Final Progress Report (After 8/1/22) - Final Progress Report Web Form

Award ID	**1160640**
Project Title	**Contemporary Problems of Pure and Applied Mathematics**
Grantee	**Petrov, Evgeniy**
Institution	**Institute of Applied Mathematics and Mechanics of the National Academy of Sciences of Ukraine**
Award Start	**06/01/2023**
Award End	**05/31/2024**

*Questions

(Do not enter text in this field) 1) Submit this progress report on or before the due date. 2) Only signing officials at your institution can sign this report and submit it to the foundation. pC instructions and award policies are located here: https://www.simonsfoundation.org/funding-opportunities/policies-and-procedures/ 3) Text boxes have a 15,000 character limit (~5 pages). You may either upload your response to question #2 as a PDF within the 'Upload' section of the webform or respond within the text box provided. Include any charts or figures in the PDF. If uploading a PDF, it should not exceed 5 pages. Please also enter 'See Upload' for question #2. All other questions must be answered in the provided text box.

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***2. PROGRESS Text boxes have a 15,000 character limit. You may either upload your response as a PDF within the 'Upload' section of the webform or respond within the text box provided. Include any charts or figures in the 'Upload' section. What were your most important results during this reporting period (this could include any updates on specific aims, hurdles encountered, important IP, milestones and/or important activities)? Please present in a format accessible to scientists outside of your field.**

With the support of the Simons Foundation Viktoriia Bilet investigated the interconnections between pseudometric spaces, combinatorial similarities, and equivalence relations. In particular, it was studied how are the algebraic properties of the homomorphism of some combinatorial self-similarities groups related to the metric properties of the initial pseudometric space. Moreover, it was given a metric characterization of pseudometric spaces for which the kernel of this homomorphism coincides with combinatorial self-similarity group and the group of combinatorial self-similarities of metric reflection of a pseudometric space coincides with its symmetric group. (Viktoriia Bilet)

We have obtained a series of effective integral criteria for the existence of solutions of the Dirichlet problem for the semi-linear equations of the type of Beltrami and Poisson with the corresponding applications to various semi-linear equations of mathematical physics in anisotropic and inhomogeneous media. (V. Gutlyanskii, O. Nesmelova, V. Ryazanov).

The study was dedicated to estimating the convergence rate of the observer for a class of linear dynamical systems in Hilbert space. The resolvent for the error dynamics operator was explicitly constructed for systems with both one-dimensional and finite-dimensional outputs. It was demonstrated that the trivial error decays with a polynomial rate. This result is based on the analysis of the characteristic equation and norm estimates of the resolvent along the imaginary axis. (Julia Kalosha)

The problem of modeling rotation in a medium with resistance of a free elastic solid body in the form of a system of two and three elastically connected solid bodies is considered. Derived equations of rotation in a medium with resistance of a free system of two and three elastically connected solid bodies. For three Lagrangian gyroscopes, asymptotic stability conditions were obtained in the form of a system of five inequalities, respectively, of the coefficients of elasticity of the hinges, and their analytical studies were carried out. The problem of modeling rotation in a medium with resistance of a free elastic solid body with cavities containing an ideal liquid, in the form of a system of two elastically connected solid bodies

with a liquid, is considered. A transcendental characteristic equation is derived for Lagrange gyroscopes with arbitrary axisymmetric cavities. Taking into account the fundamental tone of liquid vibrations, the characteristic equation of the sixth order and the conditions of asymptotic stability of uniform rotation of Lagrange gyroscopes with liquid were obtained. The obtained stability conditions are exact for ellipsoidal cavities, and only approximate for all other cavities. It has been proven that when the first tones of the fluid vibrations in the cavities are greater than one, asymptotic stability will always be possible with the growth of the elasticity coefficients of the hinges. For ellipsoidal cavities, this means that they must be compressed along the axis of rotation. It is shown that there is no internal resonance at the coincidence of the first tones of vibrations of liquids in cavities. (Yuriy Kononov)

