



Dyrekcja Instytutu Fizyki
Akademii im. Jana Długosza w Częstochowie
Oddział Częstochowski
Polskiego Towarzystwa Fizycznego

zapraszają na seminarium naukowe:

***LIQUID PHASE EPITAXY: A BENEFICIAL
METHOD FOR DEVELOPMENT OF PHOSPHORS
BASED ON SINGLE CRYSTALLINE FILMS OF
OXIDE COMPOUNDS***

prof. dr hab. Yuriy Zorenko
Uniwersytet Lwowski

które odbędzie się

21 stycznia 2010 (czwartek), godz. 11:30,
Instytut Fizyki AJD, ul. Armii Krajowej 13/15
budynek B, sala 1023

The lectures is dedicated to the achievements in the development of new type of phosphors based on the single crystalline films of oxide compounds (garnets, perovskites, sapphire) by the **liquid phase epitaxy (LPE)** method in Electronic Department of National University of Lviv.

The first part of the lecture is addressed to the technology of LPE growth of film phosphors of garnets and perovskite compounds, doped with Ce^{3+} and Pr^{3+} activators, from supercooling melt-solution based on the $PbO-B_2O_3$ flux. The main important conditions of the film crystallization are considered: 1) the boundary condition for mismatch between the lattice of film and substrate; 2) the respective choice of the content of melt-solution for optimization of activator / Pb content in film; 3) the influence of lead ions on the light yield of film phosphors.

The differences in the structural and luminescent properties of the crystal and film phosphors of garnet and perovskite compounds are shown in the **second part** of report. The reasons for such differences are discussed.

The main fields of application of phosphors based on SCF of oxide compounds are considered in the **third part** of the lectures: scintillators, screens for visualization of X-ray image; cathodoluminescent screens and luminescent converters of blue LED.

The peculiarities of Ce^{3+} luminescence and energy transfer in phosphors based on single crystals and films of garnets and perovskites are considered and advantages of film scintillators and screens with respect to the single crystal analogues are evidenced.

In the **conclusions** the wide possibilities related to the LPE technology for industrial applications, investigation of the fundamental optical properties of the developed oxides and teaching in universities and academy institutions is summarized.