Physics – Uspekhi **51** (11) 1191 – 1192 (2008)

PERSONALIA

PACS number: **01.60.+q**

In memory of Mikhail Dmitrievich Galanin

DOI: 10.1070/PU2008v051n11ABEH006698

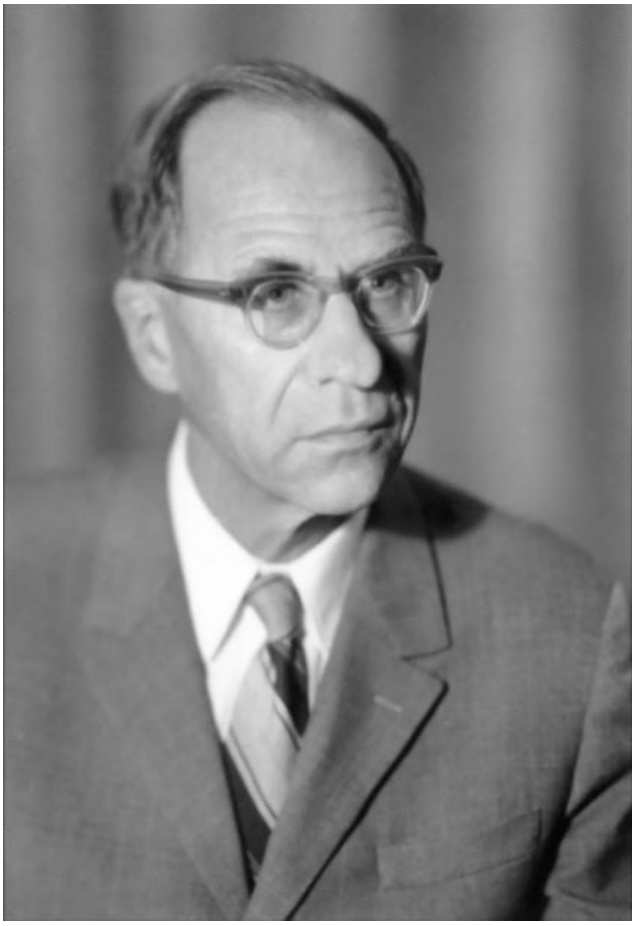
Mikhail Dmitrievich Galanin — brilliant scientist, Corresponding Member of the Russian Academy of Sciences (RAS), Honored Scientist of the Russian Soviet Federal Socialist Republic, Professor at Moscow Institute of Physics and Technology — died on 3 May 2008.

M D Galanin was the leader of the Russian school of luminescence, the closest student and successor of the founder of this school, Academician S I Vavilov. His fundamental research work is widely known both in this country and abroad. The main avenues of his work were luminescence, quantum radiophysics, and nonlinear optics.

He was born in Moscow on 7 February 1915, and graduated from the Physics Department of Moscow State University (MGU) in 1938, majoring in optics. M D Galanin's entire life in science was rooted in the P N Lebedev Physical Institute of the Russian Academy of Sciences (FIAN in *Russ. abbr.*). He completed his graduation thesis under S M Rytov's guidance, and in June 1938 began his work at FIAN as a laboratory assistant. In September 1939, M D Galanin enrolled in FIAN postgraduate courses but already in November 1939 was conscripted to active duty in the Red Army and took part in the Great Patriotic War. M D Galanin served in communications units and received combat awards: the Order of the Red Star and the medal For Defense of the Caucasus. In September 1945, he was reinstated as a FIAN postgraduate and his research work was supervised by S I Vavilov. In 1948, M D Galanin submitted and defended his thesis for Candidate of Physicomathematical Sciences. Between 1963 and 1988 he headed the FIAN Luminescence Laboratory. For many years Mikhail Dmitrievich was chairman of the RAS Scientific Council for the problem "Luminescence and progress in its applications in the national economy".

M D Galanin earned his high reputation in physics in this country and later on the international stage by studying the transfer of the electron excitation energy in condensed matter. In this work, which he began together with S I Vavilov, he exhibited his art as a skilful broad-minded physics experimenter. The theoretical interpretation of rich and elegant experimental data brought M D Galanin the results that formed the basis of the general theory of transfer of the electron excitation energy in condensed matter. The theory is known in the Russian and world literature as the Förster – Dekster – Galanin theory. It is successfully applied in solid-state physics, photochemistry, molecular biology, and other fields of science.

