From 1966 till 2017 the laboratory was headed by Academician M.I.Imanaliev. He had prepared 36 candidates of sciences and 15 doctors of sciences. Since 2017 the laboratory is headed by P.S.Pankov, corresponding member of NAS of KR. He has prepared 8 candidates of sciences and two doctors of sciences.

The following results have been obtained in the laboratory.

The method of constructing of asymptotical expansions of various kinds of singularly perturbed dynamical systems had been elaborated and applied to various initial value problems and boundary value problems for systems of differential and integro-differential equations with a small parameter by the highest derivatives.

A theory of generalized solutions of integral equations of the first kind is constructed.

The method of validating computations on a computer had been developed and applied to obtain new results in various branches of mathematics improving known ones or resolving known problems.

The method of additional argument for investigation of various kinds of non-linear partial differential and integro-differential equations had been created.

Firstly, general definitions of concepts "phenomenon" and "effect" were introduced in the theory of dynamical systems. The phenomena of asymptotical separatrix, of rotating boundary layer, of receding inner layer, of splash, of practical bifurcation, of singular cycle, of existence of some limits of solution of singularly perturbed equations while a small parameter tends to zero, of correctness of an initial value problems for the heat equation and for integral equations of the first kind with analytical functions were discovered.

The effect of numerousity (number of constituents is greater than 100-150) is revealed and its following consequences were discovered: the earliest mention of a synergetic phenomenon in

literature "irgöö" (modeled by a stochastic system of difference equations) and the phenomenon of arising a final regular grid of equal electrical charges from a random initial distribution on a topological torus.

[A strange attractor](#) is implemented mechanically.
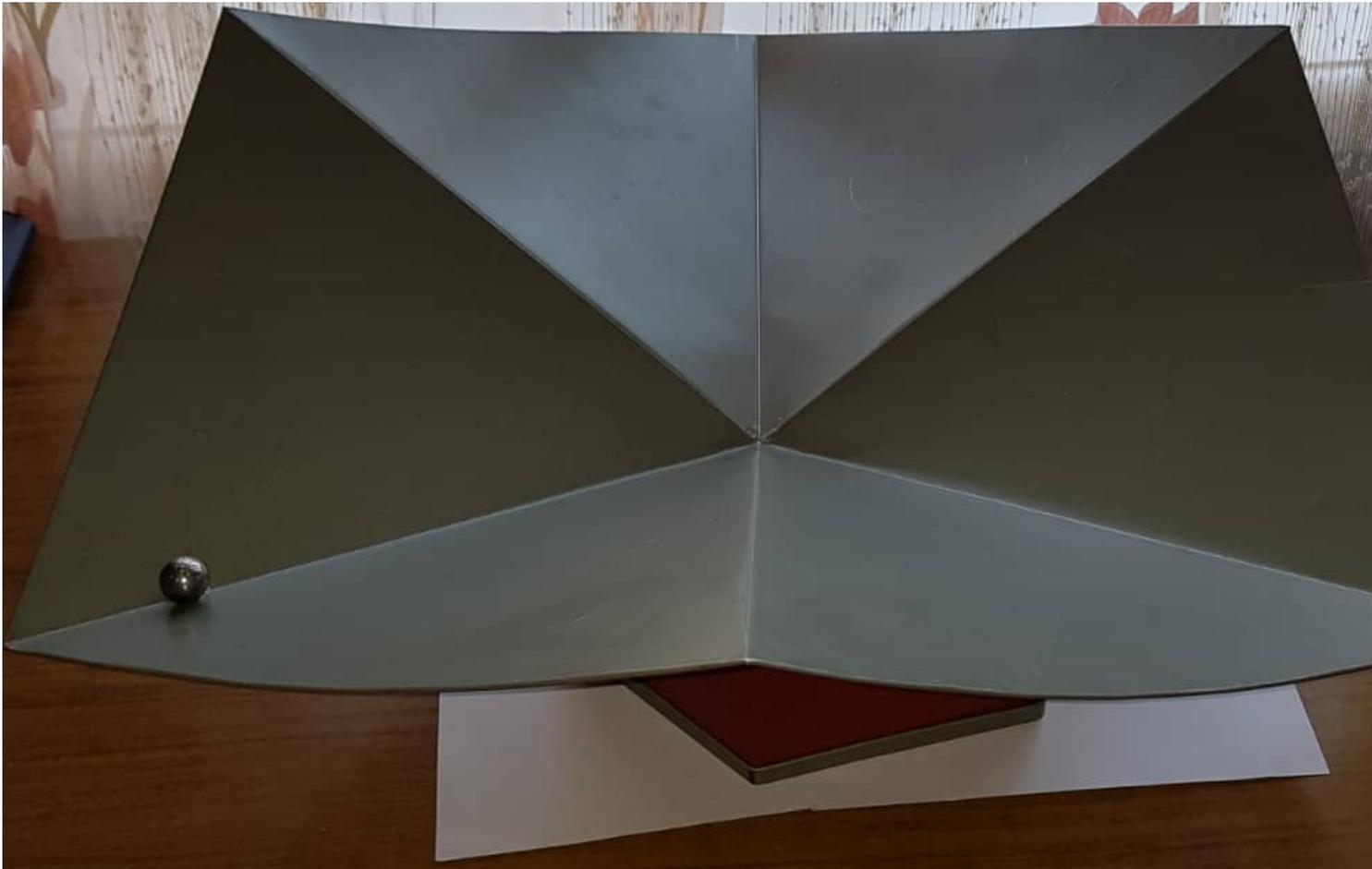
Asymptotical and analytical methods in the theory of difference, differential, integro-differential and integral equations;

A new general notion of equation is introduced and elements of the category of equations with its objects and morphisms and its subcategories including known types of tasks for various equations as well as new types of mathematical tasks are constructed on the base of

well-known categories of sets and of topological spaces.

A definition of kinematical topological spaces was introduced and interactive presentation of such spaces is implemented on computer. In the problem of motion of permanently unstable object estimations from below for increasing of entropy are obtained.

The unified algorithm of word-formation in Kyrgyz language has been implemented on computer and is u

An author's certificate on invention was obtained. More than 1200 paper including 70 ones abroad, 10 m