Simulating the growth of ultrathin materials for nanoelectronic devices (SIGMUND)

Dr Simon Elliott

Activity Leader – Thin Film Simulation

Tyndall National Institute

Abstract

This project uses atomic-scale simulations to investigate questions in the chemical deposition of nanometre-thin films in electronic devices, thus enabling increased control of materials properties at the nanoscale. Most of the work considers the deposition of high-*k* dielectric materials, like hafnium dioxide or strontium titanate, onto substrates such as gallium arsenide and silicon nitride, since these are important for future computer transistors and memories. Related simulations are also carried out on the deposition of metals as thin films. An additional goal of the research is a multi-scale computational tool for linking microstructure to processing conditions.