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Anatoly M. Stepin (20.07.1940 - 7.11.2020)

On the last stage of the preparation of the Special Issue of the Journal "Applied Mathematics and Nonlinear Sciences" associated with the conference "Mathematical Physics, Dynamical Systems and Infinite-Dimensional Analysis - 2019" (Dolgoprudny, Moscow Region, Russia) we received very sad news that coronavirus infection took away the life of one of the editors of this Issue Honoured Professor of the Lomonosov Moscow State University Anatole M. Stepin.

Anatole M. Stepin is the brilliant representative of the Moscow Mathematical School. He is the recognized specialist in ergodic theory and dynamical systems, who has left his own inimitable and deep trace in the mathematical science. Being the representative of the elder mathematical generation, Anatole Stepin was rather focused on the extension of the mathematical building itself then on the solution of particular problems. He is the author of over a hundred articles, 2 monographs and 10 surveys.

He solved Kolmogorov's problem on the group property for spectra of dynamical origin, discovered new effects in the spectral theory of measure-preserving actions. Jointly with A. Katok he created the theory of periodic approximations of dynamical systems enriched ergodic theory with new approaches showing the amazing diversity of the transformation world.

These early works laid the foundation of the theory of interval exchange transformations. It explains Stepin's deep interest to low-dimensional dynamics (in particular, to dynamics of interval, circle and graph maps and dynamics of skew products of one-dimensional maps). Stepin constructed everywhere dense measures with mutually singular convolutions. These measures have found wide applications in ergodic theory and harmonic analysis. He has results on constructive coding of stationary processes. Stepin among first mathematicians began to develop the ergodic theory of transformation groups. He clarified the fundamental role of the Lyapunov exponents in the spectral theory of the weighted shift operators. He investigated the appearance mechanism of periodic trajectories in billiard systems without focusing and scattering. Of great importance are results of Stepin and his students on the theory of Hamiltonian and integrable systems. Stepin was one of those who started the study of models of statistical physics, in particular, the Ising model on graphs and groups.

In 1967 Anatole M. Stepin received the Prize of the Moscow Mathematical Society (jointly with A.B. Katok and V.I. Oseledets) for the cycle of works on approximations of dynamical systems by periodic transformations.

In 2009 he received Kolmogorov prize of the Russian Academy of Sciences (jointly with B.M. Gurevich and V.I. Oseledets) for the cycle of works "Ergodic Theory and Related Topics".

In the last years the structure of invariant measures for multivalued maps, the asymptotic contractions, boundary-value problems for elliptic operators on manifolds and the multiplicative ergodic theorem for operator cocycles have been the topics of Stepin's special interest.



During over 50 years of work at the Department of Mathematics and Mechanics of Moscow State University, Anatole Stepin supervised more than 30 PhD students. Since 1978, he has been organizing (together with Dmitri Anosov; from 1985 to 2002, Rostislav Grigorchuk; from 2014, Alexey Davydov) the research seminar on dynamical systems and ergodic theory; from 2014, on dynamical systems and differential equations, at Moscow State University. The colleagues and students of Anatole Stepin praised him for his permanent and careful attention, supportiveness and high professional ethic. Every his student was finally provided by personal direction indicating a huge variety of subareas in mathematics Stepin was interested in. He exercised a deep positive influence on the scientific fate of experienced mathematicians that had a great pleasure to associate with him.

A brilliant mathematician, a strong character, a cheerful man, has left us.

The memory of him will always be in our hearts.

Oleg Ageev, Lyudmila Efremova, Rostislav Grigorchuk, Alexander Plakhov, Valery Ryzhikov, Vsevolod Sakbaev, Andrey Shafarevich