POLITECNICO DI MILANO

PhD in BIOINGEGNERIA / BIOENGINEERING - 39th cycle

THEMATIC Research Field: CHALLENGES FOR HUMAN EMF EXPOSURE ASSESSMENT IN 5G AND 6G EMERGING SCENARIOS

Monthly net income of PhDscholarship (max 36 months)
€ 1400.0
In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
Motivation and objectives of the research in this field	The deployment of 5G mobile networks and the emergence of 6G mobile networks create new EMF challenges because of the introduction of new technologies, the use of new frequency bands (e.g., higher frequencies such as mmWave and sub-Terahertz) and the coexistence of several generations and operators in the same mobile site. Due to the above and the emergence of new disruptive technologies, the electromagnetic field (EMF) exposure assessment methodologies are destined to be updated and will attract more attention. This research activity deals with the human exposure assessment in the 5G exposure scenario and beyond 5G technologies by simulation methodologies and statistical approaches. The main objective will be to analyse how the physical and geometrical parameters variations induced by age and pregnancy impact the power deposition and resulting heating in near-surface tissues in realistic exposure scenarios. This project will contribute to improve the existing knowledge on the exposure of the whole population to one or multiple electromagnetic (EM) sources operating in the bands of 5G and beyond positioned in near- or far- field with respect to the user.
Methods and techniques that will be developed and used to carry out the research	Development and application of deterministic and advanced stochastic techniques and statistical modelling of exposure for EMF applications in health and medicine.

Educational objectives	To train the PhD student in stochastic and deterministic methods and techniques to assess EMF RF exposure.
Job opportunities	The research will be carried out in the framework of the project CHILD_5G – "Deterministic and stochastic exposure assessment of children and pregnant women at emerging 5G frequencies" financed by ANSES (DIT.AD009.170, G.A. ANSES-23-RF-07) from May 2024 to March 2027 and the project GOLIAT – "5G RF-EMF expOsure, causaL health and biological effects, and rIsk perception in children and workers through citizen engagement" (DIT.AD009.138, G.A. 101057262) from March to April 2027, in strong cooperation with CNR IEIIT, participant to both projects. CNR IEIIT has large opportunities for post-doc positions and interdisciplinary research carrier.
Composition of the research group	1 Full Professors 0 Associated Professors 7 Assistant Professors 2 PhD Students
Name of the research directors	Prof. Marta Parazzini

Contacts
Ing. Marta Parazzini Email address: marta.parazzini@ cnr.it Phone number:+39-02-2399-3379 Web page:https://www.ieiit.cnr.it/people/Parazzini-Marta

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
The student will be encouraged to attend courses with subjects bioelectromagnetics, statistics

and stochastic modeling either at POLIMI and at CNR IEIIT