The TSU and VIAM Jubilees: History and Challenges for the Future

2018 was marked with three Jubilees. Centenary of declaration of independence of the first Georgian Republic. Centenary of the I. Javakhishvili Tbilisi State University (TSU), the eldest university in the Caucasus, and 50th anniversary of the I.Vekua Institute of Applied Mathematics (VIAM) which was founded at the University after 50 years of foundation of the University and it is an only Institute which has been existing permanently for 50 years at the University.

By the time of the establishment of Tbilisi State University only the faculty of philosophy with departments of Humanities, Mathematics, and Natural Sciences was opened in 1918. The faculty had 369 students, 7 Professors, 5 Deputy Professors, 2 supervisor-scientists and 3 lecturers.

Nowadays, 100 years later, Tbilisi State University is a top ranked institution among 2% of the top universities of the world (The U.S. News &World Report) and it owns 13 educational buildings (two of them have the status of historical heritage).

Presently 67 undergraduate, 95 postgraduate and 51 Doctoral Degree Programs are implemented at 7 faculties of TSU (Faculty of Exact and Natural Sciences, Faculty of Economics and Business, Faculty of Law, Faculty of Social and Political Sciences, Faculty of Humanities, Faculty of Psychology and Educational Sciences, Faculty of Medicine). Besides, 19 vocational and 3 one-step educational programs are offered (at the Faculty of Medicine). In addition, the university provides training program for teachers as well as Georgian language preparation educational program for ethnic Azeri, Armenian and Abkhazian students.

In total, 22 000 students pursue their studies at the university nowadays, including 600 international students. Currently, 705 academic personnel are employed at Tbilisi State University – 158 Professors, 371 Associate Professors and 176 Assistant-Professors.

More than 500 TSU students have participated in the exchange programs during the last three years. 75 Professors have delivered lectures and conducted researches at foreign universities.

The number of Tbilisi State University alumni has exceeded 300 000 during 100 years.

The university offers 21 foreign educational programs, including 13 educational programs where the language of instruction is English; 6 joint international educational programs issue double academic degree upon the completion.

Students of San Diego State University – Georgia English undergraduate Programs in Electrical Engineering, Computer Engineering, Computer Sciences and Chemistry-Biochemistry are given such kind of opportunity (the university provides

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high level laboratories in these directions). Georgian students have been given this chance since 2015. San Diego State University (SDSU), which has been selected within the framework of Millennium Challenge Account (MCA Georgia), is offering a high quality and internationally accredited (ABET, CSA, WASC) Bachelor's Programs in STEM. The above mentioned programs will facilitate the development of natural sciences and technologies field in Georgia and preparation of high qualified employees.

The university also offers international foreign graduate programs in Eurasian and Caucasian Studies, Economics, European Studies (Interdisciplinary Program about EU); European Literature (joint Doctoral Degree Program, language of instruction French); Computer Sciences (language of instruction French, undergraduate program); in addition, a joint interdisciplinary post-graduate program in "Public Management" offered by TSU and German University of Administrative Sciences (Speyer) and postgraduate program in "Master of Law" provided by University of Cologne (Germany). Worth noticing is also a newly established International Doctoral Programme in Mathematics at I. Javakhishvili Tbilisi State University, funded by the Volkswagen Foundation and the Shota Rustaveli Georgian Science Foundation. Besides seven faculties, the scientific activities are carried out at 16 independent scientific-research institutes of the university which cover all fields of science and technology. The Scientific-Research Institute of Applied Mathematics was founded at Tbilisi State University on October, 29, 1968 by decision of the Collegium of the State Committee of science and technique at the Council of ministers of the former Soviet Union. The initiator and the first director of the Institute was Ilia Vekua. Earlier at the faculty of Mechanics and Mathematics of the University, at the Chair of applied analysis and computing technique, guided by Shalva Mikeladze, since 1960 the laboratory of electronic computing technique was functioning, on the base of which on the initiative of Ilia Vekua in 1966 the Problem Scientific Research Laboratory of Applied Mathematics with rights of the Institute was founded. This laboratory was the base on which the Institute of Applied Mathematics was founded.

