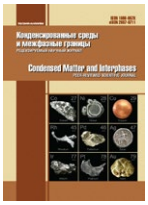

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Congratulations to Professor A. G. Syrkov

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Abstract

On the eve of the 250th anniversary of the first graduating class of engineers at the St. Petersburg Mining Institute of Empress Catherine II, the 165th anniversary of the birth of academician N. S. Kurnakov and the 120th anniversary of the discovery of Weimarn's law it is important to remember those who continue to preserve the memory of these significant events. Professor A.G. Syrkov, celebrating his seventieth birthday, and his research team have been following their own unique path. By arranging international seminars and symposiums on relevant scientific topic "Nanophysics and Nanomaterials" (N&N), the event planners always dedicate a portion of the presentations to the work of outstanding scientists who stood at the origins of Russian schools in the fields of materials science, nanotechnology and metallurgy.

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Professor of the St. Petersburg Mining University of Empress Catherine II, Full Member of the Russian Academy of Natural Sciences, organizer and scientific head of the international symposium "Nanophysics and Nanomaterials" Andrey Gordianovich Syrkov will celebrate his 70th birthday at the end of January 2026. We congratulate him on this wonderful milestone anniversary and wish him robust health, new creative projects, well-being, success and good luck in his scientific and educational activities and in his dedicated labors and initiatives!

Born on January 29, 1956 in Leningrad. In 1979, he graduated with honors from the Leningrad Lensovet Institute of Technology (Technical University) and was assigned to the position of assistant at the Solid State Chemistry Department of Leningrad State University named after A.A. Zhdanov. While studying in a correspondence postgraduate program, he prepared and defended his Candidate of Sciences dissertation (PhD thesis) ahead of schedule in 1984 in the specialty «Physical Chemistry». His work focused on surface reactions in the chemical metallization of silica and hydridopolysiloxane. The work was carried out under the supervision of the Rector

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of Leningrad State University, Corresponding Member of the USSR Academy of Sciences V.B. Aleskovsky – the founder of the world–famous scientific school in the field of nanotechnology by the method of molecular layering and chemical assembly of solids, the author of the "framework" hypothesis and concepts of informational and quantum synthesis of highly organized substances and materials [1,2]. In 1988, A.G. Syrkov became the head of the Faculty of Advanced Training "Scientific Foundations and Methods of solid-state Technology" of Leningrad State University. Since 1989, he has been an associate professor; in 1990, he received the academic title of Associate Professor.

In 1996, he joined Metal Polymer CJSC where he completed the implementation of the results of his doctoral research at the Prometey Central Scientific Research Institute of Structural Materials and the Research Institute of "Energostal". In 1999, he defended his doctoral thesis "Hydride solid-state synthesis of metallic substances and its fundamental patterns" at St. Petersburg State Technological Institute (Technical University) in the specialty "Chemistry and Physics of Surfaces". In this work, Syrkov A.G. formulated a new scientific direction – the influence of the reducing agent on the structure and reactivity of dispersed metallic materials.

From 1996 to 2001, he worked as Deputy Director for Scientific Research at Metal Polymer CJSC and concurrently as Director for Science and Development at Pimtek LLC (St. Petersburg). Here he began to develop formulations of industrial lubricants that have been repeatedly tested on the conveyors of leading brewing companies in Russia. At the same time, he heads the retraining of specialists at St. Petersburg State University Faculty of Advanced Training "Scientific foundations and methods for obtaining modern detergents." In 2001, at the invitation of Professor E.I. Boguslavsky begins teaching at the Department of General and Technical Physics (GTP) of the St. Petersburg State Mining Institute (Technical University). At the department, he continued to research and create new lubricating and corrosion-resistant materials,developing and expanding relevant sections of physics, physical chemistry, as well as metallurgy and materials science [3–5].

