

## DEPARTMENT OF NON-HARMONIC ANALYSIS

**Institute of Mathematics and Mechanics The Ministry of Science  
and Education of the Republic of Azerbaijan**

### **BRIEF ANNUAL REPORT ON SCIENTIFIC & ORGANIZATIONAL ACTIVITIES FOR 2025**

6 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 2025.

There are 9 employees in DNHA, including 4 Doctors of Sciences (3 of them parttimers), 3 PhD’s (1 of them part-timers), 2 senior laboratory assistants.

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

A total of 20 scientific works have been published by the department's employees. Of these, 1 monograph, 10 scientific articles (5 abroad) (4 WOS, 9 SCOPUS), 9 (3 abroad) are conference theses. In addition, 5 articles have been accepted for publication, and more than 7 articles have been submitted for publication. A monograph on the topic "Selected questions of elliptic equations" has been prepared for publication in Turkish and Azerbaijani languages.

Monography	Articles	Abstarcts
1	10	9

#### **Monography**

*Bilalov B.T. (Editor) Understanding Function Spaces. Nova Science Publishers, 2025*

#### **Published articles**

##### **In journals included in Web of Science and SCOPUS:**

1. **Bilalov, B.T.**, Buyukarslan, A., Nasibova, N.P. , S.R. Sadigova.  $X$ -valued Smirnov classes and  $t$ -basicity of Faber polynomials. *Results Math* **80**, 215 (2025).  
<https://doi.org/10.1007/s00025-025-02525-z>

2. Bilalov, B., Mamedov, E., Sezer, Y. et al. Compactness in Banach function spaces: Poincaré and Friedrichs inequalities. *Rend. Circ. Mat. Palermo, II. Ser* 74, 68 (2025). <https://doi.org/10.1007/s12215-024-01172-7>
3. B.T. Bilalov, S.R. Sadigova, Y. Sezer, Vector-valued grand Hardy classes. *Journal of Contemporary Applied Mathematics* V. 15, No 1, 2025, January, pp. 122-155 <https://doi.org/10.62476/jcam.151.9>
4. B.T. Bilalov, N.P. Nasibova, V.Q. Alili, On the strong solvability of a nonlocal boundary value problem for the Laplace equation in an unbounded domain. *Journal of Contemporary Applied Mathematics*. *Journal of Contemporary Applied Mathematics* V. 15, No 1, 2025, pp. 92-106 <https://doi.org/10.62476/jcam.151.7>
5. BİLAL T. BİLALOV AND SABINA R. SADIGOVA. THE CONCEPT OF  $t$ -BASIS AND VECTOR-VALUED HARDY CLASSES. *Turk J Math* (2025) 49: 261 – 286 doi: 10.55730/1300-0098.3588
6. BİLAL T. BİLALOV, NIGAR R. AHMEDZADE, AND ZAUR A. KASUMOV. The weighted grand Lebesgue class of harmonic functions and the Dirichlet problem. *Lobachevskii Journal of Mathematics*, 2025, Vol. 46, No. 1, pp. 377–387
7. T.B. Gasymov, S.R. Sadigova, I.G. Feyzullayev. On the Noetherness of one mixed value problem for Laplace equation in the weighted Sobolev space. *Journal of Mathematical Sciences*, 2025, pp. 1-12 <https://doi.org/10.1007/s10958-025-07953-4>
8. Telman B. Gasymov, Reyhan J. Taghiyeva. Spectral properties of a differential operator with integral boundary conditions. *Journal of Contemporary Applied Mathematics*. V. 15, No 2, 2025, December, p.1-18. <https://doi.org/10.62476/jcam.151.13>
9. Telman Gasymov, Baharchin Akhmadli, Behbudova Jamala. On strong solvability of one nonlocal boundary value problem for Poisson's equation in grand Sobolev space in rectangle. *Trans. Natl. Acad. Sci. Azerb. Ser. Phys.-Tech. Math. Sci. Mathematics*, 45 (4), 68-75 (2025). <https://doi.org/10.30546/2617-7900.45.4.2025.075>

#### **In other journals**

10. Zabidov Z.C., Şükürov A.Ş., Qədirova X.M. Bitkilərin çiçəklənmə vəziyyətinin spektral təsvirlər əsasında qiymətləndirilməsi. *Azərbaycan Milli Aerokosmik Agentliyinin Xəbərləri*, 2025, C.28, N 1(28), s.27-34.

