



SEMINARIO PRESENCIAL

Viernes, 1 de Diciembre de 2023

12:30 h. Instituto Cajal (CSIC) Madrid

DRA. GUIOMAR NISO
Instituto Cajal (CSIC)

OPEN NEUROIMAGING TO UNDERSTAND THE HUMAN BRAIN

Abstract

The human brain comprises 86 million neurons, each communicating through a thousand synapses. This large number of connections provides the fundamental environment for neuronal ensembles to become transiently synchronized or functionally connected. Understanding the complex network organization of the human brain represents one of the greatest challenges for neuroscience nowadays. In this talk, I will present some of my work using magnetoencephalography and electroencephalography to study and characterize brain function in humans at the millisecond scale. I will also introduce some open initiatives in neuroimaging I'm currently leading, encompassing open software, open data repositories and open standards. Moreover, I will provide an integrated overview of community-developed resources that can support collaborative, open, and reproducible neuroimaging throughout the entire research cycle, from inception to publication and across different neuroimaging modalities.

Affiliation and short bio

Dr. Guiomar Niso is the head of the Neuroimaging Group at Cajal Institute, CSIC, and an elected member of the Young Academy of Spain. She has worked over 15 years in human electrophysiology and neuroimaging to characterise healthy and diseased brain states (e.g. epilepsy, Alzheimer's disease, blindness), her final goal is understanding brain dynamics to enhance clinical applications and ultimately improve peoples' lives. MSc in Telecommunications Engineering and PhD in Biomedical Engineering at the Universidad Politécnica de Madrid. Postdoctoral researcher at the Montreal Neurological Institute, McGill University and at Indiana University. Dr. Niso contributes to multiple open science initiatives: pioneering open data repositories (the Open MEG Archives: [OMEGA](#)), open software ([Brainlife](#), [Brainstorm](#), [Hermes](#)) and open standards (the Brain Imaging Data Structure: [BIDS](#)), to foster reproducibility and transparency in neuroscience. Currently, Chair of the BIDS Steering Group. Her leadership has been recognized by multiple awards, highlighting the Medal for Young Researchers by the Royal Academy of Engineering, the Ada Byron Award to Women Technologist by Deusto University, the International Open Science Prize by the Tanenbaum Institute and her distinction as a member of the Young Academy of Spain. See more at: <https://guiomarniso.com>

Related publications with the topic:

Niso G., Botvinik-Nezer, R., Appelhoff, S., De La Vega, A., Esteban, O., Etzel, J. A., ... & Rieger, J. (2022). Open and reproducible neuroimaging: from study inception to publication. *NeuroImage*, 119623. doi: <https://doi.org/10.1016/j.neuroimage.2022.119623>

Niso G. / Müller F., Samiee S., Ptito M., Baillet S., Kupers R. (2019) A thalamocortical pathway for fast rerouting of tactile information to occipital cortex in congenital blindness. *Nature Communications* 10(1), 5154. doi: <https://doi.org/10.1038/s41467-019-13173-7>

Niso G., Gorgolewski K.J., Bock E., Brooks T.L., Flandin G., Gramfort A., Henson R.N., Jas M., Litvak V., Moreau J., Oostenveld R., Schoffelen J.M., Tadel F., Wexler J., Baillet S. (2018) MEG-BIDS: an extension to the Brain Imaging Data Structure for magnetoencephalography. *Scientific Data* 5, 180110. <https://doi.org/10.1038/sdata.2018.110>

Niso G., Rogers C., Moreau J.T., Chen L.Y., Madjar C., Das S., Bock E., Tadel F., Evans A.C., Jolicoeur P., Baillet S. (2016). OMEGA: The Open MEG Archive. *NeuroImage* 124, 1182-1187. doi: <https://doi.org/10.1016/j.neuroimage.2015.04.028>