CLAIMS

1. A charged particle assessment tool comprising:

an objective lens array configured to project a plurality of charged particle beams onto a sample, the objective lens array defining a plurality of beam apertures through which respective ones of the charged particle beams can propagate toward the sample; and

a plurality of sensor units substantially surrounding respective ones of the beam apertures and configured to capture charged particles emitted from the sample.

2. A tool according to claim 1, wherein the sensor units have a circular outer perimeter, wherein the sensor unit has an area extending between the aperture and the perimeter of the sensor unit.

3. A tool according to claim 1 or 2 comprising a substrate provided at a downbeam-facing surface of the objective lens array and on which the sensor units are formed.

4. A tool according to claim 3 wherein the sensor units are configured to substantially fill the sample-facing surface.

5. A tool according to claim 3 or 4 wherein the sensor units are capture electrodes.

6. A tool according to any of the preceding claims further comprising a substrate provided at an upbeam-facing surface of the objective lens array and on which the sensor units are formed, preferably the sensor units are configured to face downbeam.

7. A tool according to any of the preceding claims, where the plurality of sensor units integrated into the objective lens.

8. A tool according to any one of claims 3 to 7 further comprising control circuitry formed in the substrate.

9. A tool according to claim 8 wherein the control circuitry comprises one or more of:

- an amplifier, e.g. a trans-impedance amplifier;
- an analog-to-digital converter;
- a data multiplexor;
- read-out gates.

10. A tool according to any one of claims 3 to 9 further comprising vias passing though the substrate.

11. A tool according to any of the preceding claims wherein each sensor unit comprises a plurality of sensor elements.

12. A tool according to claim 11, wherein the plurality of sensor elements divide each sensor unit radially.

13. A tool according to claim 11 or 12, wherein the plurality of sensor elements divide each sensor unit angularly.

14. A tool according to any of claims 10 to 13, wherein the sensor elements of a sensor unit together have an area extending between the aperture and a perimeter of the plurality of sensor units. .

15. A tool according to any of the preceding claims wherein the beam apertures may be arranged in a hexagonal array

16. An inspection method comprising:

emitting a plurality of charged-particle beams through a plurality of beam apertures of an objective lens array to a sample; and

capturing charged particles emitted by the sample in response to the charged-particle beams using a plurality of sensor units provided surrounding respective ones of the beam apertures, the sensor units having a circular perimeter and an area extending between the aperture and the perimeter of the sensor unit.

17. The inspection method of claim 16, further comprising generating detection signals by the sensor units, and preferably further comprising processing the detection signals by circuitry within a substrate that comprises the sensor units.

18. A charged particle assessment tool comprising:

an objective lens array configured to project a plurality of charged particle beams onto a sample, the objective lens array defining a plurality of beam apertures through which respective ones of the charged particle beams can propagate toward the sample; and

a plurality of sensor units substantially surrounding respective ones of the beam apertures

and configured to capture charged particles emitted from the sample , wherein the objective lens array is an electrostatic array objective lens.

19. The charged particle assessment tool of claim 18, wherein the objective lens array has at least two plates each with a plurality of holes or apertures.

20. The charged particle assessment tool of claim 18 or 19, wherein the sensor units have a circular outer perimeter and the sensor unit has an area extending between the aperture and the perimeter of the sensor unit.