

Physics Colloquium

Michigan Technological University

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4:00 pm

Room 139 Fisher Hall



Cosmic Neutrinos and Cosmic Particles in IceCube

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Abstract: IceCube is a kilometer scale detector at the South Pole consisting of 5400 optical sensors that detect cosmic rays and neutrinos. The main array is shielded by 1.5 km of ice so that it can identify and reconstruct events generated by neutrinos, which are relatively rare compared to the background of atmospheric muons. On the surface above the neutrino detector is the IceTop air shower array, which is fully integrated into the data acquisition system of IceCube. Its main purpose is to measure the cosmic-ray spectrum at high energy, and it also provides a partial shield for the neutrino detector.

IceCube recently discovered the first evidence for neutrinos of high energy from extraterrestrial sources. In this talk I will describe the data and explain the significance of such a discovery. I will also describe how IceCube measures the spectrum of cosmic-ray particles and how they may be related to the neutrinos.

Biography: Tom Gaisser is a professor at the University of Delaware in the Bartol Research Institute, which is now a Center within the Department of Physics and Astronomy.

He is author of Cosmic Rays and Particle Physics (Cambridge University Press, 1990) and has worked on particle astrophysics and neutrinos since joining Bartol in 1970. He received his Ph.D. in particle theory from Brown University.