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Autore	Scherer Kai Hermann
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Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction -- Theoretical Background -- Experimental Setup & Methods Development -- Bi-directional Phase-Contrast Mammography -- Screening Value of Phase-Contrast Mammography -- Microcalcification Assessment with Dark-Field Mammography -- Toward Clinically Compatible Phase-Contrast Mammography -- Non-invasive Kidney Stone Differentiation Using Dark-Field Radiography -- Summary & Outlook.
Sommario/riassunto	This thesis offers an accessible guide to biomedical phase-contrast imaging with over 20 radiographic illustrations. It focuses on research to improve radiography, and particularly mammography applications, by using a novel X-ray imaging modality that exploits the wave-nature of X-rays, rather than just their absorption in tissue. Further, it explores a broad range of potential applications – from the assessment of breast cancer and the evaluation of microcalcification clusters, to the examination of renal stones. X-ray imaging is an indispensable tool in

modern medical diagnostics, and ranges from simple radiography applications to advanced CT imaging protocols. This novel phase-contrast approach has the potential to deliver significantly improved diagnostic information, also and especially in cases where mammography is used for screening purposes. The thesis is based on several studies conducted by the author – working in close interdisciplinary cooperation with medical doctors at two university clinics in Munich – and successfully demonstrates this diagnostic potential in pre-clinical experiments.
