

Invited scholar

Dr. Lionel Santinacci

*Center for Interdisciplinary
Nanoscience of Marseille (CINaM);
Aix-Marseille University, France*



Atomic Layer Deposition

Week #1

Atomic Layer Deposition: An Introduction to a powerful thin film technology

- Thin film deposition, Context, A brief History
- Principle of ALD, Key parameters of ALD, CVD or ALD?
- Examples
- Reactor geometries
- Derived techniques: Plasma-enhanced ALD, Molecular Layer Deposition, Atomic Layer Etching (ALE), Area-selective ALD (ASD)
- ALD in liquid
- Low vapor pressure precursors
- How to speed up the processes?
- Alloying and doping
- Precursor dosing
- In situ and ex situ characterizations
- How to setup a recipe

Week #2

Atomic Layer Deposition for Energy Applications

- Introduction
- Surface nanostructuring for Energy
- Functionalization of nanostructured substrates for ultracapacitors
- Li-ion Batteries (Deposition of the active material, Nanostructuring by templating, Protective coating)
- Electrochemical supercapacitors
- Catalysis (Deposition of the active material, Core/shell nanoparticles synthesis, Protective coating)
- Functionalization of nanostructured substrates for fuel cells technology
- Solar cells
- Photocatalytic applications (Deposition of the active material, Protective coating for anodes/cathodes)
- Photo-electrochemical water splitting applications
- OLED encapsulation
- Membranes for gas filtration