

Preface

The International Symposium on Nonequilibrium Processes, Combustion, and Atmospheric Phenomena has already become a notable biannual event attracting a growing attendance of experts from all over the world. The Symposium covers a variety of topics in combustion, plasma, and atmospheric pollution and is traditionally organized without any parallel session ensuring that the full benefit of the Symposium will be available to all participants. The main objective of the Symposium is to provide a forum for international experts to discuss novel approaches to combustion with high efficiency and low pollutant emission, to address the issues of combustion-generated pollutants and technogeneous aerosols, and application of plasma and combustion for production of nanoparticles and surface treatment.

The First Symposium was organized in St. Petersburg, Russia, July 8–11, 2003, and was dedicated to the memory of N. N. Semenov, a founder of the chain-branching reaction theory and a Nobel prizewinner. The Second and Third Symposia were held in Sochi, Russia, October 3–7, 2005, and June 25–29, 2007, respectively. The present, Fourth, Symposium we also organized in Sochi, Russia, October 5–9, 2009. Similar to the previous Symposia, the scope of this Symposium included fundamentals of combustion and detonation with the emphasis to emission problems, pollutant formation chemistry, in particular, formation of soot, chemi-ions, sulphur and nitrogen containing species, and polycyclic aromatics, physics and chemistry of exhaust related clusters and aerosols, including liquid aerosols, ice particulates, and charged particles, and assessments of accompanying environmental effects.

We are pleased with the response from the international scientific and technological community to our call for papers. There are 78 papers written by 230 scientists and engineers from 15 countries. We have carefully edited the submittals and properly distributed them to maintain the flow of the subject dealt with. With this in mind, the content of the Book is divided by 5 Parts:

Part 1: Elementary Processes

Part 2: Plasma

Part 3: Combustion

Part 4: Detonation

Part 5: Atmosphere

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We thank the members of the International Advisory Committee of the Symposium for their active participation in elaborating the technical program of the meeting, and to plenary speakers for their excellent presentations on the challenging issues of modern physics and chemistry. We are indebted to the Symposium participants for being a part of this endeavor in bringing the state-of-the-art of combustion, plasma, aerosol, and atmospheric science for fruitful discussions and dissemination.

Finally, we express our appreciation to the Russian Foundation for Basic Research, Department of Chemistry and Material Science of the Russian Academy of Sciences, N. N. Semenov Institute of Chemical Physics, P. I. Baranov Institute of Aviation Motors, and the Combustion Council of the Russian Academy of Sciences for continuous their support and sponsorship.

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