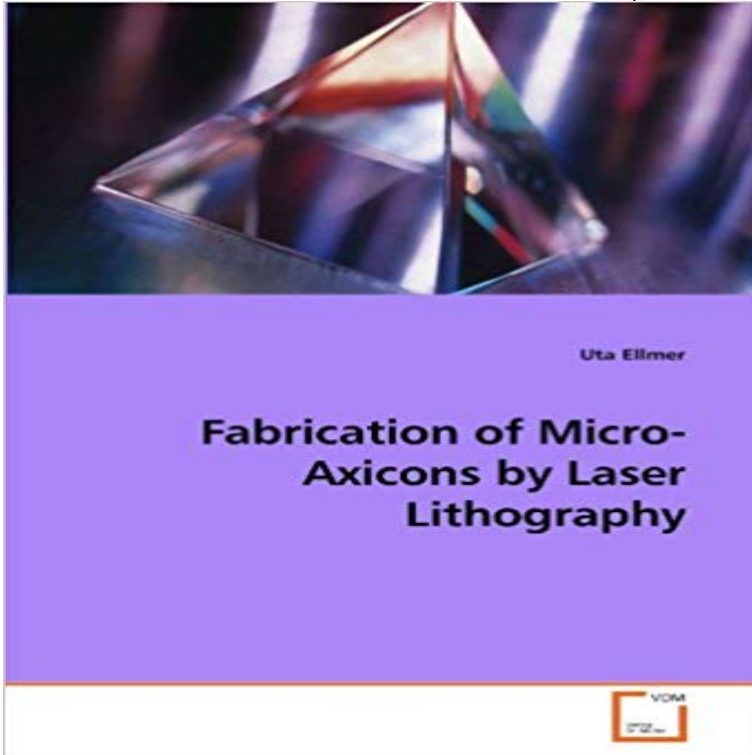


# Fabrication of Micro-Axicons by Laser Lithography



Axicons first appeared by this name in 1954, when all elements that focus light onto the axis were called axicons. The name axicon is a combination of the Greek words for axis and image. Cone shaped lenses are now commonly regarded as axicons. Their behavior and design possibilities are widely studied, yet primarily refractive axicons are used. The specific conical shape of the axicon makes them well suited for the generation of so-called Bessel beams. Lithography techniques have been developed, which allow for the manufacturing of arbitrary phase functions on planar substrates. Using this technology, a diffractive microaxicon can be manufactured if the necessary phase distribution is known. Therefore, a diffractive optical approach to axicons is suggested, which can be fabricated by using laser direct writing lithography. The manufactured structure is characterized by mechanical and optical surface measurements. The mainly observed manufacturing errors and the ideal profile are simulated. The simulated beam propagation is then compared to its experimental counterpart. The experimental results coincide reasonably well with the simulation.

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