PREFACE

The 6th International Scientific Conference: NEWTECH 2020 – Advanced Manufacturing Engineering and Technologies was organized by Dunarea de Jos University of Galati, Romania. It was held between 9th-11th of September 2020 in Galati, Romania and was supported by the The Executive Unit for Financing Higher Education, Research, Development and Innovation (UEFISCDI).

The Conference: NEWTECH 2020 – Advanced Manufacturing Engineering and Technologies has a tradition of over 10 years, the inaugural edition having been organized in 2009 by the Dunarea de Jos University of Galati. This was followed by the 2011 edition in Brno, Czech Republic; 2013 at the KHT Institute of Technology, Stockholm; 2015 at Wroclaw University of Technology and 2017 at the University of Belgrade.

One achievement we can be proud of is that the current edition, the sixth, has returned to the place where this scientific event originated, and takes place in the year in which the Manufacturing Engineering Department from Faculty of Engineering, Dunarea de Jos University of Galati, Romania, celebrates 60 years of existence.

The situation with COVID-19 imposed restrictions on holding mass events and travelling. The health of the participants is key and so, the organizing committee, encouraged by the eagerness of the participants to share their scientific work despite the circumstances, decided to hold the conference online.

The 6th International Scientific Conference: NEWTECH 2020 – Advanced Manufacturing Engineering and Technologies provides a forum where recent advances and future directions in the manufacturing processes and forming are discussed by scientists and engineers from academia and industry worldwide. The topics covered are of great interest for academics and for professionals (engineers and researchers) from industry involved in traditional and novel forming and manufacturing technologies for conventional and emerging materials.

A total of 40 oral presentations from 10 worldwide countries, Algeria, Cech Republic, France, Greece, Portugal, Serbia, Spain, Romania, Russia, and United States of America are registered including:

• 10 plenary lectures given by renowned experts from academia;
• 30 oral presentations organized in 4 general sessions. The 30 oral presentations are composed of 30 peer-reviewed full papers (between 6 and 14 pages each one).

All the papers have been reviewed by two expert referees in their relevant fields. The papers selected for the volume depended on their quality and relevancy to the conference.

Free access to all papers will be granted to all the registered attendees. However, the peer-reviewed full papers and a part of the plenary lectures will be published after the conference, in the open access proceedings by IOP’s Conference Series journals, IOP Conference Series: Materials Science and Engineering (https://iopscience.iop.org/journal/1757-899X).

Many ideas have been delivered, covering the different aspects of advanced manufacturing as seen from the perspective of academics and industry alike. I would briefly like to review some of the main points tackled during the conference:
1. The adoption of AI techniques, based on stochastic analysis, machine learning, neural network, to industrial applications must continue for the development of the new manufacturing technologies

2. Engineering models derived, based on the fundamental understanding of the engineering design and analysis, are an important topic which will contribute to design new tools for cutting and forming and new processes

3. Macro, Micro and nano modeling are beginning to receive more attention and will remain a focal point of interest both in cutting and metal forming

4. Incremental forming and 3d Printing are high topics in research with large application

5. New systems based on Industrial Internet of Things (IIoT) for the monitoring of the manufacturing parameters could lead to future progress in this domain

6. Smart metrology models for Industry 4.0 must continue to be developed

7. The experimental work together with modern metrological systems and control are the key factor for a quality research

8. Application of Product lifecycle management (PLM) it’s important to be used for reducing the time to market and save resources

The sessions took the form of video conferences, with the scientific community showing great interest all throughout. More than 80 researchers took part online. Each of the authors used Microsoft Teams to present their report, after which the participants in the forum were given the opportunity for discussions.

The main goal of NEWTECH 2020, under the given conditions, was successfully achieved - to bring together researchers from academia and industry, scientists and experts in engineering and technology to address new challenges, share solutions and discuss future research directions.

We would like to thank all those researchers who have trusted the conference and who recognized NEWTECH 2020 as an appropriate forum to share their recent developments and learn about the new trends in the field of technical sciences and engineering. I would like to express my gratitude to Professors Miroslav Piska, Andreas Archenti and Vidosav Majstorovic for encouraging us to organize this conference.

We thank all the authors for their contribution to this valuable volume. We must also thank all the reviewers for their effort, which ensured not only excellent feedbacks for the authors but also a high-quality scientific research.

Last but not least, we sincerely thank the whole team involved in organizing the NEWTECH 2020 conference. I kindly thank our organizing committee, especially Nicusor Baroiu, Assoc. Professor, Virgil Teodor, Professor, Cezarina Afteni, PhD Researcher Assistant and Georgiana Costin, PhD candidate. Without their support this conference would not have been possible to arrange.

We plan to continue this conference. As such, the steering committee has decided to organize the next conference in Rennes, France, in 2022. We wish you good luck to the future president of the event, Adinel Gavrus, Assoc. Professor.

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Computational Framework Concerning the Formulation of Maximum Work Principle used in Plasticity, Materials Forming and Tribology as a Consequence of a Variational Optimization Problem Defined From the Constructal Law
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Brno University of Technology, CZECH REPUBLIC

Tribological Performance of Graphene and Graphene Oxide Films as Solid Lubricant Layers on Tool Steel Surfaces

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Precision engineering’s impact on society

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Collaborative Robots is Smart Manufacturing

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Mechanical and Thermal Analyses of Biodegradable Materials for Injection Moulding and Additive Manufacturing

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A new approach in manufacturing process optimization: the holistic optimization
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