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S.A. Beznosyuk as the Founder and Leader of a New Direction of Quantum Field Chemistry in Subatomic Quantum Nanotechnologies of Materials

The article highlights the creative path of S.A. Beznosyuk, an outstanding physico-chemist, who celebrates his 70th anniversary in 2023. The main stages of his career and significant events of his scientific creativity are presented here. The contribution of Professor S.A. Beznosyuk to the establishment and development of two scientific schools, namely quantum field chemistry of the condensed state at the Karaganda Buketov University and subatomic quantum nanotechnology of materials at Altai State University is shown.

The scientist's anniversary is a good occasion to summarize what he has done, to see the significance of his works in the research area. Sergey Aleksandrovich Beznosyuk, Doctor of Physical and Mathematical Sciences, Professor, the founder and leader of a new direction in quantum chemistry and quantum nanotechnologies of materials, is a scientist whose works are widely known in the scientific circles of Russia, Kazakhstan and other countries. His name is associated with the development of a number of modern theoretical models of quantum chemistry and quantum subatomic nanotechnologies of materials.

Sergey Aleksandrovich Beznosyuk was born in the city of Shymkent, South Kazakhstan region, KazSSR, on January 5, 1953. After school, he entered Tomsk State University in the city of Tomsk, which he successfully graduated from in 1974.

After graduation from the university in 1974–1977 S.A. Beznosyuk continued his postgraduate studies at TSU and in January 1978 defended his candidate dissertation entitled "The method of spin-charge density functionals and the ground state of alkali and 3d-transition metals" in the specialty 01.04.07 — Solid State Physics. These were his most significant achievements of that period [1–4]. After graduation from graduate school in 1977, he was competitively elected to the position of a teacher at the Faculty of Physics of TSU.

In 1979, S.A. Beznosyuk received an invitation and was elected to the position of a senior researcher at the Kazakh Institute of Chemical Technology in the city of Shymkent. Here he was engaged in quantum calculations of catalysts until 1984 in a special laboratory of the Institute of Organic Catalysis and Electrochemistry of the Kazakh Academy of Sciences (Almaty). In 1984, he was awarded the academic title of Senior Researcher of the Higher Attestation Commission of the USSR in the specialty "Chemical technology and catalysis". His main works of this period are [5, 6].

In 1985, Sergey Aleksandrovich Beznosyuk was invited to the position of Associate Professor of the Quantum Chemistry Department of Karaganda State University. In the final period (1989–1994) of his fruitful scientific activity in the field of quantum field chemistry of the condensed state, he held the position of the Head of the Department of Quantum Chemistry of Karaganda State University. The main results of this period were published in [7–9].

In 1993, S.A. Beznosyuk successfully defended his doctoral thesis: "Electronic theory of active centers of microstructural transformations of materials" in the specialty 01.04.07 — Condensed Matter Physics at the Institute of Strength Physics and Materials Science (ISPMS) SB RAS (Tomsk). In 1994, he accepted an invitation to become a professor at Altai State University in Barnaul (Russia). Two years later, in 1997, he was awarded the title of Professor by the Higher Attestation Commission of the Russian Federation.

From 1994 to the present time he has been working at Altai State University. For almost 30 years of work at ASU, his track record includes the following list of achievements: Professor of the Faculty of Physics (1994–1996), the main publications of this period are [10, 11]; the Head of the Physical & Colloidal Chemistry Department (1996–2015), the main achievements of this period are published in [12–27]; the Head of the Physical & Inorganic Chemistry Department (2015 – up to the present time), the last period of research is presented in [28–37].

The scientist's authority in the research community can also be confirmed by his membership in dissertation councils. For many years, Sergey Aleksandrovich Beznosyuk was a member of doctoral dissertation councils on physics and mathematics specialties at Altai State University and Altai State Technical University of the name of I.I. Polzunov, Barnaul, Russia. Currently, S.A. Beznosyuk is a member of the Doctoral Dissertation Council in the specialty Condensed Matter Physics in ASU (Barnaul, Russia).

