CLAIMS

1. 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 the scattering structure 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 method as claimed in claim 1, the method comprising twisting the scattering structure by rotating the preform at a variable spinning rate.

3. The method as claimed in claim 1 or claim 2, the method comprising applying a pressure control to build positive pressure in the void.

4. The method as claimed in any one of claims 1 to 3, the method comprising drilling the preform to form a pair of voids.

5. The method as claimed in claim 1, the method comprising forming the optical fiber with the scattering structure which has a refractive index that is different from a refractive index of the core region.

6. The method as claimed in claim 1 or claim 5, the method further comprising filling a material within the void so that a refractive index of the scattering structure is different from a refractive index of the core region.

7. The method as claimed in any one of claims 1, 5 or 6, the method comprising transversely offsetting the scattering structure from a central axis of the core region.

8. The method as claimed in claim 7, the method comprising twisting the scattering structure with a transverse offset that is at least substantially constant.

9. The method as claimed in claim 7, the method comprising twisting the scattering structure with a transverse offset that is variable.

10. The method as claimed in claim 1 or any one of claims 5 to 9, the method comprising twisting the scattering structure about the longitudinal axis with a twist period that is at least substantially constant.

11. The method as claimed in claim 1 or any one of claims 5 to 9, the method comprising twisting the scattering structure about the longitudinal axis with a twist period that is variable.

12. The method as claimed in claim 11, the method comprising twisting the scattering structure with the twist period decreasing along a length portion of the core region in a longitudinal direction away from at least one input region of the optical fiber.

13. The method as claimed in claim 1 or any one of claims 5 to 12, wherein a size of the scattering structure is variable.

14. The method as claimed in claim 1 or any one of claims 5 to 13, wherein a perimeter of the core region has a non-circular shape, the method comprising twisting the perimeter of the core region about the longitudinal axis to define the scattering structure.

15. The method as claimed in claim 1 or any one of claims 5 to 13, wherein the optical fiber comprises a structure defined in the core region, wherein a perimeter of the structure has a non-circular shape, the method comprising twisting the perimeter of the structure about the longitudinal axis to define the scattering structure.

16. The method as claimed in claim 1 or any one of claims 5 to 15, wherein at least a portion of the optical fiber is externally twisted.

17. The method as claimed in claim 1 or any one of claims 5 to 16, the method further comprising including a plurality of scattering agents in the optical fiber, the plurality of scattering agents configured to scatter the light propagating in the optical fiber out of the optical fiber.

18. The method as claimed in claim 1 or any one of claims 5 to 17, the method further comprising forming the optical fiber with 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.