Since 2001, A.G. Syrkov has been actively publishing in the scientific journal "Condensed Matter and Interphases" [6–8]; since 2004, also in the scientific-technical and industrial journal "Tsvetnye Metally" [9]. Both journals are included in the list of the Higher Attestation Commission of Russia (HAC) and in the international citation-analytical database Scopus. In 2005, on the initiative of Professor I.. Beloglazov (1950-2011) and the leadership of the «Ore and Metals» Publishing House, he became a member of the editorial board for the special thematic issue «Nanostructured Metals and Materials» published based on the journals "Tsvetnye Metally" and "Non-ferrous Metals" (Moscow) [10, 11]. From 2012 to 2021, he was a member of the editorial board of the scientific journal "Journal of Mining Institute" (a HAC-listed journal and a Q1 journal in Scopus). From 2013 to 2017, he was a member of the editorial board of the scientific journal "Smart Nanocomposites"; since 2018, he is a member of the editorial board of the journal "Smart Nanocomposites Letters" (USA). Syrkov A. G. is a reviewer for articles in the following journals: Journal of Mining Institute; Tsvetnye Metally; Condensed Matter and Interphases; Izvestiya VUZ; Glass Physics and Chemistry; Journal of Surface Investigation: X-Ray, Synchrotron and Neutron Techniques.

In 2003, Syrkov A. G. successfully applied for and moved from the position of associate professor to the position of professor; in 2006, he received the academic title of Professor in the Department of General and Technical Physics (GTP). In 2003, he organized the scientific seminar «Nanophysics and Nanomaterials» and became its scientific director. Since 2013, by order of the Rector of the Mining University (SPMI), the seminar has officially held the status of an international seminar (symposium) [12–14].

The annually held «Nanophysics and Nanomaterials» (N&N) symposium serves not only for the traditional exchange of scientific and technical information, discussions on presentations, but also for the preliminary defense of materials for future Candidate and Doctor of Sciences dissertations. Over the 22 years of the symposium's operation, hundreds of degree candidates from 15 universities in Russia and Belarus, including Moscow State University,

Saint Petersburg State University, Voronezh State University, Belarusian State Technological University; from universities in China, Egypt, Vietnam; and from academic institutes in Russia, Belarus, Azerbaijan (Ioffe Physico-Technical Institute of the Russian Academy of Sciences, Institute of Metallurgy of the Ural Branch of the Russian Academy of Sciences (IMET UrB RAS), Institute of Chemistry of Silicates of the RAS, Institute of High-Molecular Compounds of the RAS, Institute of Geology of the Karelian Research Centre of the RAS (IG KarRC RAS), Joint Institute of Machine Building of the National Academy of Sciences of Belarus, Metal–Polymer Research Institute of National Academy of Sciences of Belarus, etc.) have presented their research results at its plenary sessions, section meetings, and round tables. Among the organizations that have presented their reports at the N&N symposium are also Princeton University, West Virginia University (USA), University of Campinas (Brazil), IMC Montan (UK), and Beneq (Finland).

The most important and distinctive feature of the N&N symposium, conducted under the leadership of A.G. Syrkov, is that a portion of the presentations at the meetings is always dedicated to the memorial dates and great scientists who made decisive contributions to the formation of famous national scientific schools in metallurgy, materials science, nanotechnology, as well as the physics, chemistry, and technology of low-dimensional structures and materials. The reports presented on this topic necessarily analyze not only the biographical data of scientists, but also the connection with modern research, the real directions of the development of the works of these scientists in the 21st century [14–16]. The authorship of the cited works clearly

Professor Syrkov A. G. with his research team, which organizes and conducts the International Symposium “Nanophysics and Nanomaterials» (since 2003)

demonstrates the active participationof students and postgraduates from the Mining University. Leading Professor of the GTP Department A. G. Syrkov gives lectures on physics and nanotechnology to about two hundred students every semester.As a result, these students know who N. S. Kurnakov, P. P. Weimarn, V. B. Aleskovsky, L. A. Sena, I. N. Beloglazov are and what these scientists did for the priority of Russian science. This mission of the N&N symposium and Professor Syrkov's lectures is extremely important today for the patriotic education of the young generation.

In 2008, A. G. Syrkov was elected a Corresponding Member of the Russian Academy of Natural Sciences, and in 2012, a Full Member of the Russian Academy of Natural Sciences in the mining and metallurgy section. Currently, Andrey Gordianovich Syrkov is the Scientific Supervisor for the «Nanotechnology» direction at the Mining University, an expert for UNESCO, the National Research Centre «Kurchatov Institute» (Moscow), and the London-based Institute of Materials, Minerals and Mining (IOM3). In 2024, he became a member of the Materials Science Section of the St. Petersburg Branch of the Russian Academy of Sciences (by invitation of Academician V. Ya. Shevchenko). A. G. Syrkov is a recognized specialist in the physics, chemistry, and technology of metal surfaces [17–19]. He developed the theory and patented methods for the solid-phase hydride synthesis of nanostructured metallic materials and the layering of variously sized quaternary ammonium compound molecules on metals [8, 20, 21]. He has original works in the field of nonlinear properties of surface-modified metals [3, 14, 28]. The developments of Syrkov A. G. and his students have been implemented at ten enterprises in the mineral resource sector of Russia and Belarus with a total annual economic effect exceeding 100 million rubles [3, 5, 14].