As basic scientific directions were determined:

(1) Investigation (by using computers) of multi-dimensional differential and integral equations and development of methods of their solutions for the problems of shell theory, theory of elasticity, meteorology and radiation transfer theory
(2) Investigation (by using computers) of problems of probability theory and mathematical statistics and their applications to problems of dynamical programming, mass service and processing of experimental data
(3) Elaboration (by using computers) of problems of mathematical economics and their implementation in planning and management in different fields of economics with application of computers
(4) Theoretical investigation and elaboration (by using computers) of numerical methods for solving some problems of optimal control
(5) Development of theoretical and applied problems of programming, including the formation of the system of algorithms and programs to solve the typical problems on the computer
(6) Development and application of methods of applied mathematics and computer techniques in organizing the teaching process at Universities.

The Institute's aims were to carry out research on topical problems of applied mathematics, to involve University professors, teachers, and students in joint research activities in order to integrate mathematics into the study processes and research, and to implement mathematical methodologies and calculating technology in the non-mathematical fields of the University.

In 1978, the Institute was named after its founder and first Director – Ilia Vekua.

In 1968-1977 the Director and Scientific leader of the Institute was Ilia Vekua, in 1979-1983 – Andro Bitsadze, in 1986-2006 – David Gordeziani, and since the end of 2006 – George Jaiani. At different times the Acting Directors of the Institute were Guram Chilashvili, and Revaz Kordzadze, Deputy Directors for research were Gvanji Mania, Shota Nikolaishvili, Revaz Kordzadze, David Gordeziani, George Jaiani, Kote Samsonia, Ilia Tavkhelidze, Natalia Chinchaladze, and Deputy Directors for management and general affairs were Kote Loladze and Murad Makharadze. The position of the Chief engineer was held at different periods by Vladimer Janjgava, Amiran Getia, and Kote Samsonia. The first Scientific Secretary of the Institute was Richard Skhirtladze, then at different times were Robert Devdariani, George Jaiani, Nugzar Skhirtladze, and since 1987 the Scientific Secretary has been Nikoloz Avazashvili.

The foundation of the Institute coincides with the period when the computer techniques and respectively, intensive development of new methods of investigation have started. Ilia Vekua's idea about the formation of a scientific centre of a new type had solid prerequisites in Georgia as the success of world recognized Georgian mathematicians and mechanists, as well as young scholars, working in these fields.

The Institute was equipped with the most powerful park of electronic computers existing in the south part of the former Soviet Union.

The main idea for the foundation of the Institute of the very beginning was to carry out fundamental investigations by using modern achievements of mathematics and wide use of computer technology. In its realization alongside main staff (scientific researchers) should participate not only post graduates, doctoral students and professors, but students of the very first courses.

As a result of I.Vekua's scientific authority and research, carried out by young scientists, working with him, the Institute soon won name as one of the leading centres in applied mathematics. Especially successful was the period since its foundation till the eighties of the last century. At that time in the Institute departments up to 30 scientific and scientific-educational seminars were held. The Seminar of the Institute which was founded by I.Vekua and directed by him to the end of his life (December 2, 1977), enjoyed great international reputation. Since 1985, on the initiative of Ivane Kiguradze, the Enlarged sessions of the Seminar were set up and dedicated to I.Vekua's birthday annually in April. The Organizing Committee of the Seminar was headed by Levan Magnaradze. Three sections were functioning at the Seminar: complex analysis and its application (Head Giorgi Manjavidze), theory of a function of a real variable (Zaur Chanturia) and ordinary differential equations (Head Ivane Kiguradze). Later the themes of the Seminar were enlarged and now at least 10 sections are working annually, with the participation of representatives of scientific and educational institutions of our country, as well as those from foreign universities and scientific centres. Of high scientific reputation was also the seminar, founded by Andro Bitsadze which had been functioning under his leadership in 1979-1983. This seminar was later (1987-2006) headed by George Jaiani. In 2016 on the initiative of George Jaiani this seminar was renewed and now

it is headed by the pupils of its founder – S.Kharibegashvili and T.Jangveladze.

In the above period the Institute was the organizer and co-organizer of many scientific events, among them the Third symposium of the International Union of Theoretical and Applied Mechanics (IUTAM) in shell theory in Tbilisi. The scientific committee of the symposium was headed by I. Vekua, and after his death by E.Kharadze. In 1982 the All-union symposium (with the participation of foreign scientists) "Partial differential equations and their applications" and in 1987 (also with the participation of foreign scientist) the all-union symposium "Modern problems of mathematical physics" were held.

