

**Marie Skłodowska Curie Action –Postdoctoral Fellowship 2024
(MSCA-PF-2024)**

Contact Person/Scientist in charge	Name	Antonio
	Surname	Pérez Yuste
	Email	antonio.perez@upm.es
Department /Institute /Centre	Name	Departamento de Ingeniería Audiovisual y Comunicaciones (DIAC-UPM)
	Address	ETSI Sistemas de Telecomunicación, Campus Sur UPM, Ctra. Valencia, km. 7
	Province	Madrid, Spain
Research Area	<u>Information Science and Engineering (ENG)</u>	
Brief description of the Centre/Research Group	The Radio Communications Group at UPM (GRC-UPM) is a European research leader with expertise in wireless communications and the development of RF hardware equipment. Our research has grown over the years in according to international standards. We give research a high priority with a clear commitment with innovation and transfer of know-how to industry. Our group has more than 15 years working on wireless communications for intelligent transportation systems and on personal mobile communications, and more than 25 years working on radio communications, including the development of microwave devices and systems. Know more about us at our webpage: grc.upm.es	
Project description	Wireless Power Transfer for Future Self-empowered IoT Sensors Based on 3D-printed Antennas. The need for battery-free wireless devices became a hot topic particularly after the extreme growth in the number of Internet-of-Things (IoT) devices, which passed over 15 billion in 2023. Currently, commercial-available IoT wireless sensors have main limitations of battery lifetime and complex high-cost periodic maintenance. Therefore, in this proposal, an efficient green system based on wireless power transfer (WPT) is proposed where sensors are self-empowered by radio frequency energy harvesting (RFEH) of the electromagnetic (EM) fields from an artificial radiator. The challenge is to improve the received power without increasing the transmitted power to comply with EM exposure and health standards. The solution should be met by following four strategies. I) High-Gain antennas to increase harvesting; II) Circular Polarization (CP) to defeat losses from multipath and misalignment; III) Optimized rectifying circuits for high-efficiency AC-DC conversion; and IV) Storage unit (such as a supercapacitor) through an ultra-low-power boost converter with a proper power management algorithm. Hence, this proposal aims to fulfill the research gap in both the RFEH sensor and transmitter sides. Compact antennas based on low-cost 3-D printing along with the rectifier circuit should be designed and built to be integrated. The complete system will be tested in both indoor and outdoor scenarios.	
Applications: documents to be submitted and deadlines	Those interested in the position and meeting the requirements, please send your application with next documents before April 30, 2024: - Transcript of records of previous studies. - Resume, also including publications and projects. - Motivation letter.	