**Title (provisorio):** Criticality in different conscious states

**Relatore/i:** Arnulfo Gabriele

**E-mail:** gabriele.arnulfo@edu.unige.it

**Indirizzo:**

**Tel.:**

### Description

**Motivation and field of application**

Over the last decade, numerous signatures of criticality have been identified in brain activity. Some of the most striking examples are the probability distributions of size and duration for intermittent spontaneous activity bursts during ongoing activity in the cortex. Recently it has been observed that avalanches dynamics are modulated during sleep stages.

### General and main tasks

The thesis aims at extensively investigating the characteristics of neuronal avalanches in the human brain at different conscious states. The candidates will analyse intra-cranial data from epileptic patients recorded in 5 different conditions (wakefulness, 2 NREM and 2 REM stages).

The thesis requires the construction of advanced processing pipeline for the estimation of avalanche distributions and long-range temporal correlations on intra-cerebral data.

### Learning objectives (technical tools and analytical methods, experimental methodologies)

The candidates will learn about self-organized criticality concepts and how to analyse SEEG data to characterize the dynamical properties of neuronal avalanches.

### Place where the work will be carried out:

DIBRIS – Università di Genova Neuroscience Centre – University of Helsinki, Finland

### Additional information

**Maximum number of students:** 1

**Financial support/scholarships:** ERASMUS+