

# Department of Physics

Condensed Matter Physics

Clarendon Laboratory, Parks Road, Oxford OX1 3PU



## CONDENSED MATTER SEMINAR

Thursday 2 May at 2.15pm

***“Physics of ferroelectric polymers and their application in electronic devices”***

**Dr Kamal Asadi**

**Max-Planck Institute for Polymer Research, Stuttgart, Germany**

Organic electronics has emerged as a promising technology for roll-able displays, smart labels, small-scale wearable electronics and biomedical implants. Such technologies require technologically compatible memory devices or energy sources, respectively, to log information or deliver the required power. Piezoelectric/ferroelectric polymers such as poly(vinylidene fluoride) (PVDF) and its random copolymers with trifluoroethylene, P(VDF-TrFE), are among the promising materials for memory and energy devices. PVDF and P(VDF-TrFE) are exceptional piezoelectrics because of their negative longitudinal piezoelectric coefficient. In this talk I will present our recent understanding of the unconventional piezoelectric effect in PVDF-based polymers, and then discuss dynamics of polarization switching in ferroelectric polymers. Next, the realization of ferroelectric PVDF-based memory devices and mechanical energy harvesters will be demonstrated. Finally, I will present our recent research direction towards multi-functional piezo-ferroelectric-ferromagnetic composites for novel microelectronic devices.

**Host: Prof Robert Taylor**

**Simpkins Lee Room, Beecroft Building**