

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 2015

17 research works have been done in the field of basis theory by the employees of the Department of Non-Harmonic Analysis (DNHA) in the first half of 2015.

There are 24 employees in DNHA, including 2 Doctors of Sciences (1 of them being a part-timer), 13 PhD's (5 of them being part-timers), 3 researchers, and 6 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.

60 research works by the employees of DNHA, including 31 scientific articles and 1 monograph, have been published in top mathematical journals during 2015. Short summaries of 28 research works by the employees of DNHA have been included in proceedings of various national and international scientific conferences. 8 scientific articles in journals with an impact factor. 20 scientific articles abroad and 11 articles were published in journals published in our Republic. 1 monograph submitted for publication.

One new issue of *Azerbaijan Journal of Mathematics* (which included 10 articles written by the authors from Azerbaijan, Iran, India, Ukraine, Serbia, Spain, China, Portugal and Russia) has been published and one issue of *Caspian Journal of Applied Mathematics, Ecology and Economics* has been published for publication during 2015.

The project entitled *Mathematical Modelling and Software for Regional Ecological Monitoring System* (a winner of the contest organized by the Science Development Foundation under the President of Azerbaijan Republic in 2013) and managed by our coworker Telman Kasumov has been successfully completed in the reporting period.

The project entitled *Some Problems of Removable Singularity for Parabolic and Elliptic Type Partial Differential Equations* (a winner of the contest organized by the Science Development Foundation under the President of Azerbaijan Republic (EIF/GAM-2013-2(8)) in 2013) and managed by our coworker Vafa Mamedova has been successfully completed in the reporting period.

The project entitled *Faber Polynomials as Bases for Weighted Smirnov Classes* (a winner of the contest organized by the Science Development Foundation under the President of Azerbaijan Republic (EIF/GAM-2013-2(8)) in 2013) and managed by our coworker Sabina Sadigova has been successfully completed in the reporting period.

The project entitled *Frame Theory – Application of Wavelet Analysis to Signal Processing in Seismology and Other Fields* and submitted by professor B. Bilalov, head of DNHA, became a winner of the contest organized by the National Academy of Sciences of Azerbaijan in the reporting period. Within the framework of this project, professor Bilalov, as a project manager, and professor Farman Mamedov, as a project participant, attended the international ICAAMM conference held in Yildiz Technical University in Istanbul, Turkey, from 7 to 17 June 2015. Both made the speeches at this conference and held fruitful negotiations with

YTU staff members Vatan Karakaya and Yusuf Zeren aimed at strengthening scientific ties between YTU and IMM.

Our coworker Zakir Zabidov, together with Hasan Naghiyev (also from IMM), have visited Kazan Federal University in Kazan, Russia, from 10 to 17 June 2015 within the framework of the above project Frame Theory – Application of Wavelet Analysis to Signal *Processing in Seismology and Other Fields*. There they had very interesting and useful discussions with professor Olga Khuturova about the methods of analysis of ecological and seismological data represented in time series and calculation algorithms of wavelet analysis.

Professor Bilal Bilalov, the head of the Department of Non-Harmonic Analysis (DNHA), and Zakir Zabidov, also from DNHA, have visited Samara, Russia, from 23 to 26 September 2015, and Ufa, Russia, from 27 September to 1 October 2015. They have attended the seminar led by professor V.V.Sergeyev, the head of the Department of Geoinformatics and Information Security at the Samara State Aerospace University. There they had very interesting and useful discussions concerning further cooperation between IMM and SSAU. Also, professor Bilalov made a speech at the plenary session of the international scientific conference held in Bashkir State University in Ufa entitled “Atomic Decomposition and some Problems of Frames”.

Three employees of DNHA, Ali Huseynli, Aydin Shukurov and Natavan Nasibova, were among the winners of the 3rd Grant competition of young scientists and specialists organized by the Science Development Foundation under the President of the Republic of Azerbaijan during 2015.

Two employees of DNHA finished their theses and submitted them to dissertation council during 2015. Three more theses are ready for submission.

Below is the list of international conferences at which the employees of DNHA made reports during 2015:

- 1) International Conference On Applied Analysis and Mathematical Modelling (ICAAMM2015), Istanbul, Turkey
- 2) VI Annual Conference of the Georgian Mathematical Union, July 12-16, 2015, Batumi, Georgia
- 3) 7th International Conference on Mathematical Analysis, Differential Equations & Their Applications MADEA-7, September 8-13, 2015, Baku, Azerbaijan
- 4) Fundamental Mathematics and its Applications in Natural Sciences. Abstracts of the 8th International Conference of Students, Post-Graduates and Young Scientists. Ufa, Russia, 2015