



GaNforPro

(GaN for Proton-therapy) PhD proposal

Context

Proton therapy is currently the most advanced radiation therapy available for cancer treatment. Due to its specificities, proton beam can destroy cancer cells without attacking the surrounding healthy tissue. However, the proton beam position and shape must be accurately measured before each radiation since it directly affects the treatment efficiency and the eventual collateral damages. We propose a new calibration approach by developing robust GaN semiconductor detector arrays allowing to increase the control of the irradiated dose while strongly reducing the system complexity and cost. This innovation may thus drastically improve the proton therapy.

In this context, the PhD. student will participate at all steps required to elaborate the GaN detectors at CRHEA-CNRS (<http://www.crhea.cnrs.fr>). He/she will benefit of the access to the regional technological platform CRHEATEC in order to develop the different processes of these devices fabrication. In a second period, he/she will characterize the devices directly on the medical site using the proton beam of the IMPT-CAL (Institut Méditerranéen de Proton Thérapie – Centre Antoine Lacassagne, <https://www.protontherapie.fr>). Subsequently, the student will spend 6 months in Professor Wieck's group at the University of Bochum to manufacture complete arrays of detectors but also to develop their interfacing with a commercially available readout circuit based on silicon.

This thesis project offers a unique opportunity of contributing to the complete development of a novel electronic device dedicated to proton therapy, currently a very hot field of cancer treatment. This dual expertise (semiconductor electronic and medical field) represents a real added value for future career development.

Instruction to apply

This PhD. proposal has already been selected by the University Cote d'Azur (UCA) and will received the funding from the European Union's Horizon 2020 research and innovation program under the Marie Skłodowska-Curie grant. All the modalities and eligibility details to the boostUrCareer PhD. program can be find at this address:

<http://univ-cotedazur.fr/fr/recherche/boosturcareer#.XjrFWbfQiUk>

If you are interested, please send a CV and a motivation letter to Dr. Maxime HUGUES (mh@crhea.cnrs.fr) before the submission of your candidature on the boostUrCareer website.