Grand Technion Energy Program
תוכנית האנרגיה ע"ש גרנד

הפקולטה למדע והנדסה של חומרים
Department of Materials Science and Engineering

Technion
Israel Institute of Technology

Professor Robin Grimes,
FCO Chief Scientific Advisor, UK

Robin Grimes is currently Professor of Materials Physics at Imperial College. His research is focussed on the use of high performance computing techniques to understand the behaviour of materials for energy applications including nuclear fission and fusion, fuel cells, batteries and solar cells. He is also Principal Investigator of the Research Council's UK Nuclear Fission consortium project.
Professor Grimes has advised the House of Lords Science and Technology Committee's inquiry into nuclear research requirements, and was part of the Scientific Advisory Group for Emergencies (SAGE) that provided official advice on the 2011 Fukushima disaster. He has considerable experience of high-level international work with HMG, including overseas missions to India, Vietnam, South Korea, Malaysia and Japan.

FCO Chief Scientific Advisor
The FCO's Chief Scientific Adviser (CSA) is responsible for providing advice to the Foreign Secretary, Ministers and officials on science, technology and innovation. His role is to ensure that our work on key issues undergoes proper scientific challenge, and to strengthen the scientific and engineering capacity within the Foreign Office. The CSA works closely with the cross-government community of Chief Scientific Advisers and the wider UK and international academic science community.

Will lecture on:

Atomic Scale Simulation in the Service of Nuclear Materials

Our understanding of materials performance is based on experimental data. We use it to generate predictive models that allow us to develop improved materials and sometimes even select new materials or compositions. With nuclear energy related technologies, however, experimental data is often difficult to obtain either because the controlling factor takes place on time scales or length scales that are challenging or the hazard is such that facilities are not available. In these circumstances atomic scale computer simulations can be exceptionally useful.

We can use the results of simulation in four different ways. First, most simply, to provide property values for existing models and add context to experimental data – as we have for the thermal conductivity of actinides oxides, simulated using molecular dynamics. Second, to 'check' or 'test' existing assumptions such as He release from the potential burnable poison ZrB_2, simulated using density functional simulation. Third, to improve existing models by 'developing' the physical models – as with our understanding of the role that additives have on improving the durability of nuclear waste glass. Sometimes, however, it is possible to develop totally new models so the fourth approach uses simulations to 'discover' or 'identify' the physics/chemistry behind the process – here we will consider dislocation processes in UO_2.

Wednesday, May 18, 2016, 12:30 p.m.

Department of Materials Science and Engineering

David Wang Auditorium, 3rd floor, Dalia Maydan Bldg.

Technion City, Haifa