

# INTERNATIONAL SUMMER SCHOOL ON FUNDAMENTALS AND BASIC METHODS OF CRYSTAL GROWTH

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**Abstract:** *The “International Summer School on Fundamentals and Basic Methods of Crystal Growth”, 24<sup>th</sup> till 29<sup>th</sup>, August 2009, Braşov, Romania was organized by the Romanian Materials Science - Crystal Growth Society at Transilvania University of Braşov, under the sponsorship of the IUCr and with contribution of some prestigious international institutions. The participants were graduate and undergraduate students, post-docs and representatives from industrial laboratories. The high quality of lectures was appreciated by all the participants.*

**Key words:** *crystal growth, thin film technologies, nanotechnology.*

## 1. Introduction

The “International Summer School on Fundamentals and Basic Methods of Crystal Growth” was organized at *Transilvania* University of Braşov by the Romanian Materials Science - Crystal Growth Society; IKZ-LEIBNIZ Institute for Crystal Growth, Berlin, Germany; *Transilvania* University of Braşov; University of Bucharest - Faculty of Physics; National Institute of Materials Physics Bucharest.

The Summer School took place from 24<sup>th</sup> till 29<sup>th</sup> of August 2009 in Braşov, Romania under auspices and under the sponsorship of International Union of Crystallography (IUCr).

The objective of the Summer School was to provide a comprehensive series of lectures on theoretical and experimental aspects of growth and characterization of

semiconducting, oxide, metallic, organic, and biological crystals. All participants received a textbook based on the lectures presented during the Summer School.

The Organizing Committee of the International Summer School on Fundamentals and Basic Methods of Crystal Growth was chaired by Prof. H.V. Alexandru, Prof. P. Rudolf and Prof. F. Stanculescu. The members of the International Committee were Thomas Kuech (USA), Peter Rudolph (Germany), Hanna Dabkowska (Canada), Roberto Fornari (Germany), Thierry Duffar (France), Dave Bliss (USA) and Koichi Kakimoto (Japan).

## 2. Participants and Program

The International Summer School on Fundamentals and Basic Methods of Crystal Growth received 47 applications

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from all around the world. Finally, 35 graduate and undergraduate students, post-docs and representatives from industrial laboratories attended the summer school.

Participants come from Russian Federation - 6, Brazil - 6, Ukraine - 3, Germany - 3, Poland - 2, Bulgaria - 1, France - 1, Israel - 1, Italy - 1, Latvia - 1, UK - 1, Romania - 9.

The opening ceremony was chaired by Prof. Horia Alexandru (University of Bucharest, Faculty of Physics, Romania), Prof. Peter Rudolph (Institute for Crystal Growth (IKZ), Germany), Prof. Roberto Fornari (Director of the Institute for Crystal Growth (IKZ), Germany) and Prof. Anca Duţă (*Transilvania* University of Braşov). An introductory lecture on Crystal Growth: a historical and economical perspective was presented by Prof. Roberto Fornari.

A comprehensive series of lectures provided an overview of traditional crystal growth as well as emerging technologies.

Lectures encompassed theoretical and experimental aspects of growth, including the thermodynamics, kinetics, fluid dynamics, and growth mechanisms of crystals grown from melts, solutions, and vapours.

The topic of the lectures was divided in two parts: I. Fundamentals and II. Crystal Growth Methods.

The first part was focused on Thermodynamics, Phase equilibria, Phase diagrams, Nucleation theory (especially for nanocrystals), step dynamics, Crystal growth kinetics, Self-organization of nanocrystal systems, Morphological stability and pattern formation, Transport of heat and mass - Numeric modelling and Defects. Lectures were presented by Manfred Muehlberg, Horia V. Alexandru, Dirk Holland-Moritz, Peter Rudolf, Knut Deppert, Wolfram Miller, Jeffrey Derby and Stefan Antohe.

The second part was focused on Methods

of Bulk crystal growth - Solution Growth, Thin film technologies, Nano-crystallization, Protein growth and Crystallization for photovoltaics. Lectures were presented by Roberto Fornari, Horia V. Alexandru, Thomas Kuech, M. Heuken, Stefan Antohe, Mauro Epifani, Alexander van Drische and Anca Duţă.



Fig. 1. *Participants at the Summer School*

Furthermore, during the summer school it was organized a “night student’s communication session” where selected participants give 10/15 min oral presentations of their research results.

Special poster session was organized for school students joint to the poster session of ROCAM 2009 conference.

### 3. Conclusions

In summary, the International Summer School on Fundamentals and Basic Methods of Crystal Growth was successfully completed.

The feedback received from lecturers and students was mainly extremely positive. Especially the high quality lectures presented during the summer school were appreciated.

The participants found the School beneficial both in professional terms as well as in creating new contacts and social interaction with colleagues.