The Institute's members have received numerous awards, namely, I. Vekua (the Sovjet State Premium, 1984, posthumous), T. Gegelia, M. Basheleishvili (the Georgian State Premium, 1971), A. Bitsadze (N. Muskhelishvili Premium of the Georgian Academy of Sciences, 1980), I. Kiguradze (A. Razmadze Premium of the Georgian Academy of Sciences, 1976), G. Jaiani (Medal and Premium of the Georgian Academy of Sciences for young researchers, 1978), Z. Chanturia (A. Razmadze Premium of the Georgian Academy of Sciences, 1981), and I. Tavkhelidze (I.Vekua Premium of the Georgian Academy of Sciences, 1984). From the very beginning the Institute has cooperated through bilateral and multilateral agreements with other leading centres and universities abroad, in particular, with V. Steklov Mathematical Institute, M. Keldysh Institute of Applied Mathematics, I. Kurchatov Institute of Nuclear Energy, M. Lomonosov Moscow State University, scientific institutions of Novosibirsk, Kharkov Institute of Physics and Technics, Friedrich Schiller University (Jena), A. Komensky University (Lodz). J.–L. Lions, G. Fichera, A. Tikhonov, A. Samarski, G. Marchak, A. Weil, R. Glovinsky and others have visited the Institute and gave lectures. The Institute's members as trainees visited significant scientific centres of the World such as Paris Universities, INRIA (D. Gordeziani, K. Tsiskaridze), University of Rome "La Sapienza" (G. Jaiani), etc. On their part, scientists from USA, Great Britain, East Germany, Poland, Chekh and Slovak Republics, Bulgarian, North Vietnam visited the Institute as trainees and for scientific work. The Institute's members have worked on contracted projects, including those for the government. Researches of this kind in this direction have been implemented in industry with economic effects annually one million Soviet rubles at the average. In this connection the achievements of the Institute have been marked with the premium of the Government of the Soviet Union (G. Sharashidze) and the premium of the Georgian Government (D. Gordeziani, R. Devdariani).

The contacts of the Institute with educational processes at TSU and other institutions were widened and deepened. Annually about 1500 students did practical works of different kind at the Institute. Annually about 200 students participated in the scientific activities of the Institute.

The school (guided by K. Tsiskaridze, A. Tsiskaridze) of young mathematicians and programmers of the Institute played an important role in the sense of professional orientation of high school pupils.

In the nineties of the last century in view of very hard financial-political situation in Georgia the research at Institute became difficult; a great part of members left the Institute, some of them went abroad. Nevertheless, those scientists who remained with their enthusiasm keep preserving the scientific potential and material and technical basis and scientific library and tried hard to renew computer technics of the Institute.

Even throughout the most difficult times for Georgia, the Institute continued to

be a successful scientific centre. During those years (1991-2007) the Institute published 14 monographs by Pitman Advanced Publishing Program, North-Holland Publishers, Lodz University Press, Naukova Dumka (Scientific Thought, Ukraine), Nauka (Science, Russia) and Georgian publishing houses as well. They also published 339 articles in foreign and Georgian periodicals. At the same time 11 doctoral and 11 pre-doctoral theses were defended by researchers at the Institute; the works of seven researchers received awards of the Georgian National Academy of Sciences: G. Manjavidze (A. Razmadze Premium, 1991), T. Tadumadze (A. Razmadze Premium, 2001), S. Kharibegashvili (N. Muskhelishvili Premium, 1997), M. Basheleishvili (N. Muskhelishvili Premium, 2000), A. Kharazishvili (N. Muskhelishvili Premium, 2009), T. Vashakmadze (I. Vekua Premium, 1993), I. Koplatadze (I. Vekua Premium, 1996), T. Kaladze (I. Vekua Premium, 2002); four were awarded the President's scholarship; ten were awarded Soros fellowships; two TSU students involved in the Institute research activities obtained the President's award; and six students won awards at Soros conferences.

