Universität Stuttgart physik fakultät 8

SCoPE
STUTTGART RESEARCH CENTER OF PHOTONIC ENGINEERING

Robert McLaughlin
University of Adelaide

Imaging needles: bringing optics deep inside the body

Tuesday, September 3rd, 2019, 1 pm
Seminar Room 4th Physics Institute, PWR 57, 4.319

Abstract

Optical imaging technologies, such as optical coherence tomography (OCT), have the potential to acquire exquisitely high-resolution images of tissue and provide surgeons with a new generation of intra-operative guidance tools. However, their limited image penetration depth of only a few millimetres places most diseases beyond their reach. Our team has focused on the development of OCT needle probes: highly miniaturized imaging probes that are encased within a hypodermic needle, and that may be inserted deep into tissue. In this talk, I will describe our development of OCT needle probes, and give specific case studies of clinical applications. Recently, we have integrated our probes into brain biopsy needles to enable safer neurosurgery, and have performed our first experiments in humans. In addition, we have developed the first dual-modality needle probes, capable of simultaneously acquiring OCT and fluorescence images, and showed them to be sufficiently sensitive to detect signal from fluorescently-labelled anti-bodies targeted for specific cells types.

Biography

Prof. Robert McLaughlin is Chair of Biophotonics in the Centre of Excellence for Nanoscale Biophotonics at the University of Adelaide, and Managing Director of Miniprobes Pty Ltd. Previously, he has been a post-doctoral researcher at the University of Oxford, and spent 5 years in the medical device industry where he was responsible for the development of three commercial products. He has published 2 book chapters, 76 journal papers and 8 patents, and been awarded over EURO$4M in research funding. In 2014, he led the team named WA Innovator of the Year. In 2015, his team were awarded the Australian Innovation Challenge. In 2016, he was awarded the South Australian Premier's Research and Industry Fund Fellowship.

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