From Process Understanding to Scalable Finishing: ZEISS Strategies for Next-Generation Laser-Based Optical Fabrication

In a presentation outlining its interests to the IOM, ZEISS seeks to advance laser-based manufacturing technologies for high-precision optical components by combining fundamental process understanding with application-oriented demonstrators. Central interests include the investigation of laser–material interaction mechanisms and their impact on surface quality parameters such as roughness and subsurface damage. Furthermore, ZEISS aims to exploit new design freedoms enabled by laser-based micro- and nanostructuring, for example by fabricating high-precision optical elements as functional demonstrators. Complementary research topics address the development of scalable, cost-efficient alternatives to established surface correction and polishing processes, with the goal of achieving deterministic, mid-spatial-frequency-free finishing suitable for industrial implementation.