CLAIMS

What is claimed is:

1. A wide spectrum light source comprising:

a housing with an aperture, said aperture adapted to emit light;

a plurality of light emitting diode (LED) sources mounted in said housing, said LED sources are arranged at different heights in said housing adapted to provide wide spectrum operation of said light source characterised in that:

said housing comprises a stepped base portion wherein lower efficiency LEDs are mounted on said stepped base portion at a height higher than higher efficiency LEDs, such that said lower efficiency LEDs are positioned closer to said aperture.

2. The wide spectrum light source as claimed in claim 1 wherein said stepped base portion provides a plurality of levels for mounting said light emitting diodes at different heights in said housing.

3. The wide spectrum light source as claimed in claims 1 or 2 wherein the lower efficiency LEDs are mounted in the centre of the housing for enhanced output coupling through the aperture.

4. The wide spectrum light source as claimed in any preceding claim wherein internal walls of the housing are coated with a reflective material.

5. The wide spectrum light source as claimed in any preceding claim wherein said stepped base portion is coated with a reflective material.

6. The wide spectrum light source as claimed in claims 4 or 5 wherein said reflective material comprises Barium Sulphate.

7. The wide spectrum light source as claimed in any preceding claim wherein said housing comprises a phosphorous coating.

8. The wide spectrum light source as claimed in any preceding claim wherein at least two LEDs comprise the same wavelength adapted to provide a smooth spectral profile or spectral balancing.

9. The wide spectrum light source as claimed in any preceding claim wherein the housing comprises a light mixing cavity adapted to provide spatially uniform light output at said aperture.

10. The wide spectrum light source as claimed in any preceding claim wherein the aperture comprises a narrow slit.

11. The wide spectrum light source as claimed in any preceding claim wherein said housing comprises a stepped pyramid shaped base, wherein each step provides an area for mounting said LEDs.

12. The wide spectrum light source as claimed in any of claims 2 to 11 wherein each step of said stepped base portion is angled to maximise the reflection in said housing.

13. A sensor comprising a wide spectrum light source as claimed in any of Claims 1 to 12.

14. A wide spectrum light source comprising:
a housing with an aperture, said aperture adapted to emit light;
a plurality of light emitting diode (LED) sources mounted in said housing, said LED sources are arranged at different heights in said housing adapted to provide wide spectrum operation of said light source characterised in that:

said housing comprises a reflector and a stepped portion wherein lower efficiency LEDs are mounted on said stepped portion at a height higher than higher efficiency LEDs, such that said lower efficiency LEDs are positioned closer to said reflector.

15. The wide spectrum light source as claimed in claim 14 wherein the reflector is adapted with a parabolic reflector surface and dimensioned to reflect light emitted from said LED sources and out through said aperture.