

# Commissioning of the Ultracold Neutron Facility at TRIUMF – a first step towards a neutron electric dipole moment search

*Monday, 10 September 2018 18:00 (40 minutes)*

A permanent electric dipole moment (EDM) of the neutron would violate parity and time reversal symmetry. Assuming CPT to be a good symmetry of nature, this implies a CP symmetry violation as well. Thus, observing or further limiting the existence of the neutron EDM beyond the current best measurement sensitivity of  $3 \times 10^{-26}$  ecm would increase our understanding of the Baryon Asymmetry of the Universe.

The search for the neutron EDM makes use of the well understood coupling of its spin to the magnetic field by looking for a deviation in precession frequency when overlaying an electric field parallel or antiparallel to a magnetic one. Ultracold neutrons (UCN) are a particularly well suited tool for this technique due to their low kinetic energy and velocity. As a consequence they can be stored analogous to a gas and observation times of the order of 100-200s become possible.

This presentation shall show results from the commissioning of a prototype UCN source at TRIUMF in 2017, which comprises a major milestone towards the neutron EDM search. Furthermore, an outlook towards a high intensity new generation UCN source, as well as the ongoing design of a high precision neutron EDM spectrometer will be given.

**Primary author:** Dr FRANKE, Beatrice (TRIUMF)

**Presenter:** Dr FRANKE, Beatrice (TRIUMF)

**Session Classification:** Fundamental Symmetries and Spin Physics Beyond the Standard Model

**Track Classification:** Fundamental Symmetries and Spin Physics Beyond the Standard Model