Professor Mykola Perestyuk

(01.01.1946 – 25.01.2024)

On January 1, 2026, we celebrate the 80th anniversary of the birth of the outstanding mathematician in the field of differential equations and their applications – Academician of the National Academy of Sciences of Ukraine and Honored Professor of Taras Shevchenko National University of Kyiv – Mykola Oleksiiovych Perestyuk.

Professor Perestyuk was a world-renowned scientist, an outstanding expert in the qualitative and asymptotic theory of differential equations, and an undisputed leader in the theory of impulsive systems – a field whose foundations were laid by his fundamental and pioneering contributions.

Mykola Perestyuk was born on January 1, 1946, in the village of Ploska, Slavuta District, Khmelnytskyi region. After graduating from Myrutyn Secondary School in 1963 with honors, Mykola Oleksiiovych entered the Faculty of Mechanics and Mathematics at Taras Shevchenko Kyiv State University. Upon completing his studies at the university in 1968, he enrolled in postgraduate studies and, starting in December 1969, began working as an Assistant Professor at the Department of Integral and Differential Equations at the Faculty of Mechanics and Mathematics.

Professor Perestyuk dedicated his entire professional life – over 54 years – to the Faculty of Mechanics and Mathematics of Taras Shevchenko National University of Kyiv. In 1972, under the supervision of the prominent contemporary mathematician, Academician of the National Academy of Sciences of Ukraine A. M. Samoilenko, he defended his Candidate's Dissertation titled *"Some Problems in the Study of Nonlinear Systems of Differential Equations with Instantaneous Changes"*. In 1976, he was appointed Associate Professor of the Department of Integral and Differential Equations, and in 1978, he was awarded the academic title of Associate Professor.

Following the defense of his doctoral dissertation, *"Oscillatory Solutions of Differential Equations with Impulsive Effects and Their Stability"*, in 1986, he was appointed Professor in 1987. In 1988, he was officially awarded the academic title of Professor of the Department of Integral and Differential Equations.

Since December 15, 1987, for 35 years, Professor Perestyuk headed the Department of Integral and Differential Equations (1987–2022). Having earned the respect and authority of his university colleagues, he became the Dean of the Faculty of Mechanics and Mathematics in 1987 and successfully led it for the next 16 years (1987–2003).

The significance and importance of Mykola Oleksiiovych's scientific work and teaching activities have been recognized by mathematicians around the world. In particular, he was elected Corresponding Member of the National Academy of Sciences of Ukraine in 1997 and Full Academician in 2009. He has also received numerous state awards, among which the following are especially noteworthy:

- Election as an academician of the Department of Mathematics of the Academy of Sciences of the Higher School of Ukraine (1993);
- The State Prize of Ukraine in Science and Technology for the series of works "New Mathematical Methods in Nonlinear Analysis" (1996);
- The M. M. Krylov Prize of the National Academy of Sciences of Ukraine for the series of scientific works "Modern Methods for the Study of Dynamical Systems" (1998);
- The honorary title "Honored Scientist and Technician of Ukraine" (2002);
- The Taras Shevchenko Prize of Taras Shevchenko National University of Kyiv (2005);
- The Yaroslav the Wise Award in Science and Technology from the Academy of Sciences of the Higher School of Ukraine (2005);
- The title of Honorary Doctor of Uzhhorod National University (2005);
- The Distinction of the National Academy of Sciences of Ukraine for Scientific Achievements (2009);
- The Order of Merit, 3rd Class (2009);
- The title of Honorary Doctor of Yuriy Fedkovych Chernivtsi National University (2010);
- The title of Merited Professor of Taras Shevchenko National University of Kyiv (2010);
- The State Prize of Ukraine in Education (2012) in the category "Higher Education" for the educational-methodical set "Differential Equations", as a part of the authoring team;
- The Distinction of the National Academy of Sciences of Ukraine for Training the Scientific Successors (2015);
- The Order of Saint Volodymyr in Science and Technology from the Academy of Sciences of the Higher School of Ukraine (2016);
- The title of Honorary Professor of Ivan Ohienko Kamianets-Podilskyi National University (2017);
- The M. M. Bogolyubov Prize of the National Academy of Sciences of Ukraine for the series of works "Asymptotic Methods of Nonlinear Mechanics and Statistical Physics" (2018);
- The Order of Merit, 2nd Class (2019);
- The D. O. Grave Prize of the National Academy of Sciences of Ukraine for the series of works "Current Problems in the Theory of Differential Equations and Methods of Their Solution" (2024, posthumously).

Professor Perestyuk always devoted great effort and energy to teaching. For over 54 years, he taught general and specialized courses in the theory of ordinary differential equations. Among his students are 10 Doctors of Sciences and 22 Candidates of Physical and Mathematical Sciences.

Mykola Oleksiiovych Perestyuk devoted considerable time and effort to scientific and organizational work. He was a member of the Bureau of the Department of Mathematics of the National Academy of Sciences of Ukraine, a member of the section of the State Committee for State Prizes in Science and Technology, the head of the Expert Council on Mathematics and Mechanics at the Ministry of

Education and Science of Ukraine, and a member of the editorial boards of several mathematical journals, including three international ones (from Georgia, China, and Hungary).

The scientific interests of Mykola Oleksiiovych Perestyuk encompassed a wide range of complex and substantial problems in the theory of differential equations and nonlinear mechanics. His work contributed significantly to the development of a new branch in the theory of differential equations with impulsive effects and their application to the study of oscillatory processes subject to impulsive disturbances. Perestyuk's active scientific efforts led to a series of internationally recognized results. At the core of his research were the theory of impulsive systems and the theory of invariant sets of differential and difference equations. In 1987, the monograph "Differential Equations with Impulsive Action", co-authored with A. M. Samoilenko, was published. This was the first monograph in the world devoted to a systematic exposition of the theory of impulsive systems. In 1995, an expanded English version of this work was published under the title "Impulsive Differential Equations" [81], and it has since been widely cited in the international scientific community.

