Ca' Foscari University of Venice

PROJECT ACRONYM AND TITLE: **ORANG - Open and Resilient Radio Access Network for Next Generation Wireless Backhauls**

FUNDING PROGRAMME: **H2020 ICT - Information and Communication Technologies**

CALL: **NGIatlantic.eu - 5th Open Call**

SCIENTIFIC FIELDS: **Informatics**

HOST DEPARTMENT: **Department of Environmental Sciences, Informatics and Statistics**

SCIENTIFIC RESPONSIBLE: **Maccari Leonardo**

FINANCIAL DATA:

Project total costs	Overall funding assigned to UNIVE
€ 46.134,00	€ 46.134,00

ABSTRACT:

5G was designed to provide an impressive performance step-up compared to its predecessors, but its success depends on a strong increase on the number of Base Stations, named Next Generation NodeB (gNB), which may pass from 8-10 per km², to tens and maybe hundreds of gNBs per km². All the gNBs need to be connected to the core network, which dramatically increases the costs of the infrastructure, making the necessary coverage affordable only in densely inhabited areas, and thus, increasing the divide between well served and underserved areas. To solve this challenge 5G introduced the concept of Integrated Access and Backhaul (IAB) in which "IAB-nodes" collect the traffic from user terminals and have no wired connection, and "IAB-donors" are fiber-connected to the network core. A wireless backhaul network between gNBs needs to be created to route the user traffic from IAB-nodes to the closest IAB-donor. Replacing the cable connections with a wireless multi-hop network is a key opportunity to make 5G services profitable even in situations where a capillary cabled infrastructure would be unaffordable, and in general to extend the reach of mobile networks. A new challenge for research is to provide performance, reliability, and dependability to those we call Next Generation Wireless Backhaul (NGWB), leveraging on the research background on wireless mesh networks. This project aims to evaluate the technical feasibility of large-scale NGWB using real world data and taking advantage of the "Colosseum" testbed available at Northeastern University. This testbed, based on 256 software-defined radios, allows the deployment and testing of solutions at scale under different channel conditions, which are emulated through FPGA-based filters.

Our goal is to design networks based on realistic scenarios and assess to what extent NGWB can be used to make 5G more accessible by the end users.

Planned Start date	Planned End date
01/07/2022	30/11/2022

PARTNERSHIP:

1. Ca' Foscari University	**IT**	**Coordinator**
2. Northeastern University Team	**USA**	**Partner**