

Editorial Foreword-*Light: Advanced Manufacturing*

Jianlin Cao^{1*}, Wolfgang Osten², Lianshan Yan³ and Xinhua Wu⁴

Light: Advanced Manufacturing (LAM), a journal affiliated to *Light: Science & Applications (Light) Group*, has finally come into realization after two years' endeavour.

Advanced manufacturing is a comprehensive discipline which has its root in traditional manufacturing, but applies to industrial manufacturing and engineering all the latest advancements of other sciences and technologies (especially information, communication, computer, sensing, artificial intelligence and management science). Thirty years after its establishment, the discipline is focused on the direction of pushing manufacturing to be more precise, more network-based, more integrated, more intelligent, more flexible, more personalised, more energy-efficient and cleaner. In the 21st century, advanced manufacturing is even more integrated with the development and application of the Internet, big data, and artificial intelligence, and considered as a priority for development in many countries.

Its history almost as long as that of the human species, manufacturing is the embodiment of human intelligence and abilities. From the first wooden tool to the daily necessities we enjoy today, so far as to the advanced machines which allow human beings to go into outer space or the bottom of the ocean, optical instruments through which we can explore the smallest particle or into unknown distances in space, the advancement of manufacturing was, is and will continue to be the most important foundation

and driving force for human development.

The Chinese people have always much relied on and directed great importance to manufacturing. In the last few thousand years, the natural environment, history and culture of the land resulted in the fact that our ancestors have always been the world's largest group of manufacturers (letterpress printing, mining, weapons production, trade, clothing industry, medical industry, et al), creating many advanced manufacturing technologies, leaving a wealth of craft heritage, written records and fine cultural relics. The melodious camel bells constantly heard along the Silk Road are witnesses to how Chinese manufactured goods have travelled across mountains and waters to other countries. The yearning for and pursuit of advanced manufacturing technology is branded onto our being, part of our flesh and blood.

Since the founding of the People's Republic of China, especially since the late 1970s when China introduced the reform and opening-up policies, the Chinese have diligently studied the advanced science and technology knowledge and management experience of developed countries. Through hard work and determination, the Chinese manufacturing industry, considered rather backward only a few decades ago, has made rapid progress and gone through fundamental changes. We wonder if it is noticed that Chinese manufacturing industry's entering into the world market in the 1980s actually coincided with the period when advanced manufacturing became a proper term with its connotation generally recognized and accepted. China, is now one of the world's largest manufacturer, number one producer and consumer of many industrial goods in scale, in addition to being the world's largest importer and exporter.

However, China is still not an advanced manufacturing

Correspondence: Jianlin Cao (caojianlin@ciomp.ac.cn)

¹Ministry of Science and Technology, Professor of Film Optics, State Key Laboratory of Applied Optics, CIOMP, Dong Nanhu Road 3888, Changchun, 130033, China

²28865 Lilienthal, Germany

Full list of author information is available at the end of the article.



power. Chinese scientists, engineers, researchers, technicians and workers have always dreamed about and strived towards the ultimate goal—for Made in China to be recognized as a label of excellence throughout the world. To achieve this, we still need to learn from and collaborate with our counterparts around the world, especially those in developed countries. Nowadays the Belt and Road Initiative connects China with the Western world again in trade, manufacturing and cultural exchange. We are pleased to see that this consensus has led to various resources being invested throughout China to encourage scientific research, technology development and industrial applications in advanced manufacturing.

The world urgently calls for advanced manufacturing. The advancement of science and technology knows no ends; nor acknowledges national borders or differences of skin colours. All people need advanced manufacturing to adjust their industrial structure, improve economic efficiency and the quality of life. On the other hand, the world also needs to tackle, as one, global problems, such as energy and the environment, poverty, diseases the gap between the rich and the poor. All countries and peoples need to work together on these issues. Advanced manufacturing is definitely among the most important scientific and technological support for this effort.

That is why, like *Light*, this new journal will also be published in English. It will cover the fields of advanced manufacturing-related scientific research, technology development and industrial applications. We have invited some of the world's top experts (on various aspects of advanced manufacturing) to join the editorial board. More than two-thirds of those experts are from developed countries. This journal will present the readers with the latest research progress and the most distinctive and promising progresses in advanced manufacturing.

We understand that the focus of research and the definitions of terms vary from country to country and branch to branch. In China's case, traditionally manufacturing industry includes general machinery, chemical engineering, building materials, metallurgy, food, textiles, electronics, instrumentation, transportation equipment, etc. All publications strive to have a unique voice. This journal has two traits, one is to be down to earth. This means to be grounded as in focusing on those research developments and achievements that meets the urgent needs of the people and industry. The other is to be cross-industrial. That means to observe and to reflect modern trends in manufacturing, to create a platform for readers coming from different branches and to analyse general aspects of advanced industrial manufacturing.

Our target readers are scientists, engineers, high school teachers, technicians, business executives and policy

makers working in advanced manufacturing, as well as young students who are aspired to this field. The contributors, members of the editorial board, editorial staff and readers of this journal form a group which in Chinese can be called Tongdao, which means people in the same pursuit. We sincerely hope that this journal can be helpful to each one of those people mentioned above in their work and career development.

This journal is jointly published by Jihua Laboratory and Changchun Institute of Optics, Fine Mechanics and Physics (CIOMP), Chinese Academy of Sciences.

Established in 2018 in Guangdong Province, China's most economically advanced region, Jihua Laboratory is a provincial level lab dedicated to the research of advanced manufacturing. It is located in Foshan, the largest traditional manufacturing centre in Guangdong and home to countless factories whose products are distributed all over the world. Jihua Laboratory is expected to play an important role in the transformation and upgrade of not only Guangdong Province, but also the whole China's manufacturing industry.



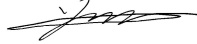

CIOMP, co-publisher with Springer Nature of *Light*, is the cradle of China's applied optics research and optical engineering, the birthplace of China's precision machinery industry, and has accumulated decades of experiences and achievements in the design, processing and testing of precision and ultra-precision equipments since PRC was founded.

Jihua Laboratory was established with the support of CIOMP. From the management team to the core research and development personnel, the two institutes have shared development opportunities, jointly overcome difficulties, and created a new model for cross-regional and complementary development, which has won acknowledgement and support from the academic community. Jihua Laboratory has already attracted hundreds of experts from different regions of China and abroad. With excellent infrastructure and advanced equipment in place, a number of national level research and development projects are underway.

With a whole decade's experience from the publication of *Light*, the editorial team and editorial board are confident that this journal will soon be one of the most read and cited in the field of advanced industry, just as Jihua Laboratory will become world-renowned.

This journal has received a great deal of support from the governments of Guangdong Province, Foshan City, Foshan Nanhai District, and Foshan High-tech Industrial Development Zone. We look forward to building a world-class advanced manufacturing exchange platform, and hope it can become a symbol of the development of scientific culture in Foshan.

We look forward to the future when this journal will be making constant, steady progress. For now, We would like to extend a heartfelt thank you to all who have made the launch of this journal possible.

Co-Editors-in-Chief, ***Light: Advanced Manufacturing***

Author details

¹Ministry of Science and Technology, Professor of Film Optics, State Key Laboratory of Applied Optics, CIOMP, Dong Nanhu Road 3888, Changchun, 130033, China. ²28865 Lilienthal, Germany. ³Center for Information Photonics & Communications, School of Information Science & Technology, Southwest Jiaotong University, Chengdu, Sichuan, 611756, China. ⁴Department of Materials Science and Engineering, Monash University, Clayton, VIC 3800, Australia

Published online: 17 April 2020