

# Georgii Anatol'evich Smolenskii (on his seventieth birthday)

K. S. Aleksandrov, B. K. Vaĭnshteĭn, B. M. Vul, and L. A. Shuvalov

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One of the leading Soviet scientists in the field of solid state physics, specialist in ferroelectricity and magnetism, laureate of the State Prize of the USSR, corresponding member of the Academy of Sciences of the USSR Georgii Anatol'evich Smolenskii has attained the age of seventy.

G. A. Smolenskii was born on the 23rd of June 1910 into a family of engineers in Yalta. He graduated from high school there in 1929 and came to Leningrad. From 1930 until 1933 he worked as a worker at the Baltic plant. Then he entered the physical-mechanical department of the Leningrad Polytechnical Institute.

After graduation with honors from the institute in 1938 G. A. Smolenskii worked for a long time (till 1951) in one of the largest industrial research institutes, being for more than 10 years the director of a laboratory. There the range of the scientific interests of Georgii Anatol'evich was formed which determined substantially the direction and the character of his subsequent work—the study of dielectric and nonmetallic magnetic materials in close connection with their practical applications.

Georgii Anatol'evich made large scale and important (for industrial applications) studies of mechanisms of losses and polarization processes in dielectrics, the anharmonicity of ion vibrations being taken into account for the first time. In the difficult time of the blockade Georgii Anatol'evich prepared and in 1944 defended the candidate dissertation "Highly stable materials for capacitor technology" which made an important contribution to the development of radio devices with stabilization without quartz.

Having become one of the creators of the radio ceramic industry in our country Georgii Anatol'evich Smolenskii started the fundamental studies in the field of physics of magnetism and ferroelectricity in the first postwar years. He carried out pioneer investigations of ferrites with a small anisotropy constant and formulated the criterion of obtaining ferrites with high magnetic permeability, by this layering the foundations of industrial production of ferrites in the USSR, now one of the most important class of electronics materials. Relying on the discovery of the ferroelectric properties of barium titanate Georgii Anatol'evich found and investigated ferroelectric properties of a number of other perovskite type materials, starting the intense growth of discoveries and studies of new ferroelectrics all over the world. In 1952 for these studies of ferrites and ferroelectrics G. A. Smolenskii was awarded the State Prize of the USSR.

In 1951 Georgii Anatol'evich started to work at the in-



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stitute of the Chemistry of Silicates of the Academy of Sciences of the USSR and organized there the laboratory for studies of ferroelectrics and similar materials which was transferred in 1956 to the Institute of Semiconductors of the Academy of Sciences of the USSR where Georgii Anatol'evich became the deputy director. After the fusion of the Institute of Semiconductors with the Physico-Technical Institute of the Academy of Sciences of the USSR in 1972 Georgii Anatol'evich became the director of the laboratory of magnetism and ferroelectricity in the Physico-Technical Institute.

During the years of work at the Academy of Sciences of the USSR G. A. Smolenskii made outstanding scientific and administrative contribution to the transformation of studies of ferroelectricity into one of the leading parts of contemporary fundamental and applied solid state physics. Having formulated the empirical criterion for ferroelectricity Georgii Anatol'evich and his collaborators discovered and investigated a number of new ferroelectrics, fundamentally new materials amongst them—ferroelectrics-ferromagnetics possessing electric and magnetic ordering simultaneously. On the basis of these studies ferroelectric materials were obtained in the USSR and in other countries which

found many applications in different branches of technology, Georgii Anatol'evich taking a leading part in the creation of the industry of ferroelectric ceramics for piezoelectric devices and capacitors in the USSR.

In subsequent years G. A. Smolenskiĭ and his collaborators developed the physics of ferroelectrics with diffuse phase transitions—the largest class of ferroelectrics. They studied the phenomenon of longtime memory in ferroelectric and piezoelectric crystals and powders following the application of electromagnetic pulses (electroacoustical echo). In recent years studies of ferroelectric and ferroelastic phase transitions by different spectroscopic methods (soft modes and the central peak are found in a number of crystals) are being conducted on a large scale, studies of propagation and transformation of laser radiation in ferroelectric film waveguides which are important for optoelectronics have been made, and non-reciprocal effects in layer structures were discovered (a number of devices based on these results was proposed).

It is difficult to overestimate the contribution of G. A. Smolenskiĭ to the creation and development of the new branches of physics of magnetism. Under his guidance the relaxation processes of ferromagnetic resonance had been studied and this made it possible to obtain UHF ferrites with a narrow resonance band; the spatial oscillation of the spin density in paramagnetics was discovered by the NMR method, a new phenomenon—induced ferromagnetism—was found and the influence of parametric spin waves on the processes of nuclear relaxation in ferrites was discovered.

In the field of magneto-optics G. A. Smolenskiĭ with his collaborators also obtained a number of cardinal results: an anomalously large Cotton-Mouton effect was found in a number of crystals with different types of magnetic ordering and a new mechanism of the interaction of light with magnetic crystals was studied, light scattering at compensation points of ferrites was found.

In recent decades G. A. Smolenskiĭ with collaborators has been conducting more and more extensive studies in the field of UHF acoustics of a wide class of crystals which are of great fundamental and applied significance. Important results have been obtained from studying the influence of impurities and anharmonicity on the attenuation of hypersound waves and from studying magnon-phonon interactions in ferrites; an "intrinsic" magneto-

elastic resonance has been found; ways of constructing controlled acoustic delay lines for UHF signals have been demonstrated.

Georgii Anatol'evich is the author of four monographs, more than 220 scientific papers, and 10 inventions.

So broad a spectrum of achievements of G. A. Smolenskiĭ in the formation and development of new scientific directions and of their practical applications would have been, probably, impossible if he had not created a large scientific school, many representatives of which have already become prominent scientists and have made important contributions to the development of different branches of basic solid state physics. Under the direction of Georgii Anatol'evich six individuals have obtained the degree of doctor of science and 27 individuals the degree of candidate of science. It is also impossible not to mention the pedagogic activities of Georgii Anatol'evich extending over more than thirty years at the Leningrad Polytechnical Institute where he is teaching a number of general and special courses.

It is necessary to note also the great scientific administrative and public service activity of Georgii Anatol'evich. He is a member of the executive of the Division of General Physics and Astronomy of the Academy of Sciences of the USSR, the chairman of the Scientific Council of the Academy of Sciences of the USSR on the physics of ferroelectrics and dielectrics, a member of a number of other scientific councils and editorial boards of domestic and international journals.

Georgii Anatol'evich was awarded the Order of Red Banner of Labor.

The inexhaustible energy, precision and self-discipline, broad and deep scientific erudition, benevolent attitude to people, and a high degree of authority in domestic and international scientific circles have allowed Georgii Anatol'evich to combine successfully over the course of many years fruitful creative work with management of a large scientific organization involving numerous duties.

A talented scientist and administrator, creator of a large scientific school, communist, and a charming modest man, Georgii Anatol'evich Smolenskiĭ celebrates his 70th anniversary at a flourishing stage of his energy and talent.

Translated by D. Kirillov