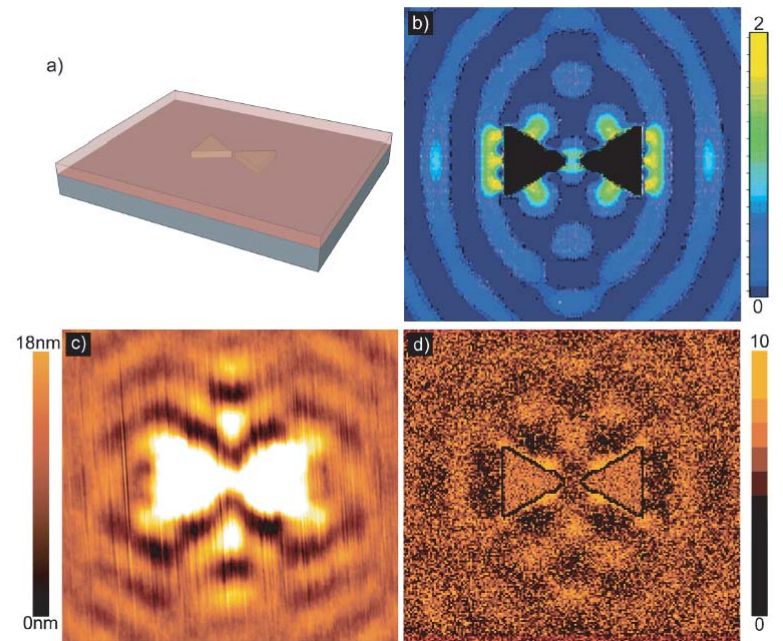


# Near Field Photo Induced Molecular Movement in Azobenzene Polymer Films



**Dr. Mathieu L. A. Juan**  
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**& Argonne National Laboratory**



1:30 pm, Thursday, May 8  
 Goergen 108  
 Refreshments provided

This talk will describe how azobenzene in polymer films can be used to image the near field produced by illuminated metallic nano particles.

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## **Abstract**

Light induced topographic modification in azobenzene containing polymer films has been initially observed for simple far field configuration in the early 90's [1]. The processes rely on the possibility to photo induce isomerization of the azobenzene molecules between *trans* and *cis* isomer leading to a mechanical movement of the molecule [2]. The resulting photo-induced dynamics of such polymer systems have been extensively studied since, underlining complex sensitivity to the incident optical field.

Our approach consists in the use of azobenzene containing polymer to image optical near field produced by metal nano particles when illuminated. We first examine azobenzene polymer film topographic modification under various far field [3] and near field [4,5] complex optical fields. Depending on the polarization of the incident field, the polymer exhibits different sensitivity. To help understanding the dynamic of this system, we develop a Monte Carlo based model to simulate the photo-induced topographic modification in azobenzene containing polymer systems. The calculations were confronted with experimental AFM images for different field configurations such as gaussian laser beam or holographic pattern and more complex optical near field like "Bow Tie" gold nanoparticles.

## **Biography**

He works at the Laboratory of Nanotechnology and Optic Instrumentation (LNIO) in the University of Technology of Troyes (France) where he is a member of the Nano Photo Chemistry group. He mainly works on the optical near field induced by lithographic metallic nanostructures (interaction with molecular systems and characterization). Currently, he is a visiting scientist at Argonne National Laboratory.