Postdoctoral position at the LTM laboratory in Grenoble

Advanced chemical characterization of III-V heterostructures for optoelectronics and RF electronic components

Job description:

A postdoctoral research position is offered within the framework of a collaboration between CNRS-LTM and CEA-Leti funded by the MINOS LabEx. The candidate will work at the Microelectronics Technologies Laboratory (LTM), in close collaboration with the Nanocharacterization Platform (PFNC) of CEA-Grenoble (Leti Institute). The appointment has a fixed duration of 24 months, starting in September 2023.

You will be involved in an exciting project which will focus on improving the epitaxial growth of III-V semiconductors to find relevant technological solutions in order to obtain III-V heterostructures with abrupt interfaces and high dopants concentrations while minimizing inter-diffusion phenomena. There is a clear need to know how the III-V heterostructures chemical properties impact on the device electrical performances. The selected III-V semiconductors will be indium gallium arsenide and indium phosphide which exhibit excellent properties for optoelectronic or communication applications.

You will be mainly focused on understanding how the epitaxy parameters influence the dopants concentrations and chemical changes at critical interfaces, as well as changes of the electrical properties. This will require the development of a methodology for a complete chemical characterization of the III-V heterostructures, based on combining high energy X-ray photoemission (HAXPES) and secondary ions mass spectrometry (SIMS/ToF-SIMS). The work will consist in optimizing the experimental protocols for arsenide and phosphide components. Results from both techniques will be correlated to get a complete picture of the structures (concentration profiles, dopants, binding states, interfaces composition). This information will be used to improve the epitaxy processes.

Scientific environment:

The candidate will work within the LTM (CNRS) and CEA-Leti, both members of the Grenoble Alpes University (UGA), located in the heart of an exceptional scientific environment, the Minatec Campus in Grenoble. Part of the activity will be performed at the Nanocaracterization Platform (PFNC), within the SMCP laboratory from the CEA-Leti institute. The candidate will benefit from this unique environment to extend its professional skills and widen his(her) contacts to favor his(her) future professional integration.

The LTM houses state-of-the-art experimental instruments such as an industrial MOCVD deposition reactor for the epitaxy of III-V semiconductors. Besides, the PFNC has strong expertise in material characterization together with state-of-the-art tools including one SIMS instrument, two ToF-SIMS, one HAXPES tool and several TEM and AFM instruments.

Application procedure:

Please send motivation letter and CV to:

Franck BASSANI, LTM-CNRS, franck.bassani@cea.fr, Tel : 0438786511
Eugénie MARTINEZ, CEA-Leti/DPFT/SMCP, eugénie.martinez@cea.fr, Tel : 0438781951
Marc VEILLEROT, CEA-Leti/DPFT/SMCP, marc.veillerot@cea.fr, Tel : 0438784193