

LAPHIA

Laser & Photonics
in Aquitaine

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**Cluster of Excellence LAPHIA
Seminar**

Nanostructured glasses
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Abstract

Last decades extensive studies of glasses with dielectric, metal and semiconductor nanoinclusions are being carried out. Properties of these glassy nanocomposites are attractive for photonics because of the possibility to combine luminescent and electrooptical features of dielectric crystals, nonlinearity and plasmonic features of semiconductors and metals with optical transparency and flexibility of glasses. Additionally the resonant enhancement of local electric field at wavelengths corresponding to surface plasmon resonance in metal nanoparticles strengthens Raman scattering and luminescence, while the features the dielectric function of metal-based nanocomposites allow formation of near zero and negative epsilon materials, particularly ones supporting plasmon polaritons propagation. The set of recent experimental results and models related to the formation of glassy nanocomposites and metal island films on the surface via phase decomposition of glasses, nonlinear and plasmonic properties, and structuring of these materials is presented.

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