

## Preface

It is our great pleasure to publish the proceedings of the 23rd Chitose International Forum on Science and Technology (CIF23) which was held successfully on September 28th and 29th. CIF23 has many scopes in the wide fields of science and technology, including material science, semiconductor integrated electronics, data science using artificial intelligence (AI), and data handling technology such as image sensing, digital signal processing, and numerical simulations. In addition, integrated fields of science and technology such as information and communication technology (ICT) systems and their related devices are also included in the scope. Moreover, this forum has recently focused on novel attractive interdisciplinary fields between science and technology such as bio-mimetics, photonics, robotics, and service science management and engineering (SSME).

This forum has been held annually from 1998, the year of the foundation of the Chitose Institute of Science and Technology. Due to the global outbreak of COVID-19, the forum had had to be postponed once, and it has restarted in 2021 by fully utilizing IT technology. In order to reduce close contacts and avoid crowding, the forum was held in a hybrid fashion with both onsite talks and real-time online lecture. The poster sessions were held in two ways, the one was through interactive online, and the other was pre-recorded poster presentations session that could be viewed on demand. We had three invited talks, eight oral, 20 interactive, and 18 VoD presentations.

Every presentation, except for the invited, was evaluated by multiple referees, and some of the excels were recommended to publish in the proceedings. The papers in this volume of proceedings were contributed from such authors. We hope these newly published scientific achievements will invite opportunities for next developments and future collaborations.

Finally, I would like to express my sincere thanks to all distinguished guest speakers for their stimulating presentations and discussion during the forum, to other presenters for their newest achievement, and to all the participants of CIF23. The symposium would not have been successful without the help of the many faculty members and staff members who worked hard to prepare the forum and manage the difficult task of a hybrid conference. Finally, I also thank the Photonics World Consortium (PWC) and Chitose city for their financial and logistical support.

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General Chair of CIF23