FLEET
ARC CENTRE OF EXCELLENCE IN FUTURE LOW-ENERGY ELECTRONICS TECHNOLOGIES

RESEARCH SEMINAR

Controlling the growth of molecular nanoarchitectures on surfaces

JENNIFER MACLEOD

Queensland University of Technology

Abstract: This seminar will discuss our recent work in using small molecule precursors to synthesize nanomaterials through on-surface reactions. Using surface-catalyzed dehalogenative and decarboxylative reactions, we have investigated the on-surface coupling of a range of small aromatic molecules on transition metal surfaces.

Although the organometallic products of these reactions are often beautifully ordered, the covalent products can be quite disordered and unpredictable. We have used a range of techniques (photoemission spectroscopy, near-edge x-ray absorption fine structure spectroscopy, scanning tunneling microscopy, density functional theory) to performed detailed investigations of the reaction process, providing insight into some of the factors that lead to poor control over covalent products.

Using a home-built low-energy inverse photoelectron spectroscopy (LE-IPES) in combination with ultraviolet photoemission spectroscopy, we have been able to examine how the electronic properties (HOMO-LUMO gap) evolve during these on-surface reactions, providing insight into structure/function relationships in one- and two-dimensional organic materials.

About the Speaker: Jennifer MacLeod is an Associate Professor and Head of School of Chemistry and Physics at Queensland University of Technology (QUT). She has a PhD in Physics from Queen's University (Canada), and has worked in Canada (INRS-EMT, Quebec), Italy (University of Trieste) and Australia (QUT) as a surface science researcher. Her interests are in molecular reactions on surfaces, 2D materials, and spectroscopy and microscopy techniques to elucidate these systems.

DATE: Wednesday 4 Aug 2021
TIME: 2:00PM - 3:00PM
VENUE: Online
Zoom Registration

INFO: education@fleet.org.au

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