科目名　ナノテクノロジー特別講義 **IV**（１単位）
Subject :　Advanced Nanotechnology IV (one credit)
担当教員　黒田眞司
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科目番号　Syllabus Code : 02BQ209, 01BF294, 01BG092, 01BC309

Self assembly of organic molecules and nanoparticles on substrates

By Emmanuelle Lacaze (Institut de NanoSciences de Paris, France)

Course description:

I introduce relevant techniques available for the study of molecular assemblies, in particular scanning probe microscopies. Then, I discuss how the molecular assemblies, on graphite, Au(111) and MoS_2 substrates are formed with the balance between intermolecular and molecular/substrate interactions. I also discuss how the plasma resonance of gold nanoparticles can be controlled by the assemblies.

Outline:

1) The beginning of my course will be devoted to the relevant techniques, available for the study of molecular assemblies, in particular Scanning Probe Microscopies.
2) Then, in a first step I will focus on molecular assemblies. I will concentrate on graphite, Au(111) and MoS2 substrates. I will present the possible assemblies of organic molecules in relation with the balance between intermolecular and molecule/substrate interactions, first in the framework on Van der Waals interactions, then extending towards more complex interactions, like hydrogen bonding.
3) In a second step, I will focus on gold nanoparticles for their optical properties. I will present gold nanoparticle Plasmon resonance. I will describe how to assemble nanoparticles and how their optical properties can be controlled by these assemblies.
4) I may discuss quantum dots properties as well if time is still available.

Grading:

Attendance more than 70%, home work and/or final exam
(If the students in Osaka University who encounter any difficulty of 70% attendance due to the overlap with other ordinary lectures, please consult the coordinator.)

Textbook:

No textbook required, we shall follow the Lecture Notes which will be posted on the course Web page.

Prerequisite:

Knowledge on electromagnetism, quantum mechanics, solid state physics, and physical chemistry is advantages