

THE SCIENTIFIC SCHOOL OF ACADEMICIAN A.M. ANDRIESH

Doctor habilitate in physical-mathematical sciences (1977),

Corresponding Member (1978),

Professor (1990),

Academician (1984),

Director of the Center of Optoelectronics (1993).

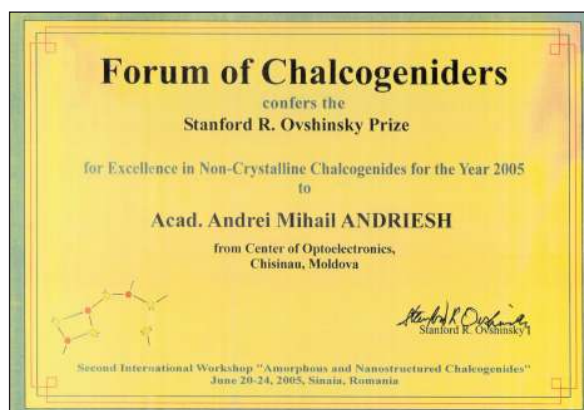
On 24 October 2008 academician Andrei Andriesh, director of the Center of Optoelectronics of the Institute of Applied Physics of the Academy of Sciences of Moldova, celebrated his 75-th birthday anniversary. Academician Andrei Andriesh has made a significant contribution to the development of fundamental and applicative investigations of non-crystalline semiconductors in the Republic of Moldova, establishing a new scientific school.

The non-crystalline semiconductors present a new group of materials with physical properties different from crystalline semiconductors due to disordered structure of atomic network in these materials. The chalcogenide glasses belong to this group, and they are transparent in the infrared region and are promising material for different applications in photonics and optoelectronics.

Academician Andrei Andriesh has an honor to work to work under leadership of Prof. B.T. Kololmiets, Academician R. Grigorovici, Professor S. Ovshischy, and Professor N. Mott – Nobel Laureate in the field of non-crystalline semiconductors. Academician Andrei Andriesh has initiated in the R. Moldova the systematic investigations of photoelectric and optical properties of chalcogenide glasses, the light propagation in optical waveguides, the photoinduced optical phenomena, including non-linear effects. Due to the significant scientific results obtained in this field with his coauthors, in 2001 for the second time, he became the Laureate of the State Prize of the R. Moldova in science, techniques, and production, and the winner of the “Stanford R. Ovshinsky” Award in the field of chalcogenides in 2005.



The Laureates of the State Prize of the R. Moldova in science, techniques, and production (2001).



The Diploma of the “Stanford R. Ovshinsky” Award field of chalcogenides (2005).

In the Centre of Optoelectronics, the basic physical properties of the chalcogenide glasses have been studied. It has been demonstrated that the spectrum of localized states and energy distribution is possible to be modified through variation of chalcogenide glass composition,

temperature and light irradiation. For the first time, there was carried out a complex experimental study of the transient processes of the dispersive transport, of photoconductivity and of photoinduced optical absorption, the specific character of which is determined by the non-equilibrium carriers and of the spectrum of the localized states. In the case of dispersive transport, a theoretical model of multiple trapping of charge carriers was developed, which allowed explaining the experimental results and features of the drift in chalcogenide glasses, photoinduced absorption, photoconductivity, and non-linear phenomena.

Under the supervision of Academician Andrei Andriesh, in the Center of Optoelectronics, the new investigations in searching and development of novel methods of recording of optical and holographic information, as well as of effective media for optical registration, have been carried out. At present, the holograms of various types (rainbow holograms, focused image holograms, Fourier holograms, volume holograms) are formed with high diffraction efficiency (up to 40%), large scene depth (up to 15 cm), and dimensions from 0.5 mm² to 140 cm². A technology process of obtaining of metal matrix for multiplication of patterns from a hologram origin was developed. The study of the structural transformations in thin films of vitreous semiconductors stimulated by low-energy electron irradiation presents interest from the practical point of view, for formation of phase and relief diffraction elements with submicron period for various optoelectronic applications with the aid of this effect.

In the recent years, in the Center of Optoelectronics, the development and investigation of the new organic/inorganic nanostructured composite materials were initiated. The nanostructured composite materials are very attractive for future implementation of new photonic and optoelectronic devices. Actually, the definition of nanocomposite materials has broadened significantly; it includes a large variety of systems and structures, such as one-dimensional, two-dimensional (metal oxides, metal phosphates, chalcogenides), three-dimensional, and amorphous materials. Now the main efforts are focused on the ability to control nanoscale structures with the required physical and optical characteristics through innovational synthesizing approaches. In the recent years, the luminescent composites based on lanthanide complexes have attracted much attention due to scientific interests as well as for its wide variety of application in photonics and optoelectronics: planar optical amplifiers, solar cells, light emitting diodes, gas selective sensors, photonic devices, etc. Only in 2008, Academician Andrei Andriesh presented invited reports in this area at two international conferences (Bran, Romania and S.-Petersburg, Russia).

Academician Andrei Andriesh is an author and coauthor of about 500 scientific papers and 30 patents. Among these are: "Vitreous arsenic sulfide and its alloys" (1981), "Non-stationary currents in disordered solids" (1983), "The vitreous semiconductors in the photoelectric systems of recording of optical information" (1988), "Physics of chalcogenide glasses" (1996), etc. He has contributed to training of scientists of high qualification, among them 17 doctors and 8 doctors habilitate.

Academician Andrei Andriesh is a Member of the Engineering Academy of the Russian Federation, Corresponding Member of the Austrian Society Albert Schweitzer-Gesellschaft Modling, Member of the European Academy of Arts, Honorable Member of the Romanian Academy of Sciences, President SPIE-Moldova Society, Honorable Member of the American-Romanian Academy, and Doctor Honoris Causa of the Polytechnical University from Bucharest.

Academician Andrei Andriesh was awarded with the title “Om Emerit”, he was the winner of the Award “C. Miculescu” of the Romanian Academy of Sciences, the Medal “Insigna de Onoare”, “Ordinul Republicii”, “Academician S.I. Vavilov”, etc.

His productive research activity in the field of non-crystalline semiconductors, the creativity, and directed actions are an example for the young researchers and encourage him to discoveries of new materials, photonic and optoelectronic devices. The collective of the Center of Optoelectronics wishes Academician Andrei Andriesh many happy returns.

Dr. Maria Iovu

Senior Scientific Researcher of the Institute of Applied Physics