

Institute of Mathematics and Mechanics of ANAS
Annual report of the “Optimal Control” Department for 2021
scientific and scientific organization

Employees of the department

The department of “Optimal Control” employs 10 researchers (3 full-time employees, 6 part time) 8 of them are doctors of science, 2 of them are corresponding members of ANAS:

1. Professor Misir Mardanov – head of department (corr. member of ANAS)
2. Professor Kamil Aidazade – Senior Researcher-part time (Corr. Member of ANAS)
3. Professor Telman Melikov – Senior Researcher
4. Professor Hamlet Guliyev – Senior Researcher-part time
5. Professor Yagub Sharifov – Senior Researcher-part time
6. Professor Ramin Rzayev – Senior Researcher-part time
7. Professor Yusif Gasimov – Leading Researcher-part time
8. Professor Ramiz Aslanov – Senior Researcher
9. Ph.D. of Physics and Mathematics Eldar Mammadov – Leading Researcher.
10. Samin Malik, Ph.D. – Scientific Researcher (part-time.).

In the department of "Optimal control", scientific researches were carried out on the topic "**Optimal control problems described by various systems**" 2021 according to the approved plan:

- 1) **Work:** “Obtaining new necessary as well as sufficient conditions for weak and strong extremum in problems one-dimensional and multidimensional variation”

Executers: Corresponding member of ANAS, prof. Misir Mardanov, doct. of phys. Math. Sci. prof. Telman Malikov, Scientific Researcher Samin Malik

The problem of simple variation has been studied. For this purpose, new first-order necessary conditions design for strong and weak minimums, including the concept of Weierstrass-type variation, were obtained.

The following results were obtained on the topic:

1. M.J.Mardanov, S.T.Malik. “Discrete maximum principle in systems with a delay in control”, Dynamic Systems and Computer Science: Theory and Applications (DYSC) 2020, Journal of Physics: Conference Series 1847 (2021) 012021 IOP Publishing, doi:10.1088/1742-6596/1847/1/012021

2. M.J.Mardanov, T.K.Melikov, S.T.Malik. “Necessary conditions for the extremum in non-smooth problems of variational calculus” Journal of Computational and Applied Mathematics. <https://doi.org/10.1016/j.cam.2021.113723>, **Impact Factor 2.621, Q1.**

3. M.J.Mardanov, T.K.Melikov, S.T.Malik. Minimum conditions in calculus of variations problems In the presence of various types of degenerations, Динамические системы и компьютерные науки: Теория и приложения (DYSC), Материалы 3-й Международной конференции, с. 126-128.

4. Sh.E.Guseynov, S.I.Matyukhin, M.J.Mardanov, J.V.Aleksejeva, O.V.Sidorenko (2021). On the issue of planning sowing agricultural crops with the minimum risk under the presence of various agroclimatic conditions. – *Proceedings of the 13th International Scientific and Practical Conference "Environment. Technology. Resources"*, June 17-18, 2021, Rezekne, Latvia, ISSN: 2256-070X, Vol. 1, pp. 72-83. <https://doi.org/10.17770/etr2021vol1.6649> **SCOPUS**

5. Марданов М.Д., Асланов Р.М., Гасанова Т.Х., Штрихи к портрету З.И.Халилова (к 110-летнему юбилею), Математическое образование в школе и вузе, Материалы X

Международной научно-практической конференции, Казан, 22-28 марта 2021 г. С. 130-143. (РИИЦ).

6. Марданов М.Д., Асланов Р.М. Бесценное наследие Насиреддина Туси в развитии тригонометрии, Материалы XVII Всероссийской с международным участием научно – практической конференции «Артемовские чтения», г. Пенза, 21 апреля 2021 г., стр. 71-78. (РИИЦ).

7. M.J.Mardanov. “To the 70th anniversary of corresponding member of ANAS, doctor of physical and mathematical sciences, professor Kamil Ayda-Zade” in bibliographic reference book Kamil Rajab oglu Ayda-Zadeh, on pages 102-105.

Related to education

Misir Mardanov. Jalal Allahverdiyev. Honorary Page of the History of Education of Azerbaijan, 525th newspaper, August 28, 2021.

Related to science

Misir Mardanov, Aynur Hasanova. “The Sultan of Sciences-Mathematics!”, 525th newspaper, March 13, 2021, 47 (5613).

