MASTER 2 INTERNSHIP 2021

LABORATOIRE: GROUPE D'ETUDES DE LA MATIERE CONDENSEE (GEMAC) UMR 8635 UNIVERSITE DE VERSAILLES ST QUENTIN EN Y. - CNRS ADRESSE: 45 AVENUE DES ETATS-UNIS, 78035 VERSAILLES CEDEX DIRECTEUR DU LABORATOIRE: DR. ALLAIN LUSSON	UNIVERSITÉ DE VERSAILLES ST-QUENTIN-EN-YVELINES université PARIS-SACLAY
RESPONSABLE(S) DU STAGE : DR. EKATERINE CHIKOIDZE TÉLÉPHONE : 01 3925 5025 E-MAIL : EKATERINE.CHIKOIDZE@UVSQ.FR	GEMaC Groupe d'Etude de la Matière Condensée www.gemac.uvsq.fr

Ultra Wide Bandgap Ga_2O_3 to reduce carbon footprint

Challenge: At the global level, COP21 and the Paris Agreement have recently set ambitious targets which will stimulate huge investments in low-carbon energy solutions in the next decades and, at the same time, demand a fundamental shift in technology, energy, economics, finance and ultimately society as a whole. Two separate developments are needed to secure stable energy supplies in the near future: Widespread adoption of revolutionary **sustainable generation technologies and Efficient Energy Use**. The one very concrete way to reach the target of Energy Efficiency is to turn to more efficient power electronics. Alternative to Si technology which reaches it's limit of operation a new generation of Wide Band Gap (WBG) semiconductors as SiC and GaN start to be applied, which have the capability to operate at higher temperatures, switching frequencies, higher voltages. To extend the range of high voltage application Ultra wide band gap Ga2O3 is very promising material. Proposed internship work will be a part of international collaborative project :" « ultra-wide band gap Gallium Oxide:from material to devices". The objective is understanding opto-electronic properties of material for it's successful application in **power electronics devices for electrical vehicles/trains/electrical aircrafts and for renewable energy sector (Wind turbines and PV converters).**

Goal of the internship: study optoelectronic properties of Ga_2O_3 thin films elaborated in GEMaC and in Kyma Technologies, USA .

Developed competences and skills during the internship:

-Technical: Preparation of electrical contacts. Measurements: Electrical and magneto transport measurements; Seebeck Effect; Optical transmittance; Participation in the experimental development of new option of electrical measurements.

-Theoretical: Background in Material science of Oxides; Data validation and analyses; Writing scientific reports; Oral presentation; participating in scientific meetings; writing scientific articles;

-Communication: Work in scientific consortium: in tight collaboration with PhD student(GEMaC) and partners from Spain ,UK and USA

REQUIRED SKILLS: Strong background in solid state physics/semiconductors science; motivation to learn power electronics device principals and applications. Willing perform experimental work;Strong interest into material science and electronics; English language (read, write); Good skill of communication. Well organized, capability respect deadlines, ability to share, work in team; Interest regarding industrial partnership/market analyses will be greatly appreciated.

PAYEMENT : 520 EURO/MONTS

PHD PERSPECTIVE: Will be determined during the internship