Because of the favorable characteristics of solid-state lasers, they have become the preferred candidates for a wide range of applications in science and technology, including spectroscopy, atmospheric monitoring, micromachining, and precision metrology. Presenting the most recent developments in the field, Solid-State Lasers and Applications focuses on the design and applications of solid-state laser systems.

With contributions from leading international experts, the book explores the latest research results and applications of solid-state lasers as well as various laser systems. The beginning chapters discuss current developments and applications of new solid-state gain media in different wavelength regions, including cerium-doped lasers in the ultraviolet range, ytterbium lasers near 1 μm, rare-earth ion-doped lasers in the eye-safe region, and tunable Cr²⁺:ZnSe lasers in the mid-infrared range. The remaining chapters study specific modes of operation of solid-state laser systems, such as pulsed microchip lasers, high-power neodymium lasers, ultrafast solid-state lasers, amplification of femtosecond pulses with optical parametric amplifiers, and noise characteristics of solid-state lasers.

Solid-State Lasers and Applications covers the most important aspects of the field to provide current, comprehensive coverage of solid-state lasers.

Features
• Provides an in-depth, up-to-date account of major advances in the field
• Covers both theoretical design principles and experimental realizations of systems
• Emphasizes real-world applications, such as microfabrication, ranging, and precision metrology
• Explores numerous novel solid-state materials that produce laser light in different parts of the electromagnetic spectrum, from ultraviolet to mid infrared
• Describes compact, cost-effective designs for the integration of various solid-state lasers into complete measurement and characterization systems
• Discusses the significant achievements in the generation and amplification of ultrashort optical pulses, from the femtosecond to nanosecond time scales