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Jerome Mertz received an AB in physics from Princeton University in 1984, and a PhD in quantum optics from UC Santa Barbara and the University of Paris VI in 1991. Following postdoctoral studies at the University of Konstanz and at Cornell University, he became a CNRS research director at the Ecole Supérieure de Physique et de Chimie Industrielle in Paris. He is currently a professor of Biomedical Engineering at Boston University. His interests are in the development and applications of novel optical microscopy techniques for biological imaging. He is also author of a textbook entitled Introduction to Optical Microscopy.

#### ABSTRACT

##### **Fast, volumetric fluorescence imaging in brain tissue**

Neuronal signals can vary on millisecond timescales, with communicating neurons often separated by hundreds of microns. Imaging such fast dynamics over extended volumes presents a challenge for standard fluorescence microscopes. I will describe some of the solutions we have developed to address this challenge. Specifically, I will outline the problems associated with fluorescence imaging in thick tissue, and present some of the technologies to achieve in-vivo brain imaging with high contrast, large field of view, and high speed.