

brainbox

initiative

**Advanced TMS Techniques:
TMS-EEG Acquisition &
Analysis**

Nov 19 - 21

13:00 Welcome and registration

13:30 Lecture: **An Introduction to TMS & EEG**

Dr Rory Cutler will cover:

Basic principles of both transcranial magnetic stimulation (TMS) and electroencephalography (EEG) techniques, and an exploration of the current state of TMS and EEG research in the field

Combining TMS and EEG: an overview of why and how to combine these techniques

An introduction to TMS-EEG data analysis techniques

14:30 Meet the Machine: **TruScan Research EEG and DuoMAG TMS**

Delegates will have the opportunity to familiarise themselves with the equipment that they will be using for the upcoming practical sessions of the workshop, under the guidance of the workshop leaders

17:00 Workshop day one close

November 19: Introduction

09:30 Registration and coffee

10:00 Lecture: **Applications of TMS-EEG**

Dr Lorenzo Rocchi and Dr Isabella Premoli will lead a morning of lectures on the practical applications of TMS-EEG, covering the technique's use in physiology, and the potential uses it may have in psychiatric and neurological conditions

12:00 Lunch

13:00 Practical session: **TMS-EEG Data Acquisition**

Delegates will gain hands-on experience of acquiring TMS-EEG data, including:

- Cap placement
- Impedance reduction
- Electrode lead rotation
- TMS intensity calibration prior to TMS-EEG
- Online inspection of TMS-evoked potentials to engage with stimulation targets
- Online demonstration of artefacts evoked by TMS, and how to avoid these

17:00 Workshop day two close

19:00 Workshop dinner at Bill's, Cardiff for all attendees

November 20: Acquisition

09:30 Registration and coffee

10:00 Lecture: **TMS-EEG ‘Schools of Thought’**

Dr Nigel Rogasch will give delegates an introduction to the different schools of thought in TMS-EEG research and the fundamentals of EEG and TMS-EEG analyses.

10:30 Practical session: **Run-through and workshop of TMS-EEG signal analyser (TESA) in MATLAB**

This practical session, led by Dr Nigel Rogasch and Dr Lorenzo Rocchi will cover:

Principal components analysis (PCA) using TESA to remove scalp artefact, TMS pulse artefact, muscle artefact, and electrode movement artefact.

Analysis of artefact-free datasets will be completed to investigate components that are likely to be evoked by TMS

13:00 Lunch

13:00 Practical session: **Run-through and workshop of Brain Electrical Source Analysis (BESA) software**

Under Dr Mateusz Rusinak’s guidance, delegates will examine source localisation of TMS-evoked potentials from the scalp.

16:30 Final Q&A session and group discussion

17:00 Workshop close

November 21: Analysis