PhD student – High-k Oxide Characterization on Si and Wide Bandgap Substrates (m/w/div)*

Advanced semiconductor power devices are a key enabler for the technological transformation towards a sustainable world. Using regenerative energy sources or constructing modern electric vehicles is only possible by using power transistors based on Silicon or wide bandgap substrates. Using so-called high-k oxides as a gate oxide for these transistors could be a huge step in further enhancing the performance of these devices. NaMLab is very experienced with high-k oxides and works with various industry partners in that field. In the present PhD position, we will focus on various combinations of novel thick high-k oxides on Silicon and wide bandgap substrates.

Tasks

- Fabrication of various MOS capacitors with ALD-high-k oxides
- Electrical and physical characterization of these films
- Detailed reliability characterization
- Dynamic tests (switching) of these MOS structures
- ALD for TiN-top electrode and its physical end electrical characterization
- Working in an interdisciplinary team together with other PhD students and technicians.
- Alignment with the industry partner

Your Qualifications:

- Master in physics, material science, electrical engineering or similar
- Strong perseverance in experimental work
- Self-organized and conscientious way of working
- Basic understanding of semiconductor device physics
- Fluent in German or English
- Ability to work in a team

Timeline:

- Start date: as soon as possible after project release (expected beginning of May)
- Target duration: three years
- Full time position

We offer

- an inspiring international and open atmosphere
- a team consisting of a well-balanced mixture of PhD students, experienced Post-Docs from different fields and process/facility technicians
- focused guidance throughout the project
- on-the-job-training
- access to various high-end characterization and fabrication tools
- collaboration with our industry partner

NaMLab

NaMLab gGmbH is a research organization and associated institute of the Technical University Dresden. NaMLab provides industry-oriented and basic research in material science for electronic devices. Based on its key expertise in dielectric materials for semiconductor devices NaMLab focuses on the integration and application of materials applied to reconfigurable and energy efficiency devices. NaMLab‘s approach of placing the device rather than the material system itself into the center of its research activities differentiates it from other world-class material research activities in the Dresden area. Additionally, it allows taking full advantage of the already existing expertise by forming orthogonal consortia. It therefore fills the gap between basic materials research and its application towards electronic circuits and systems.

Check also our video about working on capacitors at Namlab:
https://www.youtube.com/watch?v=_e8pqf5RTqw

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