Electrical Neuroimaging for the investigation of human brain functions

Organizer(s)	Marzia De Lucia, CHUV-UNIL
	1 ECTS
Summary	This course provides a fundamental understanding of EEG neuroimaging, covering data preprocessing, advanced analyses, and statistical methods. Students will explore EEG applications in functional connectivity, neurofeedback, and integration with fMRI for a comprehensive approach to brain imaging.
Course level **Pre-requirements**	The courses is adapted for beginners and intermediate level PhD students The student should ideally cover basic algebra knowledge and being able to perform calculations with vectors and matrices; some programming knowledge is an advantage. Before each lecture students will be required to read papers and relevant materials suggested by the teachers.
Content of course sessions	- Intro to EEG, physics and neurophysiology (Marzia De Lucia) - Recordings and preprocessing (Marzia De Lucia) - Power spectra and cluster permutation statistics (Marzia De Lucia) - Inverse solution (Isotta Rigoni) - Time-frequency analysis (Fosco Bernasconi) - Multivariate decoding analysis (Marzia De Lucia) - EEG-based functional connectivity (Nicolas Roehri) - Neurofeedback (Tomas Ros) - EEG and fMRI combination (Jonathan Wirsich)
Location	Geneva, Campus Biotech, Building H4, H4-02-A(2)
Course dates in 2025	We will start at 10:00, with each lecture lasting 1 hour. There will be two lectures per day, on the following dates: - 6th of March 2025 (De Lucia) - 13th of March 2025 (De Lucia + Rigoni) - 20th of March 2025 (Bernasconi + De Lucia) - 3rd of April (Ros + Roehri) - 10th of April (Wirsich)
Course materials	- go to "https://moodle2.unil.ch" - log in with your institutional address (unige, unil, chuv, epfl) - click on "Faculté de Biologie et de Médecine" > "Ecole doctorale / doctoral school" > "Lemanic Neuroscience Doctoral School" - course materials and papers will be stored under "Electrical Neuroimaging for the investigation of human brain functions"

Evaluation	Students will be asked to write a project proposal (1-2 pages) integrating material learned during the course with explicit reference to in class-resources such as experimental data that has been reviewed together or specific discussion. Ideally the project proposal should be relevant for the students' PhD project.
Registration	The course is limited to 30 participants. Register before February 25, 2025 by writing a mail to lndscourses@gmail.com (with your supervisor in copy) and stating the course title as subject.