



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

UAB
Universitat Autònoma
de Barcelona



UNIVERSITAT DE
BARCELONA

ICFO
The Institute
of Photonic
Sciences



Erasmus+

PHOTONICS - EUROPHOTONICS MASTER COURSE

PROPOSAL FOR A MASTER THESIS

Dates: February 1st, 2023 – September 30th, 2023

Laboratory: Optical packaging lab of CD6

Institution: CD6-UPC

City, Country: Terrassa, Spain

Title of the master thesis: Novel optical packaging of silicon photonics emitter to optimize streetlight visual comfort

Name of the master thesis supervisor and co-supervisor: Nuria Tomas (supervisor) and Carles Pizarro (co-supervisor)

Email address nuria.tomas@upc.edu

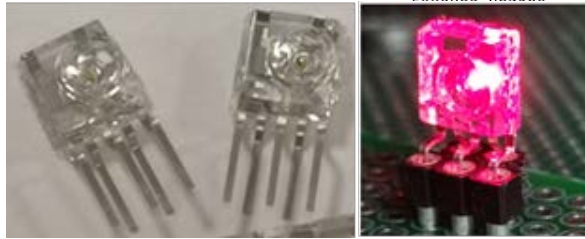
Phone number: 654138543

Mail address: carles.pizarro.bondia@upc.edu

Keywords: Optical design, Optical Packaging, Comfort visual, Streetlighting

Summary of the subject (maximum 1 page):

The present proposed work is part of the Optical packaging lab of CD6, where a pilot line of optical packaging is taking place. This pilot line has been developed in the European project 820661-FLOIM - Flexible Optical Injection Moulding of optoelectronic devices-. FLOIM project has developed innovative manufacturing chains, adequate for complex optoelectronic device designs, with dramatically reducing its number and the time consumption for assembly operations, which is critical. For automated flexible optical injection overmoulding for flexible mass production using thermoplastics. We can see at next figure the Fiber Optical transceiver (FOT) manufactured.



Extremely compact optical transceiver for
optical communication. FOT-Fiber Optical
transceiver

The incorporation of silicon photonics emitter technology in light engines for streetlighting has reduced electrical consumption and maintenance. However, it has caused a problem of visual comfort. The silicon photonics emitter concentrates high energy density into small areas, which causes glare and visual discomfort.

In the present work, a new design is proposed including a novel optical packaging of silicon photonics emitter using FLOIM manufacturing technology in which the glare is minimized and the visual comfort is increased without reducing the streetlight efficiency

Objetives:

- To determine the parameters that define efficiency and visual comfort for streetlight.
- To obtain the mathematical quality function that represents the performance of visual comfort and efficiency of streetlight.
- To design and optimize an optical packaging of silicon photonics emitter using FLOIM manufacturing technology in order to increase the visual comfort of streetlighting without reducing its efficiency.

Additional information (if needed):

- Required skills:
- Miscellaneous: