DEPARTMENT OF NON-HARMONIC ANALYSIS
Institute of Mathematics and Mechanics
The Ministry of Science and Education of the Republic of Azerbaijan

BRIEF SEMI-ANNUAL REPORT ON SCIENTIFIC & ORGANIZATIONAL
ACTIVITIES FOR 2024

9 research works have been done on the topics of "Problems of the theory of approximations and frames in Banach function spaces" and "Spectral properties of differential operators in rearrangement invariant spaces and applications to the Noetherness of elliptic equations" by the employees of the Department of Non-Harmonic Analysis (DNHA) in 2024.

There are 11 employees in DNHA, including 4 Doctors of Sciences (2 of them part-timers), 4 PhD's (1 of them part-timers), 2 senior laboratory assistants and 1 laboratory assistant.

Most of the department's employees are engaged in teaching activities in higher educational institutions (Baku State University, Khazar University, Guba branch of Azerbaijan State Pedagogical University, Odlar Yurdu University).

16 research works have been published by the employees of DNHA in 2024, including **8** scientific articles (3 of them published abroad). Short summaries of **8** research works by the employees of DNHA have been included in proceedings of various scientific conferences. Besides, 4 articles have been accepted and more than 10 articles have been submitted for publication in various scientific journals. A monograph in Azerbaijani language on "Selected problems of elliptic equations" has been prepared for publication.

Articles	Abstracts
8	8

Articles journals included in the Web of Science, SCOPUS and Zentralblatt MATH databases:

1. Bilal T. Bilalov, Sabina R. Sadigova, Yonca Sezer, Natavan P. Nasibova. On solvability of polyharmonic Dirichlet problem in symmetric Sobolev spaces. Math. Meth. Appl. Sci. 2024;1–16. DOI: 10.1002/mma.10279 (WOS, SCOPUS) **IF=2.1 (SCIE)**
2. B.T. Bilalov, Y. Sezer, F.A. Alizadeh, U. Ildiz, Solvability of Riemann Boundary Value Problems and Applications to Approximative Properties of Perturbed Exponential System in Orlicz Spaces. Azerbaijan Journal of Mathematics V. 14, No 1, 2024, 164-185 (**WOS, SCOPUS**)
3. Bilal Bilalov, Yonca Sezer, Umit Ildiz, Tural Hagverdi, On the basicity of one trigonometric system in Orlicz spaces. Trans. Natl. Acad. Sci. Azerb. Ser. Phys.-Tech. Math. Sci. Mathematics, 44 (1), 31-40 (2024). https://doi.org/10.30546/2617-7900.44.1.2024.31 (**SCOPUS**)
4. Bilalov, B.T., Sadigova, S.R. & Softova, L.G. Higher order elliptic equations in weighted Banach spaces. Ann Univ Ferrara (2024). https://doi.org/10.1007/s11565-024-00505-9 https://link.springer.com/article/10.1007/s11565-024-00505-9#Ack1 (**SCOPUS**)

5. GASYMOV, TELMAN; AKHMADLI, BAHARCHIN; and ILDIZ, ÜMİT (2024) "On strong solvability of one nonlocal boundary value problem for Laplace equation in rectangle," *Turkish Journal of Mathematics*: Vol. 48: No. 1, Article 4, pp. 21-33 https://doi.org/10.55730/1300-0098.3489 (**WOS, SCOPUS**)
6. L. N. ATAMOVA, A. A. HUSEYNLI, The regularized trace formula for a discontinuous Sturm-Liouville problem with a spectral parameter dependent jump condition, Baku Math J, 2024, 3 (1), 75-83 (Zentralblatt MATH)

In other journals

7. T.B. Gasymov, A.Q. Akhmedov, R.J. Taghiyeva. On Basicity of Eigenfunctions of One Spectral Problem with the Discontinuity Point in Morrey-Lebesgue Spaces. Caspian Journal of Applied Mathematics, Ecology and Economics, 2023, vol.11, No 2, p.42-53.
8. T.B. Gasymov, B.Q. Akhmadli. On Strong Solvability of One Nonlocal Boundary Value Problem for Laplace Equation in Grand Sobolev Space in Rectangle. Caspian Journal of Applied Mathematics, Ecology and Economics V. 12, No 1, 2024, p.3-15.