#### **Abstracts**

1. Bilalov B.T. Some Questions of  $X$ -Valued Elliptic Equations. *TURAN-Fundamental Sciences Symposium*. June 23-24-25, 2025 İstanbul/Türkiye, p. 25
2. Bilal T. BİLALOV, Eminaga MAMEDOV, and Yonca SEZER. Schauder Estimates for Elliptic Operators in Banach-Sobolev Spaces. *TURAN-Fundamental Sciences Symposium*. June 23-24-25, 2025 İstanbul/Türkiye, p. 57

3. Nigar R. Ahmedzade, Zaur A. Kasumov, Tarlan Z. Garayev. Some Properties of Functions of the Weighted Grand Lebesgue Class  $hp$ ;  $p$ . Modern problems of Mathematics and Mechanics, September 03-06, 2025 Baku, Azerbaijan, pp. 65-67
4. Qasimov T.B., Fətullalı H.A. Bir spektral məsələnin məxsusi funksiyalarının çəkili Lebeq və çəkili qrand-Lebeq fəzasında bazisliyinin tədqiqi. AMEA-nın müxbir üzvü A.Ə. Babayevin anadan olmasının 90-cı ildönümünə həsr olunmuş “Diferensial və integral operatorlar” mövzusunda II Respublika Elmi konfransının materialları, 03-04 dekabr 2024, BDU, səh.149.
5. Qasimov T.B., Əliyeva Z.E. Bir qeyri-lokal sərhəd məsələsinin klassik və güclü həll olunması haqqında. AMEA-nın müxbir üzvü A.Ə. Babayevin anadan olmasının 90-cı ildönümünə həsr olunmuş “Diferensial və integral operatorlar” mövzusunda II Respublika Elmi konfransının materialları, 03-04 dekabr 2024, BDU, səh.150-151.
6. Qasimov T.B., Məmmədzadə G.R. Kəsilmə nöqtəsinə malik bir spektral məsələnin məxsusi funksiyalarının qrand-lebeq fəzasında bazisliyi. AMEA-nın müxbir üzvü A.Ə. Babayevin anadan olmasının 90-cı ildönümünə həsr olunmuş “Diferensial və integral operatorlar” mövzusunda II Respublika Elmi konfransının materialları, 03-04 dekabr 2024, BDU, səh.151-153.
7. Agayeva G., Feyzullayev İ. Solution of the boundary value problem for operator-differential equations in Hilbert spaces. International Conference on Management and Control in Solving Engineering Problems (MaCoSEP 2025), March 13-15, 2025, Baku, Azerbaijan.
8. Telman Gasymov, Baharchin Akhmadli. On the strong solvability of a nonlocal boundary value problem for the Laplace equation in weighted grand Sobolev spaces in rectangle. Turan-Fundamental Sciences Symposium (TURAN25), 23-25 June, 2025, Yıldız Technical University, Istanbul, Turkey, p.77
9. Telman Gasymov, Baharchin Akhmadli. On the strong solvability of a nonlocal boundary value problem for the Poisson's equation in rectangle. International Congress on New Trends in Mechanics (ICNTM25), 2-5 September, 2025, Azerbaijan State Pedagogical University, Baku, Azerbaijan

## 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

<b>PLENARY</b>		
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	“Some questions of $X$ - valued elliptic equations” .	TURAN-Fundamental Sciences Symposium (TURAN25) June, 23-25, 2025
<b>SEMINARS</b>		
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	Hardi siniflərinin təyini üçün bir metod haqqında	<b>The regular seminar of the Institute of Mathematics and Mechanics 26.02.2025</b>
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	<b>“On <math>H_p(X)</math> class on <math>X</math>- valued harmonic functions”.</b>	Yıldız Technical University, Faculty of Arts and Sciences, Seminar of the Department of Mathematics  <b>16.04.2025</b>

<b>REVIEWERSHIP</b>	
<b>FOR PEER REVIEWED INTERNATIONAL REFERRED JOURNALS</b>	
<b>Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan</b>	
<ul style="list-style-type: none"> <li>- Applicable Analysis;</li> <li>- Turkish Journal of Matheamtics;</li> <li>- Journal of Mathematical Sciences, Mathematical Methods in the Applied Sciences;</li> <li>- Journal of Taibah University for Science;</li> <li>- Boundary value problem;</li> <li>- Filomat;</li> <li>- Afrika Matematika;</li> <li>- Integral Transforms and Special Functions;</li> <li>- Complex Variables and Elliptic Equations;</li> <li>- Mathematica Slovaca;</li> <li>- Mathematical Review;</li> <li>- Zentralblatt Math</li> </ul>	
Ph.D. Ali Huseynli	

<ul style="list-style-type: none"> <li>- Proceedings of Institute of Mathematics and Mechanics;</li> <li>- Baku Mathematical Journal;</li> <li>- Canadian Mathematical Bulletin;</li> <li>- Mathematical Review</li> </ul>
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<b>MEMBERSHIP IN EDITORIAL BOARDS OF SCIENTIFIC MATHEMATICAL JOURNALS</b>	
<b>Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan</b>	
<ul style="list-style-type: none"> <li>• Azerbaijan Journal of Mathematics;</li> <li>• Caspian Journal of Applied Mathematics, Ecology and Economics;</li> <li>• Transactions of National Academy of Sciences of Azerbaijan;</li> <li>• Proceedings of Institute of Mathematics and Mechanics of National Academy of Sciences of Azerbaijan;</li> <li>• Sahand Communications in Mathematical Analysis (SCMA);</li> <li>• International Journal of Mathematical Analysis;</li> <li>• Advances in Analysis;</li> <li>• Journal of Function Spaces;</li> <li>• International Journal of Mathematical Analysis</li> </ul>	
<b>Dr., Associate professor Telman Kasumov</b>	
<ul style="list-style-type: none"> <li>• Azerbaijan Journal of Mathematics;</li> <li>• "Caspian Journal of Applied Mathematics, Ecology and Economics"</li> <li>• "Journal of Contemporary Applied Mathematics"</li> </ul>	

