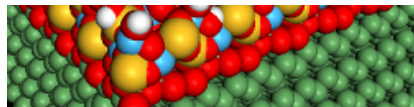


Materials Modelling for Devices

Materials Modelling for Devices

Our research group aims to understand and predict how devices work, by research based on modelling materials at the atomic scale. We supply fundamental insights into how materials perform in various technologies, ranging from electronics to solar power, and so work closely with experimental groups in academia and industry. There is particular focus on modelling atomic layer deposition (ALD) and heterogeneous catalysis at surfaces.

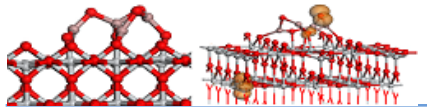
Atomic layer deposition (ALD) of alumina, hafnia/zirconia



Thin film dielectrics for transistors, capacitors and memory

ELECTRONICS

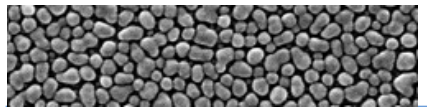
Oxide-oxide heterojunctions on titania



Photocatalysis for renewable energy

ENERGY

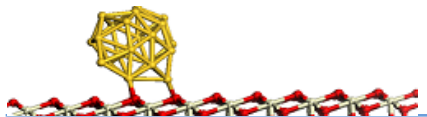
Chemistries for depositing copper metal and surfaces during growth



3D nanoelectronic interconnects

ELECTRONICS

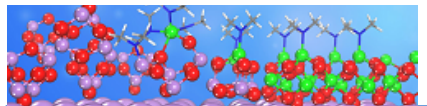
Surfaces of ceria



Heterogeneous catalysis

ENERGY

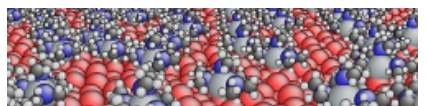
Native oxides of III-V semiconductors



Interfaces in CMOS transistors

ELECTRONICS

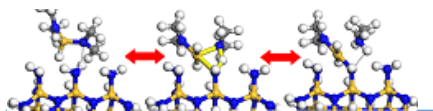
Multi-scale modelling of oxide growth



Thin film dielectrics for transistors, capacitors and memory

MATERIALS

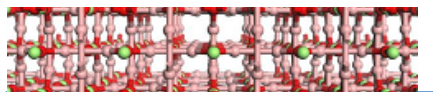
ALD of silicon nitride,
silicon carbide and
silicon oxide



Etch-resistant
layers for
fabricating
electronic devices

ELECTRONICS

Functional Metals
Oxides: Surfaces and
Interfaces



Solar cells and
smart windows

ENERGY

Industry and Technology Partners:

We have bilateral projects including industry funding with:

- **Johnson Matthey**
- **Intel Ireland**
- **Applied Materials**
- **Henkel Ireland**
- **Lam Research**

In addition, we are involved in multi-lateral projects and have published joint papers with other companies.

University Collaboration:

We have joint papers or bilateral projects with:

- **TU Eindhoven**, Netherlands
- **MDM National Laboratory**, Italy
- **University of Liverpool**, UK
- **University of Reading**, UK
- **Strathclyde University**, UK
- **University of Barcelona**, Spain
- **Kinki University**, Japan
- **Freidrich-Alexander University** Erlangen-Nuremberg, Germany
- **University of Osnabruck**, Germany
- **CSIC Madrid**, Spain
- **Carleton University**, Canada
- **CIC Nanogune**, Spain

as well as multi-lateral projects with other research groups world-wide.

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