Concerning personalities

1. Misir Mardanov, Aynur Hasanova. "Founder of the theory of fuzzy logic - Lotfi Zadeh", 525th newspaper, February 4, 2021, № 21 (5587), p. 10-11.

2. Misir Mardanov. Well-known research scientist, educator. Respublika newspaper, October 5, 2021 (together with academician Yusif Mammadov).

3. Misir Mardanov. Heydar Aliyev Phenomenon and Rescue Mission, People's Newspaper, May 8, 2021.

Books

1. Misir Mardanov. Baku State University. Baku: Education Publishing House, Baku, 2021, 672 pages.

2. Misir Mardanov, Adalat Tahirzade. “The Azerbaijanis studied of higher institutes to 1920 year”. Encyclopedic questionnaire. Volume V, Baku: Education Publishing House, 2021, 616 pages.

3. Misir Mardanov, Adalat Tahirzade. “The Azerbaijanis studied of higher institutes to 1920 year”. Encyclopedic questionnaire. Volume VI, Baku: Education Publishing House, 2021, 584 pages.

2) Work: “Investigation of the of feedback optimal control problem of the heating process with moving sources”

Executer: Corresponding member of ANAS Kamil Aida-zade

Necessary conditions for the optimality of the right-hand sides values of nonlocal boundary conditions with pointwise and integral values of an unknown phase trajectory with respect to ordinary differential equations system are obtained. An algorithm for the numerical solution to the problem has been developed, computer experiments have been carried out.

The following results were obtained on the topic:

1. K.R.Aida-zade and E.R.Ashrafova. Control of Effects in the Right-Hand Sides of Large ODE System of Block Structure and Optimization of Sources in Unseparated Boundary Conditions. ISSN 1995-4239, Numerical Analysis and Applications, 2021, Vol. 14, No. 3, pp. 1–19. c_ Pleiades Publishing, Ltd., 2021. Russian Text c_ The Author(s), 2021, published in Sibirskii Zhurnal Vychislitel’noi Matematiki, 2021, Vol. 24, No. 3, pp. 229–251. (**Clarivate Analytics, Emerging Sources Citation Index**).

2. Kamil R.Aida-zade, Vugar A.Hashimov and Arzu H.Bagirov. On A Problem Of Synthesis Of Control Of Power Of The Moving Sources On Heating Of A Rod. Proceedings of the Institute of Mathematics and Mechanics, National Academy of Sciences of Azerbaijan, Volume 47, Number 1,

2021, Pages 183-196. <https://doi.org/10.30546/2409-4994.47.1/183>. (**Clarivate Analytics, Emerging Sources Citation Index**).

3. K.R.Aida-zade and V.M.Abdullayev. Optimization of Right-Hand Sides of Nonlocal Boundary Conditions in a Controlled Dynamical System. ISSN 0005-1179, Automation and Remote Control, 2021, Vol. 82, No. 3, pp. 375–397. ©Pleiades Publishing, Ltd., 2021. Russian Text©The Author(s), 2021, published in Avtomatika i Telemekhanika, 2021, No. 3, pp. 3–31. (**Clarivate Analytics SCI**). **Impact Factor 0.52, Q4**.

4. K.R.Aida-zade, and Ye.R.Ashrafova. Optimization of Source Locations and Parameters for Network Structure Objects. ISSN 0005-1179, Automation and Remote Control, 2021, Vol. 82, No. 7, pp. 1201–1221.©Pleiades Publishing, Ltd., 2021. Russian Text©The Author(s), 2021, published in Avtomatika i Telemekhanika, 2021, No. 7, pp. 107–132. (**Clarivate Analytics SCI**). **Impact Factor 0.52, Q4**.

5. V.M.Abdullayev and K. R. Aida-zade. Optimization of Source Parameters in Multipoint Nonseparated Conditions for Linear Dynamical Systems. ISSN 0965-5425, Computational Mathematics and Mathematical Physics, 2021, Vol. 61, No. 4, pp. 512–526. © Pleiades Publishing, Ltd., 2021. Russian Text © The Author(s), 2021, published in Zhurnal Vychislitel'noi Matematiki i Matematicheskoi Fiziki, 2021, Vol. 61, No. 4, pp. 539–554. (**Clarivate Analytics SCI Expanded**). **Impact Factor 0.675, Q4**.

