ICFO

ICFO Colloquium Series: Photonics Solutions to Transform How, When and Where We Can Image the Brain

CLARE ELWELL

March 31, 2025
12:00 to 13:00
ICFO Auditorium

BIO:

Clare Elwell is a Professor of Medical Physics at University College London (UCL) and Vice Dean for Impact for UCL Engineering. She develops functional near infrared spectroscopy (fNIRS) technologies to image the human brain and her research projects include studies of acute brain injury, infant brain development, autism, migraine and malaria. She currently leads the Brain Imaging for Global Health (BRIGHT) project which delivered the first brain images of infants in Africa. In 2023 she was awarded a Brocher Foundation Fellowship to investigate the responsible use of neuroimaging in disorders of consciousness.

Clare is Past President of the Society for Functional Near Infrared Spectroscopy and hosted the society's biennial meeting in 2012 at UCL. Clare is also Past President of the International

Society on Oxygen Transport to Tissue and hosted the 42nd Annual Meeting of the society in 2014 at UCL. She is current President of the London International Youth Science Forum. She was a 2018 British Science Association Media Fellow at the Financial Times and is a Fellow of the Institute of Physics and of the Royal Society for Arts, Manufactures and Commerce. She is Founder and Trustee of the charity Young Scientists for Africa. She has won numerous awards for research, teaching and public engagement and in July 2024 she delivered the UCL Festival of Engineering - Six Days to Change the World which attracted over 10,00 attendees of industry partners, policy makers, general public and school and communit groups to engage with engineering innovations at UCL

ABSTRACT:
The last decade has seen unprecedented advances in the capability of neuroimaging technologies for studies of the human brain. Many of these advances have targeted increasingly specific investigations of brain activity and function under a range of applications. The advent of non invasive photonics technologies has opened up whole new horizons for how, when and where we can image the brain
During this talk I will discuss the transformative impact of one such technology, near infrared spectroscopy (NIRS), a portable, wearable and affordable optical neuroimaging technique. Engineering innovations have enabled NIRS images of brain oxygen metabolism to be acquired in infants and adults. NIRS studies of the developing brain are paving the way for early markers of autism and studies in toddlers. And following its successful implementation in resource poor settings, NIRS is now an important brain imaging tool in global health studies.
With these advances comes a responsibility to understand the ethical and societal implications of increased accessibility to brain imaging and the data it generates. I will consider these issues and particularly the role played by medical physicists in guiding the appropriate use of neuroimaging technologies.
Hosted by: Prof. Dr. Turgut Durduran