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ALEXANDER MIHAILOVICH ZAMORZAEV (1927-1997)

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Professor Alexander Mihailovich Zamorzaev, the doctor of physical – mathematical sciences, the Correspondent-member of the Academy of Sciences of the Republic Moldova, world-known scientist in the field of geometrical crystallography and discrete geometry, died on 1 November 1997.

Bibliographical data

Professor A.M. Zamorzaev was born on 23 January 1927 in Leningrad. He graduated in 1950 at the University of Leningrad. At the Department of Geometry of the same university, under the scientific guidance of the academician A.D. Alexandrov, he gained in 1953 the M.A. degree with the dissertation *Generalization of Fedorov groups*, where he developed the general theory of antisymmetry. Using the Shubnikov method for the derivation of point antisymmetry groups, he obtained the space antisymmetry groups, called by the author "Shubnikov groups", in the honor of the pioneer of antisymmetry. After that, he continued his work at the new-opened University of Kishinev (KGU).

In the automn 1953, at the Department of Geometry and Algebra remained only two lecturers, and the new lecturer A.M. Zamorzaev was the third with M.A. degree in the whole mathematical department of physical-mathematical faculty. He started to teach six "vacant" courses, not all of the geometrical profile, special seminary and the work with six graduating students — a very large program for the beginning lecturer. Anyway, as A.M. Zamorzaev mentioned in his memories about this period of his work, the War-years experience, student working semesters and sportive training helped him not only to sustain, but also to make the fundament for the future fruitful scientific research. Namely in his first 1953-54 teaching year, from the graduating work of E.I. Sokolov, mentored by A.M. Zamorzaev, started the development of the theory of multiple antisymmetry, generalizing the antisymmetry of the academician A.V. Shubnikov by asigning to points not only one, but several "+" or "-" signs. Beginning from 1954, the research and the derivation of multiple antisymmetry groups of finite figures was continued in 1955, and extended in 1956 from finite to infinite figures.

By the efforts of A.M. Zamorzaev, at the Department of Geometry and Algebra in 1955 was opened the particular specialization, needing to develope special courses — additional chapters in high geometry, mathematical crystallography problems, the theory of antisymmetry and its generalizations.

To introduce such geometrical specialization, it was necessary to have the geometry specialists. This problem A.M. Zamorzaev sucesfuly solved as well, by organizing in 1960 the Scientific Seminary in Mathematical Crystalography and including in the work his graduated students. Very soon, this seminary outgrowed to the Republic Seminary in Discrete Geometry.

Beginning from the small group of his students in 50-ies, thanks to the pedagogical and scientific initiative of A.M. Zamorzaev it was formed the Kishinev Geometry School, announced in 1964 by the Second General Geometry Conference in Harkow as the second scientific center for discrete geometry in USSR (after B.N. Delone school from Moscow). By their own way, different from the methods of geometrical number theory developed by B.N. Delone, Kishinev geometers used the theory of generalized antisymmetry as the approach to the multidimensional crystallography, and to the discrete symmetry groups of Lobachevski and Minkowski spaces.

A.M. Zamorzaev is the author of three very important theories in the geometry and mathematical crystallography:

1) the theory of multiple antisymmetry;

2) the theory of similarity symmetry and conformal symmetry;

3) the theory of P-symmetry, including various generalizations of A.V. Shubnikov's antisymmetry and N.V.Belov's color symmetry, proposed by different authors (Russian and others) and in different times.

The collected results of those three theories represent the basic content of his doctoral dissertation *Theory of antisymmetry and its different generalizations*, presented to the Scientific Board of Crystallography Institute Acad.Sci. USSR. Under the scientific guidance of A.M. Zamorzaev, they are completed 107 graduating works, ten M.A. dissertations and three Ph.D. disserations.

His scientific fields of interest were very distinct. A.M. Zamorzaev published works covering different branches of geometry:

a) the axiomatics of different geometries;

b) the discrete groups of generalized antisymmetry in Euclidean spaces;

c) the similarity symmetry and conformal symmetry;

d) the discrete symmetry groups of non-Euclidean spaces;

e) the theory of space tessellations;

f) the discrete groups of affine transformations.

They represented the foundation for the profound research of multidimensional symmetry groups of different geometries, realised by the Department of Geometry at the University of Moldova, as well as by the complete geometry research program, continued mostly by his scholars. The application of the methods developed by A.M. Zamorzaev in the field of P-symmetry for analizing the phisical properties of crystals, opened new prospective for the further generalizations, developed by Moscow crystallographers and by Yugoslav mathematician S.V. Jablan.

In 1973 at the Faculty of Mathematics and Cybernetics at the University of Moldova was opened the particular Department of High Geometry, consisting of A.M. Zamorzaev's scholars oriented to the problems of generalized symmetry, and Prof. A.M. Zamorzev was his first Chairman.

The works of A.M. Zamorzaev are presently very relevant, modern and well accepted. As the awards, they could be mentioned the Fedorov Premium of Acad.Sci. USSR obtained by him in 1973 for the fundamental contribution to the development of the theory of symmetry, and the Premium of Republic Moldova for Science and Technichs in 1974 for his fundamental results in discrete geometry. In 1977 he obtained the honorary title for his merits in the education of scientific and pedagogical specialists, and from 1989 he is the elected Correspondent-member of the Acad.Sci. R. Moldova.

Till 6 October 1997 A.M. Zamorzaev continued his work, with his characteristic activity, dynamism and enthusiasm: reading the lectures in all geometry topics and his special course *Theory of antisymmetry and its different generalizations*, coordinating the scientific work of the Seminary for Discrete Geometry and of the Geometry Department. On 7 October 1997 he was feeling badly, and on 1 November 1997 he died.

The energy, sedulousness, unique inteligence, many talents (to rehearse his own and classical poetry, for the sport – jogging...), the deep knowledge on the history of mathematics in Moldova, are some of his main personal values. As the man of strong principles, always ready to give a help, support or good advice to his coleagues and students, he was greately respected by all of them.

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