

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

**DOTTORATO DI RICERCA / PHD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING**

Seminar announcement

Wednesday 3 May 2023, Time: 15:00 – 16.00

“Aula Seminari DIETI”, Floor 1, Building 3/A, DIETI - Via Claudio, 21 – NAPOLI



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Nanoneuro: the power of nanoscience to explore the frontiers of neuroscience

Abstract: In this talk, we will learn a little about nanoscience, a little about neuroscience, and a lot about the future that neuro-technologies are bringing us closer at a dizzying pace. Neurotechnologies are defined as methods capable of reading and manipulating brain activity in both animals and humans. In just a few years, through these technologies, science has achieved incredible milestones, such as bringing a very advanced ALS patient out of isolation or restoring part of the vision to patients with a very specific type of blindness. At present, applying these therapies (still experimental) requires aggressive surgery on patients and the installation of microelectronic devices in the brain capable of reading and modifying the behavior of neurons. Ideally, we would like to be able to achieve the same in a non-invasive way, i.e., by means of devices that act from outside the skull.

There are currently many initiatives worldwide pursuing these objectives. In the Basque Country, around the year 2020, we launched the nanoneuro initiative, which aims to use all the knowledge in nanotechnologies existing in the Basque Country to develop neuro-technologies capable of reading and modifying neuronal activity in a minimally invasive way. Currently, under the Basque Government's IKUR initiative, the project brings together 8 research centers in the Basque Country structured as a network under the name of Basque Nanoneuro Network (B3N). In this talk, we will explain the basis of neuro-technologies and the functioning of the nanoparticles that we intend to use for their development. Likewise, we will also talk about neuro-rights, 5 new rights that aim to be added to the universal declaration of human rights to protect us from the negative drifts that these technologies may take.

Lecturer short bio: Aitzol Garcia-Etxarri is an Ikerbasque researcher at the Donostia International Physics Center. Aitzol is a telecommunications engineer and holds a PhD in physical sciences. His doctoral thesis, supervised by Javier Aizpurua and Pedro Miguel Etxenike, was awarded with the extraordinary doctoral prize in 2010. Subsequently, he worked at Stanford University for 4 years as a postdoctoral researcher. In 2015, thanks to the Fellows Gipuzkoa grant from the Diputación de Gipuzkoa, she returned to Donostia to form her own research group. Currently, Aitzol, leads the nano-photonics group of the DIPC, where 12 researchers study the interaction of light with objects at the nanometer scale. These studies have allowed the development of new optical technologies with applications in the field of biomedicine and computing. Among other scientific ventures, Aitzol is currently co-leading the nanoneuro project, which aims to use nanoparticles to record and induce neuronal activity in brain cells.

For information: Prof. Carlo Forestiere (DIETI, UniNA) – carlo.forestiere@unina.it (organizer)

Attendance at the seminar is in-person. Students that wish to follow the seminar via MS TEAMS, must send a mail to the seminar's organizer with proper motivations. Once authorized, they must keep the camera on for the entire duration of the seminar. LINK: https://teams.microsoft.com/L/MEETUP-JOIN/19%3AMEETING_NZGWZDI3OWITNJK0ZC00ZjQ4LWFYjUtZDM4MDZLYjC0NTc3%40THREAD.v2/0?CONTEXT=%7B%22TID%22%3A%22FCFE26A-BB62-46B0-B1E3-28F9DA0C45FD%22%2C%22OID%22%3A%22BD21EE8C-CFA0-4160-951B-F0D21106565B%22%7D