Since 2008 the members of the Institute had not been receiving payment for their work, though they had financial support from International and National projects and grants. But in 2009 one-year agreements were concluded with 39 researchers and in 2010 a special wages fund was created for graduate and doctoral students. In 2012 the number of employees reached 50, among them were 3 doctoral and 7 graduate students. In 2007-2012 the members of the Institute published in all 381 papers abroad, as well as in the Institute and other international journals, issued in Georgia, 155 among them were in impact-factor journals. At the same time 5 monographs of the Institute members were published, some by Springer, Kluwer and Tbilisi University Publishing houses, as well as textbooks and lecture courses, 3 of them in printed form and 10 – electronically. The members of the Institute delivered 234 lectures at 20 conferences, among them 20 at the Institute and 135 – abroad.

In 2007-2012 with the support of the National scientific fund 18 projects were carried out at the Institute 3 within INTAS, 3 within CRDF/GRDF, 1 within FP7 (Marie-Curie International Research Staff Exchange Scheme (IRSES), Call:FP7-PEOPLE – 2010-IRSES), 2 within STCU (Scientific and Technological Centre of Ukraine) and 1 within ECONET.

At present there are 4 scientific directions at the Institute:

(1) Mathematical problems of mechanics of continua and related problems of analysis
(2) Mathematical modeling and computing mathematics
(3) Discrete mathematics and theory of algorithms
(4) Probability theory and mathematical statistics

In 2013-2017 the Institute members published in all 363 works abroad, as well as in Georgian journals, 123 among them in impact-factor journals. At the same period 11 their monographs were published by Chapman & Hall, Elsevier and Tbilisi University Publishing house. Besides, 22 textbooks and lecture courses were published both in printed form and electronically. The Institute members gave 313 talks, among them: 13 at the Institute and 150 at the conferences abroad.

In 2013-2017 25 scientific projects were carried out, 22 among them were financed by Shota Rustaveli National Science Foundation, one was financed together by Shota Rustaveli National Science Foundation and National Council of France'

scientific Research (CNRS), one by Shota Rustaveli National Science Foundation for joint research with the participation of pupils of Tbilisi Komarov physics and mathematics school, and one was financed by Brazil's National council of science and technologies; in 2012-2013 T.Jangveladze was within the Fulbright Visiting Scholar Program at USA State Department and at the Naval Postgraduate School in Monterey, University in California.

At present Tbilisi University Press publishes 6 peer-reviewed scientific journals prepared by the International editorial boards in the English language on the base of the Institute, 2 of them (Bulletin of TICMI and Lecture Notes of TICMI) are related to Tbilisi International Centre in mathematics and Informatics (TICMI), acting on the base of the Institute and are indexed in SCOPUS.

The Institute traditionally sends as an exchange its scientific production (journals) to different scientific centres of the world and receives every year more than fifty types of scientific, mostly impact-factor journals in the fields of mathematics, applied mathematics, mechanics and informatics and has an electronic subscription to "Mathematical reviews". Besides the Institute, those who are interested, can have an access to "Mathematical Review's" in adjacent buildings and in the Central library of the University.

The scientific staff of the Institute had always been involved in the educational process of TSU (be it part-time work, hourly reimbursement, or guiding training and production practice). In the educational process of the University the Institute has traditional close relations with the faculty of exact and natural sciences. 9 scientists which had been trained at the Institute, as a result of competition, occupy academic positions at the University. They are still cooperating with the Institute in one way or another. 3 scientific-educational laboratories are staffed by the scientific workers of the Institute, the students of mathematics, physics, chemistry, biology, applied biology and ecology are carrying out laboratory work at the Institute, with the use of computers.

The Institute has great traditions of holding international conferences and symposia (among them under the auspices of International scientific organizations). It is sufficient to mention two symposia in shell theory under the auspices and with partial funding of IUTAM in 1978 (Chair I. Vekua) and 2007 (Chair G. Jaiani) and ISAAC conference in 2007 (Chair H. Begehr). Furthermore the Institute hosted international conferences, "Modern Problems of Applied Mathematics", dedicated to the 40th and 45th anniversaries of the Institute in 2008 (Chair G. Jaiani) and 2013 (Chair N. Chinchaladze) and international conferences of the Georgian Mechanical Union in 2010-2012, 2014, 2017. Since 2015 the annual international conference "Application of Mathematics and Informatics in Natural Sciences and Engineering", has been held which in 2016 was dedicated to the centenary of Andro Bitsadze, and in 2017 – to the 80th birthday of David Gordeziani. It is noteworthy too that the Institute members have defended more than 40 doctoral and 100 candidates' theses. Many of them continue their scientific activities abroad, e.g. in the USA, Israel, Holland, Germany, Austria and in other centres in Georgia, e.g. I A.Razmadze Institute of mathematics, and the Technical University of Georgia. However, despite different career routes, they maintain scientific ties with the "native" Institute.

