

## A Great Scientist and a Teacher

**On December 15<sup>th</sup>, 2006 it was the 90<sup>th</sup> birthday of Petros Hakob Bezirganyan – the Doctor of Physics and Mathematics, Professor, the honorable member of Scholars of Republic of Armenia, and the laureate of Republic of Armenia honor.**

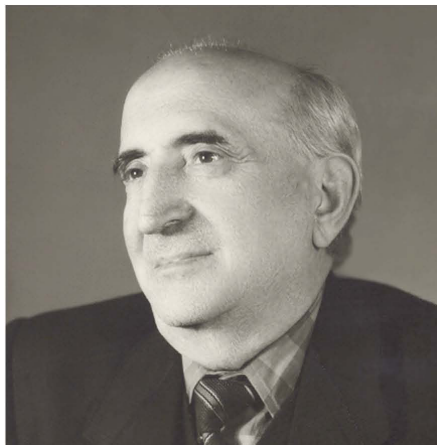
Prof. P. Bezirganyan was born on December 15th, 1916 in a village of Alastan in present-day Republic of Georgia, in the family of a teacher. In 1932 he graduated from the Armenian Pedagogic Technical Institute in the town of Akh'alqalaki. From 1932 to 1938 he was engaged in teaching (started as a teacher, then became a supervisor and a director) in the Akh'alqalaki district high schools.

In 1938 P.H. Bezirganyan entered the Faculty of Physics and Mathematics of the Yerevan State University. From 1941 to 1945 he fought for his country by enlisting in the Army. After the end of the World War II, and his subsequent demobilization in 1946, he continued his education at the faculty, and in 1948 graduated from it with honors. In 1949 he entered the Post Graduate School of University of Moscow after Lomonosov. In 1954 he defended his graduation theses, and was awarded a PhD degree. In 1969 he was awarded a title of a Professor.

Starting from 1952, and for the rest of his life (he passed away in 1994) he worked at the Yerevan State University. From 1960 through 1987 he served as the head of Chair of Solid State Physics. In a short period of time he managed to build a modern educational and scientific platform, and a strong experimental base.

In 1964 by Prof. Bezirganyan's own initiative and under his direct supervision the Problem Laboratory of Solid State Physics was formed, which was in 1983 renamed to Problem Laboratory of Physics of Coherent X-ray Interaction with Matter. The main focus of the laboratory was the development of new and more precise methods of studying the imperfections in crystals based on the theoretical and experimental research conducted in the field of X-ray scattering. In order to advance the X-ray-related research and its applications, in 1978 the X-ray Research Branch Laboratory attached to the Faculty of Solid State Physics was formed. He played direct role in the establishment of X-ray research laboratories at the State Engineering University of Armenia (SEUA), at Medical University after Mkhitar Heratsi, and at the Gyumri Pedagogic Institute.

In 1986 Prof. Bezirganyan pioneered a comprehensive program known as "X-ray-based Diagnostics of Imperfections in Crystals Used by Scientific Communities and by Semiconductor and Other Technology Industries" - a co-operation program between the various universities and other institutions of higher education of the former USSR focused on solving the scientific and technological problems, which lasted until 1990. Among the participants in this program were the



leading Institutions of higher education of former USSR, as well as the employees of the Chair of Solid State Physics of the Yerevan State University, and the X-ray Research Laboratory of the Department of Physics at the State Engineering University of Armenia.

The Yerevan State University was the primary participant in this program, and the professor became its scientific supervisor.

The scientific research activities conducted under the supervision of Prof. P.H. Bezirganyan, and with his direct participation had a wide scope. It included fundamental and applied research in the field of X-ray Interference and Diffraction, development of new methods of studying the crystal lattices, and creation of essential equipment specifically designed to be used in Science and Technology, etc.

Some of the most important accomplishments include:

- Solving of a number of fundamental problems related to the Theory of X-Ray Kinematical and Dynamical Scattering in the Ideal and Real Crystalline Structures;
- Development of X-ray Resonator Theory, and select implementation of these devices having the most important applications in the field of X-ray Optics;
- Founding of the school of X-Ray Interferometry Research in the former USSR;
- Development of High Resolution X-ray Interferometer Theory that has a wide range of applications in science and in practice, and development and application of such devices. The importance of X-ray Interferometer research is underscored by the fact that it can be used to develop various methods of detecting the isolated imperfections in almost perfect crystals, used in semiconductor devices and in Electronics Industry;
- Development of a graphical method of research of the conditions under which the X-ray Moire patterns are formed and observed in crystalline structures;
- The determination of criteria of X-ray Moire patterns formation for the primary plane waves.

The development of a two-crystal universal X-ray unit controlled by a high precision piezoelectric-based automated control system in the former USSR is closely associated with his name.

Prof. Bezirganyan pioneered the creation of a CRT-based television system at the Chair of Solid State Physics of the Yerevan State University for visualization of the X-ray diffraction topographic patterns of the crystals' structural imperfections, which allows exercising strict control over the crystals' purity. The application of such system, heightens the reliability of semiconductor devices, and makes their production more profitable. The visualizing system is instrumental in researching and solving the urgent and important fundamental problems of science involving rapid processes.

For his work done on creation of this unique CRT-based television system for visualizing the X-ray diffraction patterns of the crystals' structural imperfections and for its important economic value, Prof. Bezirganyan received the Achievement in Science and Technology State Award of Republic of Armenia.

This is the legacy of his tireless efforts; this is the legacy of this scientist and a teacher.

Prof. Bezirganyan has authored more than 350 scientific works published in various scientific periodicals of the former USSR, Republic of Armenia, and foreign journals; he has 30 inventions, 2 monographs, and a number of published textbooks and learner's manuals.

He also played an important role in experts training in the field of Solid State Physics as in Republic of Armenia, as well as abroad. Prof. Bezirganyan oversaw the graduation of more than 40 graduate students and scientists, all of whom were awarded scientific degrees, 10 of whom subsequently were awarded a doctorate degree, and at present many of them work at scientific, scientific-industrial and higher education institutions.

For his prolific scientific and academic efforts the professor was awarded the Title of the Distinguished Member of the Board of Higher Education Establishment of Republic of Armenia.

Prof. P.H. Bezirganyan held a great authority as a scientist in his field of studies; he was deeply respected as an organizer and as a mentor for the next generation of the scientists.

The achievements in question are the ultimate proof of his tireless efforts and his patriotic and selfless dedication to the cause of advancement of Solid State Physics in Republic of Armenia, especially to the challenging but rewarding task of promoting the advancements in the field of X-ray research, and raising its standards internationally.

- by **Arsen O. Aboyan**  
(Doctor of Physics and Mathematics,  
Professor)

- translated by  
**Petros H. Bezirganyan (Jr.)**  
(MSc, Software & Hardware Engineer)