CLAIMS

1. A method for forming an optical fiber, wherein the method comprises:

providing a manufacturing intermediate having an elongate body and comprising an outer tube and a plurality of inner tubes, the plurality of inner tubes being arranged in the outer tube, the plurality of inner tubes being arranged in one or more ring structures around, and at least partially defining, an aperture extending through the elongate body along an axial dimension of the elongate body, a boundary of the aperture defining an internal surface of the manufacturing intermediate;

etching the internal surface of the manufacturing intermediate using an etching substance; and

drawing the manufacturing intermediate along the axial dimension so as to form the optical fiber, the optical fiber being a hollow-core anti-resonant-reflecting fiber comprising a plurality of anti-resonant elements formed from the inner tubes, wherein the dimensions of the manufacturing intermediate perpendicular to the axial dimension are reduced by a factor, wherein the factor is at least 10.

2. The method according to claim 1 wherein the plurality of inner tubes are arranged in a single ring structure around the hollow core so that each of the inner tubes is not in contact with any of the other inner tubes.

~~3. A method according to claim 1 or claim 2 wherein by drawing the manufacturing intermediate along an axial dimension the dimensions of the manufacturing intermediate perpendicular to the axial dimension are reduced by a factor, wherein the factor is at least 10.~~

~~4~~3. ~~A~~ The method according to any of the preceding claims wherein the etching of the internal surface of the manufacturing intermediate comprises a wet chemical etching process.

~~5~~4. ~~A~~ The method according to claim ~~4~~3 wherein etching of the internal surface of the manufacturing intermediate comprises one of liquid submerging, capillary filling, pressurized filling, or spray etching.

~~6~~5. ~~A~~ The method according to any of the preceding claims wherein the etching substance comprises one of HF, a mixture of HF and HNO_3, or KOH.

~~7~~6. ~~A~~ The method according to any of the preceding claims wherein the method is performed at room temperature.

~~8~~7. ~~A~~ The method according to any of claims 1 to ~~2~~3, or ~~5~~4 to ~~6~~7, wherein the etching of the internal surface of the manufacturing intermediate comprises a dry chemical etch.

~~9~~8. ~~A~~ The method according to any of the preceding claims further comprising etching an internal surface of one or more of the inner tubes of the manufacturing intermediate using the etching substance.

~~10~~9. ~~A~~ The method according to any of the preceding claims wherein the etching the internal surface of the manufacturing intermediate using an etching substance comprises preferentially etching one or more portions of the internal surface of the manufacturing intermediate which correspond to one or more portions of the optical fiber that, in use, have dominant contact or interaction with light propagating through the optical fiber.

~~11. A lithographic apparatus comprising an optical fiber formed according to the method of claims 1 to 10.~~