1. Record Nr. UNINA9910427684103321

| | |
|---|---|
| Autore | Zannotti Alessandro |
| Titolo | Caustic light in nonlinear photonic media / / Alessandro Zannotti |
| Pubbl/distr/stampa | Cham, Switzerland : , : Springer, , [2020]<br>©2020 |
| ISBN | 3-030-53088-4 |
| Edizione | [1st ed. 2020.] |
| Descrizione fisica | 1 online resource (XIII, 180 p. 70 illus., 59 illus. in color.) |
| Collana | Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053 |
| Disciplina | 535.32 |
| Soggetti | Caustics (Optics) |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Nota di contenuto | Introduction and Motivation -- Realization and Exploration of Structured Light and Photonic Structures -- Elementary Optical Catastrophes and Caustic-Based Photonic Structures -- Propagation-Invariant Caustics -- Caustic Networks and Rogue Waves -- Conclusion and Outlook. |
| Sommario/riassunto | Caustics are natural phenomena, forming light patterns in rainbows or through drinking glasses, and creating light networks at the bottom of swimming pools. Only in recent years have scientists started to artificially create simple caustics with laser light. However, these realizations have already contributed to progress in advanced imaging, lithography, and micro-manipulation. In this book, Alessandro Zannotti pioneers caustics in many ways, establishing the field of artificial caustic optics. He employs caustic design to customize high-intensity laser light. This is of great relevance for laser-based machining, sensing, microscopy, and secure communication. The author also solves a long standing problem concerning the origin of rogue waves which appear naturally in the sea and can have disastrous consequences. By means of a far-reaching optical analogy, he identifies scattering of caustics in random media as the origin of rogue waves, and shows how nonlinear light-matter interaction increases their probability. |