We consider a one-dimensional one-phase Stefan problem with the Riemann-Liouville fractional derivatives, corresponding to the nonlocal generalization of the Fourier's law. By the Stefan problem one usually means the class of mathematical models describing heat processes accompanied by phase changes of the media and absorption of latent heat. The boundary between two phases is unknown beforehand and must be determined together with the solution of the heat equation. By reducing to an equivalent nonlinear integral equation, the problem is shown to admit a local in time classical solution. The actual proof is carried out by means of a layer potential technique similar to that of A. Friedman. (Mykola Krasnoshchok)

I studied the convergence of solutions of Ito stochastic differential equations and stochastic differential equations with local time with irregular dependence of the coefficients of the equations on a small parameter that tends to 0. The necessary and sufficient conditions for the weak convergence of the solutions of Ito stochastic differential equations and stochastic differential equations with local time to limit random processes were obtained. (Ivan Krykun)

We studied nonlinear boundary value problems unsolved with respect to the derivative. We established constructive necessary and sufficient conditions of solvability and propose a scheme for the construction of solutions of this problem in the critical case. We also built convergent iterative schemes for finding approximate solutions of this problem with using least-square methods and Adomian decomposition method. As an example of application of the proposed iterative scheme, we found approximations to the solutions of periodic boundary value problems for a Rayleigh-type equation unsolved with respect to the derivative, in particular, in the case of a periodic problem for the equation used to describe the motion of satellites on elliptic orbits. (Olga Nesmelova)

The effect on the fields of pressure, velocity, and vortex structures of the rheological properties of blood, which change under the influence of drugs, geometric features of blood vessels and the cardiac cycle, was investigated. The results of numerical modeling of blood flow in structurally different types of arterial dichotomies within the intracardiac lumen of the human heart allow us to assert their different functional roles. After passing through various types of dichotomies in sequence, the flow of blood acquires unified properties necessary for flowing in the capillary section of the blood system. (Vitalii Overko)

Three-point analogues of Ciric-Reich-Rus and Kannan type mappings were introduced and the fixed-point theorems for such mappings were proved. By imposing additional conditions, specifically asymptotic regularity and continuity, we extended the applicability of fixed-point theorems to a broader class of mappings. Generalizations of Banach, Kannan, Ciric-Reich-Rus, Chatterjea fixed point theorems, as well as of the fixed-point theorem for mappings contracting perimeters of triangles were proved via considering the corresponding mappings in semimetric spaces with triangle functions introduced by M. Bessenyei and Z. Pales. Using the language of graph theory, we have generalized the criteria of existence of continuation of a partially defined metric and a partially defined ultrametric. (Evgeniy Petrov)

We study the following problem: Can a collective of finite compassless automata explore an anonymous ladder graph. The automata do not distinguish between vertices and edges (that means each automaton has no compass). We considered collectives consisting of an automaton and some pebbles, which are automata of the simplest form, whose positions are entirely determined by the automaton. In particular, it is proved that an automaton with four pebbles explores Ln for any natural n. Some estimates of the optimal number of pebbles for exploring some subgraphs of a ladder graph are discussed. (Sergey Sapunov)

The theory of linguistic presentation of deterministic and strongly deterministic graphs is developed. As part of this development, we propose an algorithm for transitioning from a pair of sets of words of a special kind to a graph for which this pair is a presentation (if such that graph exists). Also proposed is an algorithm for constructing a canonical presentation of an arbitrary deterministic / strongly deterministic graph and investigated properties of this canonical representation. In addition, a compression algorithm is proposed that converts an arbitrary pair of words of a special kind to a canonical one for a graph (if it exists) that is a presentation for this pair. (Oleksii Senchenko)

A new method of asymptotic estimation of harmonic load parameters of a nonlinear self-oscillating system and determination of frequency, amplitude, and phase for a sinusoidal signal has been developed. The proposed algorithm can be used in problems of compensation of disturbances caused by a harmonic or polyharmonic external A two-stage scheme for constructing a nonlinear observer is proposed. (Volodymir Shcherbak)

