High Energy Neutrino Astronomy with IceCube

Prof. Dr. Christopher Wiebusch

RWTH Aachen

Astrophysical neutrinos are almost ideal messenger particles to understand the non-thermal hadronic processes in the high energy universe. However, their detection is difficult and detectors of the size of a cubic kilometer are required. The most advanced experiment is the IceCube Neutrino Observatory at the South Pole, which has been commissioned in 2011.

In 2013 the IceCube neutrino observatory has reported evidence for the observation of high energy cosmic neutrinos based on the first two years of full detector operation. Meanwile a third year of data has been analysed, consolidating the result. In the talk a motivation for neutrino astronomy and the detection principles of IceCube is given. Selected science results with a focus on the measurement of cosmic neutrinos will be presented.

The talk ends with an outlook to the future measurements and possible enhancements of the instrument.