CLAIMS

1. A method of fabricating a visible spectrum optical component, comprising:

providing a substrate;

forming a resist layer over a surface of the substrate;

patterning the resist layer to form a patterned resist layer defining openings exposing portions of the surface of the substrate;

performing deposition to form a dielectric film over the patterned resist layer and over the exposed portions of the surface of the substrate, wherein a top surface of the dielectric film is above a top surface of the patterned resist layer;

removing a top portion of the dielectric film to expose the top surface of the patterned resist layer and top surfaces of dielectric units within the openings of the patterned resist layer; and

removing the patterned resist layer to retain the dielectric units over the substrate.

2. The method of claim 1, wherein performing deposition includes performing atomic layer deposition.

3. The method of claim 1, wherein the substrate is a glass substrate.

4. The method of claim 1, wherein sidewalls of the openings of the patterned resist layer are substantially perpendicular to the surface of the substrate.

5. The method of claim 1, wherein the openings of the patterned resist layer have widths no greater than 400 nm.

6. The method of claim 1, wherein the openings of the patterned resist layer have a maximum width w_{max}, performing deposition includes depositing the dielectric film to a thickness t_{film} and filling the openings of the patterned resist layer, and $t_{film} \geq w_{max}/2$.

7. The method of claim 1, wherein performing deposition is carried out at a temperature below 115 °C.

8. The method of claim 1, wherein the dielectric film includes an oxide.

9. The method of claim 1, wherein removing the top portion of the dielectric film includes performing reactive ion etching.

10. The method of claim 1, wherein at least one of the dielectric units has a height of 100 nm or greater.

11. The method of claim 1, wherein at least one of the dielectric units has a width no greater than 100 nm.

12. A method of fabricating a metasurface, comprising:

providing a substrate and a patterned layer over the substrate, the patterned layer defining openings;

performing atomic layer deposition to deposit a conformal film over the patterned layer and extending into the openings of the patterned layer;

removing a top portion of the conformal film to expose top surfaces of metasurface units within the openings of the patterned layer; and

removing the patterned layer to retain the metasurface units over the substrate.

13. The method of claim 12, wherein performing atomic layer deposition includes depositing a dielectric material having an imaginary part of a refractive index no greater than 0.1 over the visible spectrum.

14. The method of claim 12, wherein performing atomic layer deposition includes depositing a dielectric material having a real part of a refraction index of at least 2 over the visible spectrum.

15. The method of claim 12, wherein the patterned layer includes a resist having a glass transition temperature, and performing atomic layer deposition is carried out at a temperature below the glass transition temperature of the resist.

16. The method of claim 12, wherein at least one of the metasurface units has an aspect ratio of at least 2:1.