CLAIMS

1. An optical lens comprising:

   a substrate; and

   a plurality of concentric rings on the substrate, the plurality of concentric rings comprising a dielectric;

   wherein the plurality of concentric rings comprises a focusing lens configured to focus light onto a focal spot and further comprises a modulation lens superimposed with the focusing lens, the modulation lens configured to decrease a size of the focal spot to below a diffraction limit of the light by interference of the focused light at a focal length of at least 600 μm;

   wherein the focusing lens comprises one or more focusing rings in a modified Fresnel zone-plate; and

   wherein the modulation lens comprises one or more modulation rings, the one or more modulation rings being fewer than the one or more focusing rings in the modified Fresnel zone-plate.

2. The optical lens according to claim 1,

   wherein the focal spot has a diameter of at most 0.515 of a ratio of a wavelength of the light to a numerical aperture of the optical lens.

3. The optical lens according to claim 1,

   wherein the focal spot has a diameter of at most 0.45 of a wavelength of the light.

4. The optical lens according to any one of claims 1 to 3,

   wherein the dielectric is quartz.

5. The optical lens according to any one of claims 1 to 4,

   wherein the substrate also comprises the dielectric.

6. The optical lens according to any one of claims 1 to 5,
wherein the substrate and the plurality of concentric rings form a single integral structure.

7. The optical lens according to any one of claims 1 to 6,
wherein the optical lens has an efficiency of 40%.

8. The optical lens according to any one of claims 1 to 7,
wherein the modulation lens is configured to decrease the size of the focal spot to below the diffraction limit of the light using optimization algorithms.

9. A method of forming an optical lens, the method comprising:
forming a plurality of concentric rings on a substrate, the plurality of concentric rings comprising a dielectric;
wherein the plurality of concentric rings comprises a focusing lens configured to focus light onto a focal spot and further comprises a modulation lens superimposed with the focusing lens, the modulation lens configured to decrease a size of the focal spot to below a diffraction limit of the light by interference of the focused light at a focal length of at least 600 μm;
wherein the focusing lens comprises one or more focusing rings in a modified Fresnel zone-plate; and
wherein the modulation lens comprises one or more modulation rings, the one or more modulation rings being fewer than the one or more focusing rings in the modified Fresnel zone-plate.

10. The method according to claim 9,
wherein the focal spot has a diameter of at most 0.515 of a ratio of a wavelength of the light to a numerical aperture of the optical lens.

11. The method according to claim 9,

wherein the focal spot has a diameter of at most 0.45 of a wavelength of the light.

12. The method according to any one of claims 9 to 11,
wherein the dielectric is quartz.

13. The method according to any one of claims 9 to 12,
wherein the substrate also comprises the dielectric.

14. The method according to any one of claims 9 to 13,
wherein the substrate and the plurality of concentric rings form a single integral structure.

15. The method according to any one of claims 9 to 14,
wherein the optical lens has an efficiency of 40%.

16. The method according to any one of claims 9 to 15,
wherein the modulation lens is configured to decrease the size of the focal spot to below the diffraction limit of the light using optimization algorithms.