CLAIMS:

1. A self-contained particle detector comprising an enclosure formed in part by a transmission mode secondary electron emissive element, the enclosure defining an internal environment and an external environment, wherein the transmission mode secondary electron emissive element has an externally facing surface and an internally facing surface and is configured such that impact of a particle on the externally facing surface causes emission of one or more secondary electrons from the internally facing surface, wherein the electron emissive element comprises two or more discrete electron emissive sub-elements having a space formed therebetween such that a secondary electron which is emitted from one of the two or more sub-elements travels through the space to the other sub-element .

2. The self-contained particle detector of claim 1, wherein the transmission mode secondary electron emissive element has the structure and/or function of a transmission dynode.

3. The self-contained particle detector of claim 1 or claim 2, wherein each of the two or more electron emissive sub-elements has the structure and/or function of a transmission dynode.

4. The self-contained particle detector of any one of claims 1 to 3, wherein each of the two or more sub-elements is spherical or spheroid.

5. The self-contained particle detector of claim 4, wherein the electron emissive element is constructed in accordance with a microsphere electron multiplier.

6. The self-contained particle detector of any one of claims 1 to 5, wherein the enclosure prevents or inhibits the movement of a contaminant from the external environment to the internal environment.

7. The self-contained particle detector of any one of claims 1 to 6, wherein the enclosure comprises a walled structure, and the transmission mode secondary electron emissive element is substantially continuous with a wall of the walled structure.

8. The self-contained particle detector of any one of claims 1 to 7, wherein the enclosure forms a sealed or a substantially sealed arrangement.

9. The self-contained particle detector of any one of claims 1 to 8, comprising electron amplification means configured to amplify a secondary electron emitted from the transmission mode secondary electron emissive element.

10. The self-contained particle detector of claim 9, wherein the electron amplification means is an electron multiplier.

11. The self-contained particle detector of claim 10, wherein the electron multiplier is a discrete dynode electron multiplier, or a continuous electron multiplier, or a multi-channel continuous electron multiplier, or a cross-field detector (such as the magneTOF™), or a microchannel plate (MCP) detector.

12. The self-contained particle detector of any one of claims 9 to 11, comprising electron collection means in operable association with the electron amplification means.

13. The self-contained particle detector of claim 12, wherein the electron collection means is an anode.

14. The self-contained particle detector of claim 12 or claim 13, wherein the electron amplification means and the electron collection means are contained wholly within the enclosure.

15. A mass spectrometer comprising the self-contained particle detector of any one of claims 1 to 14.

16. A method for detecting a particle, the method comprising causing or allowing a particle to impact an externally facing side of a transmission mode secondary electron emissive element which forms part of an enclosure, and causing or allowing the transmission mode secondary electron emissive element to emit a secondary electron from an internally facing side of the transmission mode secondary electron emissive element, wherein the transmission mode

secondary electron emissive element which forms part of an enclosure is provided by the self-contained particle detector of any one of claims 1 to 14.