



Centre de Nanosciences et de Nanotechnologies

# Soutenance de thèse

Vendredi 18 décembre

9h30

Centre de Nanosciences et de Nanotechnologies  
10 boulevard Thomas Gobert  
91120 Palaiseau  
Amphithéâtre

**Giulia RIZZO**

## “ Study of a MagnetoElectric Transducer to Wireless Power Medical Implants ”

Lien public :

<https://zoom.us/j/96887704627?pwd=UVdxbTdPVDN2Vmd3YnBsRHpJSDlDQT09>

**Jury members :**

Prof. Mickaël LALLART (INSA de Lyon), Reviewer

Dr. Hakeim TALLEB (Sorbonne Université), Reviewer

Prof. Adrien BADEL (Université Savoie Mont Blanc)

Prof. Ilangko BALASINGHAM, (Norwegian University of Science and Technology)

Dr. Vincent LOYAU (ENS Paris-Saclay)

Prof. Elie LEFEUVRE (Université Paris-Saclay), Thesis Director

Mr. Jean-Christophe LOURME, (CEO ValoTec), Thesis Co-Supervisor

**Abstract :**

Nowadays, active implantable medical devices have taken a fundamental role in the monitoring, diagnosis, and treatment of patients. Despite the progress, the most employed energy source remains the single-use battery, whose replacement requires costly and invasive surgical procedures. As part of this thesis, a new wireless energy-transmission technology has been studied to improve the energy autonomy and solve the problem of battery replacement. The originality of this work consists in using a magnetoelectric composite placed in the implant. An out-body coil is used to create a low-frequency magnetic field, which penetrates in the body interacting very little with tissues. Under the effect of this magnetic field, the magnetoelectric composite is excited at resonance, and converts efficiently the received magnetic energy into electrical energy. This promising solution could contribute to the development of future generations of very long-lasting implants with extensive miniaturization.