CLAIMS

1 A mass spectrometer comprising:

~~A~~an ion guide comprising:

an inlet having a first longitudinal axis;

a middle section; and

an outlet having a second longitudinal axis, ;

wherein the inlet, middle section and outlet together define an ion path, the first axis is substantially co-axial with the second axis, and the middle section is non-linear;

an ionization source to supply ions to the inlet of the ion guide;

an optical detector to receive ions from the outlet of the ion guide; and

a shroud surrounding the detector.

2. A mass spectrometer ~~An ion guide~~ according to claim 1, wherein at least a part of the middle section is offset from the first and second longitudinal axes.

3. A mass spectrometer ~~An ion guide~~ according to claim 2, wherein the offset is 4mm.

4 A mass spectrometer ~~An ion guide~~ according to any preceding claim, wherein at least a part of the middle section is V-shaped.

5. A mass spectrometer ~~An ion guide~~ according to any preceding claim, wherein the ion path of the inlet, middle section and outlet is of substantially the same diameter along its axial length.

6. A mass spectrometer ~~An ion guide~~ according to claim 5, wherein at least a part of the middle section is offset from the first and second longitudinal axes by a distance at least equal to said diameter.

7. A mass spectrometer ~~An ion guide~~ according to any preceding claim, comprising a plurality of electrodes.

8. A mass spectrometer ~~An ion guide~~ according to claim 7, wherein each electrode comprises an aperture.

9. A mass spectrometer ~~An ion guide~~ according to ~~any of claims 7 to 8~~ claim 7 or 8, further comprising a power supply for selectively providing a voltage to the plurality of electrodes.

10. A mass spectrometer ~~An ion guide~~ according to claim 9, wherein the power supply is configured to apply one or more transient or static DC voltages or potentials to the plurality of electrodes in order to urge ions axially or longitudinally along at least a portion of the ion path.

11. A mass spectrometer ~~An ion guide~~ according to any preceding claim, wherein the middle section is configured to substantially prevent a line of sight between the inlet and the outlet through the middle section.

~~12. A mass spectrometer comprising an ion guide according to any preceding claim, comprising at least an ionization source to supply ions to the inlet of the ion guide; and an optical detector to receive ions from the outlet of the ion guide.~~

~~13~~12. A mass spectrometer ~~A mass spectrometer~~ according to any preceding claim ~~12~~, wherein the ionization source includes at least one filament and/or creates light in use.

~~14~~13. A mass spectrometer ~~A mass spectrometer~~ according to any ~~of~~ preceding claim~~s 12 to 13~~, wherein the optical detector is a photomultiplier tube.

~~15. A mass spectrometer according to any of claims 12 to 14, further comprising a shroud surrounding the detector.~~

~~16~~14. A mass spectrometer ~~A mass spectrometer~~ according to any preceding claim ~~15~~, wherein the shroud comprises a housing having an aperture to receive ions to be detected therethrough.

15. A mass spectrometer according to claim 14, wherein~~, and~~ the optical detector has a detector inlet, wherein the detector inlet is arranged substantially co-axially with the aperture of the housing.

~~17. A shroud comprising a housing sized to receive an optical detector, wherein the housing comprises an aperture to receive ions to be detected therethrough.~~

~~18~~16. A mass spectrometer ~~A shroud~~ according to any preceding claim ~~17~~, wherein the shroud is comprised at least in part of PEEK.

~~19 A detector assembly comprising:~~

~~a shroud according to any of claims 17 and 18;~~

~~an optical detector arranged in the shroud, the optical detector having a detector inlet, wherein the detector inlet is arranged substantially co-axially with the aperture of the shroud.~~

~~20~~17. A mass spectrometer ~~comprising a detector assembly according to claim 19, further comprising at least:~~

~~an ion guide defining an ion path and having an outlet,~~ according to claim 14, wherein the outlet of the ion guide is arranged substantially co-axially with the aperture of the housing of the shroud.

~~21 A shroud comprising a housing sized to receive an optical detector, wherein the housing comprises an aperture to receive ions to be detected therethrough.~~

~~22. A shroud according to claim 21, comprised at least in part of PEEK.~~

~~23. A detector assembly comprising:~~

~~a shroud according to any of claims 21 and 22~~

~~an optical detector arranged in the shroud, the optical detector having a detector inlet, wherein the detector inlet is arranged substantially co-axially with the aperture of the shroud.~~

~~24. A mass spectrometer comprising a detector assembly according to claim 23, further comprising at least:~~

~~an ion guide defining an ion path and having an outlet, wherein the outlet of the ion guide is arranged substantially co-axially with the aperture of the housing of the shroud.~~