1. Record Nr. UNINA9910254624603321

Autore	Fattahi Hanieh
Titolo	Third-Generation Femtosecond Technology / / by Hanieh Fattahi
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2016
ISBN	3-319-20025-9
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (150 p.)
Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053
Disciplina	621.366
Soggetti	Lasers Photonics Quantum optics Optical materials Electronic materials Optics, Lasers, Photonics, Optical Devices Quantum Optics Optical and Electronic Materials
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	How to Amplify Photons -- Broadband Seed Generation -- Regenerative Amplifiers -- Experimental OPCPA -- Design of a Multi-Terawatt Field Synthesizer (LWS-Pro) -- Conclusion and Outlook.
Sommario/riassunto	This thesis offers a thorough and informative study of high-power, high-energy optical parametric chirped pulse amplifications systems, the foundation of the next generation of femtosecond laser technology. Starting from the basics of the linear processes involved and the essential design considerations, the author clearly and systematically describes the various prerequisites of the nonlinear optical systems expected to drive attosecond physics in the coming decade. In this context, he gives an overview of methods for generating the broadband and carrier-envelope-phase stable seed pulses necessary for producing controlled electric-field waveforms in the final system; provides a guide to handling the high-power, high-energy pump lasers required to boost the pulse energy to the desired operating range; describes the

design of the nonlinear optical system used to perform the amplification, including modes of operation for ultra-broadband infrared-visible pulses or narrowband (yet still ultrafast) pulses tunable over multiple octaves; and finally presents a prospective high-energy field synthesizer based upon these techniques. As such, this work is essential reading for all scientists interested in utilizing the newest generation of ultrafast systems.