

## Séminaire Labex NanoSaclay

Le **vendredi 4 mai** à **14h** au **LSI**

### Nanocomposites for DLP 3D Printing, from Materials' Engineering to Materials' Science



**Dr Ignazio Roppolo**

*Department of Applied Science and Technology, [Politecnico di Torino](#), Turin, Italy*

#### **Abstract:**

In the last decade there has been an exponential increase of the industrial and scientific interest for additive manufacturing (AM) technologies. Among the different classes of materials that could be shaped through AM techniques, polymers are of special interest for many reasons: flexibility of the available technologies, large variety of printable materials, wide range of applications, relative low costs... Considering the 3D technologies, those based on light induced polymerization e.g. Stereolithography (SLA) and Digital Light Processing (DLP) are becoming particularly interesting. These systems, which allow producing 3D objects by the spatially controlled solidification of a liquid resin exploiting the fast photopolymerization process, have seen a huge development in the last years.

The success of these technologies are related in particular to the fast production process and the high precision in the printed objects; however the main applications are still limited to rapid prototyping basically due to the relative limited number of available printable materials with peculiar properties. In this frame, the first strategy for imparting new functionalities to the printable materials (and thus to the printed objects) consists in mixing fillers in the printable formulations thus obtaining (nano)composites materials. However this approach is not always convenient, implying many drawbacks such as increase of the viscosity of the printable formulation, decrease of reactivity towards the light, difficult control over the formulation stability and many others which strongly affect the printability.

Here we present how it is possible to prevent some of the drawbacks related with nanocomposites in 3D printing moving from Materials' Engineering (i.e. the simple control of the printable formulations' composition) to Materials' Science, playing with in situ reaction for obtaining new 3D printed nanocomposites.

**Contact:** [Giancarlo Rizza](#), [Physics and Chemistry of Nano-Objects, LSI](#)