

Guest Editorial

Special Issue on Plenary, Invited and Tutorial Papers from ICOPS 2022

The IEEE International Conference on Plasma Science (ICOPS) is an annual meeting of plasma physics researchers with an emphasis on various applications of plasma science and technology. This meeting is organized by the Plasma Science and Application Committee (PSAC) of the IEEE Nuclear and Plasma Sciences Society (NPSS).

The 49th ICOPS was held in Seattle, Washington State, from May 22-26, 2022. This is the first time the ICOPS was held in a hybrid format - in person at the Sheraton Grand Seattle with a virtual component. Over 500 presentations were accepted, representing scientists from over 30 countries. The ICOPS technical program included seven plenary talks, 239 oral presentations, including 29 invited presentations, and 194 poster presentations. The plenary talks were given by Dr. Thomas M. Antonsen, Jr. (University of Maryland), Dr. Christopher Deeney (University of Rochester), Dr. J. Gary Eden (University of Illinois at Urbana-Champaign), Dr. Carmen Guerra-Garcia (Massachusetts Institute of Technology), Dr. Ammar Hakim (Princeton Plasma Physics Laboratory), Dr. Omar Hurricane (Lawrence Livermore National Laboratory), and Dr. John P. Verboncoeur (Michigan State University).

The research presented at ICOPS highlighted the latest progress in seven broad areas of plasma science and applications. These included the following: 1) *basic processes in fully and partially ionized plasmas*; 2) *microwave generation and plasma interactions*; 3) *charged particle beams and sources*; 4) *high energy-density plasma applications*; 5) *industrial, commercial, and medical plasma applications*; 6) *plasma diagnostics*; and 7) *pulsed-power and other plasma applications*. Collectively, they represent a vast diversity from intriguing nanoscale plasmas formed at the tip of a nanostructure, through very large-scale fusion systems, to space plasmas. Applications of these diverse plasma systems are also wide ranging, including energy, coherent light sources, flat-panel displays, coatings, surface modification, microscopic fabrication, medicine, and biology. ICOPS also offered a Minicourse on Plasmas for Space Propulsion.

This special issue represents a collection of papers selected from the Plenary, Invited, and Tutorial Mini-Course presentations. As Guest Editors, we would like to thank all the authors who submitted their papers to this issue. We would also like to thank the referees of this issue for their timely, meticulous, and constructive reports that helped improve the papers. Our special appreciation goes to Editor-in-Chief Dr. S. Gitomer of the IEEE Transactions on Plasma Science for their guidance, assistance, and patience.

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