We considered the boundary behavior of solutions to parabolic double-phase equations. The analysis is conducted for cylindrical domains and the regularity up to the lateral boundary is shown in terms of either its p or q capacity, depending on whether the phase vanishes at the boundary or not. Eventually we obtain a fine boundary estimate that, when considering uniform geometric conditions as density or fatness, leads us to the boundary Holder continuity of solutions. In particular, the double-phase elicits new questions on the definition of an adapted capacity. We proved the Weak Harnack inequality for unbounded functions from the corresponding De Giorgi's classes with generalized Orlicz growth under the non-logarithmic conditions. This study gives a wider interpretation of Harnack-type estimates derived to double-phase, degenerate double-phase functionals and functionals with variable exponents. (Igor Skrypnik)

We analyze long-time behavior of solutions to a class of problems related to very fast and singular diffusion porous medium equations having non-homogeneous in space and time source terms with zero mean. In dimensions two and three, we determine critical values of porous medium exponent for the asymptotic H^1-convergence of the solutions to a unique non-homogeneous positive steady state generally to hold. We consider a degenerate nonlocal parabolic equation in a milti-dimensional domain introduced to model hydraulic fractures, where the nonlocal operator is given by a fractional power of the Laplacian, and the degenerate mobility exponent corresponds to "strong slippage" regime with "complete wetting" interfacial conditions for local thin-film equations. Using a localized entropy estimate and a Stampacchia-type lemma, we establish a finite speed of propagation result and sufficient conditions (and lower bounds) for the waiting-time phenomenon. (Roman Taranets)

A method has been developed for restoring an unknown external force applied to a mechanical system. The external disturbance is represented as a partial sum of the Fourier series. A scheme for asymptotic estimation of unknown coefficients of a series using information about the phase vector of the system is proposed. The results of numerical simulation of estimating the external force for the Duffing generator are presented. (Nadiia Zhogoleva)

The conditions of the asymptotic stability of rotation on the suspension of the Lagrangian gyroscope and the Lagrangian gyroscope with an ideal fluid in a medium with resistance are obtained and investigated. Taking into account the fundamental tone of the fluid oscillations, it is proved that for arbitrary values of the mechanical parameters of the system and for an arbitrary axisymmetric cavity, as the elasticity of the spherical joints increases, asymptotic stability will be possible if the condition for the first tone of the fluid oscillation is greater than 1 is met. On March 5, I successfully defended my thesis for the Doctor of Philosophy degree. Dissertation title: “On the stability of rotation in a resistive medium of a system of two elastically connected Lagrangian gyroscopes with an ideal fluid”. On March 25, i received a confirmation of the award of the Doctor of Philosophy degree. (Yaroslav Sviatenko)

The theory of linguistic presentation of deterministic and strongly deterministic graphs is developed. As part of this development, we propose an algorithm for transitioning from a pair of sets of words of a special kind to a graph for which this pair is a presentation (if such that graph exists). Also proposed is an algorithm for constructing a canonical presentation of an arbitrary deterministic / strongly deterministic graph and developed a software implementation of the above algorithms. In addition, a compression algorithm is proposed that converts an arbitrary pair of words of a special kind to a canonical one for a graph (if it exists) that is a presentation for this pair and a software prototype implementing the compression algorithm is developed. (Mykola Prytula)

We obtained constructive conditions of existence of solutions of linear boundary value problems for differential-algebraic equations with impulse action and constructed the generalized Green’s operator to find solutions of such problems. Also, we proved the existence of solutions of nonlinear boundary-value problems for ordinary differential equations with switchings at non-fixed points in time and constructed an iterative scheme for finding the solution of such problems using the Adomian decomposition method. (Kateryna Shevtsova)

We obtained constructive conditions of solvability of nonlinear periodic boundary- value problems for ordinary differential equations in the critical and noncritical cases and propose a scheme for finding solutions for such problems using the Adomian decomposition method. (Mykyta Popov)

***3. PEOPLE SUPPORTED Provide a list of people supported including Name, Position, ORCID iD (PIs, Co-Investigators, collaborators, visitors, postdoctoral fellows, postdoctoral research associates, graduate students, etc) on this project.**

