

Discussion board

for the course “Material science in space” by Dr.Prof. P. Galenko

Lecture 1

Introduction to material science in space. Definitions.

Questions, please:

Vladimir Ankudinov: What is a limitation of a sample size to induce the homogeneous nucleation for different materials in containerless experiments?

ANSWER: there are no limitation for the sample size to initiate homogeneous nucleation, however, there is a problem to recognize homo- or heterogeneous nucleation in droplets processed in atomization and in drop tube (in Electromagnetic Levitator we always know which type of nucleation do we get because we control the nucleation process by triggering needle or spontaneously)

Vladimir Ankudinov: How the containerless facility (electromagnetic grip etc.) influences the microstructure of solidified metal?

ANSWER: the present lecture course is devoted to answer this question

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Lecture 2

Characteristic length scales

Questions, please:

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Lecture 3

Spinodal decomposition - 1

Questions, please:

Vladimir Ankudinov: To compare the theoretical predictions of spinodal decomposition in a terrestrial conditions and in microgravity we have to somehow introduce the pressure gradient in a Cahn-Hilliard model. How exactly it can be done?

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Lecture 4

Spinodal decomposition - 2

Questions, please:

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Lecture 5-6

Effect of forced convection on dendritic growth.

Questions, please:

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Lecture 7-8

Theoretical modeling of rapid solidification

Questions, please: