

## Preface

The main content of this topical issue is formed from publications on results of investigations conducted by the research team of the Scientific School "Optical Spectroscopy of Molecules and Radiative Processes in the Atmosphere." These works are carried out within the framework of the priority direction "Urgent Problems of Optics and Laser Physics" including basic programs and integration projects of SB RAS, the DPS RAS Program "Optical Spectroscopy and Frequency Standards," initiative grants of RFBR, as well as international grants and projects. In the investigations, the School team implements the combined approach in development of high-resolution molecular spectroscopy and application of the obtained results to solution of problems of atmospheric optics, *in situ* and remote gas analysis, and optical radiation transfer in the atmosphere, which was formulated by Academician Vladimir Evseevich Zuev, the founder of the Institute of Atmospheric Optics SB RAS.

This topical issue presents the results of investigations in main fields of modern theoretical and experimental high-resolution and high-sensitivity molecular spectroscopy and their applications to atmospheric optics. Traditionally, the issue includes papers on spectroscopy of intermolecular interactions and the interaction of intense laser radiation with atoms and molecules. Some papers concern problems of diagnostics of minor gaseous constituents and molecular complexes in the atmosphere, optical radiation transfer, and development of databases on atmospheric spectroscopy.

Besides the papers on subjects of the Scientific School, the issue includes publications of leading research workers of the Institute of Atmospheric Optics devoted to the 50th jubilee of the Siberian Branch of the Russian Academy of Sciences. They reflect the state-of-the-art in some research fields, the Institute of Atmospheric Optics deals with, along with historic aspects of their development.

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