Mykola Oleksiiovych was a world-renowned scholar in the qualitative and asymptotic theory of differential equations, and a global leader in the theory of differential equations with impulsive effects. His pioneering contributions in this field have had a decisive impact on its development. His most significant and foundational results in the theory of impulsive systems include:

- the development of a fundamentally new method for analyzing nonlinear impulsive and discontinuous systems, which enabled the investigation of the differential properties of solutions and integral sets of differential equations with impulsive action on surfaces. For the first time in the mathematical literature, the concept of piecewise-continuous higher-order derivatives of solutions with respect to initial data and parameters was introduced. This breakthrough made it possible to prove deep theorems on the differentiability of solutions whose graphs lie on the integral surfaces of weakly nonlinear systems with an exponentially dichotomous linear component [54, 60, 68, 81];
- the establishment of conditions under which a system with impulsive action on hypersurfaces is, in a certain sense, equivalent to a system of differential equations with impulses at fixed moments of time. Qualitatively new theorems on the existence of integral manifolds of impulsive systems in the so-called critical case were proved. Analogues of the reduction principle for impulsive systems and of the Poincaré method for finding periodic and almost periodic solutions of perturbations of such systems in the case of an isolated generating solution were justified. The problem of the existence and stability of periodic and almost periodic solutions of strongly nonlinear systems with impulsive action was also investigated [81];
- the development of algorithms for the approximate solution of a sufficiently broad class of differential equations with impulsive action. Analogues of N. N. Bogolyubov's theorems justifying the averaging method were proved [18, 20, 22];
- the development of a scheme of the numerical-analytical method of A. Samoilenko for finding periodic solutions of essentially nonlinear systems with impulsive action – both at fixed and non-fixed moments of time [1–3]. Using this method, coefficient-based conditions for the existence of periodic regimes in broad classes of impulsive systems were obtained;
- the justification of the averaging method on the real axis for impulsive systems of coupled oscillators, which made it possible to reduce the asymptotic analysis of nonlinear impulsive systems to autonomous systems of ordinary differential equations [7, 10–-12];
- the further development of the theory of discontinuous limit cycles in the plane and the derivation of conditions for their existence and stability [13, 21];
- the derivation of a series of integro-summation inequalities (analogues of Gronwall-type inequalities), which significantly advanced various aspects of the theory of impulsive systems through their application, including continuous dependence, uniqueness theorems, bounded solutions, stability, integral manifolds, and others [25, 26];
- the extension of the Floquet-–Lyapunov theory to impulsive systems, which made it possible to reduce a linear periodic impulsive system to a system of linear equations with constant coefficients and facilitated the development of the Lyapunov exponent theory for impulsive systems [42];

- the establishment of effective stability criteria for solutions of differential equations with impulsive action occurring both at fixed moments of time and at moments when the phase point enters predefined sets in the extended phase space. These criteria are complete and constructive in nature and have been successfully applied in the study of the stability of motion in specific mechanical systems [21, 27, 37, 114];
- the derivation of a theorem on stability in the first approximation, the key element of which is the formulation of the impulsive linear system of the first approximation [42];
- together with his student S. Gurgula, the development of the second Lyapunov method in stability theory for essentially nonlinear impulsive systems with non-fixed impulses [45];
- together with his student M. Akhmet, the proposal of a refined technique – based on abstract implicit function theorems – for reducing systems with impulsive action at non-fixed moments of time to systems with impulsive action at fixed moments. This approach made it possible to study problems concerning globally bounded and periodic solutions of impulsive systems with non-fixed impulse moments [47-–49];
- together with his teacher A. Samoilenko, the derivation of foundational results in the theory of discontinuous integral manifolds for impulsive systems. Their approach, based on the impulsive Green's function and the subsequent representation of the manifold in an integro-summation form, enabled significant further development of this theory [43, 46];
- the introduction of an analogue of the Green–Samoilenko function in the problem of invariant sets of a linear extension of a discontinuous dynamical system enabled the development of a perturbation theory of invariant sets for discontinuous dynamical systems [75, 117, 120, 121];
- based on the ideas of A. Samoilenko, the development of a theory of discontinuous dynamical systems on the torus using a discontinuous Green–Samoilenko function with a subsequent integro-summation representation of the discontinuous toroidal manifold [21, 36, 75, 117];
- together with A. Samoilenko and S. Trofimchuk, the investigation of the problem of "bouncing" of solutions against the hypersurface of impulsive action. Conditions ensuring the absence of such bouncing were established, which allowed for the further development of continuation theory for impulsive systems [58, 62];
- along with A. Samoilenko and S. Trofimchuk, the establishment of the foundations of the theory of quasi-periodic solutions of impulsive systems [62];
- together with I. Korol, the extension of numerical-analytical methods to a broader class of problems and studied solutions to boundary value problems for degenerate impulsive systems [112];
- together with P. Feketa, the development of a perturbation theory of smooth invariant tori in the case where the perturbations are sufficiently small in the non-wandering set of a dynamical system on the torus [124, 131, 134]. These results made it possible to investigate the qualitative behavior of solutions of wide classes of nonlinear systems that have a simple structure of limit sets and recurrent trajectories, including certain classes of impulsive differential equations defined on the product of a torus and a Euclidean space [119–122];
- together with O. Kapustyan, the establishment of the foundations of the theory of global attractors for dissipative infinite-dimensional impulsive systems. Their introduction of the notion of a uniform attractor – where invariance is replaced by minimality – made it possible to establish effective sufficient conditions for the existence of compact uniformly attracting sets for wide classes of parabolic and hyperbolic equations whose trajectories undergo impulsive effects upon reaching a fixed subset of the phase space, as well as to investigate their stability and structure [136–140];
- together with N. Skrypnyk, the justification of the averaging method for certain classes of multivalued impulsive systems, in particular for impulsive differential inclusions, impulsive differential equations and inclusions with the Hukuhara derivative, and impulsive fuzzy differential equations and inclusions [123, 127, 141].

The results of Mykola Oleksiiovych also had a significant impact on the development of the theory of difference equations, where, together with A. Samoilenko and D. Martynyuk, he significantly advanced:

- the theory of reducibility of discrete dynamical systems [8, 9];
- the theory of invariant toroidal manifolds of systems of difference equations [6].

