

CAMT Seminar

“Introduction to Nanoparticle Science”

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Location: Main Conference Room (1st floor), Bldg. A12

Center for Atomic and Molecular Technologies (CAMT)

& Online (for the link, please contact the host)

(A12 棟 1 階会議室)

Abstract

Smoke from a fire; a stormy cloud: both naturally occurring phenomena due to aggregation of molecules from the gas phase. In this seminar we will focus on a special type of “cloud”, that of inorganic nanoparticles grown from some sort of physical vapour deposition (PVD) method. To design and fabricate sophisticated nanoparticles for specific (nano)technological applications,



molecular dynamics simulations offer an invaluable tool, as they can probe various simultaneous processes during nucleation and growth in atomistic detail. Nanomatter can be dramatically different from bulk matter, as physical properties do not always scale down to the nano-regime. Why? Which fundamental properties showcase this difference? In this seminar we will also identify some cases where nanomatter behaves “weirdly” (i.e., differently from our every-day experience), and choose one as the most characteristic; we will also try to understand why.

Learning objectives

1. *In silico* observation of nucleation & growth processes
2. Understanding of physical mechanisms of gas aggregation (e.g., cloud formation)
3. Examples of physical properties that differentiate nanoobjects from bulk, everyday objects.

Keywords: atomistic modelling, nanoparticles, cluster beam deposition, nucleation & growth, magnetron sputtering

[1] P. Grammatikopoulos, *Current Opinion in Chemical Engineering*, **2019**, 23, 164.

(Host: Satoshi Hamaguchi Ext: 7913)