Lately under the leadership of the Institute members 12 doctoral students defended their theses, 9 of them are employed at the Institute. Among 50 Institute members there are 7 doctoral and 2 graduate students at present.

The young members of the Institute go abroad for scientific training. Very of-

ten there are exchange visits of the Institute members and their foreign colleagues for fulfilling the joint scientific research work. For the fruitful cooperation with the scientists of the Institute, in particular, for the contribution they made in preparing young scientists, with the honorary doctorate degrees were conferred Professor Adolf Ebel from Köln University, Paolo Emilio Ricci from Rome University "La Sapienza", Professor Robert Gilbert from Delaware University, Professor Bert-Wolfgang Schultze from Potsdam University, Professor Holm Altenbach from Magdeburg Otto von Guericke University and Professor Reinhold Kienzler from Bremen University.

On September , 2016, by the decision of the University representative council the status of the Institute as the independent scientific-research unit was restored. The following scientific-structural units were also restored:

(1) Department of shell theory and elasticity (Head T. Meunargia)
(2) Department of computing mathematics and modeling (Head T. Vashakmadze)
(3) Department of differential equations and optimal control (Head T. Tadumadze)
(4) Department of partial differential equations (Head T. Jangveladze)
(5) Department of functional analysis and applications (Head U. Goginava)
(6) Department of complex analysis and applications (Head G. Giorgadze)
(7) Department of probability and mathematical statistics (Head E. Nadaraia)
(8) Department of discrete mathematics (Head A. Kharazishvili)
(9) Department of programming (Head J. Antidze)
(10) Department of scientific and technical information (Head G. Akhalaia)

Besides, members of cancelled laboratories of Investigations of magnetohydrodynamic processes in plazma and investigations of extraordinary phenomena created Laboratory of plasma physics.

Since 2018 the Institute has been involved in the State program of assistance of scientific research.

At present the Institute sees its mission in:

(1) Undertaking fundamental and practical research activities in applied mathematics, mathematical and technical mechanics, industrial mathematics and informatics, also taking state and private sector's tasks for the provision of consultation and expert services.
(2) Representing the University base for the University professors and teachers, research employees and students not only of the faculty of exact and natural sciences, but also faculties of humanitarian, social economic, law, medical sciences in order that they undertook their scientific activities using mathematical methods and high-level computer technology.
(3) Promoting a high-level fulfillment of bachelor, master and doctoral students' programs within the profile of the Institute and involving students in scientific grants and assist their participation in local and international conferences.
(4) If necessary, promote the fulfillment of students' works within the framework of the University in non-profile directions of the Institute with the application of mathematical methods and computer techniques.
(5) Promoting training of bachelor, master and doctoral students within the framework of main scientific directions of the Institute and providing their

employment at the Institute.

(6) Promoting students' laboratory and if necessary, practical work on the base of the Institute.

On September 19-21, 2018 III International Conference "MODERN PROBLEMS IN APPLIED MATHEMATICS" was held. The conference was dedicated to the Centenary of I.Javakhishvili Tbilisi State University (TSU) & 50th Anniversary of I.Vekua Institute of Applied Mathematics (VIAM).

The topics of the conference belonged to modern problems of applied mathematics which are actual for Georgia, especially from the viewpoint of their application in practice. Besides, they deal with modern international trends in pure and applied mathematics and mechanics.

The programme envisaged opening (Pavel Exner, President of the European Mathematical Society), closing (Dietmar Kröner, Albert-Ludwig University, Freiburg, Germany), 14 plenary and 20 sectional talks. Besides, at the opening ceremony two survey talks were given: dedicated to the 50^{th} Anniversary of I.Vekua Institute of Applied Mathematics (VIAM) (George Jaiani) and to the development of mathematics at I.Javakhishvili Tbilisi State University (TSU) (Tamaz Tadumadze).

The opening speech was made by the director of the Institute, Professor George Jaiani.