1) Viktoriia Bilet, Researcher https://orcid.org/0000-0002-2047-5201
2) Volodymyr Gutlyanskii, Researcher https://orcid.org/0000-0002-8691-4617
3) Nadiia Zhogoleva, Researcher https://orcid.org/0000-0002-1598-5653
4) Julia Kalosha, Researcher https://orcid.org/0000-0002-6871-9252
5) Yuriy Kononov, Researcher https://orcid.org/0000-0002-1609-0253
6) Mykola Krasnoshchok, Researcher https://orcid.org/0000-0003-3478-6673
7) Olga Nesmelova, Researcher https://orcid.org/0000-0003-2542-5980
8) Ivan Krykun, Researcher https://orcid.org/0000-0001-5468-512X
9) Evgeniy Petrov, Researcher (PI) https://orcid.org/0000-0002-6902-9640
10) Vladimir Ryazanov, Researcher https://orcid.org/0000-0002-4503-4939
11) Sergey Sapunov, Researcher https://orcid.org/0000-0001-6435-819X
12) Oleksii Senchenko, Researcher https://orcid.org/0000-0002-6684-6530
13) Igor Skrypnik, Researcher https://orcid.org/0000-0002-7398-9273
14) Roman Taranets, Researcher https://orcid.org/0000-0002-9177-5500
15) Volodymir Shcherbak, Researcher https://orcid.org/0000-0002-3928-3410

16) Vitalii Overko, Researcher https://orcid.org/0000-0002-4861-3274
17) Mykyta Popov, PhD Student https://orcid.org/0000-0001-9106-2650
18) Mykola Prytula, PhD Student https://orcid.org/0000-0001-8426-6364
19) Yaroslav Sviatenko, PhD Student https://orcid.org/0000-0003-2317-3556
20) Kateryna Shevtsova, PhD Student https://orcid.org/0000-0002-1112-1145

***4. HONORS OR AWARDS List any honors or awards received for anyone supported by this award.**

Volodymir Gutlyansky was awarded the honorary title “Honored Worker of Science and Technology of Ukraine” (Decree of the President of Ukraine dated May 18, 2024, No. 338/2024)

Igor Skrypnyk was elected an academician of the National Academy of Sciences of Ukraine on April 25, 2024

Yuriy Kononov received an Acknowledgment of the National Academy of Sciences of Ukraine (Resolution of the Presidium of the National Academy of Sciences of Ukraine dated November 01, 2023, No. 370)

Evgeniy Petrov received a Certificate of Honor of the Presidium of the National Academy of Sciences of Ukraine and the Central Committee of the Labor Union of the National Academy of Sciences of Ukraine (Resolution of the Presidium of the National Academy of Sciences of Ukraine dated May 01, 2024, No. 186)

***5. RENEWABLE REAGENTS Were renewable reagents generated by your research during this funding period? Yes or No; If yes, describe what renewable reagents were generated and how they were shared with the scientific community**

No

***6. DATA Was data generated by your research during this funding period? Yes or No; If yes, describe what data was generated by your research during this funding period and how it was shared with the scientific community.**

No

7. List any changes in personnel during the period covered by this report or proposed changes in personnel.

There were no changes in personnel during the period covered by this report.

In the new period it is planned to exclude PhD student Mykyta Popov and researcher Viktoriia Bilet from the project and include active researcher Mariia Savchenko.

Publications

The PI must submit all publications that are aligned with the Simons Foundation mission and that have n previously reported to the foundation. Indicate which publications were a direct result of Simons Foundation funding by marking the Title of a publication with an asterisk (*). If you would prefer to upload this info please submit the information as a PDF in the Upload section of this web form.

Note: Publications are initially updated and saved in the Contact PI's Professional Profile in proposalCENT The Publications section in this web form can be populated by the information entered in the Professional Pr using the 'Add New Entry' feature. Therefore, before completing this web form, it is recommended that the Publications section of the Contact PI's Professional Profile is updated.

All Simons Foundation-funded investigators must use the following required language when publishing work related to the project: This work was supported by a grant from the Simons Foundation ([award #], [Grantee Initials]).