Abstarcts

1. Bilalov B.T. On solvability problems of elliptic equations in Banach-Sobolev spaces. XI International Scientific Conference "Modern Problems of Mathematics and Mechanics", dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 94-95
2. T.B. Gasymov, B.Q. Akhmadli, On the strong solvability of a nonlocal boundary value problem for the Poisson's equation in a rectangular. XI International Scientific Conference "Modern Problems of Mathematics and Mechanics", dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 105-107
3. N.R. Ahmedzade, Z.A. Kasumov, The Weighted Grand Lebesgue class of harmonic functions and the Dirichlet problem. XI International Scientific Conference "Modern Problems of Mathematics and Mechanics", dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 320-321
4. Qasımov Telman Benser oğlu, Tağıyeva Reyhan Calal qızı, İbrahimli Katya İbrahim qızı, İNTEQRAL SƏRHƏD ŞƏRTLİ BİR DİFERENSİAL OPERATORUN SPEKTRAL XASSƏLƏRİ. Azərbaycan xalqının Ümummilli Lideri Heydər Əliyevin anadan olmasının 100 illik yubileyinə həsr olunmuş "Diferensial və inteqral operatorlar" mövzusunda RESPUBLİKA ELMİ KONFRANSI. 7-8 Dekabr, BAKI – 2023, s.95-96.
5. Gasymov Telman Benser, Akhmedov Alirza Qadir, ON THE BASIS PROPERTY IN Lp(0,1) EIGENFUNCTIONS OF A SECOND-ORDER DIFFERENTIAL OPERATOR WITH A DISCONTINUITY POINT. Azərbaycan xalqının Ümummilli Lideri Heydər Əliyevin anadan olmasının 100 illik yubileyinə həsr olunmuş "Diferensial və inteqral operatorlar" mövzusunda Respublika Elmi Konfransı. 7-8 Dekabr, Bakı – 2023, s.156-158
6. Telman Gasymov and Baharchin Akhmedli, On the strong solvability of a nonlocal boundary value problem for the Poisson's equation in a rectangular. 7th International

HYBRID Conference on Mathematical Advances and Applications May 8-11, 2024, İstanbul / TÜRKİYE, pp. 55

7. A.Kh. Asgarova, A.A. Huseynli, V.E. Ismailov, On the equioscillation theorem for approximation by sums of two algebras, XI International Scientific Conference "Modern Problems of Mathematics and Mechanics", July 03-06, 2024, pp. 289-291

L.N. Atamova, A.A. Huseynli, The regularized trace formula for a discontinuous Sturm-Liouville problem with a spectral parameter dependent jump condition, XI International Scientific Conference "Modern Problems of Mathematics and Mechanics", July 03-06, 2024, 228-231

INTERNATIONAL COOPERATION

- Aligarh Muslim University (India)
- Yıldız Technical University (Turkiye)
- Istanbul Technical University (Turkiye)
- Bashkir State Pedagogical University (Russia)
- Sterlitamak branch of Bashkir State University (Russia)
- University of Salerno (Italy)
- Balikesir University (Turkiye)
- Middle East Technical University (Turkiye)

REPORTS

PLENARY		
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	On the correct statements of boundary value problems for PDE's in Banach-Sobolev spaces	The International Conference on Modern Problems of Mathş, Mechanics and their Applications, June 20-22, 2024
The regular seminar of the Institute of Mathematics and Mechanics		
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	"On solutions of elliptic equations in Banach-Sobolev spaces and t-Riesz property"	03.04.2024
"ANALYSIS AND APPLIED MATHEMATICS" WEEKLY ONLINE SEMINAR		
Workshop leaders:		
prof. Allaberen Ashyralyev (Bahçeşehir University, Istanbul, Turkey),		
Prof. Michael Ruzhansky (Analysis and PDE Center, Ghent University, Ghent, Belgium),		
Prof. Mahmud Sadybekov (Institute of Mathematics and Mathematical Modeling, Almaty, Kazakhstan		
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	Interior Schauder type estimates for m-th order elliptic equations in weighted Banach spaces	30.04.2024

REVIEWERSHIP FOR PEER REVIEWED INTERNATIONAL REFERRED JOURNALS

Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan

- American Mathematical Society;
- Applied Mathematics Letters (Elsevier);
- Proceedings of the Estonian Academy of Sciences ;
- Journal of Applied Mathematics and Computing (Springer);
- Zentralblatt MATH;
- British Journal of Mathematics & Computer Science;
- Sahand Communications in Mathematical Analysis;
- Wavelet and Linear Algebra;
- International Journal of Mathematical Analysis;
- Applied Mathematical Sciences;
- Asian Journal of Mathematics and Computer Research;
- Advances in Analysis;
- Turkish Journal of Matheamtics;
- Kuwait Journal of Science;
- Filomat;
- Journal of Classical Analysis;
- Sarajevo Journal of Mathematics;
- Kragujevac Journal of Mathematics;
- Communications Faculty of Sciences University of Ankara Series A1 Mathematics and Statistics;
- Mathematics and Statistics;
- Mathematical Sciences;
- Iranian Journal of Mathematical Sciences and Informatics;
- Siberian Mathematical Journal;
- Mathematics;
- Mathematical Sciences;
- Mathematics and Statistics;
- Iranian Journal of Science and Technology, Transactions A: Science;
- Communications in Statistics - Theory and Methods;
- Symmetry;
- Journal of Mathematics;
- Fractals;
- International Journal of Differential Equations.

