



## **MASTER 2 Fundamental and Clinical Neurosciences**

### **Internship proposal 2022-2023**

*(internship from January to June 2023)*

**Host laboratory:**

Lyon Neuroscience Research Center (CRNL)

Impact team, 16 avenue du Doyen Jean Lépine, 69500 Bron, France

**Host team:**

Impact team

<https://www.crnl.fr/fr/equipe/impact>

**Internship supervisors:**

Marine Vernet, Ph.D., Chargée de Recherche CNRS

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**Project title:**

Reading the thinking brain: decoding verbal and visual thinking from MEG signals

**Project summary:**

Human thoughts can be described using several dimensions, including content (what we think about), modality (how we think about it) and intensity (how strong, how clear are our thoughts). The purpose of this internship will be to decode these three dimensions during guided or spontaneous thinking in a group of healthy participants involved in thinking tasks. In these tasks, participants are instructed to think about specific objects (task 1) or anything they want (task 2). On every trial, they choose between developing an internal dialogue or visual imagery. Finally, they report the intensity of their thoughts. Machine learning algorithm will be applied to their brain signals recorded with magnetoencephalography (MEG) to predict, for each trial, the content, modality and intensity of their thoughts. The spatio-temporal neural signatures of these content, modality and intensity will also be described. Experience with Python (or willingness to learn) is recommended.

**3-5 recent publications:**

Vernet M, Quentin R, Japee S, Ungerleider LG. (2020) From visual awareness to consciousness without sensory input: the role of spontaneous brain activity. *Cogn Neuropsychol*, 37 (3-4), 216-219  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7335319/>

Vernet M, Japee S, Lokey S, Ahmed S, Zachariou V, Ungerleider LG. (2019). Endogenous visuospatial attention increases visual awareness independent of visual discrimination sensitivity. *Neuropsychologia*, 128, 297-304.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5809327/>

Vernet M, Stengel C, Quentin R, Amengual JL, Valero-Cabre A. (2019). Entrainment of local synchrony reveals a causal role for high-beta right frontal oscillations in human visual consciousness. *Sci Rep*, 9(1), 14510.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6787242/>