



WEBINAR ANNOUNCEMENT

Who: Carlos López-Martínez - IEEE Distinguished Lecturer - Associate Professor in the area of remote sensing and microwave technology in the Universitat Politècnica de Catalunya, Barcelona, Spain.

What: SAR Polarimetry: Theory, Machine Learning & Applications

When: October 19th, 2021 at 10:00am

Where: Google Meet

joining info:

Video call link: <https://meet.google.com/izv-oxco-skj>

Or dial: (IT) +39 02 3046 1778 PIN: 424 615 779#

More phone numbers: <https://tel.meet/izv-oxco-skj?pin=7883223951972>

Abstract: Nowadays, several spaceborne Polarimetric Synthetic Aperture Radar (PolSAR) systems are in operation: TerraSAR-X (X-Band), RADARSAT-2 (C-Band), Sentinel-1a&b (C-band dual polarimetric), ALOS-2 (L-band), SAOCOM (L-band), RCM (C-band) and Gaofen-3. Also, future missions as BIOMASS (P-band) or NISAR (L&S-bands) are designed to have polarimetric sensitivity. In addition, already operational systems as Sentinel-1 (C-band) have also polarimetric capabilities.

The availability of spaceborne PolSAR data provides an unprecedented opportunity for applying advanced PolSAR information processing techniques, as well as artificial intelligence and machine learning methodologies, to the important tasks of environmental monitoring and risks management. PolSAR remote sensing offers an efficient and reliable means of collecting information required to extract quantitative geophysical and biophysical parameters from Earth's surface. This remote sensing technique has found many successful applications in crop monitoring and damage assessment, in forestry clear cut mapping, deforestation and burn mapping, in land surface structure (geology) land cover (biomass) and land use, in hydrology (soil moisture, flood delineation), in sea ice monitoring, in oceans and coastal monitoring (oil spill detection) etc. The scope of different applications is increasing nowadays thanks to the availability of multi-temporal and dual polarimetric acquisitions.

PolSAR represents today a very active area of research in radar remote sensing and Earth observation, and for instance polarimetric applications start to be operational in the frame of the Sentinel-1. Consequently, it becomes important to train and to prepare the future generation of researchers to this very important topic.

The aim of this presentation is to provide a substantial and balanced introduction to the theory, scattering concepts, systems and advanced concepts, and applications typical to PolSAR. This presentation on PolSAR touches several subjects: theory, scattering modelling, data representations, target decompositions, speckle filtering, terrain and land-use classification, man-made target analysis, etc. The presentation will be illustrated by images for the different sensors indicated above.

This lecture is intended to scientists, engineers and students engaged in the fields of Radar Remote Sensing and interested in PolSAR image analysis and applications.



Short bio: Dr. Carlos López-Martínez received the MSc degree in Electrical Engineering and the PhD degree from the Universitat Politècnica de Catalunya UPC, Barcelona, Spain, in 1999 and 2003, respectively, as well as the Postgraduate Diploma in Data Science and Big Data from the Universitat de Barcelona UB, Barcelona, Spain in 2021.

Dr. López-Martínez is Associate Professor in the area of remote sensing and microwave technology in the Universitat Politècnica de Catalunya, Barcelona, Spain. He has a large professional international experience at DLR (Germany), at the University of Rennes 1 (France), and as a group leader of the Remote Sensing and Natural Resources Modelling team in the Luxembourg Institute of Science and Technology (Luxembourg). His research interests include Synthetic Aperture Radar (SAR) theory, statistics and applications, multidimensional SAR, radar polarimetry, physical parameter inversion, advanced digital signal processing,

estimation theory, and harmonic analysis.

Dr. López-Martínez has authored more than 200 articles in journals, books, and conference proceedings, and received the EUSAR 2002 Conference Student Prize Paper Award, co-authored the paper awarded with the EUSAR 2012 Conference First Place Student Paper Award, and received the IEEE-GRSS 2013 GOLD Early Career Award. Dr. López-Martínez has broad academic teaching experience from bachelor, master, and PhD levels to advanced technical tutorials presented at international conferences and space and research institutions worldwide. He is an associate editor of the IEEE-JSTARS journal and the MDPI Remote Sensing, acting also as invited guest editor for several special issues. He has collaborated in the Spanish PAZ and the ESA's SAOCOM-CS missions, in the proposal of the Parsifal mission and he is member of the ESA's Sentinel ROSE-L Mission Advisory Group. He was appointed vice-president of the IEEE-GRSS Spanish chapter, and in 2016 he became its secretary and treasurer. From 2011 Dr. López-Martínez collaborates with the IEEE-GRSS Globalization initiative in Latin America, contributing to the creation of the IEEE-GRSS Chilean chapter and the organization of the 2020 LAGIRSS conference, being appointed as Latin America liaison in 2019. He is also co-chair of the Tutorial Technical Committee of the Indian 2020 InGARSS conference.