

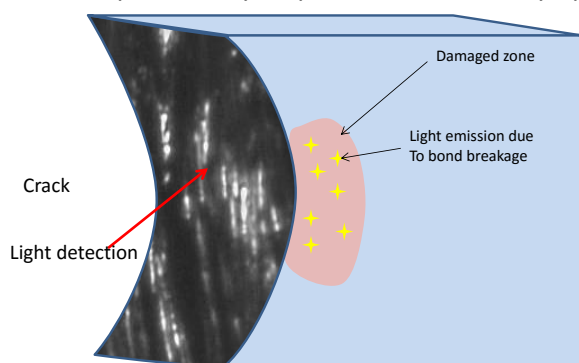
Post-doctoral position in organic and polymer chemistry

Developing and Applying Mechanophores and Mechanoluminescent Probes to Understand Fracture of Soft Materials

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New materials applications such as actuators¹, biomedical hydrogels² and soft robotics³ require more targeted mechanical properties than ordinary rubbers. In particular a good resistance to fracture combined to a very low level of dissipation during cycling and a full reversibility of the deformation⁴.

A recent ERC funded project (in 2016) focuses on the combined use of novel fluorescent markers inspired by those used in biology and quantitative optical techniques, to bring a molecular and mesoscopic picture of the deformation and fracture of soft gels and elastomers to a level that has never been seen before. We are building an interdisciplinary team of PhD students and post-docs with complementary expertise in chemistry, physics and mechanics to work together and are



currently seeking a motivated post-doc in synthetic organic or polymer chemistry to develop new luminescent probes in particular in aqueous media. The dual objective is to support the PhD students in those areas and to develop new markers that can be used to detect structural changes inducing molecular stretching or bond scission^{5, 6} in a volume of a few hundreds of microns directly ahead of a crack propagating soft

and transparent materials⁶. The light emitted will then be mapped and quantified by the physicists in the team and combine with spatially resolved optical techniques such as digital image correlation and birefringence to detect average orientation and macroscopic strain.

Required skills : Solid experience in organic or polymer chemistry. Interest for interdisciplinary subjects. Basic knowledge of rheology and/or mechanics of polymers is a plus.

Funding : ERC CHEMECH project, Salary ~ 2200 €/mo net depending on experience.

References:

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