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【60】 XRnanotech - Nanostructured Diffractive Optics –New Opportunities at Short Wavelengths

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X-rays offer unrivaled insights into intricate samples with their high penetration and sensitivity, necessitating constant X-ray-optics advancement. Nanostructured-diffractive-optics, facilitated by recent nanotechnology, have catalyzed major scientific discoveries in premier research-facilities. Utilizing nanolithography techniques like electron-beam-nanolithography, two-photon polymerization, and direct laser writing, we've opened new doors in the field. This has led to the creation of transmission achromatic X-ray optics, ultra-high resolution zone plates, and blazed reflection gratings from materials like diamonds, metals, and 3D nanoprinted polymers. This offers wide-ranging X-ray energy efficiency and unique optical functionalities. We'll showcase recent developments, including high-resolution X-ray zone plates, silicon reflection gratings, and high-stability diamond gratings, demonstrating nanolithography's potential in enhancing X-ray research.

Theoretical Work

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