Preface

Within the International Year of Light and Light-based Technologies, proclaimed by the UN General Assembly, it is worthwhile to take a look at the contribution of laser technologies to our daily life and to actual developments. At the World of Photonics congress this will be done with respect to many different aspects. The use of lasers in production technology will be addressed by the LiM conference. Compared to the situation a few years ago, the role of lasers in manufacturing has changed or, more precisely, has become twofold: One is the continued extension of the influence of lasers by enabling new processes or process variants. The second is the laser as an established tool in industrial processes, where high power lasers are no more an exotic experiment but just a commodity. Despite the fact that the laser-based processes are well accepted and adapted in industrial daily life, there are still significant efforts ongoing to enhance precision, reliability and effectivity. In the first mentioned category of processes there still has to be fundamental research and development to implement new ideas also in production. As an example new materials like press hardened steel have to be joined and laser technology brings a very important prerequisite of low line energy in brazing and welding. In tool making, new materials, especially surface coatings and structures for extreme mechanical and tribological loads and high number of process cycles are needed to realize dry metal forming. Dry metal forming omits lubricants to protect the environment, but the stress on the forming tools increases. Process developments for such applications long for new high-power lasers such as ultrafast lasers with pulse widths of some ps at average powers exceeding 1 kW. Using those and other new developments, new processes can be worked out. The 3D printing of metallic components is another example for a process, which is nowadays at the threshold to industrial use. Applications in medical and biological fields are maybe the next areas which will come up.

The WLT – Wissenschaftliche Gesellschaft Lasertechnik – is the German association of scientists who are leading the larger institutes working on laser technology in Germany. The association promotes collaboration between the scientists linked to the WLT and their institutes, foster education in summer schools and classes, develops new research programs, and last but not least organizes the LiM.

The LiM– International Conference on Lasers in Manufacturing – is the platform for discussing scientific and application oriented contributions from research and development in universities, institutes and industry. It brings together young scientist, experienced researchers and people from industry. The mutual exchange opens chances for the application of new ideas to solve actual problems and gives impulses for new research work. In more than 230 contributions – the largest number since the launch of the LiM conference series in 2001 – from 28 countries all over the world actual results will be presented and discussed.

Such a conference cannot run without the help of a large number of unresting helping hands. We therefore like to express our gratitude to all members of the Organizing Committee and the Scientific Committee for their valuable support of the preparation of the LiM. Special thanks for the organization of the conference reception is due to our colleague Prof. M. Zäh.

We hope that the conference venue, the reception, the proceedings and especially the contents meet your demands and are helpful for your further work in research, development or application of laser technology!

Munich, June 2015

On behalf of the WLT: The Chairmen of LiM 2015

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in cooperation with

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