6. Kamil Aida-zade, Vagif Abdullayev. Optimization of the Right-hand Sides of Multi-point and Integral Conditions of the Controlled Dynamic System. Bulletin of the Iranian Mathematical Society. <https://doi.org/10.1007/s41980-021-00628-1>. (**Clarivate Analytics SCI Expanded**). **Impact Factor 0.644, Q4**.

7. Айда-заде К.Р., Абдуллаев В.М. Исследование класса интегро-дифференциальных уравнений с многоточечными и интегральными условиями. IX Международная конференция “современные проблемы математики и физики Г.Стерлитамак, 2021”.

8. Айда-заде К.Р., Ашрафова Е.Р. Обратная задача по определению значений источников в нелокальных условиях большой системы оду блочной структуры. IX Международная конференция “современные проблемы математики и физики Г.Стерлитамак, 2021”.

9. Айда-заде К.Р., Гашимов В.А. Обратная задача по определению мест и источников колебаний мембраны. IX Международная конференция “современные проблемы математики и физики Г.Стерлитамак, 2021”.

10. К.Р.Айда-заде, Е.Р.Ашрафова. Оптимизация мест и параметров источников для объектов сетевой структуры. Автоматика и телемеханика, № 7, 2021.

11. В. М. Абдуллаев, К. Р. Айда-заде. Оптимизация Параметров Источников В Многоточечных Неразделенных Условиях Линейных Динамических Систем. Журнал Вычислительной Математики И Математической Физики, 2021, том 61, № 4, с. 539–554.

12. К.Р.Айда-заде, В.М.Абдуллаев. Оптимизация правых частей нелокальных краевых условий управляемой динамической системы. Автоматика и телемеханика, № 3, 2021.

13. К.Р.Айда-заде, Е.Р.Ашрафова. Управление воздействиями в правых частях большой системы ОДУ блочной структуры и оптимизация источников в неразделенных краевых условиях. Сибирский журнал вычислительной математики. 2021. Т.24, № 3.

3) Work: “Development of analytical and numerical solutions of problems for a class of equations describing different processes”.

Executer: doct. of phys. Math. Sci. prof. Yusif Qasimov

Research was conducted in accordance with the work plan in the reporting year. Non-local and multi-point conditional border issues were investigated, the existence and uniqueness of their solutions were shown, and solution methods were developed. Numerical methods for solving problems for different types of differential equations are proposed.

As a result of the research, the following 7 articles were published in journals indexed in the Web of Science and Scopus databases:

The following results were obtained on the topic:

1. The following results were obtained on the topic: 1. Mardanov, M.J., Sharifov, Y.A., Gasimov, Y.S., & Cattani, C. (2021). Non-linear first-order differential boundary problems with multipoint and integral conditions. *Fractal and Fractional*, 5(1), 15. <https://doi.org/10.3390/fractalfract5010015>

(Web of Science Impakt Faktor – 3.313 – Q1, Scopus)

2. Gasimov Y.S., Jafari H., Mardanov M.J., Sardarova R.A., Sharifov Y.A. (2021). Existence and uniqueness of the solutions of the nonlinear impulse differential equations with nonlocal boundary conditions. *Quaestiones Mathematicae*, 1-14.

(Web of Science Impakt Faktor – 1.474 – Q1, Scopus).

3. Srivastava, H.M., Iqbal, J., Arif, M., Khan, A., Gasimov, Y.S., & Chinram, R. (2021). A new application of Gauss quadrature method for solving systems of nonlinear equations. *Symmetry*, 13(3), 432. <https://doi.org/10.3390/sym13030432>

(Web of Science Impakt Faktor – 2.713 – Q2, Scopus)

4. Li, J., Singh, G., Ilhan, O.A., Manafian, J., & Gasimov, Y.S. (2021). Modulational instability, multiple Exp-function method, SIVP, solitary and cross-kink solutions for the generalized KP equation. *AIMS Mathematics*, 6(7), 7555-7584. <https://doi.org/10.3934/math.2021441>

(Web of Science Impakt Faktor – 1.427 – Q2, Scopus)

5. Valdes, J.E.N., Gasimov, Y.S., & Aliyeva, A.R. (2021). On the oscillatory behavior of some generalized differential equation. *Punjab University Journal of Mathematics*, 53(1), 71-82.

(Web of Science – Emerging Source Citation Index).