In addition to active scientific and organizational work, Syrkov A.G. conducts intensive research together with his postgraduates, students, and faculty members–young Ph.D. (Candidate of Sciences) holders [3, 15, 16] (see team photo). Professor Syrkov A. G. leads the Mining University's world-class research direction «Nanostructured highly hydrophobic metals and solid-state methods for their synthesis» [14, 17, 23]. In recent years, under his leadership, projects No. 5279 and No. 8635 under the thematic plan of fundamental research within state assignments of the Russian Ministry of Science and Higher Education, and contract No. 18017 with GMC Company (Moscow) have been executed; the research team participated in the implementation of several state contracts (2012–2020) and in research under a grant from the Foundation for Assistance to Innovations (contract No. 16679GU/2021) in 2021–2023 [23, 24]. A.G. Syrkov is a co-author of more than 220 scientific works, 8 monographs, 15 textbooks, and 17 inventions. The research team he led won a competition and received two awards from the International Fund "Generation" in the nomination "Best scientific team in the Field of Nanomaterials and Nanotechnology". A. G. Syrkov has supervised 3 Doctors and 15 Candidates of Sciences to successful dissertation defenses, including two international scholars.

His successful supervision of postgraduates in 2021-2024 has been repeatedly acknowledged with letters of appreciation and an award from the leadership of the St. Petersburg Mining University. Students and postgraduates not only at SPMI but also at St. Petersburg State Technological Institute (Technical University) and Saint Petersburg Electrotechnical University "LETI" study from books and textbooks on nanotechnology written by Syrkov. In 2019, "LETI" University purchased an additional print run of Syrkov A. G.'s book [25], dedicated to surface physics and the laws of P. P. Weimarn, from the SPbPU publishing house. Currently, students from 11 groups at "LETI" study from this book, including those specializing in the Department of Microradioelectronics and Radio Equipment Technology. The university leadership of SPMI and the book's author received a formal letter of appreciation from the Vice-Rector of «LETI».

At the International N&N symposium organized by A. G. Syrkov, where he is a co-chairmanof the organizing committee, in addition to presentations by young scientists, many substantial plenary lectures have been delivered by: Professor Y. Nakanishi (Shizuoka University, Japan); I. Kaganovich (Princeton University, USA); M. Brzhezinskaya (Helmholtz Centre,

Germany); Corresponding Member of the NAS of Belarus N. R. Prokopchuk; S. N. Saltykov (NLMK); N. N. Rozhkova (IG KarRC RAS); V. N. Pak; N. M. Barbin (IMET UrB RAS) and others. A special mention deserves the preliminary defense of materials related to a scientific discovery (Diploma No. 509), conducted at N&N by Professor A. S. Mustafayev [17, 23].

The scientific level of presentations at N&N is such that articles and chapters based on their materials are published in publications included in the Scopus database [18, 26, 27], including high-quartile journals [28–30]. These materials align with the global trend of advanced research in nanotechnology, nanoelectronics [31–33], and related fundamental research [34–36]. By dedicating presentations and articles to the anniversaries of N. S. Kurnakov, P. P. Weimarn, V. B. Aleskovsky, K. F. Beloglazov, I. N. Beloglazov [14, 16, 23], the participants of the N&N symposium make an invaluable contribution to preserving the historical memory of the representatives of the best national scientific schools in metallurgy, nanotechnology, and materials science [37]. On the initiative of N&N Organizing Committee members from St. Petersburg State Mining Institute (Technical University), since 2021, a special Professor P. P. Weimarn Prize for outstanding scientists in the field of nanotechnology has been awarded at the symposium's annual meetings. It is worth emphasizing the objectivity of the selection of laureates by the N&N Organizing Committee under the leadership of Syrkov A. G. In the year of awarding the prize, its holders, as a rule, independently received confirmation of their merits from other (scientific or government) structures. For instance, M. M. Sychev in 2022, besides the prize, received the Academician Grebenshchikov Prize from the Presidium of the RAS; N. R. Prokopchuk in 2023 received the Order of Labor Glory from the President of Belarus; N. N. Rozhkova (N&N laureate in 2024) in 2025 received the honorary title "Honored Scientist of the Republic of Karelia".

