

# Preface

The 4th International Conference on Advanced Engineering Materials and Technology (AEMT 2014) was successfully taken place in Xiamen, China, on June 14–15, 2014, after the very successful previous issues AEMT'2011 (Sanya, China) , AEMT'2012 (Zhuhai, China) and AEMT'2013 (Zhangjiajie, China). All submitted papers are reviewed by the researchers with expertise that covered the range of topics presented at the conference. Only novel contributions to the field of engineering materials or manufacturing technology were considered for publication. After the standard review process by at least two reviewers, all accepted papers are included into the present volumes.

This book covers the subject areas of Nano Materials Science and Technology, Metals and Alloys, Steel Materials and Applications, Resin, Rubber and Polymer Materials, Optical/Electrical/Magnetic Materials and Technology, Ceramic Materials and Technologies, Composite Research and Applications, Fiber Materials, Chemical and Energy Materials and Technologies, Films Materials, Surface and Coating Research, Biomaterials and Applied Research, Environmental-Friendly Materials and Green Technologies, Materials Processing, Testing and Monitoring Technologies, Applied Mechanics, Building Materials and Construction Engineering.

We are sincerely grateful to the authors for the high scientific quality of papers and to the reviewers and editors for diligent and timely processing of the manuscripts. I wish to express my gratitude to all invited speakers who came to share their knowledge with us and provided the necessary volunteer time and expertise. We look forward to the next AEMT conference.

*The Committee of AEMT 2014*

The 4th International Conference on  
Advanced Engineering Materials and Technology  
(AEMT 2014)

## **Conference Organization**

### **Chairman**

Prof. Xianghua Liu, Northeastern University, China

### **Co-Chairman**

Prof. Yun-Hae Kim, Korea Maritime University, Korea

### **International Scientific Committee**

Prof. Liquan Ai, Hebei United University, China

Prof. Shuang Liu, Hebei University of Technology, China

Prof. Yinghua Liang, Hebei United University, China

Prof. Lichen Zhao, Hebei University of Technology, China

Prof. Jinglong Bu, Hebei United University, China

Prof. Daolun Chen, Ryerson University, Canada

Prof. Yongjin Chen, Kunming Univ. of Science of Technology, China

Prof. Weixing Chen, Xi'an Technological University, China

Prof. Jiwei Cai, Henan University, China

Prof. Wenbo Du, Beijing University of Technology, China

Prof. Huili Ding, Hebei University of Technology, China

Prof. Xianjin Yu, Shandong University of Technology, China

Prof. Ming Dong, Shanghai Jiao Tong University, China

Prof. Xiaoxing Feng, Hebei University of Technology, China

Prof. Jian Gao, Guangdong University of Technology, China

Prof. Jing Guo, Dalian Polytechnic University, China

Prof. Kai Gu, Beijing Institute of Petrochemical Technology

Prof. Yin Biao Guo, Xiamen University, China

Prof. Zhaohui Huang, China University of Geosciences, China

Prof. Junjie Hao, University of Science & Technology Beijing , China

Prof. Julong He, Yanshan University, China

Prof. Xingang Hou, Lanzhou Uinversity of Technology, China

Prof. Jingtao Han, University of Science & Technology Beijing , China

Prof. Xiaoming Jia, Hebei United University, China

Prof. Xiaolin Jia, Zhengzhou University, China

Prof. Zhenglian Jiang, Research Institute, Baosteel, China

Prof. Sihai Jiao, Research Institute, Baosteel, China

Prof. Shanqing Li, Research Institute, Baosteel, China

Prof. Xianghua Liu, Northeastern University, China

Prof. Jiacheng Liu, Tianjing University, China

Prof. Kaiqi Liu, Iron&Steel Reserch Institute, China

Prof. Yaqing Liu, North University of China

Prof. Jialu Li, Tianjin University of Technology, China

Prof. Yungang Li, Hebei United University, China

Prof. Dehong Lu, Kunming University of Science and Technology

Prof. Baochun Lu, Nanjing University of Science and Technology

Prof. Chenxu Lu, Insti. of Process Eng., Chinese Academy of Science

Prof. Yongcheng Lin, Central South University, China

Prof. Gaifei Peng, Beijing Jiaotong University, China

Prof. Dianli Qu, University of Science and Technology Liaoning

Prof. Junan Shen, Georgia Southern University, USA

Prof. Wenlei Sun, Xinjiang University, China

Prof. Junyou Shi, Qingdao University of Science&Technology,China

Prof. Zhiming Shi, Inner Mongolia University of Technology, China

Prof. Yi Shen, Hebei United University, China

Prof. Xiaoming Sang, Hebei United University, China

Prof. Xitang Wang, Wuhan University of Science and Technology

Prof. Jun Wang, Northeastern University, China

Prof. Qiang Wang, University of Jinan, China

Prof. Pengcheng Wang, Inner Mongolia University of Technology, China

Prof. Mingzhi Wang, Yanshan University, China

Prof. Jiuba Wen, Henan University of Science and Technology

Prof. Ming Wen, Hebei University of Technology, China

Prof. Kaiming Wu, Wuhan University of Science and Technology

Prof. Guoqing Xiao, xi'an University of Architecture and Technology

Prof. Peiyu Yan, Tsinghua University, China

Prof. Xiaoyan Yuan, Tianjin University, China

Prof. Shao Hui Yin, Hunan University, China

Prof. Rong Zhu, University of Science & Technology Beijing , China

Prof. AKM Nurul Amin, International Islamic University, Malaysia

Prof. Carlos Caceres, The University of Queensland, Australia

Dr. Chunsheng Lu, Curtin University of Technology, Australia

Dr. Dongbin Wei, University of Technology, Sydney, Australia

Prof. Geun Jo Han, Dong-A Univeristy, Korea

Dr. Gui Wang, The University of Queensland, Australia

Prof. Jong Kook Lee, Chosun University, Korea

Prof. Ken-ichi Manabe, Tokyo Metropolitan University, Japan

Prof. Jeng-Haur Horng, National Formosa University, Taiwan

Prof. Jia-Horng Lin, Feng Chia University, Taiwan

Prof. Indra Putra Almanar, Universiti Sains Malaysia

Prof. Kyung-Man Moon, Korea Maritime University, Korea

Prof. P. S. Pa, National Taipei University of Education, Taiwan

Prof. Sagar Kamarthi, Northeastern University, USA

Prof. Shahrum Abdullah, University Kebangsaan Malaysia, Malaysia

Prof. Toshio Haga, Osaka Institute of Technology, Japan

Prof. Walid Mahmoud Shewakh, Beni Suef university, Egypt

Prof. Yun-Hae Kim, Korea Maritime University, Korea

Dr. Yuentong Gu, Queensland University of Technology,

Prof. Yu-Shiang Wu, China University of Sci. and Tech., Taiwan

Prof. Heinz-Gunter, Brokmeier, Technische Universitat Clausthal, Germany

Prof. Zhengyi Jiang, University of Wollongong, Australia

Prof. Yun-Hae Kim, Korea Maritime University, Korea

Prof. Christian Kloc, Nanyang Technological University, Singapore

Prof. Jacques Noudem, CRISMAT laboratory, France