Mykola Oleksiiovych was also active in the field of functional-differential equations. Together with V. Slyusarchuk, I. Cherevko, and I. Klevchuk, he obtained the following important results:

- the development of the theory of integral manifolds for singularly perturbed systems of functional-differential equations [105, 130];
- the decomposition of nonlinear singularly perturbed systems of functional-differential equations and the establishment of a reduction principle for stability analysis [98, 99];
- the application of the averaging method to the study of periodic solutions of conservative systems with small delays and the analysis of stability of weakly coupled oscillators with time delay [130];
- the derivation of coefficient conditions for the oscillation and non-oscillation of solutions of functional-differential equations [106, 107].

O. Kapustyan, I. Cherevko, I. Kiguradze, I. Korol, A. Lomtatidze, O. Stanzhytskyi

List of the main publications by Mykola Perestyuk

1. Numerisch-analytische Methode zur Untersuchung periodischer Systeme mit Impulsen. (Russian) *Trudy Sem. mat. Fiz. nelin. Koleb.* **3** (1969), 243–253.
2. Periodic solutions of sampled data systems. (Ukrainian) *Vīsnik Kiïv. Unīv.* 1971, no. 13, 100–105.
3. The periodic solutions of certain systems of differential equations. (Russian) *Asymptotic and qualitative methods in the theory of nonlinear oscillations (Russian)*, pp. 136–146, *Izdanie Inst. Mat. Akad. Nauk Ukrain. SSR, Kiev*, 1971.
4. Invariant sets of systems with instantaneous change in standard form (with A. M. Samoĭlenko). (Russian) *Ukrain. Mat. Zh.* **25** (1973), 129–134.
5. The existence of invariant toroidal sets of systems with instantaneous change (with A. M. Samoĭlenko). (Russian) *The method of integral manifolds in nonlinear differential equations (Russian)*, pp. 262–273, *Izdanie Inst. Mat. Akad. Nauk Ukrain. SSR, Kiev*, 1973.
6. Existence of invariant tori for systems of difference equations (with A. M. Samoĭlenko and D. I. Martynjuk). (Russian) *Differencial'nye Uravnenija* **9** (1973), 1904–1910.
7. On the question of the justification of the averaging method for second order differential equations with pulses (with A. M. Samoĭlenko). (Russian) *Nonlinear oscillations and stability of motion (Russian)*, pp. 273–282, *Izdanie Inst. Mat. Akad. Nauk Ukrain. SSR, Kiev*, 1973.
8. The reducibility of linear systems of difference equations with quasiperiodic coefficients (with D. I. Martynjuk). (Russian) *Vychisl. Prikl. Mat. (Kiev)* **1974**, no. 23, 116–126.
9. Periodic solutions of a certain class of systems of difference equations (with D. I. Martynjuk and L. V. Harabovskaja). (Russian) M*athematical physics, No. 15 (Russian)*, pp. 98–104, *Izdat. "Naukova Dumka", Kiev*, 1974.
10. The averaging method in systems with impulsive action (with A. M. Samoĭlenko). (Russian) *Ukrain. Mat. Zh.* **26** (1974), 411–418.
11. *On the Averaging Principle in Systems with Impulsive Action. Nonlinear Effects in Microelectronics and Their Applications* (with A. M. Samoĭlenko). (Russian) Znanie, Kyiv, 1974.
12. N. N. Bogoljubov's second theorem for systems of differential equations with impulse action (with A. M. Samoĭlenko). (Russian) *Differencial'nye Uravnenija* **10** (1974), 2001–2009
13. Discontinuous cycles of a second-order equation with instantaneous change (with K. V. Tsidylo). (Russian) *Asimptot. Metody nelin. Meh.*, 1974, 193–203.

14. The reducibility of difference equations on a torus (with D. I. Martynjuk). (Russian) *Vychisl. Prikl. Mat. (Kiev)* **1975**, no. 26, 42–48.

15. Reducibility of linear systems of difference schemes with a smooth right-hand side (with D. I. Martynjuk). (Russian) *Vychisl. Prikl. Mat. (Kiev)* **1975**, no. 27, 34–39.

16. On the question of the justification of the averaging principle in systems with impulsive action (with A. M. Samoĭlenko). (Russian) Conference on Differential Equations and Applications (Ruse, 1975). *Godishnik Vissh. Uchebn. Zaved. Prilozhna Mat.* **11** (1975), no. 1, 207–213 (1977).

17. On the question of the stability of the equilibrium of impulsive systems. (Russian) Conference on Differential Equations and Applications (Ruse, 1975). *Godishnik Vissh. Uchebn. Zaved. Prilozhna Mat.* **11** (1975), no. 1, 145–151 (1977).

18. Application of the Krylov–Bogolyubov asymptotic method to the study of systems with impulsive perturbation. (Ukrainian) *Vīsnik Kiïv. Unīv. Ser. Mat. Mekh.* no. 19 (1977).

19. Stability of the solutions of differential equations with impulsive action (with A. M. Samoĭlenko). (Russian) *Differencial'nye Uravnenija* **13** (1977), no. 11, 1981–1992.

20. On the question of the justification of the averaging method for a second order equation with impulsive interaction (with Ju. A. Mitropol'skiĭ and A. M. Samoĭlenko). (Russian) *Ukrain. Mat. Zh.* **29** (1977), no. 6, 750–762.

21. Periodic solutions of weakly nonlinear systems with impulse action (with A. M. Samoĭlenko). (Russian) *Differencial'nye Uravnenija* **14** (1978), no. 6, 1034–1045.

22. Application of the Krylov–Bogoljubov asymptotic method to the study of systems with impulse action (with Ī. Karkīnbaēv). (Ukrainian) *Vīsnik Kiïv. Unīv. Ser. Mat. Mekh.* no. 20 (1978), 51–59.

23. On the question of the justification of the application of asymptotic methods to the study of impulse systems (with Ī. Karkīnbaēv). (Russian) *Asymptotic methods in the theory of nonlinear oscillations (Proc. All-Union Conf. Asymptotic Methods in Nonlinear Mech., Katsiveli, 1977) (Russian)*, pp. 43–50, 273, *"Naukova Dumka", Kiev*, 1979.

