



**Department of Electrical and Computer Engineering**

**Title:** Photonic Integrated Circuit-based Micro-LIDAR for precision and safe landing on planetary bodies

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***Room: XOD02-013***

**Abstract:** LIDAR and laser rangefinders are critical instruments for planetary landing and navigation in comet/asteroid missions, supporting spacecraft navigation from flyby to landing. In order to meet current and emerging SWaP requirements of the NewSpace era and the trend towards compact and reconfigurable payloads, there is a need to employ smaller and lower mass technology solutions that are compatible with Small Sats, CubeSats and emerging NanoSats. Photonic integrated circuit (PIC) technology offers a path to the required SWaP reduction, along with increased functionality. In this regard, an extensive European (and global) value chain has been developed, primarily serving the needs of the data centre & fibre communications sector, in addition to environmental, bio-sensors and automotive applications. The aim of this work was to investigate the feasibility of PIC technology for micro-LiDARs for landing on celestial bodies by replacing discrete optical and optoelectronic components with PIC-based components.

**Biography:** Chrysovalantis Avraam received his B.Sc. degree in Electrical Engineering from the University of Cyprus (UCY) in 2019, specialising in antennas and optics. During his final year project, he designed a 60 GHz Doppler radar system for vital signs monitoring, and an X-band microwave photonic radar measure speed. Since September 2020 he is a Ph.D student at the University of Cyprus (Department of Electrical and Computer Engineering) and is working at the EMPHASIS Research Centre at UCY as a Special Scientist. He is currently engaged in a project funded by ESA, in which he is responsible for scoping PIC technology platforms, identifying required PIC component specifications and producing a preliminary PIC design for an FMCW LIDAR.