6. Usman T., Khan N.U., Aman M., Gasimov Y. (2021). **A unified family of multivariable Legendre poly-Genocchi polynomials.** *Tbilisi Mathematical Journal*, 14(2), 153-170. <https://doi.org/10.32513/tmj/19322008130>

(Web of Science – Emerging Source Citation Index)

7. Guzman P.M., Valdes J.E.N., Gasimov Y.S. (2021). Integral inequalities within the framework of generalized fractional integrals. *Fractional Differential Calculus*, 11(1), 69-84. <https://doi:10.7153/fdc-2021-11-05> **(Scopus)**

4)Work: “The most immediate effect problem for a two-order hyperbolic equation”.

Executer: doct. of phys. Math. Sci. prof. Hamlet Quliyev

The most immediate effect for a nonlinear two-order hyperbolic equation was considered. The theorem of the existence of an optimal controller has been proved, and the necessary condition for optimality in the form of variational inequalities has been derived.

Under H.F.Guliyev's leadership, Vusala Nazim gizi Nasibzadeh defendes her PhD in mathematics in June.

The following results were obtained on the topic:

1. H.F.Quliyev, L.Ələkbərli. “Həllinin kəsilməsi olan simin rəqsləri tənliyi üçün bir optimal idarəetmə məsələsi”, Ümummilli Lider Heydər Əliyevin 98-ci ildönümünə həsr olunmuş "Riyaziyyat, mexanika və onların tətbiqi" mövzusunda respublika virtual elmi konfransı. 24-25 may, 2021, Bakı, Azərbaycan, s. 85-86.

2. Кулиев Г.Ф., Сейфуллаева Х.И. «Задача оптимального управления с коэффициентами для уравнения колебаний тонкой пластины с разрывным», **Материалы XIV международной конференции, приуроченной к 90-летию Дагестанского государственного университета.** 16-19 сентября 2020 г. Махачкала. Изд-во ДГУ, 2021, с. 138-140. «Фундаментальные и прикладные проблемы математики и информатики».

3. Г.Ф.Кулиев, Х.Т.Тагиев. Об определении коэффициента гиперболического уравнения второго порядка с нелокальным условием. Тезисы научн. Конф. Посв. 80 летию Р. Габбасова, Беларусь, сентябрь, 2021.

4. Г.Ф.Кулиев, Х.Т.Тагиев. Об определении коэффициента гиперболического уравнения второго порядка с нелокальным условием. Вестник БГУ, серия физико-математических наук, №1, 2021, стр. 20-28.

5. H.F.Quliyev, H.T.Tagiyev. On the determination of the coefficients of the second order hyperbolic equation with a nonlocal condition // *Advanced Mathematical Models & Applications*. 2021 (**Web of Science**)

6. H.F.Quliyev, H.T.Tagiyev, A.A.Mehdiyev. On determining the coefficients of a second order hyperbolic equation with a nonlocal condition in a one dimensional case // 1st International Symposium on recent advances in fundamental and applied sciences (ISFAS-2021) p. 126.

5) Work: “Investigation of some multi-point boundary conditional boundary and optimal control problems”.

Executers: Corresponding member of ANAS, prof. Misir Mardanov and doct. of phys. Math. Sci. prof.Yaqub Şarifov

The first order nonlinear differential, integral-differential and fractional differential equations with non-local boundary condition are studied in the study. The Green function is built to bring the boundary value problem into an integral equation. Thus, the theorems on the existence and uniqueness of the solution of the boundary value problem were proved by applying Banach's principle of compressed inequality and Schaefer's theorem on a fixed point to the integral equation. In addition, the issue of non-locally conditioned optimal management has been investigated. In this paper, we first consider the multipoint and integral boundary value problem for ordinary differential equations of the first order. A theorem on the existence and uniqueness of the solution of a differential equation by the method of principle of compressed mappings is proved. A theorem on the existence of a solution is proved using the Schaefer fixed-point theorem.

Similar results were obtained for the boundary problem given by two-point boundary conditions for integrodifferential equations.

The following results were obtained on the topic:

1. Mardanov M.J., Sharifov Y.A., Gasimov Y.S. & Cattani C. (2021). Non-linear first-order differential boundary problems with multipoint and integral conditions. *Fractal and Fractional*, 5(1),15. (**Web of science**) <https://doi.org/10.3390/fractalfract5010015>

2. M.J. Mardanov, R.S. Mammadov, S.Y. Gasimov, Y.A. Sharifov. Existence and uniqueness results for the first-order non-linear impulsive integro-differential equations with two-point boundary conditions. *Bulletin Karaganda University*, (**Web of science**) *Mathematics Series*, №2 (102)/2021, DOI 10.31489/2021M2/74-83, pp. 74-83.

