The interest in nonlinear optics was initially mostly related to practical applications of those findings, such as efficient frequency conversion of laser radiation in “nonlinear” crystals toward the visible and ultraviolet ranges. Later it became a useful method of study of the nonlinear optical response of the media during interaction with ultrafast laser pulses. Currently, it is a well-developed branch of optics where various nonlinear optical processes are studied in many laboratories worldwide.

The topics presented in this book are mostly concerned with experimental research of the nonlinear optical characteristics (such as nonlinear refraction and absorption) of various media, low- and high-order harmonic generation in different materials, and formation and nonlinear optical characterization of clusters. These topics became the area of interest from the very beginning of my career. The motivation in writing this book was based on my willingness to show the inter-connection between these areas of nonlinear optics and demonstrate the experimental achievements in this field.

I carried out these studies in collaboration with many researchers from Japan, India, Uzbekistan, France, Canada, Germany, Ukraine, United Kingdom, Russia, Spain, and other countries. The studies presented in this book are based on my collaboration with those researchers and could not be realized without their generous efforts. I would like to thank all of them for long lasting scientific ties and discussions of various aspects of nonlinear optics.

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