

# Department of Physics

Particle Physics

The Denys Wilkinson Building, Keble Road, Oxford OX1 3RH



## Experimental Particle Physics Seminar

at 2.15 pm

Dennis Sciama Lecture Theatre

Tuesday 5<sup>th</sup> March 2019

Professor William Barletta

Department of Physics, MIT Cambridge MA

### High power cyclotrons for neutrino physics

#### Abstract

Persistent anomalies in the behavior of neutrino oscillations calls for the fielding of a definitive experiment at the level of 5 to 10 sigma to search for the possible existence of so-called sterile neutrinos that can mix with the well-known electron, muon and tau varieties but which have no weak interactions. The high statistics and low systematics demanded for such a measurement require producing beams that can put  $\sim 10$  moles of protons on a neutrino production target in a few years. The IsoDAR collaboration proposes to use a new generation of compact cyclotrons that can far out perform commercial machines. The very high beam powers on target introduce their own technical challenges. This seminar will present an overview of the research that has been done to make practical, the technologies that underlie the IsoDAR experiment.