

In memory of Yurii Aleksandrovich Romanov

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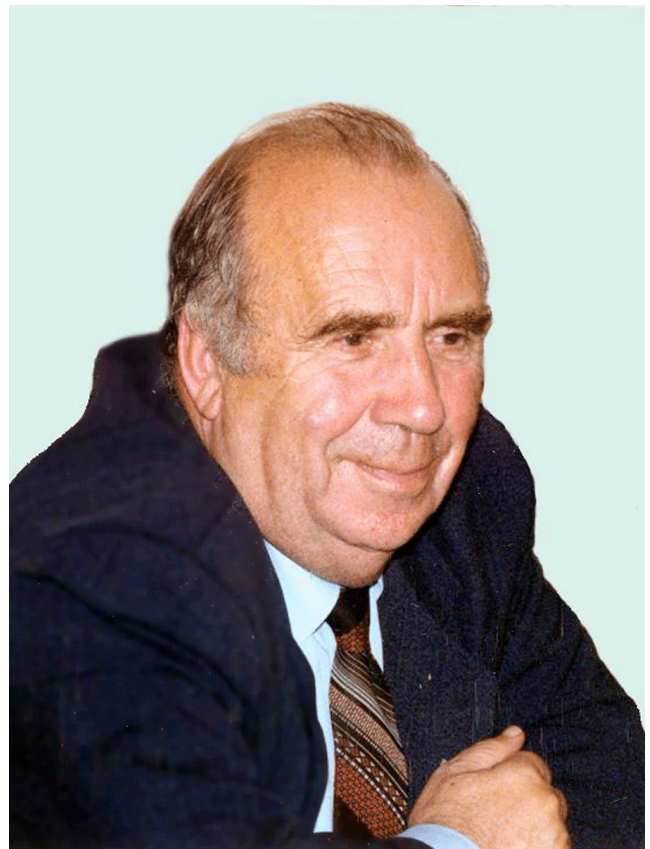
Professor Yurii Aleksandrovich Romanov, outstanding specialist in atomic science and industry, Hero of Socialist Labor, winner of the Lenin, Stalin, and State Prizes of the USSR, died on November 1, 2010 at 84 years of age.

Yurii Aleksandrovich was born on June 17, 1926 in Moscow. Having graduated from high school, he was enrolled in a correspondence course at Moscow State University (MGU in *Russ. abbr.*), then temporarily evacuated to Sverdlovsk. In 1947, Yurii Aleksandrovich graduated from MGU and in 1948 joined the Theory Department of the P N Lebedev Physical Institute as postgraduate student of Igor Evgen'evich Tamm, Corresponding Member of the USSR Academy of Sciences.

In summer 1950, a resolution of the USSR Council of Ministers of February 26 assigned Yu A Romanov to work at Design Bureau No. 11 [KB-11 in *Russ. abbr.*, currently FGUP Russian Federal Nuclear Center 'All-Russian Scientific Research Institute of Experimental Physics' (RFNC–VNIIEF) in Sarov] as a member of theoretical and computations group set up for developing the first thermonuclear explosive charge RDS-6s (A D Sakharov's 'sloika') and headed by I E Tamm. In 1951–1952, the Tamm–Sakharov group was expanded by the arrival of Yu N Babaev, VI Ritus, V G Zagrafov, B N Kozlov, G A Goncharov, and M P Shumaev. Yu A Romanov, who by that time had already had three years' experience working on the Atomic project, was happy to share his knowledge and research techniques with them. The team fast evolved into a group of friends, and this group became a valuable theoretical link in the work of Design Bureau No. 11. In 1950–1953, Yu A Romanov developed an improved diffusion method of neutron transfer based on solutions of the single-velocity kinetic equation, and carried out calculations of the kinetics of nuclear and thermonuclear reactions in the layers of heavy and light materials in the RDS-6s. This research program made important contributions to justifying the effectiveness of neutron-initiated nuclear processes, which worked on August 12, 1953 in the successful testing of the RDS-6s.

Yu A Romanov was one of the leading developers of the RDS-37 hydrogen bomb, which became a prototype of modern thermonuclear weapons based on the principle of implosion of the main energy-releasing component by X-ray radiation generated by the explosion of the atomic-bomb charge.

