

Georgian Mathematical Union – History and Activity

Roland Duduchava (University of Georgia, Tbilisi, Georgia), Guram Gogishvili (St. Andrew the First Called Georgian University, Tbilisi, Georgia) and David Natroshvili (Georgian Technical University, Tbilisi, Georgia)

The Georgian Mathematical Union (GMU), formerly the Georgian Mathematical Society, was founded on 21 February 1923. One of its founders and the first president was the distinguished mathematician Andrea Razmadze. Active co-founders and members were Nikolz Muskhelishvili, Giorgi Nikoladze and Archil Kharadze. These Georgian mathematicians, educated in Moscow and Saint Petersburg, founded the Georgian Mathematical School and launched mathematical education in Georgia at the first university in Caucasus, opened in Tbilisi in 1918. A. Razmadze represented Georgia at the International Congress of Mathematicians in Toronto, Canada, in 1924. At the same congress in Toronto, the Georgian Mathematical Society was accepted as a member of the International Mathematical Union.

After the death of A. Razmadze in 1929, the Georgian Mathematical Society became inactive until 1962, when it was re-established due to the efforts of Viktor Kupradze, Boris Khvedelidze, Levan Gokieli and Archil Kharadze. Mathematicians from Georgian universities, scientific research institutes, institutions of higher education and secondary schools consolidated in its ranks. Viktor Kupradze became the president of the newly



Founders of the Georgian Mathematical School and Georgian Mathematical Union: A. Kharadze, A. Razmadze, G. Nikoladze and N. Muskhelishvili.

revived society from 1962 to 1966. Later presidents of the GMU were Levan Gokieli (1966–1970), Archil Kharadze (1970–1974), Levan Magnaradze (1974–1994), David

Natroshvili (1994–1997), Roland Duduchava (1997–2001), Teimuraz Vepkhvadze (2001–2005), Jondo Shari-kadze (2005–2009) and Roland Duduchava (2009–2017). The current president of the GMU is David Natroshvili (since 2017).

In 1990, the Georgian Mathematical Society became one of the founders of the European Mathematical Society. In 1991, it became a member of the International Mathematical Union. In 1994, it was renamed the Georgian Mathematical Union.

The mission of the Georgian Mathematical Union is to promote mathematical sciences, especially among the young generation, and to establish and strengthen contacts with colleagues from abroad and with international professional organisations such as the International Mathematical Union and the European Mathematical Society. To this end, the GMU organises public meetings where novel scientific results are reported and discussed. The GMU often organises memorial meetings dedicated to outstanding mathematicians, which essentially promote mathematics popularisation.

Special workshops are devoted to contemporary problems related to the teaching of mathematics at schools and universities. The GMU actively collaborates with schoolteachers. Members of the GMU intensively participate in consideration of educational standards and in the preparation of Georgian mathematical textbooks for secondary schools and universities. The GMU organises competitions of young scientists and gives awards to authors of the best mathematical papers.

Every four years, before the International Congress of Mathematicians, the GMU organises a congress, where the President and Vice-Presidents of the GMU, the Chair of the Georgian National Committee for Mathematics, the Chairs of different commissions and Members of the Council of the GMU are elected. At the congress, the Niko Nikolkadze Prize is awarded to a young mathematicians under the age of 40.

Since 2010, at the beginning of September, the GMU organises Annual International Conferences in Batumi, a wonderful Black Sea resort of Georgia. The 9th conference took place on 3–7 September 2018 and was dedicated to the centenary of the Ivane Javakhishvili Tbilisi State University.

In 2014, the GMU hosted the First Caucasian Mathematics Conference (CMC) in Tbilisi.

The idea of CMCs was initiated by the Turkish Mathematical Union (President B. Tanbay), the Moscow Mathematical Society (Vice-President A. Sergeev) and the Georgian Mathematical Union (President R. Duduchava) at their meeting in Istanbul at the beginning of 2014. The initiative was supported by the European Mathematical Society. Later, the Mathematical Societies of Armenia, Azerbaijan and Iran joined the project. It was decided to organise the CMC bi-annually under the auspices of the European Mathematical Society and the cooperation of the aforementioned mathematical societies. The scope of the CMC is to bring together mathematicians from Caucasian and neighbouring countries to promote scientific collaboration in the region.

In CMC I in Tbilisi, about 150 mathematicians participated from Caucasian and other countries. CMC II was held in Van, Turkey, and members of the GMU actively participated in the work of the conference.

Among other international meetings organised by the GMU is the 26th International Workshop on Operator Theory and Applications (IWOTA), which took place in Tbilisi, Georgia, 6–10 July 2015. It brought together mathematicians and engineers working in operator theory and its applications to related fields, ranging from classical analysis, differential and integral equations, complex and harmonic analysis to mathematical physics.

The GMU was a co-founder, alongside 11 other societies, of the Silkroad Mathematical Centre of the Chinese Mathematical Society (SMC-CMS) in Beijing, China, in 2016 (http://www.cms.org.cn/en/mathcenterintro_332.html). Professor R. Duduchava is a member of the Steering Committee of the SMC-CMS. One representative and three young mathematicians under 35 from all the member countries of the centre are invited to the annual conference in Beijing.