24. Periodic solutions of nonlinear differential equations with an impulse influence (with V. N. Shovkopljas). (Russian) *Ukrain. Mat. Zh.* **31** (1979), no. 5, 517–524; translation in *Ukr. Math. J.* **31** (1979), no. 5, 408–414.

25. A linear integral inequality for piecewise continuous functions (with S. G. Khristova and D. D. Baĭnov). (Bulgarian) *Godishnik Vissh. Uchebn. Zaved. Prilozhna Mat.* **16** (1980), no. 3, 221–226 (1981).

26. Periodic solutions of weakly nonlinear integro-differential equations with impulse action (with G. H. Sarafova and M. A. Khekimova). (Ukrainian) *Vīsnik Kiïv. Unīv. Ser. Mat. Mekh.* no. 22 (1980), 96–101.

27. On the stability of solutions of systems with impulse action (with A. M. Samoĭlenko). (Russian) *Differentsial'nye Uravneniya* **17** (1981), no. 11, 1995–2001.

28. On the Stability of Solutions of Impulsive Systems(with S. I. Gurgula). (Ukrainian) *Vīsnik Kiïv. Unīv. Ser. Mat. Mekh.* no. 23 (1981), 33–40.

29. Stability of the equilibrium situation in impulse systems (with S. I. Gurgula). (Russian) *Mat. Fiz.* no. 31 (1982), 9–14.

30. Periodic and almost periodic solutions of differential equations with impulse action (with A. M. Samoĭlenko). (Russian) *Ukrain. Mat. Zh.* **34** (1982), no. 1, 66–73; translation in *Ukr. Math. J.* **34** (1982), 55–61.

31. Lyapunov's second method in systems with impulse action (with S. I. Gurgula). (Russian) *Dokl. Akad. Nauk Ukrain. SSR Ser. A* **10** (1982), 11–14.

32. Almost periodic solutions of differential equations with impulse action (with A. M. Samoĭlenko and M. U. Akhmetov). (Russian) *Akad. Nauk Ukrain. SSR Inst. Mat. Preprint* **1983**, no. 26, 49 pp.

33. Periodic and almost periodic solutions of systems with impulse action (with M. U. Akhmetov). (Russian) *Mat. Fiz.* no. 34 (1983), 3–8.
34. Convergence of systems of differential equations with impulse action (with Yu. A. Mitropol'skiĭ and O. S. Chernikova). (Russian) *Dokl. Akad. Nauk Ukrain. SSR Ser. A* **1983**, no. 11, 11–15.
35. Periodic solutions of systems with impulse action (with M. U. Akhmetov). (Russian) *Izv. Akad. Nauk Kazakh. SSR Ser. Fiz.-Mat.* **1984**, no. 1, 13–17.
36. Invariant sets of a class of discontinuous dynamical systems. (Russian) *Ukrain. Mat. Zh.* **36** (1984), no. 1, 63–68; translation in *Ukr. Math. J.* **36** (1984), 58–62.
37. On the question of stability of solutions of systems of differential equations with impulse action (with O. S. Chernikova). (Russian) *Ukrain. Mat. Zh.* **36** (1984), no. 2, 190–195; translation in *Ukr. Math. J.* **36** (1984), 171–176.
38. Almost-periodic solutions of one class of systems with impulses (with M. U. Akhmetov). (Russian) *Ukr. Mat. Zh.* **36** (1984), no. 4, 486–490; translation in *Ukr. Math. J.* **36** (1984), 397–401.
39. Canonical Form of Systems of Difference Equations in the Neighborhood of a Compact Invariant Manifold (with V. V. Ishchuk). (Russian)*Akad. Nauk Ukrain. SSR Inst. Mat. Preprint* **1984**, 36 pp.
40. Averaging method in systems with impulses (with Yu. A. Mitropol'skiĭ and A. M. Samoĭlenko). (Russian) *Ukrain. Mat. Zh.* **37** (1985), no. 1, 55–64; translation in *Ukr. Math. J.* **37** (1985), 48–55.
41. Asymptotic integration of weakly nonlinear impulse systems (with V. V. Ishchuk). (Russian) *Ukrain. Mat. Zh.* **37** (1985), no. 3, 363–368; translation in *Ukr. Math. J.* **37** (1985), 288–291.
42. Necessary and sufficient conditions for stability of characteristic exponents of a linear system of differential equations with impulse action (with M. U. Akhmetov). (Russian) *Dokl. Akad. Nauk Ukrain. SSR Ser. A* **1985**, no. 3, 3–5.
43. Canonical form of a class of differential equations with impulse action (with Yu. A. Mitropol'skiĭ and A. M. Samoĭlenko). (Russian) *Reports of the extended sessions of a seminar of the I. N. Vekua Institute of Applied Mathematics, Vol. I, no. 3 (Russian) (Tbilisi, 1985)*, 105–110, 172–173, *Tbilis. Gos. Univ., Tbilisi*, 1985.
44. Stability of solutions of a class of integro-differential equations (with B. E. Turbaev and G. Kh. Safarova). (Russian) *Asymptotic integration of differential equations (Russian)*, 133–140, *Akad. Nauk Ukrain. SSR, Inst. Mat., Kiev*, 1985.
45. The direct method of Lyapunov for differential equations with impulse action (with S. I. Gurgula). (Russian) *Mat. Fiz. Nelineĭn. Mekh.* no. 5(39) (1986), 4–9.
46. Integral sets of a class of differential equations with impulse action (with Yu. A. Mitropol'skiĭ and A. M. Samoĭlenko). (Russian) *Akad. Nauk Ukrain. SSR Inst. Mat. Preprint* **1987**, no. 2, 43 pp.
47. Almost-periodic solutions of impulse systems (with M. U. Akhmetov). (Russian) *Ukrain. Mat. Zh.* **39** (1987), no. 1, 74–80; translation in *Ukr. Math. J.* **39** (1987), 61–66.
48. Periodic solutions of systems of differential equations with impulse actions on surfaces (with M. U. Akhmetov). (Russian) *Application of asymptotic methods in the theory of nonlinear differential equations (Russian)*, 11–17, *Akad. Nauk Ukrain. SSR, Kiev*, 1987.
49. Almost periodic solutions of nonlinear sampled-data systems (with M. U. Akhmetov). (Russian) *Dokl. Akad. Nauk Ukrain. SSR Ser. A* **1988**, no. 1, 3–6.
50. Differential equations with discontinuous trajectories (with A. A. Aslanyan). (Russian) *Ukrainian Journal "Znannya", Ukrainian SSR, Kyiv*, 1989, 16 pp.
51. The comparison method for systems of differential equations with impulse action (with A. M. Samoĭlenko and M. U. Akhmetov). (Russian) *Akad. Nauk Ukrain. SSR Inst. Mat. Preprint* **1989**, no. 3, 42 pp.

