

DEPARTMENT OF NON-HARMONIC ANALYSIS
Institute of Mathematics and Mechanics
National Academy of Sciences of Azerbaijan

BRIEF REPORT ON SCIENTIFIC & ORGANIZATIONAL ACTIVITIES
FOR THE YEAR 2021

12 research works have been done on the topics of “Frame theory and its applications” and “Spectral properties of differential operators in symmetric spaces and applications to neutrality of elliptic equations” by the employees of the Department of Non-Harmonic Analysis (DNHA) in 2021.

There are 19 employees in DNHA, including 3 Doctors of Sciences (2 of them part-timers), 8 PhD’s (2 of them part-timers), 2 researchers, 2 senior laboratory assistants and 4 laboratory assistants. (Three lab assistants were laid off in October.)

33 research works have been published by the employees of DNHA in 2020, including **11** scientific articles (**5** of them published abroad) (**WOS-6; Zentralblatt MATH-1**). Short summaries of **22** research works (**16** of them published abroad) by the employees of DNHA have been included in proceedings of various scientific conferences. Besides, **7** articles have been accepted and more than 10 articles have been submitted for publication in various scientific journals.

Articles	Printed abroad	Printed in Azerbaijan	Short summaries
11	5	6	22

ARTICLES PUBLISHED IN THE JOURNALS INDEXED IN WEB OF SCIENCE AND SCOPUS

1. B.T. Bilalov, S.R. Sadigova, Interior Schauder-type Estimates for higher-order elliptic operators in grand-Sobolev spaces. *Sahand Communications in Mathematical Analysis*, Vol. 18 No. 2 (2021), pp. 129-148 (**WOS- Emerging Sources Citation Index; SCOPUS**)
2. Bilalov, B., Sadigova, S. On the Fredholmness of the Dirichlet problem for a second-order elliptic equation in grand-Sobolev spaces. *Ricerche mat* (2021). <https://doi.org/10.1007/s11587-021-00599-9> (**WOS-Science Citation Index Expanded; SCOPUS**)
3. B.T. Bilalov, S.R. Sadigova, A.E. Guliyeva, On Riemann problem in weighted Smirnov classes with general weight. *Acta et Commentationes Universitatis Tartuensis de Mathematica*, Volume 25, Number 1, June 2021, pp. 33-56 (**WOS- Emerging Sources Citation Index; SCOPUS**)

4. Bilalov B. T., Ismailov M. I., and Kasumov Z. A. "On Solvability of One Class of Third Order Differential Equations". *Ukrains'kyi Matematychnyi Zhurnal*, Vol. 73, no. 3, Mar. 2021, pp. 314-328 (**WOS-Science Citation Index Expanded; SCOPUS**)
5. A.M.Akhtyamov, T.B.Gasymov. Degenerated Boundary Conditions of a Sturm–Liouville Problem with a Potential–Distribution. *Azerbaijan Journal of Mathematics*, V.11, № 2, 2021, pp. 98-104 (**WOS- Emerging Sources Citation Index; SCOPUS**)
6. Касумов Т.Б., Магеррамова Г.В., Касимов Т.Ф. О полноте и минимальности собственных функций одной спектральной задачи в пространствах $L_p \oplus C$ и L_p . *Journal of Contemporary Applied Mathematics*, V. 10, № 2, 2020, December, pp. 84-100. (**Zentralblatt MATH**)
7. Ismailov M.I., Jafarova S.I. Uncountable K-Bessel and K-Hilbert systems in nonseparable Banach spaces. Uncountable K-Bessel and K-Hilbert systems in nonseparable Banach spaces. *Bulletin of Mathematical Analysis and Applications* ISSN: 1821-1291, Volume 13 Issue 1(2021), pp. 57-70 (**WOS- Emerging Sources Citation Index; SCOPUS**)

IN OTHER JOURNALS

1. B.T.Bilalov, A.A.Huseynli, Z.A.Kasumov, Basis properties of the system of exponentials in weighted Morrey spaces. *AMEA Məruzələr*, 2019, vol. LXXV, №1, s. 9-11
2. Билалов Б.Т., Садыгова С.Р., Сейидова Ф.Ш. О разрешимости однородной задачи Римана в классах Морри-Харди. *AMEA Məruzələr*, 2020, vol. LXXVI, №1-2, s. 14-17
3. Gasymov T.B., G.V.Maqerramova, S.Kh.Amiraslanova On basicity of eigenfunctions of a spectral problem in $L_p \oplus C$ and L_p spaces. *Caspian Journal of Applied Mathematics, Ecology and Economics*, V. 8, № 2, 2020, pp. 17-28
4. N.R. Ahmedzade, Z.A. Kasumov. On the solvability of the Dirichlet problem for the Laplace equation with the boundary value in grand-Lebesgue space. *Nakhchivan State University. Scientific works. The series of Physical, mathematical and technical sciences. 2020 №5 (106)*, pp. 62-69

INTERNATIONAL COOPERATION

- Aligarh Muslim University
- Yildiz Technical University
- Bashkir State Pedagogical University
- Sterlitamak branch of Bashkir State University

