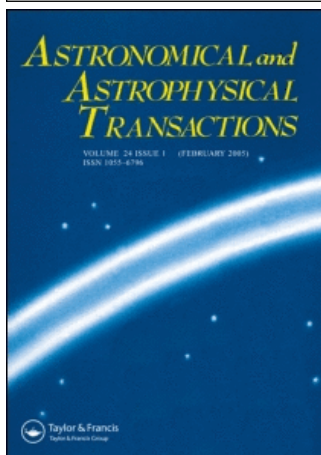


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Mathematical methods in studying the structure and dynamics of gravitating systems: Vadim anatoljevich antonov

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Vadim Anatoljevich Antonov

V. A. Antonov was born on May 20, 1933 and graduated from the Perm University as a biologist in 1955. Being a student, he began to study exact sciences including astronomy. Until 1960, he worked in the Agricultural Research Institute. Once he met K. F. Ogorodnikov's paper on stellar dynamics in "Astronomicheskij Zhurnal". He wrote the author some critical comments. After some scientific discussions, Professor Ogorodnikov invited the young biologist to enter the post-graduate scholarship of the Leningrad University. V. A. Antonov received his degree of the Candidate of Physical and Mathematical Sciences in 1964 and his Doctor degree in 1983. Until 1989, he worked at the Leningrad University. At present, V. A. Antonov is a Leading Researcher at the Institute for Theoretical Astronomy of Russian Academy of Sciences.

V. A. Antonov successfully works in many fields of stellar dynamics, dynamics of comets, theory of geopotential, theory of dynamical systems, theoretical optics, theory of random processes and others. His pioneering papers (1960, 1962) gave rise

to a new branch of stellar dynamics – theory of stability of collisionless gravitating systems. He found the necessary and sufficient conditions for stability of a wide class of spherical self-gravitating systems with spherical velocity distributions. Later he gave a complete analysis of the stability problem for spatially uniform collisionless models. He began to study non-linear oscillations of uniform systems.

In 1962, V. A. Antonov proved that statistical equilibrium is possible in gravitating systems only under some conditions. Else the spherical system will contract and become hotter and hotter (the “gravithermal catastrophe”). So the thermal death is not possible in the realm of gravitation!

In the 70's, V. A. Antonov studied area-preserving twist plane mappings and proved the existence of periodic orbits. Besides, he proved the instability of stationary systems with radial orbits. At present, he works mainly on finding invariants of motion in two- and three-dimensional dynamical problems.

V. A. Antonov is always full of new ideas. He generously presents them to his colleagues. Being an exigent judge of his own works he has not published many his prominent results. But modern stellar dynamics has been already influenced by Dr. V. A. Antonov.