

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

PHD PROGRAM IN

INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

PHD PROGRAM IN INFORMATION AND TECHNOLOGY FOR HEALTH

Seminar announcement

Thursday 29 June 2023, Time: 10:30 - 12:30

Room CL-T-2, Ground Floor, - Via Claudio, 21 - NAPOLI



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Insights into the Design of Transmit and Receive Coils for Ultra-High Field MRI

Abstract: Radiofrequency (RF) coil design is a critical determinant of the performance of all MR imaging systems. RF coils are especially critical for parallel MRI methods, which have been developed for both reception and transmission of MR signals, and which rely explicitly on the simultaneous use of multiple coils. While careful coil design is important at all field strengths, appropriate coil designs are truly essential for ultra-high-field (UHF) MRI, both for the preservation/improvement of image quality and for the avoidance of adverse effects in patients. techniques for electrical property mapping: Nevertheless, RF coil optimization has remained a largely empirical process,

in part because the complexity of Maxwell's equations makes it challenging to gain clear intuition about what might constitute a truly task-optimal coil performance. Since time, cost and complexity limit the practical number of prototype arrays that can be built, simulations are a feasible alternative approach to investigate the effect of increasing the number of coil elements on imaging performance. Ultimate performance limits, independent of the particular coil geometry, are absolute metrics that enable us to predict coil performance in simulation or to rigorously assess the performance of actual coil prototypes

Lecturer short bio: *Riccardo Lattanzi is a professor of radiology, electrical and computer engineering, and biomedical engineering at the New York University. His research work lies at the boundary between physics, engineering and medicine. He investigates fundamental principles involving the interactions of electromagnetic fields with biological tissue in order to improve the diagnostic power of magnetic resonance imaging. His honors include an ISMRM Young Investigator Award and an NSF CAREER Award. He holds a degree in electronic engineering from University of Bologna and a Ph.D. in medical and electrical engineering from the Harvard-MIT Division of Health Sciences and Technology.*

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