



## Soutenance de thèse

**Rudy DESMARCHELIER**

*Institut des Sciences Moléculaires d'Orsay (ISMO), Orsay*

### **ANALYSES OF PHOTO-INDUCED FORCES BY FEMTOSECOND LASER IN SILICA-BASED GLASSES**

Beyond the simple deposit of energy with long pulse lasers, the femtosecond laser created forces acting on the matter, which print 3D nanostructuring in silica, classified as type II damage. If one proves to be able to control these forces, one could exceed the current applications of the lasers and open new possibilities in materials sciences. This thesis contributes to characterize and understand the transformation induced by the laser.

At first, this thesis contributes to improve our knowledge about the sensitivity of the interaction to the writing and polarization directions. The study of the optical properties of linear birefringence and analysis of the observations of the laser/matter interaction highlight his origin to the beam asymmetry and consolidate the model of form birefringence at the origin of a strong birefringence. All studies have allowed the determination of possible physical mechanisms during the laser irradiation.

Second discovery, also at the base of this thesis, is the presence of a photo-induced chirality. In this direction, we studied the circular properties but the characterization of those raises technical problems: measurements are distorted because of the simultaneous presence of strong linear properties and weak circular properties. Nevertheless, the interpretation of measurements highlights the presence of a circularity without revealing its amplitude.

**Attention !  
Jour et heure  
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**Vendredi 4 juillet 2014 à 14h30**

Bât 210 – Amphi 2 (2<sup>ème</sup> étage)

*Université Paris-Sud, 91405 Orsay Cedex*

*La soutenance sera suivie d'un pot auquel vous êtes chaleureusement conviés.*