Status	PMID	Title	Journal
Submitted		About convergence of solutions of one-dimensional stochastic equations	Stochastic Models
Accepted		Adomian decomposition method in th theory of autonomous nonlinear boundary value problems with switchings at non-fixed points in time	Journal of Mathematical Sciences
Accepted		Adomian decomposition method in th theory of nonlinear boundary value problems	Ukrainian Mathematical Journal
Accepted		Adomian decomposition method in th theory of nonlinear boundary-value problems unsolved with respect to th derivative	Journal of Mathematical Sciences
Submitted		Anonymous 2-way infinite ladder graph traversal by a collective of compassless graph-walking automata	Algebra and Discrete Mathematics
Published		Asymptotic decay towards steady states of solutions to very fast and singular diffusion equations	Asymptotic Analysis
Submitted		Asymptotic reconstruction of the Fourier expansion of inputs of nonlinear oscillator	Journal of Theoretical and Applied Mechanics
Accepted		BMO and Dirichlet problem for semi-linear equations in the plane	Topological Methods in Nonlinear Analysis
Submitted		Compression of defining pair for D-graphs	Algebra and Discrete Mathematics

Submitted		Fine boundary continuity for degenerate double-phase diffusion	Journal of the London Mathematical Society
Published		Fixed point theorem for generalized Kannan type mappings	Rendiconti del Circolo Matematico di Palermo Series 2
Submitted		Identification of the periodic force acting on a mechanical system	Journal of Mathematical Sciences
Submitted		Influence of rheological properties o the hydrodynamics of blood flow in the intraorganic circulatory system the heart and in the human left ventricle,	Applied and Computational Mathematics
Submitted		Non-Newtonian blood flow in the different types of arteria dichotomy	WSEAS Transactions on Fluid Mechanics
Accepted		On a one-dimensional time-fractional Stefan problem	Applicationes Mathematicae
Submitted		On Dirichlet problem for semi-linear Poisson type equations in general domains	Constructive Mathematical Analysis
Published		On generalizations of some fixed po theorems in semimetric spaces with triangle functions	Frontiers in Applied Mathematics and Statistics
Published		On monoids of metric preserving functions	Frontiers in Applied Mathematics and Statistics
Published		On the stability of rotation in an environment with resistance of a free system of two elastically connected rigid bodies	Proceedings of the Institute of Applied Mathematics and Mechanics NAS of Ukraine
Accepted		On the stability of rotation in an environment with resistance of a free system of two solid bodies connecte by an elastic spherical joint and havi a cavity with a liquid	Ukrainian Mathematical Bulletin
Submitted		On the stability of rotation in an environment with resistance of a suspended Lagrange gyroscope takin into account the elasticity of spheric joints	Proceedings of the Institute of Applied Mathematics and Mechanics of the NAS of Ukraine
Published		ON THE STABILITY OF ROTATION OF A FREE SYSTEM OF TWO ELASTICLY CONNECTED RIGID BODIES	Mechanics And Mathematical Methods

Submitted		On the stability of rotation on the suspension of a Lagrangian gyroscop with an ideal fluid in a medium with resistance	Applied Mechanics
Submitted		Polynomial convergence of the observer for an infinite-dimensional model of a flexible beam-body system	Mathematics of Control, Signal and Systems
Published		Pseudometric spaces: From minimal to maximality in the groups of combinatorial self-similarities	Analysis and Geometry in Metr Spaces
Submitted		The existence of continuations for different types of metrics	Acta Mathematica Hungarica
Submitted		The weak Harnack inequality for unbounded minimizers of elliptic functionals with generalized Orlicz growth	Advances in the Calculus of Variations
Published		Three point analogue of Ciric-Reich-Rus type mappings with non-unique fixed points	The Journal of Analysis

	***Status:**	Submitted
	PubMed Identifier (PMID):	
	PubMed Central Identifier (PMCID):	
	Digital Object Identifier (DOI):	
	URL:	
	Authors:	I. H. Krykun
	***Title:**	About convergence of solutions of one-dimensional stochastic equations
	Journal:	Stochastic Models
Citation:	**Volume:**	
	Issue:	
	Pages:	
	Year:	
	***File:**	Blank file.pdf
*** Please confirm if this publication is a direct result of this Simons Foundation grant.**		No