52. Normal solution of a special system of second-order partial differential equations (with A. M. Samoĭlenko and Zh. N. Tasmambetov). (Russian) *Akad. Nauk Ukrain. SSR Inst. Mat. Preprint* **1989**, no. 4, 40 pp.
53. Almost periodic solutions of nonlinear sampled-data systems (with M. U. Akhmetov). (Russian) *Ukrain. Mat. Zh.* **41** (1989), no. 3, 291–296; translation in *Ukrainian Math. J.* **41** (1989), no. 3, 259–263.
54. Differentiable dependence of solutions of sampled-data systems on initial data (with M. U. khmetov). (Russian) *Ukrain. Mat. Zh.* **41** (1989), no. 8, 1028–1033; translation in *Ukrainian Math. J.* **41** (1989), no. 8, 878–882 (1990).
55. Stability of periodic solutions of differential equations with impulse action on surfaces (with M. U. Akhmetov). (Russian) *Ukrain. Mat. Zh.* **41** (1989), no. 12, 1596–1601; translation in *Ukrainian Math. J.* **41** (1989), no. 12, 1368–1372 (1990).
56. Solutions in finite form of a regular system of partial differential equations (with A. M. Samoĭlenko and Zh. N. Tasmambetov). (Russian) *Akad. Nauk Ukrain. SSR Inst. Mat. Preprint* **1990**, no. 21, 42 pp.
57. Optimization Methods for Processes with Discontinuous Phase Trajectories. (with A. A. Aslanyan). (Russian) *Ukrainian Journal "Znannya", Ukrainian SSR, Kyiv*, 1990, 20 pp.
58. A problem of "beats" in impulse systems (with A. M. Samoĭlenko and S. I. Trofimchuk). (Russian) *Akad. Nauk Ukrain. SSR Inst. Mat. Preprint* **1990**, no. 11, 46 pp.
59. The comparison method for differential equations with impulse action (with M. U. Akhmetov). (Russian) *Differentsial'nye Uravneniya* **26** (1990), no. 9, 1475–1483; translation in *Differential Equations* **26** (1990), no. 9, 1079–1086 (1991).
60. Differential properties of solutions and integral surfaces of nonlinear impulsive systems (with A. M. Samoilenko and M. U. Akhmetov). (Russian) *Akad. Nauk Ukrain. SSR Inst. Mat. Preprint* **1990**, 50 pp.
61. Periodic solutions of quasilinear impulse systems in the critical case (with M. U. Akhmetov. (Russian) *Ukrain. Mat. Zh.* **43** (1991), no. 3, 308–315; translation in *Ukrainian Math. J.* **43** (1991), no. 3, 273–279.
62. Generalized solutions of impulse systems, and the beats phenomenon (with A. M. Samoĭlenko and S. I. Trofimchuk). (Russian) *Ukrain. Mat. Zh.* **43** (1991), no. 5, 657–663; translation in *Ukrainian Math. J.* **43** (1991), no. 5, 610–615 (1992).
63. The freezing method in systems with impulse action (with O. A. Ashirov). (Russian) *Ukrain. Mat. Zh.* **43** (1991), no. 6, 848–853; translation in *Ukrainian Math. J.* **43** (1991), no. 6, 796–801 (1992).
64. Periodic solutions of impulse differential systems in critical cases (with A. A. Boĭchuk and A. M. Samoĭlenko). (Russian) *Differentsial'nye Uravneniya* **27** (1991), no. 9, 1516–1521; translation in *Differential Equations* **27** (1991), no. 9, 1070–1073 (1992).
65. Asymptotic representation of solutions of regularly perturbed systems of differential equations with a nonclassical right-hand side (with M. U. Akhmetov). (Russian) *Ukrain. Mat. Zh.* **43** (1991), no. 10, 1298–1304; translation in *Ukrainian Math. J.* **43** (1991), no. 10, 1209–1214 (1992).
66. Integral sets of quasilinear impulse systems (with M. U. Akhmetov). (Russian) *Ukraïn. Mat. Zh.* **44** (1992), no. 1, 5–11; translation in *Ukrainian Math. J.* **44** (1992), no. 1, 1–7.
67. Integral sets of a class of discontinuous dynamical systems (with O. V. Vyshenskaya). (Russian) *Ukraïn. Mat. Zh.* **44** (1992), no. 5, 589–595; translation in *Ukrainian Math. J.* **44** (1992), no. 5, 528–534 (1993).
68. Differential properties of solutions and integral surfaces of nonlinear impulse systems (with M. U. Akhmetov). (Russian) *Differentsial'nye Uravneniya* **28** (1992), no. 4, 555–566; translation in *Differential Equations* **28** (1992), no. 4, 445–453.

69. Periodic and almost periodic solutions of strongly nonlinear impulse systems (with M. U. Akhmetov). (Russian) *Prikl. Mat. Mekh.* **56** (1992), no. 6, 926–934; translation in *J. Appl. Math. Mech.* **56** (1992), no. 6, 829–837.

70. Investigation of periodic solutions of weakly nonlinear and singularly perturbed impulse systems (with V. P. Līsovs'ka). (Ukrainian) *Nonlinear differential equations and their application (Ukrainian)*, 141–150, *Akad. Nauk Ukraïni, Īnst. Mat., Kiev*, 1993.