The welcoming speeches at the opening of the conference were made by:

Nunu Ovsyannikova (Chancellor of TSU):

50 years ago on the initiative of the world-famous scientist Ilia Vekua the scientific-research Institute of Applied Mathematics was founded which had afterwards been named after its founder. At that time the foundation of the Institute was motivated by the intensive development of computer techniques and new tendencies in research, recognition of successful results of Georgian mathematicians and mechanists all over the world. The aim was the integration of scientific studies and educational processes. The Institute had soon become one of the important scientific centres. Nowadays, within the scientific programs of the Institute as well as International and local grants (projects) the investigation of actual problems of applied mathematics has been carried out by the joint efforts of professors of the University, doctoral and master students. The students that had been studying at the Institute are now its members. Many of them have been employed in different foreign as well as Georgian scientific centres. I would like to wish further success to the members of the Institute and to the participants of the present conference.

Pavel Exner (Dopler Institute for Mathematical Physics and Applied Mathematics, Prague, Czech Rep. President of the European Mathematical Society):

Dear colleagues, Dear friends,

I am glad I can congratulate the Javanakhishvili University and the Vekua Institute on the occasion of their anniversaries on behalf of the European Mathematical Society which I have to chair presently. The Georgian mathematical community was always an active member of the EMS and we hope it will remain in the future.

We all know the history does not favour a slow and steady progress, rather it shows long stable periods interlaced with abrupt changes. In this light it is interesting that both the anniversaries we are celebrating refer to such years, 1918 and 1968, that had a profound impact on European history.

Mathematics is a global activity but we naturally see what are the contribution of each national community. In a sense, Georgians have it easy, because if the author

name is Muskhelishvili or Petviashvili, everybody knows where he comes from. The same may be true for Bitsadze, one the other hand I am sure many people abroad would recognize Vekua.

This says that the impact of Georgian mathematics has a larger impact than it may seem at a glance, and I wish my Georgian colleagues that it remains so in the next fifty, one hundred and two hundred years.

Ralf Mayer (Mathematisches Institut, Universität Goettingen):

I am Ralf Meyer, director of a newly established International Doctoral Programme in Mathematics at Tbilisi State University, funded by the Volkswagen Foundation and the Rustaveli Foundation. I am here mainly because of this week's Summer School on Topological Insulators within this doctoral programme. So I cannot take part in the academic programme of the conference in honour of 50 years of VIAM and 100 years of Tbilisi State University. This conference honours the rich tradition of mathematics at VIAM and TSU. This is also an occasion, however, to look into the future. When I look at mathematics in Georgia, I miss mathematicians of my generation. In fact, there are only few of them, due to the difficulties Georgia went through some years ago. So the continuation of the tradition of mathematics in Georgia depends on the mathematicians even younger than me. It is crucial that they choose mathematics as a career and are given the chance to pursue this career in Georgia. Much effort is still needed to ensure that mathematics in Georgia can survive. The new doctoral programme is an important step in this direction. It allows the doctoral students to focus on their work and collaborate with mathematicians from Germany, and doctoral study in mathematics is now attractive enough to be a reasonable option for those with a talent for mathematics. I am thankful to VIAM and George Jaiani, in particular, for supporting the new doctoral programme in various ways, such as giving office space to its students. On the postdoc level, however, the situation has not yet improved. Positions for postdocs seem to exist only in the research institutes, and the pay there is very low. Structural reforms are necessary to fill the gap in the career path for young mathematicians. In particular, to qualify for professorships, advanced postdocs must get a chance to teach courses. TSU must develop career paths for young researchers and cannot leave this to the research institutes.

Flavia Lanzara (Rome University "La Sapienza"):

First of all, I would like to thank all the organizers, and in particular Prof. George Jaiani, for kindly inviting me to the important event dedicated to the centenary of the Tbilisi State University (TSU) and the 50th anniversary of the Vekua Institute of Applied Mathematics (VIAM). It is a great pleasure for me to attend this conference. I am particularly pleased because there is a strict relation between the Mathematics Department of my University, Sapienza University of Rome, and the Vekua Institute of Applied Mathematics. Professor Gaetano Fichera, my teacher, was very close to Tbilisi and to many important Georgian mathematicians. In particular I remember Proff. Muskhelishvili, Vekua, Kupradze, Bitzadze, Gordeziani, Vashakmadze, Jaiani, Natroshvili and many others. I remember when, in 1991, Professor Fichera had planned to partecipate to a Conference in Tbilisi to celebrate the centenary of Prof. Muskhelishvili. But in the end he could not attend the conference because of his health conditions but he proposed to his students to participate to that important event. Thanks to that conference I came to Tblisi. I remember a very warm welcome. Anyway it was just the first time I came here: others followed

