

## *Editorial Preface*

The Fourth International Conference on “Modern Problems in Applied Mathematics” (MPAM 2023) was held in Tbilisi, Georgia, September 13-15, 2023. The conference was organized by VIAM and was dedicated to the 105th anniversary of I. Javakhishvili Tbilisi State University (TSU) and 55th anniversary of Ilia Vekua Institute of Applied Mathematics (VIAM).

The aim of MPAM 2023 was to bring together scientists to discuss their research results in many aspects of Applied Mathematics. There were four major topics for the conference:

- Mathematical problems of mechanics of continua and related problems of analysis
- Mathematical modelling and numerical mathematics
- Discrete mathematics and theory of algorithms
- Probability theory and mathematical statistics

This series of international conferences was founded in 2008, when the first conference dedicated to the 90th anniversary of the founding of TSU and the 40th anniversary of the establishment of VIAM at TSU was held, and the second and third conferences were held in 2013 and in 2018 respectively.

The conference was opened by the director of the institute, Professor George Jaiani. TSU deputy rector, Professor Nino Okribelashvili welcomed the conference participants and wished them a successful work. She noted that holding such conferences helps to maintain, expand and deepen existing scientific as well as personal connections between Georgian and foreign scientists, this allows them to directly communicate their research interests to each other and to stimulate and expand such interests among young researchers from their countries. As a result of all this, the international recognition of our country’s mathematicians is increasing.

At the opening, the conference participants were welcomed and TSU and VIAM were awarded with honorary diplomas by Professor Lucian Beznea, director of the Simon Stoilov Institute of Mathematics of the Romanian Academy of Sciences, who is a member of the International Scientific Council of the Tbilisi International Center for Mathematics and Informatics (TICMI), nominated by the Executive Committee of the Scientific Council of the European Mathematical Society.

Two talks were made at the opening ceremony:

- “VAIM TSU – 55-years history” (G. Jaiani, Director of VIAM);
- “Mathematics at TSU from creation to the present day” (O. Purtukhia, Head of Department of Mathematics of the Faculty of Exact and Natural Sciences).

The program included 40-minute opening (by Professor Ayech Benjeddou (France)) and closing (by Professor Alexander Meskhi (President of the Georgian Mathematical Union)) talks and 35-minute plenary and 20-minute sectional talks. It is worth noting the participation of young scientists, PhD and master’s students in the work of the conference.

The volume of Proceeding of the Conference includes selected papers presented at the Conference. The opening and closing talks are presented by their abstracts.

The sponsor of the conference was Shota Rustaveli National Science Foundation (the winning project #MG-ISE-23-874 in the grant competition for mobility and

scientific events (Lot II)).

At last here are cited extracts from greeting speeches of Professors Lucian Beznea (Simion Stoilow Institute of Mathematics of the Romanian Academy); Alberto Cialdea (University of Basilicata) and Flavia Lanzara (University of Rome “La Sapienza”) given in different time at the Jubilee Conferences of VIAM TSU.

**Lucian Beznea:** It is a great honour and pleasure to represent Simion Stoilow Institute of Mathematics of the Romanian Academy at this ceremony and to award a Honorary Diploma to Ivane Javakhishvili Tbilisi State University, on behalf of our institute in Bucharest, on the occasion of its 105<sup>th</sup> anniversary. We award a Honorary Diploma to Ilia Vekua Institute of Applied Mathematics, on the occasion of its 55<sup>th</sup> anniversary.

It is also a great pleasure to represent here the Romanian Mathematica Society, as a vice-president of it, and to award to Ilia Vekua Institute of Applied Mathematics an official copy of the Medal of the International Mathematical Olimpiade which was organized in Romania, recognizing the remarkable results obtained by a Georgian team at this edition.

**Flavia Lanzara:** There was a close relationship between the Mathematics Department of Sapienza University of Rome, and I. Vekua Institute of Applied Mathematics. Professor Gaetano Fichera, was very close to Tbilisi and to Georgian mathematicians, in particular, professors N. Muskhelishvili, I. Vekua, V. Kupradze, A. Bitsadze, D. Gordeziani, T. Vashakmadze, G. Jaiani, D. Natroshvili and many others. I remember when, in 1991, professor G. Fichera had planned to participate to a Conference in Tbilisi to celebrate the centenary of Prof. N. Muskhelishvili. In the end he couldn't attend the conference because of his health conditions but he proposed to his students to take part in this important event. It was thanks to this conference that I came to Tbilisi. I remember a very warm welcome. But it was only the first time I came here: others followed over the years and the welcome was always the same, even when the political and economic situation here was really bad. After death of professor Gaetano Fichera (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 student of Fichera's, and professor George Jaiani, a student of I. Vekua. The aim was to continue the collaboration that professor G. Fichera had with Georgian mathematicians. The agreement concerns namely the Mathematics Department “Guido Castelnuovo” of Sapienza University of Rome and I. Vekua Institute of Applied Mathematics of Tbilisi State University.

**Alberto Cialdea:** 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 recalled, he was a close friend of several Georgian mathematicians and I know that he had a great respect for their scientific activity. It was from G. 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 N. Muskhelishvili on Singular Integral Equations and the impressive book by V. Kupradze and his coauthors on Elasticity. I still remember how happy G. Fichera was when I told him that my father had bought me V. Kupradze's book. N. Muskhelishvili's and V. 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 N. 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 these anniversaries will be only the first ones of a very long series.

After the retirement of the Italian coordinator of the above agreement, professor P.E. Ricci from the University La Sapienza, in 2009, Professor F. Lanzara took over as coordinator. The collaboration with the Georgian colleagues has been active for many years during which many research topics have been developed. In fact, scientific information, documentation, and publications have been systematically exchanged during personal meetings or by mail.

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N. Chinchaladze (Tbilisi)  
A. Cialdea (Potenza)  
N. Avazashvili (Tbilisi)

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