**CLAIMS**

1. A waveguide, comprising:

a substrate, the substrate having a substrate depth defined by a top surface of the substrate and a bottom surface of the substrate, wherein the substrate depth varies across the waveguide;

an index layer disposed over the substrate, the index layer having a layer depth defined by an upper surface of the index layer and a lower surface of the index layer, wherein the layer depth varies across the substrate; and

a grating having optical device structures disposed on the upper surface of the index layer.

2. The waveguide of claim 1, wherein the substrate has a first refractive index and the index layer has a second refractive index, wherein the second refractive index matches the first refractive index or a difference between the first refractive index and the second refractive index is between about 0 and about 0.1.

3. The waveguide of claim 1, further comprising a material disposed between the grating and the substrate.

4. The waveguide of claim 3, wherein the material is substantially equal to a refractive index of the optical device structures.

5. The waveguide of claim 3, wherein the material is conformal to the upper surface of the index layer.

6. The waveguide of claim 3, wherein the material is infiltrated into the index layer to form an encapsulation material gradient.

7. The waveguide of claim 3, wherein the material is infiltrated into the index layer to form an encapsulation material gradient, wherein a concentration of the material in the encapsulation material gradient is higher where the index layer is furthest from the bottom surface of the substrate.

8. The waveguide of claim 1, wherein a portion of the optical device structures are angled relative to the bottom surface of the substrate.

9. The waveguide of claim 1, wherein a device height defined from the bottom surface to top surfaces of the optical device structures is constant.

10. The waveguide of claim 1, wherein the index layer is polymer material or a nanoparticle based material.

11. A method of forming an optical device, comprising:

disposing an index layer over a substrate, the substrate having a substrate depth defined by a top surface of the substrate and a bottom surface of the substrate, wherein the substrate depth varies across the optical device such that a lower surface of the index layer varies according to the substrate depth;

patterning the index layer, wherein the index layer and the substrate define a target thickness distribution that varies across the substrate;

disposing an optical device film over index layer; and

patterning a plurality of optical device structures in the optical device film, wherein adjacent structure top surfaces of the plurality of optical device structures are planar.

12. The method of forming an optical device of claim 11, wherein the patterning the index layer is via a gray-tone lithography process, wherein the gray-tone lithography process includes patterning a gray-tone resist with a resist thickness distribution that corresponds to the target thickness distribution.

13. The method of forming an optical device of claim 11, wherein the patterning the index layer includes an inkjet printing process, wherein the index layer is disposed via the inkjet printing process to have the target thickness distribution.

14. The method of forming an optical device of claim 11, wherein the patterning the plurality of optical device structures includes a nanoimprint lithography process.

15. A method of forming an optical device, comprising:

disposing an index layer over a substrate, the substrate having a substrate depth defined by a top surface of the substrate and a bottom surface of the substrate,

wherein the substrate depth varies across the optical device such that a lower surface of the index layer varies according to the substrate depth;

patterning index layer, wherein the index layer and the substrate define a target thickness distribution that varies across the substrate;

disposing an optical device film over the index layer; and

patterning a plurality of optical device structures in the optical device film, wherein adjacent structure top surfaces of the plurality of optical device structures are planar, wherein a device height defined from the bottom surface to each of the structure top surfaces is constant.

16. The method of forming an optical device of claim 15, wherein the patterning the index layer is via a gray-tone lithography process, wherein the gray-tone lithography process includes patterning a gray-tone resist with a resist thickness distribution that corresponds to the target thickness distribution.

17. The method of forming an optical device of claim 15, wherein the patterning the index layer includes an inkjet printing process, wherein the index layer is disposed via the inkjet printing process to have the target thickness distribution.

18. The method of forming an optical device of claim 15, wherein the patterning the plurality of optical device structures includes a nanoimprint lithography process.

19.The method of forming an optical device of claim 15, further comprising disposing an encapsulation material.

20. The method of claim 11, the substrate has a first refractive index and the index layer has a second refractive index, wherein the second refractive index matches the first refractive index or a difference between the first refractive index and the second refractive index is between about 0 and about 0.1.