The first summary of these many years of work appeared in 1956 in M D Galanin's thesis "The resonance transfer of the electron excitation energy in luminescent solutions" for Doctorate of Physicomathematical Sciences. In 1978, M D Galanin (together with V M Agranovich) published a monograph *Transfer of the Electron Excitation Energy in Condensed Matter*. The book presented the main results of the investigation of electron excitation energy transfer and discussed its various mechanisms: resonance energy transfer, energy transfer by excitons, radiative transfer, and energy transfer at high excitation levels.



Mikhail Dmitrievich Galanin
(07.02.1915 – 03.05. 2008)

M D Galanin worked on many fundamental aspects of luminescence. He studied all principal characteristics of luminescence, such as absorption and luminescence spectra, luminescence yield, polarization, kinetics, and energy transfer. He investigated luminescence quenching and the effects of reabsorption on luminescence. These characteristics were studied not only under ordinary photoexcitation but also under radiative excitation and laser light. He carried out many measurements of luminescence yield in various substances. Many publications dealt with measurements of luminescence center lifetimes and kinetics of luminescence.

In the 1950s, M D Galanin and his coworkers completed a large series of works dealing with radioluminescence and

Uspekhi Fizicheskikh Nauk **178** (11) 1237 – 1238 (2008)
DOI: 10.3367/UFNr.0178.200811i.1237
Translated by V I Kisin

energy transfer under hard excitation. These results were of great practical value as it was the time of the rapid growth of nuclear power engineering, and became the launching pad for developing high-efficiency scintillators.

M D Galanin achieved a great deal in laser physics and nonlinear optics. In September 1961, a solid-state ruby laser started working in his group. He was the first in this country to use lasers for studying luminescence. With laser-light excitation, M D Galanin discovered the two-photon dichroism in liquids and quenching of luminescence by intense light beams, observed anti-Stokes Raman scattering on electron levels of dye molecules, and studied superluminescence in laser-excited molecular crystals. He conducted a series of experiments to study polariton luminescence in molecular crystals at low temperatures, which strengthened the polariton theory of luminescence in these media. Specialists know M D Galanin's works on two-photon absorption. Dye luminescence from the second excited level ($S_2 \to S_0$ luminescence) was studied in detail. This revealed the peculiarities emerging in luminescence excited by picosecond pulses.

M D Galanin did much for physics training in our country. He taught at the Moscow Institute of Physics and Technology (MFTI in *Russ. abbr.*) beginning in 1948, worked for many years at the Chair of General Physics, and from 1969 — the year the Chair of Quantum Radiophysics was set up — until 1989 headed this chair. He taught many students at MFTI, who still remember him as an attentive and benevolent teacher. Dozens of his former students are now on the staff at FIAN. In 1999, M D Galanin published a book *Luminescence of Molecules and Crystals* (in Russian and in English). It presented the fundamentals of the physics of luminescence. It was intended for researchers, teachers, postgraduates, and undergraduate students. The book became widely known internationally and was highly praised by specialists.

M D Galanin was an experimenter born, invariably mastering new techniques bravely and enthusiastically, carrying out any experimental work himself. He would do experiments for most of his publications with his own hands, continuing at the same time his teaching and managerial activities. These qualities, together with those inherent in a man of high theoretical culture, earned M D Galanin an enormously high standing, both in this country and abroad.

Mikhail Dmitrievich was exemplary in combining a sense of duty, modesty, and benevolence with people, regardless of the position they occupied, and in the high standards he imposed on himself. He could be called a true member of the intelligentsia in the lofty meaning that this term carries in Russia. M D Galanin was for many years head of a large research establishment, but for all that remained accessible to every one on the staff and every student. His personality left its imprint on the kind and fruitful atmosphere that was maintained in FIAN's Laboratory of Luminescence.

For many years M D Galanin worked hard to popularize scientific knowledge. He wrote many articles on optics and luminescence for the Great Soviet Encyclopedia. He actively cooperated with the Znanie (Knowledge) society, and wrote articles for popular science publications.

He was a member of editorial boards of the magazines *Quantum Electronics* and *the Journal of Applied Spectroscopy*. He worked for many years in the Supreme Certifying Commission (VAK in *Russ. abbr.*) and earned general recognition as one of the best experts.

His outstanding results in physics brought him the S I Vavilov Gold Medal (1976) and the P N Lebedev Gold Medal (2001) of the RAS.

The memory of Mikhail Dmitrievich, a wonderful person and an outstanding scientist, will live for years and years in the hearts of his friends, disciples and colleagues.

V M Agranovich, Yu N Vavilov, A G Vitukhnovskii, A N Georgobiani, V L Ginzburg, O N Krokhin, V S Lebedev, A M Leontovich, A V Masalov, Yu P Timofeev, Z A Chizhikova