71. Periodic solutions of differential equations in the resonant case (with S. M. Kopystyra). (Ukrainian) *Bulletin of Taras Shevchenko National University of Kyiv, Series: Physics* & *Mathematics* no. 1 (1993), 34–44.

72. On the comparison method for impulse systems in the space $\mathbf{R}^n$ (with M. U. Akhmetov). (Russian) *Ukraïn. Mat. Zh.* **45** (1993), no. 6, 753–762; translation in *Ukrainian Math. J.* **45** (1993), no. 6, 826–836 (1994).

73. Integral sets of systems of difference equations (with Kh. M. Gulov). (Russian) *Ukraïn. Mat. Zh.* **45** (1993), no. 12, 1613–1621; translation in *Ukrainian Math. J.* **45** (1993), no. 12, 1815–1824 (1994).

74. Reducibility of nonlinear almost periodic systems of difference equations defined on a torus (with A. M. Samoĭlenko and D. I. Martynyuk). (Russian) *Ukraïn. Mat. Zh.* **46** (1994), no. 4, 404–410; translation in *Ukrainian Math. J.* **46** (1994), no. 4, 425–432 (1995).

75. Green–Samoilenko function and existence of integral sets of linear extensions of nonautonomous equations (with F. A. Asrorov). (Russian) *Ukraïn. Mat. Zh.* **46** (1994), no. 8, 1067–1071; translation in *Ukrainian Math. J.* **46** (1994), no. 8, 1172–1177 (1996).

76. The reducibility of nonlinear almost periodic systems of difference equations defined on an infinite torus (with A. M. Samoĭlenko and D. I. Martynyuk). (Russian) *Ukraïn. Mat. Zh.* **46** (1994), no. 9, 1216–1223; translation in *Ukrainian Math. J.* **46** (1994), no. 9, 1336–1344 (1996).

77. On the preservation of certain properties of solutions of an impulse system of differential equations under perturbation (with O. S. Chernikova) *Ukraïn. Mat. Zh.* **46** (1994), no. 12, 1707–1713; translation in *Ukrainian Math. J.* **46** (1994), no. 12, 1899–1906 (1996).

78. Asymptotic stability of solutions of a class of systems of differential equations with impulsive action (with O. Ashirov). (Russian) *Proceedings of the Institute of Mathematics and Computer Technologies, Ashgabat, Ylym* **4** (1995), 64–68.

79. Control of linear impulse systems (with M. U. Akhmetov and M. A. Tleubergenova). (Russian) *Ukraïn. Mat. Zh.* **47** (1995), no. 3, 307–314; translation in *Ukrainian Math. J.* **47** (1995), no. 3, 360–368 (1996).

80. Periodic solutions of nonlinear differential equations with pulse influence in a Banach space (with V. E. Slyusarchuk). *Ukraïn. Mat. Zh.* **47** (1995), no. 3, 370–380; translation in *Ukrainian Math. J.* **47** (1995), no. 3, 430–442 (1996).

81. *Impulsive Differential Equations* (with A. M. Samoĭlenko). World Scientific Series on Nonlinear Science. Series A: Monographs and Treatises, 14. World Scientific Publishing Co., Inc., River Edge, NJ, 1995.

82. On a method for constructing successive approximations for the study of multipoint boundary value problems (with A. N. Ronto). (Russian) *Ukraïn. Mat. Zh.* **47** (1995), no. 9, 1243–1253; translation in *Ukrainian Math. J.* **47** (1995), no. 9, 1415–1426 (1996).

83. Numerical-analytic method for the equation of non-linear oscillator (with A. Ronto). *Publ. Univ. Miskolc Ser. D Nat. Sci. Math.* **36** (1996), no. 2, 115–124.

84. Stability of solutions of impulse systems (with O. S. Chernikova). (Russian) *Ukraïn. Mat. Zh.* **49** (1997), no. 1, 98–111; translation in *Ukrainian Math. J.* **49** (1997), no. 1, 109–123.

85. Periodic solutions of a weakly nonlinear system of partial differential equations with impulse action (with A. B. Tkach). (Russian) *Ukraïn. Mat. Zh.* **49** (1997), no. 4, 601–605; translation in *Ukrainian Math. J.* **49** (1997), no. 4, 665–671 (1998).

86. On the stability of an invariant torus (with S. Ī. Dudzyaniĭ). (Ukrainian) *Ukraïn. Mat. Zh.* **49** (1997), no. 9, 1213–1222; translation in *Ukrainian Math. J.* **49** (1997), no. 9, 1365–1376 (1998).