MEMBERSHIP IN EDITORIAL BOARDS OF SCIENTIFIC MATHEMATICAL JOURNALS

Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan
•   Azerbaijan Journal of Mathematics;

• Caspian Journal of Applied Mathematics, Ecology and Economics; • Transactions of National Academy of Sciences of Azerbaijan; • Proceedings of Institute of Mathematics and Mechanics of National Academy of Sciences of Azerbaijan; • Sahand Communications in Mathematical Analysis (SCMA); • International Journal of Mathematical Analysis; • Advances in Analysis; • Open Journal of Mathematical Analysis; • Journal of Function Spaces; • International Journal of Mathematical Analysis; • Mathematical Models and Methods in Modern Mathematics.	
Dr., Associate professor Telman Kasumov	
• Azerbaijan Journal of Mathematics; • "Caspian Journal of Applied Mathematics, Ecology and Economics" • "Journal of Contemporary Applied Mathematics	

Journals prepared for publication by DNHA in 2024:

- AZERBAIJAN JOURNAL OF MATHEMATİCS, VOL. 14, No 1, 2024, JANUARY

- AZERBAIJAN JOURNAL OF MATHEMATİCS, VOL. 14, No 2, 2024, JULY

PROGRAMMES and GRANTS			
"Karabakh is Azerbaijan". grant competition by the Azerbaijan Science Foundation! (AEF-MQM-QA-1-2021-4(41)-8/02/1-M-02, 24.11.2022)	"Application of modern mathematical methods to the assessment of the current state and dynamics of agricultural fields according to spectral images"	Project manager Dr. Aydin Shukurov	24 months
"Main grant competition-2023" of the Azerbaijan Science Foundation dedicated to the 100th anniversary of the National Leader Heydar Aliyev (AEF-MCG-2023-1(43)-13/06/1-M-06)	Correct solution of some non-local boundary problems modeling the processes of gas dynamics and electrodynamics	Project manager: Dr. Telman Kasumov	24 months

PEDAGOGICAL ACTIVITIES BY DNHA EMPLOYEES	
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	Yildiz Technical University
Associate Prof. Telman Kasumov	- Baku State University - Guba branch of Azerbaijan State Pedagogical University.
Associate Prof. Terlan Garayev	Khazar University
PhD Ali Huseynli	Khazar University

Membership in organizing committees of international conferences	
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan Prof. Bilal Bilalov	• International Conference on Modern Problems of Mathematics, Mechanics and their Applications, Baku, Azerbaijan, June 20-22, 2024 • International Scientific Conference "Modern Problems of Mathematics and Mechanics", dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024, Baku, Azerbaijan • 7th International Conference on Mathematical Advances and Applications (7-th ICOMAA 2024), Istanbul, Turkey, 8-11 May, 2024
Aydin Shukurov	7th International Conference on Mathematical Advances and Applications (7-th ICOMAA 2024), Istanbul, Turkey, 8-11 May, 2024
Ali Huseynli	7th International Conference on Mathematical Advances and Applications (7-th ICOMAA 2024), Istanbul, Turkey, 8-11 May, 2024

SOCIAL ACTIVITIES BY DNHA EMPLOYEES	
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	• Member of Problem Council on Physical-mathematical and technical sciences; • Reviewer of the Science Development Foundation under the President of the Republic of Azerbaijan; • President of the Actuarial Society of Azerbaijan • The member of the Board of the Azerbaijan Mathematical Society; • Editor-in-Chief of Azerbaijan Journal of Mathematics; • Editor-in-Chief of Caspian Journal of Applied

	Mathematics, Ecology and Economics;
	• Member of the Coordination Council of Sciences under the President of ANAS;
	• Chairman of the Baku State University Graduation Commission;
	• Expert on evaluation of textbooks with the Ministry of Education of the Republic of Azerbaijan;
	• Member of The Scientific Council of The İnstitute of Mathematics and Mechanics of Azerbaijan National Academy of Science;
	• Deputy Chairman of the Academic Seminar of The İnstitute of Mathematics and Mechanics of Azerbaijan National Academy of Science.
	• Academic Editor of "Journal of Function Spaces";
	• Academic Editor of "International Journal of Mathematical Analysis".
Dr., Associate Prof. Telman Gasymov	• Member of the Editorial Board of the "Azerbaijan Mathematical Journal"
	• Member of the expert council under the Higher Attestation Commission
	• Member of the Editorial Board of the "Caspian Journal of Applied Mathematics, Ecology and Economics"
	• Member of the Editorial Board of the "Journal of Contemporary Applied Mathematics" jurnalının Redaksiya Heyətinin üzvü
Associate Prof. Terlan Garayev	Executive Editor of Caspian Journal of Applied Mathematics, Ecology and Economics

Prof Bilal T. Bilalov
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