FIG. 11 shows a typical power profile as derived by such an aspheric surface, which could be on either the front or back surface of the lens. FIG. 11 illustrates a graph for aspheric multifocal lenses of % sphere distance vision as a function of % pupil, wherein the larger percentages of pupil correspond to larger radial distances up to a radius defining the outer circumference of the optic zone of the lens.

While several embodiments and variations of the present invention for concentric lens designs for astigmatism are described in detail herein, it should be apparent that the disclosure and teachings of the present invention will suggest many alternative designs to those skilled in the art.

What is claimed is:

1. A multifocus, concentric annular ring lens for astigmatic patients comprising:

a. said lens having a front surface and an opposite back surface;

b. one of the front and back surfaces defines a toric curve;

c. the other of the front and back surfaces defines a plurality of spherical concentric annular rings having at least one first spherical annular ring corresponding to the patient's basic distance spherical prescription Rx, and at least one second spherical annular ring corresponding to the patient's basic cylindrical prescription Rx, such that the multifocus toric lens is rotationally desensitized because of the enhanced depth-of-field provided by the plurality of concentric annular rings;

wherein the difference between the optical powers of the first and second spherical annular rings is less than 2.0 diopters.

2. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 1, wherein the at least one second spherical annular ring corresponds to a portion of the full cylindrical prescription Rx.

3. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 1, further including at least one third spherical annular ring corresponding to an intermediate optical power which is between the optical powers of the first and second annular rings.

4. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 1, wherein the concentric annular rings surround a central disc having the patient's basic spherical distance prescription Rx.

5. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 1, wherein the concentric annular rings are on the back surface of the lens.

6. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 1, wherein the lens is a contact lens.

7. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 1, wherein the lens is an intraocular lens.

8. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 1, wherein the lens is an intraocular lens.

9. A multifocus, concentric annular ring lens for astigmatic patients comprising:

a. said lens having a front surface and an opposite back surface;

b. one of the front and back surfaces defines a toric curve;

c. the other of the front and back surfaces defines a plurality of spherical concentric annular rings having at least one first spherical annular ring corresponding to the patient's basic distance spherical prescription Rx, and at least one second spherical annular ring corresponding to the patient's basic cylindrical prescription Rx, such that the multifocus toric lens is rotationally desensitized because of the enhanced depth-of-field provided by the plurality of concentric annular rings; and

d. said lens further including an aspheric surface superposed on the toric curve to enhance the depth-of-field effect of the lens.

10. A multifocus, concentric annular ring lens for astigmatic patients comprising:

a. said lens having a front surface and an opposite back surface;

b. one of the front and back surfaces defines a spherical or aspheric curve;

c. the other of the front and back surfaces defines a plurality of spherical concentric annular rings having at least one first spherical annular ring corresponding to the patient's basic distance prescription Rx, and at least one second spherical annular ring corresponding to the patient's cylindrical prescription Rx; and

d. at least one third spherical annular ring corresponding to an intermediate optical power which is between the optical powers of the first and second annular rings.

11. A multifocus, concentric annular ring lens for astigmatic patients comprising:

a. said lens having a front surface and an opposite back surface;

b. one of the front and back surfaces defines a spherical or aspheric curve;

c. the other of the front and back surfaces defines a plurality of spherical concentric annular rings having at least one first spherical annular ring corresponding to the patient's basic distance prescription Rx, and at least one second spherical annular ring corresponding to the patient's cylindrical prescription Rx; and

wherein the difference between the optical powers of the first and second spherical annular rings is less than 2.0 diopters.

12. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 11, wherein the at least one second spherical annular ring corresponds to a portion of the full cylindrical prescription Rx.

13. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 11, wherein the at least one first annular ring includes a central disc having the patient's basic spherical distance prescription Rx, at least one third annular ring encircles the central disc, and the at least one second annular ring encircles the third annular ring.

14. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 11, wherein the concentric annular rings are on the back surface of the lens.

15. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 11, wherein the one surface defines an aspheric curve to enhance the depth-of-field effect of the lens.

16. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 11, wherein the lens is a contact lens.

17. A multifocus, concentric annular ring lens for astigmatic patients as claimed in claim 16, wherein the lens is a soft hydrogel contact lens.

18. A multifocus, concentric annular ring lens for astigmatic patients comprising:

a. said lens having a front surface and an opposite back surface;

b. one of the front and back surfaces defines a spherical curve;

c. the other of the front and back surfaces defines a plurality of aspheric concentric annular rings having at