



Materials Modelling for Devices

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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	✗ Atomic layer deposition (ALD) of alu	Thin film dielectrics for transistors, capacitors and memory	ELECTRONICS
Oxide-oxide heterojunctions on titania	✗ Oxide-oxide heterojunctions on titan	Photocatalysis for renewable energy	ENERGY
Chemistries for depositing copper metal and surfaces during growth	✗ Deposition of Copper Metal	3D nanoelectronic interconnects	ELECTRONICS
Surfaces of ceria	✗ Surfaces of ceria	Heterogeneous catalysis	ENERGY
Native oxides of III-V semiconductors	✗ Native oxides of III-V semiconducto	Interfaces in CMOS transistors	ELECTRONICS
Multi-scale modelling of oxide growth	✗ Multi-scale modelling of oxide growt	Thin film dielectrics for transistors, capacitors and memory	MATERIALS
ALD of silicon nitride, silicon carbide and silicon oxide	✗ ALD of silicon nitride, silicon carbide	Etch-resistant layers for fabricating electronic devices	ELECTRONICS

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.

Contact enquiry (at) tyndall (dot) ie for all Business Development enquiries