# **Preface**

Dear Distinguished Delegates and Guests,

On behalf of the conference organizing committees, it is a great pleasure to welcome you to 2019 International Conference on Functional Materials (ICFM 2019), held on September 4-6, 2019 in Sendai, Japan

Advanced functional materials have been received dramatic increase in their demand in research, development and applications. The aim of the International Conference on Functional Materials (ICFM 2019) is to overview the present status with historical background and to foresee the future trends in the field of functional materials. The ICFM 2019 covers wide-variety topics among state-of-the-art advanced materials science and technology, and especially focuses on the major categories including environmental materials, electronic materials and energy materials etc. The objective of ICFM 2019 is to bring together scientists, engineers, postgraduates and other professionals in the area of functional material science and engineering technology from all over the world. The ICFM 2019 conference provides a platform for the participants to exchange and to discuss recent progress, advances, and applications in the fields of functional materials and engineering etc. All the full papers have been blind peer-reviewed by at least two experts from the International program committees to ensure high quality. Only the selected papers were accepted and orally presented at the conference.

Finally, we would also like to express our sincere appreciation to all the members of the international advisory committees, the organizing committee, program committee, organization committee and stuffs, for their hard working to the successful ICFM 2019. It is expected that the proceedings will be an original and valuable contribution to the literatures in the functional materials field.

Finally, we hope you have a unique, rewarding and enjoyable experience at ICFM 2019 in Sendai, Japan.

Sincerely yours,

Prof. Shu Yin Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan September 4-6, 2019 Sendai, Japan

# **Committee**

## **Conference Chairs**

Shu Yin, Tohoku University, Japan LU Li, National University of Singapore, Singapore

# **Program Chairs**

Yamato Hayashi, Tohoku University, Japan Takahiro Yamada, Tohoku University, Japan Jiangfeng Ni, Soochow University, China

## **Publication Chairs**

Yusuke Asakura, Tohoku University, Japan Xuelin Lei, East China University of Science and Technology, China

## **Technical Committees**

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Meihua Xin, Huaqiao University, China

Mingchun Li, Huaqiao University, China

Tian Wu, Hubei University of Education, China

Chao-Ming Lin, National Chiayi University, Taiwan

Mohamed Abdel Kader Ismail El-Gelany, Curtin University Sarawak Malaysia, Malaysia

Razali Ismail, Universiti Teknologi Malaysia, Malaysia

Yong Zhao, Nazarbayev University, Kazakhstan

Harith Ahmad, University of Malaya, Malaysia

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Fazlena Hamzah, University Technology MARA, Malaysia

TeoMing Ting, Malaysian Nuclear Agency (Nuclear Malaysia) Bangi, Malaysia

Kim Yeow TSHAI, University of Nottingham Malaysia Campus, Malaysia

Hong Zhou, Waikato Institute of Technology, New Zealand

Ping Xiang, City University of Hong Kong, Hong Kong

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Nongluck Houngkamhang, King Mongkut Institute of Technology Ladkrabang, Thailand