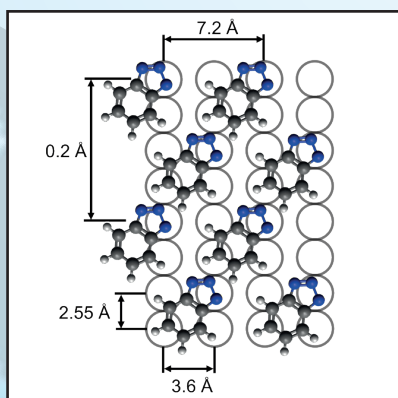
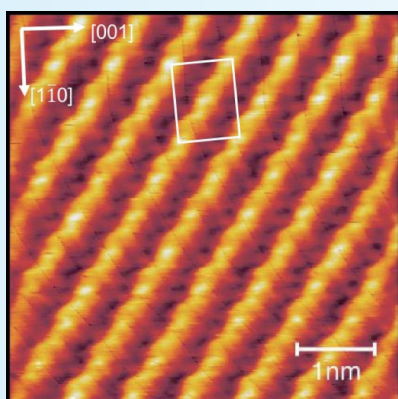
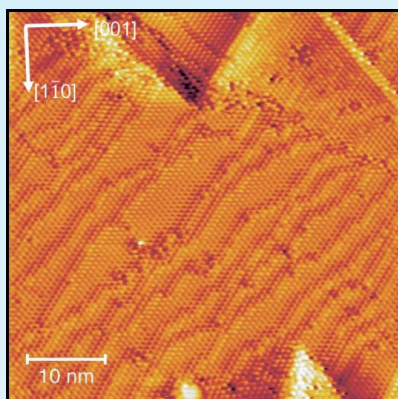


# PhD Project Studentship

## Fundamental Understanding of Corrosion Inhibitor Adsorption and Interaction Processes



### Project Description

The annual global cost of corrosion is estimated to be US\$2.5 trillion, equivalent to roughly 3.4% of global gross domestic product (GDP). Unsurprisingly, this means there is significantly growing interest in understanding the fundamental processes associated with this destructive phenomenon, with the goal of being able to apply such knowledge when designing preventative solutions across the wide range of industrial sectors in which it exists.

One current area of exploration is the use of molecular corrosion inhibitors, which are proposed to act through the formation of surface-adsorbed protective monolayers. Despite their potential importance, very little is currently known about their exact mechanism of action, hampering the intelligent design of potential new inhibitors.

This industrially funded PhD seeks to answer two fundamental questions on this topic: **what is the adsorption configuration of corrosion inhibitors on various metallic surfaces?** and **what is their chemical state?** To this end, you will investigate model systems through a variety of advanced experimental techniques, with a focus on high-resolution scanning tunneling microscopy (STM) and X-ray photoemission spectroscopy (XPS).

Research will be conducted in the group of Professor Giovanni Costantini at the internationally renowned University of Warwick. The project will be conducted in collaboration with Lubrizol, a pioneering global supplier of chemical additive technologies for engine oils, driveline applications, gasoline and diesel fuel, other transportation related fluids and industrial lubricants. It is expected this work will lead to a number of publications in high impact scientific journals.

### Funding Notes

Applicants should have (or be about to receive) an excellent master's degree (or equivalent) in physics, chemistry, engineering or materials science. Experience with scanning probe microscopy or expertise in surface science would be desirable but is not essential. The studentship provides 3.5 years of full funding for UK and EU students. This covers tuition fees and stipend, and is part of The Molecular Analytical Science Centre for Doctoral Training (MAS-CDT) at the University of Warwick. There will also be full involvement within Lubrizol's extensive PhD funding program, including on-site placement visits if relevant.

Enquires and informal applications should include a CV and be made as soon as possible to Giovanni Costantini ([g.costantini@warwick.ac.uk](mailto:g.costantini@warwick.ac.uk)).

Details on the formal application procedure can be found at: <https://www2.warwick.ac.uk/fac/sci/mas/study/apply/>