

# INTERNATIONAL BIWEEKLY ONLINE SEMINAR ON ANALYSIS, DIFFERENTIAL EQUATIONS AND MATHEMATICAL PHYSICS

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Coordinators: Prof. Alexey Karapetyants, Prof. Vladislav Kravchenko

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**21 March 2024, 6 pm (UTC+3)**

## Mathematical Models in Pure and Applied Mathematics

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„Mathematics may be compared to a mill of exquisite workmanship, which grinds you stuff of any degree of fineness; but, nevertheless, what you get out depends upon what you put in; and as the grandest mill in the world will not extract wheat-flour from peascod, so pages of formulae will not get a definite result out of loose data“ (Huxley).

So, we must try to put a good grain in mathematical mills. In other words, the adequacy of the mathematical model is no less important than the correctness of the formal mathematical analysis.

The paper discusses the definitions of Pure and Applied Mathematics and mathematical model, as well as the points of view on the subject of the classics - Poincaré, Lyapunov, Lord Rayleigh. Examples include problem of truncation, continualization and splashes, Navier-Stokes equations, Kirhhoff's and Bolotin's approximations in nonlinear dynamics of continuous systems, etc.

The main conclusion can be formulated as follows. Any correct mathematical model is asymptotic. It includes as an inseparable part the asymptotic estimates and constraints on which it is based. Only in this case it is formulated quite definitely as a mathematical one.

\*Seminar website: <https://msrn.sfedu.ru/sl>. The seminar uses Microsoft Teams online platform. Please send questions to [ademp.seminar@gmail.com](mailto:ademp.seminar@gmail.com) (Tatiana Andreeva, scientific secretary).

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The seminar is organized by the coordinators Alexey Karapetyants and Vladislav Kravchenko within the activities of the Regional Mathematical Center of the Southern Federal University in collaboration with Institute of Mathematics, Mechanics and Computer Sciences of the Southern Federal University and the OTHA research group in Operator Theory and Harmonic Analysis.



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