Since 1996 S.A. Beznosyuk has led a number of projects of Russia in the field of critical technology "Computer modeling of nanomaterials, nanodevices and nanotechnologies" on the priority direction of the development of science, technology and engineering in "Industry of nanosystems". Under his leadership, 8 fundamental studies were carried out under the programs of the Ministry of Education and Science of the Russian Federation, as well as under Russian and International grants from the Russian Foundation for Basic Research. Since 2009 Professor S.A. Beznosyuk, heading a number of significant scientific researches, has formed a powerful scientific school "Fundamentals of nanosciences and breakthrough nanotechnologies of the condensed state" at Altai State University. As part of his unique scientific school, he created scientific, methodological and educational units, namely Internet site https://comp-nano.firebaseapp.com (2011), the educational research laboratory "Computer NanoBioDesign" (2014), the network ASU — ISPMS SB RAS research laboratory "Quantum technologies of materials" (2021). The main research areas of Professor S.A. Beznosyuk include the following topics: Quantum chemistry, Physical chemistry, Physicochemistry of the condensed state, Subatomic quantum technologies of materials.

Professor S.A. Beznosyuk devotes much time to training of scientific personnel. Under his supervision 10 candidates of chemical and physical & mathematical sciences defended their theses. In 1997, S.A. Beznosyuk opened in ASU one of the first in Siberia Distance Learning Center and in 2000 created the Scientific and Methodological Institute of Open and Distance Education in ASU, which became a part of the Open University of Siberia. S.A. Beznosyuk for three years (2009–2011) was supervising educational programs for professional retraining of faculty and research staff of universities and scientific institutions of the Russian Federation in the field of nanotechnology within the framework of the unified federal program of the Ministry of Education and Science of the Russian Federation. In 1994, under the guidance of Professor S.A. Beznosyuk, the first Master's training at the Faculty of Physics began at ASU. From 2009 to 2018, S.A. Beznosyuk supervised the Master's training in physical chemistry and nanoengineering of functional and biomimetic materials at the Faculty of Chemistry of the Altai State University. About 50 people received master's degrees under those programs. In 2018, S.A. Beznosyuk developed the first in Russia innovative master's program "Quantum technologies, computer nanoengineering, physical chemistry and examination of materials" with the aim of training personnel for quantum nanotechnologies in Russia. Twenty masters of Chemistry defended their dissertations under this program.

Sergey Alexandrovich's fruitful scientific activity is reflected in about 300 scientific papers, including 67 scientific articles in 15 highly rated international journals included in the Web of Science (Hirsch index — 8) and Scopus (Hirsch index — 8) databases. He is a co-author of 7 scientific monographs and 6 textbooks (2 with a stamp), received 6 patents and 4 certificates for computer programs. The relevance of scientific results of Professor S.A. Beznosyuk is confirmed by dozens of oral and invited presentations at prestigious International conferences in the UK, France, USA, China, Italy, Russia and other world scientific centers. Due to his high level of professional excellence, he is a member of many scientific communities, such as the Federal Register of Experts in the Scientific and Technical Sphere of the Ministry of Education and Science of RF, the Central Board of the Nanotechnological Society of Russia, the Russian Professorial Assembly and others.

The merits of the celebrant were repeatedly recognized at the highest level. In 2001, S.A. Beznosyuk became an Award Winner of the Altai Territory Prize in Science and Technology. In 2005, he was awarded the Breastplate of the Honorary Worker of Higher Professional Education of the Russian Federation. He was also awarded Honorary Diploma of the International Organizing Committee of the conference "Hydrogen materials science and chemistry of carbon nanomaterials" (2009) and Honorary Diploma of the Government of the Altai Territory for many years of conscientious work and high professionalism (2018). In 2022,

S.A. Beznosyuk was awarded The Diploma of the Winner of the National Prize of Russia "Professor of the Year" in the nomination "Chemical Sciences".

On behalf of his scientific school, all his colleagues, students and friends, we congratulate Professor S.A. Beznosyuk with his 70th birthday and express our deep gratitude for his many years of work in our team! We wish Sergey Aleksandrovich good health, creative longevity, new scientific achievements, grateful students and followers!

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