Abstract

Research has shown that the properties of a light beam can be manipulated to perform ultrafast all-optical signal processing in the time domain. I will describe our work that uses nonlinear optics to create temporal lenses that can magnify, compress, and Fourier transform optical waveforms in the time domain and show that such manipulation can be extended to the quantum domain. Through use of more exotic lenses, temporal gaps in light beams can be opened and closed which can be used to cloak events over short periods of time.

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He is the David M. Rickey Professor of Applied Physics and Material Science at the University of Columbia. Gaeta received his Ph.D. in 1991 in Optics from the University of Rochester. He joined the faculty at the School of Applied and Engineering Physics at Cornell University in 1992, where he became the Samuel B. Eckert Professor of Engineering. Gaeta has published more than 200 papers which received more than 16,000 citations in the areas of integrated nonlinear optics, all-optical signal processing, nanophotonics, ultrafast nonlinear optics, and quantum effects in nonlinear optics. He is a Fellow of the Optical Society of America (OSA) and of the America Physical Society (APS) and is the founding Editor-in-Chief of Optica.