”).

The conductor of the NTU team, Professor Pisin CHEN, also Chairman of the Leung Center for Cosmology and Particle Astrophysics, has been promoting the ARA neutrino telescope in international conferences and important occasions over the years. With his efforts and launch, experts around the world thus jointly organized the ARA project in 2009. With the support and sponsor from the National Science Council and the Leung Center for Cosmology and Particle Astrophysics, the team from Taiwan led by Professor CHEN plays a significant role in this ARA project. Also, Professor CHEN is thus entitled as the project's international spokesman. The team from Taiwan has been working on the design and the development of antenna detectors. Also, the research team is still working on establishing and updating the ARA radio array via computer simulation. They have made a significant theoretical breakthrough with regard to the detection of neutrino messages.

Further Information:
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