CLAIMS

What is claimed is:

1. A method to increase the amount of wave coupled into a side illuminated waveguide,
   said wave emitted by a source,
   said side illuminated waveguide being a wave collection waveguide,
   said collection waveguide having two terminal endfaces and a side surface between these two endfaces,
   said wave being incident at the side surface of the collection waveguide at an angle measured with respect to the normal direction of the side surface of said collection waveguide,
   a fraction of said wave being coupled inside the collection waveguide as a guided wave,
   said guided wave undergoing either total internal reflection and/or partial internal reflection,
   said guided wave propagating from its point of incidence to a photodetector located at one or both terminal endfaces,
   said photodetector measuring a higher intensity of the guided wave if compared to the intensity when said wave is incident at said side surface at an angle normal to the side surface of the waveguide.

2. A method according to claim 1 whereas said wave is one of an electromagnetic wave, an acoustic wave or a particle wave.

3. A method according to claim 1 whereas said collection waveguide guides an electromagnetic wave, an acoustic wave or a particle wave.

4. A method according to claim 1 whereas said collection waveguide is either a cylindrical optical fiber or a tapered optical fiber.

5. A method according to claim 1 whereas said wave is one of a collimated or a non-collimated wave.

6. A method according to claim 1 whereas said collection waveguide is mounted over a support, said support has one or more oblique holes,

said oblique hole has an inner wall that reflects said wave,
said oblique holes have a proximal and a terminal end,
said proximal end of the hole is facing said wave source,
said terminal end of the hole is facing said collection waveguide,
said wave is emitted by a source wave,
said wave propagates from proximal end of the hole towards its terminal end,
said wave is incident on the side surface of the collection waveguide at an angle.

7. A method according to claim 6 whereas the inner wall of said oblique hole is either polished or made of a material that reflects the wave.

8. A method according to claim 6 whereas said oblique hole is either cylindrical or conical.

9. A method according to claim 1 whereas said collection waveguide is mounted over a support,
said support has one or more illumination waveguides,
said illumination waveguide having a proximal and a terminal end,
said proximal end of the illumination waveguide is facing said wave source,
said terminal end of the illumination waveguide is facing said collection waveguide,
said wave is emitted by a source wave,
said wave propagates from the proximal end of the illumination waveguide towards its terminal end,
said wave is incident on the side surface of the collection waveguide at an angle.

10. A method according to claim 9 whereas the illumination waveguide is an oblique illumination waveguide.

11. A method according to claim 10 whereas the proximal end of the oblique illumination waveguide has a geometry to minimize coupling losses of the wave from the wave source.

12. A method according to claim 10 whereas the terminal end of the oblique illumination waveguide has a geometry to minimize internal reflection losses of the wave across said terminal interface.

13. A method according to claim 9 whereas the illumination waveguide is an upright illumination waveguide.

14. A method according to claim 13 whereas the proximal end of the upright illumination waveguide has a geometry to minimize coupling losses of the wave from the wave source.

15. A method according to claim 13 whereas the terminal end of the upright illumination waveguide has angular geometry to refract the wave towards the side surface collection waveguide to couple the wave towards the endface where the photodetector is located.

16. A method according to claim 9 whereas the illumination waveguide is an oblique illumination waveguide.

17. A method according to claim 13 whereas the terminal end of the oblique illumination waveguide has angular geometry to refract the wave towards the side surface of the collection waveguide at an angle and directed the endface of the collection waveguide where the photodetector is located.

18. A method according to claim 1 whereas said source of said wave has a geometry to increase the illumination angle of the collection waveguide.

19. A method according to claim 1 whereas said source has an inclination to increase the illumination angle of the collection waveguide.

20. A system for coupling light into a waveguide, comprising:

a light source configured to generate the light;

a collection waveguide comprising a side surface that is disposed between first and second ends of the collection waveguide;

wherein the light is guided to contact the side surface of the collection waveguide at an angle between 1 and 89 degrees with respect to the normal of the side surface of the collection waveguide; and

wherein the light is transmitted by one or more of (1) a hole that is disposed between the light source and the collection waveguide, (2) an illumination waveguide that is

disposed between the light source and the collection waveguide, and (3) by an unbound medium.

21. The system of claim 20, wherein the light comprises an electromagnetic wave, an acoustic wave, or a matter wave.

22. The system of claim 20, wherein the collection waveguide is an optical fiber.

23. The system of claim 20, wherein the light is transmitted by an illumination waveguide.

24. The system of claim 23, wherein the illumination waveguide is cylindrical or conical.

25. The system of claim 23, further comprising a support that is configured to house the illumination waveguide.

26. The system of claim 20, wherein the light is transmitted by a hole, and further comprising a strip that comprises the hole.

27. The system of claim 26, wherein the hole is angled from a top of the strip to a bottom of the strip.

28. The system of claim 20, further comprising a photo detector disposed proximal to the first end of the collection waveguide.

29. The system of claim 20, wherein the light is transmitted by the unbound medium,

30. The system of claim 29, wherein the unbound medium is air, a vacuum, and water.