Museum as a Source for Historical Research in Physics in Bulgaria

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Abstract. History of Physics Museum at the Institute of Solid State Physics is a research unit with own base of sources. This paper examines the reasons of its creation, organization, funds, and regulations. There are short biographical notes about first curators of the Museum Vladimir Kusev and Alexander Vavrek.

Keywords: Museum, Physics, Bulgaria, History, BAS, ISSP.
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HISTORY OF PHYSICS

Professor Milko Borissov (18.02.1921 – 05.11.1998) initiated history of physics as a research area with two main tasks in the Institute of Solid State Physics. The first one is a new line of documentary investigations. Worked together with Christina Stojcheva, Penka Lazarova, Marko Gerdjikov, Vladimir Kusev and Alexander Vavrek, Professor Milko Borissov supervised history of physics research group [1]. Sources from Bulgarian state archives and libraries and private collections were used to investigate dissemination of physical knowledge and education on physics in Bulgarian schools during Nineteen century. Two books (1985, 1988) and many articles were published after that. Alexander Vavrek headed two projects on history of physics (F-251/1992-1995 [2] and F-517/1995-1999) [3]. History of university physics in Sofia (1889 ─ 1944) is investigated by the project F-1312 from 2003 until 2007.

MUSEUM

Accumulation of the history of physics source is the second main task for history of physics research group in the Institute of Solid State Physics. In this line of activities documentary film "Photo electrets" was pictured (1979) at first. Film producer was Konstantin Obreshkov. Professor A. Poplilov painted portrait of Professor Georgi Nadjakov. Sculpture "Head of Professor Georgi Nadjakov" was bronze made by Slavi Donchev (1984). Bulgarian Academy of Sciences placed monument on the central alley near to the main entrance (20.11.2002).

Professor Georgi Nadjakov Museum

Institute of Solid State Physics rendered homage to Professor Georgi Nadjakov after his death (February 24, 1981). His son Emil Nadjakov proposed Museum to be opened (March 1, 1981). Personal laboratory of Professor Georgi Nadjakov in the Institute of Solid State Physics was determined as a Museum office by Directorial Council (Protocol 7, March 26, 1981) [4].

Sources of Professor Georgi Nadjakov were collected in room 210. Many of them were apparatuses. They came from physical laboratories of the Faculty of Physics at the Sofia University and from his personal laboratory in Bulgarian Academy of Sciences. Vladimir

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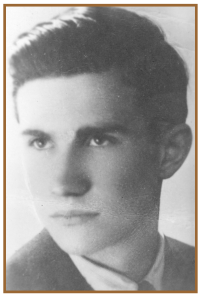
Kusev, first curator of the Georgi Nadjakov Museum, wrote in the letter to Emil Nadjakov "We plane personal laboratory to be museum, connected with Professor Georgi Nadjakov life and activities. We will collect objects, documents, and apparatuses, showing results of Professor Georgi Nadjakov in this room. Many photographs of Professor Georgi Nadjakov and other Bulgarian physicists, contributed to success of physics in our country will be shown in the Museum".

FIGURA 1. Professor Georgi Nadjakov

Institute of Solid State Physics exhibited part of first collection in the National Polytechnic Museum in Sofia (12 – 30 November 1987) in the occasion of Professor Georgi Nadjakov 90 year's anniversary.

Curators

Vladimir Kusev

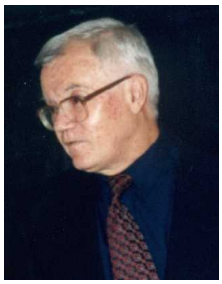


Vladimir Georgiev Kusev (22.01.1931 – 14.03.1983) is curator of the Museum for a short time (1981 ─ 1983). His father Georgi Vladimirov Kusev came from family of superior ecclesiastic Metody Kusevich (1838 ─ 01.11.1922). Vladimir Kusev was born in Sofia. His mother Theodora Fridriks was German. She left her four years old son an orphan.