***Status:**	Accepted
PubMed Identifier (PMID):	
PubMed Central Identifier (PMCID):	
Digital Object Identifier (DOI):	
URL:	
Authors:	S. M. Chuiko, E. S. Silin, and K. S. Shevtsov
***Title:**	Adomian decomposition method in the theo of autonomous nonlinear boundary value problems with switchings at non-fixed points in time
Journal:	Journal of Mathematical Sciences
Citation: Volume:	
Issue:	
Pages:	
Year:	
***File:**	Blank file.pdf
* **Please confirm if this publication is a direct result of this Simons Foundation grant.**	No

***Status:**	Accepted
PubMed Identifier (PMID):	
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Digital Object Identifier (DOI):	
URL:	
Authors:	Boichuk O.A., Chuiko S.M., Popov M.V.
***Title:**	Adomian decomposition method in the theo of nonlinear boundary value problems
Journal:	Ukrainian Mathematical Journal
Citation: Volume:	
Issue:	
Pages:	
Year:	
***File:**	Blank file.pdf
* **Please confirm if this publication is a direct result of this Simons Foundation grant.**	No

	***Status:**	Accepted
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	URL:	
	Authors:	P. Benner, S. Chuiko, and O. Nesmelova
	***Title:**	Adomian decomposition method in the theo of nonlinear boundary-value problems unsolved with respect to the derivative
	Journal:	Journal of Mathematical Sciences
Citation:	**Volume:**	
	Issue:	
	Pages:	
	Year:	
	***File:**	Blank file.pdf
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	***Status:**	Submitted
	PubMed Identifier (PMID):	
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	Digital Object Identifier (DOI):	
	URL:	
	Authors:	S. V. Sapunov
	***Title:**	Anonymous 2-way infinite ladder graph traversal by a collective of compassless graph-walking automata
	Journal:	Algebra and Discrete Mathematics
Citation:	**Volume:**	
	Issue:	
	Pages:	
	Year:	
	***File:**	Blank file.pdf
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	***Status:**	Published
	PubMed Identifier (PMID):	
	PubMed Central Identifier (PMCID):	
	Digital Object Identifier (DOI):	10.3233/asy-231884
	URL:	http://dx.doi.org/10.3233/asy-231884
	Authors:	G. Kitavtsev, R. M. Taranets
	***Title:**	Asymptotic decay towards steady states of solutions to very fast and singular diffusion equations
	Journal:	Asymptotic Analysis
Citation:	**Volume:**	137
	Issue:	3-4
	Pages:	153-176
	Year:	2024
	***File:**	Blank file.pdf
*** Please confirm if this publication is a direct result of this Simons Foundation grant.**		No

***Status:**	Submitted
PubMed Identifier (PMID):	
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Digital Object Identifier (DOI):	
URL:	
Authors:	N. V. Zhogoleva and V. F. Shcherbak
***Title:**	Asymptotic reconstruction of the Fourier expansion of inputs of nonlinear oscillator
Journal:	Journal of Theoretical and Applied Mechani
Citation: Volume:	
Issue:	
Pages:	
Year:	
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***Status:**	Accepted
PubMed Identifier (PMID):	
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Digital Object Identifier (DOI):	
URL:	
Authors:	Gutlyanskii V., Nesmelova O, Ryazanov V and Yakubov E.,
***Title:**	BMO and Dirichlet problem for semi-linear equations in the plane
Journal:	Topological Methods in Nonlinear Analy
Citation: Volume:	
Issue:	
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Year:	
***File:**	Blank file.pdf
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***Status:**	Submitted
PubMed Identifier (PMID):	
PubMed Central Identifier (PMCID):	
Digital Object Identifier (DOI):	
URL:	
Authors:	O. Senchenko and M. Prytula
***Title:**	Compression of defining pair for D-graphs
Journal:	Algebra and Discrete Mathematics
Citation: Volume:	
Issue:	
Pages:	
Year:	
***File:**	Blank file.pdf
*** Please confirm if this publication is a direct result of this Simons Foundation grant.**	No

