

INSD NanoScience Seminar (No.26)

Date and Time: **Friday, August 3rd, 2018, 16:00-17:30**

Place: **Room 305 INSD Seminar Room, Interdisciplinary
Research Building 3rd floor, Toyonaka Campus**

ナノサイエンスデザイン教育研究センターセミナー室

豊中キャンパス文理融合型研究棟 3 階 305 号室

**Title: Modification of Electronic Properties
of Semiconductor and Oxide Surfaces
by Hydrogen and Alkali Metal Adsorption**

Lecturer: Prof. Marie D'angelo
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Abstract:

Crystal surfaces are a wonderful playground for the study of electronic properties. In the last decades, characterization and control of crystal surfaces has been achieved, opening the possibility to explore their interaction with atoms and molecules and thus increasing the potentiality offered by the bare surfaces.

During this seminar, I will detail two examples of the surface electronic properties modifications that can be expected when depositing simple atoms such as hydrogen or alkali metal on semiconductor or oxide surfaces. In a first part, we will see how hydrogen or cesium interaction with $\text{SrTiO}_3(001)$ surface can induce an insulator \Leftrightarrow metal transition. By measuring photoemission spectra from the valence band and the core levels, a mechanism for the surface metallization can be proposed. In the second part of the seminar, I will concentrate on the interaction of sodium with the $\text{Si}(111)\text{-}7\times 7$ surface. For weak coverage, the alkali metal induces a transition to an insulating state. The induced conductivity decrease reveals the collapse of the Boltzmann picture for the bare $\text{Si}(111)\text{-}7\times 7$ surface and suggests that the system is rather in a hopping conduction regime.

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