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SALON DE GRADOS DE CATEPS

In-silico optimization of optical coatings: from atomic to industrial scales

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Modern optical coatings are everywhere — from colourful decorative surfaces and high-performance mirrors to energy-efficient photovoltaic panels. This seminar explores how advanced modelling and optimization techniques help design and improve optical coatings, specially produced by Physical Vapor Deposition (PVD) or Plasma-Enhanced Chemical Vapor Deposition (PECVD) processes.

We will introduce multiscale & multiphysics simulation methods, from Monte-Carlo modelling tools used to mimic industrial PVD coaters, to optical models such as FDTD, RCWA, effective medium theory, or T-Matrix approaches, together with optimization strategies based on genetic algorithms. Through practical examples, the seminar will show how virtual prototyping accelerates innovation, enabling tailored optical properties, enhanced efficiency, and novel visual effects across a wide range of industrial applications.

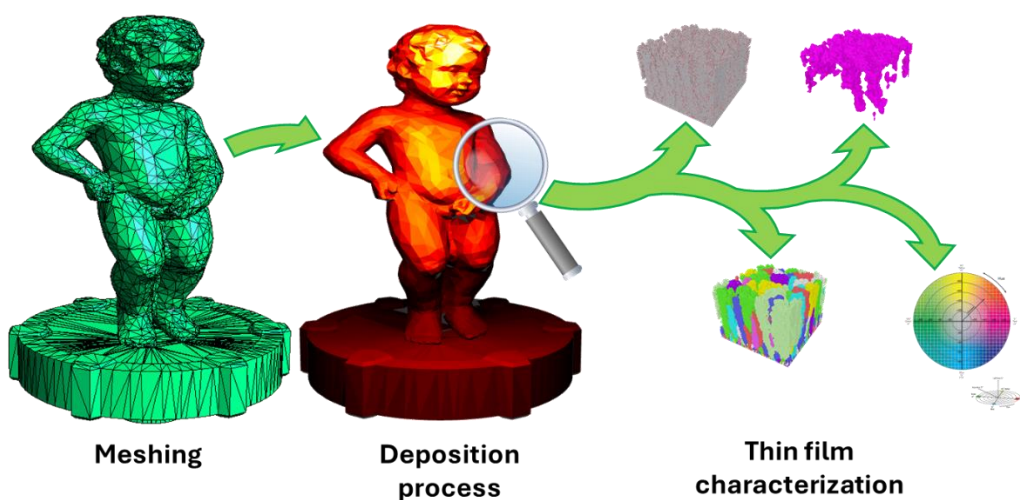


Figure 1: optical coatings on complex objects.

Bio:

Jérôme Müller is a physicist from Nancy, East of France. He earned his PhD in Physics from Henry Poincaré - Nancy I University in France before joining the University of Namur as a researcher focused on solar cell modelling and optimization. Later, by joining the company ICS (Innovative Coating Solutions), he expanded his expertise to thin-film deposition processes applied to optical coatings.