

Deep imaging with time-reversed light

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Recent advances in resolution, speed, labelling and the advent of optogenetics have greatly extended the use of optical techniques and enabled many biomedical breakthroughs. Yet, when light propagates through thick biological tissues, refractive index inhomogeneities cause diffuse scattering that increases with depth. This poses a major challenge to optical techniques, limiting their biomedical usefulness *in vivo* to superficial layers of tissue (in rodents) or to larval stages (in zebrafish). In this talk I will describe several strategies to address this key challenge using techniques based on wavefront engineering and optical time reversal, in order to enable optical imaging at unprecedented depths in biological tissues.