

TO THE 275th ANNIVERSARY OF THE RUSSIAN ACADEMY OF SCIENCES

On the celebration of the jubilee year of the Russian Academy of Sciences (1724–1999)

The celebrations of the 275th anniversary of the Russian Academy of Sciences are taking place in Moscow from 31 May to 5 June 1999.

Joint Jubilee Session of the Division of General Physics and Astronomy and the Division of Nuclear Physics of the Russian Academy of Sciences (RAS) was held at the P N Lebedev Physics Institute, RAS on 1 June 1999. The following talks will be presented:

(1) **Andreev A F** *Mesoscopic superconductivity in super-space*;

(2) **Rubakov V A** *Particle physics and cosmology: current status and anticipation*;

(3) **Gaponov-Grekhov A V, Luchinin A G and Talanov V I** *Physical foundations of remote-control probing of the ocean*;

(4) **Alferov Zh I** *Quantum-dimensional nanostructures*;

(5) **Boyarchuk A A** *Binary stars*;

(6) **Danilov M V** *Current status and prospects in elementary particle physics (experimenter's outlook)*.

Papers based on these talks will be published in a special jubilee issue of *Physics-Uspekhi*.

Brief remarks on the history of the RAS

The Russian Academy of Sciences was founded in St-Petersburg by a decree of the Governing Senate on 22 January 1724, as ordered by the emperor, Peter the Great. The act of creation of the Academy of Sciences¹ was one of the important elements of a profound modernisation of the country. The necessity of creating a science base and a system of education stemmed from the needs of industrial growth, transportation and trade, improvement in national culture, and the tasks of strengthening of the state and of Russia's geopolitical situation. Alongside this, Peter the Great strove to immerse Russia into the general process of cultural progress of European countries. In Peter's plans, the Academy was to become not only the research center but also an educational and training establishment; with this in view, a university and a college (called 'gymnasium') were set up as annexes of the Academy. The Academy's tasks were all kinds of scientific and technological services required by the state and aimed at its strengthening and centralisation. When working on the project of setting up the Academy, Peter the Great envisaged measures to ensure that its activities were at the forefront of the science of the time. To achieve this, first-class European scientists were invited to work as members of

the Academy: the mathematicians Leonard Euler, Nicolas and Daniel Bernoulli, Christian Goldbach, astronomer and geographer Jean Delisle, physicist Georg Kraft, historian G F Miller and others. In the first years after the Academy was founded, work proceeded in three directions, or 'classes': mathematics (theoretical mathematics and astronomy; geography and navigation; two chairs of mechanics), physics (theoretical and experimental physics; anatomy; chemistry; botany) and humanities (rhetoric and antiquities; ancient and modern history; law, politics and ethics). The Academy of Sciences took under its wing the wonderfully rich collections of the *Kunstkamera* and a library composed of private collections which also included books that belonged to Peter the Great. The printing works of the Academy were organised within the first several years and the publication of the science journal in Latin, *Comments of the Petersburg Academy of Sciences*, began in 1728.

Beginning with the 1820s, a large number of expeditions were organised in Russia to remote regions of the country; they were led by the scientists of the Academy or with their active participation. The famous Second Kamchatka expedition of Vitus Bering in 1733–1743 investigated in detail extensive areas of Siberia and Kamchatka. The progress in mathematics and mechanics during the initial period in the life of the Academy was mostly connected with the name Leonard Euler. In 1742 M V Lomonosov arrived on the scene and his multifaceted activities created an entire epoch in the unfolding of science in Russia. With his active participation, the Imperial Moscow University (now the M V Lomonosov Moscow State University) was founded. The progress of research in the Academy was assisted, even during the first years of its existence, by establishing contacts with academies and colleagues abroad. Western scientists were elected honorary members and corresponding members of the Academy of Sciences in Russia while the Russian full members (known as academicians in Russia) L Euler, M V Lomonosov, P Pallas and others were elected honorary members of Western academies.

The first half of the 19th century was the time of reform for the Russian Academy of Sciences. The new Statutes of the Academy were passed, which defined the targets of its activities: to spread education and help implement scientific results in practice. The main direction of work of the Academy changed to research into the theoretical foundations of science, in response to emerging problems. Owing to the introduction of the new statutes of the Academy in 1836, the financial support of the Academy was doubled, general censorship was lifted from the publications of the Academy, etc, and the museums of biology, zoology, mineralogy, ethnography etc were organised on the basis of the greatly enriched collections of Peter's former *Kunstkamera*. In 1841 the Academy comprised three divisions: Physics and Mathematics, History and Philology, and Russian Language and Literature.

The period from the mid-1800s to the beginning of the 20th century in the Russian Academy was marked by very

¹ The first science session took place in 1725; the official inauguration was in December 1725, after the death of Peter the Great. The statutes of 1747 give the title of the Academy as "Imperial Academy of Sciences and Arts in St-Petersburg", in 1803 it became the "Imperial Academy of Sciences", in 1836 — the "Imperial St-Petersburg Academy of Sciences", in July 1917 — the "Russian Academy of Sciences", in July 1925 — the "Academy of Sciences of the USSR", and in December 1991 the title returned to the "Russian Academy of Sciences".