over the years and the welcome was always the same, even when the political and economical situation here was really bad. After professor Gaetano Fichera died (on June 1st 1996) an agreement for scientific cooperation between the Rome University La Sapienza and Tbilisi State University was born on the initiative of Professor Paolo Emilio Ricci, a Fichera's student, and Professor George Jaiani. The aim was to continue the collaborations that Professor Fichera had had with Georgian mathematicians. The agreement concerns namely the Mathematics department "Guido Castelnuovo" of Sapienza University and Vekua Institute of Applied Mathematics of the Tbilisi State university. After the retirement of the coordinator Prof. Ricci in 2009, I replaced him as the coordinator of the project. The collaboration with the Georgian colleagues has been active for many years during which many research themes have been developed. In fact scientific informations, documentation, and publications were systematically exchanged during personal meetings or by mail. I wish that our cooperation and our friendship will continue over the years and I wish to congratulate TSU and VIAM for this anniversary.

Dietmar Kröner (University of Freiburg):

Dear colleagues, dear George,

It is a great pleasure for me to congratulate the University on the centenary and the Vekua Institute on its 50th anniversary, by myself and by my colleagues from the University of Freiburg and the Mathematical Research Institute in Oberwolfach. It is a great honour for me to be invited again to this excellent place of research and in particular to this special event. Many years ago I have found the book about partial differential equations of Vekua and I have learnt a lot from this book. Vekua himself had close connections to Germany. In 1969 he became honorary doctor of the University of Halle, a member of the Academy Leopoldina, a Honorary Senator the University of Jena. Since 1969 he was also a member of the German Academy of Science in Berlin.Again congratulations to the University and the Vekua Institute and I wish both successful work up to the next anniversary in 50 years.

Reinhold Kienzler (University of Bremen):

Ladies and Gentlemen,

Dear Collegues and Friends,

It is my pleasure to congratulate the Ivane Javakhishvili Tiblisi State University (TSU) on its Centenary and the Ilia Vekua Institute of Applied Mechanics (VIAM) on its Fiftieth Anniversary. Of course, this congratulation is addressed to the people: scientists, staff and administrators, who contribute by their daily efforts to the extraordinary success of both institutions. The history and scientific achivements of TSU and VIAM will be appreciated by others. As a GAMM member, I will focus on the interaction of Mathematics and Mechanics on one side and the impact of friendship and hospitality on international relations on the other.

GAMM, the "Gesellschaft für Angewandte Mathematik und Mechanik" or the "International Association of Applied Mathematics and Mechanics" strongly encourages the connection between mathematics and mechanics. This strong connection lives also in Georgia. It was the vision of Vekua that the mathematicians of VIAM have always applications in mind and should provide solutions for engineers, economists, computer scientists etc., both in research and teaching. The excellent relations between Mathematics and Mechanics are further manifested by strong interaction between the Georgian Mathematical Union and the Georgian Mechan-

ical Union. A group of Georgian scientists are member of GAMM, visit its Annual Meetings regularly and contribute to its success by their valuable contributions. In this way, existing relations are strengthened, new friendships are established and international relations are developed.

Similar comments also apply to the activities in the European framework of EUROMECH and EMS, the latter has been addressed by Prof. Exner.

In the year 2000, the "Georgian National Committee of Theoretical and Applied Mechanics" was founded as direct link to IUTAM the "International Union of Theoretical and Applied Mechanics". Since then, Georgia is a regular member of IUTAM and is represented by delegates in the general assembly. The organisation of an IUTAM symposium in 2007 (the second after 1977/78) was a distinction to and a token of confidence in the colleagues of Georgia. The symposium on "Relations of Shell, Plate, Beam and 3-D Models" was dedicated to Vekua's 100^{th} birthday and held together with ISAAC, "International Symposium on Analysis, Applications and Computations". The symposia gathered scientists from all over the world. The participants experienced Georgian friendship and hospitality, which only leads to long lasting relations if connected on personal grounds.

