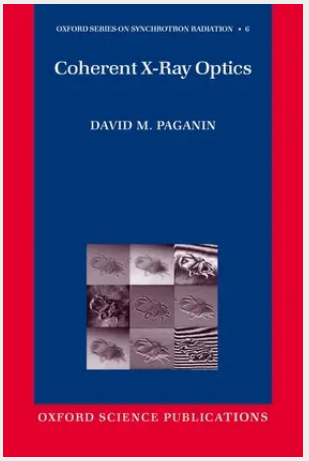
Paganin

Coherent X-Ray Optics

This book gives a thorough treatment of the rapidly-expanding field of coherent x-ray optics, which has recently experienced something of a renaissance with the availability of third-generation synchrotron sources. It is the first book of its kind. The author begins with a treatment of the fundamentals of x-ray diffraction for both coherent and partially coherent radiation, together with the interactions of x-rays with matter. X-ray sources, optics elements and detectors are then discussed, with an emphasis on their role in coherent x-ray optics. Various facets of coherent x-ray imaging are then discussed, including holography, interferometry, self imaging, phase contrast and phase retrieval. Lastly, the foundations of the new field of singular x-ray optics are examined. Most topics are developed from first principles, with numerous references given to the contemporary research literature. This book will be useful to x-ray physicists and students, together with optical physicists and engineers who wish to learn more about the fascinating subject of coherent x-ray optics.

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288,90 €
288,90 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9780198567288
Medium: Buch
ISBN: 978-0-19-856728-8
Verlag: OUP Oxford
Erscheinungstermin: 12.01.2006
Sprache(n): Englisch
Auflage: Erscheinungsjahr 2006
Produktform: Gebunden
Gewicht: 749 g
Seiten: 424
Format (B x H): 161 x 240 mm

Kundenservice Verlag Dr. Otto Schmidt KG
Neumannstraße 10, 40235 Düsseldorf | kundenservice@otto-schmidt.de | 0221-93738-997 (Inland)