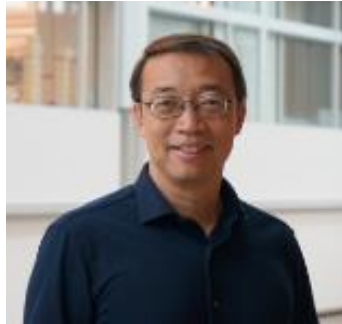# INT Symposium on "Advanced Photonic Imaging in Neuroscience"
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KN1: '*Pushing the limits of multiphoton imaging*'.

Over the last three decades, multiphoton imaging has become an indispensable tool for biological and biomedical research. In particular, there are two areas in which multiphoton imaging truly stands out: (1) in vivo fluorescence imaging deep within intact tissues and (2) in vivo imaging of intrinsic fluorophores and harmonic generations for potential clinical applications. Both areas leverage the unique capability of multiphoton excitation. The first part of this talk is on deep tissue imaging using multiphoton microscopy. The fundamental challenges of deep tissue, high-resolution optical imaging are discussed. New technologies for in vivo imaging of mouse brain structure and function using long wavelength excitation and three-photon microscopy will be presented. The second part of the talk focuses on imaging intrinsic fluorescence and harmonic generations using multiphoton endoscopy for potential clinical applications. The primary engineering challenge of translating multiphoton imaging to clinical application will be discussed. We will present our effort on optical technology development and show several miniature multiphoton endoscope prototypes that are capable of high-resolution imaging in live animals without any exogenous contrast agent.