CLAIMS

1. An assembly comprising:

an antenna comprising a ridge reflector arranged along a plane; and

at least one electromagnetic wave source;

wherein the ridge reflector is configured to enhance an emission of the at least one electromagnetic wave source providing an electromagnetic wave signal to the antenna and further configured to direct the electromagnetic wave signal in a direction at least substantially perpendicular to the plane;

wherein the ridge reflector defines a space along the plane for allowing the electromagnetic wave signal to be directed in the direction at least substantially perpendicular to the plane;

wherein the ridge reflector comprises at least one of a dielectric material and a semiconductor material;

wherein the ridge reflector is a continuous structure surrounding the space; and

wherein the at least one electromagnetic wave source is located in the space defined by the ridge reflector.

2. The assembly according to claim 1,

wherein a refractive index of the ridge reflector is equal to or greater than 2.

3. The assembly according to claim 1,

wherein the electromagnetic wave signal comprises at least one selected from a group consisting of a visible light, an infrared light, a terahertz radiation, and a microwave radiation.

4. The assembly according to claim 1,

wherein the electromagnetic wave signal has a wavelength selected from a range of 400 nm to 3 μm.

5. The assembly according to claim 1, further comprising:

one or more nanostructures in the space.

6. The assembly according to claim 5,

wherein the one or more nanostructures are nanoparticles.

7. The assembly according to claim 5,

wherein each of the one or more nanostructures has a refractive index equal to or greater than 2.

8. The assembly according to claim 5,

wherein the one or more nanostructures comprise a semiconductor material.

9. The assembly according to claim 5,

wherein the one or more nanostructures comprise a dielectric material.

10. The assembly according to claim 5,

wherein the one or more nanostructures are a plurality of nanostructures.

11. The assembly according to claim 5,

wherein the antenna is further configured to direct the electromagnetic wave signal in a further direction opposite the direction; and

wherein the further direction is also at least substantially perpendicular to the plane.

12. The assembly according to claim 5,

wherein the ridge reflector has any one suitable shape selected from a group consisting of circle, a square, and a polygon.

13. The assembly according to claim 1, further comprising:

a substrate in contact with the antenna.

14. The assembly according to claim 1, further comprising:

a medium covering the antenna;

wherein the medium has a refractive index equal to or less than 2.

15. A method of forming an assembly, the method comprising:

providing an antenna comprising arranging a ridge reflector along a plane; and

providing at least one electromagnetic source;

wherein the ridge reflector is configured to enhance an emission of the at least one electromagnetic wave source providing an electromagnetic wave signal to the antenna and further configured to direct the electromagnetic wave signal in a direction at least substantially perpendicular to the plane;

wherein the ridge reflector defines a space along the plane for allowing the electromagnetic wave signal to be directed in the direction at least substantially perpendicular to the plane;

wherein the ridge reflector comprises at least one of a dielectric material and a semiconductor material;

wherein the ridge reflector is a continuous structure surrounding the space; and

wherein the at least one electromagnetic wave source is located in the space defined by the ridge reflector.

16. The method according to claim 15, further comprising:

providing one or more nanostructures in the space.