Another measure of friendship and hospitality is TICMI, the "Tbilisi International Centre of Mathematics and Informatics". On a regular basis, international guests are invited to its Advanced Courses, Minisymposia, and Workshops etc. Its publications, Bulletin of TICMI, Lecture Notes, etc. are widely recognized. Also the International Research Projects mentioned already by others provide strong linkages to international partners and are unalterable conditions for the now-a-days global research environment.

This being said, I am looking confidently towards the future of Georgian activities in Applied Mathematics and Mechanics and science in general and wish all actors much success.

Alberto Cialdea (Universita di Basilicata):

It is a great pleasure for me to congratulate with both I. Javakhishvili Tbilisi State University and I. Vekua Institute of Applied Mathematics on the occasion of this very special anniversary. It is a great pleasure because I know very well what these institutions mean for the Georgian scientific life and more generally for the cultural life of this country. But it is a great pleasure also because the scientific relations and the friendship between Georgian and Italian mathematicians have deep roots. Like Flavia, I was among the last students of the Italian mathematician Gaetano Fichera, which many of you have known. As Flavia remembered before, he was a closed friend of several Georgian mathematicians and I know he had a great respect for their scientific activity. It is from Fichera that - as a student first and as a young researcher later - I have learned some fundamental results obtained by Georgian mathematicians. It was him to push me to study the fundamental book by Muskhelishvili on Singular Integral Equations and the impressive book by Kupradze and his coauthors on Elasticity. I still remember how happy Fichera was when I told him that my father had bought me Kupradze's book. Muskhelishvili and Kupradze's books quickly became fundamental for my research and today they still continue to be inspiring and to play a key role. My very first time in Tbilisi was in 1991 for the symposium "Continuum Mechanics and Related Problems of Analysis" dedicated to the centenary of Muskhelishvili. It was a very important conference and I still remember very clearly how I was impressed. From then on I have met Georgian mathematicians a lot of times, in Georgia as in Italy. I have

also sent some of my PhD students to Tbilisi to complete their preparation. For all these reasons I am very glad to wish to I. Javakhishvili Tbilisi State University and I. Vekua Institute of Applied Mathematics all the best for the future. I am sure that they still continue to have a fundamental role in the cultural life of Georgia and that this centenary anniversaries will be only the first ones of a very long series.

Lucian Beznea (University of Bucharest, Director of Simion Stoilow Institute of Mathematics of the Romanian Academy, Vice-President of the Romanian Society of Mathematicians):

It is a great honour and pleasure to represent the Simion Stoilow Institute of Mathematics of the Romanian Academy at this ceremony and to award a Honorary Diploma to the Ivane Javakhishvili Tbilisi State University, on behalf of our institute in Bucharest, on the occasion of its centennial anniversary. We award a Honorary Diploma to the Ilia Vekua Institute of Applied Mathematics, on the occasion of its 50th anniversary. It is also a great pleasure to represent here the Romanian Mathematica Society, as a vice-president of it, and to award to the Ilia Vekua Institute of Applied Mathematics an official copy of the Medal of the International Mathematical Olimpiade which was organized in Romania this year, recognising the remarkable results obtained by the Georgian team at this edition. It is an old tradition of holding congresses of Romanian mathematicians, largely open to international participation. Eight such congresses were organized since 1929, with a gap of almost 50 years in the communism time. The Ninth Congress will be held in Galaţi, Romania, in June 2019. We offer to the mathematical library in Tbilisi the proceedings volumes of the last two editions of the Congress of the Romanian Mathematicians.

Their speeches had also given by Holm Altenbach (Otto-von-Guericke-University Magdeburg) and Ramaz Abesadze (Director of the Institute of Economics of TSU).

The present issue, dedicated to the Centenary of I. Javakhishvili Tbilisi State University & 50th Anniversary of I. Vekua Institute of Applied Mathematics, contains eight papers. The first three papers were presented at the Third International Conference "MODERN PROBLEMS IN APPLIED MATHEMATICS" dedicated to the Centenary of I. Javakhishvili Tbilisi State University & 50th Anniversary of I. Vekua Institute of Applied Mathematics, other five papers were submitted directly to the journal.

More information about Jubilees and conference one can find on websites:
http://www.viam.science.tsu.ge/mpam2018/
https://www.tsu.ge/science/?leng=eng
http://newspaper.tsu.ge/uploads/newspaper/N-1%20(2216)-2018.pdf (see English inclusion about University in the Jubilee issue of the newspaper of February, 8, 2018, pp. 9-16)

Editors