Obtaining his degree from Sofia University (1949 ─ 1954), Vladimir Kusev worked in the field of electro-photography under Professor Georgi Nadjakov leadership. He collaborated to the Academy of Sciences in Russia in this field. Vladimir Kusev investigated ultra-violet sun radiation with Razum Andrejchin. He worked as a professional photographer on sub-aquatic photography. Vladimir Kusev was a member of Aviation club of Bulgarian Tourists Union too.

Bulgarian Academy of Sciences appointed Vladimir Kusev in Photo-laboratory of Physical Institute as a master (01.03.1955 ─ 1963). He became physicist in Professor Georgi Nadjakov section "Scientific apparatuses & special problems" (1963 ─ 1970). Vladimir Kusev was elected researcher rank III (1970 ─ 1981) and researcher rank I (1981-1983) [4].

Alexander Vavrek



Alexander Frants Vavrek (12.03.1947 ─ 07.08.2003) is next curator of the Professor Georgi Nadjakov Museum for a long time (1983 ─ 2000). He became senior researcher (1991), and head of Electron Phonon Interaction Laboratory (1989 ─ 2003), Science secretary, and member of General Meeting and Advisory Board of Bulgarian Academy of Sciences (1991 ─ 2003), member of Scientific Board of the Laboratory of High Magnetic Fields and Low Temperatures in Wroclaw (1996 – 2003) [5].

Alexander Vavrek was born in Veliko Tarnovo. His father Frants Vavrek was Czech. Alexander Vavrek studied physics in Sofia University (1965 – 1967) and Moscow state University "M. V. Lomonosov" (1967 – 1971). He worked (1971 – 2003) and appointed his PhD degree (1986) in the Institute of Solid State Physics at the Bulgarian Academy of Sciences.

Research interests of Alexander Vavrek were in the area of solid state physics. He investigated polarized phenomenon, electronic and photo-electronic conductivity in semiconductors, high temperature superconductive cuprites and waves in crystals. His results in social history of physics are in the field of secondary school and University education in Bulgaria during the first half of twenty century and dissemination of physics in Bulgarian schools during the nineteen century.

HISTORY OF PHYSICS MUSEUM

Decision of Scientific Council of the Institute of Solid State Physics (Protocol 22 from October 26, 2000) transformed Museum "Professor Geogri Nadjakov" into History of Physics Museum. Other Museum Promoters are Union of the Physicists in Bulgaria, its Branch in Sofia, and Physical section of the Union of Scientists in Bulgaria.

New documents, apparatuses, books and photographs for other Bulgarian physicists are collected in Museum depository after that.

Permanent exhibition is arranged in the occasion of 110 anniversary of Professor Georgi Nadjakov (2006) in the room 210 of the Institute of Solid State Physics main building.

History of physics symposium with 13 oral presentations was organized with our participation in 2005 for the first time [6]. Second History of physics symposium, organized by the Museum was held in 2006 with 20 oral presentations, 8 poster presentations and three school reports [7]. Professor Georgi Nadjakov memorial session was held officially [8]. Proceedings were published in Bulgarian language.

Possibilities sources to be used in reading room by visitors are legalized. Using Museum sources of old books, documents, manuscripts, photographs, and instruments everyone have opportunity to find biographical evidences for Bulgarian physicists, and make investigations about history of teaching, research and institutional history of physics in Bulgaria.

Regulation

Museum works under Regulation now. Confirmation of the Museum statute is written down by President of the Scientific Council of the Institute of Solid State Physics with decision, written in Protocol 11 (March 12, 2001).

Activity, control and finance of the Museum are defined by the regulation. History of Physics is determined as a subject of Museum activity. Historical research is the main goal of the Museum. It is realised by collecting and investigating the sources of physics.

The aims and missions of the Museum are realised through working reading room, showing exhibition, organizing seminars and symposiums.

Museum finances come from the Institute of Solid State Physics, projects, endowments, and own income, fees and services. Museum Council makes control on all activities of the Museum.

