Tyce DeYoung – Colloquium 12/6/2018

Title: First Glimpses of the High Energy Universe with IceCube

Abstract: The use of neutrinos for astronomy was first proposed half a century ago as a potential complement to electromagnetic observations. The IceCube Neutrino Observatory, fully operational since 2011, is the world's largest neutrino detector and the first of the scale required to detect high energy neutrinos from sources beyond our galaxy. In its first years of operation, IceCube established the existence of a surprisingly large flux of neutrinos emitted by extragalactic sources. More recently, we reported the detection of the first neutrinos associated with a specific astronomical object, the blazar TXS 0506+056. These results provide the first direct glimpses of high energy hadronic activity in the universe, but crucial aspects of the picture remain puzzling. After summarizing the recent results, I will outline the issues remaining to be understood and the path forward to exploring them.