



DIPARTIMENTO DI FISICA E ASTRONOMIA
"Galileo Galilei" – DFA

1222·2022
800
ANNI



UNIVERSITÀ
DEGLI STUDI
DI PADOVA

Giovedì 23 gennaio 2020
Ore 15:00 - Aula "A. Rostagni"

Prof. Francis Halzen

Wisconsin IceCube Particle Astrophysics Center

&

Department of Physics, University of Wisconsin–Madison, U.S.A.

IceCube: Opening a New Window on the Universe from the South Pole



Francis Louis Halzen



Robert Schwarz, NSF
The last DOM



Martin Wolf, IceCube/NSF
IceCube Lab under the Milkyway- 2017

We will review the scientific motivation and the early R&D that eventually led the IceCube project to transform 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 10 PeV energy range. Among those, we have isolated a flux of high-energy neutrinos of cosmic origin, with an energy density similar to that of high-energy photons and cosmic rays in the extreme universe. We recently identified their first source: 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 with an energy of 290 TeV. Archival IceCube data subsequently revealed a flare in 2014 of more than a dozen neutrinos from the same direction. At a distance of four billion light-years, ten times further than the nearest such sources, accumulating evidence indicates that the first

cosmic ray accelerator belongs to a special class of active galaxies that is responsible for the origin of the highest energy particles in the Universe.



Jamie Yang, IceCube Collaboration
Artistic rendering of IceCube DOMs

Progetto
di Eccellenza
2018 - 2022



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