3. Y.S. Gasimov, H. Jafari, M.J. Mardanov, R.A. Sardarova & Y.A. Sharifov. Existence and uniqueness of the solutions of the nonlinear impulse differential equations with nonlocal boundary conditions. *Quaestiones Mathematicae* 2021: pp. 1–14. <https://doi.org/10.2989/16073606.2021.1945702>. (**Web of Science Impact Faktor – 1.474 – Q1, Scopus**).

4. Y.A. Sharifov, S.A. Zamanova, R.A. Sardarova. Existence and uniqueness of solutions for the nonlinear fractional differential equations with two-point and integral boundary conditions. *EUROPEAN JOURNAL OF PURE AND APPLIED MATHEMATICS* Vol. 14, No. 2, 2021, 608-617. (**Web of science**)

5. Mardanov M.J., Sharifov Ya.A. First order optimality conditions for an optimal control problem with nonlocal conditions under impulse actions. Proceedings of the International Scientific Conference in memory of Professor R.F.Gabasov. pp. 24-26.

6) Scientific research on "Optimization of higher education management" was conducted:

Work: "Development of a model for calculating the rankings of universities by compiling the knowledge gained about their activities".

Executers: Corresponding member of ANAS, prof. Misir Mardanov, doctor of technical science, professor Ramin Rzayev

The decision-making process, described in this work as a continuous chain of multi-criteria choices developed and implemented under the influence of numerous factors of a different nature, is perceived as a type of human intellectual activity. The article considers each university as a system of humanistic education in the presence of the human factor, uncertainty. The assessment of the university's level of competitiveness and the calculation of the relevant rating is described as a poorly structured problem with quantitative and qualitative properties.

The following results were obtained on the topic:

1. М.Дж.Марданов, Р.Р.Рзаев "Нечёткая логика Л.А.Заде, как ключ к описанию гуманистических систем" // Problems of Information Society (İnformasiya Cəmiyyətinin Problemləri), №2, səh. 26-37, 2021. DOI: 10.25045/jpis.v12.i2.02

2. Mardanov M.C., Rzayev R.R., Abdullayev X.X. The importance of Lotfi Zadeh's heritage and fuzzy logic in the study of the behavior of humanistic systems // Azerbaijan school.Azerbaijan Journal of Educational Studies. 2021, №3, pp. 11-28.

3. Mardanov M.C., Rzayev R.R., Jamalov Z.R. Assessment of the University Competitiveness in the Paradigm of the Humanistic System Behavior // Proceeding of 11th International Conference on Theory and Application of Soft Computing, Computing with Words, Perception and Artificial Intelligence ICSCCW-2021, 23-24 August 2021, Antalya, Turkey (Indexed by **Web of Science and Scopus**)

7) The research was conducted entitled "History of Science-History of Mathematics:

Work: "Research on the history of mathematics and mathematical education".

Executer: professor Ramiz Aslanov

Published works of R.M.Aslanov during the reporting period:

1. Марданов М.Д., Асланов Р.М., Салимов А.А. Казанский университет и развитие геометрии в Азербайджане. Очерки истории. – Калуга: ИП Стрельцов И.А., Научный редактор проф. (Изд-во «Эйдос»). 2021.192 с.



2. Марданов М.Д., Асланов Р.М., Гасанова Т.Х. Штрихи к портрету З.И. Халилова (к 110-летнему юбилею), Математическое образование в школе и вузе: опыт, проблемы, перспективы (MATHEDU'2021): Материалы X Международной научно-практической конференции, Казань, 22-28 марта 2021 г./отв. ред. Л.Р. Шакирова. – Казань: Издательство Казанского университета, 2021. – 240 с. (стр. 130-143) ISBN 978-5-00130-463-0 (**РИИЦ**).

3. Асланов Р.М., Timur R.Fazliakhmetov, Leila L.Salekhova, Gulnur I.Muhutinova. Using the messenger software opportunities in distance education. **RPGE**– Revista on line de Política e Gestão Educacional, Araraquara, v. 25, n. esp. 1, p.378-386, mar. 2021. e-ISSN:1519-9029

DOI: <https://doi.org/10.22633/rpge.v25iesp.1.14974> (**SCOPUS**).

