



CYCLE DE CONFÉRENCES

Séminaire général de physique de l'Institut Polytechnique de Paris  
Département de physique de l'École polytechnique

# CONTROLLING LIGHT IN COMPLEX MEDIA : IMAGING AND APPLICATIONS



by Sylvain GIGAN

Professeur Sorbonne Université

Scattering of light in heterogeneous media, for instance the skin or a glass of milk, is usually considered an inevitable perturbation or even a nuisance. Through repeated scattering and interferences, this phenomenon seemingly destroys both the spatial and the phase information of any laser illumination. Multiple scattering is nonetheless an invaluable field of research for experimentalists and theoreticians alike, at the crossing of optics, condensed matter physics, statistical physics, chaos, to name just a few. From an operative point of view, scattering greatly limits the possibility to image with light through or in a scattering medium.

Multiple scattering is a highly complex but nonetheless deterministic process: it is therefore reversible. By « shaping » or « adapting » the incident light, it is in principle possible to control the propagation and overcome the scattering process. I will show how this concept allows us to perform imaging deep in a scattering medium, but also many other tasks. I will illustrate with some applications.

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**17H30 (horaire exceptionnel)**  
**AMPHI. PIERRE FAURRE**  
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