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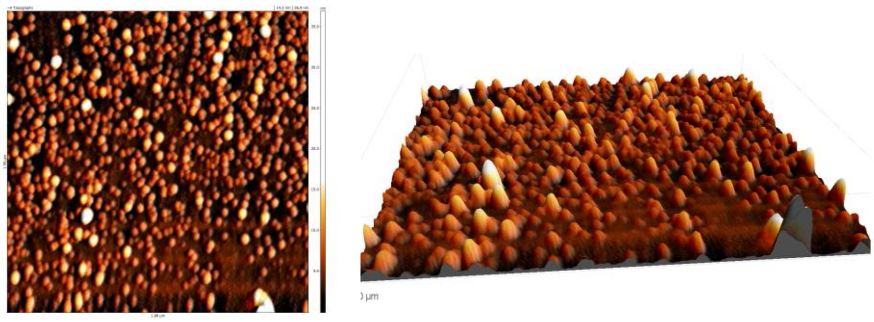
Bachelor thesis topic

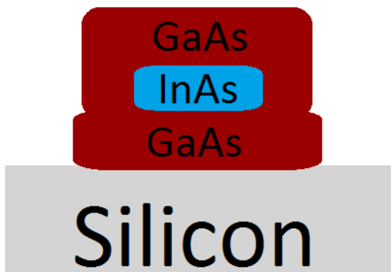
Morphological Characterization of Core/Shell InAs/GaAs Quantum Dots on Silicon

Silicon is the most important material in semiconductor electronics nowadays, because of its many advantageous properties. On the other hand, because of its indirect band gap, silicon is not viable for optoelectronic devices. Thus, direct band gap materials, like the III/V compound semiconductors, are the main materials for the fabrication of optoelectronic devices.

Our approach is to grow *optically active* III/V Quantum Dots with a *high density directly* on silicon substrates to combine the advantages of silicon with the optoelectronic properties of III/V Quantum Dots. For easier implementation of the Quantum Dots into silicon, we grow a structure consisting of an InAs core with a GaAs shell.



AFM images of high density GaAs Quantum Dots as bases for the core/shell structures



schematic view of the proposed core/shell structure

The major tasks of this bachelor work include:

- morphological characterization of different steps of the growth process with the Atomic Force Microscope in our groups clean room
- statistical evaluation of density and size distribution for different growth parameters

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