**Journals prepared for publication by DNHA in 2025:**

- AZERBAIJAN JOURNAL OF MATHEMATICS, VOL. 15, No 1, 2025, JANUARY
- AZERBAIJAN JOURNAL OF MATHEMATICS, VOL. 15, No 2, 2025, JULY

<b>PROGRAMMES and GRANTS</b>			
"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

<b>PEDAGOGICAL ACTIVITIES BY DNHA EMPLOYEES</b>	
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	Yildiz Technical University Odlar Yurdu University
Associate Prof. Telman Kasumov	- Baku State University - Guba branch of Azerbaijan State Pedagogical University.
PhD Ali Huseynli	Khazar University
<b>Membership in organizing committees of international conferences</b>	
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	<ul style="list-style-type: none"> <li>• TURAN-Fundamental Sciences Symposium (TURAN25), June 23-25, 2025 at the Faculty of Arts and Sciences, Yıldız Technical University, İstanbul, Türkiye.</li> <li>• XII International Scientific Conference "Modern Problems of Mathematics and Mechanics" September 03-06, 2025 - Baku/AZERBAIJAN</li> <li>• 8th International Conference on Mathematical Advances and Applications (8-th ICOMAA 2025), Istanbul, Turkey, 7-9 May, 2025</li> </ul>
Telman Qasimov	8th International Conference on Mathematical Advances and Applications (8-th ICOMAA 2025), Istanbul, Turkey, 7-9 May, 2025
Aydin Shukurov	8th International Conference on Mathematical Advances and Applications (8-th ICOMAA 2025), Istanbul, Turkey, 7-9 May, 2025
Ali Huseynli	8th International Conference on Mathematical Advances and Applications (8-th ICOMAA 2025), Istanbul, Turkey, 7-9 May, 2025

<b>SOCIAL ACTIVITIES BY DNHA EMPLOYEES</b>	
Prof. Bilal Bilalov, Corresponding Member of the NAS of Azerbaijan	<ul style="list-style-type: none"> <li>- Member of the editorial board of the National Encyclopedia of Azerbaijan;</li> <li>- Editor-in-chief of the journal "Azerbaijan Journal of Mathematics" (the journal is included in the extended list of Thomson Reuters and has been awarded the SCOPUS and Web of Science awards);</li> <li>- Member of the Council for Coordination of Scientific Research, member of the Terminology Commission under the Cabinet of Ministers of the Republic of Azerbaijan;</li> <li>-Reviewer of the Azerbaijan Science Foundation;</li> <li>-Chairman of the Association of Actuaries of</li> </ul>

	<p>Azerbaijan;</p> <p>-Expert on the evaluation of mathematics textbooks of the Ministry of Education of the Republic of Azerbaijan;</p> <p>-Chairman of the State Attestation Commission for the Final Examination of Bachelor's Degrees at Baku State University (in mathematics);</p> <p>-Member of the Doctoral Dissertation Council under the RMI of the Republic of Azerbaijan;</p> <p>- Member of the Scientific Council of the RMI of the Republic of Azerbaijan;</p> <p>- Chairman of the scientific seminar on “Analysis and functional analysis” of the Doctoral Dissertation Council under the RMI of the Republic of Azerbaijan; -</p> <p>-Editor-in-chief of the journal “Caspian Journal of Applied Mathematics, Ecology and Economics”</p>
Dr., Associate Prof. Telman Gasymov	<ul style="list-style-type: none"> <li>• Member of the Editorial Board of the "Azerbaijan Mathematical Journal"</li> <li>• Member of the expert council under the Higher Attestation Commission</li> <li>• Member of the Editorial Board of the "Caspian Journal of Applied Mathematics, Ecology and Economics"</li> <li>• Member of the Editorial Board of the "Journal of Contemporary Applied Mathematics" jurnalının Redaksiya Heyətinin üzvü</li> </ul>

SCHOLAR.GOOGLE.COM_CITATIONS	
<a href="#">Bilalov Bilal Telman oğlu</a>	141
<a href="#">Qasimov Telman Benser oğlu</a>	16
<a href="#">Şükürov Aydın Şükür oğlu</a>	3
<a href="#">Hüseynli Əli Abbas oğlu</a>	7
<b>Total</b>	<b>167</b>

**Prof Bilal T. Bilalov**

Head of the Department of Non-Harmonic Analysis

Corresponding Member of the National Academy of Sciences of Azerbaijan