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Efficiency of deep integration between a research university and an academic institute

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Abstract

I am analyzing the results of long-standing close cooperation between an academic institute and a national research university. I am making analysis based on sharing experience of our Samara National Research University and the Image Processing Systems Institute of the RAS. This integration has allowed us to enrich academic activities with up-to-date scientific results, to ensure the permanent inflow of young talents to science, to improve the efficiency of training highly-qualified professionals and the quality of research and development, and to jointly fulfill several large-scale projects and commercial contracts.

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Keywords: Institute of the Russian Academy of Sciences; National Research University; integration of fundamental science and higher education; training highly-qualified professionals; research activity; scientific school

*Be one of each such props to,
eliminating the other from a burden,
one dream to go with one's will...*

Michelangelo Buonarroti

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Introduction

S.P. Korolyov Samara National Research University (shortly, Samara University; the first name – Kuibyshev Aviation Institute – KuAI) was founded in 1942 in the difficult for the country wartime. Several aviation enterprises were evacuated to Kuibyshev; they demanded engineers and engineering staff. Therefore, from the very beginning the Institute was closely connected with aviation enterprises. KuAI was the first institute in the Soviet Union where industrial branch research laboratories were created as a basis for solving research and development problems in the airspace industry. Industrial branch research laboratories played an important role in the development of this institution of higher learning as a research university. Another key milestone for the University was its close cooperation with the USSR Academy of Sciences (now the Russian Academy of Sciences). This interrelationship of scientific and educational activities has contributed to efficient industrial introduction of scientific and technological achievements and ensured the fundamental character of performed scientific studies and education. This paper is devoted to the 30 years' cooperation of Samara University with the Image Processing Systems Institute of the RAS (IPSI RAS) [1] established as part of one of KuAI's laboratories.

1. Establishing the SPECTR Scientific Educational Center

Partnership with academic institutes (A Department of Lebedev Physical Institute of the USSR Academy of Sciences (LPI RAS), Prokhorov General Physics Institute of the USSR Academy of Sciences (GPI RAS), Institute for Information Transmission Problems of the USSR Academy of Sciences (IITP, Kharkevich Institute), etc.) was characteristic of a research team headed by Prof. V.A. Soifer [2] still before the Department of Engineering Cybernetics was established at Kuibyshev Aviation Institute in 1982. Lecturers from the Department of Engineering Cybernetics began to actively interact with scientists from the Computer Center of the USSR Academy of Sciences (the research team headed by Academician Yu.I. Zhulavlev), and A Department of Lebedev Physical Institute of the USSR Academy of Sciences (headed by Academician A.M. Prokhorov). Due to this partnership, high-impact research results were obtained [3–10] and several new classes of optical elements (laser focusers [5–6], laser transverse-mode composition formers and analyzers [7–8], etc.) were proposed and studied. Creation of new optical elements was justified by research findings in the field of asymptotic calculations [9] and mathematical simulation [10] that resulted in building up a new research area named Computer Optics [11]. The obtained scientific results allowed the research team headed by V.A. Soifer to build up in 1986 the Kuibyshev Department of the Central Design Bureau of Unique Instrumentation of the USSR Academy of Sciences (CDB UI, Moscow) founded with support of its office chief, design manager of CDB UI, Professor Iosif Norairovich Sisakyan [12]. In 1988, the Kuibyshev Branch of the Central Design Bureau of Unique Instrumentation of the USSR Academy of Sciences was founded based on this department (since 1993 – Image Processing Systems Institute of the RAS (IPSI RAS); since 2016 – Image Processing Systems Institute of the RAS – Branch of the “Crystallographic and Photonics” Federal Research and Development Center of the Russian Academy of Sciences).

The SPECTR Scientific Educational Center (SEC) was founded in December 1988 by the joint order No. 167 of the Vice-President of the USSR Academy of Sciences, Academician E.P. Velikhov and the Deputy Minister of Higher and Secondary Vocational Education of the RSFSR O.M. Petrov based on the Kuibyshev Branch of the Central Design Bureau of Unique Instrumentation of the USSR Academy of Sciences (KB CDB UI) and Kuibyshev Aviation Institute. Prof. Dr. Sc (Engineering) V.A. Soifer was appointed a Director of the SPECTR SEC according to the joint order of Kuibyshev Aviation Institute and the Central Design Bureau of Unique Instrumentation of the USSR Academy of Sciences. In 1990, V.A. Soifer became the President of KuAI keeping his status of the Director of KB CDB UI on a part-time basis. This type of one-man management and scientific and managerial talents of V.A. Soifer provided highly credible interaction between these research and educational institutions.

The purpose of establishing the SPECTR SEC was the joint use of facilities and resources, including human resources, of KuAI and KB CDB UI in order to efficiently solve scientific and technical problems and to train specialists and highly qualified professionals – Candidates (PhDs) and Doctors (holders of an Advanced Doctorate) of Sciences. The first step in this cooperation was the purchase of an electronic lithographer BS-600 within a logistic support program of the USSR Academy of Sciences (manufactured by Tesla Brno, Czechoslovakia) valued at more than one million transferable rubles (i.e. at the then existing official exchange rate it was more than one million and

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