In 1955, Yu A Romanov was transferred to the newly created nuclear research center NII-1011 (currently Russian Federal Nuclear Center 'E I Zababakhin All-Russian Scientific Research Institute for Technical Physics' (RFNC–VNIITF) in Snezhinsk) to the post of head of the Theory Sector (Division). In 1957, Yu A Romanov as research



Yurii Aleksandrovich Romanov
(17.06.1926–01.11.2010)

supervisor conducted the first physical experiment using a nuclear explosion to study the interaction of explosion-produced radiation with various materials. In 1958, he was appointed deputy scientific supervisor of the NII-1011, and in 1960—first deputy of scientific supervisor and head of the Theory Sector.

In 1960–1962, Yu A Romanov was the scientific supervisor of and a creative participant in the pioneering physical testing-grounds experiment which allowed his team to test and develop a theoretical understanding of the effects produced by high-intensity X-ray fluxes and by the penetrating radiation of the nuclear explosion on the substance.

During 1957–1962, the USSR was conducting aerial, high-altitude, and outer space nuclear explosions aimed at studying their effects on terrestrial and cosmic objects and the atmosphere, radar means of anti-missile defense systems, and radio and wired communication equipment. Yu A Romanov, P V Kevlishvili, and S V Forsten provided scientific guidance of the study of physical processes and destruction parameters of high-altitude and outer space nuclear explosions. These experiments permitted gathering unique information on specific features of the development of giant plasma struc-

tures, and the formation and propagation of powerful electromagnetic pulses.

In 1967, Yuri Aleksandrovich returned to the VNIIEF as deputy scientific supervisor, and in 1969 as deputy scientific supervisor and simultaneously head of the theory division, which he headed until 1998, and in 1998 he passed to the position of chief researcher and deputy scientific supervisor for anti-missile defense.

Yu A Romanov's responsibility was to exercise scientific and technical supervision over a number of unique projects in inertial confinement, ignition, and combustion of thermonuclear plasma under the conditions of radiation implosion. This program investigated the peculiarities of the processes of radiation gas dynamics far from local thermodynamic equilibrium; it developed kinetic models of charged particles in plasma and the role of the inverse Compton effect. This activity contributed importantly to the scientific foundation of the physics of high energy densities.

Yu A Romanov guided the research, design, and pilot construction for projects in nuclear charges and ammunition, anti-missile defense, and air defense. More than 50 nuclear tests were conducted during the execution of this program. The researchers studied the physics of destruction by the impact factors of a nuclear explosion and established criteria of vulnerability of anti-missile defense and air-defense targets and criteria of the survivability and destruction of rocketry, space vehicles, and various equipment. Yuri Aleksandrovich played the key role in conducting 15 intricate irradiation experiments aimed at ensuring high survivability parameters of the weaponry of this country. The generation of principally new information laid down an important scientific and technological foundation for unbiased evaluation of overcoming anti-missile defense barriers, thus increasing the efficiency of the combat readiness of this country.

Yu A Romanov wrote a number of papers on the fundamental aspects of modern physics. In 1961, he formulated, together with G F Filippov, the basic equations of quasilinear plasma. Yu A Romanov's articles on unified field theory and geometrodynamics (together with M V Gorbatenko) are well known. He devoted great attention to the training and professional maturation of research personnel in his field of work. A number of his close students received DSc degrees and then rose to membership in the Russian Academy of Sciences. For more than 40 years, Yu A Romanov sat on Scientific and Technical Council No. 2 of the Ministry of Medium Machine Building (Minatom, Rosatom).

Yu A Romanov was awarded a number of orders and medals of the USSR and Russian Federation: the Order of Lenin, the Order of the October Revolution, two Orders of the Red Banner of Labor, and the Order of Merit to the Fatherland of the Third Class. In 2001, he received the distinction of Honored Scientist of the Russian Federation.

Yu A Romanov's students and successors continue his work dedicated to strengthening the safety of our State, to ensuring a peaceful life for the people of Russia, to furthering research, and to generating new knowledge of physical processes that take place under extreme conditions of very high energy densities.

*E N Avrorin, V Ya Gol'din, R I Ilkaev,
N N Kalitkin, V P Neznamov, V I Ritus,
A A Rukhadze, L D Ryabev, V P Silin,
V E Fortov, S A Kholin*