	***Status:**	Submitted
	PubMed Identifier (PMID):	
	PubMed Central Identifier (PMCID):	
	Digital Object Identifier (DOI):	
	URL:	
	Authors:	S. Ciani, E. Henriquez, and I. I. Skrypnik
	***Title:**	Fine boundary continuity for degenerate double-phase diffusion
	Journal:	Journal of the London Mathematical Socie
Citation:	**Volume:**	
	Issue:	
	Pages:	
	Year:	
	***File:**	Blank file.pdf
* **Please confirm if this publication is a direct result of this Simons Foundation grant.**		No

	***Status:**	Published
	PubMed Identifier (PMID):	
	PubMed Central Identifier (PMCID):	
	Digital Object Identifier (DOI):	10.1007/s12215-024-01079-3
	URL:	http://dx.doi.org/10.1007/s12215-024-01079-3
	Authors:	E. Petrov and R. K. Bisht
	***Title:**	Fixed point theorem for generalized Kann type mappings
Citation:	**Journal:**	Rendiconti del Circolo Matematico di Palerr Series 2
	Volume:	
	Issue:	
	Pages:	
	Year:	2024 Jun 27
	***File:**	Blank file.pdf
	*** Please confirm if this publication is a direct result of this Simons Foundation grant.**	No

	***Status:**	Submitted
	PubMed Identifier (PMID):	
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	Digital Object Identifier (DOI):	
	URL:	
	Authors:	N. V. Zhogoleva and V. F. Shcherbak
	***Title:**	Identification of the periodic force acting o mechanical system
	Journal:	Journal of Mathematical Sciences
Citation:	**Volume:**	
	Issue:	
	Pages:	
	Year:	
	***File:**	Blank file.pdf
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	PubMed Identifier (PMID):	
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	Digital Object Identifier (DOI):	
	URL:	
	Authors:	V. Overko
	***Title:**	Influence of rheological properties on the hydrodynamics of blood flow in the intraorganic circulatory system of the heart a in the human left ventricle,
	Journal:	Applied and Computational Mathematics
Citation:	**Volume:**	
	Issue:	
	Pages:	
	Year:	
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PubMed Identifier (PMID):	
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URL:	
Authors:	V. Overko
***Title:**	Non-Newtonian blood flow in the different types of arteria dichotomy
Citation: Journal:	WSEAS Transactions on Fluid Mechanics
Volume:	
Issue:	
Pages:	
Year:	
***File:**	Blank file.pdf
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***Status:**	Accepted
PubMed Identifier (PMID):	
PubMed Central Identifier (PMCID):	
Digital Object Identifier (DOI):	
URL:	
Authors:	M. Krasnoshchok
***Title:**	On a one-dimensional time-fractional Stefan problem
Journal:	Applicationes Mathematicae
Citation: Volume:	
Issue:	
Pages:	
Year:	
***File:**	Blank file.pdf
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	PubMed Identifier (PMID):	
	PubMed Central Identifier (PMCID):	
	Digital Object Identifier (DOI):	
	URL:	
	Authors:	V. Gutlyanskii, O. Nemelova, V. Ryazano and E. Yakubov
	***Title:**	On Dirichlet problem for semi-linear Poisson type equations in general domains
	Journal:	Constructive Mathematical Analysis
Citation:	**Volume:**	
	Issue:	
	Pages:	
	Year:	
	***File:**	Blank file.pdf
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	PubMed Identifier (PMID):	
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	Digital Object Identifier (DOI):	10.3389/fams.2024.1392560
	URL:	http://dx.doi.org/10.3389/fams.2024.1392560
	Authors:	E. Petrov, R. Salimov, R. K. Bisht
	***Title:**	On generalizations of some fixed point theorems in semimetric spaces with trian functions
Citation:	**Journal:**	Frontiers in Applied Mathematics and Statist
	Volume:	10
	Issue:	
	Pages:	
	Year:	2024 Jun 17
	***File:**	Blank file.pdf
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	URL:	http://dx.doi.org/10.3389/fams.2024.1420671
	Authors:	V. Bilet, O. Dovgoshey
	***Title:**	On monoids of metric preserving functions
	Journal:	Frontiers in Applied Mathematics and Statist
Citation:	**Volume:**	10
	Issue:	
	Pages:	
	Year:	2024 Jun 14
	***File:**	Blank file.pdf
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	URL:	http://dx.doi.org/10.37069/1683-4720-2023-37-7
	Authors:	Yu. Kononov
	***Title:**	On the stability of rotation in an environm with resistance of a free system of two elastically connected rigid bodies
Citation:	**Journal:**	Proceedings of the Institute of Applied Mathematics and Mechanics NAS of Ukrain