87. Stability of invariant tori of impulsive systems (with S. I. Dudzyanyi). (Ukrainian) *Bulletin of the State University "Lviv Polytechnic". Series: Applied Mathematics* **1(337)** (1998), 145–148.
88. On the periodicity of solutions of a class of second-order differential equations (with A. M. Ronto). (Ukrainian) *Bulletin of the State University "Lviv Polytechnic". Series: Applied Mathematics* **1(337)** (1998), 148–150.
89. On the stability of a trivial invariant torus of a class of systems with impulse perturbation (with S. Ī. Dudzyaniĭ). (Ukrainian) *Ukraïn. Mat. Zh.* **50** (1998), no. 3, 338–349; translation in *Ukrainian Math. J.* **50** (1998), no. 3, 387–399.
90. Sequence mapping and periodic solutions of systems of differential equations with impulse action (with V. G. Samoĭlenko and K. K. Elgondiev). (Russian) *Nelīnīĭnī Koliv.* **1998**, no. 1, 44–50.
91. A controllable impulse action in games with fixed termination time (with E. V. Ostapenko). (Russian) *Ukraïn. Mat. Zh.* **52** (2000), no. 8, 1112–1118; translation in *Ukrainian Math. J.* **52** (2000), no. 8, 1274–1281 (2001).
92. Games with controlled impulse action at fixed moments of time (with E. V. Ostapenko). (Russian) *Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki* **2001**, no. 3, 23–26.
93. On the stability of invariant sets of discontinuous dynamical systems (with O. S. Chernīkova). (Ukrainian) *Ukraïn. Mat. Zh.* **53** (2001), no. 1, 78–84; translation in *Ukrainian Math. J.* **53** (2001), no. 1, 91–98.
94. On the existence of periodic solutions of some classes of systems of differential equations with random impulse action (with A. M. Samoĭlenko and A. N. Stanzhitskiĭ). (Russian) *Ukraïn. Mat. Zh.* **53** (2001), no. 8, 1061–1079; translation in *Ukrainian Math. J.* **53** (2001), no. 8, 1266–1289.
95. On the stability of integral sets of impulsive differential systems (with O. S. Chernikova). (Ukrainian) *Reports of the National Academy of Sciences of Ukraine* **2001**, no. 4, 24–34.
96. A system of differential equations with a turning point and zero elements of the spectrum (with V. N. Bobochko). (Russian) *Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki* **2001**, no. 6, 12–17.
97. On the stability of integral sets of impulsive differential systems (with O. S. Chernikova). *Math. Notes (Miskolc)* **2** (2001), no. 1, 49–60.
98. Center manifolds of singularly perturbed functional-differential equations (with Ī. M. Cherevko). (Ukrainian) *Vīsn. Kiïv. Unīv. Ser. Fīz.-Mat. Nauki* **2001**, no. 2, 159–169.
99. Decomposition of linear singularly perturbed functional differential equations (with I. M. Cherevko). *Nonlinear Oscil.* **4** (2001), no. 3, 345–353.
100. Singularly perturbed differential equations with a turning point (with V. N. Bobochko). (Russian) Seminar on Qualitative Theory of Differential Equations at Moscow State University. *Differencial'nye Uravnenija* **38** (2001), no. 6, 858–859.
101. Implicit function equation with discontinuous trajectories (with Yu. Kaplun and V. Samoylenko). *Math. Notes (Miskolc)* **2** (2001), no. 2, 145–157.
102. On the stability of integral sets of systems of impulsive differential equations (with O. S. Chernīkova). (Ukrainian) *Ukraïn. Mat. Zh.* **54** (2002), no. 2, 249–257; translation in *Ukrainian Math. J.* **54** (2002), no. 2, 306–315.
103. A singular set and the continuability of solutions of differential equations (with Yu. I. Kaplun, V. G. Samoĭlenko and M. Strianeze). (Russian) *Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki* **2002**, no. 9, 39–41.
104. Discontinuous solutions of equations that are not solved with respect to the unknown function (with Yu. Ī. Kaplun and V. G. Samoĭlenko). (Ukrainian) *Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki* **2002**, no. 10, 17–21.
105. Investigation of the integral manifolds of singularly perturbed functional differential equations (with I. M. Cherevko). *Math. Notes (Miskolc)* **3** (2002), no. 1, 47–58.
106. Oscillation of nonlinear differential-integral equation in a Banach space with respect to its subspace (with V. Yu. Slusarchuk). *Math. Notes (Miskolc)* **4** (2003), no. 1, 53–64.

107. Conditions for the existence of nonoscillating solutions of nonlinear differential equations with delay and impulse perturbation in a Banach space (with V. Yu. Slyusarchuk). (Ukrainian) *Ukraïn. Mat. Zh.* **55** (2003), no. 6, 790–798; translation in *Ukrainian Math. J.* **55** (2003), no. 6, 956–965.

108. The global attractor of an evolution inclusion with impulse action at fixed moments of time (with A. V. Kapustyan). (Russian) *Ukraïn. Mat. Zh.* **55** (2003), no. 8, 1058–1068; translation in *Ukrainian Math. J.* **55** (2003), no. 8, 1283–1294.

109. Stability of sets for impulsive differential systems (with G. Matarazzo and O. S. Chernikova). *Miskolc Math. Notes* **5** (2004), no. 2, 193–201.

110. Global attractors of evolutionary non-autonomous equations without solution uniqueness. (Ukrainian) *Scientific Notes of Taras Shevchenko National University of Kyiv, Faculty of Mechanics and Mathematics* **2004**, no. 8, 81–87.

111. On the solvability of differential-algebraic equations with impulse action (with L. A. Vlasenko). (Russian) *Ukraïn. Mat. Zh.* **57** (2005), no. 4, 458–468; translation in *Ukrainian Math. J.* **57** (2005), no. 4, 551–564.

112. Once more on the A. M. Samoĭlenko numerical-analytic method of successive periodic approximations (with Ī. Ī. Korol'). (Ukrainian) *Ukraïn. Mat. Zh.* **58** (2006), no. 4, 472–488; translation in *Ukrainian Math. J.* **58** (2006), no. 4, 529–550.

113. Existence and approximate construction of solutions for boundary value problems (with I. I. Korol'). (Ukrainian) *Reports of the National Academy of Sciences of Ukraine* **2007**, no. 11, 17–22.

114. Some modern aspects of the theory of differential equations with impulse action (with O. S. Chernīkova). (Ukrainian) *Ukraïn. Mat. Zh.* **60** (2008), no. 1, 81–94; translation in *Ukrainian Math. J.* **60** (2008), no. 1, 91–107.

115. On Faedo–Galerkin method for evolution inclusions with W_{λ_0}-pseudomonotone maps (with P. O. Kasyanov and N. V. Zadoyanchuk). *Mem. Differential Equations Math. Phys.* **44** (2008), 105–132.

116. On solvability of second-order evolution inclusions with Volterra type operators (with P. O. Kas'yanov and N. V. Zadoyanchuk). *Miskolc Math. Notes* **9** (2008), no. 2, 119–135.

117. Existence of an invariant torus for a class of systems of differential equations (with S. Ī. Baloga). (Ukrainian) *Nelīnīĭnī Koliv.* **11** (2008), no. 4, 520–529 (2009); translation in *Nonlinear Oscil. (N.Y.)* **11** (2008), no. 4, 548–558.

118. The Green–Samoĭlenko operator in the theory of invariant sets of nonlinear differential equations (with V. Yu. Slyusarchuk). (Ukrainian) *Ukraïn. Mat. Zh.* **61** (2009), no. 7, 948–957; translation in *Ukrainian Math. J.* **61** (2009), no. 7, 1123–1136.

