CLAIMS

1. An optical fiber ~~comprising:~~ formed from a preform having a void drilled therein, the optical fiber having been formed by heating the preform until viscous and drawing the viscous preform, the void defining a scattering structure in

~~———~~ a core region of the optical fiber~~comprising a scattering structure defined therein~~, the scattering structure being twisted about a longitudinal axis of the core region,

wherein the scattering structure is configured to scatter light propagating in the optical fiber out of the optical fiber.

2. The optical fiber as claimed in claim 1, wherein the scattering structure has a refractive index that is different from a refractive index of the core region.

~~3. The optical fiber as claimed in claim 1 or 2, wherein a void region is defined in the core region, the void region defining the scattering structure.~~

~~4~~3. The optical fiber as claimed in claim ~~3~~1 or claim 2, further comprising a material filled within the void ~~region~~ so that a refractive index of the scattering structure is different from a refractive index of the core region.

~~5~~4. The optical fiber as claimed in any one of claims 1 to ~~4~~3, wherein the scattering structure is transversely offset from a central axis of the core region.

~~6~~5. The optical fiber as claimed in claim ~~5~~4, wherein the scattering structure is twisted about the longitudinal axis with a transverse offset that is at least substantially constant.

~~7~~6. The optical fiber as claimed in claim ~~5~~4, wherein the scattering structure is twisted about the longitudinal axis with a transverse offset that is variable.

~~8~~7. The optical fiber as claimed in any one of claims 1 to ~~7~~6, wherein the scattering structure is twisted about the longitudinal axis with a twist period that is at least substantially constant.

~~9~~8. The optical fiber as claimed in any one of claims 1 to ~~7~~6, wherein the scattering structure is twisted about the longitudinal axis with a twist period that is variable.

~~10~~9. The optical fiber as claimed in claim ~~9~~8, wherein the twist period decreases, along a length portion of the core region, in a longitudinal direction away from at least one input region of the optical fiber.

~~11~~10. The optical fiber as claimed in any one of claims 1 to ~~10~~9, wherein a size of the scattering structure is variable.

~~12~~11. The optical fiber as claimed in any one of claims 1 to ~~11~~10, wherein a perimeter of the core region has a non-circular shape that is twisted about the longitudinal axis to define the scattering structure.

~~13~~12. The optical fiber as claimed in any one of claims 1 to ~~11~~10, comprising a structure defined in the core region, wherein a perimeter of the structure has a non-circular shape that is twisted about the longitudinal axis to define the scattering structure.

~~14~~13. The optical fiber as claimed in any one of claims 1 to ~~13~~12, wherein at least a portion of the optical fiber is externally twisted.

~~15~~14. The optical fiber as claimed in any one of claims 1 to ~~14~~13, further comprising a plurality of scattering agents configured to scatter the light propagating in the optical fiber out of the optical fiber.

~~16~~15. The optical fiber as claimed in any one of claims 1 to ~~15~~14, further comprising a plurality of spectral modifying agents configured to, in response to interaction with the light propagating in the optical fiber, emit a resultant light of a different wavelength.

~~17~~16. A lighting apparatus comprising:

a light source configured to provide a light; and

an optical fiber as claimed in any one of claims 1 to ~~16~~15, the optical fiber being configured for receiving the light for propagation in the optical fiber.

~~18~~17. A method for forming an optical fiber comprising:

drilling a preform to form a void;

heating the preform until viscous; and

drawing the viscous preform to form the optical fiber, the void defining a scattering structure in a core region of the optical fiber, wherein the drawing comprises twisting ~~a~~ the scattering structure ~~in a core region of the optical fiber~~ about a longitudinal axis of the core region, wherein the scattering structure is configured to scatter light propagating in the optical fiber out of the optical fiber.

18. The method as claimed in claim 17, the method comprising twisting the scattering structure by rotating the preform at a variable spinning rate.

19. The method as claimed in claim 17 or claim 18, the method comprising applying a pressure control to build positive pressure in the void.

20. The method as claimed in any one of claims 17 to 19, the method comprising drilling the preform to form a pair of voids.