

Marie Skłodowska Curie Action –Postdoctoral Fellowship 2022
(MSCA-PF-2022)

Contact Person/Scientist in charge <i>(datos del IP del grupo de investigación o responsable científico)</i>	Name	Manuel / José Manuel / Ricardo
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Department /Institute /Centre <i>(datos del centro/departamento donde estaría ubicado el investigador a contratar)</i>	Name	Grupo de Radiación/Señales, Sistemas y Radio comunicaciones/E.T.S.I. Telecomunicación/ Universidad Politécnica de Madrid y/o Departamento de Ingeniería Eléctrica, Electrónica y Automática, E.T.S.I Diseño Industrial/ Universidad Politécnica de Madrid
	Address	ETSIDI, Ronda de Valencia 3, 28012
	Province	Madrid
Research Area <i>(en base a las 8 áreas científicas establecidas en MSCA. Se podrán seleccionar entre una y tres áreas científicas por EOI)</i>		Information Science and Engineering (ENG)
Brief description of the Centre/Research Group <i>(Max. 1600 caracteres con espacio: información sobre el centro / grupo de investigación / personal científico, destacando los aspectos más relevantes de los mismos. Incluir URL si es posible.)</i>		<p>The Radiation Group is a Research Group of the Universidad Politécnica de Madrid, leader in research in antenna design and measurement, development of antenna measurement systems and development of complete communication systems on radio-software platforms. The Group is made up of 7 professors and 5 contracted researchers. Three emeritus professors who actively participate in research and design projects collaborate with the Group. A multitude of students carried out their Final Degree or Master's Thesis supervised by some of the members of the Group, almost all of them within some of the research projects in which the Group works.</p> <p>The Radiation Group collaborates with the main companies in the sector in research projects, and participates in research activities within national and international consortia. Within the facilities, the Antenna Testing and Homologation Laboratory (LEHA) stands out, which has several anechoic chambers where antenna systems of different types and frequency bands are characterized.</p> <p>https://www.gr.ssr.upm.es</p> <p>At present our group collaborates with Ricardo Albarracín-Sánchez, member of RIBAT (Low- and High-voltage Installations and Networks) research group from ETSIDI-UPM in a research project about 5G technology.</p>
Project description <i>(Max. 1800 caracteres con espacio: breve descripción sobre el proyecto /línea de investigación en el que se acogería al investigador/a Marie S.Curie.)</i>		<p>The subproject lead by UPM, UPM-InTerSpaCE, according to the experience of the researchers of Grupo de Radiación, is focused on the following four objectives:</p> <ol style="list-style-type: none"> 1.Analysis of new architectures and radio enabling technologies for massive LEO architectures in bands above 60 GHz. UPM-InTerSpaCE will propose disruptive concepts of space communications, enabling technologies in different space scenarios. Novel communication architectures will be proposed to allow the optimization of the radio resources available in the satellite segment, in high-capacity systems, to reduce system costs and to ensure quality criteria service and availability. 2.Development of new technologies for beam steering and reconfigurability for array antenna systems in Ka, Q, V bands and beyond based on liquid crystals technology and analog beamforming. The study, characterization and use of materials such as liquid crystal, with changes in electromagnetic properties is one of the alternatives proposed. The second approach is the development of planar antenna designs based on the grouping of unitary radiating elements. Designs based on slot grouping, patches in multilayer



Expression of Interest – UPM Supervisor

	<p>printed technology and apertures in gap-waveguide technology and integrated waveguide (SIW) substrate are proposed.</p> <p>3. In case of terrestrial systems, the large capacity demands and diversity of deployment scenarios that can appear in the future require the implementation of new antenna array processing techniques, both analog, digital and combination of both. In the project, we will develop algorithms and technologies to build demonstrators in millimeter-wave band for 5G systems incorporating array antenna processing techniques. The project proposed the identification of digital antenna technologies and work scenarios in the area of terrestrial 5G and space communications as well as new techniques and algorithms for array processing including new capabilities that depend on enabling technologies under development and reconfigurable architectures. Research tasks will be carried out to determine which technologies are best suited to accomplish the typical specifications of digital systems.</p> <p>4. Development of new antenna technologies measurement techniques in Ka, Q, V bands and beyond and improving the performance of the measurement systems in these bands. In order to complement the evaluation of the testbeds, new antenna measurement procedures based on Over the air and measurements without reference as well as adaptation of existing hardware architectures for the measurement of antennas in millimeter-wave bands above 110 GHz will be elaborated in the project. The project will innovate in the adequate electromagnetic characterization systems, in particular for the new digital antenna technologies, where it is not possible to have a RF signal reference. For this, it will be necessary to study the necessary modifications to be introduced in the measurement systems available to the consortium (LEHA-UPM), completing the already existing measurement set-ups.</p>
<p>Applications: documents to be submitted and deadlines <i>(Indicar qué documentación deberá remitir el /la investigador/a interesado/a al centro para establecer el contacto: CV, letter of motivation, letter of references, etc., así como la fecha límite para el envío de la misma. Recomendado: Hasta finales de abril 2022)</i></p>	<p>CV, letter of motivation, letter of references, list of merits. Deadline: 30th of April 2022</p>