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This lecture course gives an introduction to the physics of epitaxial film growth.

Lecture 1 begins with a discussion of the structure of crystal surfaces in terms of the Kossel crystal model. Key elements of the surface structure and elementary growth processes are introduced. Then different modes of epitaxial growth are discussed. The focus of the next two lectures is on the "standard" models of epitaxial growth.

In *Lecture 2*, the BCF-model of crystal growth (after Barton, Cabrera, Frank) is discussed. The general formulation of the surface diffusion problem on the growing surface is given and the solution of the diffusion problem in the case of straight vicinal steps is considered as an example.

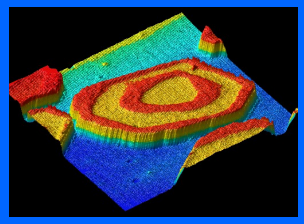
Lecture 3 introduces classical and atomistic nucleation theories. The aim of this lecture is to show how the nucleation theory helps to obtain quantitative information on the atomic scale surface processes form the nucleation experiment.

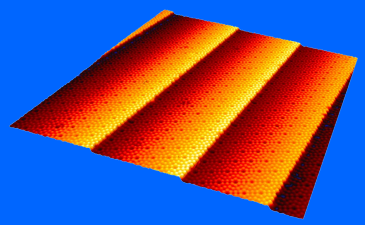
Lecture 4 is devoted to kinetic instabilities of growing surfaces. The role of the interlayer adatom transport in growth of vicinal steps and 2D islands is discussed.

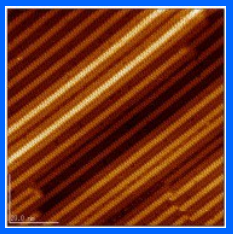
Lecture 5 discusses elastic effects in epitaxial growth. Growth instabilities due to the surface stress effect and due to the misfit strain in heteroepitaxial growth are considered. Mechanisms of the strain relaxation are described.

Lecture 6 gives a brief overview of methods used in computer simulations of epitaxial growth.

Lecture series on the Fundamentals of epitaxial growth







Lecture 1 Surface structure and elementary growth processes	**April 16 (Tue)**
Lecture 2 Step motion	**April 22 (Mon)**
Lecture 3 Island nucleation	**April 30 (Tue)**
Lecture 4 Kinetic growth instabilities	**May 7 (Tue)**
Lecture 5 Elastic effects in epitaxial growth	**May 13 (Mon)**
Lecture 6 Computer simulations of the growth processes	**May 20 (Mon)**

Time: 13:30 – 15:00

Place: Research Institute of Electrical Communication Building 1, Room 308