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**"Workshop on Ion Beam Studies of Nanomaterials:
Synthesis, Modification and Characterization"**

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Nanostructures by Ion Beams

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The lecture will give an overview about ion beam techniques, including conventional ion implantation, ion beam synthesis of nanoparticles and ion implantation with fine-focused ion beams (FIB) and their applications in nanotechnology. The self-organization of nanoparticles in a given ion implanted matrix is explained as phase separation of nanostructures from a super-saturated solid state through precipitation and Ostwald-ripening during subsequent thermal treatment of the ion implanted samples. A special topic will be addressed to self-organization processes of nanoparticles during ion irradiation of flat and curved solid state interfaces.

As an example of silicon nanocrystal application the fabrication of silicon nanocrystal non-volatile memories will be described.

In the outlook the fabrication possibilities of nanostructures, like nanowires and chains of nanoparticles (e.g. CoSi_2), by ion beam synthesis using a focused Co^+ ion beam will be demonstrated and possible applications will be mentioned.