COLLOQUIUM

IceCube: Cosmic Neutrinos and More

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March 1, 2017
4:00 p.m. - Wilson Hall, One West

The IceCube project has transformed one cubic kilometer of natural Antarctic ice into a neutrino detector. The instrument detects more than 100,000 neutrinos per year in the GeV to PeV energy range. Among those, we have isolated a flux of high-energy cosmic neutrinos. I will discuss the instrument, the analysis of the data, and the significance of the discovery of cosmic neutrinos. The observed cosmic neutrino flux implies that accelerated protons, and not just electrons, generate a significant fraction of the energy in the non-thermal universe. I will also discuss the study of the neutrinos themselves in the wide energy range revealed by IceCube.