119. Stability of an invariant manifold of a nonlinear impulsive system of differential equations defined on the direct product of a torus and Euclidean space (with P. V. Feketa). (Ukrainian) *Bulletin of University of Kyiv, Series: Physics & Mathematics* **2010**, no. 2), 73–78.

120. Invariant manifolds of a class of systems of differential equations with impulse perturbation (with P. V. Feketa). (Ukrainian) *Nelīnīĭnī Koliv.* **13** (2010), no. 2, 240–252; translation in *Nonlinear Oscil. (N.Y.)* **13** (2010), no. 2, 260–273.

121. Invariant sets of impulsive differential equations with particularities in ω-limit set (with P. Feketa). *Abstr. Appl. Anal.* **2011**, Art. ID 970469, 14 pp.

122. On existence and stability of invariant sets of discontinuous dynamical systems (with P. V. Feketa). Mathematical analysis, differential equations and their applications. *Academic Publishing house, Sofia*, 2011, 129–138.

123. *Differential Equations with Impulse Effects. Multivalued Right-Hand Sides with Discontinuities* (with V. A. Plotnikov, A. M. Samoilenko and N. V. Skripnik). De Gruyter Studies in Mathematics, 40. Walter de Gruyter & Co., Berlin, 2011.

124. On invariant tori of multifrequency systems in the Lappo–Danilevsky case (with P. V. Feketa). (Ukrainian) *Bulletin of University of Kyiv, Series: Physics & Mathematics* **2012**, no. 3, 105–110.

125. Long-time behavior of evolution inclusion with non-damped impulsive effects (woth O. Kapustyan). *Mem. Differ. Equ. Math. Phys.* **56** (2012), 89–113.
126. On the distribution of local time of a homogeneous diffusion process (with Yu. S. Mīshura and G. M. Shevchenko). (Ukrainian) *Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki* **2013**, no. 10, 29–35.
127. Averaging of set-valued impulsive systems (with N. V. Skripnik). *Ukrainian Math. J.* **65** (2013), no. 1, 140–157.
128. On the distribution of integral functionals of a homogeneous diffusion process (with Yu. Mishura and G. Shevchenko). *Mod. Stoch. Theory Appl.* **1** (2014), no. 2, 109–116.
129. On the ruin probability in a risk model with variable premium intensity (with Yu. S. Mīshura and O. Yu. Ragulīna). (Ukrainian) *Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki* **2014**, no. 9, 25–32.
130. An application of asymptotic methods to regular and singularly perturbed differential-difference equations (with Ī. Ī. Klevchuk). (Ukrainian) *Nelīnīĭnī Koliv.* **16** (2013), no. 1, 94–104; translation in *J. Math. Sci. (N.Y.)* **197** (2014), no. 1, 96–107.
131. On preservation of the invariant torus for multifrequency systems (with P. V. Feketa). (Ukrainian) *Ukraïn. Mat. Zh.* **65** (2013), no. 11, 1498–1505; translation in *Ukrainian Math. J.* **65** (2014), no. 11, 1661–1669.
132. Ruin probability in a risk model with variable premium intensity and risky investments (with Yu. Mishura and O. Ragulina). *Opuscula Math.* **35** (2015), no. 3, 333–352.
133. Existence of global attractors for impulsive dynamical systems (with O. V. Kapustyan). (Ukrainian) *Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki* **2015**, no. 12, 13–18.
134. On preservation of an exponentially stable invariant torus (with P. Feketa). *Tatra Mt. Math. Publ.* **63** (2015), 215–222.
135. Existence of an invariant torus of a degenerate linear system with impulsive action (with Yu. Yu. Korol). (Ukrainian) *Scientific Bulletin of Uzhhorod University, Series: Mathematics & Informatics* **28** (2016), no. 1, 90–96.
136. Global attractors of impulsive infinite-dimensional systems (with O. V. Kapustyan). (Ukrainian) *Ukraïn. Mat. Zh.* **68** (2016), no. 4, 517–528; translation in *Ukrainian Math. J.* **68** (2016), no. 4, 583–597.
137. The global attractor of an impulsive parabolic system (with O. V. Kapustyan and Ī. V. Romanyuk). (Ukrainian) *Dopov. Nats. Akad. Nauk Ukr. Mat. Prirodozn. Tekh. Nauki* **2017**, no. 5, 3–7.
138. Global attractor of a weakly nonlinear parabolic system with discontinuous trajectories (with O. Kapustyan and I. Romaniuk). *Mem. Differ. Equ. Math. Phys.* **72** (2017), 59–70.
139. Stability of the global attractors of impulsive infinite-dimensional systems (with O. V. Kapustyan and Ī. V. Romanyuk). (Ukrainian) *Ukraïn. Mat. Zh.* **70** (2018), no. 1, 29–39; translation in *Ukrainian Math. J.* **70** (2018), no. 1, 30–41.
140. *Attractors of Infinite-Dimensional Impulsive Dynamical Systems* (with O. V. Kapustyan and I. V. Romanyuk). Lambert Academic Publishing, Saarbrücken, Germany, 2018.
141. Averaging of fuzzy system (with N. V. Skripnik). (Russian) *Ukraïn. Mat. Zh.* **70** (2018), no. 3, 412–428; translation in *Ukrainian Math. J.* **70** (2018), no. 3, 477–494.
142. Application of the Green–Samoilenko function and operator to the investigation of non-Lipschitz differential equations (with V. Yu. Slyusarchuk). (Ukrainian) *Ukraïn. Mat. Zh.* **73** (2021), no. 12, 1673–1690; translation in *Ukrainian Math. J.* **73** (2022), no. 12, 1937–1957.
143. Systems with perturbations of parameters (with V. Yu. Slyusarchuk). (Ukrainian) *Nelīnīĭnī Koliv.* **24** (2021), no. 2, 233–248; translation in *J. Math. Sci. (N.Y.)* **270** (2023), no. 2, 335–352.
144. Method of local linear approximation in the theory of nonlinear impulsive systems (with V. Yu. Slyusarchuk). (Ukrainian) *Ukraïn. Mat. Zh.* **75** (2023), no. 1, 105–120; translation in *Ukrainian Math. J.* **75** (2023), no. 1, 118–137.