Research Field And Department	Optical Wireless Communications / Department of Signal Theory and Communications
Supervisor	Borja Genovés Guzmán
Title of the Work	Implementation of an optical OFDM system with software-defined radio (SDR) for optical wireless communications

Abstract:
Optical Wireless Communication (OWC) has recently emerged as a compelling technology to complement traditional Radio Frequency (RF) systems. As the spectrum used by RF communication systems approaches saturation, OWC offers a promising solution to meet future wireless data demands.
During this period, the student will design and prototype a functional optical wireless communication system utilizing a **Software-Defined Radio (SDR)** platform. This provides a unique opportunity for comprehensive training, combining concepts from **communications** (e.g., modulation, demodulation, and performance metrics) with **electronics and system design**. This experience will significantly **strengthen** the student's profile and marketability for future employment.

Main Tasks to Carry Out:

1) **USRP Setup and Configuration**: Two USRPs will be connected via cable for communication. Alternatively, a single USRP can be configured to function as both a Transmitter (TX) and Receiver (RX). Crucially, the existing daughterboards must first be replaced with the LFTX/LFRX boards.
2) **Optical Wireless System Integration**: If sufficient progress is made, the full optical wireless setup will be established, integrating components such as an amplifier, a bias-tee, an LED array, and a photodetector.
3) **Performance Analysis**: Analyze the results of implementing various optical Orthogonal Frequency-Division Multiplexing (OFDM) modulation schemes.

If promising results are achieved, we will discuss the possibility of publishing them in a prestigious conference or journal with the student.

References/Bibliography if required
N/A