Preface

Photonics is a systematic science dealing with the photon generation and detection, as well as stimulated emission, photon frequency conversion and polarization change. The invention of laser in the middle of the last century was a great event for the development of photonics, in which photons are performed as the information and energy carriers. The photonics has been popularized recently, and indicates its rapidly escalating importance in the future. The exploration of new photonic materials, including photonic glasses, is a key issue for advance photonic devices.

Inorganic glasses have been used as optical materials for a long time due to their isotropy, hence to make the large size and high optical homogeneity more easily, and high transparency over a wide spectral range from ultraviolet to infrared, as well as linear functional properties. Therefore, inorganic glasses still play essential role in photonics used as transmitting and linear functional media for photonics. Since the emergence of lasers, transition element doped glasses have become one of the most important laser materials. The laser glasses, glass fibers and waveguides are still the main groups of solid state laser materials. The nonlinear optical effects of inorganic glasses are always happened with intense electromagnetic field, where as the glasses can perform the nonlinear optical functional roles. The interaction of ultra-short laser pulse with glass media produces a series of new optical phenomena, which can be applied in fabrication of new photonic devices. Inorganic glasses have also been developed from three dimensional (bulk materials) to low dimensional (thin films and fibers), which play a significant role

in photonic devices for optical data storage, optical communication, as well as optical processing and display.

Authors of this book have been actively engaged in this field and made notable contributions to the above mentioned subjects and published many papers in both domestic and international journals. An attempt was made in this monograph to summarize the research results in photonic glasses, which have been achieved by the authors' research groups in Shanghai Institute of Optics and Fine Mechanics and Fudan University mainly in recent 15 years, and to compile all experimental information from journals and proceedings in a book. It is not quite enough to select those chapters in this book for reflecting all aspects of photonic glasses due to imbalance for our research achievements. It might be possible to ignore some important subjects or contents due to the limit of the authors' knowledge and incomplete access to published materials. We hope that our readers, especially the photonics experts, will give us their valuable suggestions in order to make correction and complements for us in the next edition.

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