

## Preface

The 2<sup>nd</sup> International Scientific-Practical Conference "Machine Building and Energy: New Concepts and Technologies" (MBENCT 2023) was held on December 4-5, 2023, at the Azerbaijan Technical University (AzTU) in Baku (Azerbaijan) and was organized by AzTU, Brandenburg University of Technology Cottbus-Senftenberg (Brandenburg, Germany) and Gazi University (Türkiye).

The activity of the conference is focused on the search for development prospects of enterprises in the fields of machine building and energy, new scientific and production solutions, technologies, economically efficient production areas in the current situation, comprehensive discussions on the formation and development of small and medium-sized businesses in the manufacturing sector, as well as the cooperation of higher education institutions with companies and enterprises, and the establishment of mutual relations with prestigious science schools and enterprise managers.

This specific edition of the selected papers from MBENCT 2023 will be useful to engineers from mechanical engineering, ecology protection, power engineering, mechatronics and engineering management.

Employees of 37 enterprises from different countries participated in the conference. The geographical diversity by countries covered Azerbaijan, Germany, Sweden, Russia, Türkiye, Belarus and Kazakhstan.

We are deeply grateful to MBENCT 2023 Co-Chairs, International Program Committee and Organizing Committee members, invited speakers, reviewers and conference participants for their valuable contributions to the successful organization of MBENCT 2023. Also, we would like to express our special thanks to Trans Tech Publications Ltd., Switzerland, for the support in publishing the articles from MBENCT 2023.

Best regards,

Prof. Vilayat Valiyev, Chairman of MBENCT 2023

Prof. Nizami Yusubov, Executive Secretary of MBENCT 2023

# Committee

## Conference Chair

### **Prof. Vilayat Valiyev**

(Rector of the Azerbaijan Technical University, Baku, Azerbaijan)

## Conference Co-Chair

### **Prof. Musa Yıldız** (Rector of Gazi University, Türkiye)

### **Prof. Gesine Grande**

(President of Brandenburg Technical University Cottbus-Zenftenberg, Germany)

## International Program Committee

### **Prof. Nurali Yusifbayli** (Vice-rector for educational affairs, AzTU)

**Prof. Subhan Namazov** (Vice-rector for science and innovation, AzTU)

### **Prof. Arif Hashimov**

(Full member of ANAS, Director of the Physics Institute, Azerbaijan)

### **Prof. Fikrat Aliyev**

(Full member of ANAS, Director of the Institute of Applied Mathematics of BSU, Azerbaijan)

### **Prof. Vaqif Movlazadə**

(Professor advisor of the Department of Machine-Building Technology AzTU)

### **Prof. Nariman Rasulov**

(Professor advisor of the Department of Machine-Building Technology AzTU)

### **Prof. Hasan Huseynov**

(Professor advisor of the Department of Machine-Building Technology AzTU)

### **Prof. Nizami Yusubov**

(Head of the Department of Machine-Building Technology AzTU)

### **Prof. Isa Khalilov**

(Head of the Department of Mechatronics and machine design AzTU)

### **Dr.-Ing. Yashar Musayev** (Siemens Energy enterprise, Germany)

**Prof. Aleksandr Dyakonov** (Rector of Almetyevsk State Oil Institute, Russia)

**Prof. Viktor Guzeev** (South Ural State University, Russia)

**Prof. Dmitriy Ardaşev** (South Ural State University, Russia)

### **Prof. Peter Biegel**

(Brandenburg Technical University Cottbus-Zenftenberg, Germany)

### **Prof. Sylvio Simon**

(Brandenburg Technical University Cottbus-Zenftenberg, Germany)

**Prof. Tassilo-Maria Schimmelpfennig** (University of Wismar /University of Applied Sciences - Technology, Business and Design, Germany)

**Prof. Mustafa Guden** (İzmir Institute of Technology, Türkiye)

**Prof. Suleyman Tekeli** (Gazi University, Türkiye)

### **Ph.D. Pavel Ilyushin**

(Russian Academy of Sciences Institute of Energy Research, Russia)

### **Prof. Dauren Akhmetbaev**

(Saken Seifullin Kazakh Agrotechnical University, Kazakhstan)

### **Prof. Andrey Ershov**

(REA St. Petersburg Institute of Macromolecular Compounds, Russia)

**Prof. Abdullah Avey** (Suleyman Demirel University, Türkiye)

## Organizing Committee

**Ph.D. Fariz Mustafayev** (Vice-rector for general affairs, AzTU)

**Ph.D. Fariz Mammadov** (Vice-rector for international relations, AzTU)

**Ph.D.. Anar Eminov** (Head of Research and development department, AzTU)

**Ph.D. Arastun Mammadov** (Dean of the German engineering faculty, AzTU)

**Ph.D. Malik Qarayev** (Dean of Machine Building and Robotics Faculty, AzTU)

**Prof. Valeh Bakhshali** (Head of the Mechanics Department, AzTU)

**Prof. Alakbar Huseynov**

(Head of the special technologies and equipment department, AzTU)

**Ph.D. Hikmat Aliyev**

(The head of the electrical engineering department, AzTU)

**Ph.D.. Vahid Farhadov**

(Head of the Automation and Management Department, AzTU)

**Ph.D. Vaqif Abbasov**

(Professor advisor of the special technologies and equipment department, AzTU)

**Prof. Fariz Amirov**

(Professor of the special technologies and equipment department, AzTU)

**Prof. Rasim Bashirov**

(Head of the Department of special purpose materials and tools, AzTU)

**Ph.D. Iftikhar Chalabi** (Director of Higher Education Institute, AzTU)

**Ph.D. Aqil Babayev**

(Head of the metallurgy and materials technology department, AzTU)

**Ph.D. Sergey Boqatenkov** (South Ural State University, Russia)

**Ph.D. Natalya Sazonova** (South Ural State University, Russia)

**Dr. Iqor Savin** (Kazan Technical University, Russia)

**Danil Pimenov** (South Ural State University, Russia)

**Ph.D. Ramiz Kalbiyev**

(Head of the Department of energy efficiency and green energy technologies, AzTU)

**Ph.D. Isaq Khankishiyyev** (Azerbaijan State Marine Academy, Azerbaijan)

**Dr. Rezo Aliyev** (Freiberg Mining Academy, Germany)

**Prof. Ihsan Korkut** (Gazi University, Türkiye)

**Prof. Huseyn Kizil** (Istanbul Technical University, Türkiye)

**Ivan Perfilov**

(University of Wismar /University of Applied Sciences - Technology, Business and Design, Germany)

**Prof. Yusif Hasanov** (Azerbaijan State Marine Academy, Azerbaijan)

**Prof. Karel Frana** (Zittau/Görlitz University of Applied Sciences, Germany)

**Dr. Ralf Ossenbrink**

(Brandenburg Technical University Cottbus-Zenftenberg, Germany)

## Conference Executive Secretary

**Prof. Nizami Yusubov** – Azerbaijan Technical University, Azerbaijan