



## **Photonis**

*Technische Informatici (Technische Informatica), Engineering 2 (Technische Bedrijfskunde, Toegepaste Wiskunde), Life Science (Biologie en Medisch Laboratoriumonderzoek, Chemie),*

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"PHOTONIS is a leading multinational high-technology group, manufacturing electro-optic components used in the detection of ions, electrons and photons. We innovate and engineer quality components for integration into a variety of applications such as night vision optics, digital cameras, mass spectrometry, physics research, space exploration and many others"

### **Stage: periode flexibel**

"INTERNSHIP"

Electron Radiation hardness of single photon counting detectors for Space application

### **Context**

MCP-PMT devices are highly used in medical and scientific domains to detect low intensity photon fluxes by counting single photons arriving to the detector. As examples of these applications we can mention time-resolve fluorescence spectroscopy, Cherenkov detectors, and LIDAR for space applications. A MCP-PMT is a vacuum device consisting of a photocathode, absorbing the light and emitting photoelectrons, typically two MCPs, multiplying the electrons from the photocathode by a factor of about  $10^5$  -  $10^6$  and an anode to collect the output bunches of electrons. For space application specific requirements are given around radiation hardness, both for protons and electrons. In a first project we have been testing the proton radiation behavior of our device and in this project, we would like to characterize the electron radiation response of our device.

## **The Job**

The subject for the internship is participating in the planning of the experiments at the facility, prepare the beam test, do the measurements and characterization of the detectors before and after the tests and also during the radiation tests. It also will require to learn the experimental characterization techniques, which include quantum-efficiency spectroscopy, photoluminescence spectroscopy and pulse-height distribution techniques. In the case of in situ measurements it will be required to program a remote control of the experiments. At the end of the internship project the final report has to be presented which also shall include theoretical estimations (based on literature search and simplified calculations) of possible degradation radiation impacts on the MCP-PMT characteristics.