

**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 2016**

15 research works have been done in the fields of “Frame theory and its applications” and “The spectral properties of self-adjoint differential operators” by the employees of the Department of Non-Harmonic Analysis (DNHA) in 2016.

There are 24 employees in DNHA, including 2 Doctors of Sciences (1 of them being a part-timer), 12 PhD’s (4 of them being part-timers), 3 researchers, and 7 laboratory assistants.

Every Wednesday at 11.30 a.m. DNHA holds a weekly seminar. Most of the employees of DNHA are engaged in education works in various higher education institutions.

**48 research works by the employees of DNHA.**

<b>Thesises</b>	<b>Papers</b>	<b>In foreign journals</b>	<b>In journals having impact factor</b>	<b>In local Journals</b>
<b>19</b>	<b>27</b>	<b>11</b>	<b>9</b>	<b>16</b>

**PAPERS PUBLISHED IN JOURNALS INDEXING IN WEB OF SCIENCE**

1. Bilalov B.T., Nazarova T.Y. Statistical convergence of functional sequences, **Rocky Mountain J. Math.**, volume 45, number 5, 2015, pp. 1413-1423
2. Bilalov B.T., Nazarova T.Y. On statistical type convergence in uniform spaces, **Bulletin of the Iranian Mathematical Society (BIMS)**, Vol. 42 (2016), No. 4, pp. 975–986
3. Билалов Б.Т., Касумов Т.Б. О базисах прямого разложения, **Доклады РАН**, 2016, том 467, № 4, с. 381–384
4. Bilalov B.T., Gasymov T.B., Guliyeva A.A. On solvability of Riemann boundary value problem in Morrey-Hardy classes, **Turkish Journal of Mathematics**, 2016, V.40, No 5, pp. 1085-1101

5. Aliyev Z.S., Rzayeva H.Sh. Global bifurcation for nonlinear Dirac problems, **Electronic Journal of Qualitative Theory of Differential Equations**, (46) (2016), 1–14
6. Алиев З.С., Рзаева Х.Ш. Об осцилляции собственных вектор-функции одномерного оператора Дирака, **Доклады РАН**, 469(3), (2016), 273–277
7. Алиев З.С. О глобальной бифуркации решений некоторых нелинейных задач на собственные значения для обыкновенных дифференциальных уравнений четвертого порядка, **Математический сборник**, 207(12) (2016), 4-31.
8. Muradov T.R., Hashimov Ch.M. On bases from cosines in lebesgue spaces with variable summability index, **Journal of Inequalities and Applications**, (2016), 2016:3, DOI10.1186/s13660-015-0951-6, 7 pp
9. Najafov T.I., Nasibova N.P., Mamedova Z.V. Bases of exponents with a piecewise linear phase in generalized weighted Lebesgue space. **Journal of Inequalities and Applications** (2016) 2016:92

#### MONOGRAPHS

- |               |   |
|---------------|---|
| Bilalov B.T.  | Some Problems of Approximation «Elm», 2016, 390p.   |
| Najafov T.I.  | Some generalizations of Shauder basis   |
| Mamedov Y.Y.  | Elm ve Tehsil, 2016, 198 p.   |
| Sadigova S.R. |   |
| Muradov T.R.  | The basis properties of systems in Banach spaces and their applications («FRANKFURTER BUCHMESSE (2016)» received the gold medal and have been included in the catalog «FRANKFURTER BUCHMESSE 2016») |

#### PAPERS PUBLISHRED IN JOURNALS

- Rocky Mountain Journal of Mathematics
- Bulletin of the Iranian Mathematical Society
- Доклады РАН
- Turkish Journal of Mathematics
- Electronic Journal of Qualitative Theory of Differential Equations
- Математический Сборник
- Journal of Inequalities and Applications
- Azerbaijan Journal of Mathematics

- Proceedings of the Institute of Mathematics and Mechanics
- Transactions of National Academy of Sciences of Azerbaijan
- International Journal of Mathematical Analysis
- Sahand Communications in Mathematical Analysis
- Caspian Journal of Applied Mathematics, Ecology and Economics
- Mathematica Aeterna
- The Reports of National Academy of Sciences of Azerbaijan
- Journal of Contemporary Applied Mathematics

## GRANTS

<b>Nasibova Natavan Polad kızı</b>	Basis properties of perturbed exponential system in Lebesgue spaces with a variable summability exponent	Science Development Foundation under the President of Azerbaijan Republic
<b>Huseynli Ali Abbas oglu</b>	Basis properties of system of eigen and associated functions of non self-adjoint discontinuous boundary value problem with parameter	Science Development Foundation under the President of Azerbaijan Republic
<b>Shukurov Aydın Shukur oğlu</b>	Some problems related to spectral theory of second order ordinary differential operators	Science Development Foundation under the President of Azerbaijan Republic

