1. *Interested institution:*

Universitat Politecnica de Catalunya - BarcelonaTech
Department of Network Engineering
Wireless Networks Group

2. *Brief Description of the Institution*

Universitat Politecnica de Catalunya (UPC) is a public institution dedicated to research and education, with an International Campus of Excellence Award by the Spanish Ministry. Through its technical programs in science, engineering and architecture, UPC offers 68 undergraduate and 116 graduate programs, including the 25 PhD programs with an Excellence award. In QS World University Ranking, UPC is ranked 1st in Spain in Engineering & Technology category and 17th in Europe. Research is an important pillar in UPC, with an annual R&D project budget of approx. 50M€. Currently, UPC is in the top three Spanish universities in terms of participation in EU-funded research projects.

Wireless Networks Group (WNG) of UPC has been carrying out research and innovation activities in ICT domain, specializing in wireless communication and networking areas since 1988. WNG has developed numerous R&D projects for industry, such as for Vodafone, Endesa (Enel), Alstom, HP Labs, Orange, SEAT and Nokia. Moreover, through publicly funded projects from European Commission and Spanish Government, WNG has been improving the state of the art in several areas. Members of the group have been part of standardization efforts in WiFi Alliance, IEEE, ISO, IETF and have participated in the development of several standards.

WNG assesses and improves the state of the art through test-bed evaluations (e.g. [1], [2]), computer simulations (e.g. [3,4]), mathematical analysis (e.g. [5]), and standardization efforts (e.g. [6]).

[1] “Networking Solutions for Connecting Bluetooth Low Energy Enabled Machines to the Internet of Things”, *IEEE Network Magazine*, 2014.
[2] “A Holistic Approach to ZigBee Performance Enhancement for Home Automation Networks,” *Sensors*, 2014.
[3] “Token-MAC: A Fair MAC Protocol for Passive RFID Systems“, *IEEE Transactions on Mobile Computing*, 2014.
[4] “Has Time Come to Switch From Duty-Cycled MAC Protocols to Wake-Up Radio for Wireless Sensor Networks?”, *IEEE/ACM Transactions on Networking*, 2015.
[5] “Modeling the Maximum Throughput of Bluetooth Low Energy in an Error-prone Link,” *IEEE Communications Letters*, 2011.
[6] “Problem Statement and Requirements for 6LoWPAN Routing”, *RFC 6606*, May 2012.

3. *Please tick the areas of research (as established in Marie Sklodowska Curie Actions)*

☐ Chemistry (CHE)	☐ Environmental Sciences and Geology (ENV)
☐ Social Sciences and Humanities (SOC)	☐ Life Sciences (LIF)
☐ Economic Sciences (ECO)	☐ Mathematics (MAT)
☒ Information Science and Engineering (ENG)	☐ Physics (PHY)

4. *Research / Project Description*

Ultra Low-Power Communication Enabler: Wake-up Radio

Energy efficient operation is a challenge for wireless networks. A common method employed for this purpose is duty-cycled operation, which extends battery lifetime, yet, incurs several types of energy wastes and challenges. A very promising and recent idea is the use of Wake-up Radio (WuR), where the main Microcontroller Unit (MCU) and transceiver, i.e. the two most energy consuming elements, are kept in energy-saving mode until a special signal from another node is received by an attached, secondary, ultra-low power receiver. In this work, we will study the integration of WuR to potential systems (WSN, VLC, WiFi, etc.) to achieve energy efficient operation of these systems. Imagine that your mobile phone turns itself off till a wake-up call is received from a base station or vice versa.

WiFi for Internet of Things?

The new standard IEEE 802.11ah promises to support billions of Internet of Things (IoT) nodes expected to arrive in the upcoming couple of years. The question is if this recent standard ready for this. Through comparative performance evaluations, we will analyze its advantages and limitations, and propose improvements for its integration and co-existence with current wireless systems.

Software Defined Networking for Internet of Things

Two major emerging networking trends, Software-defined networking (SDN) and Internet of Things (IoT) will be combined in this work to provide flexibility, interoperability and efficiency to IoT systems.

5. *Who can apply?*

At the deadline for the submission of proposals (10/09/2015), researchers (*):

- shall be in possession of a doctoral degree or have at least four years of full-time equivalent research experience in telecommunications engineering, computer engineering, or from a related discipline.

- must not have resided or carried out their main activities in the country of Spain for more than 12 months in the 3 years immediately prior to the abovementioned deadline.

6. *Contact person*

Dr. Ilker Demirkol
ilker.demirkol@entel.upc.edu
http://www-entel.upc.edu/ilker.demirkol/

7. *Applications: documents to be submitted and deadlines*

Curriculum Vitae (including the list of publications)
Cover Letter (highlighting the candidate's background and skills)
Reference Letters
Deadline to submit: 30th June, 2015

Please note that:

- Deadline of the next call for proposals for Marie Sklodowska – Curie Individual Fellowships is **September, 10th 2015.**
- Oficina Europea is only responsible for the display of the expressions of interests received by the institutions; further contact and information requests will take place directly between the host institutions and the interested researchers.

(*) Further details on the Call and additional eligibility criteria can be found at the Participants´Portal