PLENARY REPORT

Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	Solvability problems of elliptic equations in non-standard function spaces (26.05.2021)	“International Conference on Mathematical Advances and Applications (4-th ICOMAA2021)” international online conference, 2021, İstanbul c., Turkey
	On Fredholmness of the Dirichlet problem for a second order elliptic equation in Banach function spaces (21.06.2021)	Mathematical Analysis, Differential Equation & Applications MADEA 9,) ” international online conference, 2021, Bishkek c., Kyrgyzstan
	On the solvability in the small of elliptic equations of the m-th order in symmetric spaces(13.09.2021)	X МЕЖДУНАРОДНАЯ НАУЧНАЯ КОНФЕРЕНЦИЯ «СОВРЕМЕННЫЕ ПРОБЛЕМЫ МАТЕМАТИКИ И ФИЗИКИ» посвященная 70-летию чл.-корр. АН РБ К.Б. Сабитова 12 – 15 сентября 2021 (Sterlitamak, Russia)

REVIEWERSHIP FOR PEER REVIEWED INTERNATIONAL REFERRED JOURNALS

- 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

Journals prepared for publication by DNHA in 2021:

- **AZERBAIJAN JOURNAL OF MATHEMATICS, VOL. 11, No 1, 2021, JANUARY**
- **AZERBAIJAN JOURNAL OF MATHEMATICS, VOL. 11, No 2, 2021, JULY**
- **CASPIAN JOURNAL OF APPLIED MATHEMATICS, ECOLOGY AND ECONOMICS, VOLUME 8, No 2, 2021, DECEMBER**

SCIENTIFIC ADVISOR AND CONSULTANCY

İsmayılov Migdad	Generalizations of frames and some questions of approximation in Grand Lebesgue spaces	Scientific Consultant : Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan
Asadzadeh Cavad	On basicity of perturbed trigonometric systems in Orlicz spaces	Scientific Advisor : Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan
Guler Maharramova	Spectral properties of a class of discontinuous differential operator with a spectral parameter in boundary conditions	Scientific Advisor : Associate Prof. Telman Kasumov

PROGRAMMES and GRANTS			
№	Project	Title	Supervisor
1	1st Azeri-Russian International Grant Competition organized by the Science Development Foundation under the President of the Republic of Azerbaijan	“Methods of the theory of functions in the theory of operators”	Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan

2	A project within the framework of the joint cooperation programme between NAS of Azerbaijan and The Scientific and Technological Research Council of Turkey (TÜBİTAK)	“Frame properties of the system of eigenfunctions of a second order discontinuous differential operator”	Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan
3	The main grant competition for research projects organized by the Science Development Foundation under the President of the Republic of Azerbaijan	Methods of spectral theory and non-harmonic Fourier analysis in some problems of classical and quantum mechanics	PhD Ali Huseynli

PEDAGOGICAL ACTIVITIES BY DNHA EMPLOYEES	
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	Institute of Mathematics and Mechanics of the NAS of Azerbaijan (master degree, 1st and 2nd course)
Associate Prof. Telman Kasumov	Baku State University
Associate Prof. Migdad Ismaylov	Baku State 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	4th International Conference on Mathematical Advances and Applications (4-th ICOMAA 2021), Istanbul, Turkey, 26-29 May, 2021
	Mathematical Analysis, Differential Equation & Applications MADEA 9, Kyrgyzstan, Bishkek, 21-25 June, 2021
	IX МЕЖДУНАРОДНАЯ НАУЧНАЯ КОНФЕРЕНЦИЯ «СОВРЕМЕННЫЕ ПРОБЛЕМЫ МАТЕМАТИКИ И ФИЗИКИ» посвященная 70-летию чл.-корр. АН РБ К.Б. Сабитова, Sterlitamak, Russia, 12 – 15 september, 2021
Telman Kasumov	4th International Conference on Mathematical Advances and Applications (4-th ICOMAA 2021), Istanbul, Turkey, 26-29 May, 2021

Aydin Shukurov	4th International Conference on Mathematical Advances and Applications (4-th ICOMAA 2021), Istanbul, Turkey, 26-29 May, 2021
Migdad İsmayilov	4th International Conference on Mathematical Advances and Applications (4-th ICOMAA 2021), Istanbul, Turkey, 26-29 May, 2021
Ali Huseynli	4th International Conference on Mathematical Advances and Applications (4-th ICOMAA 2021), Istanbul, Turkey, 26-29 May, 2021

SOCIAL ACTIVITIES BY DNHA EMPLOYEES	
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	<ul style="list-style-type: none"> • Member of the Terminology Committee of the Cabinet of Ministers of Azerbaijan; • Reviewer of the Science Development Foundation under the President of the Republic of Azerbaijan; • Editor-in-Chief of Azerbaijan Journal of Mathematics; • Editor-in-Chief of Caspian Journal of Applied Mathematics, Ecology and Economics; • 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 Institute of Mathematics and Mechanics of Azerbaijan National Academy of Science; • Deputy Chairman of the Academic Seminar of The Institute of Mathematics and Mechanics of Azerbaijan National Academy of Science.
Associate Prof. Terlan Garayev	Executive Editor of Caspian Journal of Applied Mathematics, Ecology and Economics
Aida Guliyeva	Executive Editor of Azerbaijan Journal of Mathematics, Caspian Journal of Applied Mathematics, Ecology and Economics and Journal of Contemporary Applied Mathematics

Prof Bilal T. Bilalov
Head of the Department of Non-Harmonic Analysis
Corresponding Member of the National Academy of Sciences of Azerbaijan