CLAIMS

1. An optical stack, comprising a conductive film, the conductive film comprising:

at least one conductive nanostructure layer;

at least one substrate adjacent to the conductive nanostructure layer, wherein:

the conductive nanostructure layer comprises a plurality of conductive nanostructures and an insulating medium in which the plurality of conductive nanostructures are embedded, the plurality of conductive nanostructures are a plurality of metal nanostructures, and

a diffuse reflection of an incident light, as viewed from a same side of the optical stack as the incident light, is less than 6% of the incident light; and

an overcoat immediately overlying the conductive nanostructure layer; and

an undercoat immediately underlying the conductive nanostructure layer, wherein:

a refractive index of the overcoat is less than 1.35, which is less than a refractive index of the insulating medium, and

the refractive index of the insulating medium is less than a refractive index of the undercoat.

2. The optical stack of claim 1, wherein the insulating medium has a refractive index of less than 1.5.

3. The optical stack of claim 2, wherein the insulating medium is air.

4. The optical stack of claim 1, wherein individual nanostructures of the plurality of conductive nanostructures do not have an organic coating or have a low-index organic coating.

5. The optical stack of claim 1, wherein:

the insulating medium is HPMC,

the plurality of conductive nanostructures are silver nanowires,

a weight ratio of HPMC and the plurality of conductive nanostructures is about 1:1, and

the conductive nanostructure layer has a sheet resistance of less than 100 ohms/sq.

6. The optical stack of claim 1, wherein the optical stack is oriented such that the plurality of conductive nanostructures are more proximate to the incident light than the substrate.

7. The optical stack of claim 1, wherein the overcoat has a refractive index of 1.34, 1.33, 1.32, or 1.21.

8. The optical stack of claim 1, wherein the undercoat has a refractive index of at least 1.65.

9. The optical stack of claim 8, wherein the undercoat comprises TiO_2, polyimide, SiO_2, or ZnO_2.

10. The optical stack of claim 1, further comprising an outermost cover layer that is the most proximate to the incident light and has a refractive index of at least 1.7.

11. The optical stack of claim 10, wherein the outermost cover layer comprises TiO_2.

12. The optical stack of claim 1, wherein:

the conductive nanostructure layer defines a conductive region and a non-conductive region,

the conductive region has a first sheet resistance,

the non-conductive region has a second sheet resistance, and

the first sheet resistance is at least 10^3 more than the second sheet resistance.

13. The optical stack of claim 1, wherein the optical stack is oriented such that the substrate is more proximate to the incident light than the plurality of conductive nanostructures.

14. The optical stack of claim 13, wherein the undercoat has a refractive index of at least 1.65.

15. The optical stack of claim 14, wherein the undercoat comprises TiO_2, polyimide, SiO_2, or ZnO_2.

16. The optical stack of claim 13, further comprising an outermost cover layer that is the most proximate to the incident light and has a refractive index of at least 1.7.

17. The optical stack of claim 16, wherein the outermost cover layer comprises TiO_2.

18. The optical stack of claim 13, wherein:

the conductive nanostructure layer defines a conductive region and a non-conductive region,

the conductive region has a first sheet resistance,

the non-conductive region has a second sheet resistance, and

the first sheet resistance is at least 10^3 more than the second sheet resistance.

19. A display comprising the optical stack of claim 1 and an LCD module, wherein:

the optical stack and the LCD module define a space, and

the space is filled with an index fluid or a clear optical bonding material that has a reflective index of more than 1.

20. The optical stack of claim 1, wherein a weight ratio of the plurality of conductive nanostructures to the insulating medium is between 1:5-1:1.

21. The optical stack of claim 1, further comprising:

an outermost cover layer; and

a glass cover between the outermost cover layer and the overcoat, wherein a refractive index of the outermost cover layer is greater than a refractive index of the glass cover.

22. The optical stack of claim 21, wherein the glass cover is separated from the overcoat by an optically clear adhesive.

23. The optical stack of claim 21, wherein the outermost cover layer immediately overlies the glass cover.

24. The optical stack of claim 1, wherein the refractive index of the undercoat is greater than the refractive index of the substrate.

25. An optical stack, comprising a conductive film, the conductive film comprising:

at least one conductive nanostructure layer;

at least one substrate adjacent to the conductive nanostructure layer, wherein the conductive nanostructure layer comprises a plurality of conductive nanostructures and an insulating medium in which the plurality of conductive nanostructures are embedded;

an overcoat in contact with the conductive nanostructure layer; and

an undercoat in contact with the conductive nanostructure layer and spaced apart from the overcoat by the conductive nanostructure layer, wherein:

a refractive index of the overcoat is less than 1.35, which is less than a refractive index of the insulating medium,

the refractive index of the insulating medium is less than a refractive index of the undercoat, and

the plurality of conductive nanostructures are a plurality of metal nanostructures.

26. The optical stack of claim 25, further comprising:

an outermost cover layer; and

a glass cover between the outermost cover layer and the overcoat, wherein a refractive index of the outermost cover layer is greater than a refractive index of the glass cover.

27. The optical stack of claim 25, wherein a weight ratio of the plurality of conductive nanostructures to the insulating medium is between 1:5-1:1.