### Program of National Academy of Sciences of Azerbaijan

**Program: Frame Theory – Application of Wavelet Analysis to Signal Processing in Seismology and Other Fields**

**Manager: prof. Bilal Bilalov**

## BUSINESS TRIPS

<b>Date</b>	<b>Employees</b>	<b>Country, city</b>	<b>Goal of the trip</b>
21.02.2016- 15.03.2016	Bilalov Bilal	Turkey, Istanbul	Yildiz Technical University, within the framework “Frame Theory – Application of Wavelet Analysis to Signal Processing in Seismology and Other Fields”
21.02.2016- 15.03.2016	Zabidov Zakir	Russian Federation, Samara	Samara Space Agency, Yildiz Technical University, within the framework “Frame Theory – Application of Wavelet Analysis to Signal Processing in Seismology and Other Fields”
02.10.2016- 15.10.2016	Bilalov Bilal	Turkey, Istanbul	Yildiz Technical University, within the framework “Frame Theory – Application of Wavelet Analysis to Signal Processing in Seismology and Other Fields”
02.10.2016- 09.10.2016	Huseynli Ali	Turkey, Istanbul	Yildiz Technical University, within the framework “Basis properties of system of eigen and associated functions of non self-adjoint distontinuous boundary value problem with parameter”
05.09.2016- 10.09.2016	Nasibova Natavan	Georgia, Tbilisi	Tbilisi State University, within the framework Basis properties of perturbed exponential system in Lebesgue spaces with a variable summability exponent

## INTERNATIONAL WORKSHOP

**Title: “Non-harmonic analysis and differential operators”**

**Date : 25-27 May 2016**

**Co-Chairs: Misir Mardanov, Bilal Bilalov**

May 25-27, 2016 International Workshop “Nonharmonic Analysis and differential operators” supported by the Presidium of the National Academy of Sciences of Azerbaijan and organized by the Institute of Mathematics and Mechanics, which co-chair was head of the department, Corr. Member of ANAS, prof. Bilal Bilalov was held.

### JOURNALS

- **AZERBAIJAN JOURNAL OF MATHEMATICS, VOL. 6, No 1, 2016, JANUARY**
- **AZERBAIJAN JOURNAL OF MATHEMATICS, VOL. 6, No 2, 2016, JULY**
- **CASPIAN JOURNAL OF APPLIED MATHEMATICS, ECOLOGY AND ECONOMICS, VOLUME 4, No 1, 2016, JULY**

### “AWARDS-2016”

1. Azerbaijan Journal of Mathematics : SCOPUS –award (25.01.2016)
2. Azerbaijan Journal of Mathematics : Web of Science – award (Thomson Reuters) (08.11.2016)

### DISSERTATIONS

<b>DISSERTATIONS WERE DEFENDED</b>		
Nasibova Natavan Polad kızı	Bases of exponents with complex coefficients in the variable Lebesgue spaces  14.10.2016	Supervisor:  Corr. Member of ANAS, prof. Bilal Bilalov
Agayev Elmin Agalar oglu	Spectral properties of a class of differential operators of the second and fourth orders 23.09.2016	Supervisor:  prof. Ziyatxan Aliyev
Dunyamaliyeva Aida Agaisa kızı	Spectral properties of Sturm-Liouville operator with spectral parameter in the boundary conditions 25.11.2016	Supervisor:  prof. Ziyatxan Aliyev

Hashimov Chingiz Mammad oglu:	On basicity of eigenfunctions of one discontinuous differential operator containing the spectral parameter in the boundary conditions in generalized Lebesgue space 09.12.2016	Supervisor: Corr. Member of ANAS, prof. Bilal Bilalov
<b>DISSERTATIONS ARE PRESENTED</b>		
Gasymov Telman Benser oglu	Investigation of spectral properties of discontinuous differential operators	Scientific consultant: Corr. Member of ANAS, prof. Bilal Bilalov
Muradov Togrul Rafael oglu	Some of the related questions of approximation and bases in generalized Lebesgue spaces	Scientific consultant: Corr. Member of ANAS, prof. Bilal Bilalov
Zabidov Zakir Cumshud oglu	Mathematical foundations of monitoring of urban atmosphere	Supervisor: Corr. Member of ANAS, prof. Bilal Bilalov
<b>DISSERTATIONS PREPARED FOR PRESENTATION</b>		
Quliyeva Aida Agagul kızı	On basicity of trigonometric systems in morrey type spaces	Supervisor: Corr. Member of ANAS, prof. Bilal Bilalov
Nazarova Tubu Yusif kızı	Statistical types of convergence in topological spaces	Supervisor: Corr. Member of ANAS, prof. Bilal Bilalov
Safarova Arzu Ramiz kızı	Basicity of double exponent system with degeneration	Supervisor: Corr. Member of ANAS, prof. Bilal Bilalov

### **I Spartakiad was held at the Azerbaijan National Academy of Sciences**

Corr. member of ANAS, prof. Bilal Telman oglu Bilalov won the first place between men at chess.

**Head of the Department of  
Non-Harmonic Analysis**

**Corresponding Member of the  
National Academy of Sciences of  
Azerbaijan, Prof. Bilal Bilalov**