

EXCILIGHT

Donor-Acceptor light emitting exciplexes as materials for easily to tailor ultra-efficient OLED lighting

Background

Artificial lighting is a global and growing industry. New forms of efficient solid state lighting (SSL) in particular are rapidly gaining a market share. New OLED technologies can revolutionise this industry as they have done in displays because of their potential flexible structure, infinite tailoring of their properties, efficiency and high colour quality. In order to fully benefit from this huge market potential, Europe's academia and industry are eager to develop new technologies and recruit highly qualified staff.

The high demand for OLED SSL lighting will however place drastic demand on the use of very rare and expensive iridium. EXCILIGHT will address these difficulties by exploring exciplex emitters and thermally activated delayed fluorescence in OLEDs that will enable the industry to replace Ir complexes whilst retaining ultrahigh efficiency and giving new possibilities to simplify OLED design. The EXCILIGHT network will train 15 Early Stage Researchers with an innovative and multidisciplinary approach to be a new generation of scientists while at the same time integrating this new technology into the industry.

Objectives

The overarching aim of this project is to develop "Donor-Acceptor light emitting exciplexes as materials which can be easily tailored for ultra-efficient OLED lighting" through the implementation of the multi-disciplinary EXCILIGHT ITN that combines the following training and A&T objectives:

- Training of 15 European PhDs (ESRs) in a innovative and multidisciplinary way. The ESRs will carry out the majority of their research work at their home institutions and spend two secondments at other partners of the network. Another secondment will be spent working in industry to impart knowledge transfer and gain experience in the industrial research culture.
- Synthesis and characterisation of donor acceptor organic materials.
- Photophysical characterisation of exciplex systems and the TADF mechanism.
- Electrochemical and spectroelectrochemical characterisation of donor and acceptor organic materials.
- TADF OLED device fabrication and characterisation.

Funding Programme:



Horizon 2020 Framework Programme of the European Union

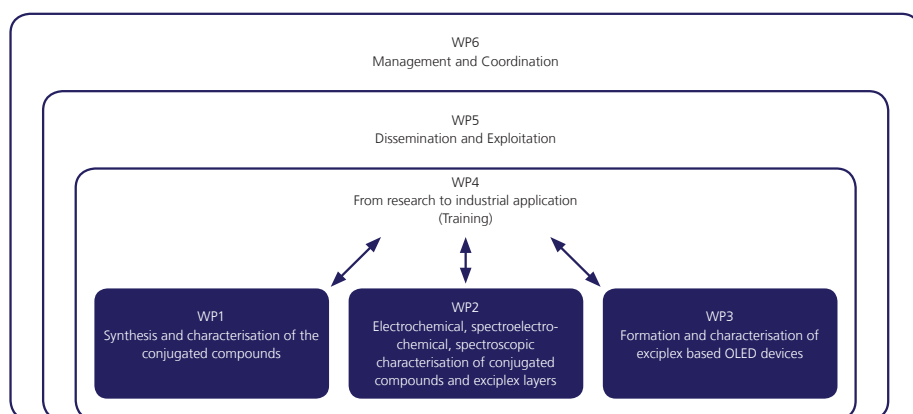
Project Duration:
01/09/2015 – 31/08/2019

Project Budget:
3.7 million euro

Project Website:
www.excilight.eu

Activities

EXCILIGHT's research is based on six work packages and three main scientific objectives:



The network will allow the ESRs to gain experience working with all stages of the industrial chain from materials production to lighting manufacture in tandem with their academic studies. In addition, they will spend time in partner research labs, experiencing different research environments and cultures, making them well-rounded 'European' researchers.

Impact

EXCILIGHT will train a multidisciplinary group of 15 ESRs to meet the future needs of academia and industry in the rapidly emerging area of OLED. The researchers will acquire knowledge in research and development of new materials for OLED lighting, but also a broad experience in team working, working with industrial and academic setting in several EU Member States, to become the research leaders of the future in OLED.

The results of EXCILIGHT will have an impact on the general public, on industry and on future research:

- The general public will benefit from new, bendy OLED devices which use limited Iridium, making them environmentally friendly as well as lower-cost.
- A new generation of scientists with new sets of techniques to combine will be crucial for future research in OLED.
- A new generation of scientist will strengthen the European electronics industry.

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- Centre for Nanotechnology and Smart Materials, PT
- Ossila Ltd., GB
- AIXTRON SE, DE
- Ecole Normale Supérieure de Cachan, FR