



# **KSETA Seminar**

## **Opening a New Window on the Universe from the South Pole**

**Prof. Francis Halzen**

*(University Wisconsin-Madison, USA)*

<b>24.10.2018</b>	<b>15:00 – 16:30 h</b>
<b>25.10.2018</b>	<b>10:30 – 12:00 h</b> <b>13:30 – 15:00 h</b>
<b>26.10.2018</b>	<b>09:30 – 11:00 h</b>

KIT Campus North, bldg. 425, room 206 (tbc)

### **Abstract:**

The IceCube project has transformed a 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 neutrinos of cosmic origin. We will explore the IceCube telescope and the significance of the discovery of cosmic neutrinos. We recently identified their first source: alerted by IceCube on September 22, 2017, several astronomical telescopes pinpointed a flaring galaxy, powered by an active supermassive black hole, as the source of a cosmic neutrino whose energy exceeds 300 TeV. Most importantly, the large cosmic neutrino flux observed implies that the Universe's energy density in high-energy neutrinos is close to that in gamma rays, suggesting that the sources are connected and that a multitude of astronomical objects await discovery.

Additionally, we will discuss particle physics and particle astrophysics problems that can be explored by exploiting the observations of very high energy cosmic neutrinos.