The achievements of our honoree, Professor Syrkov A. G., in studying the historiography of nanomaterials and proving the priority of Russian science (represented by Professor P. P. Weimarn) in the field of nanotechnology deserve special note. In 2023, the editorial board of the Great Russian Encyclopedia (GRE) approached us and Andrey Gordianovich with a request to write an article about the scientific activities of Professor Petr Weimarn of the Mining Institute (SPMI). We provided so much material that we ended up with 3 articles. One of them, the most detailed on the given topic, was presented personally by A. G. Syrkov [38]. This article was highly appreciated by the Editorial Board of Chemical Sciences of the GRE. Considering the jubilarian's other works in this direction [15, 23, 25] (he has a total of 20 works on P. P. Weimarn), the following can be stated. By the end of 2025, A. G. Syrkov has established himself as a unique specialist, perhaps the only one in the world, with such a profound understanding of the essence of P. P. Weimarn's scientific heritage, including the physicochemical meaning of Weimarn's works and issues of historiography. Syrkov A. G. today appears to be the most knowledgeable regarding the details of Weimarn's activities during his three life stages (in St. Petersburg, Yekaterinburg, and Japan), as well as the connections and continuity with the works of N.S. Kurnakov, I.F. Schroeder, Wolfgang Ostwald (Germany), V. B. Aleskovsky, and other renowned scientists. The high professionalism in the field of physicochemistry of nanomaterial production is reflected by the fact that the honoree, as follows from the above, remains an active scientist in the topic that Weimarn worked on [15]. This favorably distinguishes Syrkov A. G.'s works from those of historiographers, who mainly track the chronology of events in a scientist's life.

In our article on the occasion of Professor Syrkov A. G.'s 60th birthday [19], we wrote about some of the jubilarian's hobbies and his birthday celebration traditions. We would like to confirm that Andrey Gordianovich is still interested in the history of his family together with his brother. The family line is very interesting: ancestors Ivan, Fedor, and Dmitry Syrkov in the 16th century, by the tsar's command or as patrons themselves, built over 20 famous churches in Veliky Novgorod, Tikhvin, and other cities [24]. Syrkov Afanasy Konstantinovich, a shipbuilding scientist and uncle of Syrkov A.G., according to a biographical reference book published for the 300th anniversary of St. Petersburg [39], entered the thousand most popular St.

Petersburg (Leningrad) residents of the 20th century. Syrkov A. K. – commander of the Order of Lenin, laureate of the State Prize in Science and Technology, author of books and textbooks on ship and shipyard construction – always served as an example of dedication for Syrkov A. G. Another example for Andrey Gordianovich is his father, Gordian Konstantinovich, a Naval officer who received 18 state awards (medals and badges) for impeccable service on the ships of the Baltic and Northern Fleets. Syrkov A. G. still, if the weather permits, makes a ski run through Alexandrino Park on his birthday. Due to the lockdown in 2021/22, he sings less than before [24], but does so with pleasure. He relates to this milestone with a degree of irony, likening it to a score of 7:0 in favor of the jubilarian and his family. Since the author of this article is closely approaching the "8:0" mark, he has the right to tell the honoree that the fruitful time for writing books and interesting work is not over yet. We wish Andrey Gordianovich good Health and that his sons bring him even more joy than before!

As the main conclusions of this article, the following can be noted. Professor Syrkov A. G. approaches his milestone anniversary with strong results and achievements in scientific and educational activities. His special contribution to the science of nanotechnology and nanostructured metallic materials is associated with the creation of the theory, development of technology, and implementation of highly hydrophobic, corrosion-resistant dispersed materials with an anti-friction surface effect. His scientific, organizational, social and teaching activities are characterized by the successful training of Candidates and Doctors of Sciences for the mineral resource complex of the Union State, high-level professional proof of the priority of Russian science in nanotechnology, which gives the younger generation the opportunity to better know their "roots" and more effectively develop the work of great predecessor scientists.

The editorial board of the journal "Condensed State and Interphases" joins in congratulating and wishing success in all endeavors our great friend and sincerely respected professor Andrei G. Syrkov

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