CLAIMS:

1. A particle detector having one or more electron emissive surfaces and/or an electron collector surface therein, the particle detector having a vacuum established thereabout and comprising an enclosure or part enclosure configured to facilitate establishing and/or maintaining a difference in the environments about (i) the electron emissive surface(s) and/or the electron collector surface and (ii) the environment immediately external to the detector, wherein the enclosure comprises one or more discontinuities, and the particle detector comprises means for interrupting a flow of a gas external the particle detector to internal the particle detector .

2. The particle detector of claim 1 configured so as to allow for user control of the environment about the electron emissive surface(s) and/or the electron collector surface such that the environment about the electron emissive surface(s) is different to the environment immediately external to the enclosure.

3. The particle detector of claim 1 or claim2, wherein the environment about the electron emissive surface(s) and/or the electron collector surface is different to the environment immediately external to the enclosure with regard to: the presence, absence or partial pressure of a gas species in the respective environments; and/or the presence, absence or concentration of a contaminant species in the respective environments.

4. The particle detector of any one of claims 1 to 3 that is configured to, or comprises means for, lowering the gas pressure internal the particle detector sufficient to alter the flow characteristics of the gas flowing external to internal the particle detector and/or from internal to external the particle detector.

5. The particle detector of any one of claims 1 to 4, wherein the enclosure is formed from a single piece of material.

6. The particle detector of any one of claims 1 to 5, wherein the enclosure comprises one or more discontinuities, and the particle detector comprises means for interrupting a flow of a gas external the particle detector into one or all of the one or more discontinuities.

7. The particle detector of claim 6, wherein at least one of the one or more discontinuities, or all of the one or more discontinuities, is/are dimensioned so as to limit or prevent entry of a gas external the particle detector into the particle detector.

8. The particle detector of claim 6 or claim 7, wherein at least one of the one or more discontinuities, or all of the one or more discontinuities, is/are positioned on the enclosure and/or orientated with respect to the particle detector so as to limit or prevent entry of a gas external the particle detector into the particle detector.

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9. The particle detector of any one of claims 6 to 8, wherein at least one of the one or more discontinuities, or all of the one or more discontinuities has a gas flow barrier associated therewith, the gas flow barrier configured so as to limit or prevent the linear entry of a gas external the particle detector into the particle detector.

10. The particle detector of claim 9, wherein the gas flow barrier comprise one or more walls extending outwardly from the periphery of the discontinuity.

11. The particle detector of claim 9 or claim 10, wherein the at least one of the gas flow barriers, or all of the gas flow barriers, is/are formed as a tube having an opening distal to the discontinuity, wherein the opening distal to the discontinuity is positioned on the tube and/or orientated with respect to the particle detector so as to limit or prevent entry of a gas external the particle detector into the particle detector.

12. The particle detector of any one of claims 1 to 11, comprising an internal baffle.

13. The particle detector of claim 12, wherein the internal baffle interrupts a line of sight through the particle detector.

14. The particle detector of any one of claims 1 to 13 in functional association with an off-axis input particle optic apparatus, wherein the off-axis input particle optic apparatus is configured to inhibit or prevent the stagnation of a gas about the particle detector.

15. The particle detector of claim 14, wherein the off-axis particle input optic apparatus is configured to allow the substantially free flow of a gas therethrough.

16. The particle detector of claim 13 or claim 14, wherein the off-axis particle input optic apparatus comprises an enclosure, the enclosure comprising one or more discontinuities positioned or orientated so as to prevent the stagnation of a gas about the particle detector and/or allow the substantially free flow of a gas therethrough.

17. The particle detector of any one of claims 1 to 16, wherein the gas flowing external to internal the particle detector and/or from internal to external the particle detector gas is a particle carrier gas.

18. The particle detector of claim 17, wherein the particle carrier gas is a residual particle carrier gas of a mass spectrometer.

19. The particle detector of any one of any one of claims 1 to 18, configured to, or comprising means for increasing the pressure internal the particle detector.

20. The particle detector of claim 19 that is configured to, or comprises means for, increasing the gas pressure internal the particle detector sufficient to alter the flow

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characteristics of the gas flowing external to internal the particle detector and/or from internal to external the particle detector.

21. The particle detector of any one of claims 1 to 20, wherein the one or more emissive surfaces are arranged to form an electron multiplier.

22. A mass spectrometer comprising the particle detector of any one of claims 1 to 21.

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