



КАТЕДРА МЕТЕОРОЛОГИЯ И ГЕОФИЗИКА
ФИЗИЧЕСКИ ФАКУЛТЕТ - СУ "Св. Кл. Охридски"

Семинар „Кръстанов“

В четвъртък, 25.11.2021, 16:15 ч., онлайн

Д-р Алексей Редков

Leading researcher, Institute for Problems in Mechanical Engineering – Russian Academy of Sciences, St. Petersburg

ще изнесе доклад на тема:

Theoretical aspects of the terrace-step-kink crystal growth in multicomponent systems and some practical results on growth of widebandgap semiconductors

Резюме: In recent decades, electronics and other industries are gradually moving to new, more efficient materials and compounds, for example gallium nitride, or silicon carbide. Very complex compounds like MOFs have also received a lot of attention. The key feature of these materials is that they consist of several different elements, the atoms of which occupy nonequivalent positions in the crystal cell and are the so-called non-Kossel crystals. However, the bulk of the theoretical research was carried out using the model of a single-component simple crystal (the so-called Kossel crystal), and this basis is also frequently applied in one or another way to describe multicomponent systems using some empirical averaged parameters - diffusion coefficients, activation energies etc., found from the experiment. However, to predict multicomponent crystal growth in arbitrary conditions, it is necessary to understand how different components affect the growth and what determines such averaged coefficients. In this talk some of the theoretical approaches used to describe multicomponent BCF crystal growth in complex systems with chemical reactions [1] will be briefly discussed, as well as some effects inherent to such systems, for example nucleation of nanoislands of pure components between the steps [2], effect of advacancies, morphological instability [3], etc. The second part of the talk will be devoted to recent results of the Laboratory of phase transitions (IPME RAS) on the growth of gallium nitride on SiC-on-Si substrates using atomic substitution method [4].

[1] Redkov, A. V., Kukushkin, S. A. (2020). *Crystal Growth & Design*, 20(4), 2590-2601; [2] Redkov, A. V., Kukushkin, S. A. (2021). *Crystal Growth & Design*, 21(9), 4914-4926; [3] Kukushkin, S. A., Osipov, A. V., Redkov, A. V. (2014). *Physics of the Solid State*, 56(12), 2530-2536; [4] Kukushkin, S. A., & Osipov, A. V. (2014) *Journal of Physics D: Applied Physics*, 47(31), 313001.

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Всички заинтересовани са добре дошли!