

### Welcome Words from Conference Chair

As Chair of the International Siberian Conference on Control and Communications I would like to welcome you at Tomsk State University of Control Systems and Radioelectronics.

The SIBCON has a long tradition as a high-quality conference that covers all aspects of devices and technologies for control and communications. This Conference is organized in an effort to facilitate a deeper interaction among experts, designers, device technologists in order to support a deeper discussion of the challenges of system integration.

The past conferences were held in Tomsk, Krasnoyarsk, Omsk, Astana, Moscow, each with an increasing number of participants. Following their success and based on suggestions from the Technical Program Committee members, this year the SIBCON has returned to Tomsk, a wonderful city with a unique legacy of history, science and culture.

An important part of the conference is its social side. Tomsk is one of most popular Siberian cities for traveling. We have planned some social events and a city tour for the participants. So I encourage you to explore Tomsk and get a taste of its rich history, culture and international cuisine. I would like to join the entire SIBCON team in wishing you an enjoyable and productive stay in Tomsk.

The Conference is sponsored by the IEEE Electron Devices Society and the Tomsk IEEE Chapter. I would like to express my deep appreciation to every contributor who helps hold the event to the highest international standard. My thanks go to the members of the Local Organization Committee – Alexander Medovnik, Inna Yarimova, Oleg Stukach for their excellent work in organizing this Conference. I have no doubt that their experience and advice that have gone into the SIBCON will lead the success of the Conference. I extend special gratitude to the subcommittee chairs, members and their affiliations of the International Program Committee. It is through their efforts that the SIBCON has received many submissions, and it is also with their contributions that the conference has succeeded in selecting the highest-quality papers. Many faculty members and students have volunteered to help in organizing the Conference. We take this opportunity to thank the Technical Program Committee members, the invited speakers, session organizers, session chairmen, reviewers, authors and sponsors in organizing such an event.

Finally, let me express the best wishes for success of the SIBCON, as well as for successes of the future SIBCON conferences in other regions and countries. I hope you enjoy this Conference and the friendships you make here, and hope you keep the Conference Proceedings in your library, which may be of use for you and your colleagues in your future research.

Welcome to the 2019 SIBCON and welcome to Tomsk!

General Chair  
Vice-Rector of TUSUR



V.M. Rulevskiy

## Welcome message from the Technical Program Committee Chair

Dear colleagues,

On behalf of the Tomsk IEEE Chapter & Student Branch it is my honor to invite you to the IEEE International Siberian Conference on Control and Communications SIBCON-2019. It is aimed to offers opportunities to exchange ideas, present results of ongoing researches and share information on the latest advance in communication and control system.

All the traditional SIBCON topics are very well covered. It is Communications, Control Systems, Internet of Things, Methods of Measurement, Networking Control, Process Control, The Computer Measurements, Theory of Control. Since 1995 SIBCON represents significant achievements in allied control and communications design and application area. The Conference provides unique opportunities for experts as well as leaders in technology, application, and business areas to gather in Tomsk and to exchange ideas and information.

Number of papers in all of those areas seems to be well balanced, which can be treated as a sign of maturity of the conference. A noticeable feature of this year's submissions is the large number of papers addressing 5G communications and related high frequency applications, reflecting the enormous significance of this sector.

This year papers are distributed over eight tracks all scheduled for two days. Different levels and characters of presentations are accepted: presentation of research and scientific results, new ideas, valuable conclusions from experience, state of the art and instructive survey communications.

The organizers expect this conference provided participants with an excellent opportunity to exchange ideas and information about their research findings, and to refresh personal contacts and establish new ones.

Tomsk is an education and research center of Siberia, where many high level universities and research institutions are located. We are convinced that if SIBCON is held in Tomsk, it will be an impetus to the development of electronics in Siberia, and there will be further increase of academic exchanges and cooperation between the Siberian radioengineers and their colleagues in other countries and regions. The SIBCON application has won active support from various foundations, and our conference will be able to raise enough funds. Gratitude is also deserved for RFBR, and the IEEE ED-S as a technical co-sponsors.

Please accept my highest salutation. I hope that you will enjoy the technical and cultural events prepared for you. Looking forward with the hope that you will accept our invitation, I remain friendly and sincerely yours,

Program Co-Chair



Oleg V. Stukach