

Sergei Nikolaevich Bagaev (on his sixtieth birthday)

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September 9, 2001 is the birthday of Sergei Nikolaevich Bagaev, Full Member of the Russian Academy of Sciences, a very well known scientist in laser physics, a science organizer and Director of the Institute of Laser Physics of the Siberian Branch of the Russian Academy of Sciences.

Bagaev's entire life is connected with Siberia where he was born: he was one of the first graduates of the Physics Faculty of Novosibirsk State University, and began his very first research in 1963 at the Institute of Radiophysics and Electronics of the Siberian Branch of the Academy of Sciences of the USSR; in 1964 Bagaev started his life in science at the Institute of Semiconductor Physics of the Siberian Branch of the Academy of Sciences of the USSR.

In 1975, Bagaev presented and defended his thesis for the Candidate of Sciences under the guidance of V P Chebotarev who was a close friend and collaborator for many years. They did much research together and their results were recognized and respected by colleagues all over the world. After V P Chebotarev's death, Sergei Nikolaevich continued and extended the research started by his former supervisor.

At the Institute of Laser Physics (ILP) of the Siberian Branch of the Russian Academy of Sciences, Sergei Nikolaevich successfully organized and led research in such fields as superhigh-resolution nonlinear laser spectroscopy, frequency and time laser standards and their application to high-precision physics experiments, development of novel laser systems and their application to medicine, biology, metrology, geophysics and other areas of science.

In the field of nonlinear laser spectroscopy, S N Bagaev opened and investigated very narrow optical resonances with a record absolute width of 50 Hz; in relative values this gave 5×10^{-13} . The development of techniques producing very narrow resonances made it possible to observe and study such optical phenomena as the recoil effect, the anomalous Zeeman effect on vibrational–rotational transitions in molecules and the small-angle elastic scattering of excited molecules; this allowed Bagaev to detect the nonlinear dependences of broadening and shifting of optical resonances on gas pressure. This work formed the foundation of Bagaev's DSc thesis and attracted the attention of the world physics community.

S N Bagaev deserved much praise for his effort in getting together the team which in 1991 formed the initial core of the new Institute of Laser Physics of the Siberian Branch of the Russian Academy of Sciences (SO RAN); he became its first director in 1992.

In 1990, S N Bagaev was elected a Corresponding Member, and in 1994 a Full Member of the Russian Academy of Sciences.

S N Bagaev continues to work and produce significant results, to widen the span of his interests and to be at the forefront of research in a number of laser physics fields. He



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was able to set up an effective collaboration with the leading laboratories abroad. In Russia he initiated the creation of the State Scientific and Technical Program on Fundamental Metrology and chaired the program's board. In the abruptly deteriorated situation in Russian science, the energy and insistence displayed by S N Bagaev played a significant role in preserving the creative team of scientists and engineers of the Institute of Laser Physics of SO RAN.

During recent years S N Bagaev supervised a superhigh-resolution spectroscopic study of gases cooled to about 10^{-2} K and the development of the foundation of light scattering spectroscopy with a resolution of about 0.1 Hz for studying the dynamics of mobile forms of microorganisms. In the field of laser frequency standards, S N Bagaev and his co-workers developed lasers with a linewidth of several hundredths of a hertz and with long-time frequency stability at the level of 10^{-15} . These frequency standards were the basis on which the first-in-the-world optical clocks were built and the measurements of transition frequencies of various atoms, ions and molecules to an accuracy of 10^{-13} were conducted. S N Bagaev and his co-workers observed a new type of optical bistability for the first time — an enhanced bistability that

may lead to building optical amplifiers of weak signals and to the creation of novel laser light sources with a noise level below the quantum threshold. International programs on precision spectroscopy of hydrogen and muonium atoms and indium ions are being implemented in collaboration with laboratories in Germany, France and USA in order to increase our knowledge of the fundamental physical constants and to create laser detectors of gravitational waves.

S N Bagaev pays much attention to using the results of fundamental research in practical work. Under his guidance, laser instruments were developed for application in medicine, ecology, navigation, communications, etc. By a decree of the Government of the Russian Federation, the Intersectoral Scientific and Technical Association (MNTA) ‘Siberian Laser Center’ was created for this purpose.

S N Bagaev combines his research with a huge amount of science management. He is a member of the Presidium of SO RAN, a member of the Bureau of the Division of General Physics and Astronomy of the RAS, Chairman of the Science Council of the Academy on Optics and Laser Physics and also sits on a number of other councils. He played an important role in the creation of the Joint Physical Society of the Russian Federation and became its vice-chairman. S N Bagaev takes an active part in shaping the governmental scientific and engineering programs of the Ministry of Industries and Science and in the work of the Public Science Council with the Science and Education Committee of the State Duma.

As a member of the executive council of the European Physical Society and a member of the Commission on the Atomic, Molecular and Optical Physics of the International Union of Pure and Applied Physics, S N Bagaev drastically revived the activity of representatives of our country in these international bodies. Sergeĭ Nikolaevich is a member of the editorial boards of a number of physics journals in this country and abroad.

Among S N Bagaev’s students we find five doctors of sciences and more than 20 candidates of sciences. He heads physics chairs and also teaches at the Novosibirsk State University, Novosibirsk Technical University and the Moscow Physicotechnical Institute.

S N Bagaev’s achievements were rewarded by the Order of the Friendship between Peoples and the State Prize of 1998.

Colleagues and followers all wish S N Bagaev unassailable Siberian health, further success in his multifaceted activities, and much happiness.

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