5 PhD positions in the EU Horizon 2020 MSCA Project ENLIGHT'EM

Would you like to work on a **new disruptive technology** that takes full advantage of the low-energy footprint of **LEDs** to design the next generation of Internet-of-Things (IoT) networks?

The ENLIGHT'EM training network will prepare the next generation of talented European innovators for both industrial and research positions, and will design new communication technologies using LEDs and Visible Light Communications for sustainable development. Besides advancing the next generation of communication technologies, the training network will help provide added economic value for the society, in line with the seventeen *Sustainable Development Goals* defined by the United Nations to end poverty, fight inequality and injustice, and tackle climate change by 2030.

Applications are invited for 5 PhD positions ("Early Stage Researchers", ESRs) to be funded by the Marie-Skłodowska-Curie Innovative Training Network ENLIGHT'EM within the Horizon 2020 Programme of the European Commission. The ESRs in ENLIGHT'EM will become leading experts in a diverse array of sub-fields leading to the integration of low-energy VLC into the IoT. The ESRs will **acquire and hone cutting-edge skills contributing to IoT areas** such as connected energy, light, living and cities through a multidisciplinary network of experts from academia, research institutes, SMEs, and large companies.

Key dates

- 16-01-2019: Launch 5 PhD positions for 10 Early-Stage Researchers (ESRs)
- **29-02-2020**: **Deadline for on-line applications** (or as soon as the positions are filled)
- 01-03-2020: Target starting date for ESR contracts

Vacancies

- **Nº of vacancies**: 5
- **Research fields**: IoT, Visible Light Communications, energy-efficient design, integration with RF, emerging applications.
- **Career stage**: Early Stage Researcher (ESR) or 0-4 yrs (Post Graduate)
- **Benefits and salary**: The successful candidates will receive an **attractive salary in accordance with the MSCA regulations** for Early Stage Researchers. The fellowship will consist of a competitive salary of about € 46,440 (before taxes) per year, with country correction factor that depends on the cost of living in different EU Member States, plus an additional allowance in case of family obligations, and an allocation for research and training costs. The exact (net) salary will be confirmed upon appointment and depends on local tax regulations. The guaranteed **PhD funding covered by the training network is for 36 months** (additional funding is possible, depending on the local supervisor, and in accordance with the regular PhD time in the host country). In addition to their scientific projects, all fellows will benefit from continuing education, including internships and secondments, a variety of training modules, as well as transferable skill courses and active participation in workshops and conferences.

Recruitment and requirements
All applications proceed through the on-line recruitment portal on the **https://enlightem.eu** website. Candidates can apply electronically to **at most three PhD positions**, indicating their order of preference. Requested application details include a **detailed CV,** as well as **Bachelor and Master degree transcripts**. The selected candidates are evaluated and interviewed by the Recruitment Committee. ENLIGHT'EM is strongly committed to promoting equal opportunities and gender balance as part of the recruitment strategy. Applicants need to fully respect three eligibility criteria (to be demonstrated in the CV): 1. Early-stage researchers (ESR) are those who are, at the time of recruitment, in the **first four years (full-time equivalent) of their research careers**. This is measured from the date when they obtained the degree which formally entitles them to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the research training is provided, irrespective of whether or not a doctorate was envisaged. 2. **International mobility**: ESRs are required to undertake trans-national mobility (i.e., move from one country to another) when taking up the appointment. At the time of recruitment, *researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of their hiring organization for more than 12 months in the 3 years immediately prior to their recruitment*. For instance, a researcher who has resided in Spain for 15 months in the last three years cannot apply to any of the three PhD positions in Spain, but can apply to the any of the other 12 PhD positions. Compulsory national service and short stays, such as holidays, are not taken into account. 3. **English language proficiency**: ESRs must demonstrate proficiency in both written and spoken English. This is mandatory for the ESRs to take full advantage of the training program.

The 5 available PhD positions

ESR 2: Low-Power VLC Transmitter Design		
Host: pureLiFi (United Kingdom)	**Lead Supervisor**: Dr. M. Afgani	**Duration:** 36 months
Profile: The ESR will design and develop a novel LED driver and amplifier architecture that significantly reduces power loss to no detriment of the spectrum efficiency of the existing solutions. The ESR shall also review novel receiver structures that maximise sensitivity and therefore also help reduce power requirement at the transmitter. A number of prototypes and development cycles will be required to achieve the ideal combination of modulation bandwidth, current capacity, and power efficiency. An improvement of at least one order of magnitude in power efficiency will be targeted.		

ESR 6: : Resilient LiFi for IoT		
Host: University of Edinburgh (United Kingdom)	**Lead Supervisor**: Dr. H. Haas	**Duration:** 36 months
Profile: This ESR will address scenarios with random obstruction, random orientation and multiple reflections, which are typical of the IoT. These effects will be modelled and accounted for in the overall system performance and energy budget analysis. The ESR will also investigate the coordination of multiple APs within an ultra-dense LiFi network architecture and seamless handover techniques when a node moves from one AP to another.		

ESR 7: Algorithms for Joint Reconfiguration of Smart Lighting and LiFi Access Points in Dense Deployments		
Host: pureLiFi (United Kingdom)	**Lead Supervisor**: Dr. M. Afgani	**Duration:** 36 months
Profile: The primary task of this ESR will be to analyse the existing approaches used in smart building and smart lighting, and evaluate the applicability of these algorithms to control the LiFi access point jointly with the lighting system. LiFi connectivity requirements will be compared to those of the illumination control and categorized for further analysis and for developing appropriate alternative solutions. The performances of each solution will be thoroughly analysed and subsequently tested on a real LiFi platform.		

ESR 14: Optical frontend design for Vehicle-to-Anything (V2X) communication		
Host: Ford Otosan (Turkey)	**Lead Supervisor**: Dr. E. Kınav	**Duration:** 36 months
Profile: We will design, implement, and validate an optical front-end design for optical V2X communication. Since vehicles are constantly moving, an optical frontend with multi-directional characteristics will increase the reliability of the communication link. Such frontend will not require an exact optical alignment between the sender and the receiver, e.g. between vehicles or between vehicles and infrastructure.		

ESR 15: Low-power Architectures for Reliable VLC in Transportation and Manufacturing		
Host: Ford Otosan (Turkey)	**Lead Supervisor**: Dr. E. Kınav	**Duration:** 36 months
Profiles: We will implement novel architectures and front-end designs to enable low-power visible-light IoT devices for reliable transportation and manufacturing. This will require an investigation on HW architectures and front-end design options, as well as, a comprehensive use case requirement analysis. The analog front-end and the optics (e.g. lenses and concentrators), will be designed and optimized to reduce the power consumption for the use case at hand. The proposed solutions will be evaluated in terms of achievable performance and complexity trade-offs (backed-up by numerical results). We will implement a proof-of-concept including an experimental verification for the most promising solution.