

Bahçeşehir University, Istanbul, Türkiye
Analysis & PDE Center, Ghent University, Ghent, Belgium
Institute Mathematics & Math. Modeling, Almaty, Kazakhstan

“Analysis and Applied Mathematics”

Weekly Online Seminar

Seminar leaders:

Prof. Allaberen Ashyralyev (BAU, Istanbul),
Prof. Michael Ruzhansky (UGent, Ghent),
Prof. Makhmud Sadybekov (IMMM, Almaty)

Date: **Tuesday, June 4, 2024**

Time: 14.00-15.00 (Istanbul) = 13.00-14.00 (Ghent) = 16.00-17.00 (Almaty)

Zoom link: <https://us02web.zoom.us/j/6678270445?pwd=SFNmQUlVTD0tRaH-IDaVYrN3I5bzJVQT09>, **Conference ID:** 667 827 0445, **Access code:** 1

Speaker:

Prof. Dr. Vladimir M. Savchin

Peoples' Friendship University of Russia, Moscow, Russia

Title: On potentiality, discretization, and integral invariants of the infinite dimensional Birkhoff's systems

Abstract: In the study of the equations of motion of systems of various physical nature, there are problems of determining the qualitative indicators and properties of motion according to the known structure and properties of the equations under consideration. Such qualitative indicators for finite dimensional systems are, in particular, integral invariants - integrals of some functions that retain their value during the movement of the system. They were introduced into analytical mechanics by A. Poincare. In the future, the connection of integral invariants with a number of fundamental concepts of classical dynamics was established. The main purpose of this lecture is to extend some notions of the theory of integral invariants to broad classes of equations of motion of infinite dimensional systems. Using a given Hamilton's action, the equations of motion of potential systems with an infinite number of degrees of freedom are obtained, generalizing the well known Birkhoff's equations. A difference analog with discrete time is constructed for them. Based on it, a difference approximation of the corresponding integral invariant of the first order is found.

Biography:

Vladimir Mikhailovich Savchin graduated with honors from the Faculty of Physics, Mathematics and Natural Sciences of the Peoples' Friendship University (1981, Moscow). He defended his dissertations for the degree of Candidate of Physical and Mathematical Sciences (1984, UDN) and Doctor of Physical and Mathematical Sciences (1992, Moscow State University) – both majoring in Theoretical Mechanics. Since 1984, he has been working at the

Peoples' Friendship University. Currently, he is a professor at the S. M. Nikol'sky Mathematical Institute. Research interests: variational principles and symmetries, infinite dimensional non-potential systems, inverse problems of calculus of variations.