important discoveries and the formation of novel fields of research. The work of Russian scientists significantly influenced a number of branches of mathematics. Under P L Chebyshev's guidance (Chebyshev continued the traditions of Euler and Ostrogradsky), the Petersburg mathematical school reached maturity and produced world-famous results. A most important contribution to world science was the development of the periodic table of chemical elements by D I Mendeleev, who was a corresponding member of the Academy from 1876. The progress in the physiology of cerebral activity grew from the work of I M Sechenov and I P Pavlov. I P Pavlov and I I Mechnikov received Nobel prizes for their results. The end of the 19th and the beginning of the 20th century were marked by the prolific activities of V I Vernadsky, one of the founders of geochemistry. Outstanding results were also obtained by members of the Academy in humanities. On the initiative of the full members A S Famintsin and V I Vernadsky, and under their guidance, the Academy set up the Commission on the Survey of the Natural Productive Factors of Russia (KEPS) in 1915, which set in motion the work on studying national resources and mobilising them for strengthening the defence potential of the state. During World War I, the scientists of the Academy applied their efforts to satisfying the needs of the war front. In May 1917, in view of the end of the autocratic rule of the Russian emperor, the "Imperial St-Petersburg Academy" was renamed the "Russian Academy", and an outstanding experimentalist, A P Karpinsky, was elected its first president. The majority of the members refused to accept the revolution of October 1917. However, the scientific community did not reject professional collaboration with the Soviet authorities. After 1917, for the first time in world history, a state-run management of science was created, a course that was later followed by many developed nations. The state took science under its wing. The Academy continued functioning even during the Civil War and the period of economic destruction. The attention to fundamental research in sciences and humanities was increased. Nearly fifty new research institutes were created, including the Physics–Mathematics Institute headed by V A Steklov (the institute was later restructured into the P N Lebedev Physics Institute and the V A Steklov Mathematics Institute), the Optics Institute headed by D S Rozhdestvensky, the Radium Institute headed by V I Vernadsky, the Institute of Physico-Chemical Analysis headed by N S Kurnakov, etc. The increasing importance of the activities of the Academy in the life of the society was reflected in the governmental decree of 1925, in which the Academy was recognised as the 'highest all-Union research body' and was renamed the "Academy of Sciences of the USSR". At the end of the 1920s and the beginning of the 1930s the Academy and its institutes suffered a huge loss of personnel. As a result of 'purging of the cadres' of the Academy that began in 1929 and of the falsified "Academy plot" (1929–1931), many scientists lost their jobs and were exiled or imprisoned. Among them we find the academicians N P Likhachev, M K Lyubavsky, S F Platonov and E V Tarle. The media started a rabid campaign against the Academy and even demanded its disbanding. In this fraught atmosphere, even though the administration of the Academy had to resort to compromises with the authorities, it was able to sustain the honour and dignity of the Academy and have it survive as the highest scientific establishment of the country. In order to strengthen its contacts with the central institutions of the state and the branches of the Academy, the government

decreed its transfer in 1934 from Leningrad (now St-Petersburg) to Moscow. A number of research institutions were moved to the capital, the Presidium of the Academy, and a group of leading scientists. In 1938 the Academy of Sciences grew to eight divisions: physico-mathematical, chemical, biological, geologo-geographical sciences, economics and law, of history and philosophy, and literature and language. The Academy's network of scientific institutions was growing rapidly in the 1930s: the Institute of Genetics (headed by N I Vavilov), the Institute of Physical Problems (headed by P L Kapitza) and a number of others were founded. Some research establishments in sociology and humanities were incorporated into the Academy in 1936. Improvements in local economics, education and culture in all the republics of the Soviet Union made it possible to create the republican Academies of sciences on the basis of the affiliations and local centers of the central Academy.

During World War II the efforts of the Academy of Sciences were aimed at maximum possible strengthening of the defence potential of the country. In the hard times of the war, the scientists of the Academy worked on problems connected with developing new weaponry, expanding defence-oriented industries, the search for new resources, the development of new medical procedures for the victims of the war and so forth. As a result of fundamental research, considerable success was achieved in theoretical physics, astrophysics, chemistry and geology. During the first post-war years, measures were undertaken to expand research in the Academy, and the academic research over the entire country. In this period the Academy of Sciences of the USSR helped to complete the formation of Academies in all the republics of the Soviet Union. The scientists of the Academy solved such problems as extracting nuclear energy, creating inroads into outer space, and developing electronic devices for data processing. The scientific potential created in the USSR already before the war, the concentration of research efforts on the most important targets made it possible for Soviet scientists to solve the problems that were of vital importance for the country in a very short time, most of all for its military capability. I V Kurchatov led the first steps to the utilisation of nuclear energy for peaceful purposes: the first-in-the-world industrial power plant started generating energy in 1954. Scientists of the Academy came up with the idea of controlled nuclear fusion and pioneered experimental work in this direction. The USSR made the first step into space. The launch of Earth's first man-made sputnik in 1957 and the orbital flight of Yuriĭ Gagarin opened the era of space flights for mankind. The work of full members of the Academy of the USSR N N Semenov, I E Tamm, P A Cherenkov, I M Frank, L D Landau, N G Basov, A M Prokhorov, L V Kantorovich, P L Kapitza and A D Sakharov brought them Nobel prizes.

In 1991, after the break-up of the Soviet Union, the Academy of Sciences of the USSR was transformed into the Russian Academy of Sciences — the highest research body of the land. The Russian Academy of Sciences (RAS), created by the state as the highest research body in Russia, is an all-Russia self-governed organisation, has a state-recognised status, possesses property and has rights of self-management. The Academy functions on the basis of the laws of the Russian Federation and the Statutes of the Academy.

*Information was supplied by S I Vavilov
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