

SEMINAR

*STEM-EELS and first principles study on SrTiO₃ based materials:
Understanding and controlling intermixing at heterointerfaces*

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3.00pm – 4.00pm

Building 25, Lecture Theatre S11

ABSTRACT

Artificially constructed heterointerfaces in perovskite (ABO₃) based superlattices have attracted great interest in the field of nano-materials science because peculiar properties, such as the formation of a two dimensional electron gas (2DEG) and giant thermopower, are emergent. To obtain such properties, controlling the atomic reconstruction at the heterointerface, i.e. intermixing, and making abrupt heterointerfaces in the superlattices are crucial. However, the mechanism of the intermixing is still under controversy. To understand and control the intermixing in perovskite oxides, the migration mechanisms in SrTiO₃ were investigated by using electron energy loss spectroscopy in the scanning transmission electron microscope (STEM-EELS) and first principles calculations. In this presentation, I will discuss the following two topics: 1) the migration mechanism in SrTiO₃ [1], and 2) controlling intermixing at hetero-interfaces in SrTiO₃ based superlattices [2].

[1] T. Mizoguchi, N. Takahashi, HS. Lee, Appl. Phys. Lett. 98 (2011) 091909.

[2] T. Mizoguchi, H. Ohta, HS. Lee, N. Takahashi, and Y. Ikuhara, Adv. Funct. Mater. (2011) 21, 2258.

Convenors: Dr. Scott Findlay (School of Physics) and Professor Joanne Etheridge (MCEM)

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