

FOREWORD

The scope of the MTeM 2015 International Conference on *Modern Technologies in Manufacturing* is to bring together colleagues, academic staff and people from industry, to exchange ideas, present current researches, make new friends, new plans and prepare future research projects.

The MTeM Conference is regarded as a high-level ranking conference in the promotion of research and teaching in Manufacturing Engineering. It also serves as a forum to disseminate information to all branches of the manufacturing industries on the most recent and relevant innovations.

It started in 1991 and it has got to the 12th edition, being held at every 2 years. All previous MTeM international conferences were organized by the Department of Manufacturing Engineering (DME) from the Technical University of Cluj-Napoca. Professor Csaba Gyenge is the Honorary Founder Chairman of the MTeM Conference; he initiated and maintained the connections with participants, during the last 24 years.

DME Cluj aims to strengthen the cooperation with similar departments from Iasi, Brasov, Bucharest, Timisoara, Sibiu, Galati, Oradea, Baia-Mare, Suceava, Craiova and with all our colleagues and friends. This co-operation would strengthen the AUIF Association (Universities Association on Manufacturing Engineering - “Asociația Universitară de Ingineria Fabricației”: www.auif.utcluj.ro) and its AJME Journal (Academic Journal of Manufacturing Engineering). The AJME Journal is indexed within the international databases: Scopus, IndexCopernicus International and Ulrich.

On the occasion of this MTeM 2015 Conference, the Department of Manufacturing Engineering is celebrating 60 years since the first “TCM” – Manufacturing Engineering teaching program was established at Cluj-Napoca, in 1955. DME is among the departments and teaching programs with the longest tradition in Romania. DME Cluj is providing teaching on manufacturing engineering in 3 languages in Cluj-Napoca (Romanian, German and English) and also developed 3 extensions in other cities from Transylvania (Zalau, Satu-Mare and Alba-Iulia). Besides bachelor courses, DME is coordinating 5 master programs and is supporting research activities of the PhD students. Modern equipment is available within DME, both for research and teaching activities, mainly CNC machines, additive manufacturing and metal forming equipment. Experienced academic staff from DME have coordinated major national and international research projects. Some of the professors from DME have international teaching experience, as they had contracts of employments within western universities, where they worked on research and teaching. Main research directions within DME, with significant achievements are: Additive Manufacturing, with industrial and medical applications, as illustrated by the photos from first page and last cover of this book (projects coordinated by Prof. Petru Berce and Prof. Nicolae Balci); Metal Forming (projects coordinated by Prof. Dorel Banabic); CNC manufacturing and other modern technologies required by the manufacturing industry. The Formula 1 car illustrated on the cover of this book represents a successful project undertaken by DME two years ago, when some parts were manufactured at DME from composite materials and the whole F1 body car was assembled within DME. Dr. Paul Bere was the key person involved in this project.

All the papers included in this book were reviewed by the members of the International Scientific Committee. Previous eleven editions of the MTeM Conferences published their stand alone Proceedings book, but this edition of the MTeM 2015 conference proceedings are being published in “Applied Mechanics and Materials”, which is online available in full text via the platform:

www.scientific.net. The Proceedings will be sent to Thomson Reuters for evaluation, in order to be indexed as ISI Proceedings, if the evaluation will be successful. Thanks to the TTP team, who have provided the professional and transparent online tools, for reviewing and revising the papers.

I strongly appreciate the contribution of the authors, who submitted valuable papers and agreed to do successive revisions of their papers, following the recommendations received from the reviewers.

I am grateful to the members of the Scientific Committee, who accepted to do the reviewing free of charge, who spent their time and effort to bring a substantial contribution to the MTeM 2015 Conference, by providing professional evaluation of the papers and suitable recommendations.

This conference and the book publishing the peer reviewed papers would not have been possible, without the strong and continuous support of my colleagues from DME. Special thanks are addressed to: Dr. Dan Leordean, who did an excellent work and ensured a good communication with the corresponding authors and with reviewers for electronic submission of the papers, provided consultancy, not only on accessing the platform, but also on revising and uploading successive versions of the improved papers and on monitoring the status of the papers during the reviewing and revision period. Dr. Lucian Lazarescu managed the administrative issues, related to specific requirements of the authors, providing invoices for conference fees, hotel booking, etc. Thanks to my colleagues from the organizing committee, who are doing their best to prepare the meeting of all participants and sort out different issues and requirements of the participants. Dr. Alina Luca and Dr. Vasile Ceclan brought a significant contribution on reviewing the papers and on transmitting the recommendations to the authors.

We intend to keep the tradition of the fruitful meetings we had every 2 years in Cluj-Napoca, during the previous MTeM conferences. Partners, colleagues and friends from Romanian universities and from abroad were invited to the conference, in order to exchange experience and set up new partnerships.

It is my great pleasure to welcome all the participants to Cluj-Napoca (14-16 October 2015) and I hope that all guests will spend enjoyable days, during the MTeM 2015 Conference!

Sincerely yours,

Professor Nicolae Balci,
Director of the Manufacturing Engineering Department
Technical University of Cluj-Napoca

Chairman

Professor Nicolae BĂLC, Technical University of Cluj-Napoca, Romania
Director of Manufacturing Engineering Department (DME)

Honorary Founder Chairman

Professor Csaba GYENGE, Technical University of Cluj-Napoca, Romania

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All the members of the organizing committee are academic staff in the Department of Manufacturing Engineering, Technical University of Cluj-Napoca.

Acknowledgment:

In 2015 Gühring has offered free of charge two completely equipped CNC machine tools (Tajmac 1060 MF and HAAS VF2SS) to the Department of Manufacturing Engineering, to be used in applications classes and training for the students and university employees. Gühring KG Germany is a company rich in traditions and today is one of the



world's leading manufacturers of precision tools. Through his Romanian subsidiary Gühring SRL, since 2008 Gühring has offered support to the Manufacturing Engineering Department, which consisted in: scholarships, internships and diploma themes for the students. Support came also through different sets of cutting tools, donated for the department laboratories.