	Volume:	37
	Issue:	
	Pages:	75-84
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	***Status:**	Accepted
	PubMed Identifier (PMID):	
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	Authors:	Yu. M. Kononov
	***Title:**	On the stability of rotation in an environm with resistance of a free system of two sol bodies connected by an elastic spherical joi and having a cavity with a liquid
	Journal:	Ukrainian Mathematical Bulletin
Citation:	**Volume:**	
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***Status:**	Submitted
PubMed Identifier (PMID):	
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Authors:	Yu. M. Kononov, O. V. Nesmelova, Ya. I. Svyatenko
***Title:**	On the stability of rotation in an environm with resistance of a suspended Lagrange gyroscope taking into account the elasticity spherical joints
Journal:	Proceedings of the Institute of Applied Mathematics and Mechanics of the NAS of Ukraine
Citation: Volume:	
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	Authors:	Yu.Kononov,
	*Title:	ON THE STABILITY OF ROTATION OF A FREE SYSTEM OF TWO ELASTICLY CONNECTED RIGID BODIES
	Journal:	Mechanics And Mathematical Methods
Citation:	Volume:	5
	Issue:	2
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Authors:	Yu. M. Kononov, O. V. Nesmelova, and Ya I. Svyatenko
***Title:**	On the stability of rotation on the suspension a Lagrangian gyroscope with an ideal fluid i medium with resistance
Journal:	Applied Mechanics
Citation: Volume:	
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	***Status:**	Submitted
	PubMed Identifier (PMID):	
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	Authors:	A. Zuyev, J. Kalosha
	***Title:**	Polynomial convergence of the observer for infinite-dimensional model of a flexible beam-body system
	Journal:	Mathematics of Control, Signals, and Systen
Citation:	**Volume:**	
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	Digital Object Identifier (DOI):	10.1515/agms-2023-0103
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	Authors:	Viktoriia Bilet, Oleksiy Dovgoshey
	***Title:**	Pseudometric spaces: From minimality to maximality in the groups of combinatorial self-similarities
	Journal:	Analysis and Geometry in Metric Spaces
Citation:	**Volume:**	11
	Issue:	1
	Pages:	
	Year:	2023 Dec 31
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	***Status:**	Submitted
	PubMed Identifier (PMID):	
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	Authors:	E. Petrov
	***Title:**	The existence of continuations for different types of metrics
	Journal:	Acta Mathematica Hungarica
Citation:	**Volume:**	
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	Authors:	S. Ciani, E. Henriquez, and I. I. Skrypnik
	***Title:**	The weak Harnack inequality for unbound minimizers of elliptic functionals with generalized Orlicz growth
	Journal:	Advances in the Calculus of Variations
Citation:	**Volume:**	
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URL:	https://doi.org/10.1007/s41478-024-00743-2
Authors:	Ravindra K. Bisht; Evgeniy Petrov
***Title:**	Three point analogue of Ciric-Reich-Rus type mappings with non-unique fixed points
Journal:	The Journal of Analysis
Citation: Volume:	
Issue:	
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Year:	2024 Apr 5
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Signature	Instructions	Signature Submitted	Assigned To
Evgeniy Petrov	As an authorized representative of the organization, I certify that the information contained in this form is true and complete. I also agree th terms of this award are acceptable, and that I will comply with all applicable laws and Simons Foundation policies. Simons Foundation policies can be found online at: https://www.simonsfoundation.org/funding/policies-and-procedures/. By signing this web form, you are agreeing that you and your organiz consent to transact business using electronic communications, to rec notices and disclosures electronically and to utilize electronic signatu lieu of using paper documents. The Simons Foundation only accepts electronic signature and submiss by the Signing Official from countries where electronic signatures are legally binding.	Evgeniy Petrov (06/28/2024 9:26AM)	Not Assigned