

Preface

The 9th International Symposium on Nonequilibrium Processes, Plasma, Combustion, and Atmospheric Phenomena was dedicated to the 90th anniversary of the P.I. Baranov Central Institute of Aviation Motors, the head organization of aerospace science and technology in the Soviet Union and Russian Federation. The Symposium was held in Sochi, Russia, on October 5 to 9, 2020. The traditional scope of the Symposium topics was:

- kinetics of elementary processes in plasma, combustion, and atmosphere;
- fundamentals of ignition and combustion of organic, metalized, and synthetic materials;
- physical and chemical processes in low-temperature plasma;
- physics of shock and detonation waves;
- ignition, combustion, and detonation in application to jet and internal combustion engines and power plants;
- novel combustion concepts including plasma-assisted and laser-induced combustion;
- physics and chemistry of high-speed gas flows;
- ignition and combustion of gaseous, liquid, and solid fuels in high-speed flows;
- novel physical and chemical propulsion concepts;
- physics of clusters and nanostructures;
- combustion, laser, and plasma generated aerosols and nanoparticles;
- plasma, laser, and combustion assisted technologies;
- gaseous and particulate pollutant formation and pollution control; and
- impact of pollutant emission on the atmospheric processes and climate.

Despite the apparent diversity of the topics and disciplines, they are very closely interrelated. This allowed us to group all submitted manuscripts of international experts in 6 chapters:

- Kinetics;
- Clusters and Nanostructures;
- Ignition and Combustion;
- Engines and Power Plants;
- Shocks and Detonations; and
- Technologies.

This book highlights the state-of-the-art in physics and chemistry of various nonequilibrium phenomena and contains extended bibliography. We have revised and thoroughly edited the contributions and made our best to place them in a logical order. For the sake of convenience, all contributions are accompanied by either English or Russian abstract depending on the language used in the article (Russian or English, respectively). The book also contains the Author index at the end which helps finding the contribution of interest based on the author's name. The authors' affiliations, addresses, and e-mails are also added so that further information can be readily obtained from them.

The Symposium and this volume are the outcome of hard work of several persons, and we highly appreciate their valuable contributions. In particular, we acknowledge the assistance of Ms. Olga Rein and Ms. Tatiana Mikhailova at various stages of Symposium preparation. We thank the staff of TORUS PRESS for their excellent service in organizing the conference and producing this volume.

Special thanks are due to academician O. N. Favorskii and Director General of CIAM M. V. Gordin for their kindly and persistent support of the Symposium. We thank the authors for their time and effort in preparing their manuscripts and participation in the Symposium. We do hope that this volume will serve as a useful addition to the literature on nonequilibrium phenomena.

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