



# Worldwide Interoperability Microwave System for Next-Generation Wireless Communications

## Objectives

WiMAGIC is an industry-driven multidisciplinary research project which aims at developing innovative solutions for future evolutions of WiMAX systems towards higher capacity, higher mobility and higher performance. The project develops advanced physical (PHY) layer, medium access control (MAC) layer, and cross-layer algorithms, as well as a simulation platform and a hardware prototype for testing and validation.

## Partners

Coordinator: SEQUANS Communications

Thales  
RINICOM  
Bilkent University

Turkcell  
Ultra Electronics  
Alcatel-Lucent

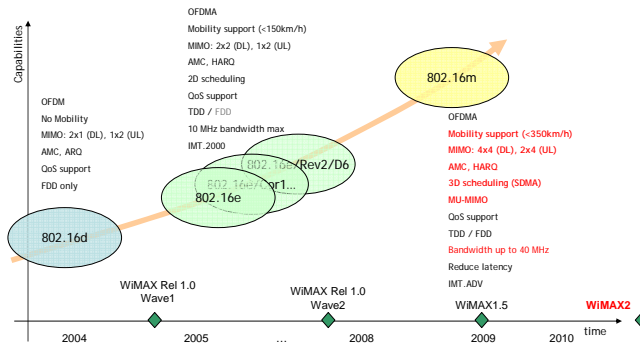
SUPELEC  
Université Catholique de Louvain  
University of Leeds

Politecnico di Torino  
University of Athens (IASA)  
Kadir Has University

## Technical Approach

### WP1: Project Management

This work-package ensures that the project is correctly driven and meets its objectives, especially with respect to innovation, dissemination and contribution to the IEEE 802.16m Task Group.



### WP2: Dissemination, Market Business Analysis, Exploitation and Dissemination

This work-package coordinates the dissemination of the collective work towards high-ranking international conferences, standardization groups and targeted events. By targeted dissemination actions, it maximizes the impact and the visibility of WiMAGIC outcomes.

### WP3: System Requirements and System-Level Design

This work-package monitors and analyzes the requirements expressed by standardization groups in order to steer the technical work of WiMAGIC in the direction of most potential relevance. It guarantees a global coherency among the other work-packages and proposes a high-level system view.

### WP4: PHY Layer

This is the main work-package of the project. In order to meet the requirements of 16m and even goes beyond (in terms of mobility support, data rate or power consumption for instance), novel techniques will be investigated to enhance PHY layer performance, covering enhanced MIMO strategies, advanced synchronization and channel estimation techniques, power amplifier non-linearity mitigation for MIMO OFDM systems, adaptive modulation and coding, and multiuser transmission techniques.

### WP5: MAC and Higher Layers, Cross-Layer Optimization

This work-package consists of some highly specialized tasks related to specific topics which we think have an important impact on the performance of the overall system. WP5 focuses on MAC layer topics as hybrid ARQ (HARQ) and adaptive radio resource management (RRM), but also on cross-layer design for optimizing video transmission and studies on the network deployment of next generation broadband wireless systems.

### WP6: Simulation Platform

In order to facilitate the benchmarking of the techniques developed in WP4, this work-package is the place where the partners develop their simulation capability, sharing simulation codes and knowhow, and building together a simple but common tool for performance assessment. Moreover, simulations will support the development of a prototype within WP7.

### WP7: Prototyping and Trials

To overcome the limitation of simulations, a prototype of main WiMAGIC features is built in this work-package leading to lab testing and true performance evaluation.



For more information about **WiMAGIC**, visit [www.wimagic.eu](http://www.wimagic.eu)