In 1995, at the I. Vekua Institute of Applied Mathematics (VIAM) of Ivane Javakhishvili Tbilisi State University, the *Tbilisi International Centre of Mathematics and Informatics* (TICMI) was founded. The TICMI is supported by the GMU and the EMS. The aims of the centre are to help young scientists of the Black Sea Basin, to improve their professional skills and to promote the exchange of scientific information worldwide. This is achieved through lecture series and Summer schools devoted to topics determined by the current interests of the centre.

The work of the centre is guided by an international scientific committee, which consists of seven members. Four members are elected for a period of four years by the Scientific Council of the VIAM and are approved by the Presidium of the GMU. They represent different interests and at least one amongst them is a member of the VIAM. The three other members are appointed for the same period by the Executive Committee of the EMS.

The current members of the international scientific committee of the TICMI are:

Lucian Beznea (Bucharest, Simion Stoilow Institute of Mathematics of the Romanian Academy).

Alice Fialowski (Budapest, Institute of Mathematics, Pazmany Peter setany 1/C).

George Jaiani, Chairman (Tbilisi, I. Vekua Institute of Applied Mathematics, Tbilisi State University).

Vaxtang Kvaratskhelia (Tbilisi, N. Muskhelishvili Institute of Computational Mathematics).

Alexander Meskhi (Tbilisi, A. Razmadze Mathematical Institute, Tbilisi State University).

David Natroshvili (Tbilisi, Georgian Technical University).

Eugene Shargorodsky (London, King's College London).

The centre presents an annual report to the GMU and the EMS.



**Nikoloz (Niko)
Muskhelishvili**

Ilia Vekua

Viktor Kupradze

In conclusion, we would like to mention the three most outstanding members who stood at the origins of the GMU.

The most outstanding Georgian mathematician and founder of the well-known Georgian Mathematical School Academician *Nikoloz (Niko) Muskhelishvili* conducted fundamental research on the theories of mathematical elasticity, integral equations and boundary value problems. He was one of the first to apply the theory of functions of complex variables to the problems of elasticity theories, proposing a number of methods that have been successfully implemented in numerous areas of mathematics, theoretical physics and mechanics. In his works, almost all major problems of the plane elasticity theory are solved. He is also well-known for his contributions to the theory of linear boundary value problems for analytic functions and one-dimensional singular integral equations. N. Muskhelishvili is the author of various scientific articles, monographs and textbooks on mathematics, which are still widely used today. His highest regarded monographs are *Singular Integral Equations*, Groningen, P. Noordhoff, 1953 (67 editions published between 1946 and 2011 in five languages and held by 849 libraries worldwide), and *Some Basic Problems of the Mathematical Theory of Elasticity*, Groningen, P. Noordhoff, 1963 (78 editions published between 1933 and 1977 in three languages and held by 846 libraries worldwide).

The distinguished Georgian mathematician Academician *Ilia Vekua* is well-known worldwide for his fundamental contributions to the theory of partial differential equations, singular integral equations, generalised analytic functions and the mathematical theory of elastic shells. Fundamental monographs of I. Vekua are: *New Methods of Solution of Elliptic Equations*, North-Holland Publ. Co., Amsterdam, 1967; *Generalized Analytic Functions*, Oxford University press, Oxford-London-New York-Paris, 1962; and *Shell Theory: General Methods of Construction*. Pitman Advanced Publishing Program, Boston-London-Melbourne, 1985.

Mathematicians and scientists working in the fields of continuum mechanics throughout the world are familiar with the name of Academician *Viktor Kupradze*, who made essential contributions in mathematical physics and the 3-dimensional theory of elasticity. The following monographs are the most popular works of V. Kupradze: *Fundamental Problems in the Mathematical Theory of Diffraction*. Los Angeles, 1952; *Potential Methods in the Theory of Elasticity*. Israel Program of Scientific Translations, Jerusalem, 1965; and *Three-dimensional Problems of the Mathematical Theory of Elasticity and Thermoelasticity*. North-Holland Publ. Comp. Amsterdam, 1979.

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Roland Duduchava [RolDud@gmail.com] is Chairman of the National Committee of Georgian Mathematicians and Head of the Department of Mathematics at the University of Georgia (Tbilisi, Georgia). His research interests are in partial differential equations, integral and pseudodifferential equations, solid mechanics, wave scattering and mathematical physics.



Guram Gogishvili [guramgog@gmail.com] is Head of the Commission of Mathematical Education and History of Mathematics at the GMU, and is Chief of the Educational Centre of St. Andrew the First-Called Georgian University. His research interests are in arithmetical aspects of the theory of quadratic forms, representation of numbers by forms, estimation of corresponding arithmetical functions and class numbers of quadratic forms.



David Natroshvili [natrosh@hotmail.com] is President of the Georgian Mathematical Union and Head of the Department of Mathematics at the Georgian Technical University (Tbilisi, Georgia). His research interests are in partial differential equations, integral and pseudodifferential equations, solid mechanics, generalised thermo-electro-magneto elasticity, wave scattering and mathematical physics.