DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Semiconductor nanowires (NWs) attracted much attention in last years as promising building blocks for construction of modern microelectronic devices. The main reason is that very high quality monocrystalline materials can be obtained in a form of NWs, even if they are grown on lattice mismatched or amorphous substrates. Moreover, a surface to volume ratio in NWs is very large, which makes them ideally suitable for sensor or light emitter applications.

The main aim of the project is to study mechanisms of spontaneous (i.e. without any external catalyst) nucleation, and then growth by plasma-assisted MBE (PAMBE) of nanowires (NWs) made of GaN and other nitride semiconductors. Two techniques, namely quadrupole mass spectroscopy (QMS) and reflection high energy electron diffraction (RHEED), will be used to analyze evolution of substrate surface during the growth and *in-situ* measurements of NW nucleation kinetics. Nowadays RHEED is used only to measure NW incubation time. On the contrary, we plan to show that the technique allows monitoring and analysis of all stages of NW growth. Having RHEED and QMS installed in our MBE chamber we will compare applicability of both tools to describe GaN NW growth by PAMBE indicating their weak and strong points. Moreover, we will use QMS for studies of selective area growth of GaN NWs. It is expected that it will help to determine easily a growth window, i.e. conditions of temperature and III/V ratio, when GaN nucleation on the mask is negligible while GaN growth inside the openings in the mask is still possible.