4. Марданов М.Д., Асланов Р.М. Бесценное наследие Насиреддина Туси в развитии тригонометрии // Современное образование: научные подходы, опыт, проблемы, перспективы: материалы XVII Всерос. с междунар. участием науч.-практ. конф. «Артемовские чтения» (г. Пенза, 21 апреля 2021 г.) / под общ. ред. д-ра пед. наук, проф. М. А. Родионова. – Пенза: Изд-во ПГУ, 2021. – 356 с. стр.71-78. ISBN 978-5-907456-18-1 (**РИИЦ**).

R.M.Aslanov received an invitation for speech at the conference (Mordkovich's 40-th workshop) to be held on October 7-9, 2021 at Bryansk State Pedagogical University.

8) Work: "Construction of a sequence of special numbers and special elements of a two-parameter spectral problem with a compact self-coupling operator."

Executer: Leading Researcher Eldar Sh. Mammadov

The eigen numbers and eigen elements of a two-parameter spectral problem with a compact self-adjoint operator were investigated, and a constructive method was found to find their sequence. Since the method of variation was applied to solve this problem, it was necessary to study the construction of the numerical domain of the problem.

1. **Eldar Sh. Mammadov.** Construction of a sequence of eigenelements of a two-parameter problem with compact self-adjoint operators. 4th International E-Conference on Mathematical Advances and Applications, May 26-29, 2021

9) Work: "Necessary and sufficient conditions for a delayed argument variation problem."

Executer: doctorant Aygun Isayeva.

The following thesis was published during the reporting period:

1. **Aygun Isayeva.** Necessary conditions in the variation problem with free right end with delay. Republican virtual scientific conference on "Mathematics, Mechanics and their application" dedicated to the 98th anniversary of National Leader Heydar Aliyev.

About speeches of department employees at the conference

In the III International Conference "Динамические Системы и Компьютерные Науки: Теория и Приложения Третья Международная Конференция" (DYSC 2021) held in Irkutsk the head of the department, professor Misir Mardanov spoke on the topic "Необходимые условия минимума в задачах вариационного исчисления при наличии различных вырождений".

In the Conference "Динамические Системы: Устойчивость, Управление, Оптимизация" (DSSCO'21) памяти профессора Р.Ф. Габасова" held in Minsk the head of the department, professor Misir Mardanov spoke on the topic "Необходимые условия минимума в задачах вариационного исчисления при наличии различных вырождений".

In the Republican Virtual Scientific Conference "Mathematics, Mechanics and Their Application" dedicated to the 98th anniversary of National Leader Heydar Aliyev held on May 24-25, 2021, Hamlet Guliyev spoke on the topic "An optimal control problem for the equation of wire oscillations with disconnection".

In the Conference "Динамические Системы: Устойчивость, Управление, Оптимизация" (DSSCO'21) held in Minsk on October 5-10, 2021 Hamlet Guliyev spoke on the topic "Об определении коэффициента гиперболического уравнения второго порядка с нелокальным условием".

In the XIV International Conference «Задача оптимального управления с коэффициентами для уравнения колебаний тонкой пластины с разрывным» held in Makhachkala on September 16-19, 2020 Hamlet Guliyev spoke on the topic «Фундаментальные и прикладные проблемы математики и информатики».

In the Scientific Proceedings of the International Scientific Conference in memory of Professor R.F.Gabasov Yaqub Sherifov spoke on the topic "First order optimality conditions for an optimal control problem with nonlocal conditions under impulse actions".

In the 11th International Conference «On Theory and Application of Soft Computing, Computing with Words, Perception and Artificial Intelligence» held in Antalya on August 23-24, 2021 Rzayev Ramin spoke on the topic "Assessment of the University Competitiveness in the Paradigm of the Humanistic System Behavior".

In the Conference "International Conference on Problems of Logistics, Management and Operation in the East-West Transport Corridor (PLMO)" Yusif Gasimov spoke on the topic "Assessment of the University Competitiveness in the Paradigm of the Humanistic System Behavior".

SCIENTIFIC AND SOCIAL ACTIVITIES

Professor Misir Mardanov is a chairman of the Dissertation Council D.01.111 and of the Scientific Council of IMM. He is deputy editor-in-chief of "AMEA Xəbərləri" journal, a member of the editorial board of "Azerbaijan Journal of Mathematics" and "Chebyshevskii sbornik", editor-in-chief of "Proc. of IMM ANAS", a member of the international editorial board of "TWMS Journal of Applied Mathematics" and chairman of Scientific Publishing of ANAS.

