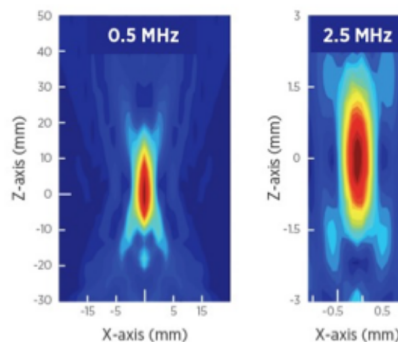
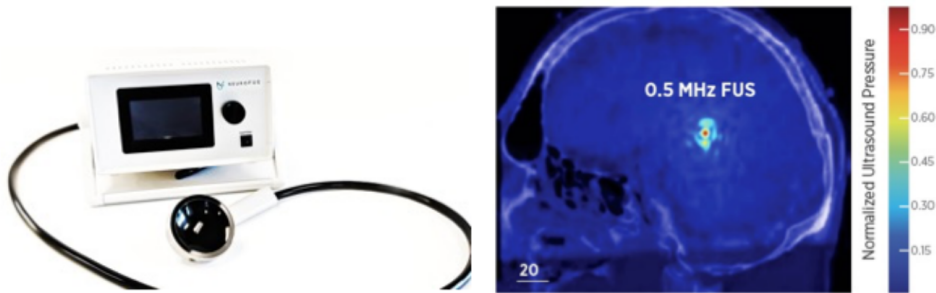




Optics and Photonics Group  
Lunchtime Seminar  
“Noninvasive brain stimulation with  
focused ultrasound: computational,  
experimental, and technical  
challenges”

Prof Marcus Kaiser

*UoN - School of Medicine*



13:30 Wednesday 24 May 2023  
Life Sciences Building - B3  
All Welcome

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# “Noninvasive brain stimulation with focused ultrasound: computational, experimental, and technical challenges”

Prof Marcus Kaiser  
13:30 Wednesday 24 May 2023  
Life Sciences Building - B3  
All Welcome  
MS Teams link

Mental and brain health conditions lead to distinct changes in brain connectivity for patients and, as a result, to changes in brain function. Current treatments with pharmaceutical drugs, however, lead to severe negative side effects as drugs reach the whole body and all parts of the brain. Brain stimulation has been proposed as an alternative treatment to pharmaceutical drugs with a potential to reduce side effects and improve cognitive function. I will outline how computational models based on brain connectivity information can help to identify network targets and to find personalised stimulation protocols. In particular, I will highlight how focused ultrasound, a novel non-invasive technology for brain stimulation, can directly target deep-brain structures involved in emotion and memory processing opening up a way to new interventions. I will discuss the current technical challenges in terms of making brain stimulation more reliable through personalised interventions, using closed-loop stimulation, and developing more affordable wearable devices.

Biography: Marcus Kaiser is leader of Neuroinformatics UK representing more than 600 researchers in the field (<http://www.neuroinformatics.org.uk/>) and Chair of the Neuroinformatics Special Interest Group of the British Neuroscience Association. After studying biology and computer science, he obtained his PhD, funded by a fellowship from the German National Academic Foundation, from Jacobs University Bremen in 2005. In 2016, he was elected Fellow of the Royal Society of Biology. He is on the editorial boards of Network Neuroscience (MIT Press), PLOS Computational Biology, and Royal Society Open Science, and author of the first review on connectomics. Research interests are understanding the origin of brain disorders through modelling brain development and using models to inform therapeutic interventions, in particular using non-invasive brain stimulation (see <http://www.dynamic-connectome.org/>).