Funds

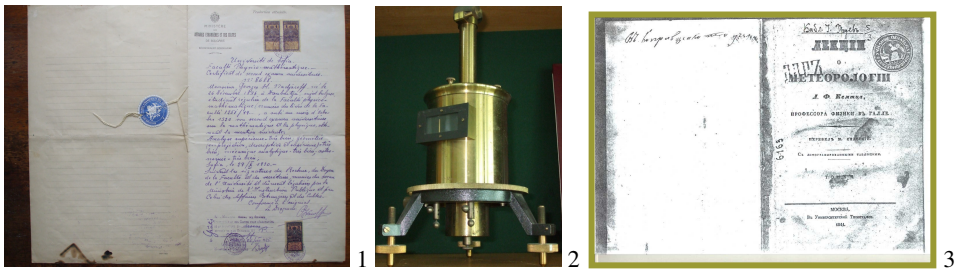


FIGURA 2. Document (1), Electrometer (2), Book (3)

Our young Museum has simple organization. All kinds of donations are devoted to Museum by records. There are two kind inventory books for incoming and outgoing sources, as primary description. After that sources registered into Museum funds, whose catalogues are opened to public. History of Physics Museum has three kinds of funds: 1) Documentary fund (personal and institutional); 2) Book-holding fund (single incomings or private collections). 3) Object fund (apparatuses, objects, pictures, photographs).

Museum holds more than forty documentary funds, ten objective funds and eight private book collections up to now. Some of them are manipulated for use. There are special library with history of physics publications.

Documents

In order to be used are prepared 12 documentary funds (4271 archival units). They are of Alexander Vavrek, Antonina Peeva, Georgi Nadjakov, Dimitar Stoyanov, Emil Nadjakov, Evgeni Leyarovski, Josif Rangelov, Konstantin Stamenov, Milko Borissov, Nikolay Pashov, Razum Andrejchin, and Vladimir Kusev. Documents of Jordanka Pacheva and Leuben Mladjov are in preparation for public use.

Documentary fund of Georgi Nadjakov is the oldest in our Museum. There are two collections of Georgi Nadjakov. The first collection completed by Penka Lazarova in the National Polytechnic Museum in Sofia and copied by us, have more institutional contents. The second one comes from Georgi Nadjakov family – daughter Elka Nadjakova and daughter-in-law Krasimira Marinova, including personal information mainly.

Apparatuses

Object fund embraces 170 physical apparatuses, 60 personal objects, 9 oil-paintings pictures and one rice-made picture, 250 photographs, around 500 audio and video materials, collecting up to now.

Object fund of Georgi Nadjakov is shown in the permanent exposition. It consist 34 physical apparatuses and instruments. Parts of them are made of brass in the Sofia University during the first half of Twenty century. The rest are duralumin made in the Bulgarian Academy of Sciences during the second half of Twenty century. Number of physical apparatuses, delivery abroad is largest.

Some apparatuses funds came from Chair of Quantum Electronics in the Faculty of Physics, Sofia University, and Laboratory of Low Temperatures in the Institute of Solid State Physics.

Books

Book funds include 2500 old books, 80 magazines, and articles prepared to use. All books are donated by Associate Professor PhD Svetla Pakeva, Senior Researcher PhD Petar Christov Peykov, Senior Researcher PhD Stoil Donev (INRNE). Private collections came from family of Josif Rangelov (in the area of theoretical physics), Razum Andreychin, Milko Borissov, and Georgi Nadjakov. All materials, used by Alexander Vavrek, came from his secretarial office in Bulgarian Academy of Sciences.

CONCLUSION

We think that sources of physics have crucial place not only in historical investigations, but in physical research too. Personal living touch to sources is important for our understanding and success on physics.

People know importance of Museum objects as sources of knowledge in science from antiquity. Archimedean globe was well kept mechanical miracle in the course of 600 years (212 B.C. – 410 A.C.). It was a model of celestial sphere, used for demonstration of the motion of planets, astronomical education, and worked mechanical machine [9].

Sources of history of physics contain scientific knowledge in our days too. Important science facts for climatology, meteorology and even astronomy can be found in “Lectures of Meteorology”, written by German natural scientist and weatherman L. F. Kemtz (1801 ─ 1867) [10]. Russian translation of this book, keeping in Yoachim Gruev Archive at the National Library in Plovdiv, was copied to our Museum. Unique old science book contains huge number of data from many year observations in different points of the world, compared, systematized and generalized by L. F. Kemtz in two volumes, nine chapters, 953 pages, 91 scales, and 48 figures [11].

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