The second volume of the "The Azerbaijanis studied of higher institutes to 1920 year" written by director of the Institute of Mathematics and Mechanics of ANAS, corresponding member of ANAS, professor Misir Mardanov and professor Adalat Tahirzade devoted to 100 years of People Republic of Azerbaijan was published.

Head of the department professor Misir Mardanov is Chairman of the Dissertation Council D.01.111 and of the Scientific Council of IMM. He is deputy editor-in-chief of "AMEA Xəbərləri" journal, a member of the editorial board of "Azerbaijan Journal of Mathematics" and "Chebyshevskii sbornik", editor-in-chief of "Proc. of IMM ANAS", a member of the international editorial board of "TWMS Journal of Applied Mathematics" and chairman of Scientific Publishing of ANAS.

PhD in Physics and Mathematics, corresponding member of ANAS, professor Kamil Aydzadə, chairman of the laboratory "Numerical methods of decision on the deterministic systems" of ANAS, editor in board in the journal published in Turkey "Ege University journal of the Faculty of Science", editor in board in "NASA Proceedings of the Institute of Mathematics and mechanics" international journal, the journal published in Russia, "Прикладная математика и фундаментальная информатика", TWNS "Pure and Applied Mathematics" international journal, Proceedings of Institute of Applied Mathematics,

ANAS news (physics-and technology, mathematics), ANAS news ("Problems of Informatics and Control"), editor in board in Azerbaijan State Exam Center journal of "Abituriyent".

Professor Telman Melikov is a member of the AAC Expert Council in Mathematics and Mechanics. Editor in board in **Proceedings of the Institute of Mathematics and Mechanics**.

Doctor of Physical and Mathematical Sciences of Department of Mechanics and Mathematics, BSU, Department of Mathematical Control, professor Hamlet Guliyev is a member of the editorial board of the journal "Modern Mathematical Models and Applications".

Professor Yagub Sharifov is a member of the editorial board of the Proceedings of the Institute of Applied Mathematics.

Professor Ramin Rzayev is a senior researcher at the Institute of Control Systems of ANAS, a member of the editorial board of the Scientific Journal of Automation and Metabolism, a member of the program committee of the International Scientific Conference "Information Systems and Technologies: Achievements and Prospects." Member of "ICSCCW - International Conference on Theory and Application of Soft Computing, Computing with Words and Perceptions" and "ICAFS - International Conference on Theory and Applications of Fuzzy Systems and Soft Computing" program committee of the international conference .

Department's Senior Researcher Yusif Gasimov **is a founder and director of Jomard Publishing that issues 8 scientific journals**, is editor in-chief of international journal "Advanced Mathematical Models and Applications", journal of "Modern Technology and Engineering" - International journalist member of the editorial board of Applied Mathematics and Information Science - international editorial board, Proceedings of the Institute of Mathematics and Mechanics.

Professor Ramiz Aslanov is a member of the editorial board of the following journals:

1. «Вестник Сыктыв «Учебный эксперимент в образовании». Мордовский государственный педагогический институт им. М.Е. Евсевьева (г. Саранск- Мордовия, РФ)
2. карского университета. Серия 1. Математика. Механика. Информатика». (г. Сыктывкар, РФ)
3. Научно-методический журнал «CONTINUUM. Математика. Информатика. Образование». Елецкий государственный университет им. И.А. Бунина.(г. Елец, РФ)
4. «Вестник Елецкого государственного университета» им. И.А. Бунина. –Серия «Педагогика». (История и теория математического образования) (г. Елец, РФ).

Final Information

Department staff throughout the year

- 1) 4 books have been published,
- 2) 48 scientific works have been published,
- 3) 34 of them are scientific articles,
- 4) 16 conference materials (14 published abroad, 2 in Azerbaijan),
- 5) 22 scientific papers have been published in journals listed by WOS, SCOPUS and РИНЦ,
- 6) 17 scientific works were published in journal included in WOS and SCOPUS (9 of them with Impact Factor); and 2 of them in journals included in РИНЦ, 3 of them only in journal included in Scopus base,
- 7) The number of references to scientific works of employees of the department is 455.

Head of department:

Corr. member of ANAS prof. Misir Mardanov